

C A S E S T U D Y
PROJECTS

APPLICATIONS


02



CULTURE VENUES

ADVANCING THE SCIENCE OF AIR DISTRIBUTION

Rethink what air management systems can be.
Revise your notion of functionality.
Redefine your comfort zone.™

An abstract graphic consisting of numerous thin, overlapping, wavy lines that create a sense of motion and depth. The lines are light gray and originate from the bottom right corner, extending towards the center of the page.

Comfort, Redefined.

Since 1946, Titus has focused on technologically advanced products that create the highest degree of comfort.

We've consistently led the industry by breaking the barriers of expectation and convention when it comes to technology. We've redefined how technology drives, influences and supports air management. And by being first to market with the most innovative approaches to air distribution, we're proud to say that the marketplace has taken notice, and is counting on us to lead the way into the next decade. A challenge we're more than happy to accommodate.

Titus has raised the bar on design, proving that functional can also be beautiful. And we've redefined what it means to be energy efficient, with a collection of smart technology products that optimize the use of natural resources.

Titus has also redefined what it means to work with an air management products partner. We pride ourselves on listening and responding so that we can not only meet expectations, but also exceed them. Service has been, and will always be, our main focus at Titus. And, it's why so many of our customers keep coming back.

Welcome to your new comfort zone. It starts here.

PROJECT - THE SHED

New York, NY

CLIENT - THE SHED

ARCHITECTS - DILLER SCOFIDIO + RENFRO / ROCKWELL GROUP

CONSTRUCTION - SCIAME CONSTRUCTION, LLC

STRUCTURAL ENGINEERS - THORTON-TOMASETTI ENGINEERS

MECHANICAL CONTRACTOR - ASM MECHANICAL

KINETIC SYSTEMS - HARDESTY & HANOVER

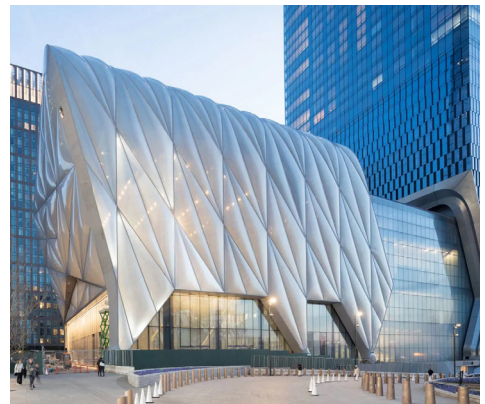
LEED CERTIFICATION - NONE

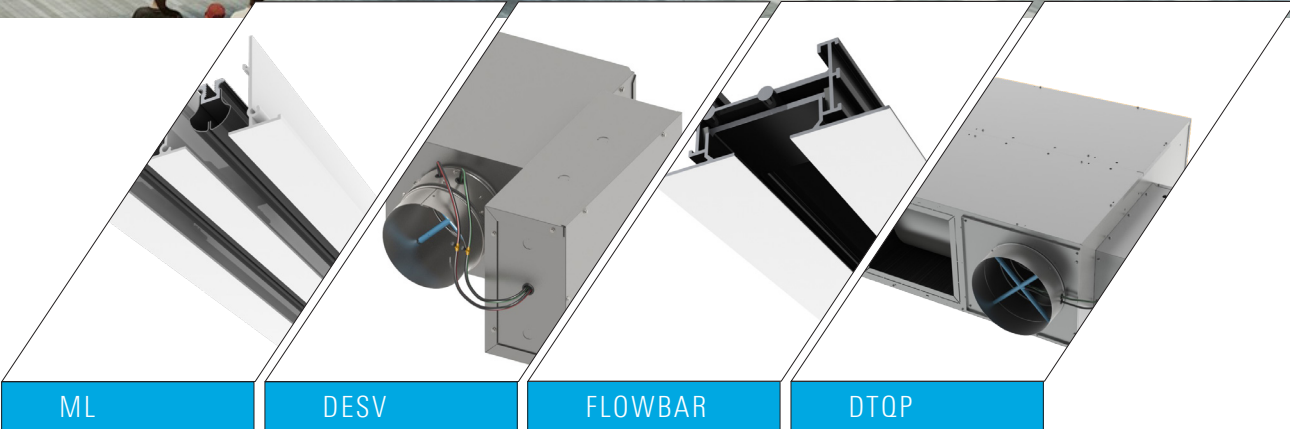


ABOUT THE PROJECT

Since its initial conception over ten years ago, The Shed has been amongst the top ten buildings everyone has been eagerly waiting to see realized for several years. The pop culture and futuristic venue opened in April 2019, and it is by far the most impressive building to be included in the Hudson Yards development to date.

