Helifix, Inc.

APPLICATOR

SEALANT, WATERPROOFING & RESTORATION INSTITUTE • LATE SUMMER 2011 • 33.3

In Concert with Restoration

Sustainable bed-joint-reinforcement system revamps stability and aesthetics of Miami's Olympia Theatre

Drafty Dilemmas
pg. 18

In Concert With Restoration

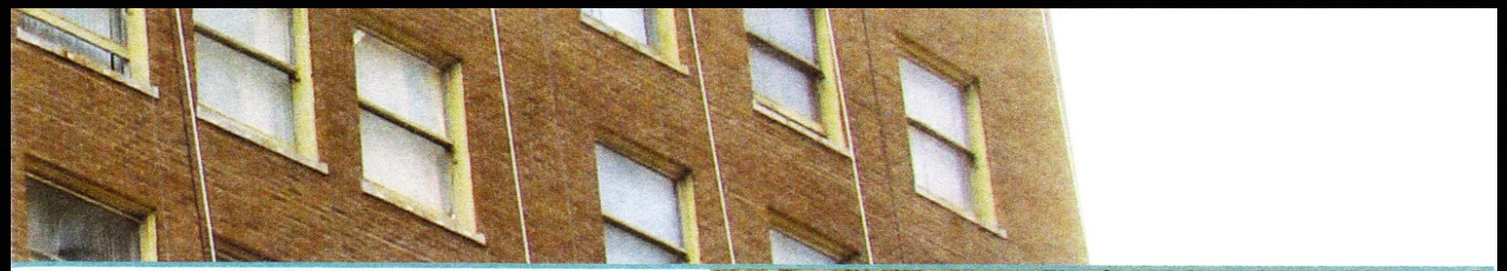
Sustainable bed-joint-reinforcement system revamps stability and aesthetics of Miami's Olympia Theatre

By Reno Fricano

A jewel of the South Florida arts and cultural community since 1926, the landmark Olympia Theater and Apartment Building at the Maurice Gusman Cultural Center was recently in a state of massive deterioration and disrepair. The historic 10-story high-rise complex in Miami faced a potential tear down/rebuild if engineers couldn't develop an emergency and long-term repair solution to address the pressing structural and safety issues of the exterior brick masonry cladding and terra cotta façade.

A concerted $2.1 million restoration effort by the City of Miami and the Miami Parking Authority (which runs the theater) began with enlisting the aid of leading historic preservation and architecture design firm R.J. Heisenbottle Architects P.A. (Coral Gables, Fla.) to head the restoration effort. RJHA President Richard Heisenbottle commissioned structural engineers from Wiss, Janney, Elstner Associates Inc. (WJE, Northbrook, Ill.) to conduct an initial on-site assessment.

WJE performed the preliminary assessment during two days in late October 2009. The firm investigated the building's distresses and designed an emergency stabilization procedure before performing long-term repairs of the exterior masonry cladding. WJE collaborated with masonry-repair/-reinforcement system manufacturer Helifix Inc. (Streetsboro, Ohio) to provide



a sustainable lateral- and gravity-support system for the building's distressed veneer using a bed-joint-reinforcement system called Helibeam.

Historic challenge

Known for the intricate and stunning Mediterranean Revival-style details on its architectural façade, the Olympia building consists of a steel-framed structure with clay tile infill supported on steel spandrel beams. The previous envelope included a brick and terra cotta veneer that was unsupported within the piers but was supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE engineers discovered that slippage of the brick veneer had led to cracked, bulging and separating masonry. This development was the direct result of insufficient vertical support and poor weight distribution. The result was failed wall ties and lintels—often the only means of support above the windows.

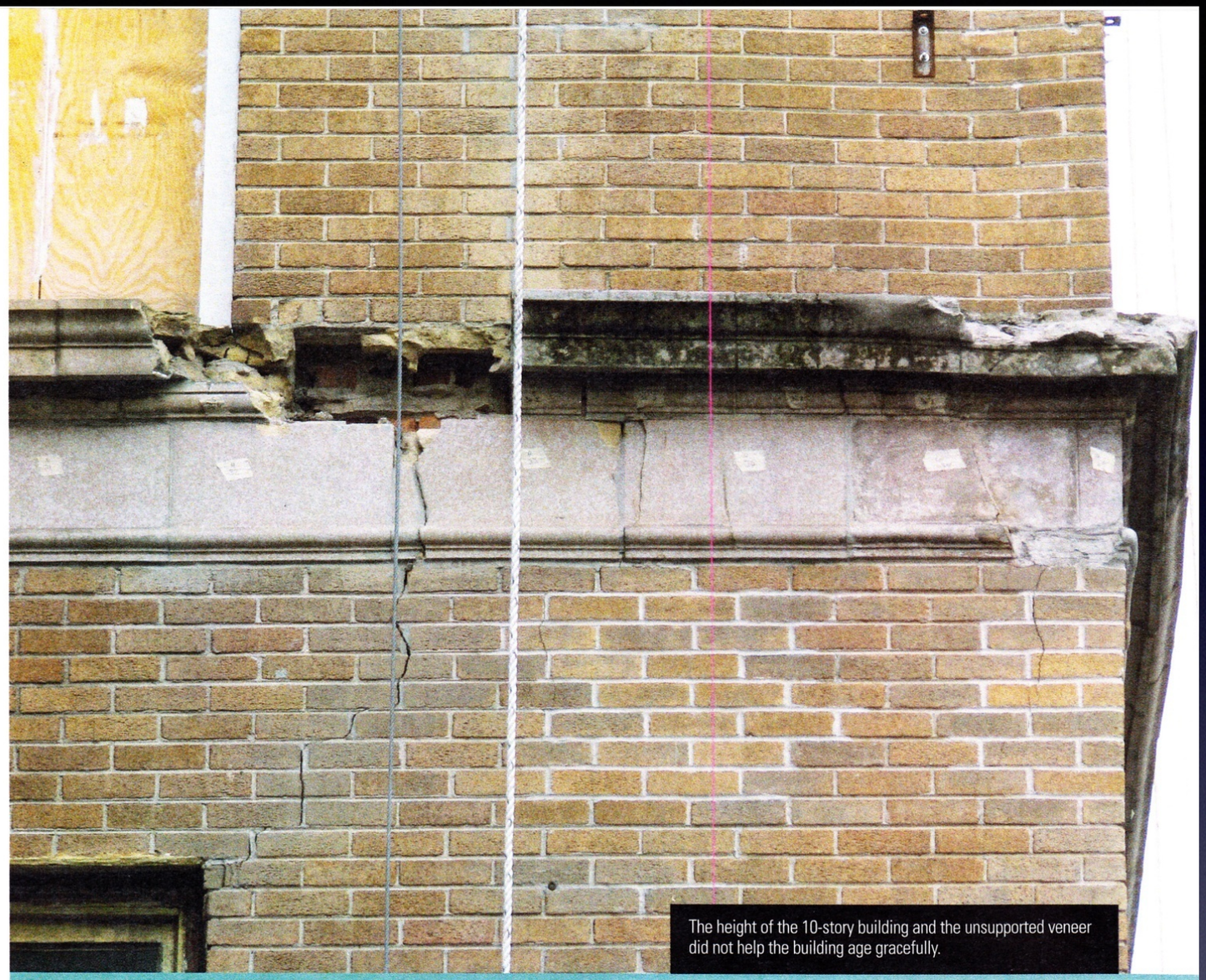
Devising a solution

To restore the Olympia's severely damaged sections back to a historic and maintainable condition, crews demolished and rebuilt various areas of the building, particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE personnel recommended installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE engineers specified Helifix's new Helibeam System, which offered a noninvasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties and crack stitching.

The key focus of the Helibeam System was the implementation of stainless-steel (austenitic grade 304 or 316) HeliBars that were approximately 22 feet long. The Helibars created a reinforced "beam" across each spandrel level to distribute and support the structural loads across the piers and into the steel lintels and spandrel beams.

HeliBar starts as round stainless-steel wire with a typical 0.2-percent proof stress of 500N/mm². After the cold-

Restoration specialists encountered severe cracks and façade deterioration around the corners of the Olympia Theatre.



The height of the 10-story building and the unsupported veneer did not help the building age gracefully.

COMBATING OLD AGE

The Olympia Theatre earned distinction in 1984 on the National Register of Historic Places. However, the building was showing severe deterioration in certain areas of the façade.

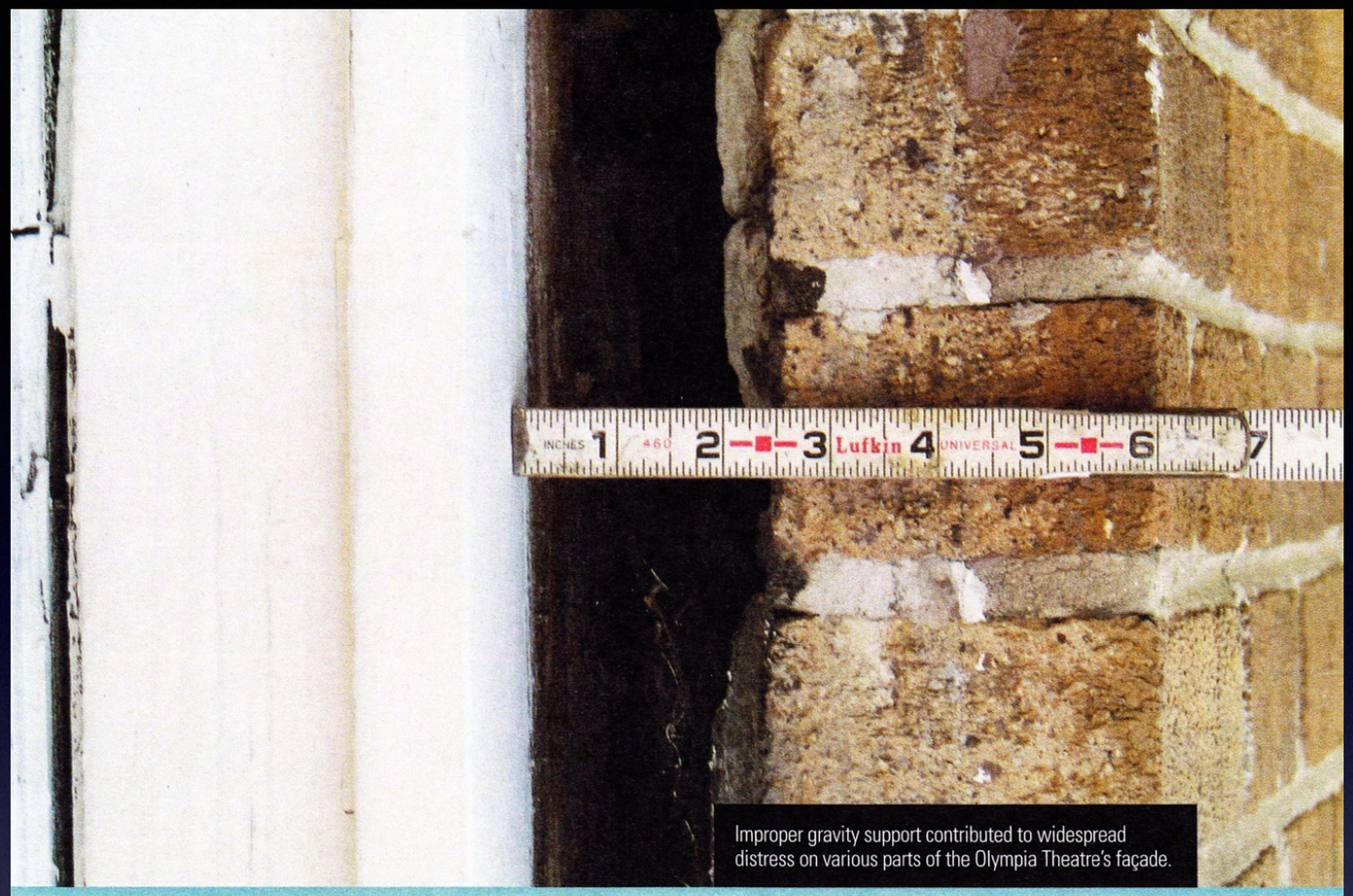
Structural engineering firm Wiss, Janney, Elstner Associates (Northbrook, Ill.) encountered problems with restoring the façade due to the differential-support conditions, as well as the 10-story height of the unsupported veneer. Some of the issues they faced included:

- Widespread distress due to improper gravity support
- Diagonal brick cracking originating from the lintel ends
- Compressive failures within the second- and third-floor terra cotta water tables
- Delaminated faces of the water-table projecting elements
- Bowed displacement of the veneer in excess of 2 inches.

forming manufacturing process, which created the helical high-fin design, this number more than doubles to around 1,100N/mm². This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry, particularly when combined with HeliBond grout, which locks between the fins and bonds to the masonry.

Rounding out the Helibeam System, to help with displacement, restoration workers installed about 9,000 10-millimeter DryFix remedial ties through the veneer and into the backup, providing lateral restraint and securing the façade.

According to WJE Associate Principal Brett Laureys, "The Helibeam System was specified because of its proven ability to secure existing masonry. It is fully concealed (once installed), and its flexibility allows it to be bent around corners with no loss of performance. It was also the most cost-effective stabilization method available and, with all work undertaken externally, there was minimal disruption to the upper-floor tenants during this 'emergency restoration' phase,



Improper gravity support contributed to widespread distress on various parts of the Olympia Theatre's façade.

Crews laid two horizontal rows of 7-meter-long stainless-steel HeliBars in tandem at various levels around the entire circumference of the building.

which overcame the veneer's lack of support, securing the structure while full renovation of the Olympia Theatre was safely undertaken."

Detailed installation

The specialty repair contracting company Structural (Hanover, Md.) and its Ft. Lauderdale, Fla., operations office—in conjunction with Helifix's onsite quality-control and assurance-support team—installed the Helibeam System at the Olympia Theatre. To form the Helibeam System, crews laid two horizontal rows of 7-meter-long stainless-steel HeliBars in tandem at various levels around the entire circumference of the building. The process created a deep masonry beam to distribute the structural load and provi gravitational support around the entire building.

Installation involved cutting out 1 3/4-inch-deep slots in the mortar joints, which crews vacuumed and then flushed with w They installed a bead of thixotropic cementitious HeliBond gro and then placed the 7-meter length of HeliBar in the slot. Work repeated the "grout-HeliBar-grout" process on top to complete the composite action of the Helibeam System. When each leng of HeliBar came to its end, the work crews overlapped the next length by 1.5 feet to create one monolithic run around the build with corners kinked in at a 90-degree bend. Then, they pointed recessed Helibeam over the top, rendering it virtually transpar to the naked eye upon completion.

Additionally, engineers used DryFix remedial ties in tandem with the Helibeam System for lateral restraint in the façade. Crews power-drove the DryFix ties into position, via a small pilot hole, using a special installation tool that leaves the end o the tie recessed below the outer face. This technique allows for an "invisible" finish. Also, engineers conducted crack stitching to secure local cracking and stabilize any further movement of separating brick areas. According to Structural's Project Manag Alan Fleischer, "The Helibeam installation was easy, as it's a lo like crack stitching but in a longer run. After we completed the installation, you'd never know what was done to the building.

The final process

Engineers installed the Helibeam System within four months of WJE's specifications, beginning with the anchors, and completed the project in August 2010. An alternative to complete structural tear down and rebuild, the system delivered an efficient, green solution for restoring the historic Olympia Theater.

WJE's Laureys said, "The repairs were successfully installed meeting the client's needs of an emergency stabilization method that could be installed immediately, quickly and inexpensively. It's hard to compare with it, as it was more cost-effective than traditional stainless-steel threaded rod and epoxy."

RJHA's Heisenbottle added, "The initial emergency stabilization phase is complete, and the building is once again safe. The team is proceeding with the final (Phase II) work: a $10 million restoration of the theater façade and repair/replacement of the damaged terra cotta tile. The project is expected to be completed in 2011."

About the author

Reno Fricano is the vice president of North American operations at Helifix Inc. (Streetsboro, Ohio). Contact him at (630) 707-7000 or reno.fricano@helifix.com.

Teams from Structural, Helifix and WJE contributed to the onsite restoration project.

