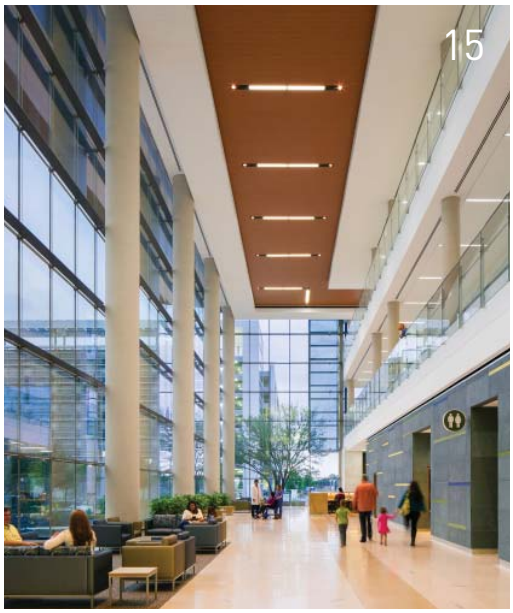
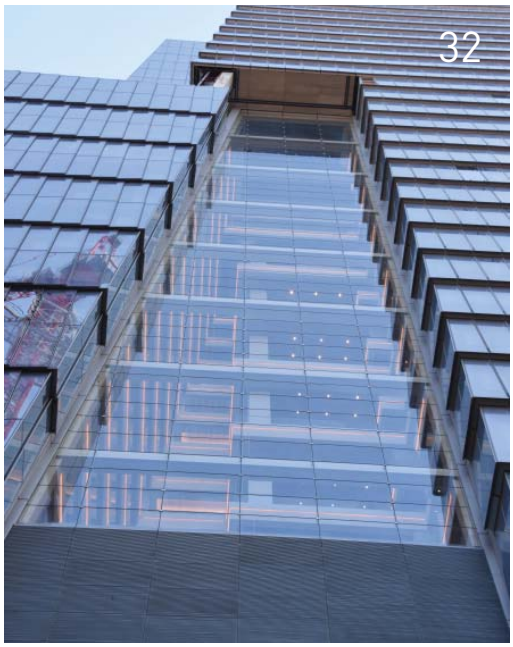
Pilkington **Planar**™

THE WORLD'S LEADING STRUCTURAL GLASS SYSTEM

GLASS FIN WALLS
TENSION STRUCTURES & CABLE NETS
ROOFS, SKYLIGHTS & CANOPIES





34

PROJECT
601 Massachusetts Avenue

LOCATION
Washington, DC

ARCHITECT
Duda Paine
Architects

THE PILKINGTON PLANAR™ SYSTEM

UNRIVALED PERFORMANCE FOR OVER 50 YEARS—THERE IS NO EQUAL.

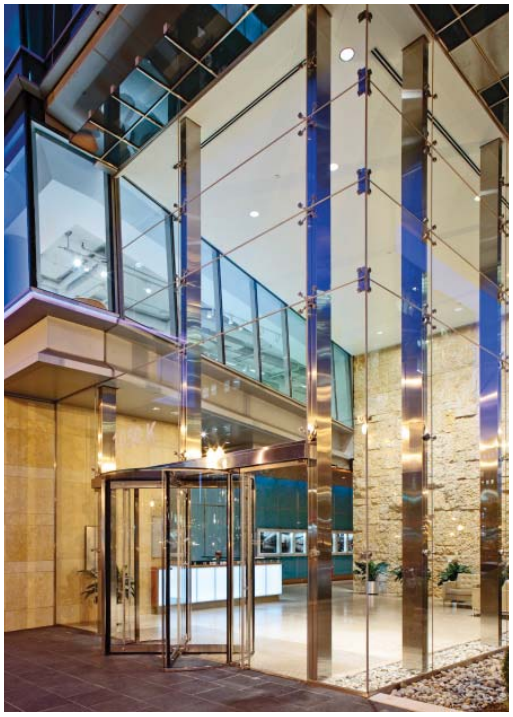
Pilkington **Planar™** structural glass systems have a proven track record in the most demanding applications. Architects can have absolute confidence in our ability to create soaring facades, roofs, canopies, or even clad an entire building. Architects can be comforted that their clients will receive the most highly engineered system in the market backed by the most respected glass manufacturer in the world. Pilkington **Planar™** readily adapts to the design team's requirements for designing backup structures that are simplistic or complex.

THE COMBINED EXPERIENCE OF ONE OF THE OLDEST AND LARGEST GLASS MAKERS IN THE WORLD ALONG WITH ONE OF THE LARGEST GLAZIERS IN THE UNITED STATES ASSURES A SAFE AND SUCCESSFUL RESULT!

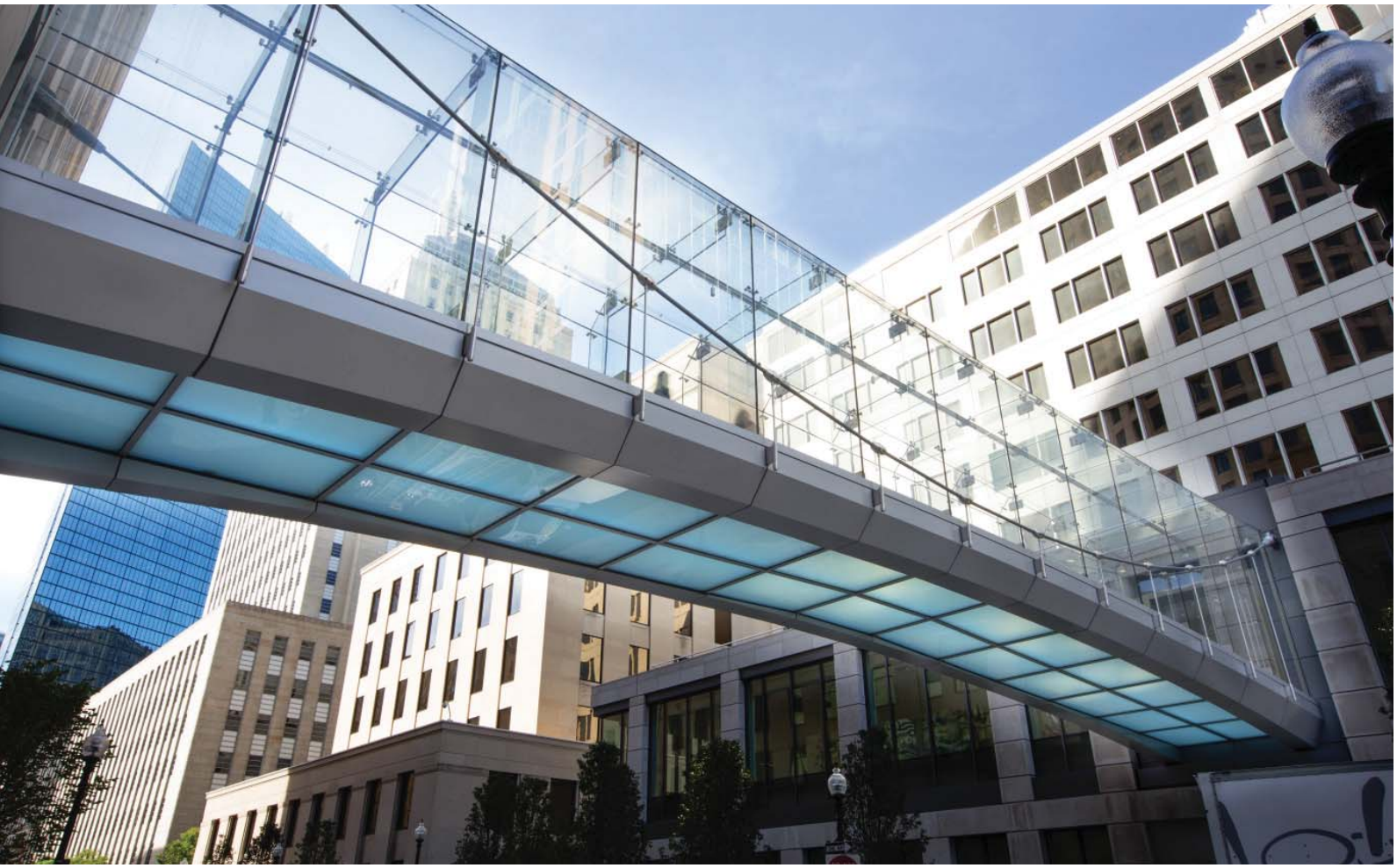
MANUFACTURER

Pilkington has been one of the world's leading glass manufacturers for over 150 years. Pilkington provides the complete glazing system as a sole source to insure undivided responsibility. One of the world's largest glass research facilities supports a rigorous continual in-house testing program. This allows Pilkington to offer their 12-year comprehensive warranty that covers design, manufacturing, and installation.

Pilkington maintains a separate facility designed strictly for the manufacturing of the Pilkington **Planar™** system. This results in exclusive glass features found only in the Planar system.



TOP: Rivers Casino, Pittsburgh, PA, Bergman Walls & Associates
BOTTOM: 1050 K Street, Washington, DC, Hickok Cole Architects



PROJECT
Liberty Mutual Bridge

LOCATION
Boston, MA

ARCHITECT
CBT Architects

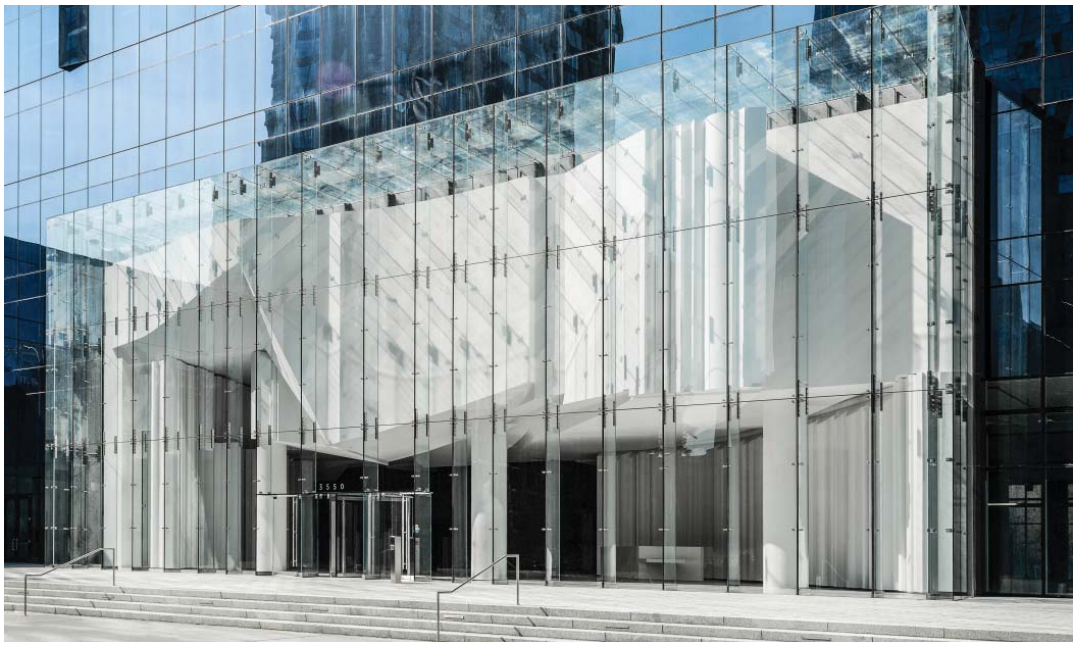
FAMILY OWNED AND OPERATED FOR OVER 70 YEARS IN THE METAL AND GLASS INDUSTRY PROVIDING SUPERIOR SOLUTIONS TO YOUR MOST CHALLENGING PROJECTS.

