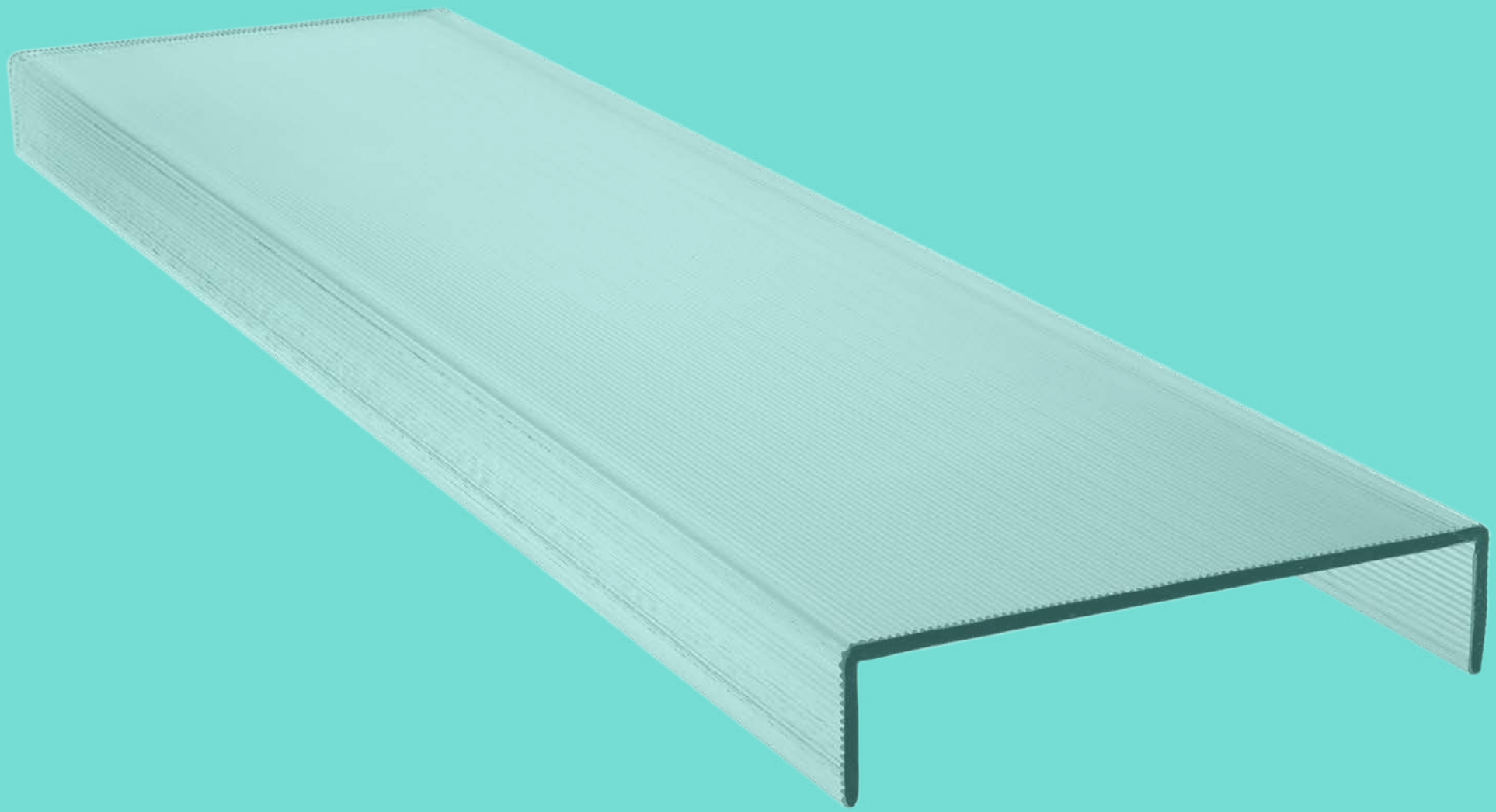
Expansive Curvilinear Glass Walls

CHANNEL GLASS

DESIGN WITH LIGHT | Channel Glass Wall Systems

BENDHEIM



“Imagine, instead of building walls of concrete,
building walls of light.”

— Robert Jayson, President

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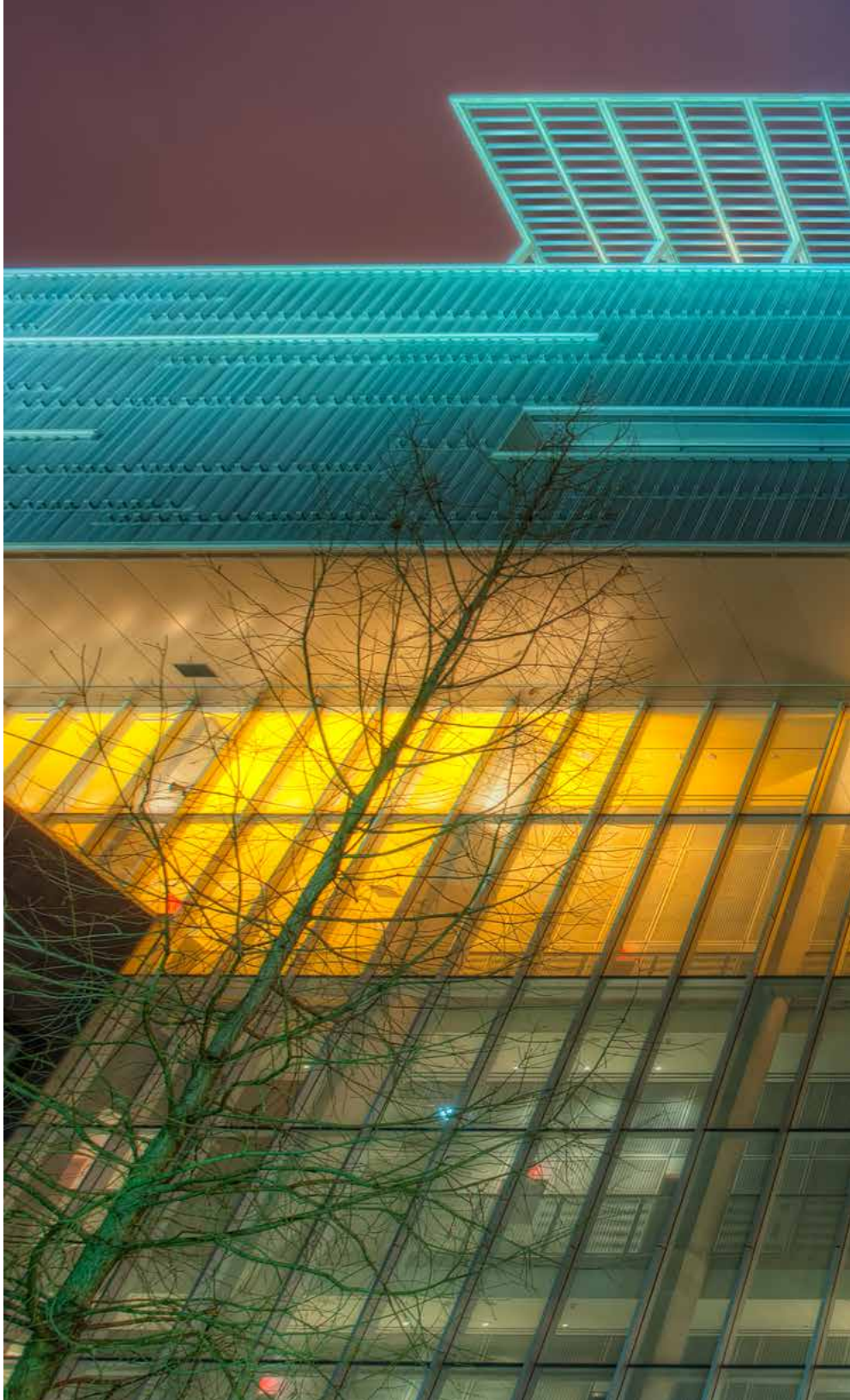


Shaw Center for the Arts, Baton Rouge, LA by Schwartz Silver Architects and Eskew+Dumez+Ripple. Photo by Timothy Hursley.

DESIGN WITH LIGHT

Bendheim's U-shaped Lamberts® channel glass creates walls of light – with depth and profile unachievable through conventional flat glass. It offers a stunning alternative to traditional opaque building walls and flat architectural glass alike. Its ability to create seamless walls of glass in tremendous sizes and proportions is virtually unsurpassed.

- Creates virtually seamless glass walls that can be hundreds of feet long and can span across elevations
- Stands as tall as 23 ft. (7 m) in a relatively lightweight 1/4" (6 – 7 mm) thickness, facilitating design & installation
- Requires minimal framing, creating a uniform appearance with clean design lines
- Effortlessly forms serpentine curves and glass-to-glass corners
- Excellent acoustic performance: reaches STC 43 – better than 4.5" (114 mm) batt-insulated interior stud wall
- All the benefits of daylight – with an added sense of privacy – in a range of light-diffusing, anti-glare textures
- Bird-friendly tested and certified
- Low CO_2 footprint: produced using Lamberts' oxygen-fueled glass-melting furnace, in 100% renewable-electricity-run plant, and with up to 40% post-consumer recycled content (EPD at bendheim.com/channel-glass)

Bronx Library by Richard Dattner & Partners. Photo by Denis Fennin.

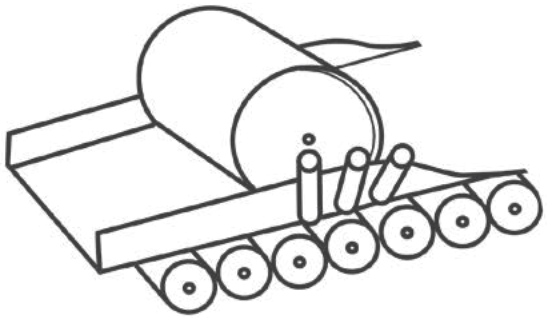
IDEAL APPLICATIONS FOR CHANNEL GLASS

Light-diffusing Lamberts® channel glass allows large amounts of natural light to enter the space, while simultaneously controlling it during the day. It is ideal for buildings that require high levels of daylight and where visual transparency is not a necessity. Look to channel glass if the project meets 1 or more of these conditions:

Project calls for:		Channel glass delivers:
	High-quality, diffused daylight is key – many times more desirable than perfectly clear views	VLT ≤ 77%
	There is an opportunity for large glazed openings – long runs of glass up to 23 ft. tall	Cont. length ≤ 23 ft.
	Glazed walls feature curves or glass-to-glass corners	Curve radius ≥ 7 ft.
	There are structural weight limits on the building	Weight ≤ 5.25 lbs/ft²
	The glass has to meet high thermal performance targets	U-Value ≥ 0.19
	Exterior glass walls to offer combined thermal & acoustic insulation	OITC ≤ 36
	Interior walls that provide daylight together with acoustic & visual privacy	STC ≤ 43
	The site is tight or does not allow the use of heavy installation equipment	As few as 3 installers

HOW IT'S MADE

Our channel glass' basic ingredients are sand, limestone, soda ash, and a high percentage of post-consumer recycled glass. The mix is combined in an oxygen-fired melting furnace and emerges from it as a ribbon of molten glass. It is then drawn over a series of steel rollers and formed into a U-shape. The steel rollers imprint a texture in the glass surface. The resulting U-glass ribbon is cooled and hardened, creating a continuous glass channel of the specified dimensions and surface finish. The channel is carefully annealed (control-cooled) and cut to the desired length prior to final processing and shipping.



Pictured here: Shaw Center for the Arts, Baton Rouge, LA by Schwartz Silver Architects and Eskew+Dumez+Ripple. 40,000 ft^2 rainscreen features 40% post-consumer recycled 504 Rough Cast™ channel glass, installed with the flanges facing out to add texture to the facade. Photos by Timothy Hursley.

Nelson-Atkins Museum of Art, Kansas City, MO by Steven Holl Architects and BNIM Architects.

GLASS DIMENSIONS

- Length: up to 23 ft. (7 m), depending on wind loads
- Widths: range 9" to 19.5" (230 – 480 mm); custom widths available for large projects
- Flange depth: 1.6" (41 mm) for interior use and 2.4" (60 mm) for exterior/interior use
- Thickness: 0.24" (6 mm) for interior use and 0.28" (7 mm) for exterior/interior use

GLASS MATERIAL OPTIONS

- Ultra-brilliant low-iron glass with **15-25%** post-consumer recycled content (see Nelson-Atkins Museum of Art on the left)
- Standard glass with **30-40%** post-consumer recycled content (see University of Iowa on the right)

GLASS SAFETY OPTIONS

- Standard (non-safety)
- Tempered safety (meets ANSI Z97.1 & CPSC 16CFR 1201 safety requirements)

APPROX. WEIGHT

- 4-5 lbs/ft² (20-25 kg/m²) single-glazed
- 8-10 lbs/ft² (40-50 kg/m²) double-glazed

LIGHT TRANSMISSION (APPROX. VLT, DOUBLE-GLAZED)

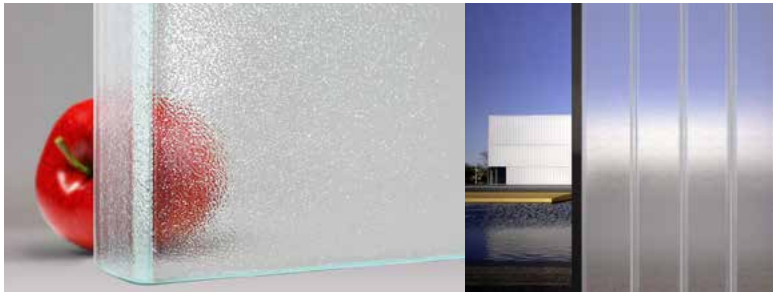
- Uncoated channel glass: **72%**
- Low-e channel glass: **64%**
- Low-e & insulated channel glass: **37%**

CUSTOMIZATION

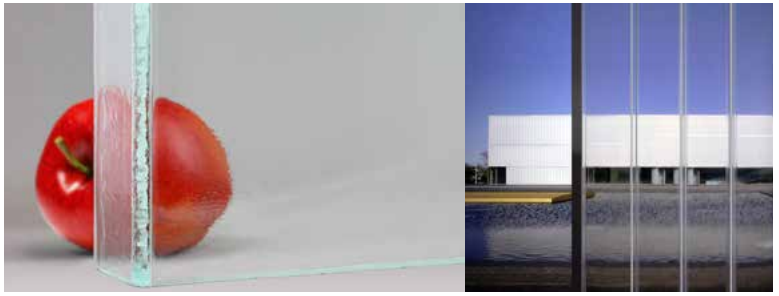
- Custom sizes: custom channel widths & flange lengths available for large projects
- Custom colors: hundreds of colorfast, scratch resistant, translucent & opaque fritted glass colors
- Enhanced privacy options: sand-blasted or fritted Dura-Etch® (simulated acid etch) back surface

University of Iowa Visual Arts Building by Steven Holl Architects

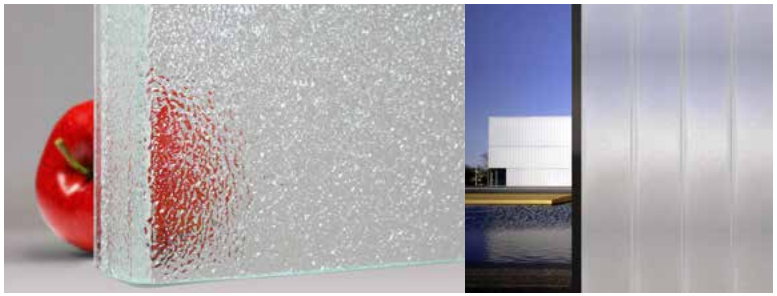
GLASS TEXTURES



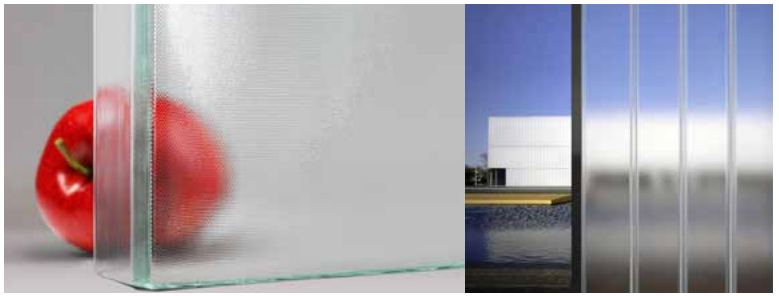
504 Rough Cast™



Clarissimo™



Ice™ (proprietary texture)



Solar™ (proprietary texture)

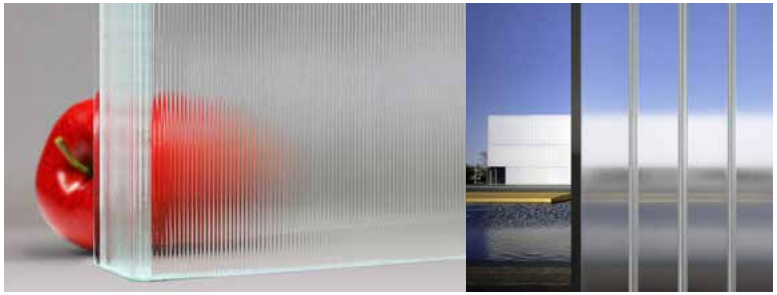
COLORS, PERFORMANCE COATINGS & THERMAL INSULATION

Color Frits

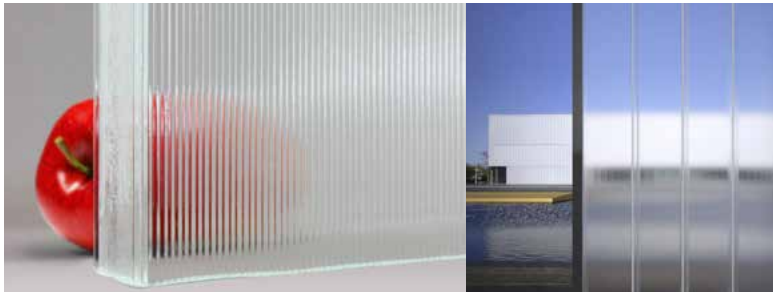
Hundreds of Opaque & Translucent Colors

Low-E Thermal Performance Coating

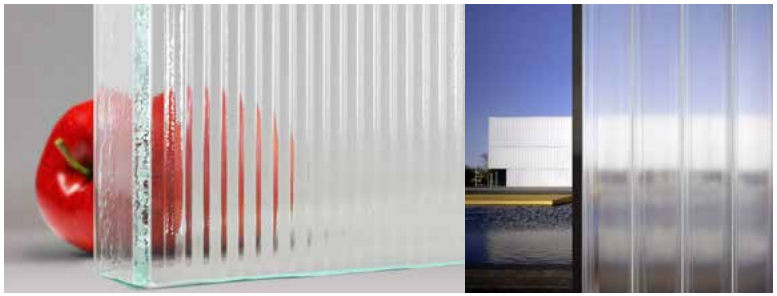
Iridescent Aesthetic, U-Value of 0.41



Houdini™ (proprietary texture)



Piccolo®



Prismasolar™ (proprietary texture)

Moire™ (proprietary texture)

Azur (SHGC) Thermal Performance Coating

Blue-Grey Aesthetic, SHGC of 0.56

Wacotech™ Thermal Insulation Material (TIM)

Translucent White Aesthetic, U-value of 0.25

VISUAL PRIVACY & CONTROLLED DAYLIGHT

https://youtu.be/4sLcBNOws18

Ultra-private Houdini™ channel glass features a heavily obscuring micro-fluted texture, delivering the highest level of privacy, while allowing maximum daylight.