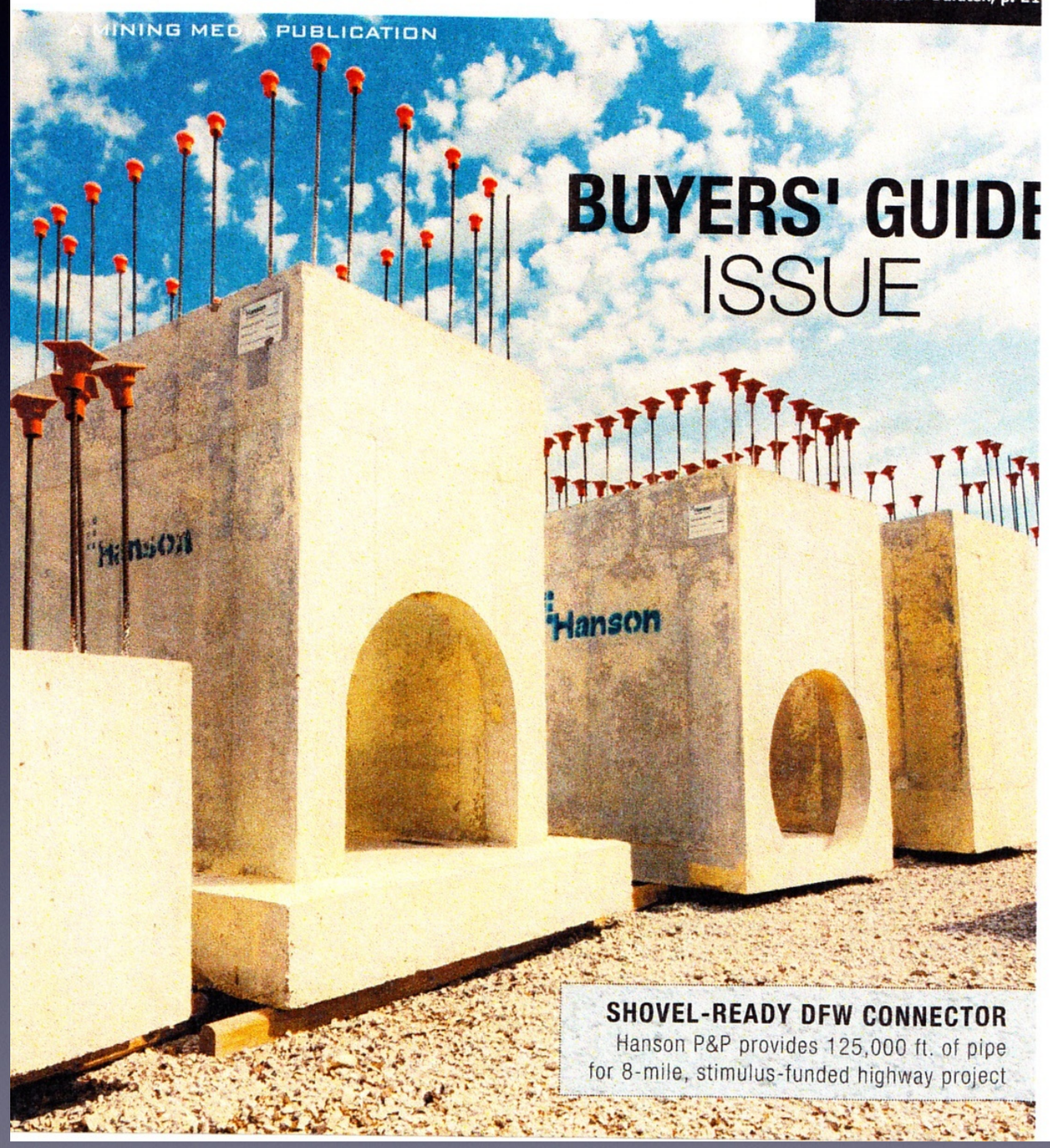
OPERATIONS • MARKET DEVELOPMENT • PRACTICE

Concrete PRODUCTS®

CONCRETEPRODUCTS.COM

JULY 2011

A MINING MEDIA PUBLICATION



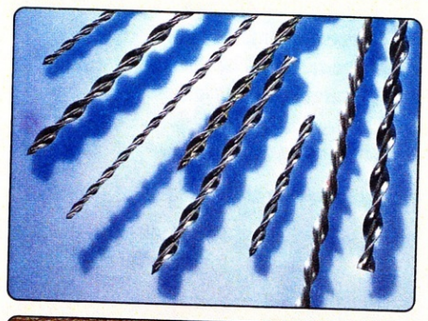
BUYERS' GUIDE ISSUE

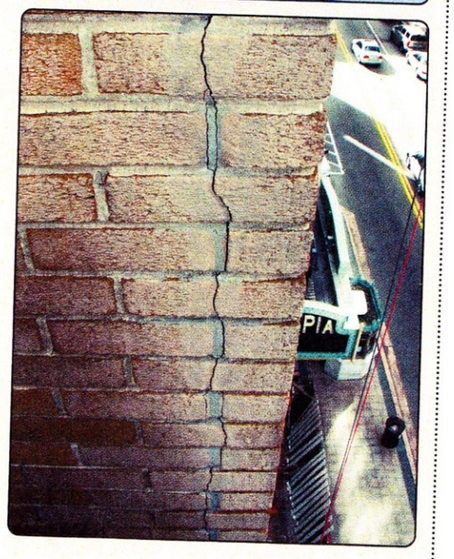
SHOVEL-READY DFW CONNECTOR
Hanson P&P provides 125,000 ft. of pipe for 8-mile, stimulus-funded highway project

HELIBEAM SYSTEM INTEGRAL TO HISTORIC MASONRY RESTORATION

As part of the $2.1 million restoration effort of the Olympia Theatre and Apartment Building in Miami, Fla., Helifix, Inc. provided a supplementary and sustainable lateral and gravity support system for the building's distressed veneer. The Helibeam System was an efficient green alternative in restoring the historic theatre. According to Reno Fricano, vice president – North American Operations, Helifix, "... the system provided a non-invasive, cost-effective and sustainable stabilization solution in revitalizing the architectural luster and integrity to one of America's original movie palaces."

To form the system, two horizontal rows of 7-meter-long, stainless-steel HeliBars were laid in tandem at various levels around the circumference of the building. Installation involved cutting out 1 ¾-in. deep slots in the mortar joints. A bead of thixotropic cementitious HeliBond grout was laid in and the HeliBar was then placed in the slot. The grout-HeliBar-grout process was then repeated on top to complete the composite action of the Helibeam System. When each length of HeliBar came to its end, the next length was overlapped by 1.5 ft. to create one monolithic run around the building; with corners kinked in at a 90-degree bend. The recessed Helibeam was then pointed over the top, rendering it virtually transparent to the naked eye upon completion. — *Helifix, Inc., Streetsboro, Ohio; www.helifix.com*





the construction
specifier

$7.00

solutions for the construction industry | september 2011

CONSTRUCT
hanley wood
55TH CSI ANNUAL CONVENTION
SHOW EDITION

Building with Cross-laminated Timber

New design opportunities for wood

The Official Magazine of the
Construction Specifications Institute

Restoring the Olympia Theater

Miami's 1926 landmark Olympia Theater and apartment building was recently in a state of massive deterioration and disrepair. The historic 10-story high-rise complex faced a potential teardown/rebuild if a long-term repair solution was not developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta façade.

A concerted $2.1-million restoration effort by the city and the Miami Parking Authority (who runs the theater) began with enlisting architecture design firm, R.J. Heisenbottle Architects, to head the restoration. Structural engineers from Wiss, Janney, Elstner Associates (WJE) conducted an initial onsite assessment.

The building is steel-framed with clay tile infill that is supported on the steel spandrel beams. The envelope consisted of brick and terra cotta veneer that are unsupported within the piers and supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE discovered slippage of the brick veneer lead to cracked, bulging, and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution, resulting in failed wall ties and lintels—often the only means of support above the windows. Due to differential support conditions and the 10-story heights of unsupported veneer, widespread distress attributable to the improper gravity support was observed, including:

- diagonal brick cracking originating from the lintel ends;
- compressive failures within the second- and third-floor terra cotta water tables;
- delaminated faces of water-table-projecting elements; and
- bowed displacement of the veneer in excess of 51 mm (2 in.).

To restore the Olympia's severely damaged sections, various areas of the building needed to be taken down and rebuilt. Additionally, WJE recommended installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry—while maintaining aesthetic integrity—WJE specified a system comprising grout, a proprietary rebar, remedial ties, and crack-stitching.

The key focus of the system was the implementation of proprietary stainless steel (austenitic grade 304 or 316) rebars that were 7 m (23 ft) long to create a reinforced 'beam' across each spandrel level to distribute and support the structural loads across the piers and into the steel lintels and spandrel beams.

Rounding out the system to help with displacement, about 9000 10-mm (0.4-in.) remedial ties were installed through the veneer and into the backup, providing lateral restraint and securing the façade.

To form the system, two horizontal rows of 7-m long proprietary stainless steel rebars were laid in tandem at various levels around the entire circumference of the building. This essentially created a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

Installation involved cutting out 440-mm (1 ¾-in.) deep slots in the mortar joints which were vacuumed and then flushed out with water. A bead of thixotropic cementitious bond grout was laid in and the 7-m length of rebar was then placed in the slot. The grout process was then repeated on top to complete the composite action of the system.

Sections of the Olympic Theater (Miami) were taken down and rebuilt to address structural and safety issues.

Photo courtesy Helifix

When each length of rebar came to its end, the next length was overlapped by 457 mm (18 in.), creating one monolithic run around the building, with corners kinked in at a 90-degree bend. The recessed beam was then pointed over the top, rendering it virtually transparent to the naked eye on completion.

Remedial ties used in tandem with the system for lateral restraint in the façade. They were installed by being power-driven into position, via a small pilot hole, using a special installation tool that left the end of the tie recessed below the outer face, allowing an 'invisible' finish. Crack-stitching was also conducted to secure local cracking.

The system was installed within four months of WJE's specification. An alternative to complete structural tear down and rebuild, it delivered an efficient means to help restore the historic Olympia Theater. **CS**

September 2011

MASONRY

The Voice of the Masonry Industry
Volume 50, Number 9

Codes and Standards Compliance

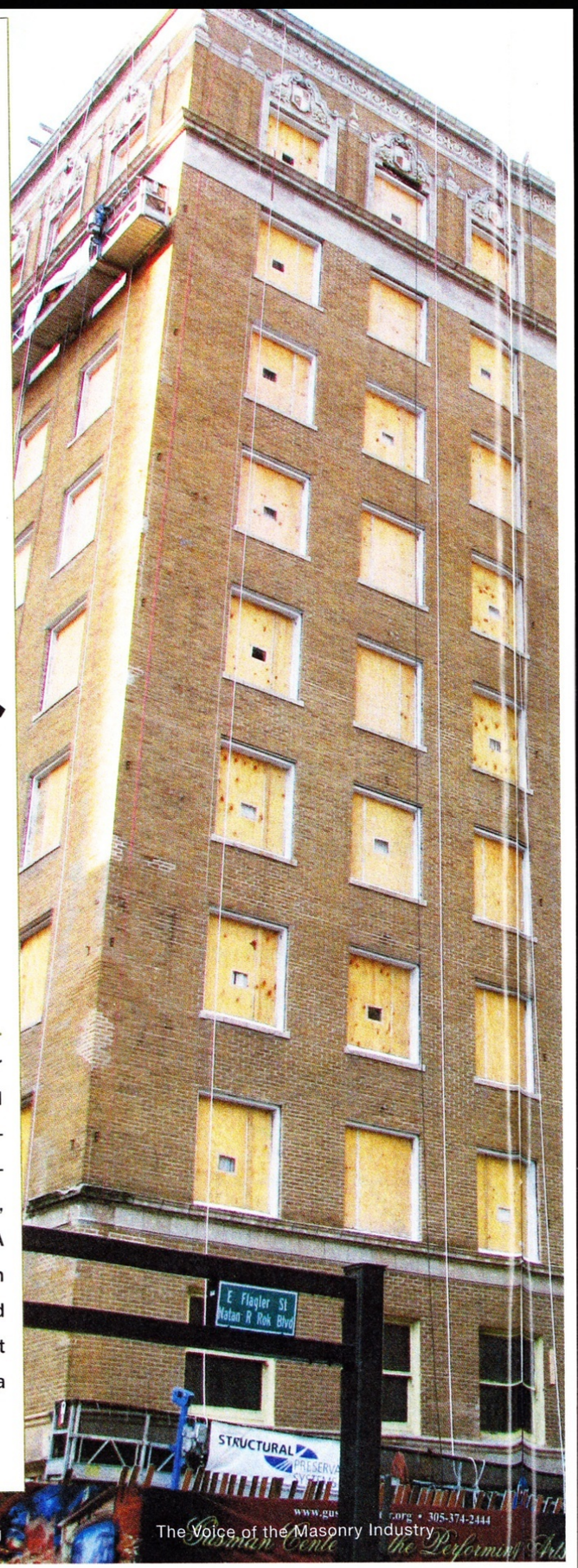
INSID

Connectors, Ancho
and Fastene

Mixers, Pumps an
Delivery Systen

Case Study:

Miami's Olympia Theater



A JEWEL OF THE SOUTH FLORIDA ARTS AND CULTURAL COMMUNITY SINCE 1926, Miami's Olympia Theater and Apartment Building, which is on the U.S. National Register of Historic Places: 1984, at the Maurice Gusman Cultural Center was recently in a state of massive deterioration and disrepair. The historic, 10-story, high-rise complex was facing an asphalt fate. A potential tear-down and rebuild would be required if an emergency and long-term repair solution wasn't developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta facade.

A concerted $2.1 million restoration effort by the City of Miami and the Miami Parking Authority, which runs the theater, began with enlisting leading historic preservation and architecture design firm, R.J. Heisenbottle Architects P.A. (RJHA), to head the restoration effort. RJHA President Richard Heisenbottle quickly involved interdisciplinary structural engineering and architectural firm Wiss, Janney, Elstner Associates Inc. (WJE) to conduct an initial onsite assessment.

The preliminary assessment was performed during two days in late-October 2009 to investigate the building's distresses, and design an emergency stabilization procedure, prior to installation of long-term repairs for the exterior masonry cladding. WJE collaborated with masonry repair reinforcement system manufacturer Helifix Inc. to provide a supplementary and sustainable lateral and gravity support system for the building's distressed veneer, using its Helibeam System.

Structural and historical challenge

KNOWN FOR the intricate and stunning Mediterranean Revival-style details on its architectural facade, the building is comprised of a steel-framed structure with clay tile infill supported on the steel spandrel beams. The envelope consisted of brick and terra cotta veneer that was unsupported within the piers, and supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE engineers discovered that slippage of the brick veneer lead to cracked, bulging and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution, which resulted in failed wall ties and lintels – often the only

WJE collaborated with Helifix to provide a lateral and gravity support system.

means of support above the windows. Due to the differential support conditions and the 10-story heights of unsupported veneer, widespread distress attributable to improper gravity support was observed including: diagonal brick cracking originating from the lintel ends, compressive failures within the second- and third-floor terra cotta water tables, delaminated faces of the water table projecting elements, and bowed displacement of the veneer in excess of two inches.

Various areas of the building would need to be taken down and rebuilt, particularly at the building's corners.

Structural and helical solution

TO RESTORE the Olympia's severely damaged sections back to a historic and maintainable condition, various areas of the building would need to be taken down and rebuilt, particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE recommend installing a support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's Helibeam System. The system offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties, and Crack Stitching.

The key focus of the Helibeam System was the implementation of stainless-steel (austenitic grade 304 or 316) HeliBars that were seven meters long to create a reinforced "beam" across each spandrel level to distribute and support the structural loads across the piers and into the steel lintels and spandrel beams.

HeliBar starts as round, stainless-steel wire with a typical 0.2-percent proof stress of 500N/mm², but after the cold forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1100N/mm². This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry. This is particularly true when combined with HeliBond grout, which locks between the fins and bonds to the masonry.

Rounding out the Helibeam System to help with displacement, about 9,000/10mm DryFix remedial ties were installed through the veneer and into the backup, thus providing lateral restraint and securing the facade.

"The Helibeam System was specified because of its proven ability to secure existing masonry," says Brett Laureys, WJE associate principal. "It is fully concealed (once installed), and its flexibility allows it to be bent around corners with no loss of performance. It was also the most cost-effective stabilization method available and, with all work undertaken externally, there was minimal disruption to the upper floor tenants during this 'emergency restoration' phase, which overcame the veneer's lack of support, securing the structure while full renovation of the Olympia Theatre was safely undertaken."

In The News

Hohmann & Barnard Acquires Sandell Industries

Hohmann & Barnard Inc., manufacturer of reinforcement, anchoring systems and accessories for masonry and stone, has acquired Sandell Industries Inc., which manufactures flashings, drainage products, and building envelope accessories to the residential and commercial construction industries.

Sandell has grown its product lines by consistently creating new products and services, including plastics, transportation, construction solutions and Diedrich Technologies – a producer of high-performance detergent products for building restoration and maintenance.

Ron Hohmann Sr., CEO of Hohmann & Barnard, says Sandell's reputation is "outstanding, and they bring a group of strong relationships and talents that are a natural fit and expansion to our current business."

"The Sandell team is truly eager about the opportunity for us," says Saverio Minucci, Sandell president and CEO. "With the additional resources of H&B, we will continue the tradition of innovation, with our 'never give up' philosophy."

Minucci will continue in his role as president of Sandell, and will report to Ron Hohmann Jr. MAS

This creates a deep masonry beam to distribute the structural load and provide gravitational support.

Installation specifications

IN CONJUNCTION WITH Helifix's on-site quality control and assurance support team, installation of the Helibeam System at the Olympia Theater was conducted by specialty repair contracting company Structural Preservation Systems (SPS). To form the Helibeam System, two horizontal rows of seven-meter stainless-steel HeliBars were laid in tandem at various levels around the entire circumference of the building. This essentially creates a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

Installation involved cutting out 1 3/4-inch-deep slots in the mortar joints, which were vacuumed and then flushed out with water. A bead of thixotropic cementitious HeliBond grout was laid in, and the seven-meter length of HeliBar was then placed in the slot. The grout-HeliBar-

MODERN CONTRACTOR SOLUTIONS®

THE EQUIPMENT & BUSINESS SOLUTION FOR CONCRETE & GENERAL CONTRACTORS

WWW.MCSMAG.COM

JULY 2011

CALCULATING THE ROI OF CTLS

DEALING WITH CONSTRUCTION TURNOVER

HEAT STRESS PREVENTION

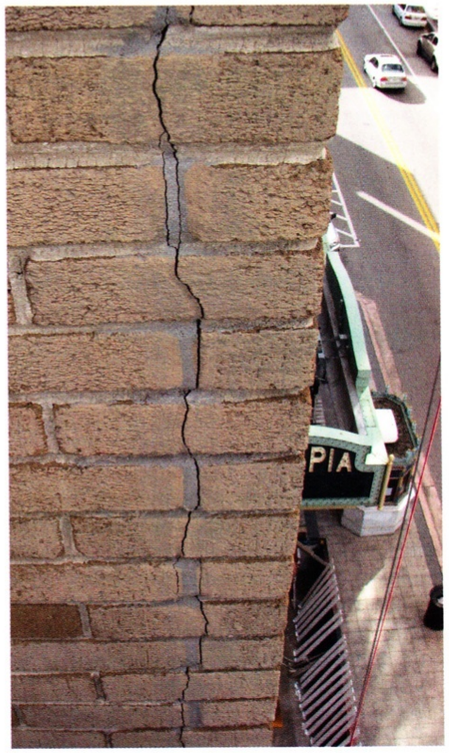
SEE OUR AD ON PAGE 63

RESTORATION OF HISTORIC OLYMPIA THEATER

By Reno Fricano

A jewel of the South Florida arts and cultural community since 1926, the landmark Olympia Theater and Apartment Building at the Maurice Gusman Cultural Center in Miami, Florida, was recently in a state of massive deterioration and disrepair. A long-term repair solution was needed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta façade.

