November/December 2019
Vol. 32, No. 6

CONCRETE REPAIR BULLETIN

A Bimonthly Publication of the International Concrete Repair Institute

2019 ICRI PROJECT OF THE YEAR AWARD WINNER

The Île-aux-Tourtes Bridge Rehabilitation

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ON THE COVER: 2019 ICRI Project of the Year Award winner "The Île-aux-Tourtes Bridge Behabilitation" submitted by Sika Canada, Inc.—page 11 .

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FEATURE ARTICLES

DEPARTMENTS

NOTE FROM THE EDITOR

The end of the year is rapidly approaching for ICRI. The Fall Convention has successfully concluded, and all our members are looking forward to a successful 2020.

The first ICRI event of the new year is the Annual ICRI Kick-off Party at World of Concrete. Plan to attend with your ICRI colleagues on February 3, 2020. There will be great food and an open bar in a space intended for celebrating at the Stratosphere Casino, Hotel, and SkyPod. The Stratosphere Tower Attraction boasts a remarkable range of entertainment options. From renowned restaurants and bars like Top of the World, 107 SkyLounge, and AirBar to one-of-a-kind thrills like SkyJump—the Tower Experience is your definitive Las Vegas adventure. Plus, there will be sponsorship opportunities available to satisfy all budgets—so stay tuned.

The final issue of the *Concrete Repair Bulletin* for 2019 is our Annual Project Awards issue. ICRI would like to congratulate the winning projects and thank those who submitted projects this year. Check out the outstanding projects by our members that were award winners in this issue of the *Concrete Repair Bulletin*.

Start the new year by submitting your articles to the *Concrete Repair Bulletin*. If you think you have an interesting project case study or topic, please feel free to reach out to us. We would love to have more member authors.

I hope you all have a successful and safe start to 2020!

Jerry Phenney, Editor, CRB
MAPEI Corporation

PRESIDENT'SMESSAGE

CHRIS LIPPMANN

In my final message as ICRI Presdent, I would like to recognize the leaders of our organization, and this project awards issue is a proven example of our industry leadership. As you may or may not know, one of our strategic pillars is industry leadership. The guidance or leadership from our membership is what continues to drive the Institute's success.

I recently attended our 20th bi-yearly chapter roundtable in Chicago. It was another incredible session of chapter leaders helping other chapter leaders. This leadership forum continues to help grow existing chapters as well as helps develop new chapters in the United States and abroad. The feedback we get from our chapter leaders is incredibly valuable, and I want to thank all our chapter leaders for your efforts and support.

Our conventions continue to grow in size and participation, and we continue to improve our product offerings with new committees. I am incredibly excited about the newly formed committee "Woman in ICRI" under the leadership of Monica Rourke. Further, just as exciting our technical activities committee is now under a new direction of Mark Nelson. The outlook is incredibly bright for ICRI under the guidance of all our administrative and technical committee chairs. Thank you.

Finally, I want to thank the leadership of our secretariat and board of directors. Working with you this past year has been an extraordinary experience. Looking back, we have made some incredible strides for both the organization and the industry. I am confident that ICRI will always be recognized as the center for repair leadership, supporting a profession built on science and craftsmanship, making the built world safer and longer-lasting.

Thank you all!

Christopher R. Lippmann

Chris Lippmann
2019 ICRI President

ICRI Mission andStrategic PlanBenefit Membersand the Industry

INDUSTRY LEADERSHIP
ICRI will be the state-of-the-art, trusted and reliable source of delivering best industry practices and professional networks in the repair industry.

- Develop industry professionals
- Professional networks
- Champion innovation and safety

PROFESSIONAL DEVELOPMENT
ICRI will develop and deliver programs, products, and services that provide knowledge, build skills, and validate expertise.

- Expand certification
- Quality programs and products
- Enhanced product program services

ICRI Mission: ICRI provides education, certification, networking and leadership to improve the quality of repair, restoration, and protection/ preservation of concrete and other material systems.

ICRI

Our Vision: ICRI will be the center for repair leadership supporting a profession built on science and craftsmanship making the built world safer and longer lasting.

ORGANIZATION STRENGTH
ICRI will have the resources, staff, and structures to fully support its strategic priorities.

- Engage members
- Strengthen chapters
- Grow staff capacity and capabilities
- Serve members

ORGANIZATION CREDIBILITY
ICRI will be a well-connected organization backed by a recognized and respected brand locally, nationally, and globally.