Channel glass creates uninterrupted walls of glass with minimal framing, making it ideal for daylighting applications. Channels of various textures and/or fritted colors can be set in the same frame to create a dynamic sense of privacy, forming translucent walls that seamlessly transition from relatively see-through to opaque.

LIGHT TRANSMISSION OF DOUBLE-GLAZED CHANNEL GLASS WALLS:

Double-Glazed Channel Glass Wall	Approx. VLT
Uncoated	**72%**
Low-E Coating on #2 Surface	**64%**
Low-E Coating on #2 Surface + Insulation Inserts	**37%**

TEXTURED SURFACES AND INSULATION INSERTS ACT AS

BUILT-IN DAYLIGHT CONTROL DEVICES

University of Houston Blaffer Art Museum, Houston, TX by Work AC

THERMAL PERFORMANCE

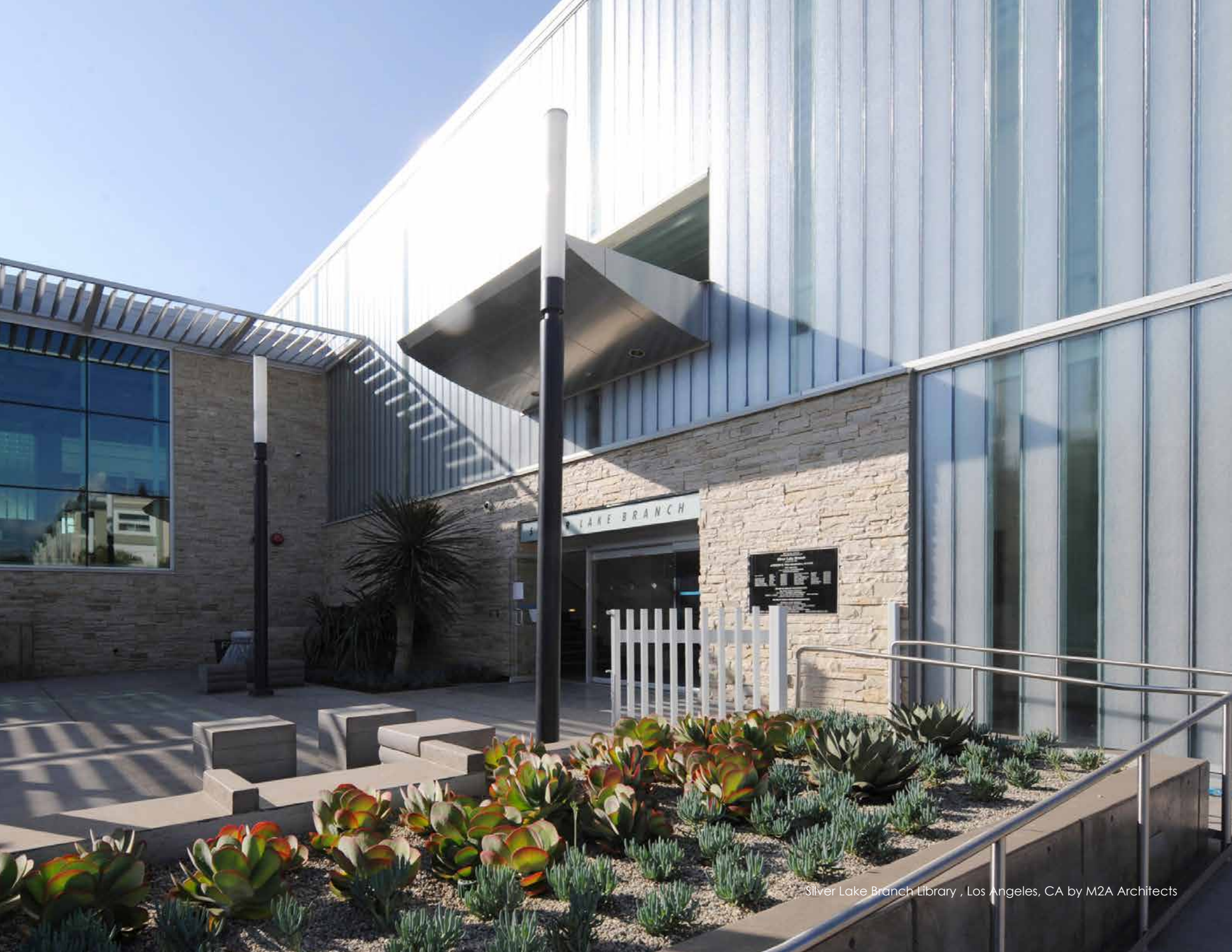
https://youtu.be/NNcp2Poktzl

Case study of Silver Lake Branch Library, Los Angeles, CA by M2A Architects.

The highest thermal performance can be achieved using Low-E coating on glass surface #3, Azur SHGC coating on surface #2, and a thermal insulation material (TIM) in the cavity of a double-glazed channel glass wall. This combination, together with Bendheim's thermally broken framing system, was used on Silver Lake Branch Library in Los Angeles, CA.

	No Insulation				With Thermal Insulation			
Exterior Glass	**Uncoated**	**Low-E**	**Azur**	**Low-E**	**Uncoated**	**Low-E**	**Azur**	**Low-E**
Interior Glass	**Uncoated**	**Uncoated**	**Uncoated**	**Azur**	**Uncoated**	**Uncoated**	**Uncoated**	**Azur**
VLT	72%	64%	53%	48%	39%	37%*	36%*	35%*
SHGC	0.66	0.61	0.56	0.53	0.43	0.41*	0.40*	0.39*
U-Value	0.49	0.41	0.52	0.42	0.25	0.19*	0.21*	0.17*
R-Value	2.04	2.44	1.92	2.38	4	5.26*	4.76*	5.88*

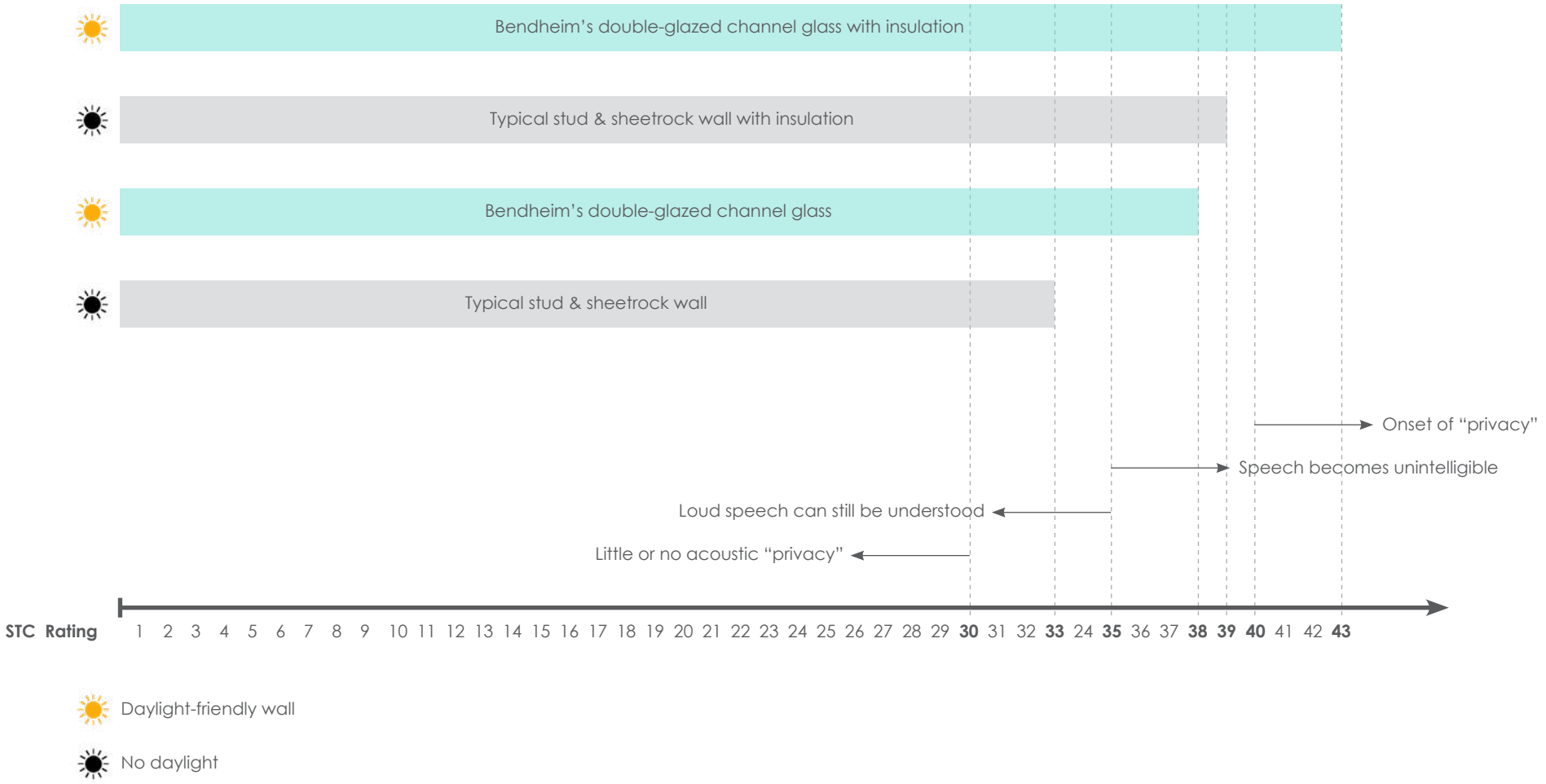
*calculated



Silver Lake Branch Library , Los Angeles, CA by M2A Architects

ACOUSTIC PRIVACY

4.5" (114 mm) daylight-friendly double-glazed channel glass walls provide outstanding acoustic benefits. Our silicone-sealed interlocking channel glass systems without insulation are projected to deliver STC 38. With added insulation inserts, the systems can deliver **STC up to 43** (for interior walls) and **OITC up to 36** (for exterior walls). Note that STC 40 is considered the "onset of acoustic privacy" (speech becomes inaudible through the wall). In comparison, Sheetrock-clad interior stud walls of the same thickness offer lower STC 33 without insulation and STC 39 with fiberglass insulation; they are also completely opaque to light.



Museum of the Bible, Washington, D.C. by SmithGroup JJR, Photos By Alex Fradkin.

SUSTAINABILITY

https://youtu.be/Cr_u9z4j_RI

Our Lamberts® glass is the first channel glass to be tested and certified Bird-Smart by the American Bird Conservancy (ABC), the preeminent authority on avian-friendly architecture. Testing was carried out at the Pennsylvania Powdermill Nature Reserve flight tunnel facility in conjunction with the Carnegie Museum of Natural History. No birds were harmed during testing.

AMERICAN BIRD CONSERVANCY
TESTED EFFECTIVE
birdsmartglass.org

TOP 10
GREEN BUILDING PRODUCT

BY SUSTAINABLE INDUSTRIES MAGAZINE

LAMBERTS & BENDHEIM | ECO-SMART PARTNERSHIP:

- High-performance assemblies – featuring thermal coatings, insulation and thermally broken frames – maximize the energy performance (U-Value of **0.19+**)
- A variety of glass textures to maximize natural light and views, minimize glare, and reduce daytime lighting costs (VLT up to **72%**)
- Standard glass with **30-40%** post-consumer content and ultra-brilliant low-iron glass with **15-25%** post-consumer recycled content
- Produced using an oxygen-fueled glass-melting furnace and 100% renewable electricity
- Demonstrably lower **CO_2 footprint** than most traditional curtain walls, please see EPD at bendheim.com/channel-glass
- Bird-friendly tested and certified

Sarah Lawrence College Heimbold Visual Arts Center, Bronxville, NY by Polshek Partnership. Photo by Richard Barnes.

AESTHETICS | GLASS CURVES & CORNERS

Bendheim's self-supporting U-shaped Lamberts® channel glass creates walls with a depth and profile unachievable through conventional flat glass, including budget-friendly curves and glass-to-glass corners.

- Curved channel glass walls, min. radius = 7 ft. (2 m)
- No interim metal supports
- No need for expensive custom glass bending – frames are curved, channel glass is segmented

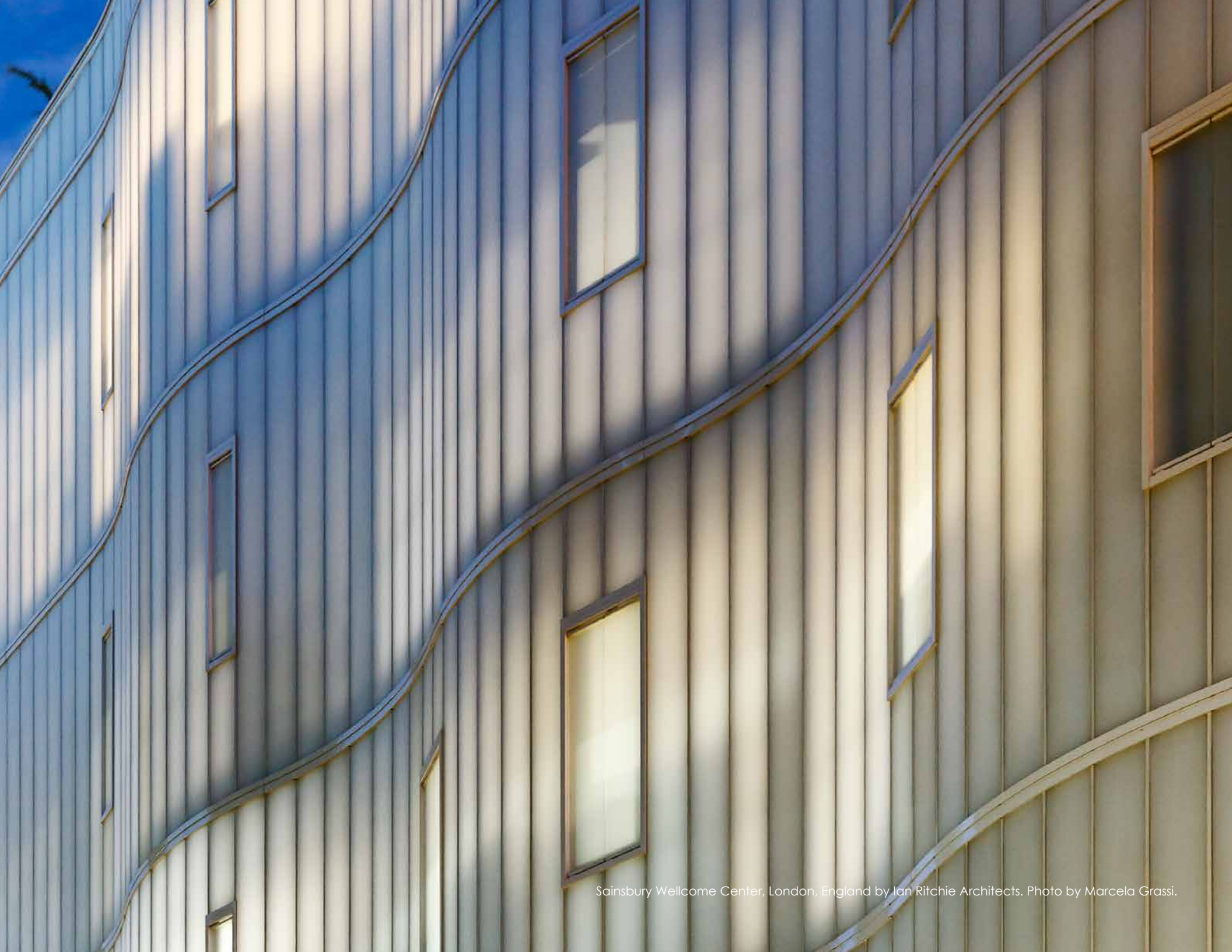
City University of New York Science Campus, New York, NY by Kohn Pedersen Fox Associates PC (above). The Mills at Jersey Gardens Mall, Elizabeth, NJ by Callison (right).