A concerted $2.1 million restoration effort by the City of Miami and the Miami Parking Authority began with enlisting leading historic preservation and architecture design firm, R.J. Heisenbottle Architects, P.A. of Coral Gables, Florida, to head the restoration effort. RJHA President Richard Heisenbottle quickly involved structural engineers from Wiss, Janney, Elstner Associates, Inc. (WJE) to conduct an initial on-site assessment.



STRUCTURAL CHALLENGE

During the initial assessment over 2 days in late October 2009, WJE engineers discovered that slippage of the brick veneer lead to cracked, bulging, and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution, resulting in failed wall ties and lintels, often the only means of support above the windows. Due to the differential support conditions and the 10-story heights of unsupported veneer, widespread distress attributable to improper gravity support was observed including: diagonal brick cracking originating from the lintel ends, compressive failures within the second and third floor terra cotta water tables, delaminated faces of the water table projecting elements, and bowed displacement of the veneer in excess of 2 inches.

STRUCTURAL SOLUTION

To restore the Olympia's severely damaged sections, various areas of the building would need to be taken down and rebuilt, particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE recommend installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's new Helibeam System, which

offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties, and Crack Stitching.

The key focus of the Helibeam System was the implementation of stainless steel (austenitic grade 304 or 316) HeliBars that were 7-meters long to create a reinforced "beam" across each spandrel level to distribute and support the structural loads across the piers, and into the steel lintels, and spandrel beams.

INSTALLATION SPECIFICATIONS

In conjunction with Helifix's on-site quality control and assurance support team, installation of the Helibeam System at the Olympia Theater was conducted by industry leading specialty repair contracting company STRUCTURAL and their Ft. Lauderdale Operations Office. To form the Helibeam System, two horizontal rows of 7-meter long stainless steel HeliBars were laid in tandem at various levels around the entire circumference of the building. This essentially creates a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

Installation involved cutting out 1¾-inch-deep slots in the mortar joints, which were vacuumed and then flushed out with water. A bead of thixotropic cementitious HeliBond grout was laid in and the 7-meter length of HeliBar was then placed in the slot. The grout-HeliBar-grout process was then repeated on top to complete the composite action of the Helibeam System. When each length of HeliBar came to its end, the next length was overlapped by 1.5 feet to create one monolithic run around the building, with corners kinked in at a 90-degree bend. The recessed Helibeam was then pointed over the top, rendering it virtually transparent to the naked eye upon completion.

Additionally, DryFix remedial ties used in tandem with Helibeam System for lateral restraint in the façade. The DryFix ties were installed simply by being power-driven into position, via a small pilot hole, using a special installation tool that leaves the end of the tie recessed below the outer face, allowing an invisible finish. Crack Stitching was also conducted to secure local cracking and stabilize any further movement of separating brick areas.

RESULTS

The Helibeam System was installed within 4 months of WJE's specification, beginning with the anchors and completed in August 2010. An alternative to complete structural tear down and rebuild, the system delivered an efficient green solution in restoring the historic Olympia Theater.

RJHA's Heisenbottle noted, "The initial emergency stabilization phase is complete and the building is once again safe. The team is proceeding with the final (Phase II) work, a $10 million restoration of the theater façade and repair/replacement of the damaged terra cotta tile. The project is expected to be completed in 2011." ■

www.RandRmagonline.com

R&R

Restoration & Remediation

September/October 2011

Helifix crack-stitching kit bonds with contractors

Helifix, Inc. is introducing the Helifix Masonry Crack Stitching Kit (CS-KIT) that provides an easy-to-use, all-in-one solution for reliable, permanent, and non-invasive crack stitching repair of all types of cracked masonry. Effective in brick, block and stone walls, the CS-KIT is a more cost-effective means of permanent crack repair that provides contractors with a sustainable, fully concealed alternative to crack injection and costly/disruptive tear-down and rebuild.

Ideal for restoring the structural integrity and permanent repair of older cracks, the CS-KIT is comprised of all the necessary tools to allow contractors to repair and redirect stresses on damaged masonry areas and create a monolithic point to distribute loads. ***For more information circle 241 on the Reader Inquiry Card.***

CONCRETE TECHNOLOGY TODAY

The Use and Abuse of the Slump Test

Malaysia's First UHPdC Bridge

The Veer Towers

WOC 2012 Preview

10 years
Moving Into The Future!

Helical solution in concert

with restoration of historic Olympia Theatre

Displacement of veneer in excess of two inches.

A jewel of the South Florida arts and cultural community since 1926, the landmark Olympia Theatre and Apartment Building at the Maurice Gusman Cultural Centre was recently in a state of massive deterioration and disrepair. The historic 10-storey high-rise complex was facing an asphalt fate as a potential tear-down/rebuild would be required if an emergency and long-term repair solution wasn't developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terracotta façade.

A concerted US$2.1 million restoration effort by the City of Miami and the Miami Parking Authority, which runs the theatre, began with enlisting leading historic preservation and architecture design firm, R.J. Heisenbottle Architects, Pennsylvania, to head the restoration effort. RJHA President Richard Heisenbottle quickly involved structural engineers from Wiss, Janney, Elstner Associates, Inc. to conduct an initial onsite assessment.

The preliminary assessment was performed over two days in late October 2009 to investigate the buildings distresses and design an emergency stabilisation procedure, prior to installation of long-term repairs for the exterior masonry cladding. WJE collaborated with industry leading masonry repair reinforcement system manufacturer Helifix®, Inc. to provide a supplementary and sustainable lateral and gravity support system

Helifix on-site quality control support team and STRUCTURAL'S specialty repair contractors perform installation.

for the building's distressed veneer using its Helibeam System®.

Known for the intricate and stunning Mediterranean Revival style details on its architectural facade, the building is comprised of a steel-framed structure with clay tile infill supported on the steel spandrel beams. The envelope consisted of brick and terracotta veneer that was unsupported within the piers and supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE engineers discovered that slippage of the brick veneer lead to cracked, bulging, and separating masonry. This was a direct result of insufficient vertical support and poor

Application On Site

Diagonal brick cracking originating from the lintel ends.

distribution; resulting in failed wall ties and lintels – often the only means of support above the windows. Due to the differential support conditions and the 10-storey heights of unsupported veneer, widespread distress attributable to improper gravity support was observed including diagonal brick cracking originating from the lintel ends, compressive failures within the second and third floor terracotta water tables, delaminated faces of the water table projecting elements, and bowed displacement of the veneer in excess of two inches.

To restore the Olympia's severely damaged sections back to a historic and maintainable condition, various areas of the building would need to be taken down and rebuilt – particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE recommend installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's new Helibeam System, which offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties, and Crack Stitching.

The key focus of the Helibeam System was the implementation of stainless steel (austenitic grade 304 or 316) HeliBars that were 7 m long to create a reinforced 'beam' across each spandrel level to distribute and support the structural loads across the piers and into the steel lintels and spandrel beams.

HeliBar starts as round stainless steel wire with a typical 0.2 percent proof stress of 500 N/mm^2 but after the cold forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1100 N/mm^2. This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry, particularly when combined with HeliBond grout, which locks between the fins and bonds to the

masonry. Rounding out the Helibeam System to help with displacement, approximately 9000/10 mm DryFix remedial ties were installed through the veneer and into the backup; thus providing lateral restraint and securing the façade.

According to WJE Associate Principal Brett Laureys, "The Helibeam System was specified because of its proven ability to secure existing masonry, it is fully concealed (once installed) and its flexibility allows it to be bent around corners with no loss of performance. It was also the most cost-effective stabilisation method available and, with all work undertaken externally, there was minimal disruption to the upper floor tenants during this 'emergency restoration' phase which overcame the veneer's lack of support, securing the structure while full renovation of the Olympia Theatre was safely undertaken."

In conjunction with Helifix's on-site quality control and assurance support team, installation of the Helibeam System at the Olympia Theatre was conducted by industry leading specialty repair contracting company STRUCTURAL and their Ft. Lauderdale operations office. To form the Helibeam System, two horizontal rows of 7-m-long stainless steel HeliBars were laid in tandem at

Olympia Theater and Apartment Building.

various levels around the entire circumference of the building. This essentially creates a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

Installation involved cutting out 1-¾-inch-deep slots in the mortar joints which were vacuumed and then flushed out with water. A bead of thixotropic cementitious HeliBond grout was laid in and the 7-m length of HeliBar was then placed in the slot. The grout-HeliBar-grout process was then repeated on top to complete the composite action of the Helibeam System. When each length of HeliBar came to its end, the next length was overlapped by 1.5 ft to create one monolithic run around the building, with corners kinked in at a 90° bend. The recessed Helibeam was then pointed over the top, rendering it virtually transparent to the naked eye upon completion.

Additionally, DryFix remedial ties used in tandem with Helibeam System for lateral restraint in the facade. The DryFix ties were installed simply by being power-driven into position, via a small pilot hole, using a special installation tool that leaves the end of the tie recessed below the outer face allowing an 'invisible' finish. Crack Stitching was also conducted to secure local cracking and stabilise any further movement of separating brick areas. According to STRUCTURAL'S Project Manager Alan Fleischer, "The Helibeam installation was easy as it's a lot like crack stitching but in a longer run. After we completed the installation, you'd never know what was done to the building."

The Helibeam System was installed within four months of WJE's specification; beginning with the anchors and completed in August 2010. An alternative to complete structural tear down and rebuild, the system delivered an efficient green solution in restoring the historic Olympia Theatre. According to Helifix VP-North American Operations Reno Fricano, "Ultimately, in collaborating with WJE and SPS throughout the entire specification, design, and installation phases, the system provided a non-invasive, cost-effective, and sustainable stabilisation solution in revitalising the architectural lustre and integrity to one of America's original movie palaces."

WJE's Brett Laureys conferred in stating, "The repairs were successfully installed, meeting the client's needs of an emergency stabilisation method which could be installed immediately, quickly, and inexpensively. It's hard to compare with it as it was more cost effective than traditional stainless steel threaded rod and epoxy."

Finally, RJHA's Heisenbottle noted that, "The initial emergency stabilisation phase is complete and the building is once again safe. The team is proceeding with the final (Phase II) work: a US$10 million restoration of the theatre façade and repair/replacement of the damaged terra cotta tile. The project is expected to be completed in 2011."

Enquiry: sales@helifix.com

Helifix's Helibeam System HeliBars create reinforced "beams" across each spandrel level.

concreteMONTHLY
News from the cement and concrete industries
November 2011

STRUCTURAL used Helibeam System to save historic theater

A jewel of the South Florida arts and cultural community since 1926, the landmark Olympia Theater and Apartment Building at the Maurice Gusman Cultural Center in Miami has recently been rescued from a state of massive deterioration and disrepair. An initial $2.1 million emergency stabilization phase is complete, and the building is now safe. Phase II work, a $10 million restoration of the theater façade and repair/replacement of the damaged terra cotta tile, will be completed this year.

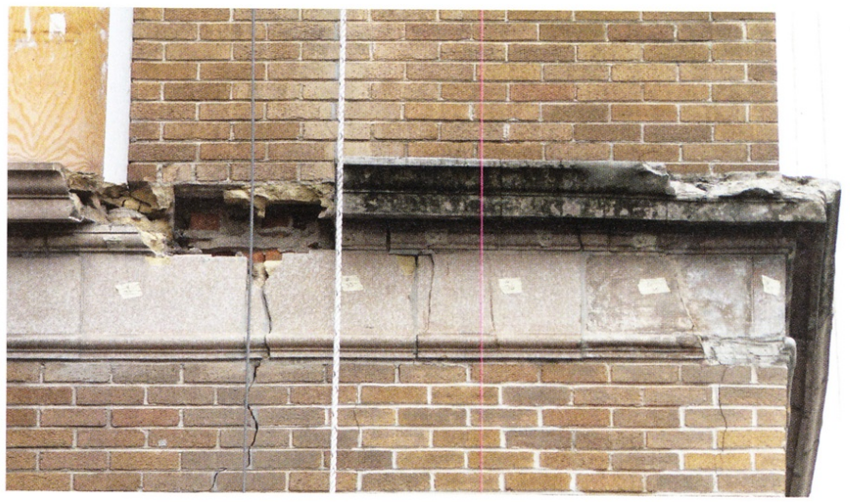
The historic 10-story high-rise complex was facing an asphalt fate as potential tear-down/rebuild would be required if an emergency and long-term repair solution wasn't developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta façade.

The restoration effort by the City of Miami and the Miami Parking Authority, which runs the theater, began with enlisting R.J. Heisenbottle Architects P.A. (RJHA) of Coral Gables, Fla., to head the project. Structural engineers from Wiss, Janney, Elstner Associates Inc. (WJE) of Northbrook, Ill., conducted the initial onsite assessment that resulted in saving the building.

WJE collaborated with masonry repair reinforcement system manufacturer Helifix Inc. of Streetsboro, Ohio, to provide a supplementary and sustainable lateral and gravity support system for the building's distressed veneer using its Helibeam System.

Known for the intricate Mediterranean Revival style details on its architectural facade, the building is comprised of a steel-framed structure with clay tile infill supported on the steel spandrel beams. The envelope consisted of brick and terra cotta veneer that was unsupported

THEATER
continued on page 25



THEATER
continued from page 23

within the piers and supported over the punched window openings by steel lintels anchored to the spandrel beams.

WJE engineers discovered that slippage of the brick veneer led to cracked, bulging and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution; resulting in failed wall ties and lintels – often the only means of support above the windows.

Due to the differential support conditions and the 10-story heights of unsupported veneer, widespread distress attributable to improper gravity support was observed including: diagonal brick cracking originating from the lintel ends, compressive failures within the second and third floor terra cotta water tables, delaminated faces of the water table projecting elements, and bowed displacement of the veneer in excess of two inches.

To restore the Olympia's severely damaged sections back to a historic and maintainable condition, various areas of the building would need to be taken down and rebuilt, particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE recommend installing a new support system for the exterior veneer.

In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's new Helibeam System, which offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties, and Crack Stitching.