W&W GLASS, LLC

W&W Glass is the NY metropolitan area's largest architectural glass and metal contractor, specializing in Curtainwalls, Storefronts, Entrances, Ornamental Metal, Skylights, and Pilkington **Planar™** structural glass systems.

W&W IS EXPERIENCED WITH VARIOUS PROJECT DELIVERY METHODS, INCLUDING THE DESIGN ASSIST/DESIGN BUILD PROCESS. WE WORK WITH ARCHITECTS AND CONTRACTORS ALL OVER NORTH AMERICA AND THE CARIBBEAN.

W&W is a family owned business with a 70-year history in the metal and glass industry. The company is one of the largest metal and glass companies in the New York metropolitan area and the largest supplier of structural glass systems to the glazing industry in the country. W&W maintains a full-time estimating and engineering department ready to provide an engineered solution to your building enclosure needs.



Three Alliance Center, Atlanta, GA, Mack Scogin Merrill Elam Architects

MAJOR ADVANTAGES

1. Sole Source Manufacturing & Engineering In-house, sole source, quality assured system totally manufactured and controlled by Pilkington. The system is never sold by mixing outside glass or hardware suppliers. Pilkington and W&W maintain a dedicated in-house engineering staff that reviews every detail of each system prior to manufacture.

2. Superior Tempering Minimum compressive strength of 16,000 psi in a custom built modern furnace versus typical domestic tempering of approximately 11,500 psi. This gives the glass added strength so that even when it is subjected to required high static and dynamic loading, there will be very high factors of safety at the hole locations where maximum stress occurs.

3. Research and Testing Pilkington maintains one of the largest glass research testing facilities in the world and regularly tests in-house for various Pilkington **Planar™** projects.

4. 12-Year Warranty Gives You Absolute Confidence Continual and rigorous testing programs have given us a wealth of knowledge concerning structural glass systems. This has allowed us to introduce a Code of Practice for structural glass facades. Every part of every Pilkington **Planar™** solution is designed in accordance with this criteria. This means we can give Pilkington **Planar™** a 12-year design and materials warranty, and give you total confidence in the system's performance and reliability.

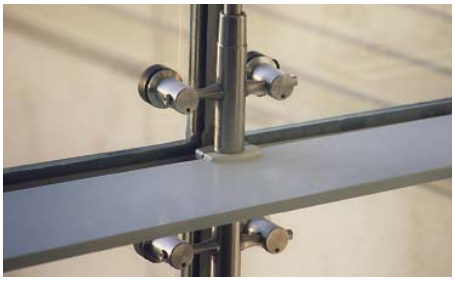
5. Rollerwave Distortion Control Rollerwave distortion (the visual waviness inherent in tempered glass) is reduced to an average of 0.02mm (0.0007") for uncoated tempered glass or 0.05mm (0.002") for low-e coated tempered glass. This is much flatter than the industry norm, which can be as high as 1.27mm (0.05"). This exclusive Pilkington feature significantly reduces visual rollerwave allowing the glass to accurately reflect its surroundings.*

* There is no published industry standard for rollerwave distortion in tempered glass.

Pilkington Planar™ Glass

Other Fabricated Glass Products

PILKINGTON PLANAR™ FITTINGS



THE CONCEPT IS CLEAR: DESIGN, TEST, AND PLACE INTO SERVICE THE BEST ENGINEERED AND YET THE SMALLEST, MOST AESTHETICALLY PLEASING FITTING WITHOUT COMPROMISING PERFORMANCE.

Rigorous testing has led to the development of a standard set of fittings using 316 grade stainless steel. These fittings are designed to deal with extraordinary forces from seismic, snow, and wind loads

Four and two-point castings, as well as various 905J countersunk series fittings, represent only some of the many types of stainless steel connectors designed to connect the glass to the backup structure.

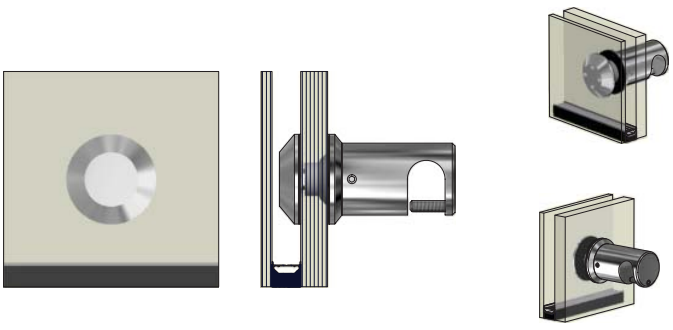
PILKINGTON PLANAR™ INTEGRAL

A fully tested and patented method of fixing laminated glass panels to a backup structure without any exterior bolts, caps, or washers! All fittings are concealed within the laminated glass. This fixing system allows a much wider variety of glass types, including art and textured glass, to be used in a structural glass application. Pilkington **Planar™** Integral allows us to horizontally glaze an entire roof or canopy without any fasteners in the exterior glass!

905J Integral in Laminated Glass

PILKINGTON PLANAR™ INTRAFIX IGU

Intrafix can be specified for applications in which the design team wants an insulated wall without any external bolts, caps, or washers. This fixing mechanism captures the tempered or laminated inner leaf of an insulated unit with a stainless steel disk system which does not penetrate the outer glass. Pilkington **Planar™** Intrafix allows high performance coated glasses to be used for the external lite of the IG unit. Intrafix carries the Pilkington **Planar™** 12-year warranty!



905J Intrafix in IGU

GLASS PERFORMANCE FIGURES

PILKINGTON OPTIFLOAT™ CLEAR INSULATED GLASS

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optifloat™ Clear	Air	Pilkington Optifloat™ Clear	0.76	0.14	0.64	0.74	0.47	0.47	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optifloat™ Clear	Air	Pilkington K Glass™ Clear on #3	0.70	0.16	0.60	0.69	0.29	0.33	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optifloat™ Clear	Air	Pilkington Optitherm™ S1 Plus Clear on #3	0.71	0.16	0.45	0.52	0.23	0.29	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Suncool™ 70/40 Pro T Clear	Air	Pilkington Optifloat™ Clear	0.67	0.09	0.37	0.43	0.24	0.30	35
Pilkington Suncool™ 66/33 Pro T Clear	Air	Pilkington Optifloat™ Clear	0.62	0.15	0.32	0.37	0.22	0.29	35
Pilkington Suncool™ 50/25 Pro T Clear	Air	Pilkington Optifloat™ Clear	0.47	0.18	0.25	0.29	0.22	0.29	35

PILKINGTON OPTIWHITE™ LOW-IRON INSULATED GLASS

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optiwhite™ Low-Iron	Air	Pilkington Optiwhite™ Low-Iron	0.83	0.15	0.81	0.93	0.47	0.47	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optiwhite™ Low-Iron	Air	Pilkington K Glass™ Low-Iron on #3	0.77	0.18	0.76	0.87	0.29	0.33	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optiwhite™ Low-Iron	Air	Pilkington Optitherm™ S1 Plus Low-Iron on #3	0.78	0.18	0.53	0.61	0.22	0.29	35

12mm Outer Pane	16mm Cavity	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Suncool™ 70/40 Pro T Low-Iron	Air	Pilkington Optiwhite™ Low-Iron	0.73	0.10	0.41	0.47	0.24	0.30	35
Pilkington Suncool™ 66/33 Pro T Low-Iron	Air	Pilkington Optiwhite™ Low-Iron	0.68	0.17	0.34	0.39	0.22	0.29	35
Pilkington Suncool™ 50/25 Pro T Clear	Air	Pilkington Optiwhite™ Low-Iron	0.51	0.19	0.26	0.30	0.22	0.29	35

PILKINGTON OPTIFLOAT™ CLEAR LAMINATED GLASS

12mm Outer Pane	1.52mm Itr.layer	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optifloat™ Clear	Trosifol® SentryGlas®	Pilkington Optifloat™ Clear	0.82	0.08	0.67	0.77	0.83	0.92	34
Pilkington Optifloat™ Clear	Trosifol® SentryGlas®	Pilkington K Glass™ on #4	0.75	0.10	0.57	0.66	0.46	0.59	34
Pilkington Optifloat™ Clear	Trosifol® SentryGlas®	Pilkington Solar-E™ on #4	0.56	0.07	0.47	0.54	0.46	0.60	34
Pilkington Suncool™ 70/40 Pro T Clear	Trosifol® SentryGlas®	Pilkington Optifloat™ Clear	0.71	0.11	0.44	0.51	1.00	0.99	34
Pilkington Suncool™ 66/33 Pro T Clear	Trosifol® SentryGlas®	Pilkington Optifloat™ Clear	0.57	0.22	0.41	0.47	0.83	0.92	34

PILKINGTON OPTIWHITE™ LOW-IRON LAMINATED GLASS

12mm Outer Pane	1.52mm Itr.layer	6mm Inner Pane	Vtc	Rf(vis)	SHGCc	SCc	'U' Summer	'U' Winter	OITC*
Pilkington Optiwhite™ Low-Iron	Trosifol® SentryGlas®	Pilkington Optiwhite™ Low-Iron	0.89	0.08	0.81	0.97	0.83	0.91	34
Pilkington Optiwhite™ Low-Iron	Trosifol® SentryGlas®	Pilkington K Glass™ Low-Iron on #4	0.83	0.11	0.74	0.85	0.46	0.59	34
Pilkington Suncool™ 70/40 Pro T Low-Iron	Trosifol® SentryGlas®	Pilkington Optiwhite™ Low-Iron	0.76	0.11	0.45	0.52	1.00	0.99	34
Pilkington Suncool™ 66/33 Pro T Low-Iron	Trosifol® SentryGlas®	Pilkington Optiwhite™ Low-Iron	0.63	0.24	0.37	0.43	0.83	0.91	34

The figures listed above are indicative only. Some products have manufacturing limitations. Please visit our website or make a technical inquiry for specific product data. Glass performance on additional tints, interlayers, low-e coatings and make-ups are available upon request.