ILLUMINATED DURING THE NIGHT, CHANNEL GLASS STRUCTURES BECOME

"LANTERN" FACADES

DURING THE DAY, INTERIORS RECEIVE A GREAT AMOUNT OF

SOFT EVEN DAYLIGHT AVOIDING GLARE



Sainsbury Wellcome Center, London, England by Ian Ritchie Architects. Photo by Marcela Grassi.

SAFETY | TEMPERED CHANNEL GLASS

https://youtu.be/siyx49JUM2s

Our tempered Prismasolar™ channel glass, featuring a deep V-groove texture, is repeatedly struck until it breaks into hundreds of small, dice-size pieces.

Testing & Certification

Bendheim tempered channel glass meets the requirements for ANSI Z97.1 and CPSC 16 CFR 1201. It is also the only tempered channel glass certified by the SGCC (Safety Glazing Certification Council). SGCC is the highest level of independent third-party certification in the U.S.

Heat soak testing is recommended for all tempered glass used in exterior applications subject to changing temperatures. The test minimizes the risk of spontaneous breakage caused by nickel sulfide (NiS) inclusions. In this 8.5-hour process, the glass channels are placed inside a specialized test chamber and subjected to an oven temperature of 550°F (287°C) to accelerate NiS expansion. This causes glass containing NiS to break in the test chamber, thus reducing the risk of field breakages. Every piece of glass is tested – not random or partial testing. Detailed test criteria are available on request, linit@bendheim.com.

Lamberts developed the tempering process for the three-dimensional channel glass to yield dimensionally consistent glass with superior compression strength. Tempered channel glass is 3 to 4 times stronger than annealed channel glass and is recognized by its break pattern – relatively small, harmless fragments.

Because of its significant added strength, tempered channel glass is often used in designs requiring tall, uninterrupted spans of glass, avoiding the need for horizontal stacked joints. It is also used as safety glazing in "hazardous" applications, such as floor-to-ceiling glass walls and partitions. It is provided with a permanently etched "safety" logo.

Broken tempered glass:

United Oil Station, Los Angeles, CA by Kanner Architects. Photo by Nico Marques, Photekt.

WALL SYSTEMS

Bendheim's engineered framing systems provide the right system for the right function, not a "one style fits all" approach. Systems are fully tested and certified to meet or exceed US building requirements.

HIGH- PERFORMANCE EXTERIOR WALLS (DOUBLE-GLAZED)

RAINSCREENS, VENTILATED FACADES & DECORATIVE SCREENS (SINGLE-GLAZED)

INTERIOR WALLS (SINGLE & DOUBLE-GLAZED)

Santa Monica Civic Ctr. Parking Structure by Moore Ruble Yudell Architects. Photo by John Linden.


PARKING
DO NOT BLOCK

HIGH-PERFORMANCE EXTERIOR WALLS (DOUBLE-GLAZED)

https://youtu.be/_nk0o0xNZCE

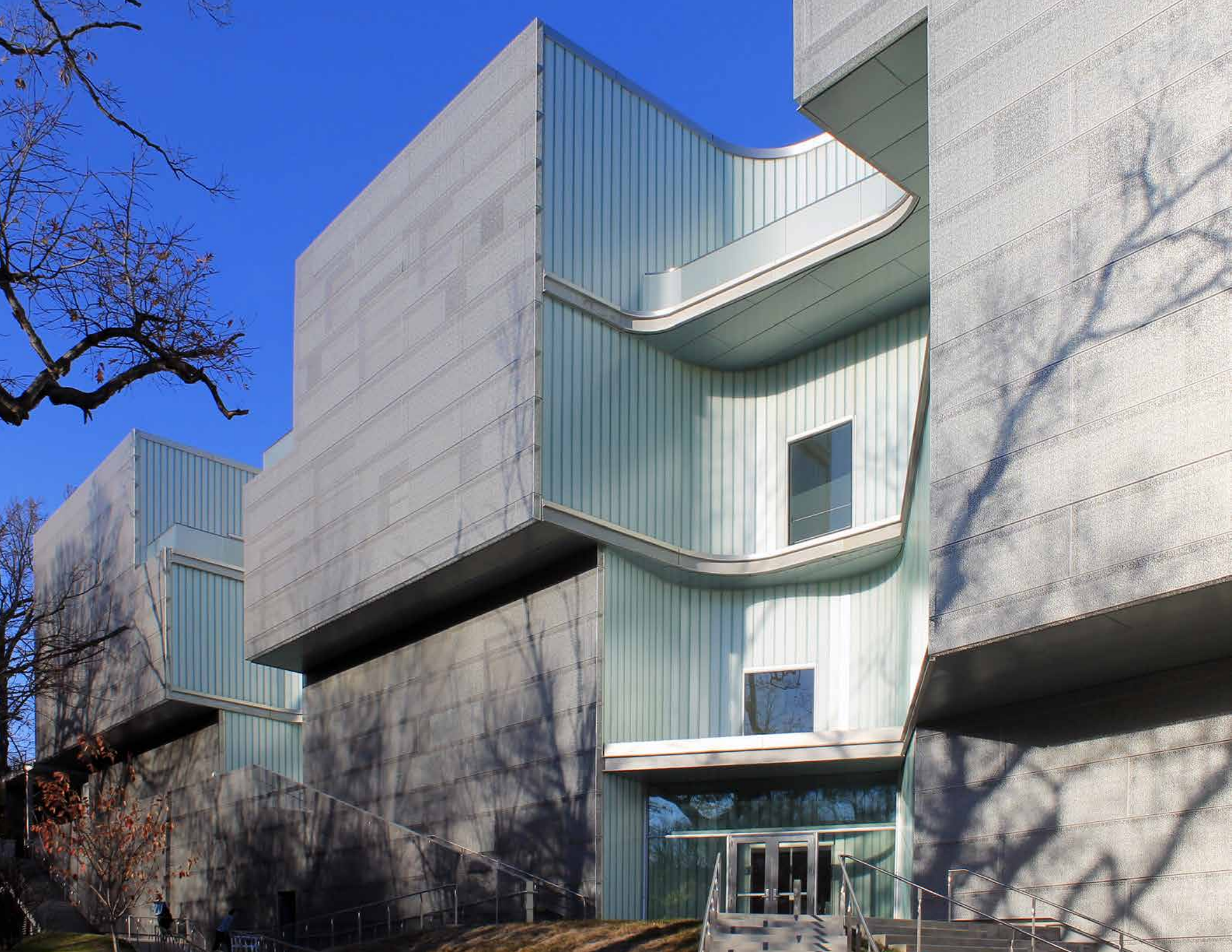
University of Iowa Visual Arts Building, Iowa City, IA by Steven Holl Architects. The combination of Bendheim's 504 Rough Cast™ channel glass texture with translucent Wacotech™ insulation delivers ideal daylight, as if filtered through a translucent cloud.

Bendheim's double-glazed channel glass wall systems are the perfect solution for daylight-friendly facades with outstanding thermal and acoustic performance. They create virtually seamless curvilinear glass walls – uninterrupted by metal frames – that can span heights up to 23 ft. (7 m) and limitless lengths in a relatively lightweight 1/4" (7 mm) glass thickness.

KEY BENEFITS:

- Double-glazed, thermally broken, water & air sealed exterior system enhances the thermal performance of the wall with U-Values ranging **from 0.49 to 0.19**
- Open-wept frame design (weep holes) effectively controls water drainage in the event of a breach
- Outstanding acoustic performance: **OITC up to 36**
- Highly adaptable: can easily and seamlessly tie-in vision areas, change elevations & planes, and integrate with flat glass IGUs for vision areas, while maintaining continuous design lines
- Frames can be specified in a variety of finishes and a virtually unlimited custom color palette
- Diffuse and control daylight and minimize glare
- Accommodate thermal insulation inserts
- Vertical or horizontal channel glass orientation
- Withstand high wind loads; fully tested to stringent North American standards for structural deflection, interstory drift, and severe seismic displacement in accordance with ASTM E330-02, ASTM E331, ASTM E283, AAMA 501, and AAMA 501.4
- Unitized options for speedier installation

Channel glass is ideal for curved applications. University of Iowa Visual Arts Building by Steven Holl Architects features numerous curved walls. The segmented glass channels are captured in the curved frames at the top and bottom only (no interim framing members). Minimum curve radius is approx. 7 ft.



University of Iowa Visual Arts Building by Steven Holl Architects. Curved insulated channel glass walls deliver daylight "as if filtered through a translucent cloud," 39% VLT, U-Value of 0.25.

Nelson-Atkins Museum of Art, Kansas City, MO by Steven Holl Architects and BNIM Architects. Photos by Bendheim and Roland Halbe.

University of California Santa Barbara Engineering Department, Santa Barbara, CA by Studios Architecture.

Azusa Pacific University Segerstrom Science Center, Azusa, CA by A.C. Martin Partners. Double- and single-glazed 504 Rough Cast™ channel glass features large-format sandblasted text.

RAINSCREENS, VENTILATED FACADES & DOUBLE SKINS (SINGLE-GLAZED)

https://youtu.be/Io_iB3Srj74

Fort York Visitor Centre, Toronto, Ontario, Canada by Kearns Mancini Architects & Patkau Architects. A "ghostly," translucent, expansive channel glass rainscreen defines the building and offers a robust layer of protection against wind and moisture.

Shield structures from rain and wind with elegant ventilated channel glass facades. Facilitate visibility and natural surveillance, while preserving daylighting advantages.

Bendheim's systems are designed to accommodate open or sealed-joint applications. They can be installed as rainscreen facades (in front of a structural wall), or as ventilated facades (without a structural wall behind) – ideal for parking structures, stadia, and other non-conditioned spaces.

KEY BENEFITS:

- Seamless expansive walls, up to 23 ft. (7 m) tall, featuring glass-to-glass corners and serpentine curves
- No vertical metal supports required
- Diffuse and control daylight and minimize glare
- Highly adaptable: can easily and seamlessly tie-in vision areas and change elevations & planes, while maintaining clean continuous design lines
- Frames can be specified in a variety of finishes and a virtually unlimited custom color palette
- Vertical or horizontal channel glass orientation
- Withstand high wind loads; fully tested to stringent North American standards for structural deflection, interstory drift, and severe seismic displacement in accordance with ASTM E330-02, ASTM E331, ASTM E283, AAMA 501, and AAMA 501.4
- Unitized options for speedier installation

Second-skin channel glass facades are ideal for creating ethereal buildings with complex facade geometries. There are numerous advantages to using them, including cost savings and risk mitigation. At Fort York Visitor Centre, Toronto, Ontario by Kearns Mancini Architects and Patkau Architects, the channel glass walls completely transform the exterior shape of the building. Photo by Riley Snelling.

Pier 17, South St. Seaport, New York, NY by SHoP Architects. Photo by C. Taylor Crothers.

Channel glass is ideal for back-lit rainscreen applications. At Blu Dot Showroom, West Hollywood, CA by Shawmut Design and Construction, the light-diffusing channel glass rainscreen revamps a 70-year-old facade. Continuous steel angles cantilever the glass system, creating a cavity for the lighting. The channel glass is captured at the top and bottom only, facilitating uniform lighting without shadow lines. Photo by Benny Chan.

Institute of Contemporary Art, Boston, MA by Diller Scofidio + Renfro. Photo by Iwan Baan.

Arizona State University, Tempe, AZ by Debartolo Architects. Photo by Michael Nothum.

Cypress College Humanities Building, Cypress, CA by LPA Architects.

INTERIOR WALL SYSTEMS (DOUBLE AND SINGLE-GLAZED)

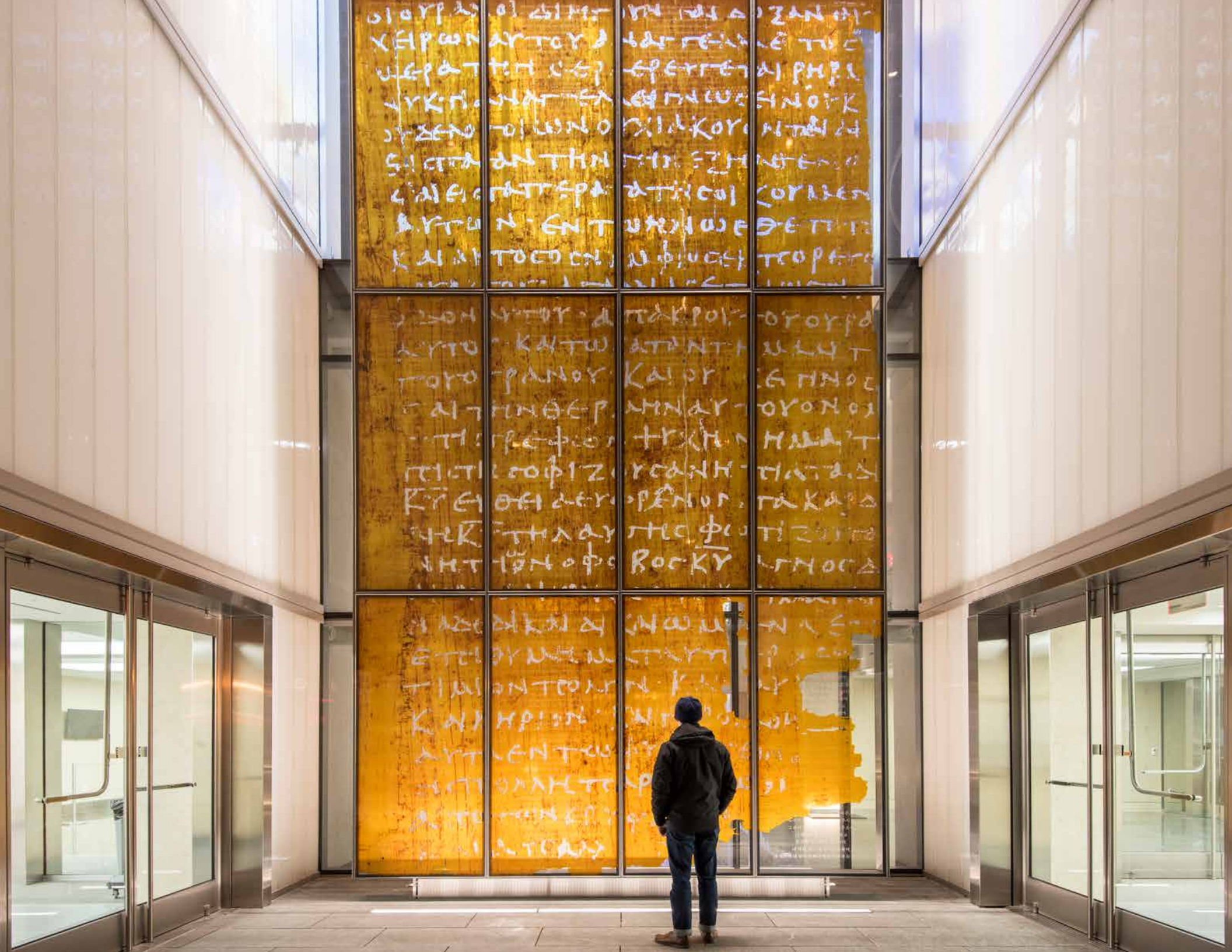
Ballinger Architects Offices, Philadelphia, PA by Ballinger. Framed openings punched through the channel glass office fronts bring a sense of mystery and discovery.

Channel glass makes it easier to create complex curvilinear walls that control daylight and provide the desired amount of visual and acoustic privacy. Double-glazed channel glass partition walls simultaneously: attenuate sound better than stud walls of the same thickness (STC 43 versus STC 39), establish a sense of privacy, maintain daylighting advantages, and create seamless curves and glass-to-glass corners reaching heights up to 23 ft. (7 m).