In conjunction with Helifix's onsite quality control and assurance support

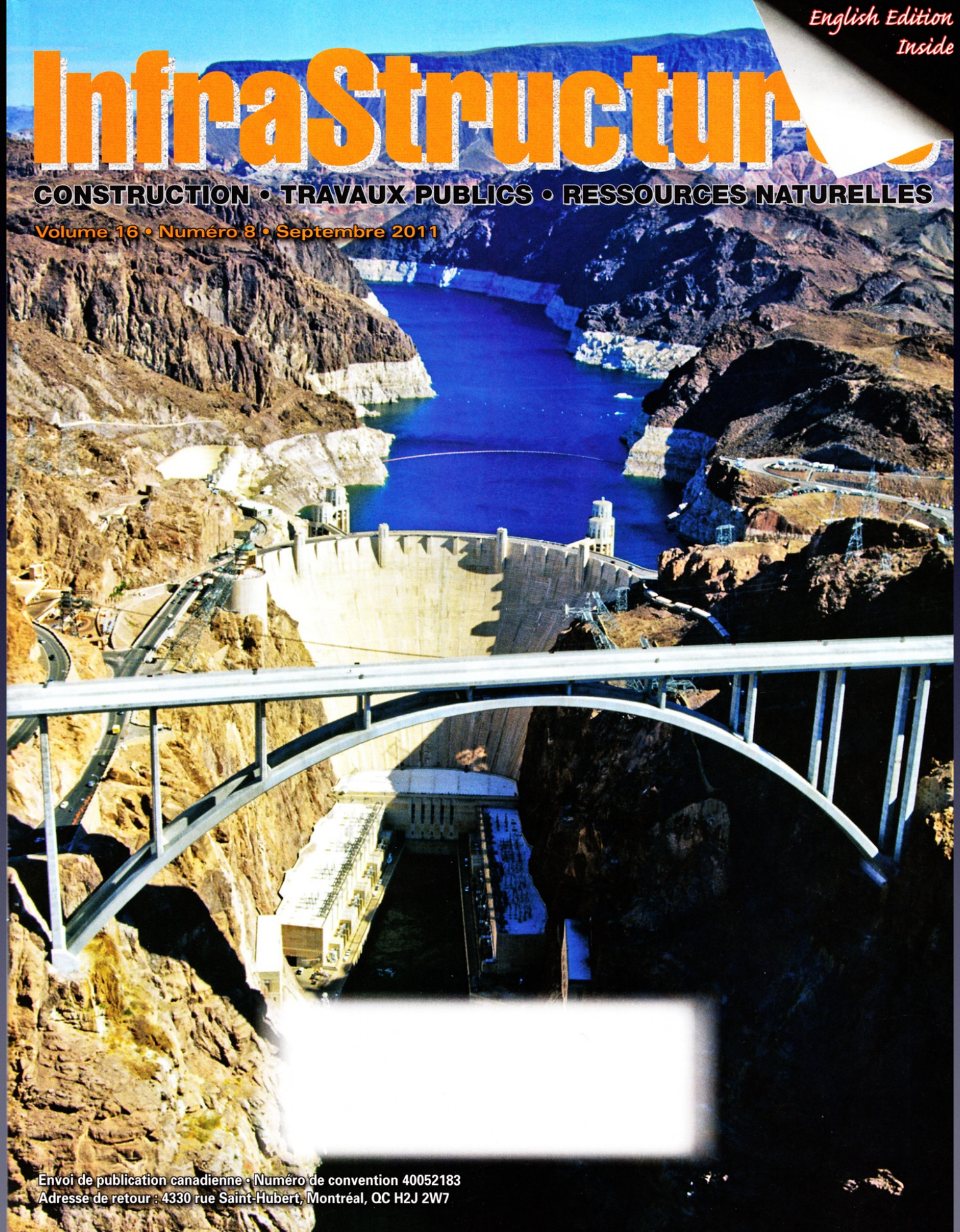
THEATER
continued on page 26

English Edition Inside

InfraStructures

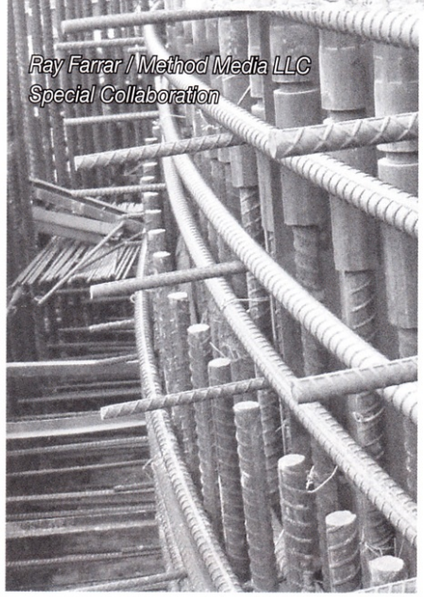
CONSTRUCTION • TRAVAUX PUBLICS • RESSOURCES NATURELLES

Volume 16 • Numéro 8 • Septembre 2011



Envoi de publication canadienne - Numéro de convention 40052183
Adresse de retour : 4330 rue Saint-Hubert, Montréal, QC H2J 2W7

Helical Solution in Concert with Restoration of Historic Olympia Theater



Ray Farrar / Method Media LLC
Special Collaboration

A jewel of the South Florida arts and cultural community since 1926, the landmark Olympia Theater and Apartment Building in Miami, Florida, also known as the Maurice Gusman Cultural Center, was recently in a state of massive deterioration and disrepair. The historic 10-story high-rise complex was facing an bleak fate as potential tear-down/rebuild would be required if an emergency and long-term repair solution was not developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta façade.

A concerted $2.1 million restoration effort by the City of Miami and the Miami Parking Authority (which runs the theater) began with enlisting leading historic preservation and architecture design firm, R.J. Heisenbottle Architects, P.A. (RJHA) of Coral Gables, Florida, to head the restoration effort. RJHA president Richard Heisenbottle quickly involved structural engineers from Wiss, Janney, Elstner Associates, Inc. (WJE) of Northbrook, Illinois, to conduct an initial onsite assessment.

The preliminary assessment was performed over two days in late October, 2009 to investigate the buildings distresses and design an emergency stabilization procedure, prior to installation of long-term repairs for the exterior masonry cladding. WJE collaborated with industry leading masonry repair reinforcement system manufacturer Helifix, Inc. to provide a supplementary and sustainable lateral and gravity support system for the building's distressed veneer using its Helibeam System®.

STRUCTURAL AND HISTORIC CHALLENGE

Known for the intricate and stunning Mediterranean Revival style details on its architectural facade, the building is comprised of a steel-framed structure with clay tile infill supported on the steel spandrel beams. The envelope consisted of brick and terra cotta veneer that was unsupported within the piers and supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE engineers discovered that slippage of the brick veneer lead to cracked, bulging and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution; resulting in failed wall ties and lintels – often the only means of support above the windows. Due to the differential support conditions and the ten-story heights of unsupported veneer, widespread distress attributable to improper gravity support was observed including: diagonal brick cracking originating from the lintel ends, compressive failures within the second and third floor terra cotta water tables, delaminated faces of the water table projecting elements, and bowed displacement of the veneer in excess of 5 cm.

To restore the Olympia's severely damaged sections back to a historic and maintainable condition, various areas of the building would need to be taken down and rebuilt – particularly at the building's corners. Additionally, due to the inadequate gravity support and subsequent damage, WJE recommended installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's new Helibeam System which offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties, and Crack Stitching.

The key focus of the Helibeam System was the implementation of stainless steel (austenitic grade 304 or 316) HeliBars that were 7 m long to create a reinforced "beam" across each spandrel level to distribute and support the structural loads across the piers and into the steel lintels and spandrel beams.

HeliBar starts as round stainless steel wire with a typical 0.2% proof stress of 500 N/mm² but after the cold forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1,100 N/mm². This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry; particularly when combined with HeliBond grout which locks between

the fins and bonds to the masonry.

Rounding out the Helibeam System to help with displacement, approximately 9,000 DryFix remedial ties were installed through the veneer and into the backup; thus providing lateral restraint and securing the façade.

According to WJE associate principal Brett Laureys, "The Helibeam System was specified because of its proven ability to secure existing masonry, it is fully concealed (once installed) and its flexibility allows it to be bent around corners with no loss of performance. It was also the most cost-effective stabilization method available and, with all work undertaken externally, there was minimal disruption to the upper floor tenants during this 'emergency restoration' phase which overcame the veneer's lack of support, securing the structure while full renovation of the Olympia Theater was safely undertaken."

INSTALLATION SPECIFICATIONS

In conjunction with Helifix's on-site quality control and assurance support team, installation of the Helibeam System at the Olympia Theater was conducted by industry leading specialty repair contracting company STRUCTURAL of Hanover, Maryland, and their Ft. Lauderdale operations office. To form the Helibeam System, two horizontal rows of 7 m long stainless steel HeliBars were laid in tandem at various levels around the entire circumference of the building. This essentially creates a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

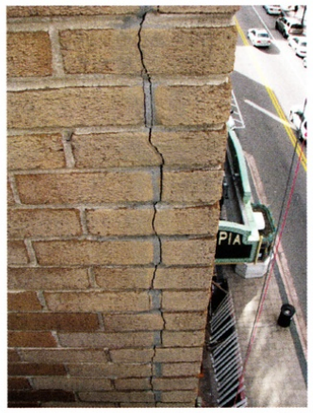
Installation involved cutting out 45 mm deep slots in the mortar joints which were vacuumed and then flushed out with water. A bead of thixotropic cementitious HeliBond grout was laid in and the 7 m length of HeliBar was then placed in the slot. The grout-HeliBar-grout process was then repeated on top to complete the composite action of the Helibeam System. When each length of HeliBar came to its end, the next length was overlapped by 45 cm to create one monolithic run around the building; with corners kinked in at a 90° bend. The recessed Helibeam was then pointed over the top – rendering it virtually transparent to the naked eye upon completion.

Additionally, DryFix remedial ties used in tandem with Helibeam System for lateral restraint in the façade. The DryFix ties were installed simply by being power-driven into position, via a small pilot hole, using a special installation tool that leaves the end of the tie recessed below the outer face – allowing an "invisible" finish. Crack Stitching was also conducted to secure local cracking and stabilize any further movement of separating brick areas. According to STRUCTURAL's project manager Alan Fleischer, "The Helibeam installation was easy as it's a lot like crack stitching but in a longer run. After we completed the installation, you'd never know what was done to the building."

CONCLUSION / RESULTS

The Helibeam System was installed within four months of WJE's specification; beginning with the anchors and completed in August 2010. An alternative to complete structural tear down and rebuild, the system delivered an efficient green solution in restoring the historic Olympia Theater. According to Helifix vice president North American Operations Reno Fricano, "Ultimately, in collaborating with WJE and SPS throughout the entire specification, design, and installation phases, the system provided a non-invasive, cost-effective, and sustainable stabilization solution in revitalizing the architectural luster and integrity to one of America's original movie palaces."

WJE's Brett Laureys conferred in stating, "The repairs were successfully installed, meeting the client's needs of an emergency stabilization method which could be installed immediately, quickly, and inexpensively. It's hard to compare with it as it was more cost effective than traditional stainless steel threaded rod and epoxy."



Finally, RJHA's Heisenbottle noted that, "The initial emergency stabilization phase is complete and the building is once again safe. The team is proceeding with the final (Phase II) work; a $10 million restoration of the theater façade and repair/replacement of the damaged terra cotta tile. The project is expected to be completed in 2011."

See our Hospitality & Retail Retreat Coverage Inside

COMMERCIAL
Construction & Renovation

Exclusive in this issue

Defining today's green regulations

Keeping your brand relevant

Top Architecture Firm Report

Who's who in fixturing

Bobbie Gerhart
President & CEO

A place to heal

Why Miami Valley Hospital continues to set the bar for health care

2012 Commercial Construction & Renovation Summit

SHOW ISSUE

January/February 2012

www.ccr-mag.com

Restoring the Historic Olympia Theater

By Reno Fricano

A jewel of the South Florida arts and cultural community since 1926, the landmark **Olympia Theater and Apartment Building**, which has been on the **U.S. National Register of Historic Places in Miami** since 1984, at the **Maurice Gusman Cultural Center** recently was in a state of massive deterioration and disrepair.

The historic, 10-story high-rise complex was facing an asphalt fate, as a potential tear-down/rebuild would be required if an emergency and long-term repair solution wasn't developed to address the pressing structural and safety issues that existed with the exterior brick masonry cladding and terra cotta façade.

Reno Fricano is VP of North American Operations for Helifix.

A concerted $2.1 million restoration effort by the city of Miami and the **Miami Parking Authority**, which runs the theater, began with enlisting leading historic preservation and architecture design firm **R.J. Heisenbottle Architects (RJHA),** to head the restoration effort. RJHA president **Richard Heisenbottle** quickly involved interdisciplinary structural engineering and architectural firm **Wiss, Janney, Elstner Associates (WJE)** to conduct an initial onsite assessment.

The preliminary assessment was performed over two days in late October 2009 to investigate the buildings distresses and design an emergency stabilization procedure prior to installation of long-term repairs for the exterior masonry cladding. WJE collaborated with industry leading masonry repair reinforcement system manufacturer **Helifix® Inc.** to provide a supplementary, and sustainable lateral and gravity support system for the building's distressed veneer using its Helibeam System®.

Structural/historic challenge

Known for the intricate and stunning Mediterranean Revival style details on its architectural facade, the building is comprised of a steel-framed structure with clay tile infill supported on the steel spandrel beams. The envelope consisted of brick and terra cotta veneer that was unsupported within the piers and supported over the punched window openings by steel lintels anchored to the spandrel beams.

During the initial assessment, WJE engineers discovered that slippage of the brick veneer lead to cracked, bulging and separating masonry. This was a direct result of insufficient vertical support and poor weight distribution; resulting in failed wall ties and lintels – often the only means of support above the windows.

Due to the differential support conditions and the 10-story heights of unsupported veneer, widespread distress attributable to improper gravity support was observed, including diagonal brick cracking originating from the lintel ends, compressive failures within the second and third

floor terra cotta water tables, delaminated faces of the water table projecting elements and bowed displacement of the veneer in excess of 2 inches.

Structural/Helical solution

To restore the Olympia's severely damaged sections back to a historic and maintainable condition, various areas of the building would need to be taken down and rebuilt – particularly at the building's corners.

Additionally, due to the inadequate gravity support and subsequent damage, WJE recommended installing a new support system for the exterior veneer. In seeking a solution to secure the existing masonry, while maintaining the aesthetic integrity of the historic building, WJE specified Helifix's new Helibeam System, which offered a non-invasive and sustainable solution comprised of HeliBars, HeliBond, DryFix remedial ties and Crack Stitching.

The key focus of the Helibeam System was the implementation of stainless steel – austenitic grade 304 or 316 – HeliBars that were 7 meters long to create a reinforced "beam" across each spandrel level to distribute and support the structural loads across the piers, and into the steel lintels and spandrel beams.

HeliBar starts as round stainless steel wire with a typical 0.2 percent proof stress of 500N/mm², but after the cold forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1100N/mm². This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry; particularly when combined with HeliBond grout, which locks between the fins and bonds to the masonry.

Rounding out the Helibeam System to help with displacement, approximately 9,000/10mm DryFix remedial ties were installed through the veneer and into the backup; thus providing lateral restraint and securing the façade.

"The Helibeam System was specified because of its proven ability to secure existing masonry, it is fully concealed (once installed) and its flexibility allows it to be bent around corners with no loss of performance," says **Brett Laureys**, WJE's associate principal. "It also was the most cost-effective stabilization method available and, with all work undertaken externally, there was minimal disruption to the upper floor tenants during this 'emergency restoration' phase, which overcame the veneer's lack of support and secured the structure while full renovation of the Olympia Theatre was safely undertaken."

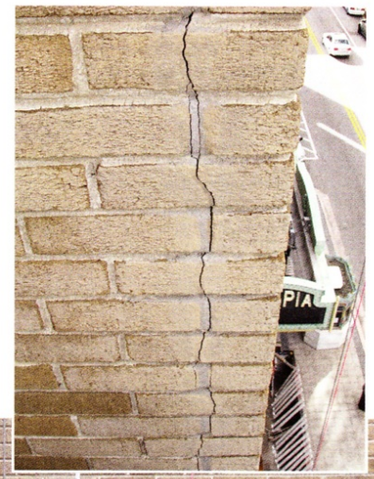
Installation Specifications

In conjunction with Helifix's on-site quality control and assurance support team, installation of the Helibeam System at the Olympia Theater was conducted by industry leading specialty repair contracting company Structural Preservation Systems (SPS).

To form the Helibeam System, two horizontal rows of 7-meter long stainless steel HeliBars were laid in tandem at various levels around the entire circumference of the building. This essentially creates a deep masonry beam to distribute the structural load and provide gravitational support around the entire building.

> **"The Helibeam installation was easy as it's a lot like crack stitching but in a longer run. After we completed the installation, you'd never know what was done to the building."**
>
> **— Alan Fleischer, Project Engineer/Manager, Structural Preservation Systems**

Installation involved cutting out 1 ¾-inch deep slots in the mortar joints, which were vacuumed and then flushed out with water. A bead of thixotropic cementitious HeliBond grout was laid in, and the 7-meter length of HeliBar then was placed in the slot. The grout-HeliBar-grout process then was repeated on top to complete the composite action of the Helibeam System.



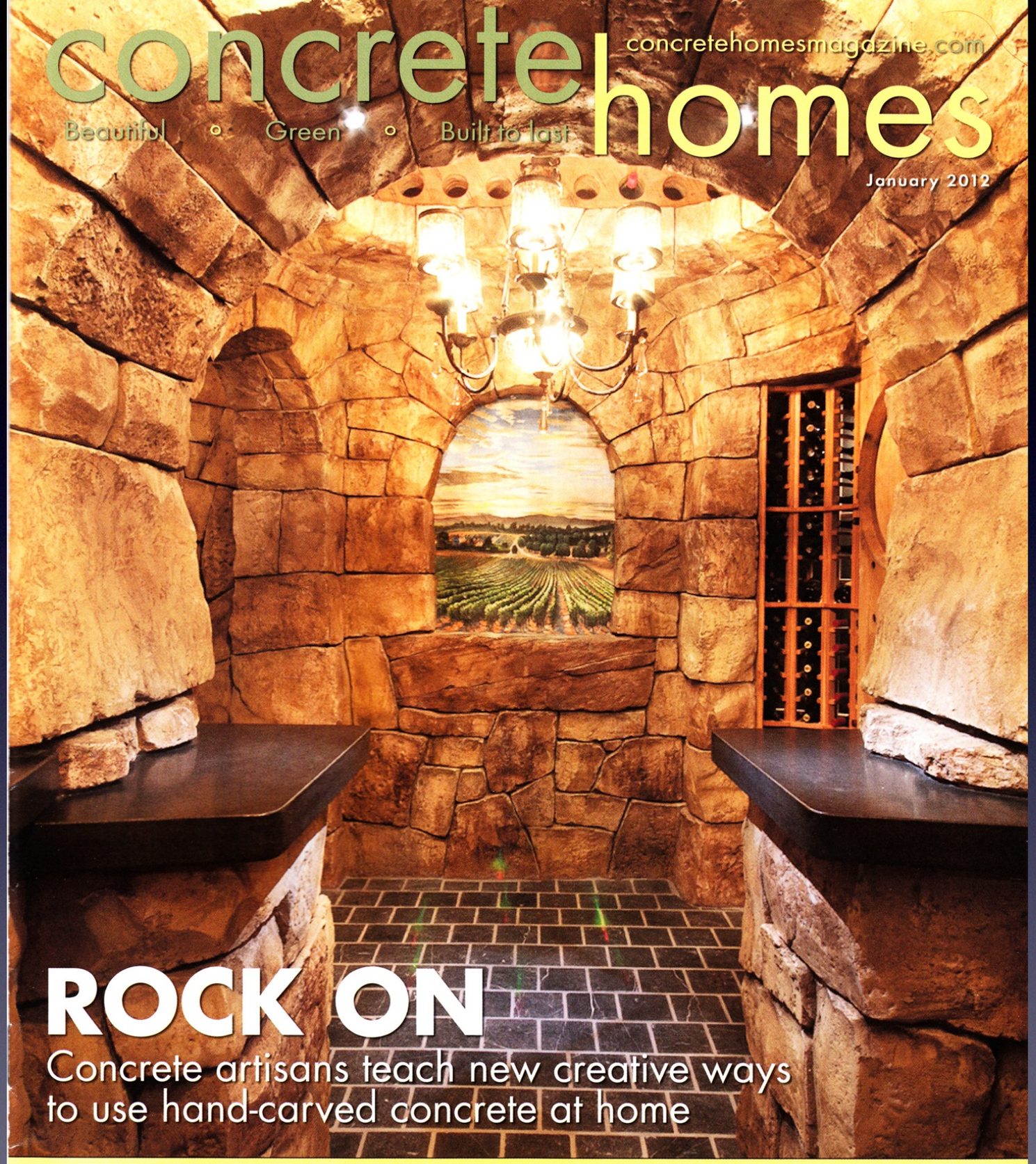
When each length of HeliBar came to its end, the next length was overlapped by 1.5 feet to create one monolithic run around

concrete homes

concretehomesmagazine.com

Beautiful ° Green ° Built to last

January 2012



ROCK ON

Concrete artisans teach new creative ways to use hand-carved concrete at home

$4.95

12>

0 74470 95265 7

January 2012

Featuring concreteMONTHLY

News from the cement and concrete industries

ONE TO GROW ON: ICF Home in Arizona

Seismic upgrades expanding beyond major faults

In response to recent seismic events in the United States and worldwide, industry leading masonry repair reinforcement system manufacturer Helifix Inc. of Streetsboro, Ohio, has advanced its patented DryFix Seismic Connector System to reconnect and stabilize existing damaged masonry or to provide retrofit strengthening and seismic upgrade for, as yet, unaffected buildings.