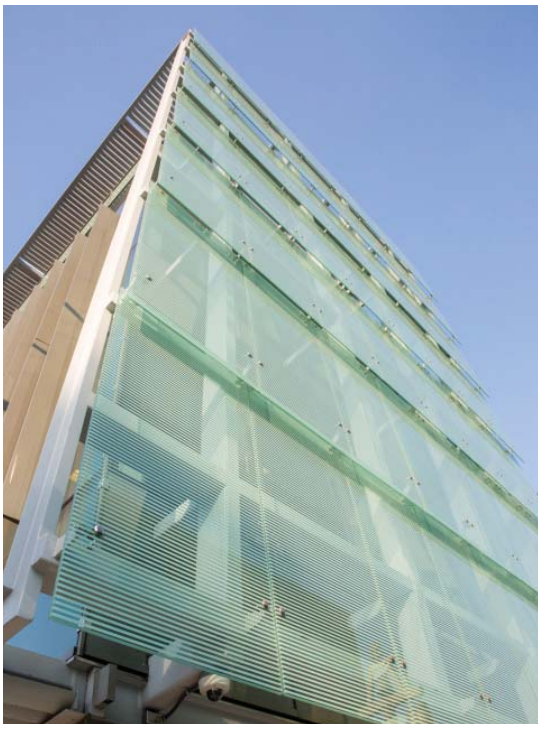
*The OITC values listed in the chart above are based on actual testing by Pilkington Architectural per DIN EN ISO 10140. Values for insulating laminated glass units, PVB interlayer, and acoustical interlayer are available by request.

STEEL BACKUP STRUCTURES CAN BE ANYTHING FROM SIMPLE PIPE COLUMNS TO COMPLICATED, EXPRESSIVE TRUSS SYSTEMS.

W&W and Pilkington can design and supply, as a sole source system, both the glass and steel. In some instances when the design is very simple, it may be advantageous to allow the steel to be furnished and erected within the steel package, with coordination by Pilkington and W&W.

When the steel design becomes expressive and close integration of the two products is needed, we will supply both steel and glass as a single source.

Harborside Financial Center Plaza 5, Jersey City, NJ, Grad Associates



TOP: United Therapeutics Bridge Phase 2B, Silver Spring, MD, EwingCole **BOTTOM: Culinary Arts And District Office Building (CAADO)**, Riverside, CA, LPA

PROJECT
601 Lexington Avenue

LOCATION
New York, NY

ARCHITECT
KlingStubbins

PROJECT
Children's Hospital of Los Angeles Sunset Bridge

LOCATION
Los Angeles, CA

ARCHITECT
ZGF

GLASS MULLION SYSTEMS

THE GLASS MULLION SYSTEM USES GLASS FINS AS A MEANS OF SUPPORT FOR MAXIMUM TRANSPARENCY.

These glass facades must be suspended from the structure above with the glass panels fastened to the mullions by Pilkington **Planar™** fittings. This means the combined weight of both the panels and the mullions is carried by the connection at the head of each fin. This allows you to design very tall facades that do not exert large in-plane loads on the Pilkington **Planar™** panels. All projects in high seismic zones must be suspended in this way.

Pilkington **Planar™** has been thoroughly tested for use in areas of high seismic activity, which has been demonstrated by the system's excellent performance in previous seismic events in both California and Japan.

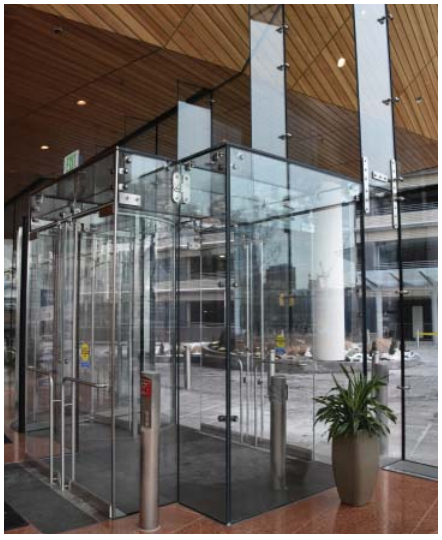
Montgomery County Judicial Center Annex, Rockville, MD, AECOM

PROJECT
Continental Tires
Manufacturing Facility

LOCATION
Sumter, SC

ARCHITECT
SSOE

A PILKINGTON PLANAR™ GLASS MULLION FACADE HAS BEEN DESIGNED AND TESTED TO WIND LOADS OF 270 PSF (320 MPH) FOR 15 MINUTES.



FMC Tower, Philadelphia, PA,
Pelli Clarke Pelli Architects

2000 Avenue of the Stars, Century City, CA,
Gensler

TENSION STRUCTURES

WE GUARANTEE THE DELIVERY, COMPATIBILITY, AND PERFORMANCE OF THE COMPLETE FACADE.

Various forms of cable-stayed backup system designs can be used to support a Pilkington **Planar™** facade. They can take the form of simple strong back trusses, bow string trusses, or lighter weight, more filigree cable trusses. Designers have complete freedom and flexibility when designing these trusses.

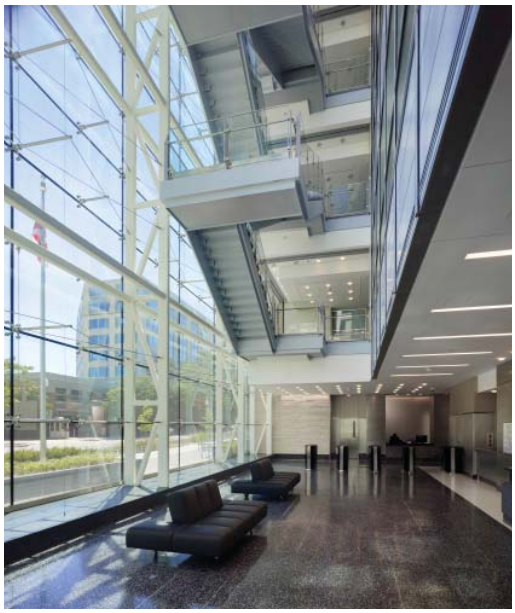
Tension rod facades have become one of the newest trends in point-supported glass systems. These systems utilize horizontal steel plate beams or tubes as a lateral brace between vertical columns with stainless steel rods supporting the dead load of the glass and sag of the beams. This type of system creates wide open spans with minimal support structure concealed behind the horizontal and vertical joints.

In all instances, the capabilities and loading of the glass must be used as the basis of the design for the backup structural system.

PROVEN PERFORMANCE

Pilkington **Planar™** Tension Structures have already met high performance requirements for seismic loads, live and dead loads, and wind loading, including hurricane force winds.

These structures require early cooperation between the design team and W&W Glass to solve both design and budget questions. We offer full technical design services, starting from the basic concept, through 2D and 3D analysis, up to full design and performance specifications, mock-ups, and testing.



TOP: Massachusetts General Hospital, Boston, MA, NBBJ **CENTER: Santa Monica College Theater**, Santa Monica, CA, Renzo Zecchetto Architects **BOTTOM: Consolidated Forensics Laboratory**, Washington, DC, HOK

PROJECT
Parkland Hospital

LOCATION
Dallas, TX

ARCHITECT
HDR/Corgan

CANOPY SYSTEMS

THE DESIGN FLEXIBILITY OF PILKINGTON PLANAR™ AND THE REDUCTION OF METAL FRAMING, WHICH CAN CAUSE MAINTENANCE PROBLEMS OVER TIME, MAKE PILKINGTON PLANAR™ THE PERFECT CHOICE FOR HORIZONTAL AND OVERHEAD GLAZING.

Pilkington **Planar™** overhead glazing has undergone extensive seismic, impact, water, and wind load testing. Backup structures can be supplied as a completely engineered sole source package for guaranteed performance of the complete skylight or canopy.

TECHNICAL CONSIDERATIONS

The backup structure is required to carry snow and other loads and resist negative wind pressures through the fitting locations. Large spans are possible if underlying purlins are reinforced with cable tension rod rigging. Pilkington **Planar™** requires a minimum of 3 degrees of slope (5/8" per foot or 5%) to eliminate ponding of water in the center of the glass. (Subject to further review on a project basis.)