KEY BENEFITS:

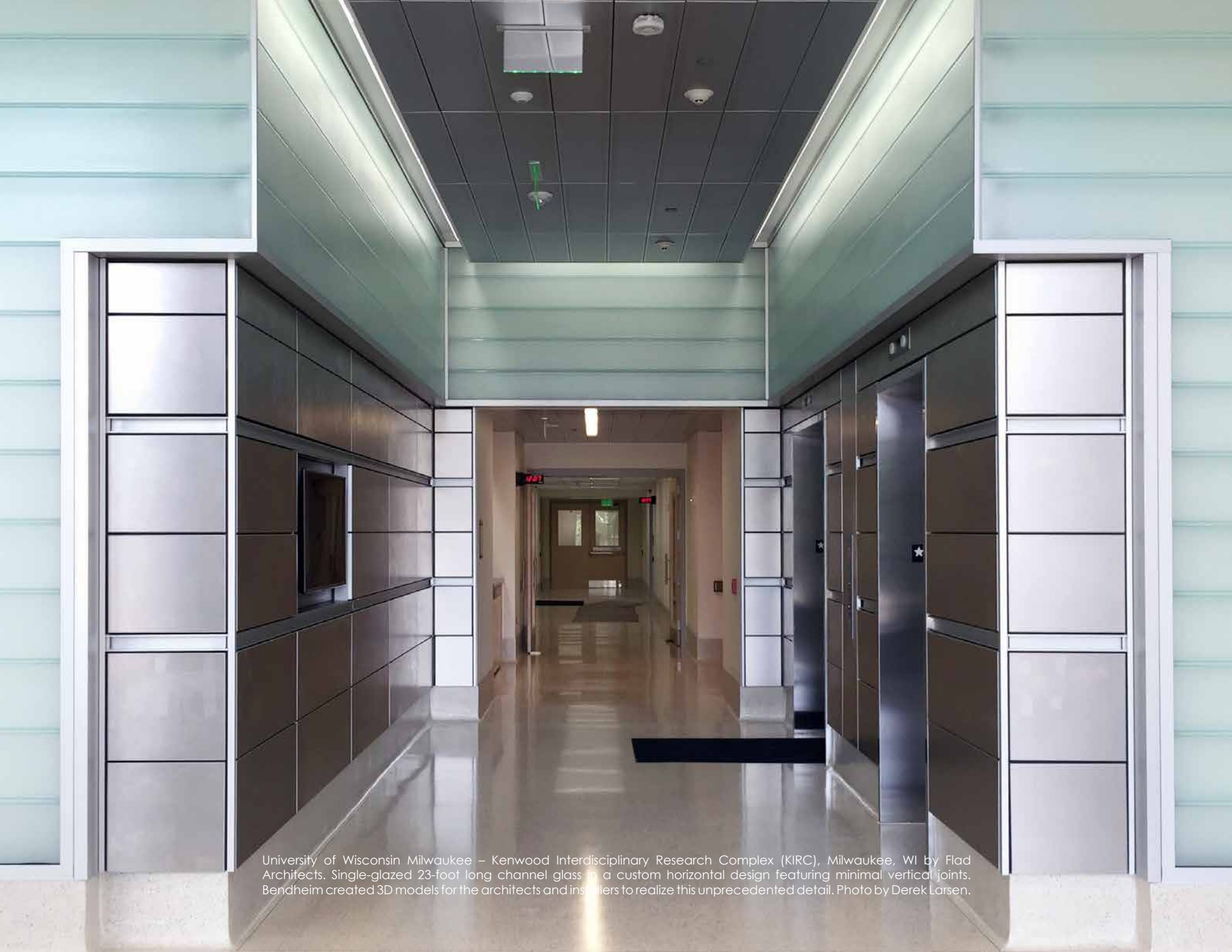
- Outstanding acoustic performance: double-glazed insulated channel glass walls can reach STC 43 – better than 4.5" (114 mm) batt-insulated interior stud wall (STC 39)
- Create seamless expansive walls, up to 23 ft. (7 m) tall, featuring glass-to-glass corners and serpentine curves
- No vertical metal supports required
- The perfect budget-smart solution for tall curved partition walls: the segmented channels turn curves and corners without the need for complex, costly glass bending
- Textured channel glass offers a sense of privacy
- Walls diffuse and control daylight and minimize glare
- Systems are highly adaptable: can easily tie-in vision areas, change elevations & planes, orient the glass channels vertically or horizontally
- Frames can be specified in a variety of finishes and a virtually unlimited custom color palette
- Vertical or horizontal channel glass orientation
- Unique frame designs permit "dry-joint" assembly, eliminating silicone sealants, speeding installation, and reducing labor and material costs

Mozilla Corporation, Mountain View, CA by MKThink. Photo courtesy of BNB Builders.



Museum of the Bible, Washington, D.C. by SmithGroup JJR. 22.5-foot tall white fritted channel glass flanks the entrance. The luminous glass channels also clad the main hallway's upper story, reflecting light from the programmable LED ceiling. Photos by Alex Fradkin.

Massive Inc., New York, NY by ASCAPE. Daylight-friendly curved office partition walls. Photo by ASCAPE.



University of Wisconsin Milwaukee – Kenwood Interdisciplinary Research Complex (KIRC), Milwaukee, WI by Flad Architects. Single-glazed 23-foot long channel glass in a custom horizontal design featuring minimal vertical joints. Bendheim created 3D models for the architects and installers to realize this unprecedented detail. Photo by Derek Larsen.

Prologis Headquarters at Pier 1, San Francisco, CA by SMWM Architects. Photo by Richard Barnes.

City University of New York, NYC by Kohn Pedersen Fox. Curved double-glazed channel glass walls define the interiors.

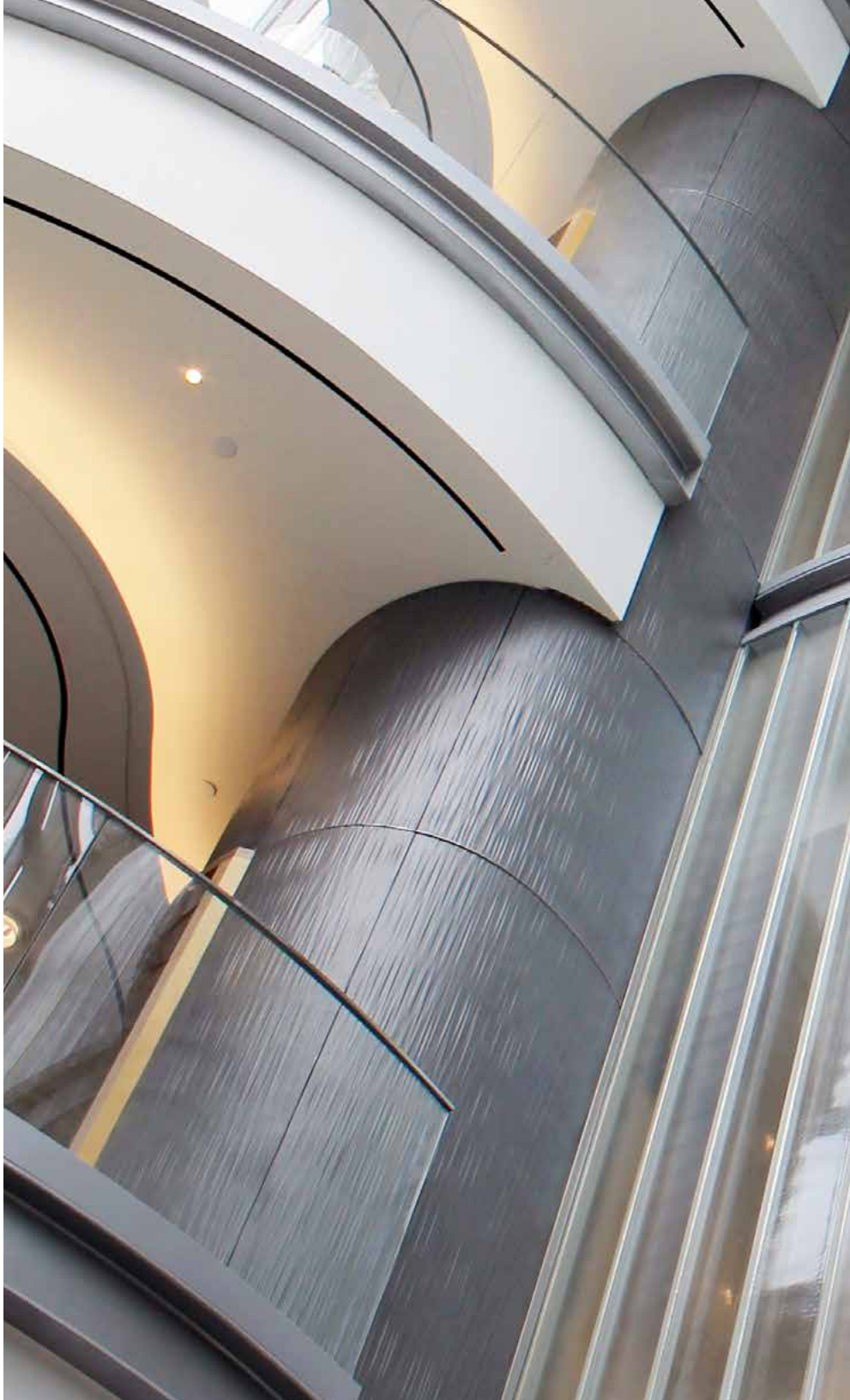
SPECIFIER'S GUIDE

Let us assist you in selecting the best system for your project. Bendheim's technical design team can help you save time and meet your project goals by providing you meaningful specification assistance, including:

- Material selection
- Custom product development
- Spec writing
- Proof of concept
- Engineering calculations
- Detail drawings for our systems
- General drawings for transition points

AutoCAD, Revit, and PDF detail drawings of our most popular wall systems, as well as easy-to-use three-part CSI drop-in specifications, are available for download at bendheim.com/professional/resources.

Application-specific detail drawings are available on request. Please send us your project info to bendheimwallsystems@bendheim.com.



City University of New York, NYC by Kohn Pedersen Fox.

GLASS PROFILES

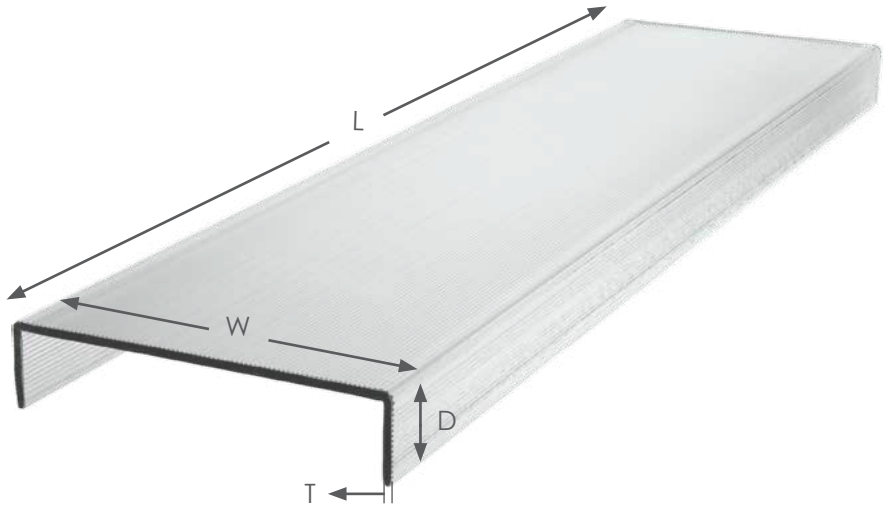
All channel glass profiles are available in standard glass with 30-40% post-consumer recycled content or ultra-brilliant low-iron glass with 15-25% post-consumer recycled content.

All profiles are available in tempered safety glass, meeting ANSI Z97.1 & CPSC 16CFR 1201 safety requirements, or standard non-safety glass.

Custom channel widths & flange lengths may be available for large projects.

P26/60/7 is the most popular profile, available in all textures and coatings, compatible with all standard systems and applications.

Profile	Channel Length (L)	Channel Width (W)	Flange Depth (D)	Glass Thickness (T)	Weight (Single Layer)	Glass Textures
P23/60/7	Fabricated to size up to 23 ft. (7 m); determined by the project-specific wall design and wind loads	9.125" (232 mm)	2.375" (60 mm)	0.28" (7 mm)	5.21 lbs/ft² (25.4 kg/m²)	504 Rough Cast™, Clarissimo™ (special order)
P26/60/7		**10.315" (262 mm)**	**2.375" (60 mm)**	**0.28" (7 mm)**	**5.02 lbs/ft² (24.5 kg/m²)**	**All textures**
P33/60/7		13" (331 mm)	2.375" (60 mm)	0.28" (7 mm)	4.80 lbs/ft² (23.4 kg/m²)	504 Rough Cast™
P23/41/6		9.125" (232 mm)	1.625" (41 mm)	0.24" (6 mm)	3.98 lbs/ft² (19.4 kg/m²)	504 Rough Cast™
P26/41/6		10.315" (262 mm)	1.625" (41 mm)	0.24" (6 mm)	3.88 lbs/ft² (19 kg/m²)	504 Rough Cast™, Clarissimo™
P33/41/6		13" (331 mm)	1.625" (41 mm)	0.24" (6 mm)	3.72 lbs/ft² (18 kg/m²)	504 Rough Cast™
P50/41/6 (special order)		19.625" (498 mm)	1.625" (41 mm)	0.24" (6 mm)	3.47 lbs/ft² (17 kg/m²)	504 Rough Cast™, Clarissimo™



Low-E Coating	Azur SHGC Coating	Thermal Insulation Inserts	Interior Use	Compatible Interior Frame Systems	Exterior Use	Compatible Exterior Frame Systems
504 Rough Cast™ (special order)	504 Rough Cast™ (special order)	✓	✓	**I-60** Double-Glazed (conventional interlocking, curves, corners, mid-point to mid-point) **I-60** Single-Glazed (alternating interlocking) **I-41** Single-Glazed (all configurations)	✓	**SF-60** Double-Glazed (conventional interlocking, curves, corners, mid-point to mid-point) **SF-60S** Single-Glazed (conventional, alternating flanges, curves, corners) **H-60** (horizontal interlocking)
504 Rough Cast™, Clarissimo™ (other textures by special order)	**504 Rough Cast™ (other textures by special order)**	✓				
504 Rough Cast™ (special order)	X	✓				
X	X	✓	✓	**I-60** Double-Glazed (tip-to-tip) **I-41** Double-Glazed (conventional interlocking, curves, corners, mid-point to mid-point) **I-41** Single-Glazed (all configurations)	X	X
504 Rough Cast™, Clarissimo™ (special)	X	✓				
X	X	✓				
X	X	✓				

SF-60 (DOUBLE-GLAZED)
VERTICAL & HORIZONTAL FACADE SYSTEM

Unique system design requires the glass be captured at the head & sill only; the jambs deflect together with the glass. Accommodates all double-glazed exterior channel glass applications in all textures (profiles with 60 mm flanges).