The recent seismic activity surge on the U.S. East Coast and in Oklahoma and Texas bring to the forefront the potential vulnerability of masonry buildings to earthquake damage even in areas far removed from the major fault lines.

The increased unpredictability of seismic activity and its ensuing level of structural damage and loss of human life and injury can be significantly reduced with the Helifix proactive seismic upgrading and reinforcement systems for existing structures to improve their resilience to earthquake damage.

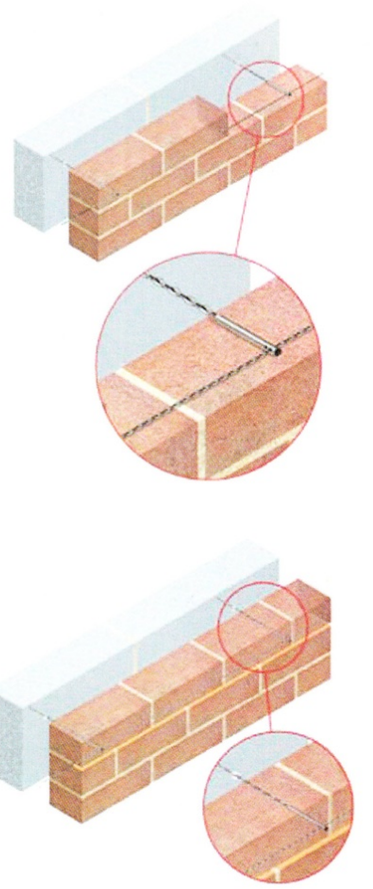
Earthquakes will magnify any inherent faults in a building's original design and construction, as well as exaggerate any weaknesses caused by previous low-level seismic activity. The degree of damage will depend on the earthquake intensity levels. Resulting effects range from masonry cracking, a lack of connection between external walls, floors and internal walls, the separation of masonry panels and structural frames, the de-lamination of the external wythe of cavity wall brickwork, and the chronic instability of gable end and parapet walls – all of which pose a serious threat of structural instability and potential collapse.

Increasingly, seismic vulnerability assessment and the ensuing necessity of strengthening or retrofit measures required to achieve earthquake resistance is being required by modern seismic codes.

In recent years, the United States has amended its modern seismic codes beyond the obvious high-risk West Coast areas to include cities such as New York in the East. In New Zealand, the government has also passed legislation requiring the remedial strengthening of many unreinforced masonry (URM) buildings using a retrofit solution that must be low-cost and must not affect the architecture of the building.

In accordance, public and privately owned buildings will require upgrading and strengthening to ensure their integrity and allow property owners to avoid liability for any potential collapse and the potential physical threat that poses to the public.

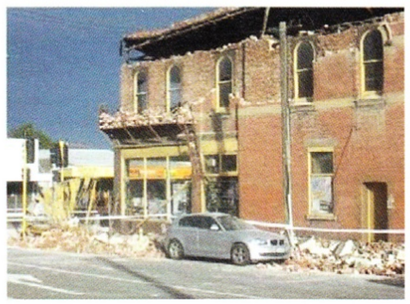
Consequently, implementing effective, reliable, cost-effective, and proven systems of masonry repair, reinforcement, and upgrade are essential; not only to restore structural integrity to damaged buildings but to upgrade existing structures to make them more resistant to future seismic activity, ground motion, or soil failure due to earthquakes.



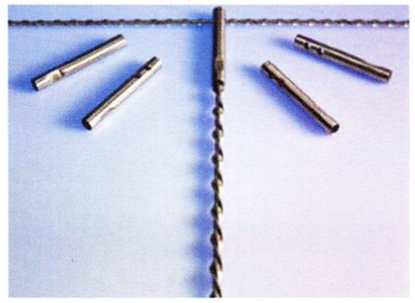
Helifix system is invisible after completion

Helifix's advanced DryFix Seismic Connector System is a positive-lock seismic connector for retrofit application. The Helifix system combines Heli-Bars, DryFix remedial ties and special patented seismic connectors to greatly improve structural strength, integrity and significantly enhance resistance to

Earthquakes magnify any inherent faults in a building's original design.



Tests show shear strength increases up to 250 percent and absorbed energy in reinforced masonry up to 12 times higher.

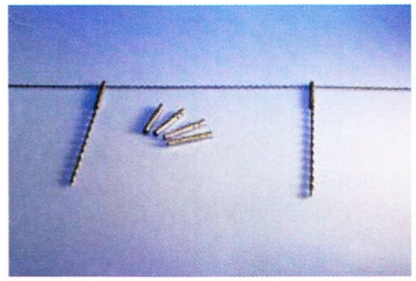


Helifix Connector System

earthquake tremors while still allowing for normal building movement. All products in the system are supported by independent testing and have been used extensively in many parts of the world on structures of all kinds and built from a wide variety of materials.

Collectively, the retrofit system, together with its associated installation techniques and Helifix grouts, produces secure connections with brickwork, CMU blocks, stonework, concrete, marble, limestone, travertine, terracotta and timber. The system is embedded within the existing masonry to be fully concealed once installed. Generally it is installed into the existing masonry; thus avoiding expensive and time consuming tear down and rebuild while retaining the visual aesthetics of the structure which makes the Helifix system ideal for historic buildings.

Used in both new build and remedial settings to meet seismic requirements and restore structural performance, the slim profile DryFix system products are



precision engineered from austenitic grade 304 stainless steel. They are used in conjunction with a special patented connector fitted to the tie end and connected laterally with HeliBar 45 rods which are embedded into the outer leaf mortar.

The HeliBar rods start as formed stainless steel wire with a typical 0.2 percent proof stress of 500N/mm², but after the cold forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1100N/mm². This means that HeliBar, with its relatively small diameter, provides substantial tensile properties to the masonry.

DryFix ties may be used in hollow materials and close to edges. They are sufficiently flexible to permit normal masonry movement, are designed to shed water in cavity construction and provide strong, reliable axial restraint in both tension and compression.

Helifix's concealed, non-disruptive systems have been included in independent seismic test programs as part of a joint research program established at the Universities of Auckland and Canterbury, New Zealand, and also involving the universities of Newcastle and Adelaide in Australia.

These are among the first tests to validate the effectiveness of remedially fitted seismic reinforcement, using both vertical and horizontal HeliBars, and Helifix ties.

The results have documented shear strength increasing by some 200-250 percent and absorbed energy in reinforced masonry being 3 to 12 times higher. **CM**

READ MORE: www.helifix.com

APRIL 2012 Vol. 34 No. 4

Concrete international

The Magazine of the American Concrete Institute — an international technical society
www.concreteinternational.com

Repair and Renovation

MODERN CONTRACTOR

S·O·L·U·T·I·O·N·S®

THE EQUIPMENT & BUSINESS SOLUTION FOR CONCRETE & GENERAL CONTRACTORS

WWW.MCSMAG.COM

APRIL 2012

INCREASE UPTIME WITH TIRE PERFORMANCE

COVERAGE FOR MOBILE CRANES

3D PRINTING TECHNOLOGY

TOWER CRANE SAFETY

see our ad on page 37

RESTORING DETROIT'S HISTORIC BRODERICK TOWER

By Brian Barnes

The Broderick Tower was one of Detroit's earliest "skyscrapers" when it pierced the downtown skyline at Grand Circus Park in 1928. Originally named Eaton Tower, the building's neoclassical architecture was a combination of Chicago school and Beaux-Arts design by famed architect Louis Kamper and was considered "a beauty by day—a jewel by night." Over the years, it went from being Michigan's second tallest skyscraper to being the third-tallest abandoned building in the United States.

Standing basically vacant, but preserved since the mid 1980's, the 34-story historic building is now part of a $53 million restoration project funded by Motown Construction Partners L.P. led by Fred Beal of JC Beal Construction Inc., which is acting as construction manager. Detroit's Kraemer Design Group and Akins Construction, Inc. are serving as the architectural firm and assembly contractor, respectively. All are onboard to restore this key component of the city's skyline to its original prominence and luster as a luxury residential and office building with panoramic views of downtown Detroit's commercial and entertainment district.

Construction began in March 2011, and with a grand opening slated for September 2012, significant budget concerns existed over the methods of repair to the exterior restoration in order to properly preserve and enhance the building's core. Notably, the deteriorating exterior limestone corners of the building would have to be completely replaced at great cost.

CORNERSTONE PROBLEM

During the projects' initial inspection, at least two large pieces of limestone corners had fallen from the 18th floor during a storm due to rusted anchoring and freeze/thaw water damage. The historic style and age of the building's expansion joints in the limestone corner columns, where major "sway" movement occurs, made the need to remove and replace the limestone corners on all 34 floors of the historic tower seem imminent.

Given the project's economical budget restraints, other methods of repair were explored and Akins Construction contacted Helifix®, whom they had used over the years for creative applications, to provide an alternative solution to replacing the large volume of loose terracotta and limestone on the building's deep corners. Helifix recommended its DryFix Remedial Tying System that offered the following solution that was quickly approved by JC Beal and Kramer Design.

CORNERSTONE SOLUTION

The DryFix Remedial Tying System is an extremely versatile and reliable remedial pinning and tying system. Quick and easy to install, it provides an effective and economical stress-free connection between all commonly used building materials in both cavity and solid masonry constructions without needing any special grouts, resins, or mechanical expansion.

The system is embedded within the existing masonry to be fully concealed once installed. Because it's generally installed into the existing masonry, expensive and time-consuming teardown and rebuild are avoided, while retaining the visual aesthetics of the structure, which made the system ideal for the Broderick Tower exterior restoration project.

CORNERSTONE INSTALLATION

The materials were delivered within 24 hours of approval and Helifix remained on-site to assist Akins Construction during the installation process. A variety of lengths and sizes (10 to 15 inches) of remedial ties were utilized to secure the loose terracotta and limestone on all four corners of the building's 34 floors, in addition to various re-anchoring throughout the rest of the building.

Installation involved the simple power-driving of approximately 4 to 6 anchor ties per cornerstone into position via a small pilot hole and using a special installation tool that leaves the end of the tie recessed below the outer face to allow an "invisible" finish. Since there was no sound "backup" anchor stone available, the ties were anchored into adjacent limestone corners on each side for an optimal structural repair. High-performance polymer grout was also used in key areas to help increase the bond.

CORNERSTONE RESULTS

The Broderick Tower is on track for its September 2012 grand opening. Notably, there was no need to remove any of the limestone corner columns and ensuing pull-tests conducted on completed installations indicate optimal flexibility and movement during "sway" as the stones stay securely anchored.

According to Akins Construction owner Rich Akins, "Other methods were explored to remove the limestone completely with new anchors to the backup walls. Ultimately, Helifix's DryFix solution provided the ability to restore rather than replace the limestone corners and saved Motown Construction Partners upwards of approximately $1 million to the project's exterior restoration budget." ■

Product Showcase

Rapid Pave

Cemstone recently introduced Rapid Pave™ Ultra Fast Setting, High Early Strength concrete, designed specifically for busy intersections and roadways where rapid completion is critical. The first commercial application of Rapid Pave was the Minnesota Department of Transportation (MnDOT) joint repair project on Interstate 94. The project repaired a busy 7.6 mile (12.2 km) section of highway originally paved in the 1960s that now carries 100,000 vehicles per day. Rapid Pave allowed MnDOT to place sections of the highway at night, minimize lane closures, and have that section ready for traffic by the next morning. In this application, Rapid Pave reached 3250 psi (22.3 MPa) strength in 3 hours and 10,800 psi (74 MPa) in 28 days.

—Cemstone

www.cemstone.com

Valspar Traffic, Marking, and Line Saving Paints

Valspar's water-based Traffic Paint, Marking Paint, and Line Saving Paint are ideal solutions for the quick application of markings to a variety of surfaces, including concrete. They are dry to the touch in 15 minutes, resistant to the elements, and are long-lasting. The Traffic Paint is available in white, yellow, black, and blue, and can be used on concrete or gravel in parking lots, warehouse docking areas, and factories. Marking Paint works well on the same materials as well as with landscaping and comes in a variety of bright colors, including OSHA colors. Line Saver is a clear-coat spray that can preserve chalk lines in surveying and construction.

—The Valspar Corporation

www.valsparglobal.com

DryFix Remedial Tying System

Helifix's DryFix Remedial Tying System provides a stress-free connection between building materials in both cavity and solid masonry constructions without needing any mechanical expansion. DryFix remedial ties, together with proper installation and high-performance Helifix grouts, produce secure connections and are designed to be installed within existing masonry, providing economical and invisible support. The system was recently used in restoration of the Broderick Tower, one of the first skyscrapers in Detroit, MI. Ties in lengths varying between 10 and 15 in. (250 and 380 mm) were used to secure loose terra cotta and limestone on all four corners of the building's 34 floors, using four to six anchor ties per cornerstone. The ties were anchored into adjacent limestone on either side of each cornerstone and reinforced with Helifix polymer grout.

—Helifix, Inc.

www.helifix.com

May 2012

MASONRY

The Voice of the Masonry Industry
Volume 51, Number 05

Masonry Restoration

INSIDE

Saw Review

Connectors, Anchors & Fasteners

Helical Restoration for a Historic Skyscraper

DryFix System provides cornerstone solution to restoring Detroit's Broderick Tower

By Chris Watson

THE BRODERICK TOWER WAS ONE OF DETROIT'S EARLIEST SKYSCRAPERS WHEN IT PIERCED THE DOWNTOWN SKYLINE AT GRAND CIRCUS PARK IN 1928. Originally named Eaton Tower, the building's neoclassical architecture was a combination of Chicago school and Beaux-Arts design by famed architect Louis Kamper. The building was considered "a beauty by day, a jewel by night." During the years, it went from being Michigan's second-tallest skyscraper to being the third-tallest abandoned building in the United States.

DryFix ties are flexible to permit normal masonry movement and are designed to shed water in cavity construction.

existing masonry to be fully concealed once installed. Because it's generally installed into the existing masonry, expensive and time-consuming tear down and rebuild are avoided. Visual aesthetics of the structure are retained, which made the system a good candidate for The Broderick Tower exterior restoration project.

The slim profile DryFix remedial ties are precision engineered from 10mm austenitic grade (304) stainless steel. The formed stainless-steel wires offer a typical 0.2 percent proof stress of 500N/mm^2. But after the cold-forming manufacturing process, which creates the helical hi-fin design, this more than doubles to around 1100N/mm^2. This means that, with its relatively small diameter, the system provides substantial tensile properties to the masonry.

Additionally, DryFix ties may be used in hollow materials and close to edges. They are sufficiently flexible to permit normal masonry movement, are designed to shed water in cavity construction as well as provide strong, reliable axial restraint in both tension and compression.

The cornerstone application

IN THE CASE of The Broderick Tower, Helifix delivered the DryFix materials within 24 hours of approval and remained onsite to assist Akins Construction during the installation process. A variety of lengths and sizes (10 to 15 inches) of DryFix remedial ties were utilized to secure the loose terracotta and limestone on all four corners of the building's 34 floors. This was done in addition to various re-anchoring throughout the remainder of the building.

Installation involved the simple power-driving of about four to six DryFix anchor ties per corner stone into position via a small pilot hole, using a special installation tool that leaves the end of the tie recessed below the outer face to allow an "invisible" finish. Since there was no sound back-up anchor stone available, the ties were anchored

assembly contractor, respectively, to restore this key component of the city's skyline to its original prominence and luster as a luxury residential and office building with panoramic views of downtown Detroit's commercial and entertainment district.