100 Light Street, Baltimore, MD, Design Collective

PROJECT
Twelve Oaks Mall

LOCATION
Novi, MI

ARCHITECT
Neumann/Smith Architecture

Cadence Health Medical Office Building , Aurora, IL
PPK Architects

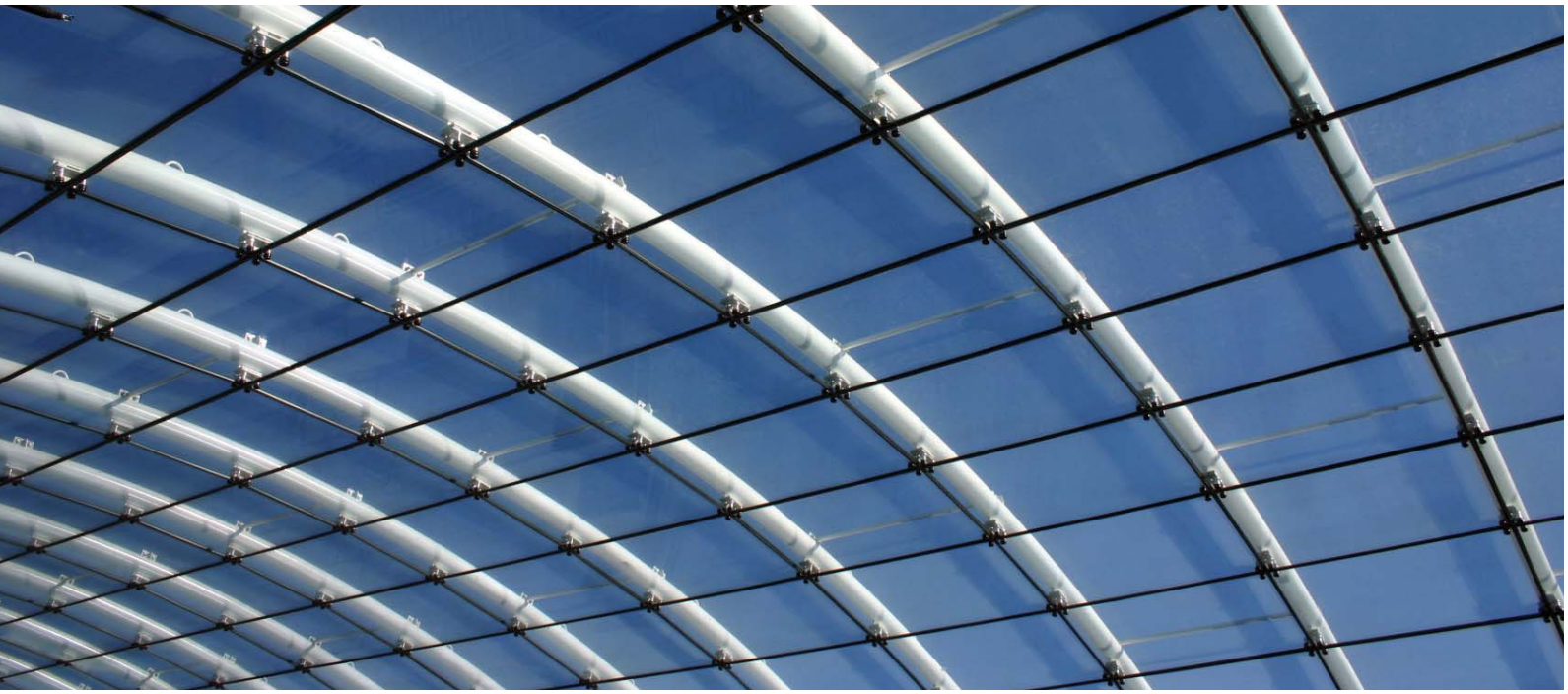
Yonge Eglinton Centre, Toronto, Ontario, Canada
Page+Steele/IBI Group Architects

ROOFS AND SKYLIGHTS

WHEN TRYING TO CREATE TRANSPARENT VIEWS OF ARTICULATED STRUCTURES, PILKINGTON PLANAR™ IS THE PERFECT WAY TO SIMPLIFY THE ALL GLASS SKYLIGHT. PILKINGTON PLANAR™ APPLICATIONS HAVE AN EXTENSIVE IN-SERVICE TRACK RECORD FOR SAFETY AND DURABILITY.

Horizontal applications are warranted for 12 years against delamination, leakage, and seal failure (IG units). Early coordination with the building structure is needed, as well as consideration of snow and drift loads, seismic zone, drainage, etc. Steel can be engineered to use combinations of glass mullions and/or cable and steel structures.

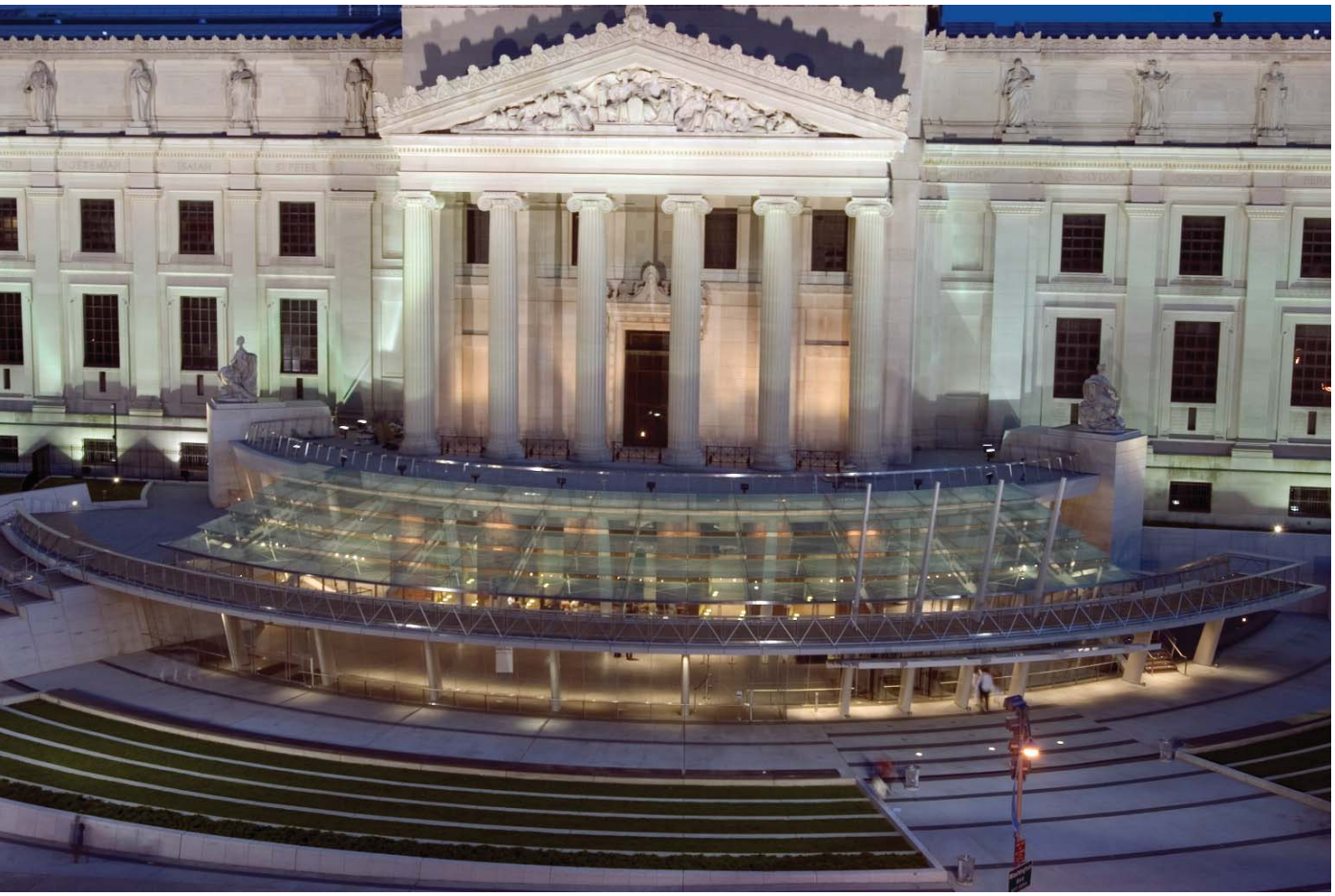
Gassiot House of St Thomas' Hospital,
London, United Kingdom, BMJ Architects



PROJECT
Yorkdale Mall

LOCATION
Toronto, Canada

ARCHITECT
MMC International



PROJECT
Brooklyn Museum of Art

LOCATION
Brooklyn, NY

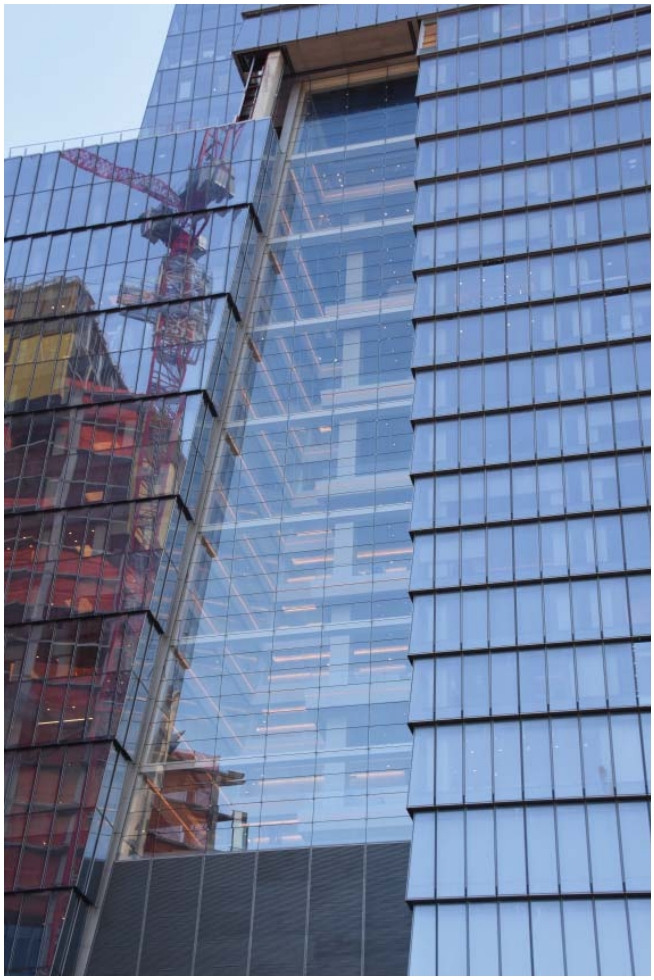
ARCHITECT
Ennead Architects

PLANAR NET

PILKINGTON AND W&W HAVE DEVELOPED AND TESTED THE PLANAR NET SYSTEM.

COMBINED WITH PLANAR INTEGRAL OR INTRAFIX DESIGNS, CABLE NETS CAN BE SUPPLIED WITHOUT ANY EXTERIOR FITTINGS OR PATCHES.

Planar Net uses the same principles used by the Pilkington **Planar™** system by attaching countersunk Planar panels to be pre-tensioned cables which are then attached to a coordinated boundary structure.