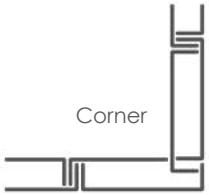
Approx. Dimensions:

- Visible components are identical for consistent, clean look: Head = 2.3" (60 mm); Sill = 2.3" (60 mm); Jambs = 2.3" (60 mm)
- Depth = 4" (100 mm)
- Stock length = 21 ft. (6.5 m); longer spans are created by butting / splicing extrusions to one another
- Max width & height depend on channel orientation & wind loads
- Max floor deflection = ¾" (19 mm)

Popular Configurations:

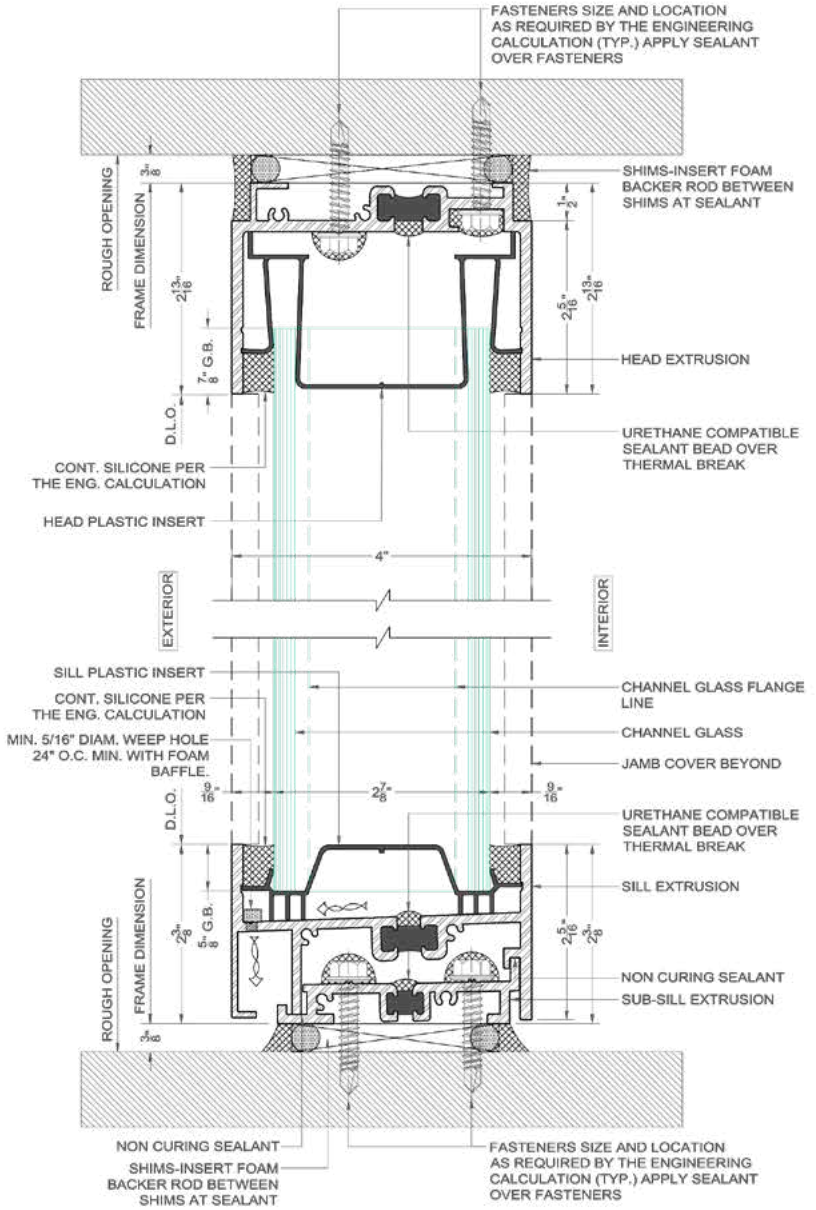
Conventional interlocking

Curved: minimum radius = 7 ft. (2 m)

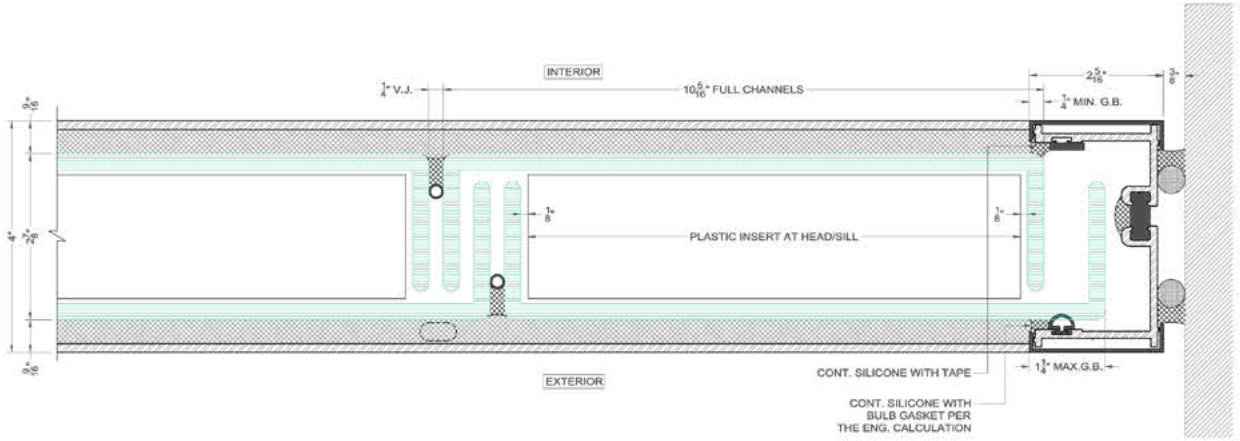


Mid-point to mid-point: minimizes the appearance of the flanges, creates an attractive tightly ribbed visual profile

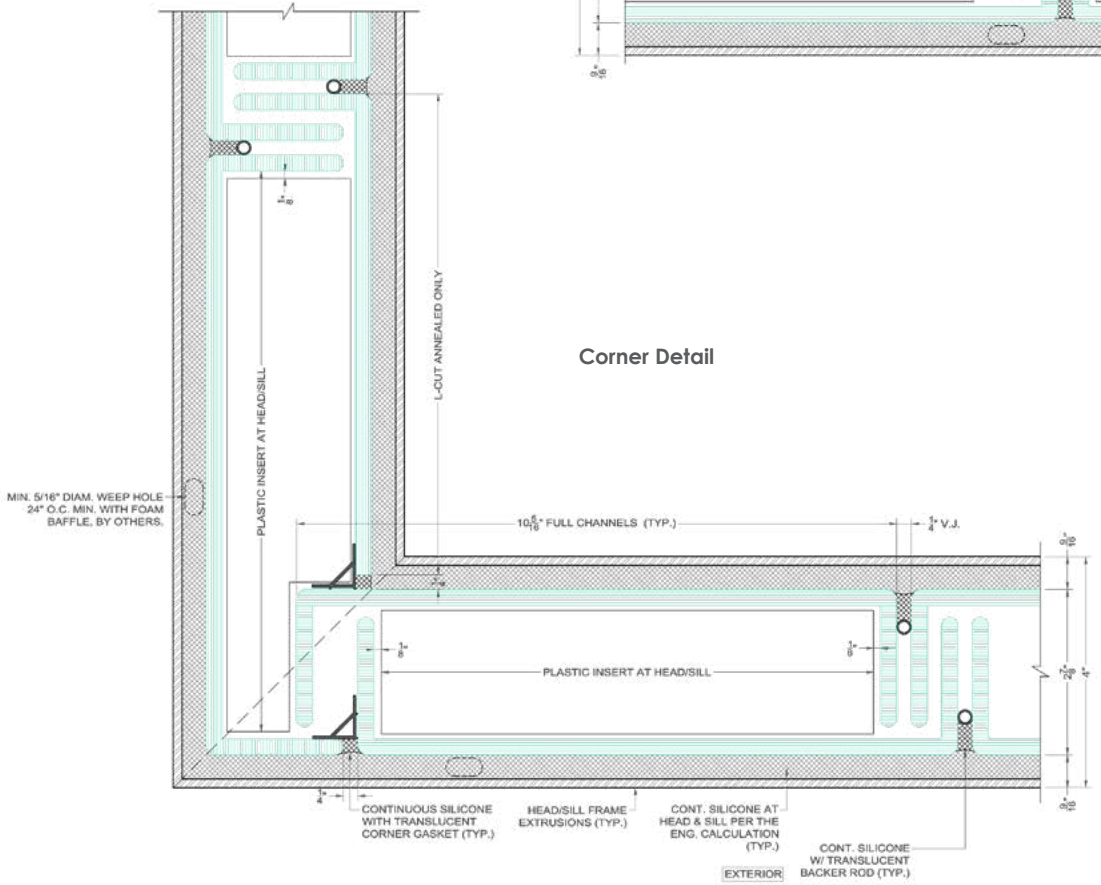
Head & Sill Detail



Jamb Detail



Corner Detail



H-60 (DOUBLE-GLAZED)
HORIZONTAL UNITIZED FACADE SYSTEM

Bendheim offers the only true unitized channel glass systems in North America. They are designed to be shop-assembled by the glazier under controlled, clean conditions, offering improved quality control and shorter construction schedules.

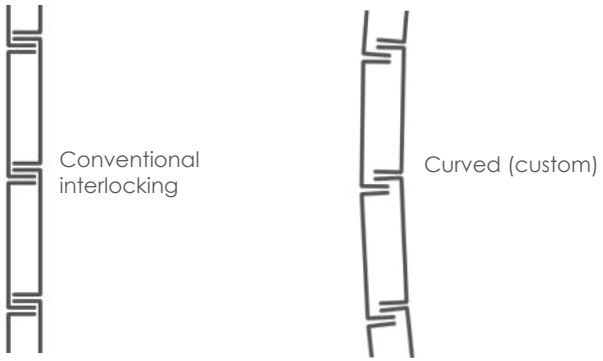
Our award-winning H-60 system provides several benefits to building budgets. Its fast installation contributes real savings in labor time and costs. In conditions requiring safety glass, the system may also allow a cost-effective mix of tempered channels at the bottom and all remaining channels in budget-smart conventional annealed glass.

H-60 can be vertically and horizontally linked to create a curtain wall. The dead load of each glass channel is taken by the jambs. The system accommodates channel glass in all textures (profiles with 60 mm flanges).

Approx. Dimensions:

- Head = 1.6" (41 mm); Sill = 1.7" (43 mm); Jambs = 3.4" (87 mm)
- Depth = 5.25" (130 mm)
- Max width = up to 23 ft. (7 m), depending on wind loads
- Max floor deflection = ¾" (19 mm)

Configurations:



Pictured right: Schermerhorn House (Affordable Housing), Brooklyn, NY by Polshek Partnership Architects. The architects used channel glass in a highly creative manner for this budget-sensitive project. The combination of the choice of glass, pre-assembly, and quick enclosure was a 'home-run' for the project schedule and budget.

The horizontal orientation of the channels maximizes the use of annealed glass and minimizes the amount of costlier tempered glass (only the bottom two channels in a unit are tempered). Commingling Rough Cast™ textured channels with the occasional Clarissimo™ vision channels eliminates the need for separate window units.

The project's location above a subway station – requiring a lightweight curtain wall – made channel glass an ideal solution, as well. At only approx. 12 lbs. per sq. ft. fully assembled, it was a perfect fit. The high recycled content of the glass and its daylighting contribution were also key to the project's environmental goals.

Unitizing the system enabled the hoisting and anchoring of each unit in approx. 30 minutes, allowing the building to be enclosed quickly. Photos by David Sundberg and Jim Donoghue.


PRODUCT INNOVATION
AWARD WINNER
PIA'11

SF-60S (SINGLE-GLAZED)
VERTICAL & HORIZONTAL FACADE SYSTEM

Unique system design requires the glass be captured at the head & sill only. Accommodates all single-glazed exterior channel glass applications in all textures (profiles with 60 mm flanges).

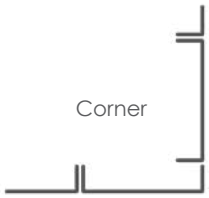
Approx. Dimensions:

- All components are identical for consistent, clean look: Head = 2.3" (60 mm); Sill = 2.3" (60 mm); Jambs = 2.3" (60 mm)
- Depth = 3.25" (80 mm)
- Stock length = 21 ft. (6.5 m); longer spans are created by butting / splicing extrusions to one another
- Max width & height depend on channel orientation & wind loads
- Max floor deflection = ¾" (19 mm)

Popular Configurations:

Conventional

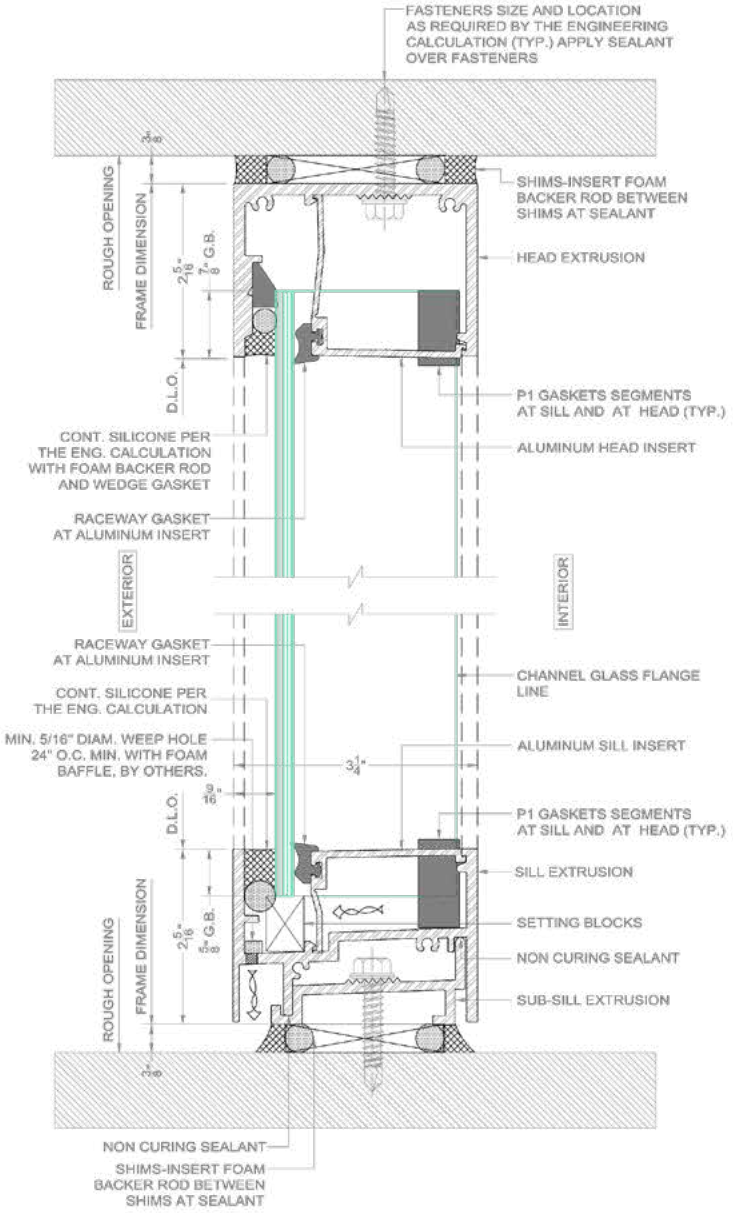
Curved: minimum radius = 7 ft. (2 m)



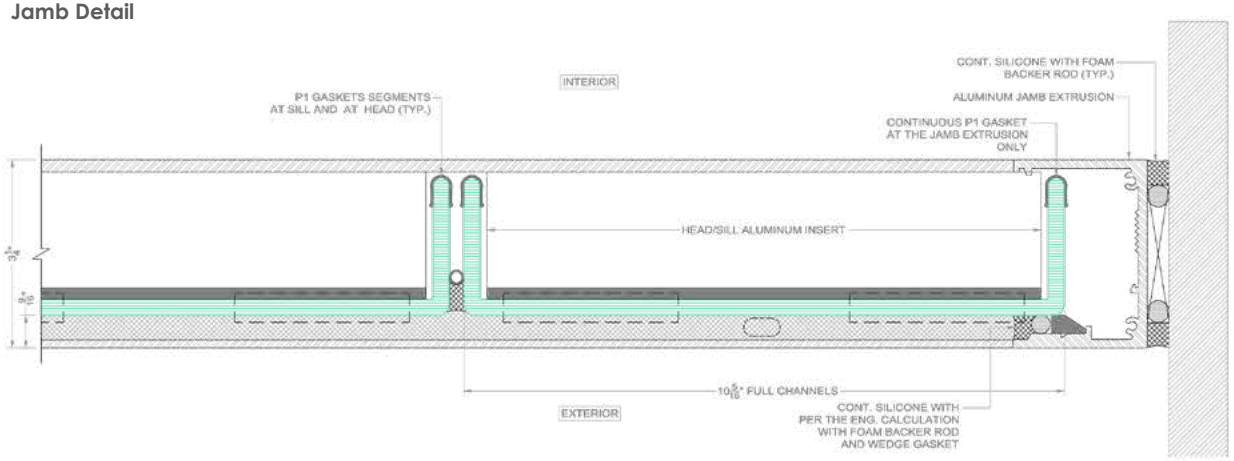
Corner

Alternating adjacent

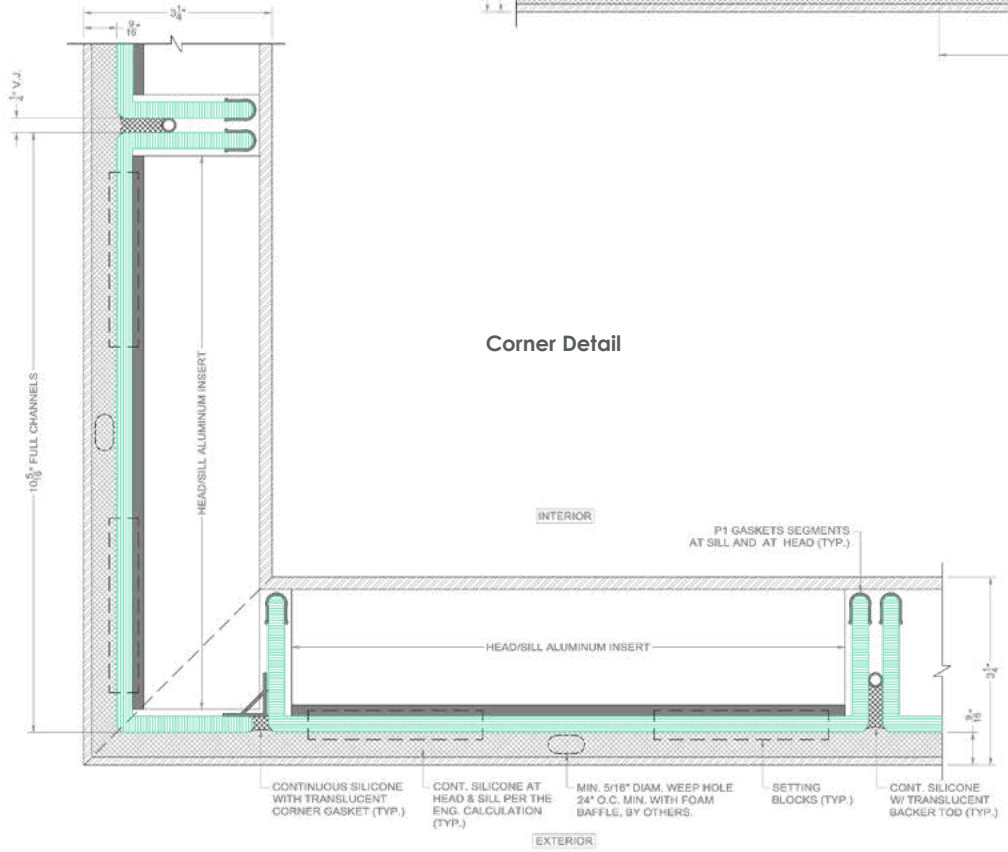
Head & Sill Detail



Jamb Detail



Corner Detail



SF-60S-CUSTOM (SINGLE-GLAZED) VERTICAL UNITIZED FACADE SYSTEM

Our award-winning Custom Vertical Unitized System requires the glass be captured at the head & sill only. Discreet mounting elements attach the glass units to the structure. The system has significant built-in flexibility to permit the units to be saddled onto the floor plate, then easily adjusted up and down for alignment.