With construction beginning in March 2011 and a Grand Opening slated for September 2012, significant budget concerns existed regarding the methods of repair to the exterior restoration, in order to properly preserve and enhance the building's core. Notably, the deteriorating exterior limestone corners of the building would have to be completely replaced at great cost. To make the numbers work, Akins Construction enlisted industrial masonry repair reinforcement system manufacturer Helifix Inc., located in Streetsboro, Ohio. Helifix would implement its patented DryFix remedial pinning and tying system to reconnect, stabilize, and provide retrofit strengthening to the existing damaged limestone corners for all 34 floors.

The DryFix system reconnected and provided retrofit strengthening to the existing damaged limestone corners.

Meeting the challenge

DURING THE PROJECTS' initial inspection, at least two large pieces of limestone corners had fallen from the 18th floor during a storm, due to rusted anchoring and freeze-thaw water damage. The historic style and age of the building's expansion

ACP
Associated Construction Publications

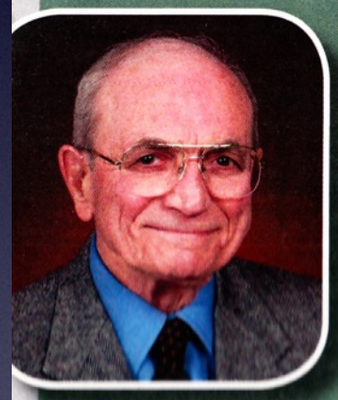
Volume 106 Number 5 • MAY 2012

MC&B

Michigan Contractor & Builder Edition

Serving Michigan including the Upper Peninsula Since 1907

INSIDE



HELICAL RESTORATION FOR HISTORIC MOTOWN SKYSCRAPER

Cornerstone Solution Aids Restoration of Detroit's Historic Broderick Tower

by Chris Watson

The Broderick Tower was one of Detroit's earliest skyscrapers when it pierced the downtown skyline at Grand Circus Park in 1928. Originally named Eaton Tower, the building's neoclassical architecture was a combination of Chicago school and Beaux-Arts design by famed architect Louis Kamper and was considered "a beauty by day – a jewel by night." Over the years, it went from being Michigan's second tallest skyscraper to being the third-tallest abandoned building in the U.S.

Standing basically vacant, but preserved since the mid-1980s, the 34-story historic building is now part of a $53 million restoration project funded by Motown Construction Partners L.P. led by Fred Beal and his JC Beal Construction Inc. (Detroit) which is acting as construction manager. Detroit's Kraemer Design Group and Akins Construction, Inc.

Significant budget concerns existed over the methods of repair to the exterior restoration in order to properly preserve and enhance the building's core

Helical Restoration for
Historic Motown Skyscraper

joints in the corner limestone columns, where major 'sway' movement occurs, made the need to remove and replace the limestone corners on all 34 floors of the historic tower seem imminent.

Developed by Helifix over many years, the patented DryFix Remedial Tying System is an extremely versatile and reliable remedial pinning and tying system. Quick and easy to install, it provides an effective and economical stress-free connection between all commonly used building materials in both cavity and solid masonry constructions without needing any special grouts, resins, or mechanical expansion.

DryFix remedial ties, together with their associated installation techniques and high performance Helifix grouts, produce secure connections with brickwork, CMU blocks, stonework, concrete, marble, limestone, travertine, terracotta and timber. The system is embedded within the existing masonry to be fully concealed once installed. Because it's generally installed into the existing masonry; expensive and time consuming tear down and rebuild are avoided while retaining the visual aesthetics of the structure – which made the system ideal for The Broderick Tower exterior restoration project.

The slim profile DryFix remedial ties are precision

Top photo: Akins Construction enlisted industrial masonry repair reinforcement system manufacturer Helifix, Inc. to implement its' patented DryFix remedial pinning and tying system to reconnect, stabilize, and provide retrofit strengthening to the existing damaged limestone corners for all 34 floors.

Additionally, DryFix ties may be used in hollow materials and close to edges. They are sufficiently flexible to permit normal masonry movement, are designed to shed water in cavity construction, and provide strong, reliable axial restraint in both tension and compression.

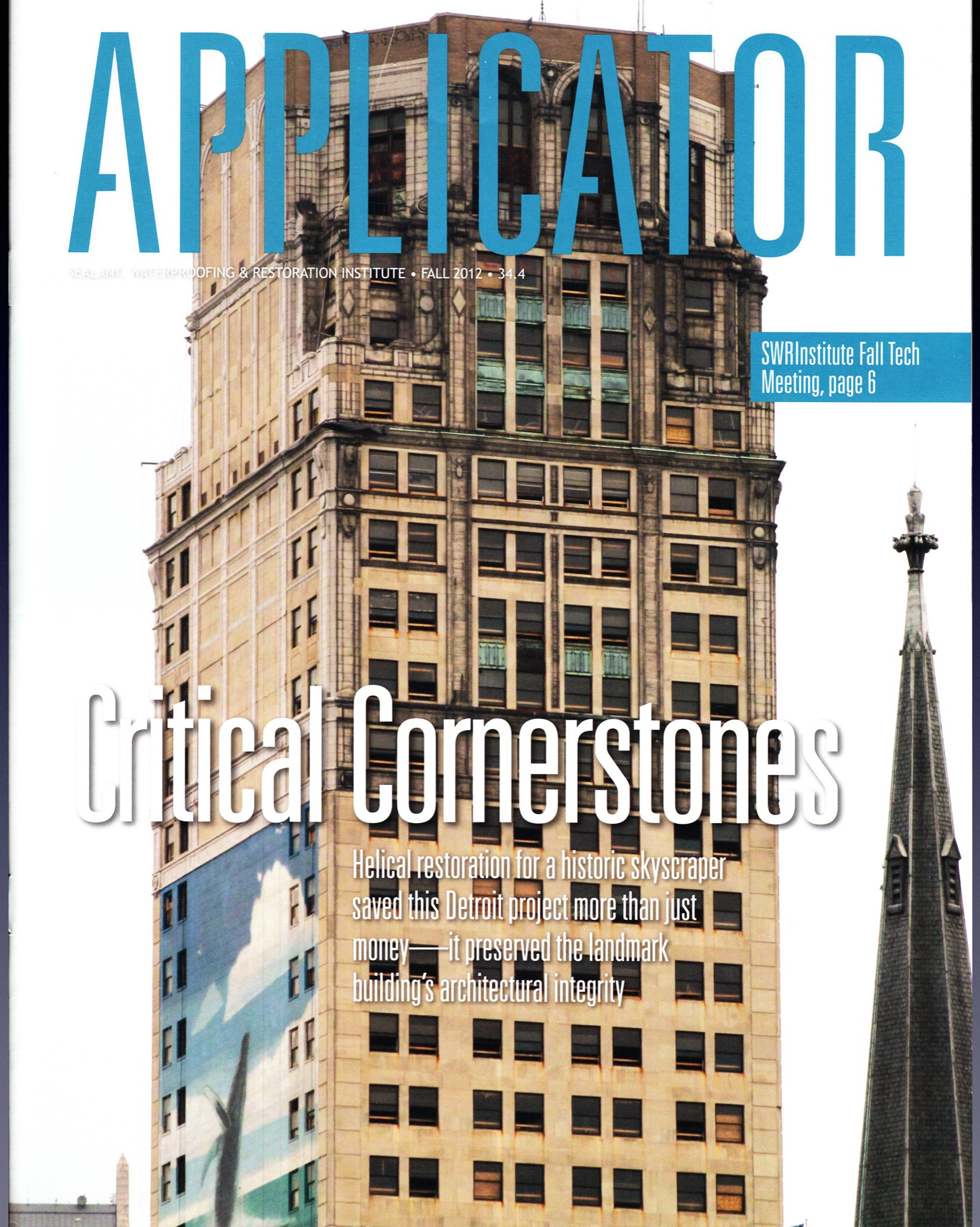
In the case of Broderick Tower, Helifix delivered the DryFix materials within 24 hours of approval and remained onsite to assist Akins Construction during the installation process. A variety of lengths and sizes (10 inches-15 inches) of DryFix remedial ties were utilized to secure the loose terracotta and limestone on all 4 corners of the building's 34 floors, in addition to various re-anchoring throughout the rest of the building.

Installation involved the simple power-driving of approximately 4-6 DryFix anchor ties per corner stone into position via a small pilot hole and using a special

APPLICATOR

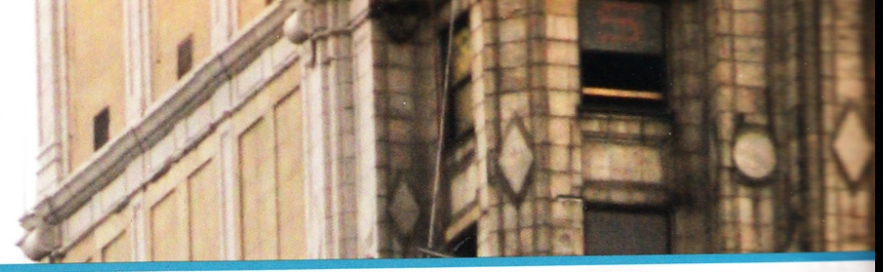
SEALANT, WATERPROOFING & RESTORATION INSTITUTE • FALL 2012 • 34.4

SWRInstitute Fall Tech Meeting, page 6



Critical Cornerstones

Helical restoration for a historic skyscraper saved this Detroit project more than just money—it preserved the landmark building's architectural integrity



Critical Cornerstones

Helical restoration for a historic skyscraper saved this Detroit project more than just money—it preserved the landmark building's architectural integrity

BY BRIAN BARNES

The Broderick Tower was one of Detroit's earliest "skyscrapers" when it pierced the downtown skyline at Grand Circus Park in 1928. Originally named Eaton Tower, the building's neoclassical architecture was a combination of Chicago school and Beaux-Arts design by famed architect Louis Kamper and was considered "a beauty by day—a jewel by night." Over the years, it went from being Michigan's second tallest skyscraper to being the third-tallest abandoned building in the United States.

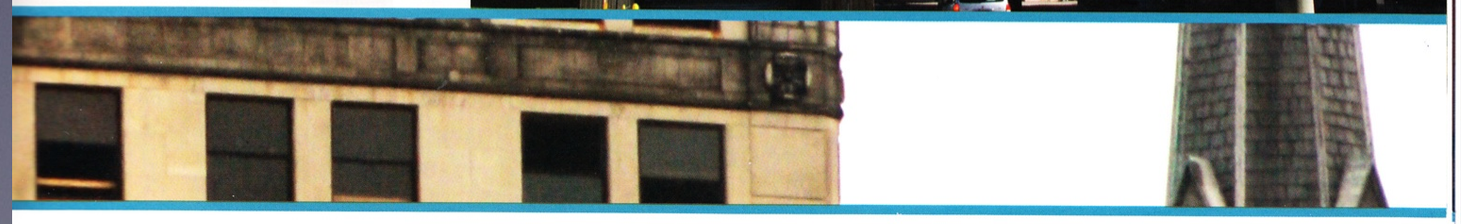
Standing mostly vacant, but preserved since the mid 1980s the 34-story historic building is now part of a $53 million restoration project funded by Motown Construction Partners. To restore this key component of the city's skyline to its original prominence and luster as a luxury residential and office building with panoramic views of downtown Detroit's commercial and entertainment district, collaboration—and passion—was key. The project was led by construction manager JC Beal Construction Inc. (Detroit), headed up by Frederick Beal. Detroit's Kraemer Design Group and Akins Construction Inc. served as the architectural firm and assembly contractor, respectively.

Significant budget concerns arose over the methods of restoration to the exterior in order to properly preserve and enhance the building's core. Notably, the deteriorating exterior limestone corners of the building would have to be completely replaced at great cost. To make the numbers work, Akins Construction enlisted industrial masonry repair reinforcement system manufacturer Helifix Inc. to implement its DryFix remedial pinning and tying system to reconnect, stabilize and provide retrofit strengthening to the existing damaged limestone corners for all 34 floors.

The cornerstone problem—and solution

During the project's initial inspection, it was determined that at least two large pieces of limestone corners had fallen from the 18th floor during a storm and because of rusted anchoring and water damage from expansion and contraction due to freezing and thawing. The historic style and age of the building's expansion joints in the corner limestone columns, where major "sway" movement occurs, made the need to remove and replace the limestone corners on all 34 floors of the historic tower seem imperative.

Akins Construction contacted Helifix about alternative



applications. To provide a more cost-effective solution to replacing the large volume of loose terra cotta and limestone on the building's deep corners, Helifix recommended its DryFix remedial tying system; the solution was approved by JC Beal and Kramer Design.

Helifix's remedial pinning and tying system provides a connection between all commonly used building materials in both cavity and solid masonry constructions without needing special grouts, resins or mechanical expansion.

DryFix remedial ties, together with their associated installation techniques and grouts, have been shown to produce secure connections with brickwork, CMU blocks, stonework, concrete, marble, limestone, travertine, terracotta and timber. The system is embedded within the existing masonry to be fully concealed once installed. Because it's generally installed into the existing masonry, tear-down and rebuilds are avoided while retaining the visual aesthetics of the structure.

The slim profile of DryFix remedial ties is precision-engineered from 10mm austenitic grade (304) stainless steel. The formed stainless steel wires offer a typical 0.2 percent proof stress of 500N/mm², but after the cold-forming manufacturing process that creates the helical hi-fin design, this more than doubles to around 1100N/mm². This means that with its relatively small diameter, the system provides substantial tensile properties to the masonry.

Additionally, DryFix ties may be used in hollow materials and close to edges. They are sufficiently flexible to permit normal masonry movement, are designed to shed water in cavity construction while providing strong, reliable axial restraint in both tension and compression.

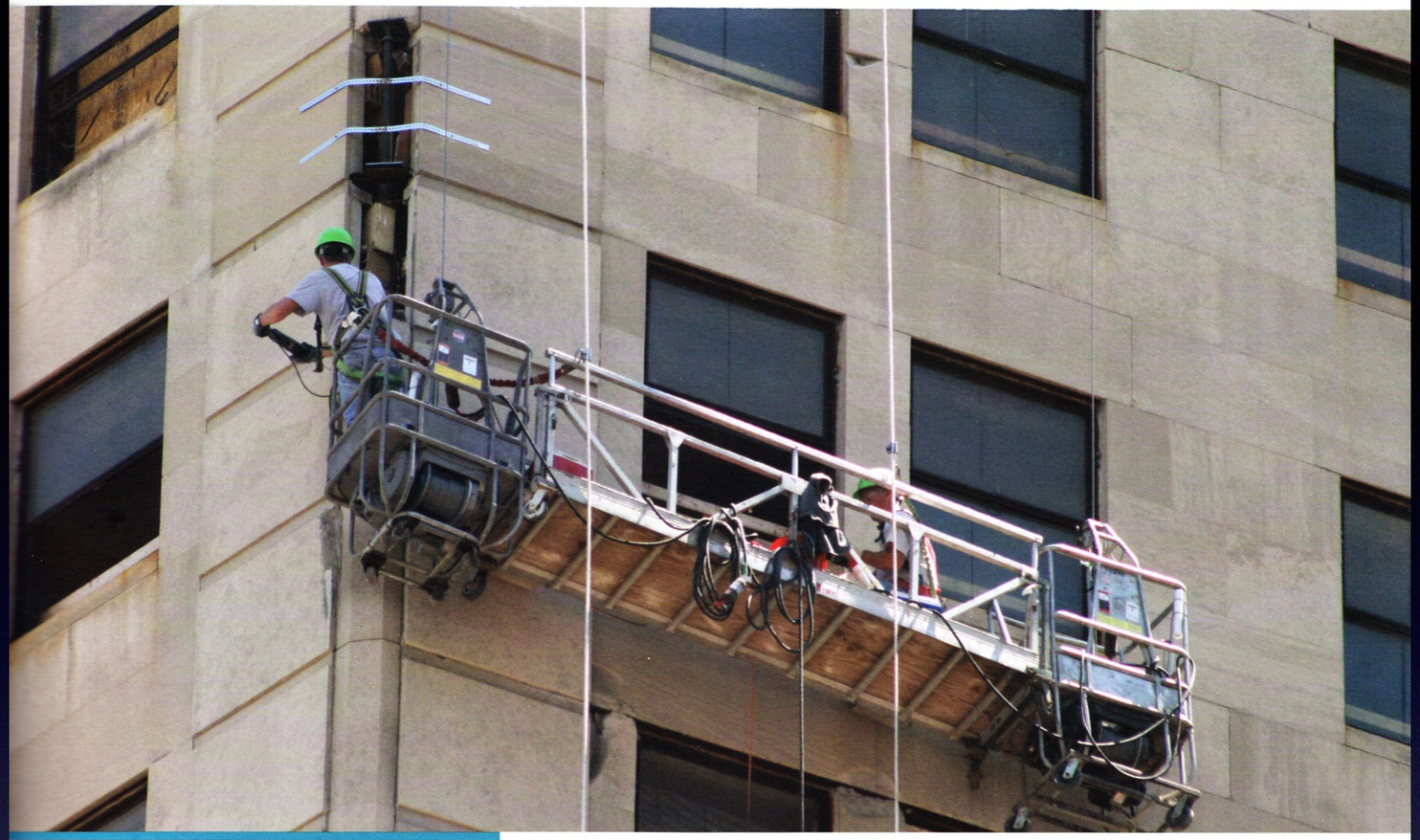
Innovative installation

In the case of Broderick Tower, a variety of lengths and sizes (10-15 inches) of DryFix ties were utilized to secure the loose terracotta and limestone on all four corners of the building's 34 floors, in addition to various re-anchorings throughout the rest of the building.

Installation involved the simple power driving of approximately four to six DryFix anchor ties per cornerstone into position via a small pilot hole and using a special installation tool that leaves the end of the tie recessed below the outer face to allow an invisible finish. Since there was no sound back-up anchor stone available, the ties were anchored into adjacent limestone corners on each side for an optimal structural repair. High-performance Helifix polymer grout was also used in key areas to help maximize the bond.