10 Hudson Yards, New York, NY, KPF

Planar Net fitting assembly

PROJECT
Alice Tully Hall
at Lincoln Center

LOCATION
New York, NY

ARCHITECT
Diller Scofidio & Renfro
with FXFowle

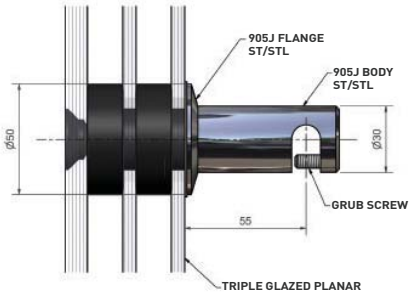
Charles Schwab Lone Tree Office Campus, Lone Tree, CO, Fentress Architects

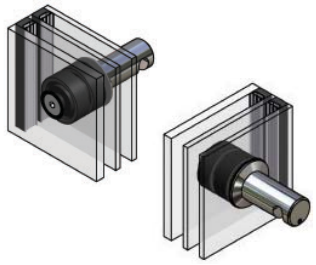
Time Warner Building, New York, NY, SOM

PILKINGTON PLANAR™ TRIPLE INSULATED GLASS

PILKINGTON INTRODUCES THE WORLD'S FIRST TRIPLE GLAZED FRAMELESS GLASS SYSTEM.

Triple glazing offers substantially lower 'U' Values than traditional double glazed Pilkington **Planar™**. There are three layers of glass giving the architect multiple choices for increased solar performance and noise control. (Performance figures available upon request.)





CANADIAN MUSEUM OF NATURE "THE QUEENS' LANTERN"

THE LANTERN AT THE CANADIAN MUSEUM OF NATURE IS A 65' TALL TRIPLE GLAZED, 3-SIDED GLASS CUBE PLANAR SYSTEM.

The glass make-up of the insulated units is comprised of a 12mm Pilkington **Optiwhite™** low-iron T-Plus outer lite, with a 6mm Pilkington **Optiwhite™** low-iron T-Plus middle lite, and the interior lite is 6mm Pilkington **Energy Advantage™** T-Plus. It was designed to handle the harsh Canadian winters common to the Ottawa area. The system is a combination of Pilkington **Planar™** seismic 905J fittings on clear glass fins, which in this unique situation penetrate the face glass and protrude from the building. The corner units are attached to steel columns that are suspended from a cantilevered roof structure.

PROJECT
Canadian Museum of Nature
"The Queens' Lantern"

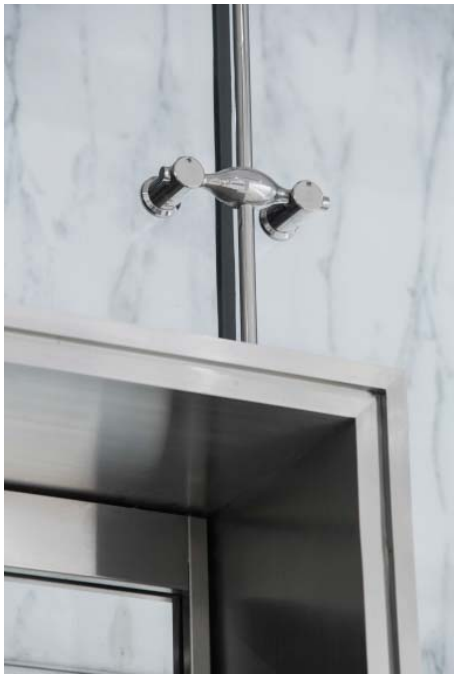
LOCATION
Ottawa, Ontario, Canada

ARCHITECT
BPA, Kuwabara Payne McKenna
Blumberg Architects, & GLC

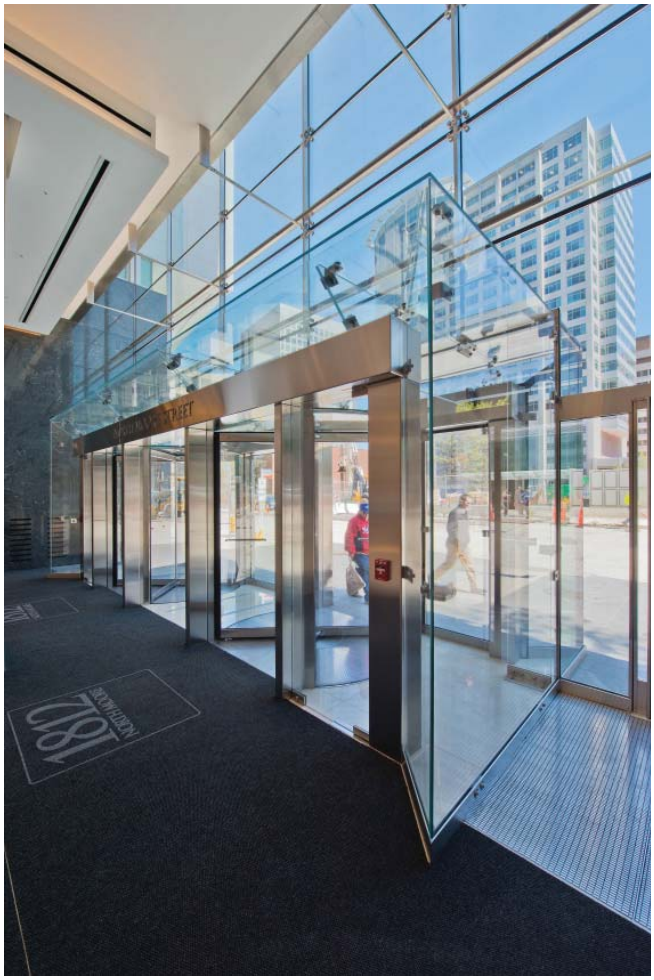
GLASS VESTIBULES AND PORTALS

PILKINGTON PLANAR™ SYSTEMS CAN BE DESIGNED TO INCORPORATE ALL GLASS VESTIBULES FOR ULTIMATE TRANSPARENCY.

In many cases, suspended structural glass wall systems will need separation from the base loaded door portal areas. This separation is often created using stainless steel-clad tube steel, however, there are custom solutions available by W&W that can use thin stainless steel plate beams for greater transparency. There are also opportunities to integrate full all glass vestibules into your design using laminated glass sidewalls, beams, and roof.



Tension Rod Connected to Portal



1812 North Moore Street, Arlington, VA, DCS Design

Marist College Lowell Thomas Communications Center, Poughkeepsie, NY, Hibbs Architects

PROJECT
1290 Avenue of the Americas

LOCATION
New York, NY

ARCHITECT
Moed de Armas & Shannon (MdeAS) Architects

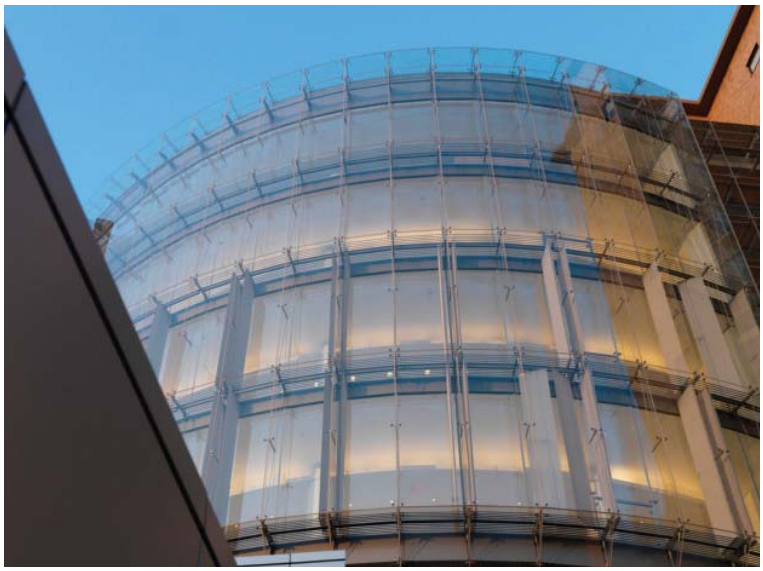
1801 California Street, Denver, CO,
Morrison Dillworth + Walls

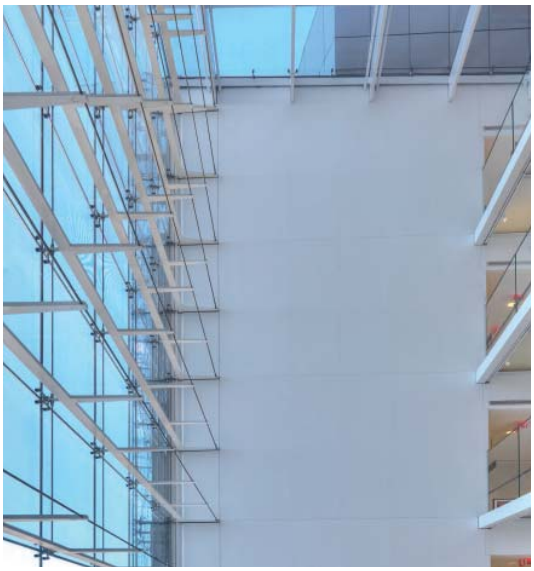
One Post Office Square, Boston, MA,
CBT Architects

NEW YORK PRESBYTERIAN HOSPITAL

The dual skin "climate wall" was designed to allow significant quantities of natural daylight into the space and to act as a natural insulator.

The outer wall of laminated glass is mounted to a series of stainless steel tension rods by countersunk Planar fittings and cast stainless steel "spiders". The inner wall of insulated laminated glass is separated by a 3' gap that acts as a thermal barrier and allows for the deployment of computer controlled shading devices as well as cleaning. In the winter, the facade acts as a large thermal blanket for the space, reducing heating costs.





Atrium and entrance enclosures were created using horizontal and vertical tension structures.

PROJECT
New York Presbyterian
Hospital Lobby Entrance

LOCATION
New York, NY

ARCHITECT
Pei Cobb Freed
& Partners

UNIVERSITY OF SOUTHERN CALIFORNIA
STEM CELL RESEARCH BUILDING

THE EXTERIOR PLANAR FACADE IS A CABLE WALL SPANNING APPROXIMATELY 63' TALL COMPRISED OF PILKINGTON OPTIWHITE™ LOW-IRON, LAMINATED GLASS MOUNTED TO STAINLESS STEEL CABLES BY PLANAR 905J STAINLESS STEEL MACHINED FITTINGS CLAMPED ONTO THE CABLE WITH SPECIALLY MADE RODS AND BOLTS.

The interior facade is a conventional window wall spanning floor to ceiling with insulated low-e glass with a 50% acid etch frit pattern.