The design collaboration of architects Diller Scofidio + Renfro and the Rockwell Group help to create a multi-functional building for the creative, visual and performing artists that has never been seen before. The eight-story base building contains two levels of gallery space, a versatile theater, an event area, rehearsal space, and a creative lab. What separates The Shed from other cultural venues is the flexibility offered by the unique





ML

DESV

FLOWBAR

DTQP

FEATURED PRODUCTS



THE SHED
interior photos

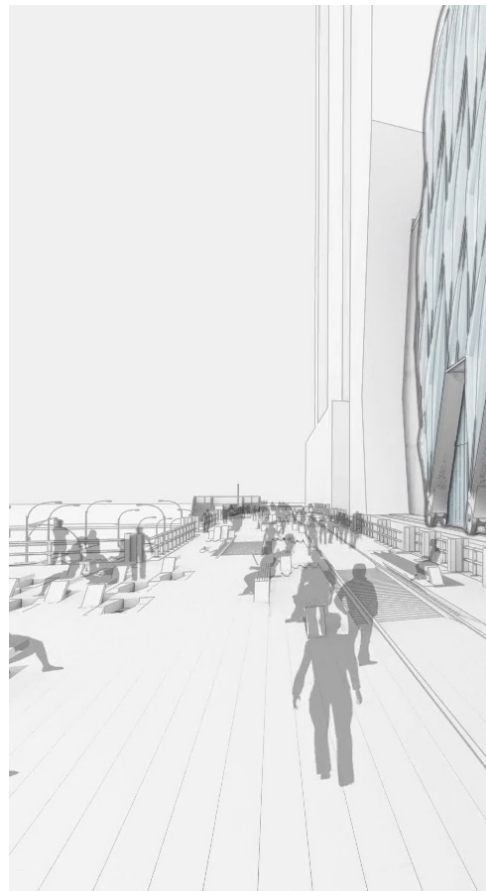
outer shell. It can deploy and extend using its railing system to the adjoining plaza space to create an awe-inspiring footprint that doubles the size of the original plaza area. Known as “The McCourt”, it is truly a sight to behold. The plaza area can then be used in a variety of ways to accommodate large-scale performances and events. Multiple events can be ongoing in different areas of the building without impacting one another as well. The perfect “Swiss Army Knife” building that can be pushed to its creative limits is the ideal venue for artists and performers alike to showcase their talents. neighborhood daycare and public library.

THE TITUS SOLUTION

HIGH PROFILE BUILDINGS DESERVE HIGH PERFORMING PRODUCTS

Incorporating the best HVAC system and corresponding products was also an integral part of this process. The products selected were not only selected for their performance, but for their aesthetics and seamless integration features as well. Several Titus products were installed throughout the many floor levels, but the most impactful ones include the FlowBar, DESV, DTQP, and the ML diffuser.

The FlowBar™ architectural linear diffuser system maximizes engineering performance without sacrificing aesthetic considerations for the designer. Its outstanding performance allows higher airflows than conventional linear diffusers, with lower noise levels, making it an ideal choice for high profile designs like The Shed. For even better aesthetics, it can be custom curved to



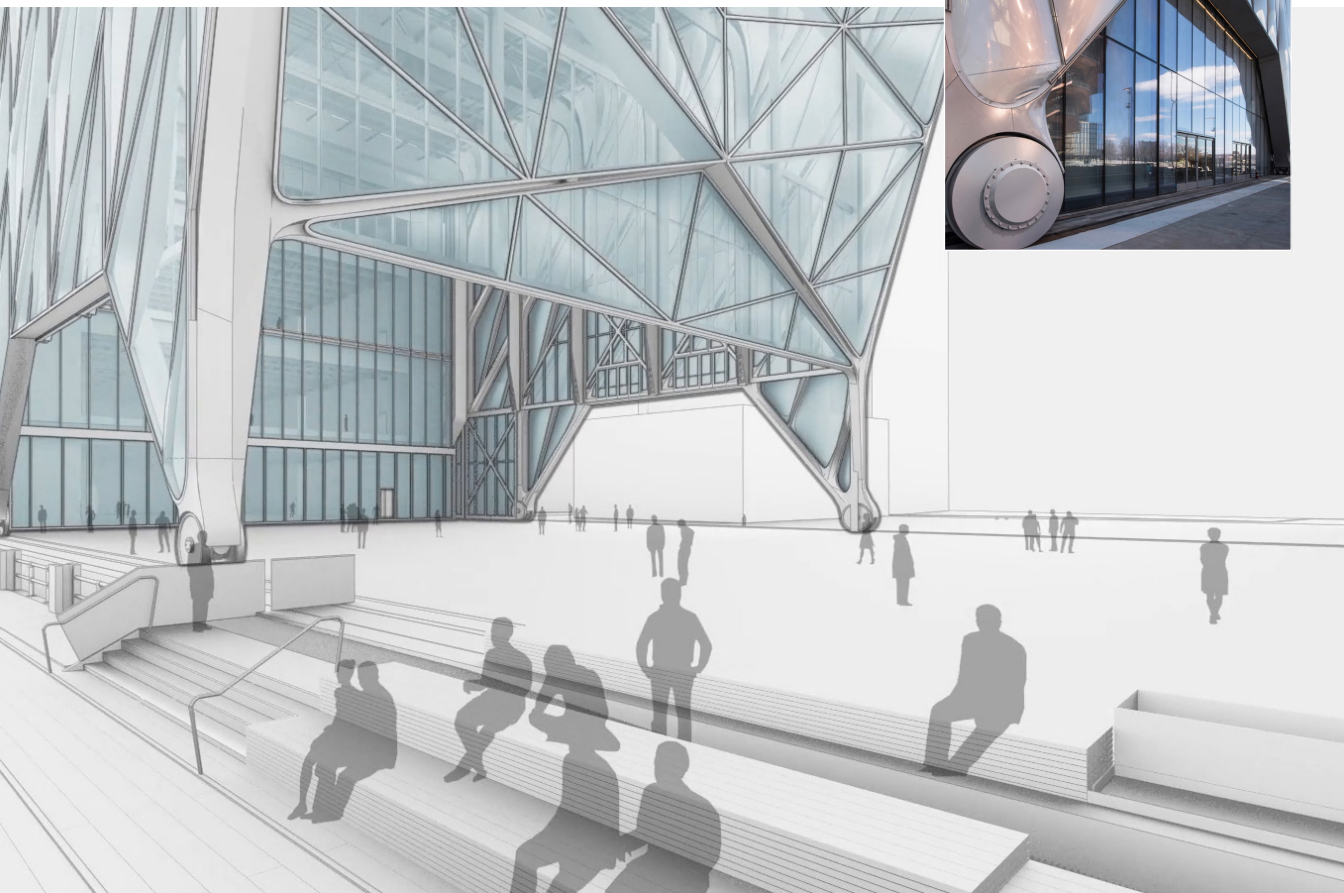
match the curvature of the ceiling making it truly a one-of-a-kind air distribution unit and a perfect fit for this project. Additionally, our ML modulinear diffuser is a high performing, high quality linear slot diffuser with unique “ice tong” deflector blades that allow both changes in air volume and direction from the face of the air device. This diffuser is also available in 1 through 8-slot configurations. The FlowBar™ and the ML are also available in a wide variety of optional wood grain finishes to blend into any interior design.