Rewarding results

With the use of the tying system, there was no need to remove any of the limestone corner columns. Ensuing pull-tests conducted on completed installations indicated optimal



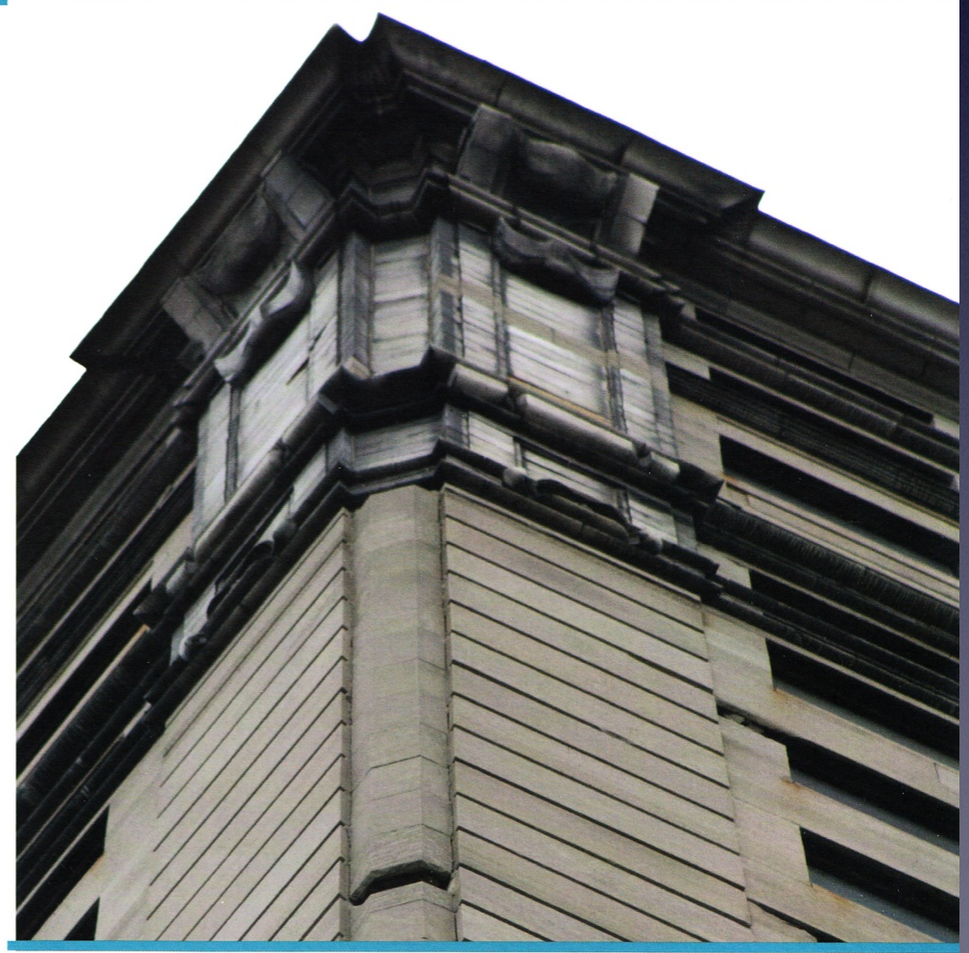
flexibility and movement during sway as the stones stayed securely anchored.

According to Akins Construction Owner Rich Akins, "Other methods were explored to remove the limestone completely with new anchors to the back-up walls, but ultimately, Helifix's solution provided the ability to restore rather than replace the limestone corners and saved Motown Construction Partners upwards of $1 million to the project's exterior restoration budget."

About the author

Brian Barnes is the vice president for sales for industrial masonry repair reinforcement system manufacturer Helifix Inc. in Streetsboro, Ohio.

Barnes is also an active member of ICRI (International Concrete Repair Institute) and SWRInstitute (Sealant Waterproofing and Restoration Institute). •



CONSTRUCCION PAN-AMERICANA

CELEBRANDO 40 AÑOS INFORMANDO EN LATINOAMÉRICA

OCTUBRE 2012

Pioneros en Argentina

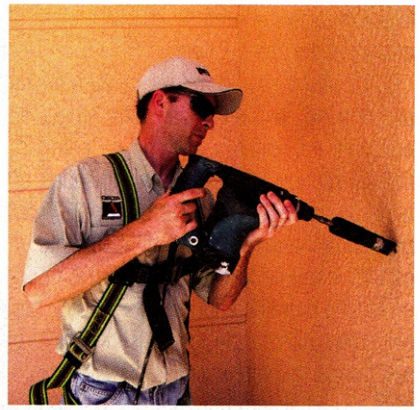
AMMANN INSTALA SU PRIMERA PLANTA ASFÁLTICA DE ÚLTIMA GENERACIÓN EN LATINOAMÉRICA

EDICION ESPECIAL

GRÚAS Y ELEVACIÓN PAN-AMERICANA

Venciendo a la humedad

El sistema StuccoPin permite restaurar muros de estuco dañados por las inclemencias climatológicas.



En el sur de Florida es normal que los edificios necesiten una remodelación profunda cinco años después de ser construidos.

Ubicada en Marco Island, un centro vacacional situado en el Golfo de México, en el estado de Florida, el complejo residencial Veracruz de Cabo Marco es el edificio más alto de esa comunidad. Tiene una altura de 24 pisos y está rodeado por 30 acres de paisaje costero. Sin embargo, una vez la humedad comienza a hacer estragos, este paraíso terrenal deja de serlo. La parte exterior de la fachada de estuco del edificio estaba llena de grietas que necesitaban ser reparadas inmediatamente.

Debido a las extremas condiciones climatológicas y al ambiente costero de Florida, es raro que un edificio supere los 25 años de vida sin que se requiera una restauración avanzada de su estructura. Construido en 2005, el edificio Veracruz mostraba síntomas de necesitar una rápida restauración debido a que los altos niveles de humedad comenzaron a deteriorar rápidamente la estructura de concreto de la fachada de estuco. La rotura de la conexión entre el estuco y el material de apoyo produjo un daño severo del estuco en todo el complejo de 24 pisos.

La Asociación de Propietarios del Veracruz había planeado pintar la parte exterior del complejo, para lo cual solicitaron al contratista Delta Engineering & Inspection de Sarasota, Florida, que comenzara a evaluar las condiciones exteriores de la fachada de estuco. Según Dan Reed, su gerente de proyecto, el repintado inicial de un edificio es por lo general la primera oportunidad de constatar la condición en la que se encuentra la fachada de estuco de un edificio. Esto permite diseñar las reparaciones antes de que se produzcan daños posteriores más severos.

Para evitar la costosa inversión en tiempo y dinero que suponía el reemplazo y la reinstalación del estuco dañado, Delta se puso en contacto con Helix, un fabricante de sistemas industriales de refuerzo de reparación de mampostería para poner en práctica su sistema StuccoPin.

Labor de estabilización

Este sistema aprovecha una versión corta del lazo en forma helicoidal Helifix de perfil plano modelo DryFix en acero inoxidable 304 o 316. Para ello, se utiliza un proceso de manufactura en acero inoxidable que crea un diseño en forma helicoidal que permite doblar la resistencia a la tensión. Con su diámetro relativamente pequeño, el sistema proporciona propiedades de tensión sustanciales al estuco y el concreto.

De forma notable, este sistema estabiliza con efectividad el estuco dañado sin rasgar o rehacer o mediante el anclaje químico con grandes pernos. StuccoPin permite acomodar movimientos diferenciales y resiste tanto a cargas de viento como a vibraciones mientras se produce un mínimo impacto visual.

Antes que comenzara la instalación en la primavera de 2012, las compañías Helifix y Delta Engineering realizaron "extracciones de prueba" del estuco y los substratos existentes en el edificio. Esas pruebas resultaron fundamentales para determinar el uso más efectivo de los pernos StuccoPin de 8 mm y así conseguir una fortaleza optima.

Se realizó una prueba en el segundo piso del edificio, tanto con estuco como con concreto por separado. Las pruebas fueron realizadas de formas completamente perpendiculares a la pared en una zona que mostraba la mayoría de las grietas. Se taladró un agujero piloto dentro del estuco y dentro de la masilla de apoyo usando un taladro de triple mandíbula.

A continuación, se introdujo el StuccoPin dentro del estuco usando el accesorio StuccoPin Power Driver incorporado al taladro rotatorio. Helifix también recomienda instalar las conexiones en una inclinación de 45° en dirección descendente, lo cual permite aumentar el área de superficie de la conexión helicoidal incrustada en el estuco para así aumentar la capacidad de extracción desde el estuco. Los resultados del muestreo produjeron un valor promedio de extracción bastante significativo.

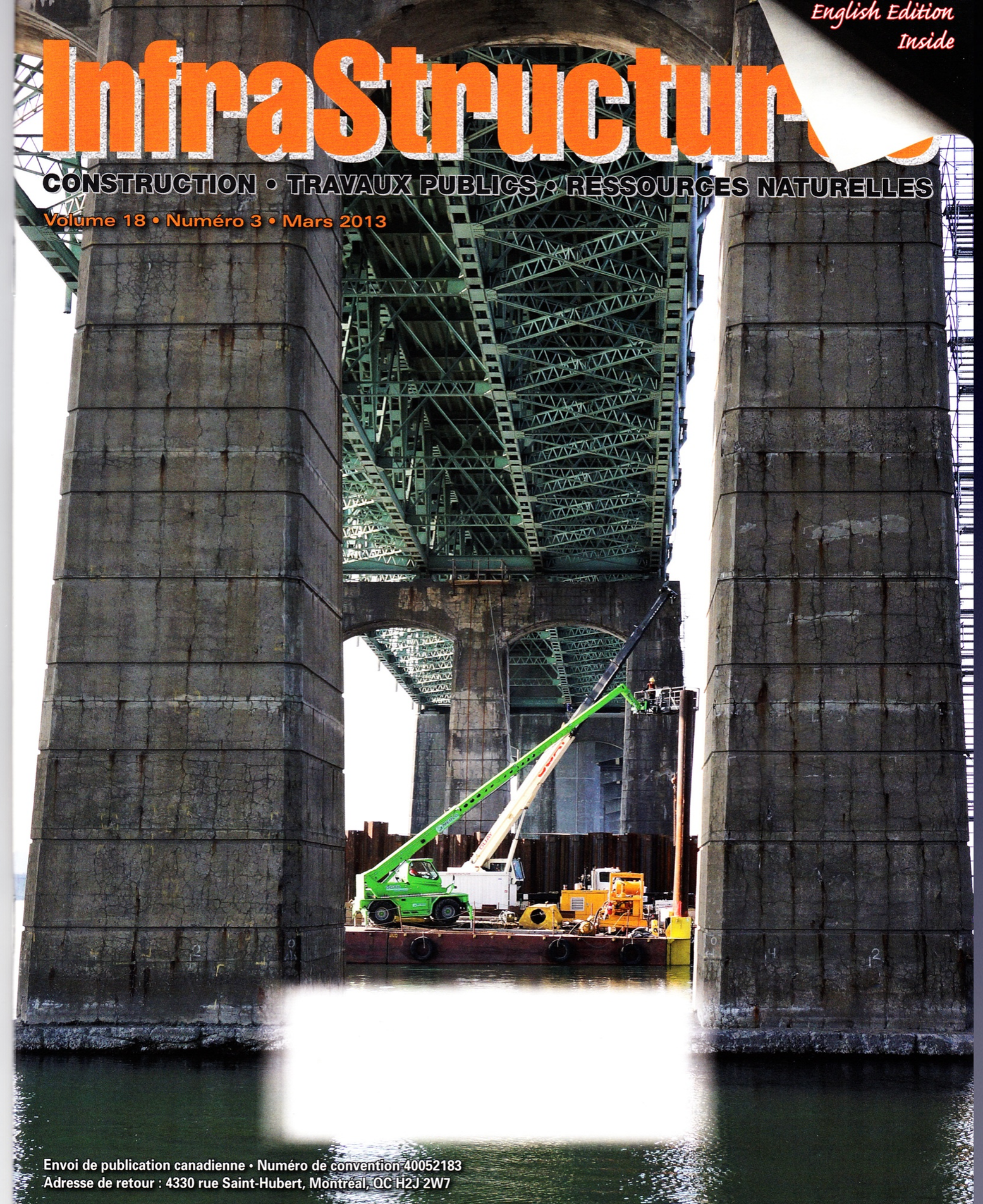
CPA

English Edition Inside

InfraStructures

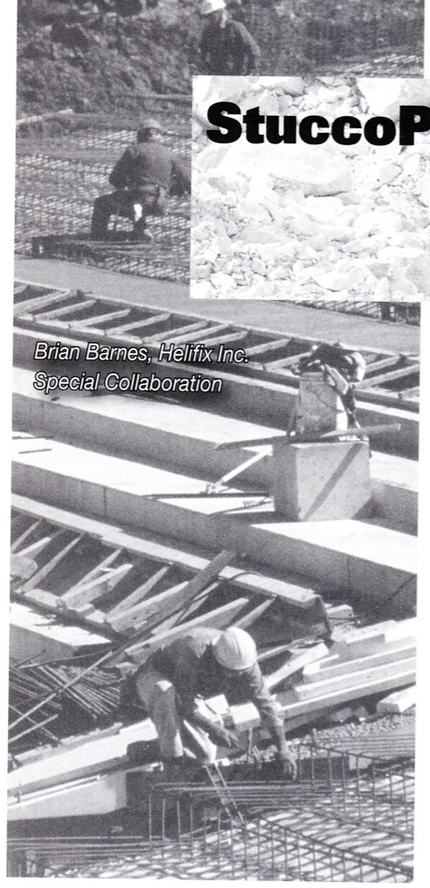
CONSTRUCTION • TRAVAUX PUBLICS • RESSOURCES NATURELLES

Volume 18 • Numéro 3 • Mars 2013



Envoi de publication canadienne • Numéro de convention 40052183
Adresse de retour : 4330 rue Saint-Hubert, Montréal, QC H2J 2W7

StuccoPin on the High-Rise



Brian Barnes, Helifix Inc.
Special Collaboration

Located in Marco Island, Florida, the Veracruz of Cape Marco is the tallest high-rise condominium complex in the world-renowned Cape Marco community. Spanning 24 floors, it boasts panoramic views of the Gulf of Mexico and is surrounded by 12 ha of beautifully landscaped beachfront grounds. However, trouble in paradise was becoming apparent as the humid climate of the oasis complex was beginning to take its toll. The building's exterior stucco façade was in a state of cracking and disrepair.

Given the extreme heat conditions and Florida's coastal environment, rarely does a building go beyond 25 years without requiring advanced restoration. Built in 2005, the Veracruz was on a fast-track of restoration needs as the climate's high humidity and moisture quickly began deteriorating the concrete structure's stucco façade. The ensuing breakdown of the bond between the stucco and backup material was resulting in severe stucco damage throughout the complex's vast 24-floor span. This could result in costly infrastructure repair as well as potentially dangerous loose stucco.

The Veracruz Condominium Association had planned to paint the entire complex so they asked Delta Engineering & Inspection, Inc. of Sarasota, Florida, to first evaluate the condition of cracks in the building's exterior stucco. According to Dan Reed, Delta Engineering's project manager, "The initial repaint of a building is usually the first opportunity to assess the condition of a building's stucco façade. This allows us to design repairs before further damage occurs."

To avoid the costly and time consuming replacement and reinstallation of the damaged stucco, Delta enlisted leading industrial masonry repair reinforcement system manufacturer Helifix®, Inc. from Streetsboro, Ohio, to implement their precision engineered StuccoPin system.

The StuccoPin system leverages a special short version of Helifix's patented, slim profile, precision engineered DryFix helical tie (stainless steel; grade 304 or 316). The drawn stainless steel manufacturing process that creates the helical hi-fin design more than doubles the proof stress. With its relatively small diameter the system provides substantial tensile properties to the stucco and concrete.

Notably, the system effectively stabilizes damaged stucco without tearing-off and re-rendering or chemical anchoring with large pins. Quick, economical and easy to install, StuccoPin also accommodates differential movement and resists wind loads and ground vibrations all while providing a clean finish with minimal visual impact. This is vital to maintaining the luxurious ambience of the Veracruz high-rise complex's exterior façade.

Before restoration began in the spring of 2012, Helifix's vice president of Sales, Brian Barnes, and Delta Engineering's Dan Reed, conducted "pull tests" of the building's existing stucco and substrates. These tests were vital in determining the most efficient use of Helifix's 8 mm StuccoPin anchors for optimal strength.

Testing was performed on the second floor at the northeast corner of the Veracruz complex on both the stucco and the concrete alone. The tests were done completely perpendicular to the wall in the area showing the most cracking. A pilot hole was drilled through the stucco and into the backup using a rotary percussion 3-jaw-chuck drill. The StuccoPin was then driven into the stucco using the StuccoPin Power Driver Attachment (PDA 0802) fitted to a SDS rotary hammer drill (650 W/700 W).

Helifix also recommended that the ties be installed at a 45° downward angle. This

was essential to increase the surface area of the helical tie embedded in the stucco thus increasing the pull-out capacity of the pin from the stucco. The results of the testing averaged a significant pull out value.