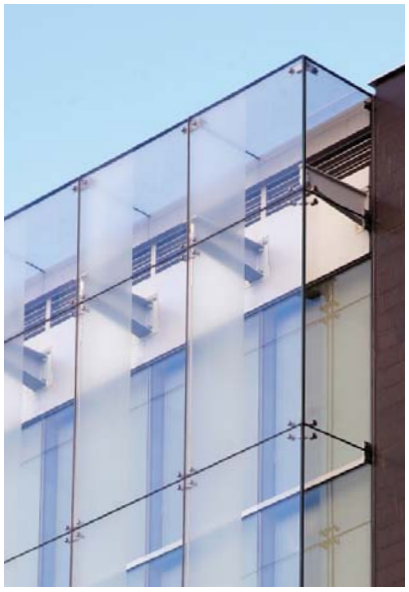
The cavity of 3' between facades is filled with walkways for access to the exterior facade and for maintenance. This space creates a thermal barrier to better insulate the interior of the building.

PROJECT
University of Southern California Stem Cell Research Building

LOCATION
Los Angeles, CA

ARCHITECT
ZGF

THIS DUAL SKIN CABLE WALL, ON THE WEST COAST, ACTS AS BOTH AN ACOUSTICAL AND THERMAL BARRIER FOR THIS NEW RESEARCH BUILDING.



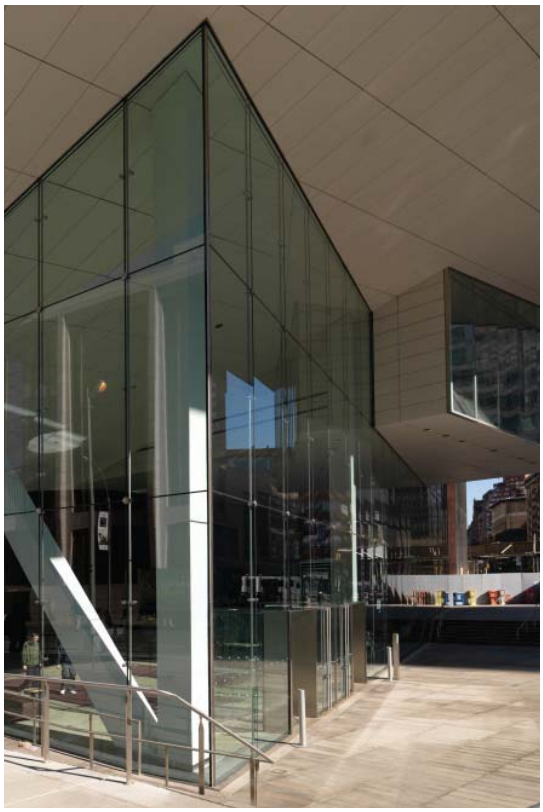
The exterior facade is supported by a series of pre-tensioned stainless steel cables that span top to bottom and are laterally braced at each floor. The glass panels are mounted to the cables by 905J countersunk Planar fittings.

ALICE TULLY HALL AT LINCOLN CENTER, NEW YORK, NY

PILKINGTON PLANAR™ STRUCTURAL GLASS WAS USED ON 4 DIFFERENT FACADES AT THE JUILLIARD SCHOOL OF MUSIC AND ALICE TULLY HALL AT LINCOLN CENTER ON BROADWAY & 65TH STREET.

The focal point of the project is the single span cable wall that faces Broadway and serves as the main entry into the complex. A series of stainless steel cables up to 1.25" diameter span heights of 45' and are tensioned up to 60kips each. 3/4" Pilkington **Planar™** clear laminated glass, mounted to the cables by use of both Pilkington **Planar™** Integral 905J fittings and stainless steel patches, serves as the skin to this facade.

Other Planar facades utilize bolted, insulated laminated glass for insulation, security, and acoustical control and are supported by laminated glass fins.



Stainless steel fittings in both countersunk and patch plate forms were used to mount the laminated glass to the stainless steel cables. The larger patch fittings were used at the four-way intersections and the small Pilkington **Planar™** Integral 905J fittings were used at the intermediate locations to reduce deflection.

PROJECT
Alice Tully Hall
at Lincoln Center

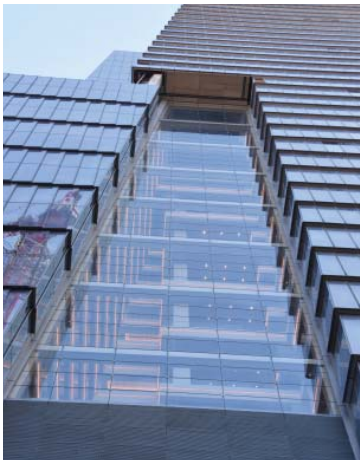
LOCATION
New York, NY

ARCHITECT
Diller Scofidio & Renfro
with FXFowle

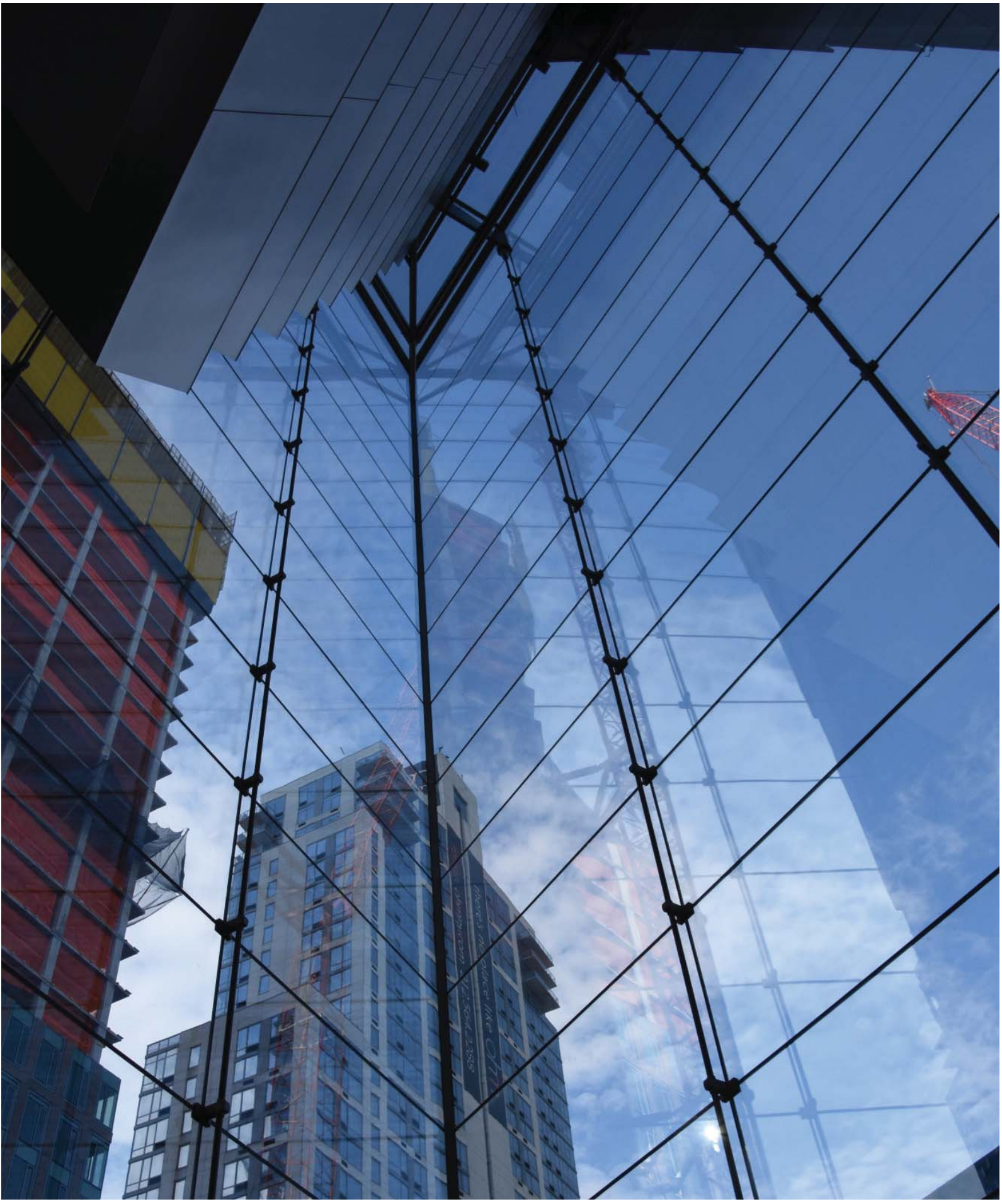
10 HUDSON YARDS, NEW YORK, NY

THE 207-FOOT TALL TRAPEZOIDAL-SHAPED "COACH ATRIUM" VERTICAL TENSION CABLE WALL AT 10 HUDSON YARDS TOWERS ABOVE THE HIGH LINE PARK IN MANHATTAN.

The architect used the Planar Net system for this large open atrium, spanning from floors 6-21, and an expansive 200-foot wide lobby wall with 10-foot wide structureless glass return walls. The system uses 1" thick Pilkington **Optiwhite™** low-iron, laminated glass, custom stainless steel corner clamp patches, and Galfan coated steel tension cables. The atrium wall was braced back at every two floors to lower the tension forces on the boundary structure.



The tension cable walls for 10 Hudson Yards were designed with 10-foot wide modules. The architect desired an ultra-clear view through the acute corner areas of the lobby walls without having to reduce the width of panels or add large steel corner posts. W&W and Pilkington designed an innovative solution to support the suspended glass from slim stainless steel bars concealed behind the corners.