The system is designed to be shop-assembled by the glazier, speeding installation and minimizing labor costs. It accommodates channel glass in all textures (profiles with 60 mm flanges).

Approx. Dimensions:

- Head = 2.3" (60 mm); Sill = 2.3" (60 mm)
- Depth = 3.25" (80 mm)
- Max height = up to 23 ft. (7 m), depending on wind loads
- Max floor deflection = 2" (50 mm)

Pictured here: The Children's Hospital of San Antonio, San Antonio, TX by Overland Partners. Bendheim's vibrant ceramic-fritted channel glass units rise along the hospital's 10 stories and a 2-story-tall 'lantern' cupola. Their striking colors are visible from a distance in the day or night, bringing children and families comfort and improving their patient experience.

The smart technical design of the system answered a number of unique design challenges. It created tall, lightweight facade units that could be quickly pre-assembled and installed onto slim concrete eyebrows. This was critical, as the available work area was insufficient to assemble the units on site.

The design team turned to channel glass for its remarkable structural qualities, allowing it to span great heights under high wind loads. The glass channels reach spans from 10 to 19 ft. in relatively lightweight ¼" (7 mm) thickness. At only 4.5 lbs./ft^2, they meet the weight limits of the concrete eyebrows, a feat unachievable by conventional flat glass.

Bendheim's technical design team designed the hoisting procedures to allow speedy installation, while avoiding the need for scaffolding, which would normally be required.

Another design challenge involved providing the units in a range of custom colors that would be visible at long distances, both in the daytime and at night. Here, too, channel glass was the right solution. Fritted in durable translucent colors, the glass appears vivid in the daylight, while transmitting colored back-light at night. Photos courtesy of the Hospital.


GOOD
DESIGN
CHILDREN'S
EMERGENCY

I-60 (DOUBLE-GLAZED)
VERTICAL & HORIZONTAL INTERIOR SYSTEM

Accommodates double-glazed interior channel glass applications in all textures (profiles with 60 mm flanges) and accepts insulation inserts for improved acoustic performance.

Approx. Dimensions:

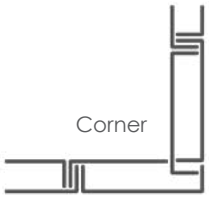
- All components are identical for consistent, clean look: Head = 2" (50 mm); Sill = 2" (50 mm); Jambs = 2" (50 mm)
- Depth = 4.5" (115 mm)
- Stock length = 21 ft. (6.5 m); longer spans are created by butting / splicing extrusions to one another
- Max width & height depend on channel orientation & wall design
- Max floor deflection = ¾" (19 mm)

Popular Configurations:

Conventional interlocking

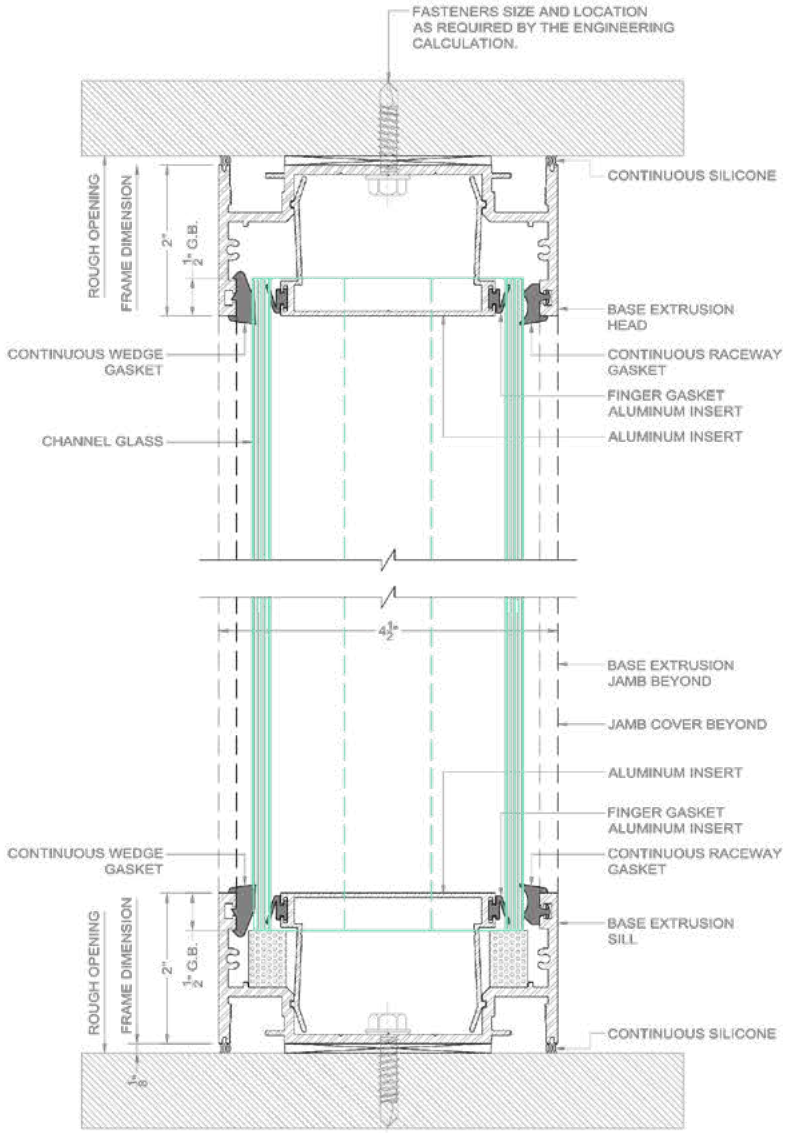
Curved: minimum radius = 7 ft. (2 m)

Mid-point to mid-point: minimizes the appearance of the flanges, creates a tightly ribbed visual profile

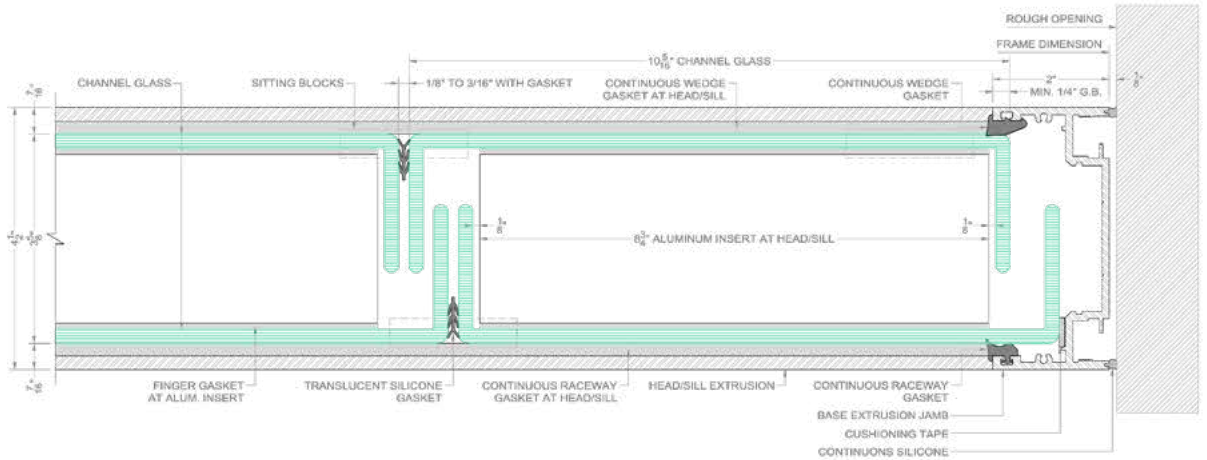


Tip-to-tip: provides cleaner, less-pronounced glass joints; for use with 41 mm flange profiles only

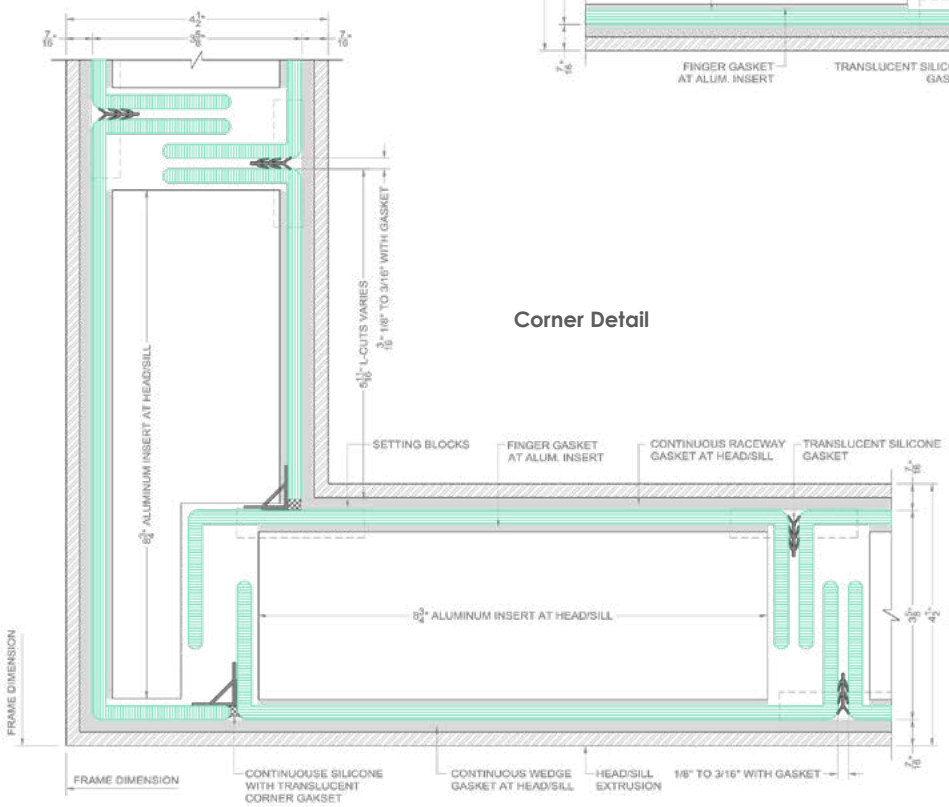
Head & Sill Detail



Jamb Detail



Corner Detail



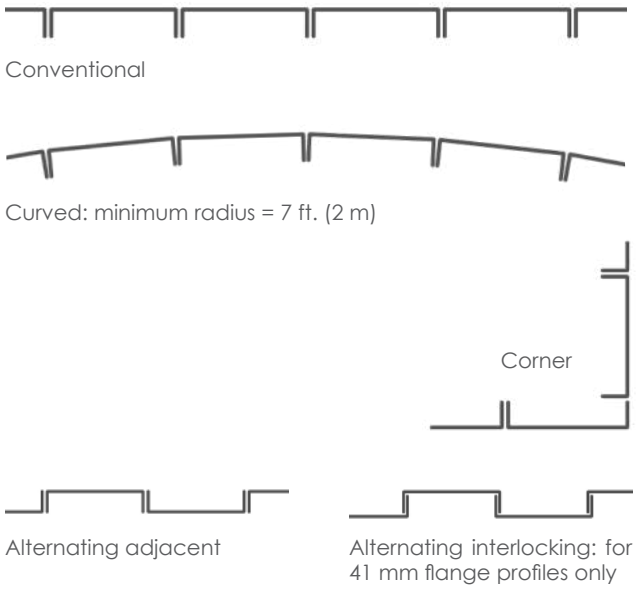
I-41 (SINGLE-GLAZED)
VERTICAL & HORIZONTAL INTERIOR SYSTEM

Accommodates single-glazed interior channel glass applications in all textures and profiles (41 mm and 60 mm flanges).

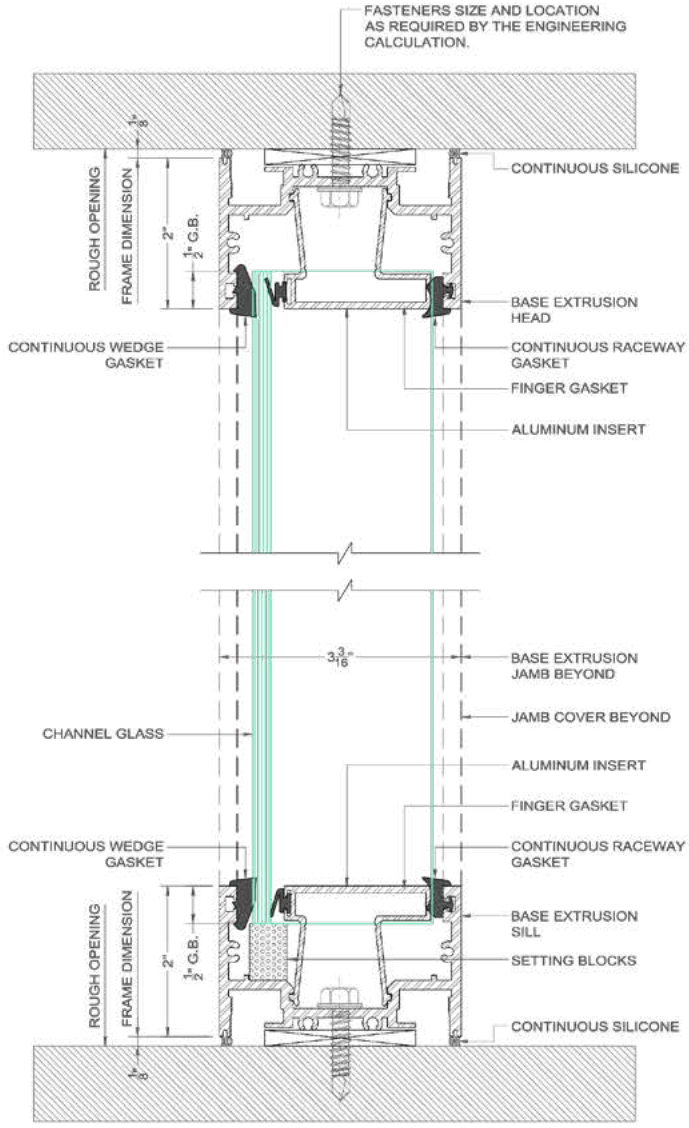
Approx. Dimensions:

- All components are identical for consistent, clean look: Head = 2" (50 mm); Sill = 2" (50 mm); Jambs = 2" (50 mm)
- Depth = 3.25" (83 mm)
- Stock length = 21 ft. (6.5 m); longer spans are created by butting / splicing extrusions to one another
- Max width & height depend on channel orientation & wall design
- Max floor deflection = ¾" (19 mm)

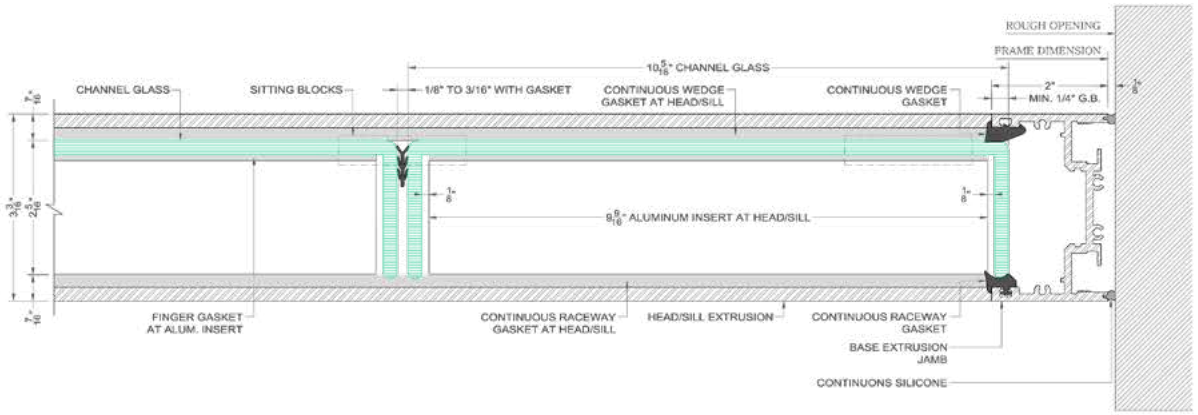
Popular Configurations:



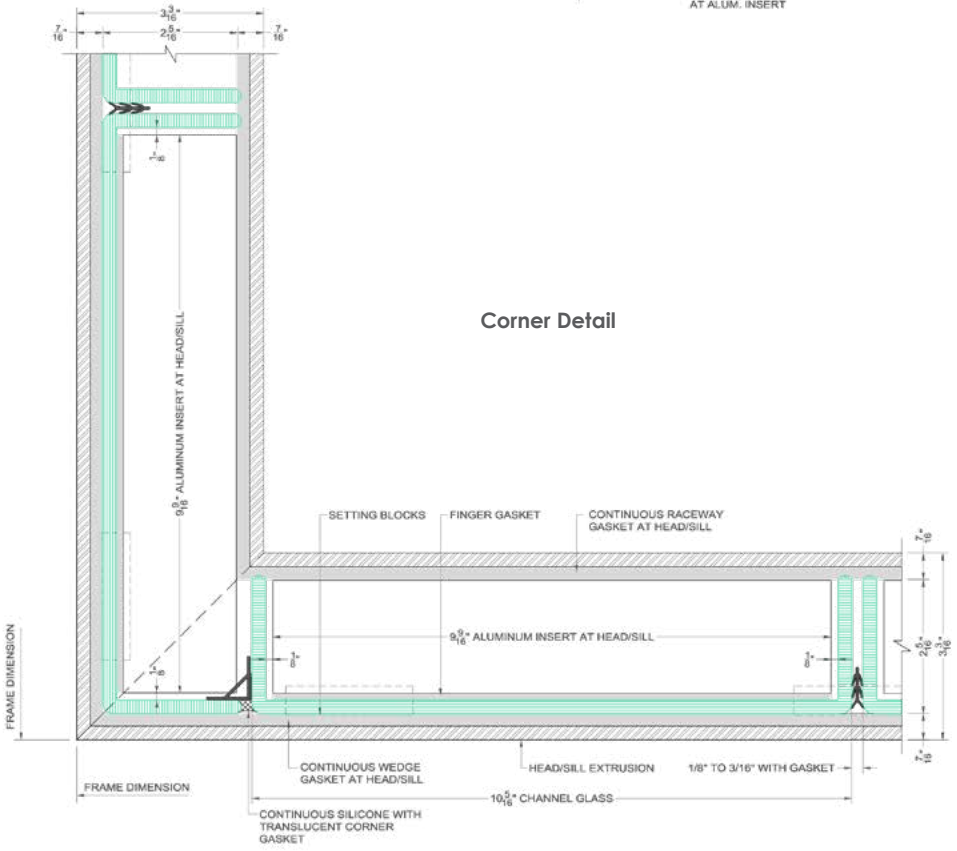
Head & Sill Detail



Jamb Detail



Corner Detail



MAINTENANCE

Museum of the Bible, Washington, D.C. by SmithGroup JJR. Channel glass and IGU vision lites are installed in the same frame, achieving minimal tie-ins, in a curtain wall designed collaboratively by the architects and Bendheim. Photo by Alex Fradkin.

CHANNEL GLASS' TEXTURED SURFACES

HIDE WATER STAINS & DIRT

Bendheim channel glass is easy to maintain. The textured glass surfaces mask the appearance of water stains and dirt, making it easier to care for than conventional flat glass. When cleaning the channel glass is required, we suggest rinsing with water or a cleaning solution. Nonabrasive glass cleaners may also be used.

Parker Gordon Residence, Washington, DC by Meditch Murphey Architects. Photo by Maxwell Mackenzie.

Missouri State University Meyer Library, Springfield, MO by Cannon Design and Perry Dean Rogers. Photo courtesy of the University.

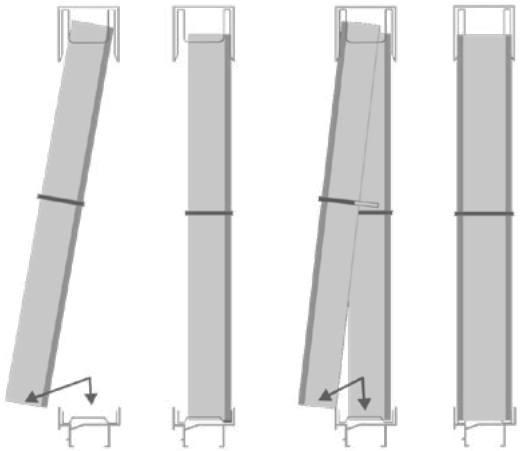
INSTALLATION

Espirito Santo Plaza Parking Structure, Miami, FL by Kohn Pedersen Fox Associates.

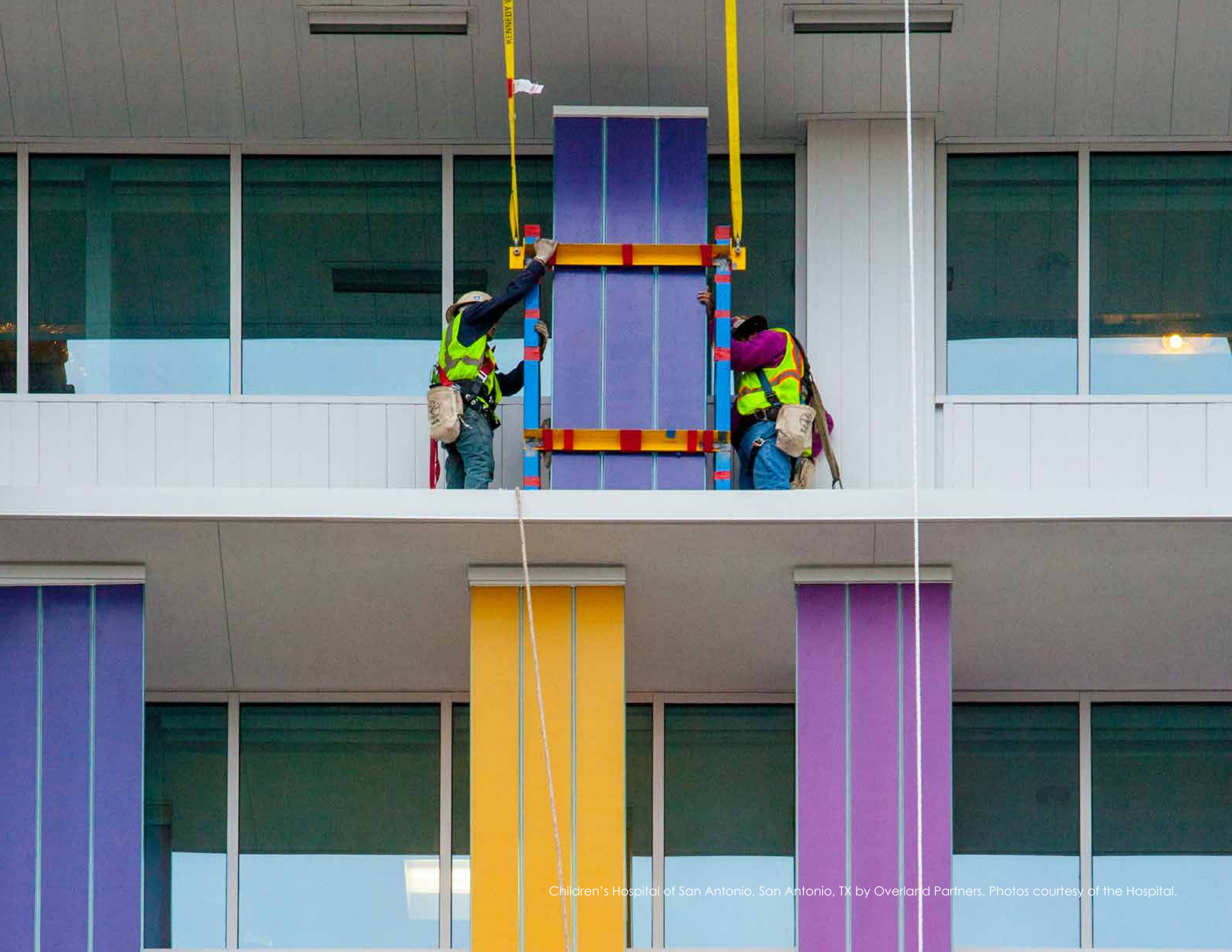
Approx. ¼"-thick lightweight glass in channel form is relatively easy to install. Any competent commercial glazier with curtainwall or storefront installation experience can handle the channel glass installation. No specialized training is required. Additionally, cranes may not be necessary, as individual glass channels are lightweight.

The channels can be glazed on site (pocket-set), or, in some cases, pre-assembled at the glazier's shop using Bendheim's unitized frame systems.

For on-site installations, the head and sill units are anchored to the building structure. The jambs are connected to the head and sill. They are not typically anchored to the building structure. This permits the jambs to flex with the channel glass under the wind load. Once the frames are anchored, the glass is inserted in a pocket-set method (see drawing below). For double-glazed applications, the second row of glass is inserted in a similar manner. After setting the glass with the proper spacing, the glass/frame perimeter and all vertical glass joints are properly sealed with silicone. Some interior applications may be "dry-sealed" using only gaskets and wedges. Please contact us for detailed instructions and installation manuals: linit@bendheim.com.



The glass channel is lifted into the head enough for its bottom edge to clear the sill, and is then dead-loaded in the sill.



Children's Hospital of San Antonio, San Antonio, TX by Overland Partners. Photos courtesy of the Hospital.

INSPIRATION

Jump-start your creativity! Browse projects by building type:

- Cultural: Museums, Performance Arts, Theaters
- Science & Education: Schools, Libraries, Research Centers
- Civic & Government
- Healthcare, Retail & Hospitality
- Parking & Transportation
- Corporate & Commercial Office
- Residential

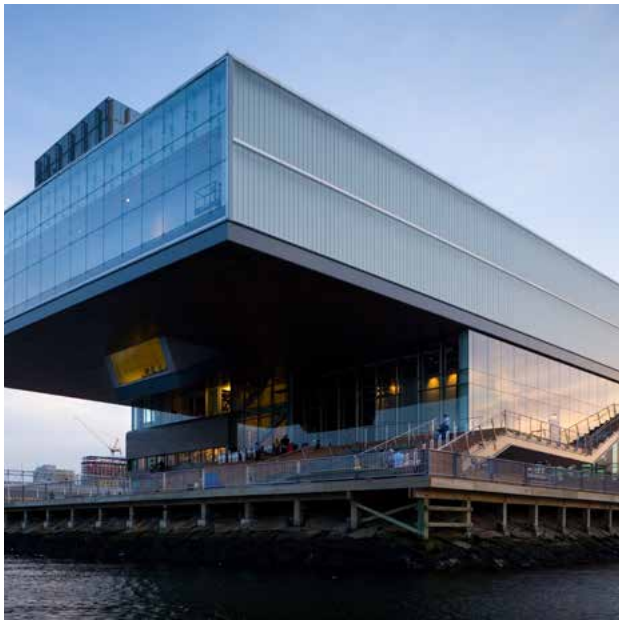
Pictured here: Bloch Building, Nelson-Atkins Museum of Art, Kansas City, MO by Steven Holl Architects and BNIM Architects. Double-glazed, low-iron, tempered, sandblasted Solar™ channel glass features a custom 15.75" (400 mm) wide profile and thermal insulation inserts. During the day, the glass fills the interior of the building with natural light, while at night the building glows like a lantern. Photo by Roland Halbe.

CULTURAL: MUSEUMS PERFORMANCE ARTS THEATERS

Nelson-Atkins Museum of Art, Kansas City, MO

Museum of the Bible, Washington, DC

Fort York Visitor Centre, Toronto, ON



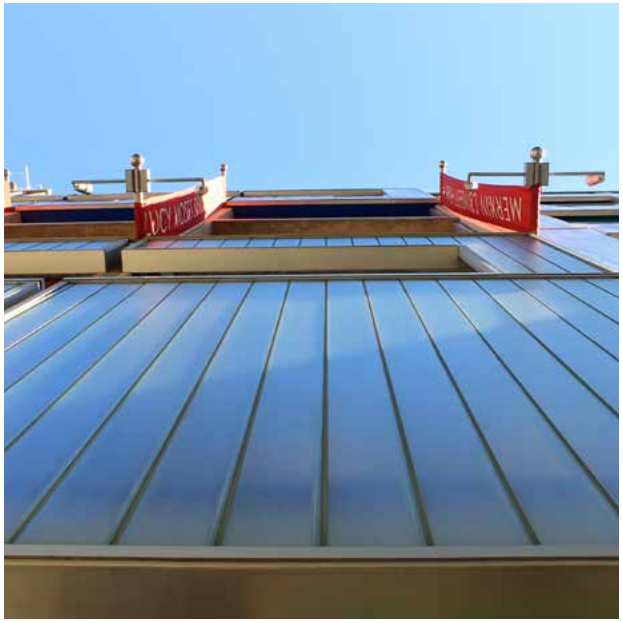
Institute of Contemporary Art (ICA), Boston, MA

Blaffer Art Museum, University of Houston, Houston, TX

Zapata County Museum, Zapata, TX

Shaw Center for the Arts, Baton Rouge, LA

PNC Legacy Project, Lantern Building, Pittsburgh, PA



Kaufman Music Center, New York, NY

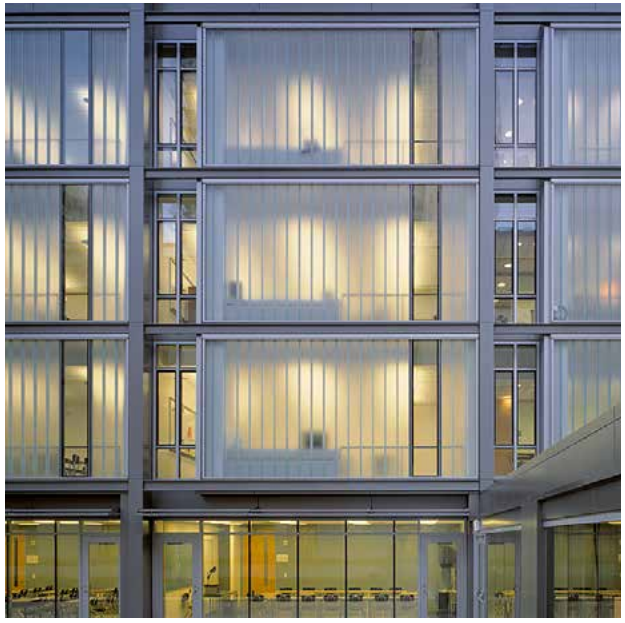
"The best way to get a good idea is to get a lot of ideas."
— Linus Pauling

ZACH Theatre, Topfer Theater, Austin, TX

SCIENCE & EDUCATION: SCHOOLS LIBRARIES RESEARCH

Pratt Institute School of Architecture, New York, NY

University of Iowa Visual Arts Building, Iowa City, IA



Lycée Français de New York, New York, NY

University of Massachusetts Fine Arts Center, Amherst, MA

University of Texas Gates Dell Complex, Austin, TX

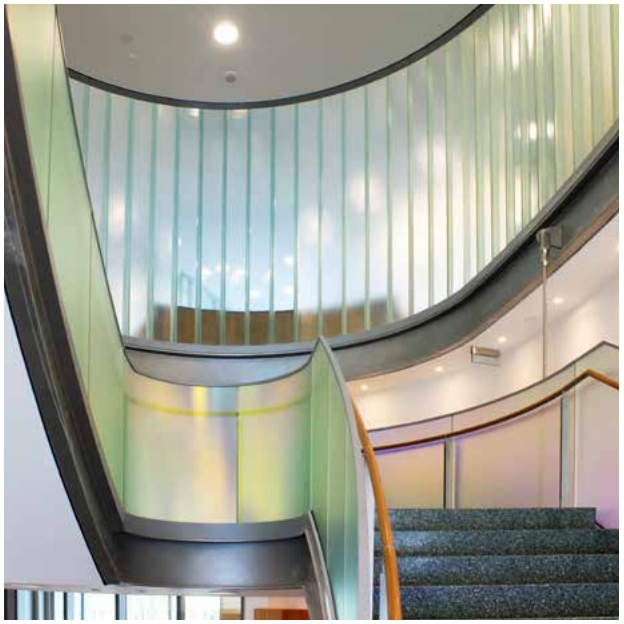
Sarah Lawrence College Visual Arts Center, Bronxville, NY

Montclair State University Recreation Center, Montclair, NJ

Azusa Pacific University Segerstrom Science Ctr., Azusa, CA

"Bendheim was the kind of unflinching partner I'm always looking for on challenging projects."