The DESV is a single duct terminal unit that regulates airflow to a zone in response to zone temperature requirements. The Titus ESV is unique as it incorporates many design features that increase performance, decrease service and installation costs, and offer increased value over the lifespan of the unit.

The DTQP is a parallel flow terminal unit with the fan positioned outside of the primary airstream and runs intermittently, when the primary air is off. Parallel flow or variable volume fan powered terminals operate in two distinct modes: variable volume, constant temperature when handling high cooling loads; and constant volume, variable temperature when heating or handling light cooling loads.

THE END RESULT

Inspired by Cedric Price’s Fun Palace, an unrealized design from the 1960s, The Shed takes moving architecture to the next level. The design team truly created a building that could meet the needs of the unknown patron, one that could last multiple generations and be a center of attraction in an ever-changing area of the city for many years to come.



PROJECT - SPERTUS JEWISH INSTITUTE

Chicago, IL

CLIENT - SPERTUS JEWISH INSTITUTE

ARCHITECT - KRUECK & SEXTON ARCHITECTS

FACADE DESIGN - ADVANCED STRUCTURES INC (ASI)

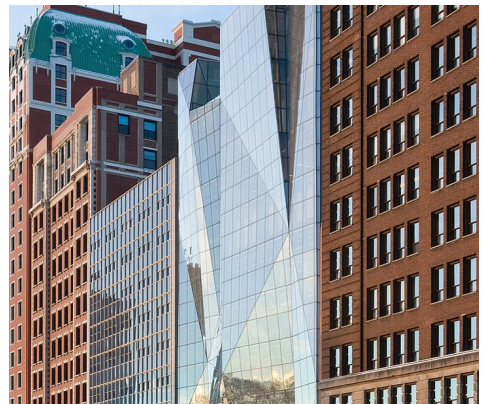
LEED CERTIFICATION - LEED SILVER CERTIFIED