PROJECT
10 Hudson Yards

LOCATION
New York, NY

ARCHITECT
KPF

PROJECT
601 Massachusetts Avenue

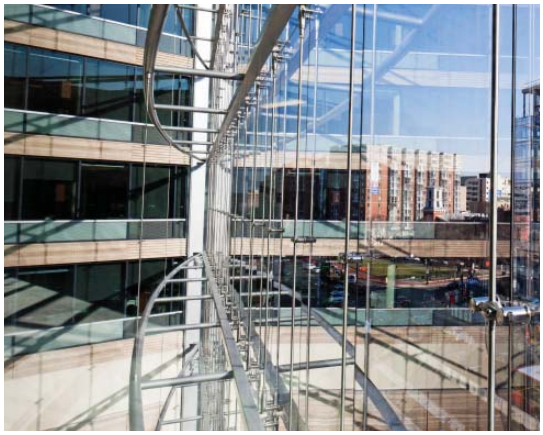
LOCATION
Washington, DC

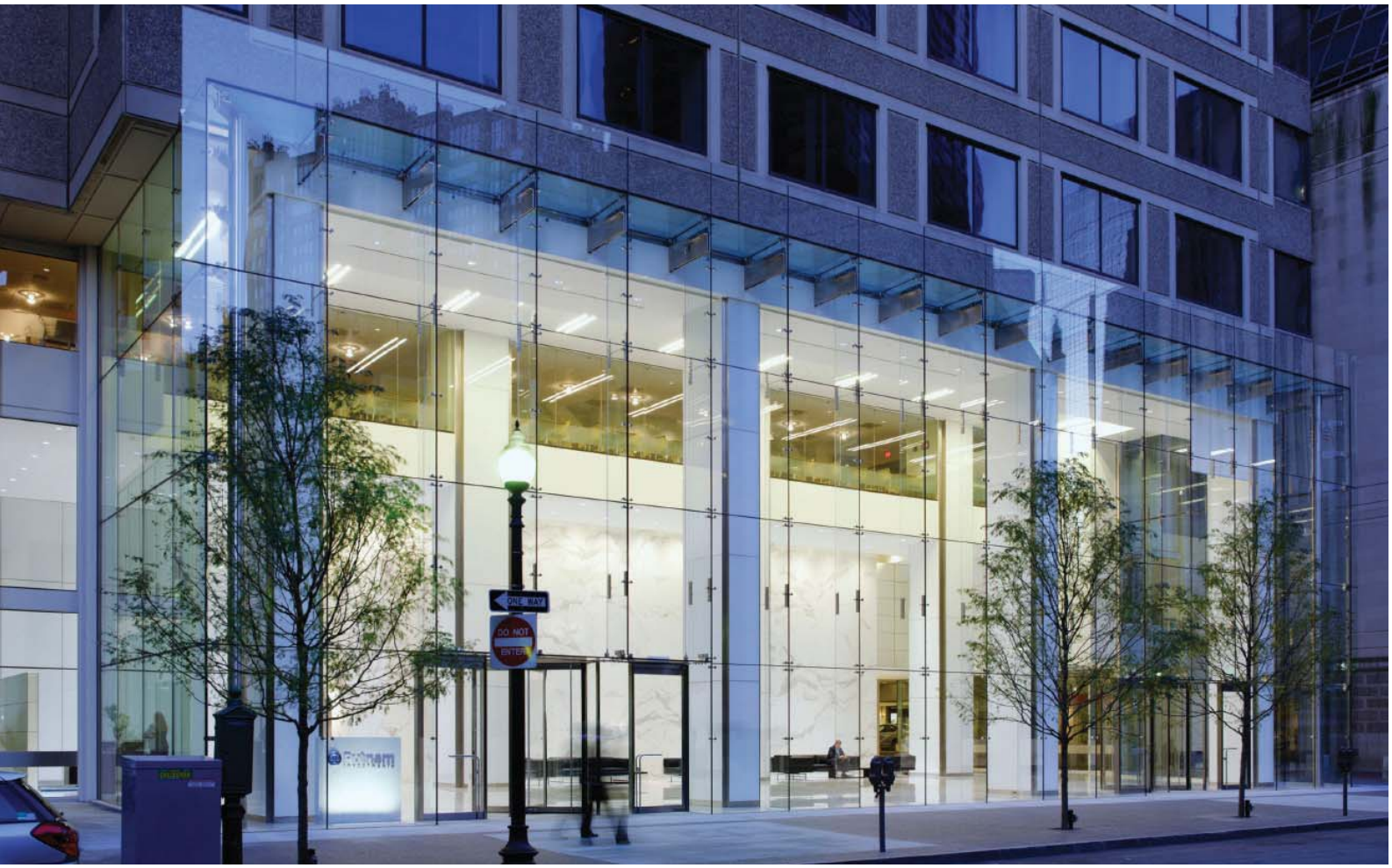
ARCHITECT
Duda Paine Architects

601 MASSACHUSETTS AVENUE

A HIGHLY TRANSPARENT ATRIUM LOBBY WAS CREATED WITH PILKINGTON OPTIWHITE™ LOW-IRON MONOLITHIC GLASS AND A PILKINGTON PLANAR™ TENSION TRUSS STRUCTURE.

601 Massachusetts Avenue features a 10-story, 133-foot tall Pilkington **Planar™** point-supported lobby atrium wall of 1/2" Pilkington **Optiwhite™** low-iron, monolithic tempered glass supported by stainless steel tension rods and 86-foot wide horizontal, painted steel trusses bracing the system at each floor.





PROJECT
One Post Office Square

LOCATION
Boston, MA

ARCHITECT
CBT Architects

ONE POST OFFICE SQUARE

AFTER A CHANGE IN OWNERSHIP OF THIS HIGH-RISE BUILDING, A NEW LOBBY WAS CREATED WITH LOW-IRON GLASS.

The new facade is supported by 19mm Pilkington **Optiwhite™** low-iron, monolithic glass fins and utilizes a "fly-by" at the head and jambs to create the illusion of a floating facade. Custom laminated glass transfer beams were introduced to help create an all glass entry portal to encase both the revolving and balanced doors.

PROJECT
Yonge Eglinton Centre

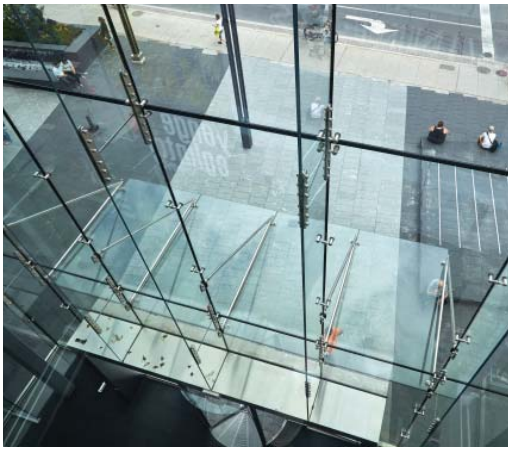
LOCATION
Toronto, Ontario, Canada

ARCHITECT
Page+Steele/IBI Group Architects

YONGE EGLINTON CENTRE

W&W WORKED IN A DESIGN ASSIST CAPACITY ON THE 83-FOOT TALL STRUCTURAL GLASS CUBE ENTRANCE AT THE NEW SHOPPING COMPLEX AT YONGE EGLINTON CENTRE.

The panels are comprised of 6' x 13'4" heavy-duty Pilkington **Planar™** Optiwhite low-iron, low-e coated insulating glass units filled with argon gas for high thermal performance. There is a tension rod canopy that floats above the entrance to the complex connected directly back into the low-iron laminated glass fins supporting the face glass. Other structural glass areas included two vertical bump-out walls, glass roof, and outdoor terrace entrance with laminated glass fin canopy.



PROJECT
Elmhurst Community Library

LOCATION
Elmhurst, NY

ARCHITECT
Marpillero Pollak Architect

ELMHURST COMMUNITY LIBRARY

THE LOW-IRON STRUCTURAL GLASS JEWEL BOX "READING ROOMS" SET THIS LIBRARY APART FROM OTHERS IN THE NEW YORK CITY AREA.

Pilkington **Optiwhite™** low-iron glass was utilized for the cantilevered vertical glass fins and insulated glass units. Stainless steel countersunk fittings join the panels together and allow for structureless glass corners to help make the illusion of floating glass cubes.

PROJECT
NuSkin Innovation Center

LOCATION
Provo, UT

ARCHITECT
Bohlin Cywinski Jackson (BCJ)

NUSKIN INNOVATION CENTER

PILKINGTON PLANAR™ INSULATED GLASS ON TWO VERTICAL WALLS CREATES A LIGHT-FILLED ATRIUM FOR A CORPORATE OFFICE BUILDING.

The glazing system is designed with a series of 3/4" thick horizontal steel plate beams and 3/8" diameter vertical stainless steel tension rods. Glass is mounted to the rods through a stainless steel fitting that extends out to connect to patch clamp plates. The glass panels are made up of Pilkington **Optiwhite™** low-iron insulated glass units with a high performance low-e coating for energy efficiency.

Horizontal painted steel beams resist wind load from the glazing and transfer it into steel columns.

PROJECT
White Plains Hospital
Expansion Phase Two

LOCATION
White Plains, NY

ARCHITECT
Perkins Eastman

WHITE PLAINS HOSPITAL EXPANSION PHASE TWO

THE 25-FOOT TALL STRUCTURAL GLASS LOBBY BATHES THE INTERIOR WITH LOTS OF NATURAL LIGHT TO PROVIDE HOSPITAL VISITORS WITH COMFORT.

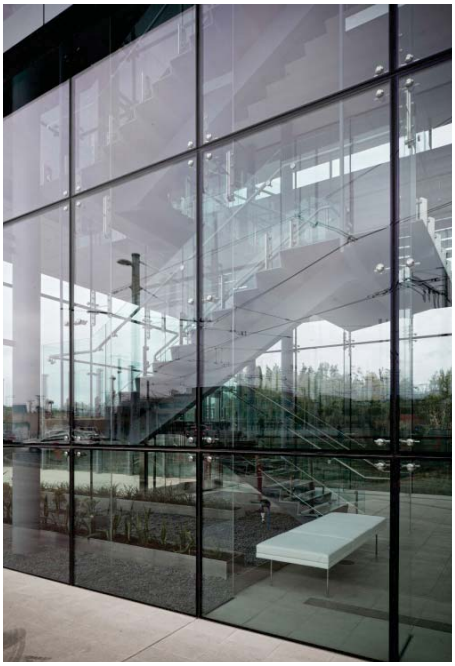
The project design uses slender, vertical painted steel plate beams (1.5" thick) to support the clear insulated glass exterior façade. Glass panels were mounted back to the steel substructure using Pilkington **Planar™** 905J series fittings.

W&W worked closely with Perkins Eastman to help refine the design from a dual plate beam type construction at each vertical joint to a more economical single plate beam model. The result was an expansive glass wall area using large glass panes with a very open feel, unhindered by any horizontal members.