- Strengthen strategic partnerships
- Strengthen brand
- Engagement of diverse participants

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TACTALK

FRED GOODWIN

It is with mixed feelings that I have announced my decision to retire as chair of ICRI Technical Activities Committee (TAC) after six years of service. ICRI has made great progress in improving its service to the industry with the implementation of its strategic plan, the adoption of the ICRI Policy Manual, the affiliation with Ewald Consulting Group as their management association, the rebranding initiative, and many other improvements for the further growth of the concrete repair industry and the organization over the past six years. It has truly been exciting to be part of this process. However, I feel that it is time for new leadership for TAC to bring new ideas, improvements in our process, and betterment of the organization. I also am approaching the end of my career with BASF, having announced my intent to retire in July 2020 after 31 years with BASF Construction Chemicals (and its predecessors) and over 40 years in the construction industry. During this same six years, I also served as a member of the American Concrete Institute (ACI) TAC and feel that this experience of concurrently being part of the technical leadership of both organizations was a great learning experience, but also a lot of work. After 6 years, I feel I have done what I can and that a change will improve the organization. Mark Nelson has been my vice-chair for the last 3 years and will take over as the new chair of TAC. He is bringing new ideas and great organization to ICRI in this role and I ask for your support.

Being chair of TAC, I have worked with truly wonderful individuals in the organization. The other members of TAC have been insightful, helpful, and supportive, and I have made many friends as they passed through the committee. The technical committee chairs have done a great job leading their teams and I commend their efforts. Working with the Strategic Plan Implementation Team, ICRI Executive Committee, the Board of Directors, ICRI staff, the ICRI Secretariat, and the Coordination Committee has been exciting and insightful. The experience of working with Jim McDonald while he was TAC Secretary was amazing as he kept TAC and ICRI running and on track.

I am willing to continue to assist in editing of documents, attending meetings, and participating as an active member of the ICRI organization but do not desire to hold a leadership position after my resignation. I would like to thank everyone for their support, insight, and friendship over the years. I am also happy to support the incoming chair of TAC (Mark Nelson) in whatever capacity is needed to facilitate this transition.

Thank you for everything, TAC has been a great experience.

Fred Goodwin *is the outgoing chair of the ICRI Technical Activities Committee (TAC).*

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SECRETARIATUPDATE

JEFF BARNES

I have been involved in ICRI since 2004 when I joined the New England chapter's board of directors and got involved at the national level in 2012 by becoming the chair of marketing's membership subcommittee, now a stand-alone administrative committee. In both instances, I got involved by showing up—to the former by joining the board meeting and asking to become a director—to the latter by attending a marketing committee meeting during the Fall 2012 convention in Rancho Mirage, California. It was at that committee meeting my interest and passion for ICRI ignited and really took off!

Over the course of 7 years at the national level, I got involved in even more committees and became a member of the board of directors, going on to serve two 3-year terms.

Every single committee and board meeting have been exciting and filled with enthusiastic talks and discussions on a number of topics and I will miss them as I am stepping down from all of my positions within ICRI.

Why, you may ask?

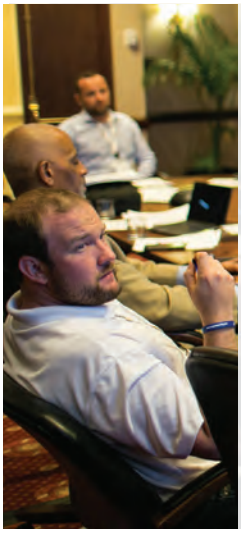
My business is really taking off. This is a great thing and one any business owner wants and needs to happen if one wants to be successful. It's this increase in business that is starting to hinder my abilities to perform the duties required for my various positions within ICRI. That being stated, I will continue to remain a company member of ICRI and will attend the local chapter events, and the national conventions when able.

I am taking this opportunity to thank ICRI, its members, directors, officers, and management staff for the support and guidance I received over the years. Without these, I would not have been able to accomplish all I have within ICRI.

If you are reading this article as one considering becoming more involved in ICRI by joining a committee or applying for a seat on the board of directors, my advice to you is simple. Do it! Get involved. Have those passionate discussions and get things moving. I have made many friends through ICRI, I cherish those friendships, and you will, too. It's a member benefit that may be overlooked, but it is a crucial one.

ICRI is growing and doing great things, and it can't continue to grow and do great things without great people. And you, dear reader, are one of those people.

Jeffrey Barnes *is an outgoing ICRI Secretariat and Director on the ICRI Board.*



VOLUNTEER

Why Volunteer?

The success of the International Concrete Repair Institute and its work in the industry depends on a strong, active volunteer force. As a member of ICRI, you are invited to participate in the meetings and projects of any ICRI administrative or technical committee. All are volunteer-led and depend on your expert contributions.

ICRI's volunteer program strives to create an environment that is friendly and welcoming. As an ICRI volunteer, you work closely with volunteer leaders and ICRI staff—active parts of each committee—and available to assist you to answer questions about how ICRI operates, and to help you be the most effective volunteer possible.

Follow Your Interests

Check out the administrative and technical committees of ICRI (see page ??? of this *CRB* issue), attend their meetings and learn what each is working on. Then decide where your area(s) of interest fit best. The ICRI staff is here to answer your questions and help align you with your interests. You are welcome to attend any meeting of any committee on the administrative or technical committee list. You attend—you can decide if you want to join.