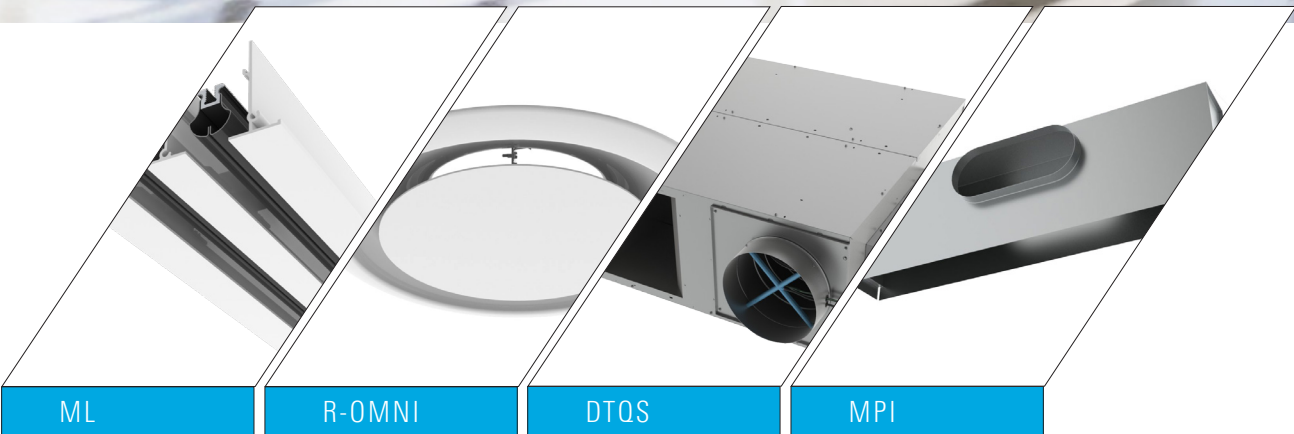


ABOUT THE PROJECT

The Spertus Institute of Jewish Studies is deeply rooted in Jewish values and invites people of all ages and backgrounds to explore the multi-faceted Jewish experience. Through its innovative programs and facilities, Spertus inspires learning and fosters understanding for Jews and people of all religious faiths from around the world. The new facility for Spertus is a mixed-use program containing exhibition galleries, a library, a 400-seat multi-use auditorium and much more.

Designed by the award-winning architectural firm of Krueck + Sexton Architects, this LEED Silver Certified building is an innovative and environmentally sustainable facility that features interconnected interior spaces and a one-of-a-kind, ten-story faceted window that provides





ML

R-OMNI

DTQS

MPI

FEATURED PRODUCTS



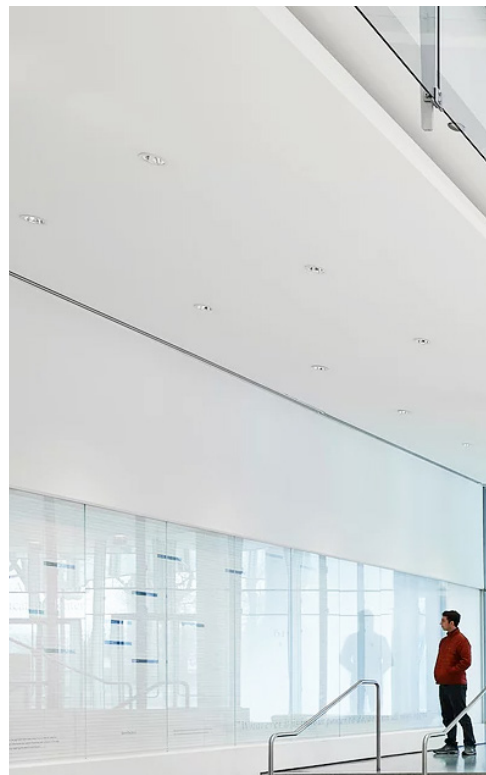
SPERTUS JEWISH INSTITUTE
interior photos

spectacular views of the Chicago skyline. A 6,700 square foot green roof - planted with special vegetation - manages storm water, absorbs air pollution and helps keep the building cool in the summer. The glass wall is built from over 700 individual pieces of glass in 556 different shapes. Thanks to recent advancements in technology, it was possible to delineate and engineer a glass shape as complex as the ones used in the glass wall of the Spertus building. For all students are the cafeteria, the athletic facility and the outdoor courtyard which is considered the heart of campus and is home to several multi-purpose events.

THE TITUS SOLUTION

The Titus products selected for this project were the ML linear slot ceiling diffuser, the DTQS fan powered terminal, the R-OMNI ceiling diffuser, and the MPI plenum. The Titus ML Modulinear diffuser is a high performance diffuser that utilizes uniquely designed “ice tong” deflector blades. These deflector blades allow for both changes in the air volume and direction from the face of the diffuser by gradually moving the pattern controllers. ML diffusers are designed for variable air volume systems (VAV) and project a uniform blanket of air that adheres to the ceiling even at low flow rates.

The DTQS is a fan powered terminal unit that provides constant air and blends the temperature well while maintaining the variable air volume energy savings at the central fan. The MPI plenum is an insulated plenum that utilizes the Modulinear diffuser’s excellent VAV performance to keep the air



on the ceiling in a tight horizontal pattern. The R-OMNI's smooth face is adjustable in three positions for horizontal or vertical airflow. It can be used effectively in heating or cooling applications.

THE END RESULT

The Spertus Building is an amazing blend of Green Building concepts that maintains the respect for the period in which it was constructed. Originally constructed in the period after the Chicago fire, this building creates an interesting dynamic that harmonizes with the surrounding buildings.