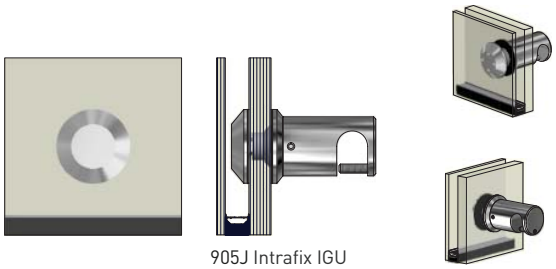
Steel plate beams were precision fabricated and erected in one piece to connect to the structure at the head and sill. The countersunk 905J fittings, that transfer the loads of the face glass, connect directly into the beams to minimize space in front of the steel.

INTRAFIX PROJECTS

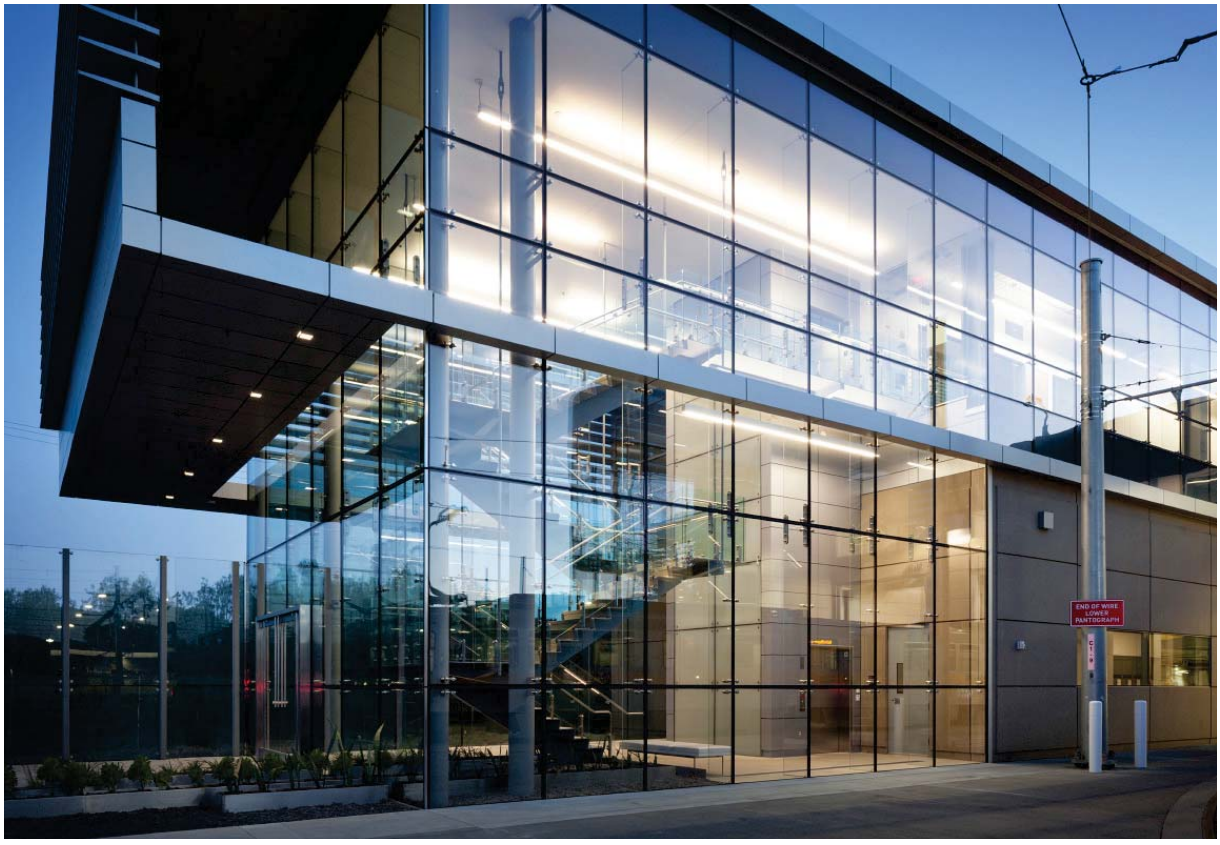
PILKINGTON PLANAR™ INTRAFIX FITTINGS WERE USED ON THE EXPO PHASE 2 – RAIL AND MAINTENANCE FACILITY AND OFFICES AND LAX INTERNATIONAL AIRPORT TERMINAL 4 CONNECTOR TO CREATE A CLEAN APPEARANCE ON THE EXTERIOR OF THE FACADES.



The Expo Phase 2 project was designed to be very transparent with Pilkington **Optiwhite™** low-iron glass units (with low-e) and low-iron monolithic glass fins. Having no exposed fittings on the outside, concealing the point-supports inside the unit, can give a more structurally-glazed appearance than traditional point-supported glass systems that have exposed bolt heads.



905J Intrafix IGU



PROJECT
Expo Phase 2 – Rail and Maintenance Facility and Offices

LOCATION
Santa Monica, CA

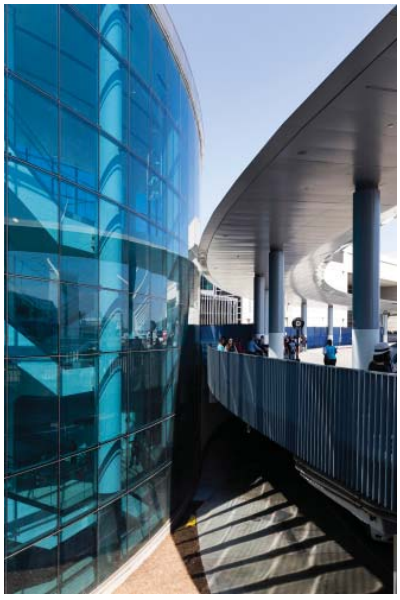
ARCHITECT
RNL Design

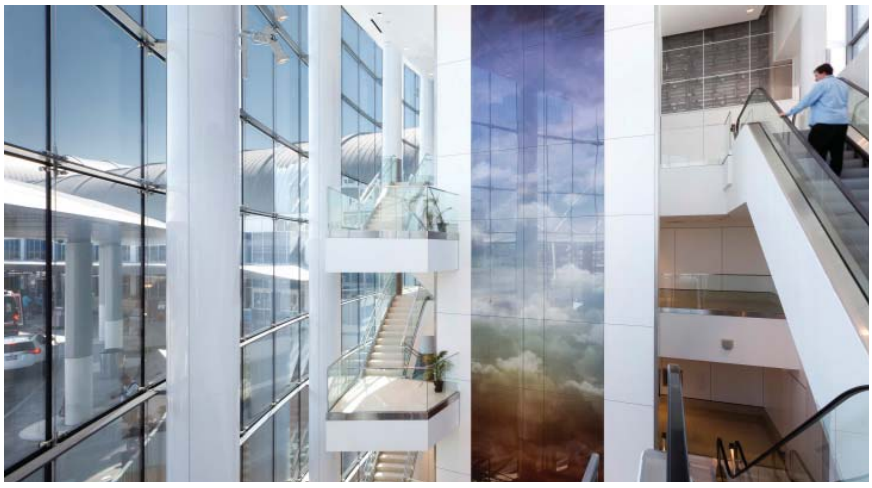
PROJECT
LAX International Airport
Terminal 4 Connector

LOCATION
Los Angeles, CA

ARCHITECT
Corgan

The LAX Terminal 4 Connector project was engineered by W&W and Pilkington to have Pilkington **Planar™** Intrafix Blue-Green tinted, insulated glass units with thin horizontal steel plate beams and vertical tension cables. The curved exterior structural glass walls look very sleek and modern, while the interior has a more high-tech style with steel beams curving around at each level.





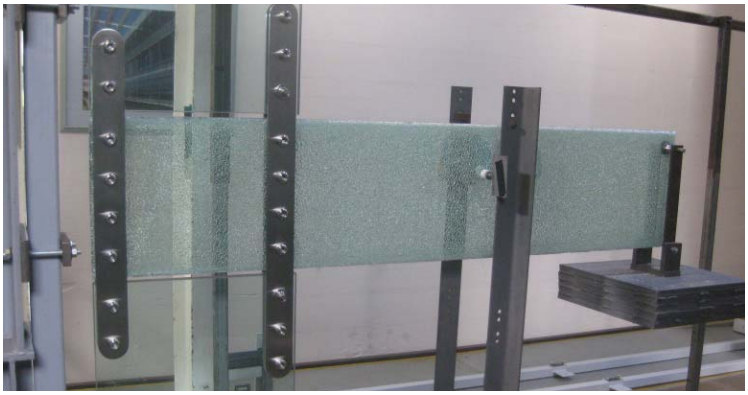
ARCHITECTS, ENGINEERS, AND CONSULTANTS ARE CONTINUALLY DEMANDING HIGHER PERFORMANCE AND CREATING NEWER AND MORE COMPLEX DESIGNS.

When you select the Pilkington **Planar™** system, you are selecting the most tested system available in the marketplace. You are selecting a system backed by over 50 years of IN-HOUSE testing where the end product gives your client unparalleled levels of comfort in the knowledge that all systems are backed by the Pilkington 12-year total warranty.

RECENT TESTING

Testing never stops with the Pilkington **Planar™** system. Recent testing has been carried out on Pilkington **Planar™** Integral hidden bolt laminated glass, energy efficient Pilkington **Planar™** triple glazed and double glazed insulated units, Pilkington **Activ™** self-cleaning glass, and Pilkington **Planar™** Intrafix concealed bolt IG units

Fail-Safe Redundancy of Fins A consultant demanded an unprecedented fail-safe, redundancy test that had never been done before. Under design load (40 psf), we remotely broke a glass fin to prove that the system would stay in place with a broken structural element on the wall. In addition, we tested for dynamic water, air, and seismic loading.



High Strength Laminated Fin Test

WHEN YOU SELECT THE PILKINGTON PLANAR™ SYSTEM, YOU ARE SELECTING THE MOST TESTED SYSTEM AVAILABLE IN THE MARKETPLACE.

Hurricane Testing With the development of the Pilkington **Planar™** / Trosifol® SentryGlas® system, and with the growth of hurricane impact codes, Pilkington has successfully tested an impact-resistant Pilkington **Planar™** facade for both large missile impact and cyclic loading in accordance with ASTM-E 1886.

Bomb-Blast Testing Pilkington leads the way with recent testing allowing Pilkington to design systems to the level 1 standard of the GSA when tested to both GSA level C and D standards.

PROJECT
The Rose Center for Earth and Space Science - American Museum of Natural History

LOCATION
New York, NY

ARCHITECT
Ennead Architects

W&W GLASS, LLC

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Nanuet, NY 10954 - 5285
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