— Alex Terzich, SHoP Architects,
Pier 17 South Street Seaport

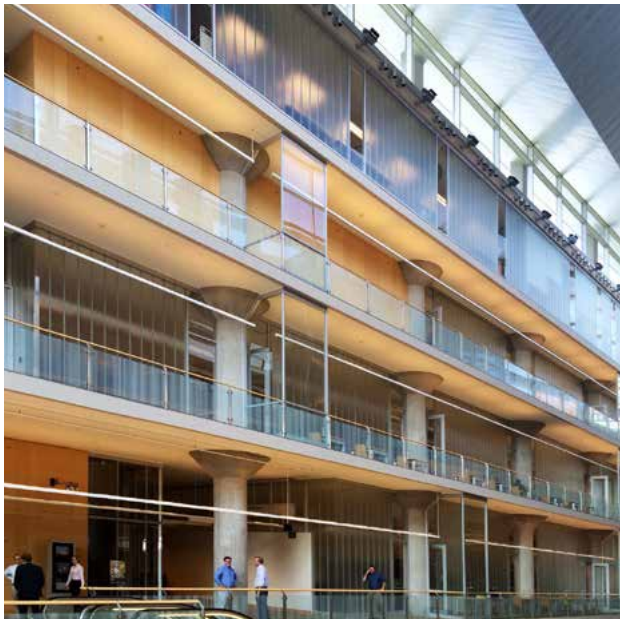


City University of New York (CUNY), New York, NY

James A. Garfield High School, Los Angeles, CA

Arizona State University Orange Mall, Tempe, AZ

Carbondale Branch Library, Carbondale, CO



Minneapolis Central Library, Minneapolis, MN

"The textural quality of the glass and the unique profile of the extrusions display the light in dynamic ways and reflect the surroundings that are constantly changing as the day progresses. The result is a space that invites interaction and celebrates the library experience."

— Tony Major, Architect, Willis Pember Architects, Carbondale Library

Westwood Branch Library, Los Angeles, CA

Princeton University Lewis-Sigler Institute, Princeton, NJ

Indiana University Neurosciences, Indianapolis, IN

University of Wisconsin KIRC, Milwaukee, WI

Plymouth Library, Plymouth, MN

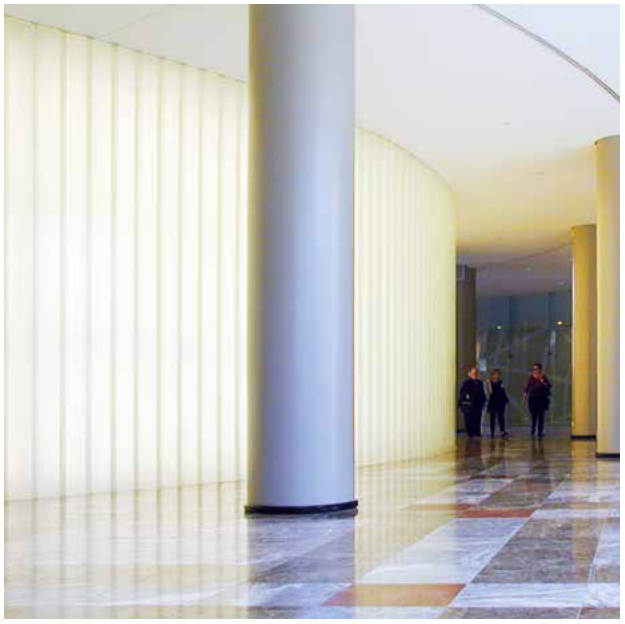
Stephen F. Austin University Student Ctr., Nacogdoches, TX

Yeshiva University Glueck Center, New York, NY

Sainsbury Wellcome Center, London, England

CIVIC & GOVERNMENT

U.S. Census Bureau HQ, Suitland, MD



World Financial Center Winter Garden, New York, NY

Swiss Embassy Residences, Washington, DC

Union County Juvenile Center, Linden, NJ

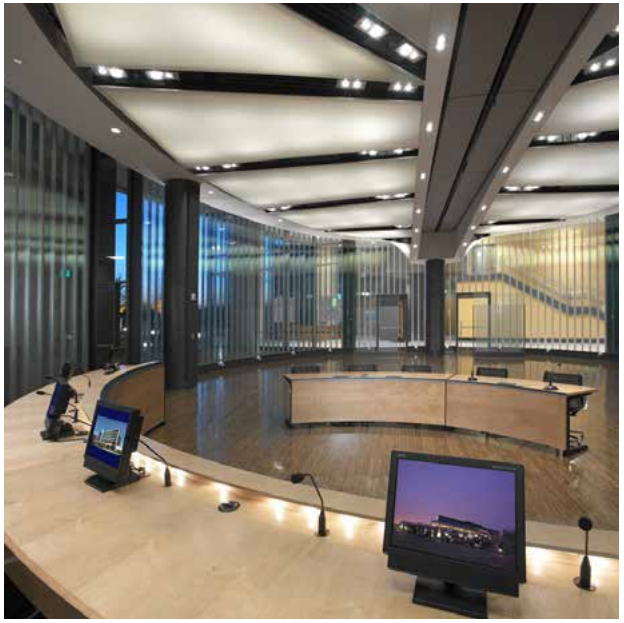
"Imagine space and light and order. Things we need as much as bread or a place to sleep."
— Le Corbusier

Robert B. Diemer Water Treatment Plant, Yorba Linda, CA

Contra Costa County DA's Office, Martinez, CA

Encina Wastewater Authority, Carlsbad, CA

Port Authority Express Rail Administration, Elizabeth, NJ



Norm Dicks Government Center, Bremerton, WA

Champlain Land Port of Entry, Champlain, NY

HEALTHCARE
RETAIL
HOSPITALITY

Callen-Lorde Community Health Center, New York, NY

Nolitan Hotel, New York, NY

The Children's Hospital of San Antonio, San Antonio, TX

"Bendheim's technical expertise and willingness to roll up their sleeves to help figure out solutions for each application gave the design team and contractor the confidence to lobby for the colored panels as an integral component of the project."

— Kris Feldmann, Lead Architect, Overland Partners, The Children's Hospital of San Antonio

Bay Area Bank, Santa Clara, CA

Anthropologie at The Shops at Dos Lagos, Corona, CA

Pier 17, South Street Seaport, New York, NY

CADE Winery, Angwin, CA

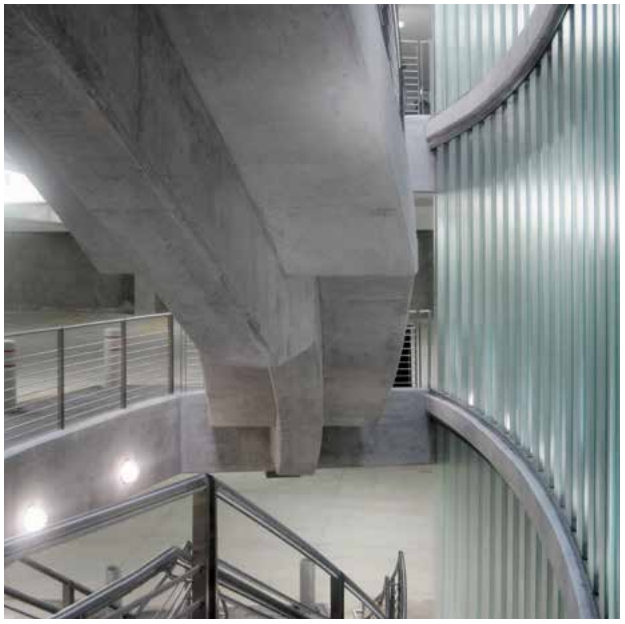
Pacific Rim Sushi, Hoover, AL

Hyatt Regency, Chicago, IL

Blu Dot Showroom & Store, West Hollywood, CA

PARKING & TRANSPORT

Santa Monica Civic Center Parking, Santa Monica, CA



Ann Arbor 5th St. Underground Parking, Ann Arbor, MI

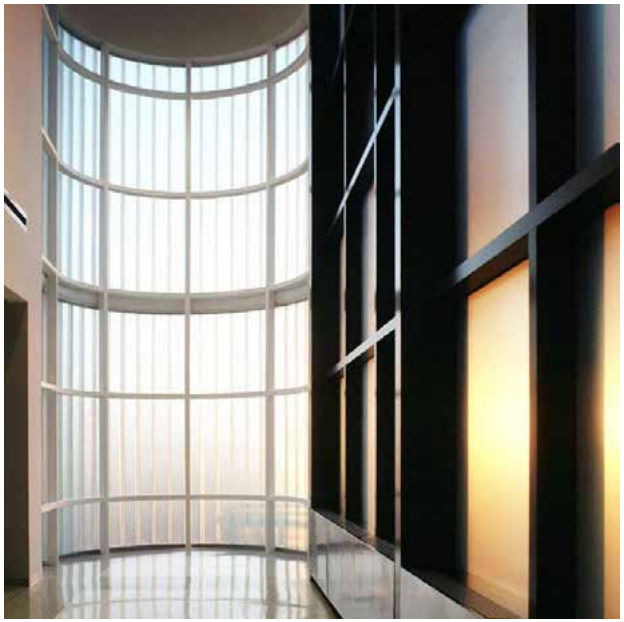
Jubilee Auditorium Parking, Edmonton, AB, Canada

Lexington Park Condominiums Parking, Chicago, IL

Espirito Santo Plaza Parking, Miami, FL

Optima Horizons Parking Structure, Evanston, IL

Minneapolis Airport, C Concourse, Minneapolis, MN



Rochester Airport, Rochester, NY

United Oil Station, Los Angeles, CA

"Bendheim's channel glass system turned out to be the perfect solution. Not only does it have excellent insulating properties, the tall spans and beautifully diffused lighting quality helped us achieve the dramatic visual impact we were after".

— Derek M. Norton, Principal, Ritter Architects,
Martha Washington Library

Allguth Car Wash, Munich, Germany

CORPORATE & COMMERCIAL O F F I C E

Devon Energy HQ, Oklahoma City, OK

Evonik / Degussa, Marl, Germany

Jones Lang LaSalle, New York, NY

Massive Inc., New York, NY

Ballinger Architects, Philadelphia, PA

Nail Communications, Providence, RI

HKS Architects, Dallas, TX

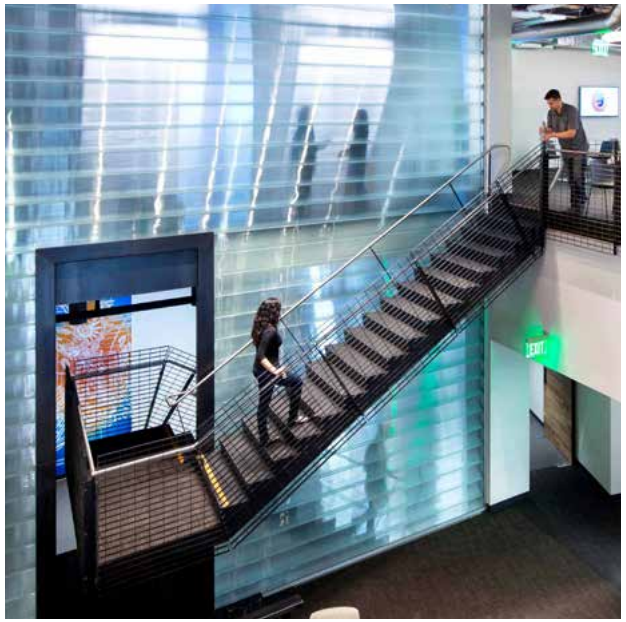
Prologis Headquarters at Pier 1, San Francisco, CA

"We wanted to provide as much natural light as possible to the production building to minimize the use of artificial light during working hours. Bendheim's channel glass gave us the flexibility of achieving this."

— Juancarlos Fernandez, Architect,
Lail Design Group, CADE Winery

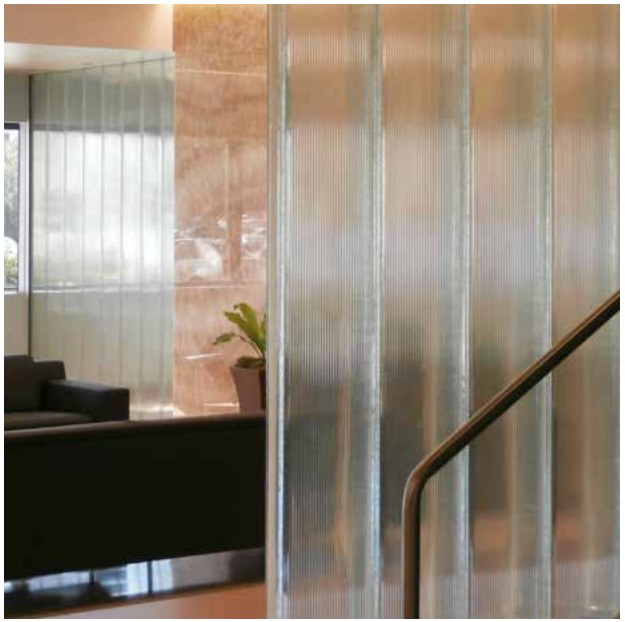
425 California Street, San Francsco, CA

640 Memorial Drive, Cambridge, MA



Mozilla Corporation, Mountain View, CA

Serta International Center, Hoffman Estates, IL



1170 Devon Park Drive, Wayne, PA

Sunrise Enterprises, Fayetteville, AR

"Our experience with Bendheim on The Children's Hospital of San Antonio was nothing short of great... Bendheim helped us with the pre-assembled panel design, which saved us thousands on the installation and allowed us to beat the schedule."

— Alan Sharp, CEO, Sharp Glass

1211 Avenue of the Americas, New York, NY

RESIDENTIAL

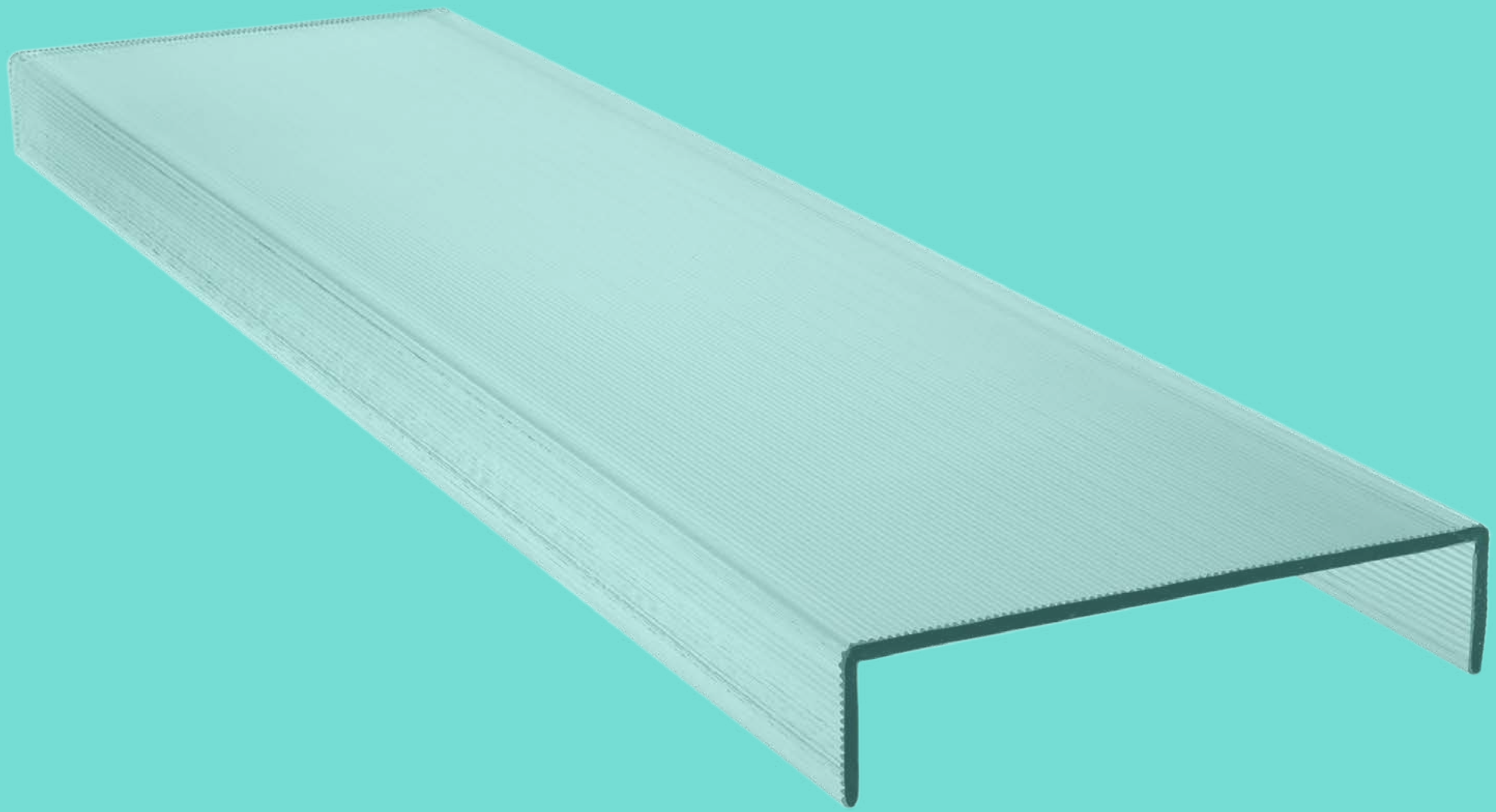
C-Glass House, Tomales, CA

Schermerhorn Affordable Housing, Brooklyn, NY

Parker Gordon Residence, Washington, DC

263 Surfside Drive, Bridgehampton, NY

Acero House, Las Vegas, NE



To contact the most experienced channel glass design team in North America:

1.800.221.7379 ext. 5

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CHANNEL GLASS

BENDHEIM

TRADE SHOWROOM
200 Lexington Avenue
New York, NY 10016

HEADQUARTERS
82 Totowa Road
Wayne, NJ 07470

T: 800.221.7379
linit@bendheim.com
www.Bendheim.com