Even though the glass facade is huge collectively, individually they are the same size as the other buildings on Michigan Avenue. The glass facade also consistently allows natural light to penetrate from several angles and expands the views of the interior. This emphasis on light echoes the logo of Spertus - a flame accompanied by the biblical phrase yehi meaning "let there be light." This symbolizes both physical light and the light of learning. The building has also received numerous accolades since opening its door in 2007. It has been honored with the following:

- » [LEED-NC Silver](#)
- » [Patron of the Year, 2007 | Chicago Architecture Foundation](#)
- » [Building Award, 2008 | AIA Chicago Chapter](#)
- » [Divine Detail Award, 2008 | AIA Chicago Chapter](#)
- » [Building of the Year, 2008 | Interior Design Magazine](#)
- » [Crystal Achievement Award | Most Innovative Curtain Wall](#)

Today, Spertus is powered exclusively by renewable energy. Over the course of three years, this process will reduce the CO² level by 6,200 tons from entering Earth's atmosphere. It also saves 40 tons of waste from entering landfills through recycling initiatives each year. Spertus continues to do its part in healing the world and hopes others will follow suit for future generations.



PROJECT - WINSPEAR OPERA HOUSE

Dallas, TX

CLIENT - AT&T PERFORMING ARTS CENTER

ARCHITECTS - FOSTER + PARTNERS

STRUCTURAL ENGINEER - THORTON-TOMASETTI ENGINEERS

LIGHTING ENGINEER - CLAUDE ENGLE

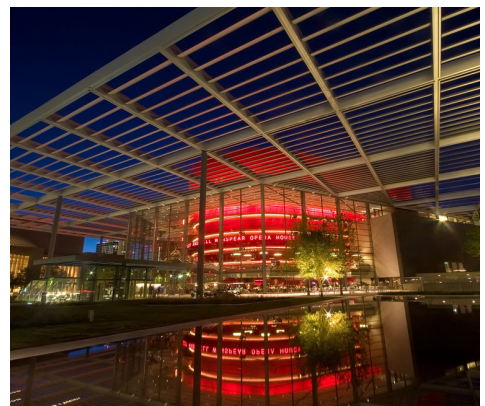
LEED CERTIFICATION - NONE



ABOUT THE PROJECT

The Margot and Bill Winspear Opera House is one of five buildings that make up the new Dallas Center for the Performing Arts. It is the new home for the Dallas Opera, Texas Ballet Theater, touring shows and numerous other productions. Designed to take opera houses into the twenty first century, the Winspear Opera House is positioned to provide audiences a deeper theatrical experience.

Designed by the renowned architectural firm of Foster + Partners, this new opera house was created to be environmentally aware while incorporating state-of-the-art technology. The ever-changing climate in Dallas presented a unique challenge that caused the architects to employ a variety of solutions. For the sometimes overwhelming heat in associated with Texas,





TAF-R

OMNI-AA

FEATURED PRODUCTS



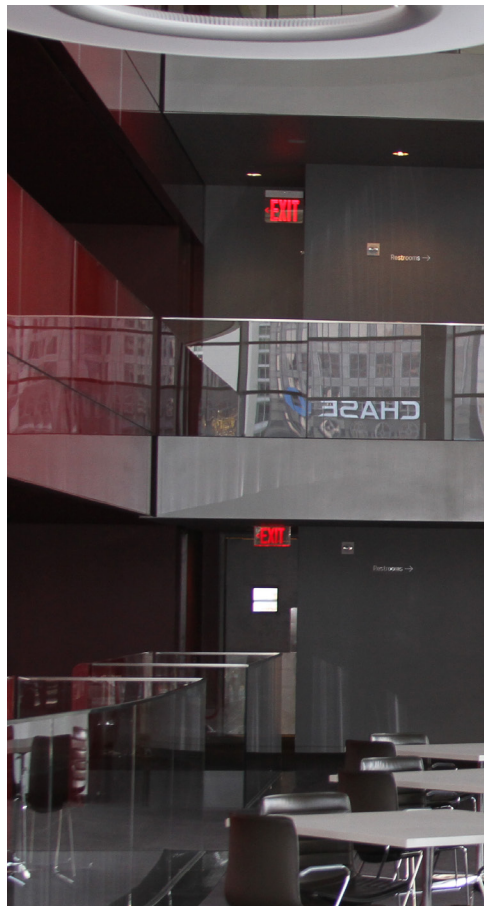
WINSPEAR OPERA HOUSE
interior photos

a solar canopy was built on the exterior of the building. It extends from the building and creates an appealing and unique outdoor space for the facility and its patrons to relax. There is also an abundance of natural light that penetrates deep into the sixty-foot high lobby area.

THE TITUS SOLUTION

When the designers of the Winspear wanted an underfloor air distribution solution for the interior space, they turned to Titus. The TAF-R diffuser was selected to be the primary source of airflow inside the performance hall. This air device is a round underfloor product that is architecturally pleasing and designed for use in high induction raised floor applications. It is constructed of a high impact, polymeric material that is durable enough to resist foot traffic. This diffuser has the fastest installation in the industry with the new spring clip design and can be relocated easily to another location. Another benefit of the TAF-R is the ease it can be adjusted. The top of the unit can be turned clockwise or counterclockwise to reduce or add airflow into the occupied space. It is also a GreenSpec Listed™ product.