With the positive pull test data approved and the guidance of Helifix on-site, installation procedures were initiated by Complete General Contractors (CGC) of Sarasota, Florida. CGC western sales manager, Josh

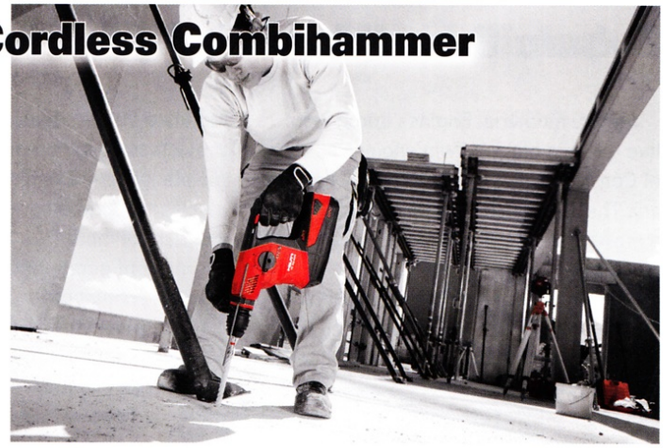
Senevey, states "This is the largest project we've used Helifix's StuccoPin system on so the pull tests were vital to ensure the system would provide superior hold for the Veracruz high-rise complex."

Mr. Senevey also noted that the initial installation on eight key "drop points" (designated areas of weakness) on the building's first few floors went seamlessly. "We used approximately 800 StuccoPins and all de-bonded areas were pinned. The pinning extended at least 60 cm outside the affected areas for strength. Installation is as simple as drilling the pilot hole, driving the tie in and caulking over the hole. This saves a substantial amount of time versus entirely removing the stucco and replacing it."

With the effective use of Helifix's concealed, non-disruptive StuccoPin system, the completion of the restoration of the Veracruz of Cape Marco was right on target.

Innovative founders of the one-piece helical tie and retrofit masonry reinforcement, Helifix®, Inc. has amassed over 25 years of market leading structural masonry restoration system experience in the United Kingdom and United States combined. Helifix has engineered a comprehensive package of cost-effective, stress-free, and fully concealed (once installed) remedial ties, fixings, crack stitching bars, masonry reinforcement products and techniques that comprise its world renowned Helibeam System®. Independently tested and approved, Helifix products are manufactured at its own factory to ISO 9001:2000 international quality standards. Products are available direct, through all major reputable merchants in Canada and exported worldwide. Helifix is also AIA (American Institute of Architects) approved and offers free training seminars anywhere in the United States and Canada.

Hilti Launches World's First Cordless Combihammer



The new Hilti TE 30-A36 is the world's first cordless combihammer drill and it delivers on productivity. With a drilling range of 1/4" -1" diameter with SDS+ (TE-C) drill bits, and up to 3-1/2" using percussion core bits, the TE 30-A36 drills and chips into concrete up to 40% faster than the largest SDS corded tools on the market. This speed is made possible due to the high efficiency brushless motor and higher mass hammering mechanism. Professionals can now do demanding applications never before possible with a cordless tool and work longer because the TE 30-A36 comes with the highest capacity battery on the market, the new 36 volt, 6.0 amp hour battery which provides more than double the work per charge of other batteries.

There is no need to drag out the extension cord or compressor, the TE 30-A36 Combihammer boasts extreme performance and extreme run time never seen before in a cordless tool and the widest range of applications on the market. By combining the high-capacity battery and utilizing Hilti brushless motor technology, Hilti is providing a cordless solution that delivers a single impact energy of 2.7 ft-lbs and a full hammering frequency of 4,500 impacts per minute—rivaling its corded counterpart.

The TE 30-A36 also features the Active Torque Control (ATC) system for increased operator protection if a bit binds while drilling and active vibration reduction (AVR) to improve operator comfort and productivity.

The TE 30-A36, batteries and chargers also are covered by Hilti's Lifetime Service, a unique service agreement that includes two years of wear and tear, no-cost coverage*. In fact, the system is so good, that with Hilti Tool Fleet Management, the tools and batteries are covered for four years, including wear and tear.

**Some limitations apply. Contact Hilti for details.*

Source: Hilti, Inc.

MODERN CONTRACTOR
S·O·L·U·T·I·O·N·S®
THE EQUIPMENT & BUSINESS SOLUTION FOR CONCRETE & GENERAL CONTRACTORS

WWW.MCSMAG.COM
APRIL 2013

STRUCTURAL RESTORATION

TALLEST HIGH-RISE CONDO RESTORED

FULL-DEPTH GRADE CONTROL

NEW FORM I-9

THE CASE FOR TRAINING

Structural Resolution

Restoring beauty to the tallest high-rise condominium

By Brian Barnes

The Veracruz of Cape Marco is the tallest high-rise condominium complex in the world-renowned Cape Marco community located in Marco Island, Florida.

Located in Marco Island, Florida, the Veracruz of Cape Marco is the tallest high-rise condominium complex in the world-renowned Cape Marco community. Spanning 24 floors, it boasts panoramic views of the Gulf of Mexico and is surrounded by 30 acres of beautifully landscaped beachfront grounds. However, trouble in paradise was becoming apparent as the humid climate of the oasis complex was beginning to take its toll. The building's exterior stucco façade was in a state of cracking and disrepair.

STUCCO DETERIORATION

Given the extreme heat conditions and Florida's coastal environment, rarely does a building go beyond 25 years without requiring advanced restoration. Built in 2005, the Veracruz was on a fast-track of restoration needs as the climate's high humidity and moisture quickly began deteriorating the concrete structure's stucco façade. The ensuing breakdown of the bond between the stucco and backup material was resulting in severe stucco damage throughout the complex's vast 24-floor span. This could result in costly infrastructure repair, as well as potentially dangerous loose stucco.

The Veracruz Condominium Association had planned to paint the entire complex so they asked Delta Engineering & Inspection, Inc. of Sarasota, Florida, to first evaluate the condition of cracks in the building's exterior stucco. According to Dan Reed, Delta Engineering's senior project manager, "The initial repaint of a building is usually the first opportunity to assess the condition of a building's stucco façade. This allows us to design repairs before further damage occurs."

To avoid the costly and time-consuming replacement and reinstallation of the damaged stucco, Delta enlisted leading industrial masonry repair reinforcement system manufacturer Helifix, Inc. of Streetsboro, Ohio, to implement its precision engineered StuccoPin system.

STREAMLINED STABILIZATION

The StuccoPin system leverages a special short version of Helifix's patented, slim profile, precision engineered Dry Fix helical tie (stainless steel; grade 304 or 316). The drawn stainless steel manufacturing process that creates the helical hi-fin design more than doubles the proof stress. With its relatively small diameter, the system provides substantial tensile properties to the stucco and concrete.

Notably, the system effectively stabilizes damaged stucco without tearing off and rerendering or chemical anchoring with large pins. Quick, economical and easy to install, StuccoPin also accommodates differential movement and resists wind loads and ground vibrations all while providing a clean finish with minimal visual impact. This is vital to maintaining the luxurious ambience of the Veracruz high-rise complex's exterior façade.

ABOUT THE AUTHOR

Brian Barnes is the vice president of sales with Helifix. For more information, call 888.992.9989, or visit www.helifix.com.

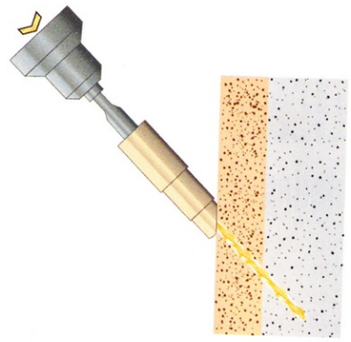
PULL-TESTING AND INSTALLATION

Before restoration began in the spring of 2012, "pull tests" were conducted on the building's existing stucco and substrates. These tests were vital in determining the most efficient use of Helifix's 8mm StuccoPin anchors for optimal strength.

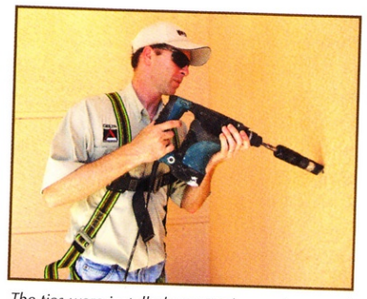
Testing was performed on the second floor at the northeast corner of the Veracruz complex on both the stucco and the concrete alone. The tests were done completely perpendicular to the wall in the area showing the most cracking. A pilot hole was drilled through the stucco and into the backup using a rotary percussion 3-jaw-chuck drill. The StuccoPin was then driven into the stucco using the StuccoPin Power Driver Attachment (PDA 0802) fitted to a SDS rotary hammer drill (650w/700w).

Helifix also recommended that the ties be installed at a 45-degree downward angle. This was essential to increase the surface area of the helical tie embedded in the stucco, thus increasing the pull-out capacity of the pin from the stucco. The results of the testing averaged a significant pull out value.

With the positive pull test data approved and the guidance of Helifix on-site, installation procedures were initiated by Complete General Contractors (CGC) of Sarasota, Florida. CGC western sales manager, Josh, Senevey, states, "This is the largest project we've used Helifix's StuccoPin system on, so the pull tests were vital to ensure the system would provide superior hold for the Veracruz high-rise complex."



The StuccoPin was driven into the stucco using the StuccoPin Power Driver Attachment (PDA 0802) fitted to a SDS rotary hammer drill (650w/700w).



The ties were installed at a 45-degree downward angle to increase the surface area of the helical tie embedded in the stucco, increasing the pull-out capacity of the pin from the stucco.

CONCLUSION

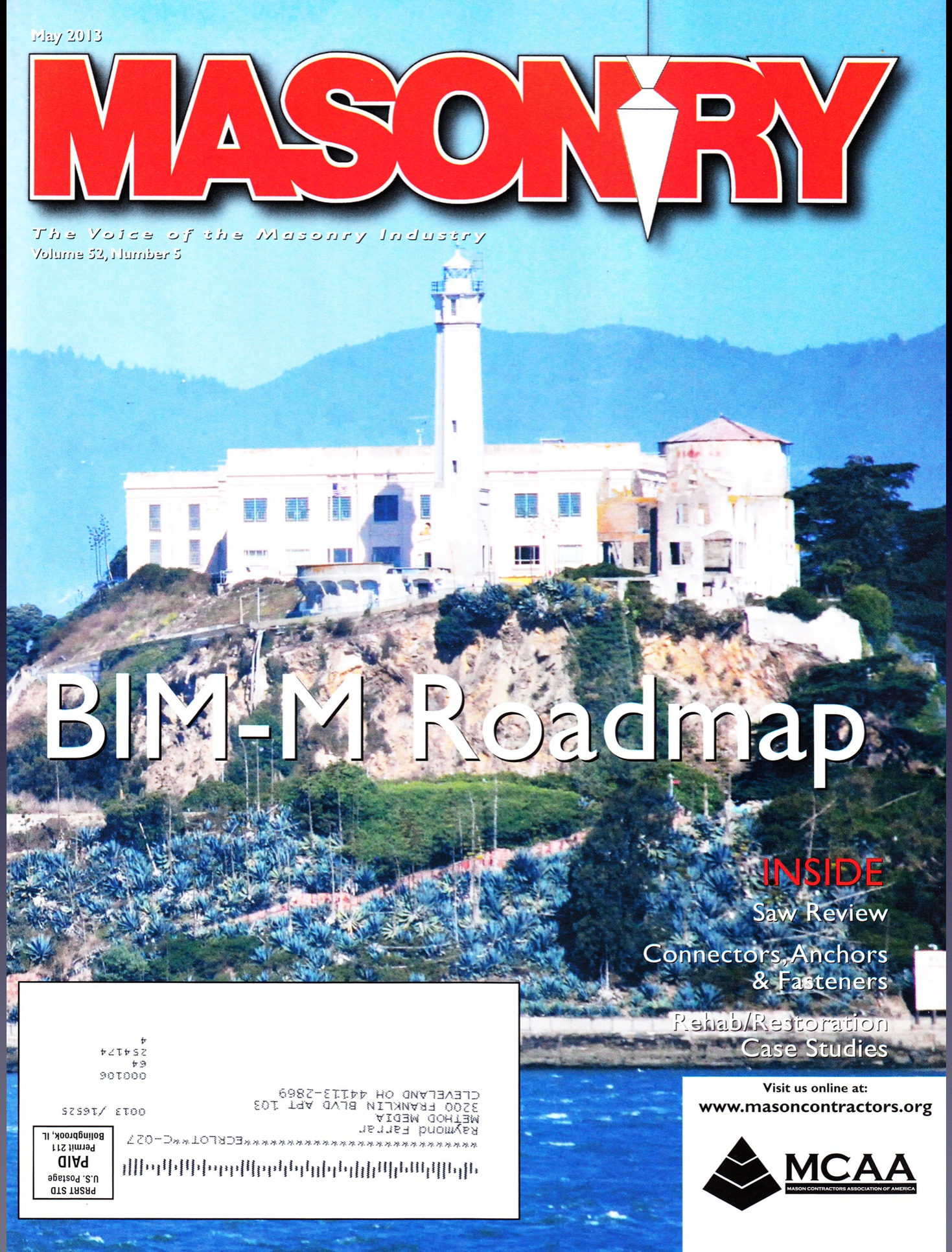
Senevey also notes that the initial installation on eight key "drop points" (designated areas of weakness) on the building's first few floors went seamlessly. "We used approximately 800 StuccoPins and all debonded areas were pinned. The pinning extended at least 2 feet outside the affected areas for strength. Installation is as simple as drilling the pilot hole, driving the tie in, and caulking over the hole. This saves a substantial amount of time versus entirely removing the stucco and replacing it."

With the effective use of Helifix's concealed, non-disruptive StuccoPin system, the completion of the restoration of the Veracruz of Cape Marco finished right on target in fall of 2012. ■

May 2013

MASONRY

The Voice of the Masonry Industry
Volume 52, Number 5



BIM-M Roadmap

INSIDE

Saw Review

Connectors, Anchors & Fasteners

Rehab/Restoration Case Studies

Visit us online at:
www.masoncontractors.org

MCAA
MASON CONTRACTORS ASSOCIATION OF AMERICA

Tobacco Row Restoration

Faced with the possibility of moving its deteriorating 230,000-square-foot tobacco curing and processing complex in 2009, the Lancaster Leaf Tobacco Co. Inc. in Lancaster, Pa., embarked on an $11.5 million expansion and restoration project to modernize its operation and save nearly 120 jobs. A subsidiary of Universal Corp., Lancaster Leaf's revitalization advancements are poised to make it one of North America's largest processors of dark, air-cured tobacco and stimulate job growth in the region's future.

SUSPECT SUPER STRUCTURE

As part of this renovation, many of the early-1900s tobacco warehouse structures at the Pitney Road complex are being preserved, rather than replaced, including the recent structural restoration of a five-story warehouse on the southwest corner of the campus. Notably, a 40-X 50-foot section on the east elevation of the warehouse had collapsed in the summer of 2011. Immediately, a detailed inspection was done on the remaining masonry façade by Caretti Restoration & Preservation Services Inc., Camp Hill, Pa., to determine the best implement of repair for the severe structural issues.

The inspection revealed that a triple wythe of bricks was coming apart, and the header courses that tied the walls together were not intact. Deterioration occurred, because it was a concrete superstructure with brick infill that expands when it gets wet, pulling the concrete apart versus a steel-based superstructure.

SYNERGISTIC SYSTEM SOLUTION

To avoid the costly and time-consuming replacement and reinstallation of the damaged concrete superstructure, Caretti Restoration's GM/VP, Bob Gensel, enlisted industrial masonry repair reinforcement system manufacturer Helifix Inc., Streetsboro, Ohio. Helifix would implement a strategic combination of its Crack Stitch and DryFix systems in early-October of 2011.

Helifix's Crack Stitch system was used, predominantly, for repairing vertical cracks on the building's corners. This would solve key structural concerns and address aesthetics. Helifix's Dryfix remedial pinning and tying system was used for tying the wythes of bricks to the walls, and for repair of the corroding, loose and missing steel shelf angles supporting the brick veneer for the warehouse's damaged areas.

DRYFIX

About 6,400 DryFix helical anchor ties were used throughout key focus areas of the tobacco warehouse's north, south and west elevations. Also, roughly 1,800 lineal feet of shelf angles were repaired using the system at a 3.5- x 3.5-inch angle for every floor at the top of the windows to support the brick masonry above.

Helifix's patented DryFix Remedial Pinning and Tying System provides a retrofit connection between all commonly used building materials. The DryFix helical ties (stainless steel; grade 304 or 316) are made from a drawn stainless-steel manufacturing process that creates the helical hi-fin design, more than doubling the proof stress. With its relatively small diameter, the system provides substantial tensile properties to the concrete.

Ideal cavity and solid masonry constructions, the DryFix system requires no special grouts, resins or mechanical expansion, and is embedded within the existing masonry to be fully concealed once installed.

CRACK STITCH

About 300 lineal feet of HeliBar were used to repair vertical cracking in the brick masonry for numerous focus locations of the tobacco warehouse. Helifix's Crack Stitching system is a means of permanent crack repair designed for restoring the structural integrity and permanent repair of older cracks.

The system allows contractors to repair and redirect stresses on damaged masonry areas and create a monolithic point to distribute loads. This is achieved by combining stainless-steel (austenitic grade 304) HeliBar reinforcement rods with injectable, non-shrink cementitious HeliBond grout, producing a high compressive strength.

Once installed to the channeled-out mortar beds, the HeliBar rod's hi-fin design delivers substantial axial strength, while providing flexibility across the crack to accommodate natural building movement.

Because both the Crack Stitch and DryFix systems are installed into the existing masonry, expensive and time-consuming tear down and rebuild were avoided, while the visual aesthetics of the structure were retained. This effective combination made the systems ideal for the Lancaster Leaf Tobacco Co.'s structural warehouse restoration project.