The Titus OMNI-AA diffuser satisfies architectural as well as engineering criteria. Its strong, clean, unobtrusive lines harmonize with the ceiling system, without sacrificing performance. The curvature of the OMNI-AA backpan works with the formed edges of the face panel to deliver a uniform 360° horizontal air pattern, without excessive noise or pressure drop. The OMNI-AA is constructed of aluminum and works well in this application.



Additionally, the TAF-R and the OMNI-AA devices are available in wood grain finish options which offers the interior designer a multitude of final outputs to choose from.

THE END RESULT

The Margot and Bill Winspear Opera House creates an intimate theatrical experience by bringing the audience as close as possible to the performance. The air outlets from Titus further reinforce this by providing superior performance while being installed in areas that do not distract the patrons from the performance.



PROJECT - NATIONAL UNDERGROUND RAILROAD FREEDOM CENTER

Cincinnati, OH

CLIENT - CITY OF CINCINNATI

ARCHITECTS - BLACKBURN ARCHITECTS

LEED CERTIFICATION - NONE

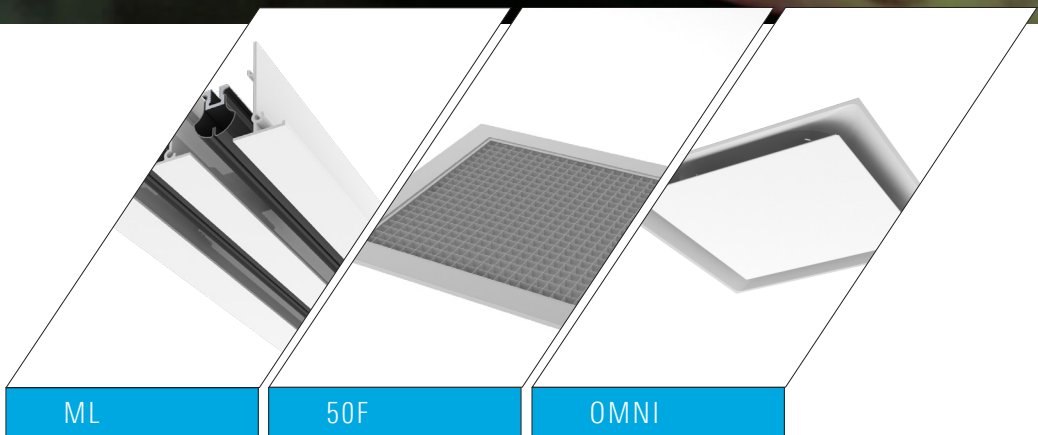


ABOUT THE PROJECT

The National Underground Railroad Freedom Center opened its doors in August 2004. Since that time, the center has shed light into America's dark past and told the story of the quest for freedom by slaves through images, artifacts and exhibitions. "The Underground Railroad" as it has come to be known, is a dramatic point in the history of America. This secret network of freedom-fighters from all backgrounds helped slaves journey to freedom and eventually cross the Ohio River. The center was purposely built on the banks of the Ohio River because it served as the barrier between the slave states of the South and the free states of the North.

The building consists of three linked pavilions and is 158,000 square-feet. Guests can explore the many different exhibits, which includes an actual





FEATURED PRODUCTS



FREEDOM CENTER
interior photos

slave pen that was recoved and restored from a farm house in Kentucky. The Freedom Center also has a story theater, a multi-use theater, an education and research center, a café, and a gift shop.

THE TITUS SOLUTION

Titus was pleased to partner with the design team on such a prestigious high profile project. The grilles and diffusers featured throughout this impressive facility complement the design of the architects at Blackburn Architects. The airflow for this project is provided by the ML, 50F and the OMNI diffuser. The Titus ML is a modular diffuser that provides high performance. This high quality linear slot diffuser has unique “ice tong” deflector blades that allows for both changes in air volume and direction from the face of the diffuser by gradually adjusted the air pattern controllers. It projects a uniform blanket of air that adheres to the ceiling even during low flow rates. The ML is available in several different border and mounting frames. This makes it an ideal diffuser for any ceiling installation.

The 50F is an aluminum eggcrate grille that has the highest amount of free area for any return grille. This unit is available in many core sizes and the border and grid can either be a mixture of steel and aluminum or completely stainless steel. The OMNI works well in any architectural ceiling. It has strong, clean, unobstrusive lines that blend seamlessly into the ceiling system. This high performing unit is designed to provide a uniform 360 degree horizontal air pattern with minimal noise and pressure drop. The



OMNI is also an excellent selection for variable air volume systems and is available in a vast assortment of wood grain finishes as an option.

THE END RESULT

The National Underground Railroad Freedom Center is a testament to the struggle that many slaves endured for their freedom. This center enlightens and educates society on the constant struggle for equality that some even experience today. The Freedom Center serves as a tribute to how far we've come, but also serves as a reminder of how far we must go to propel ourselves even closer to our eventual goal.



PROJECT - BOSTON CHILDREN'S MUSEUM

Boston, MA

CLIENT - BOSTON CHILDREN'S MUSEUM

ARCHITECT - CAMBRIDGE SEVEN ASSOCIATES

LEED CERTIFICATION - LEED GOLD CERTIFIED

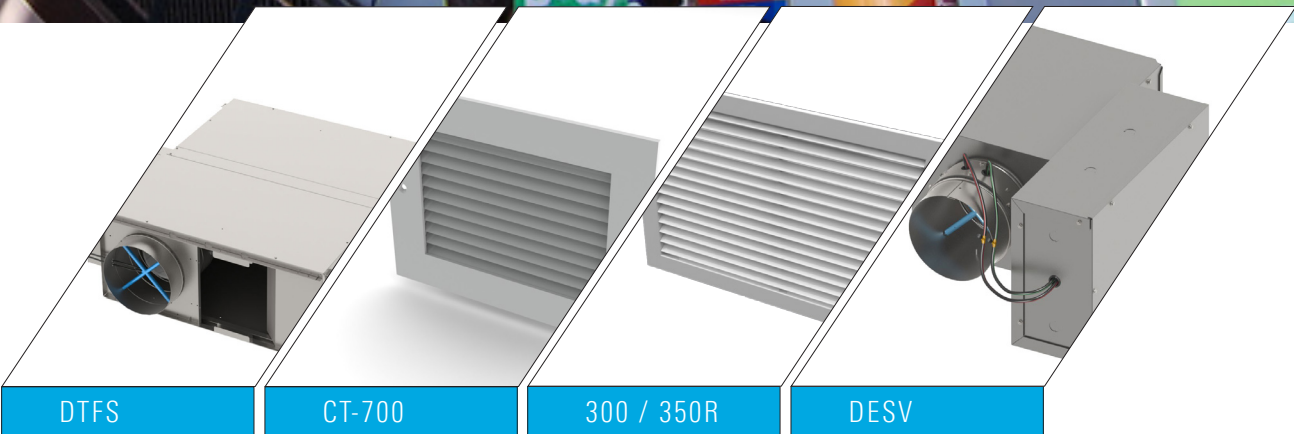


ABOUT THE PROJECT

The recent addition and renovation to the Boston Children's Museum utilized many green design elements that garnered the facility the LEED Gold Certification for NC. Designed by Cambridge Seven Associates, the architectural firm created a building that serves not only as a museum, but as a classroom for the environment for the young and old to explore together.

The energy harvesting potential of the building is amazing. The architects at Cambridge Seven were committed to protecting the adjacent Fort Point Channel. This was done by reducing the storm water discharge. Storm and roof water are collected and stored on site in a cistern, thus providing a gray-water source. The building also features living green roof systems that enhance and improve insulation, reduce heat, and hold rainwater.





DTFS

CT-700

300 / 350R

DESV

FEATURED PRODUCTS



BOSTON CHILDREN'S MUSEUM
interior photos

The architects had to reconfigure the interior of the old warehouse building, revamp energy and lighting-control systems, consolidate the museum's exhibit space and offices to the first three floors, and add a theater to the structure.

THE TITUS SOLUTION

Throughout the years, Titus has developed several energy-efficient solutions that have shown to work well in an open-ceiling application and could assist in achieving LEED certification credits. The products selected for this project were the DTFS fan powered terminal unit, the CT-700 and 300/350R grilles and the DESV single duct terminal unit.

The DTFS is a digitally controlled fan powered terminal unit that has an energy efficient fan motor mounted with vibration isolators. It maintains the variable air volume (VAV) energy savings at the central fan. The DTFS is a quiet unit that provides pressure independent airflow control. It is available from 150 - 3800 cfm flow range and has an assortment of inlet sizes to meet the needs of any application. The CT-700 and 300/350R grilles utilized are excellent units for air distribution. Both grilles have blades parallel to the long dimension and work well in open ceiling environments.

The DESV is a single duct terminal unit. Its primary function is to regulate airflow to a zone, in response to zone temperature requirements. The digitally controlled unit is unique as it incorporates many design features



that increase performance, decrease service and installation costs, and offers increased value, over and above its basic function.

THE END RESULT

The primary mission for the Boston Children's Museum is to exist to help children and families enjoy, understand and become active citizens of the world in which they live. The new addition further enhances this by placing emphasis on the environmental, health, and human aspects while providing a safe place to learn and monitor the performance of a Green Building. The museum is fully committed to having children grow up as successful learners who respect others and the natural world. They encourage imagination, curiosity, investigation, innovation, and play.



PROJECT - NATIONAL MUSEUM OF THE AMERICAN INDIAN

Washington, D.C.

CLIENT - SMITHSONIAN

ARCHITECT - DOUGLAS CARDINAL ARCHITECTS

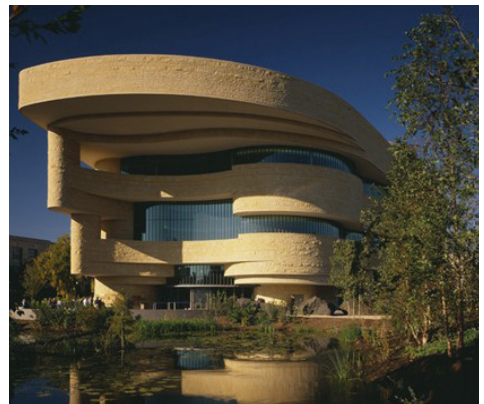
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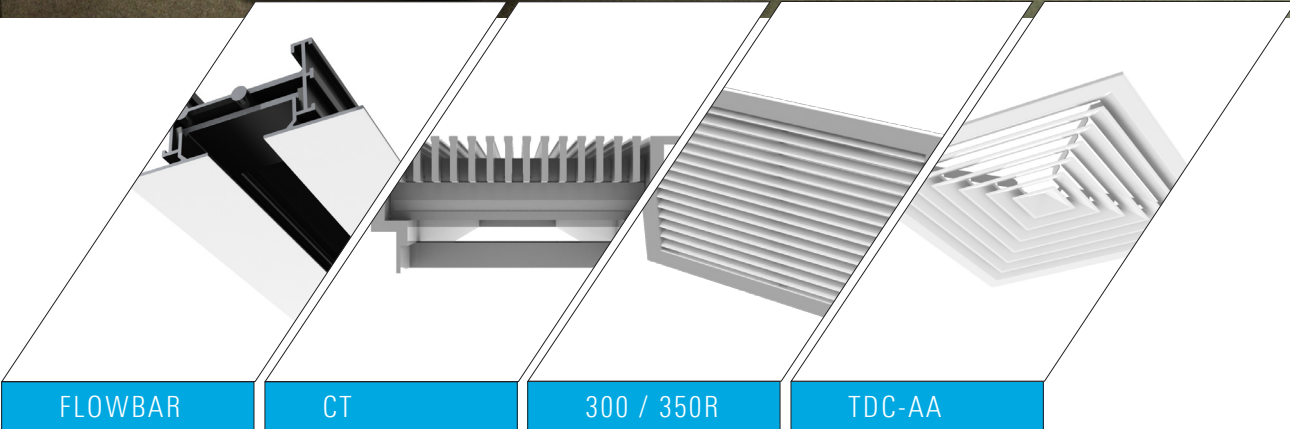


ABOUT THE PROJECT

The Smithsonian's National Museum of the American Indian on the National Mall opened in September 2004. Several years in the making, it is the first national museum in the United States dedicated exclusively to the Native American heritage. The building is five-stories tall and is 250,000 square-feet. Immediately noticeable are the abundance of curves the building consists of. This curvilinear form is constructed of a golden-colored Kasota limestone that is designed to evoke natural rock formations that have been shaped by wind and water over thousands of years.

The museum is set on a 4.25-acre site and is surrounded by simulated wetlands. The National Museum's east-facing entrance, its prism window and its 120-foot-high space for contemporary Native performances are direct





FLOWBAR

CT

300 / 350R

TDC-AA

FEATURED PRODUCTS



AMERICAN INDIAN MUSEUM
interior photos

results of extensive consultations with Native Americans. Similar to the Heye Center in Lower Manhattan, the museum offers a range of exhibitions, film and video screenings, school group programs, public programs and living culture presentations throughout the year.

THE TITUS SOLUTION

Providing air distribution solutions is nothing new for Titus, we have a rich history of proven success. The curved form of the building meant traditional ceiling diffusers would not work, but that an alternative would be needed - the FlowBar.

Titus FlowBar is an architectural linear diffuser system that maximizes engineering performance without sacrificing aesthetic considerations for the designer. Its outstanding performance allows higher airflows than conventional linear diffuser systems. The wide array of slot widths that are available allow for more CFM per linear foot while minimizing noise and pressure loss. The Flowbar system is available in continuous linear, incremental linear and square configurations.

FlowBar also provides an installation alternative to the conventional linear diffuser. Conventional linear diffusers are supported by the duct system and in most cases are installed after the ceiling system is in place. For complete ceiling integration, the FlowBar system is offered with a large selection of flange styles compatible with various ceiling applications. Our unique clip/



hanger support system allows for quick and easy installations. The system actually supports and becomes an integral part of the ceiling system and is installed along with the ceiling suspension system. This entire series of diffusers is available with two unique pattern controllers.

Other Titus products that can found throughtout the museum are the CT linear bar diffuser, the 300/350F grille and the TDC-AA diffuser. These additional GRD products do a great job of complimenting the FlowBar system while providing superior performance for the facility.

THE END RESULT

The National Museum of the American Indian is an environmentally friendly building that was designed to express the spirit of the Native American people inside and out. Positioned close to nature and having a form that represents wind, this living museum is a true testament to the culture and heritage of the Native American people and a place that many generations of all races can learn about this unique culture.



C A S E S T U D Y
PROJECTS



ADVANCING THE SCIENCE OF AIR DISTRIBUTION

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