Length of Commitment

Most volunteer commitments are ongoing; leadership positions are a 3-year commitment. Committees usually meet monthly for 1-1.5 hours. In addition, committees often require tasks to be completed outside of the meetings on the volunteer's own time. **Visit www.icri.org for more information**.

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CONCRETE REPAIR

PROJECT AWARDS 2019

2019 PROJECT OF THE YEAR
TRANSPORTATION CATEGORY

The Île-aux-Tourtes Bridge Rehabilitation

MONTREAL, QUEBEC, CANADA
SUBMITTED BY SIKA CANADA, INC.

The Île-aux-Tourtes Bridge

INTRODUCTION

The Île-aux-Tourtes Bridge is a highway bridge (Fig. 1) linking Vaudreuil-Dorion to Senneville, crossing Girwood Island and lac des Deux-Montagnes (lake), an extension of the Ottawa River to the west of the island of Montreal. It connects the administrative regions of Montérégie and Montreal in the province of Quebec, Canada.

The bridge is part of Highway 40 and forms part of the Trans-Canada Highway. It has six lanes of traffic, three lanes per direction, which are separated by a median barrier. It is estimated that about 60,000 vehicles use it per day at an annual average of 21.9 million vehicles.

The bridge was built between 1962 and 1965. The total bridge length is about 1.25 miles (2 km) and consists of two types of structural systems: 8 spans of reinforced concrete girders and 35 spans of prestressed concrete girders.

In 2017, the 54 year old structure exhibited signs of deterioration at some girders and slabs, and the Ministry of Transportation of Quebec (MTQ) contracted for the reinforcing of two post-tension box girders over the Île-aux-Tourtes Bridge seaway. The construction segment began in mid-2017 and was completed in early August 2018.

SPECIAL CHARACTERISTICS

- Repair of two prestressed edge box girders with internal prestressed cables showing significant corrosion, concrete cracking, and delamination at certain locations. The strengthening of these two bridge girders was a priority;

Fig. 1: Working platforms over the maritime corridor

Fig. 2: Test beam

Fig. 3: Rebar and strand identification

- The bridge did not have a waterproofing deck membrane since it was not mandatory to be installed at the time of construction;
- The concrete prestressed box girder seaway spans (x2) suffered settlement from the shoring system at the time of construction which generated negative vertical grade. Additional asphalt was required to obtain the proper design vertical grade increasing the bridge dead load which had to be carried by strengthening of the girders;
- In 2000, the bridge deck had an enlargement of about 3.3 ft (1m) on both sides of the bridge which had to be taken into account in the bridge supplemental dead loads; and
- Shear strengthening of the box girder dap ends combined with the shear and flexural strengthening of both girders.

CHALLENGES

- Designing a high strength girder reinforcement with minimal dead load increase;
- Repairing the damaged girders before strengthening could be achieved since the initial concrete demolition and drilling of anchor holes adds further weakness to the structure initially;
- Maintaining the seaway operational throughout the work without vessel obstruction; and
- Maintaining three lanes open in the rush hour direction.

INNOVATIONS

The reinforcing consisted of two steps:

Step 1: Girder and dap end shear strengthening by adding carbon fiber reinforced polymer (CFRP).

Step 2: Girder flexural strengthening by adding external post-tensioning (EPT).

The design had to be carefully planned to overcome the lack of capacity caused by the present girder condition. Several construction stages were required to gradually strengthen the girders by minimizing the risks during each step. This was done using various work zones.

The CFRP installed in the negative bending moment location was mechanically anchored as recommended by various manufacturer CFRP design guides. All CFRP strips in this zone were anchored by an innovative system of steel anchor plates and steel rods. The anchor rod holes were produced using a vertical and horizontal drilling template due to the high amount of required precision and number of holes.

3D girder scanning was used to generate the data required for the production of the 256 anchor plate drawings. The fabrication and installation of the plates was carried out quickly and successfully without any on-site modification.

The EPT blocks were designed in steel in to minimize any dead load increase until the external post-tension was added, reducing the shear and bending moment of the girders. This procedure reduced the risk of further girder damage before the final post-tensioning could be carried out.

The steel geometry was more compact and lighter than the concrete blocks and were factory built instead of on-site construction minimizing any on-site potential delays or quality issues.

The use of several technologies was required to add the correct amount of final EPT reflecting the non-homogeneous degradation of the girder internal prestressing cables:

- 3D scanner for accurate girder camber surveying before and during added EPT;
- Measurement of the internal stresses of concrete by slot stress;
- Strain gauges added to monitor girder strain variations during EPT which were converted into longitudinal stresses and added to initial internal girder stresses from the slot stress; and
- Installation of a strand tension load sensor in each of the active EPT blocks to confirm the final EPT and for future strand load monitoring.

GIRDER REHABILITATION

Test beam

A small scale girder section was produced in a factory to reproduce all girder work steps required (Fig. 2). This was specified by the designer to validate the contractor drilling template, hole preparation, 3D scanning, CFRP steel plate drawing, and the anchor plate installation. Once the test beam work was approved, the contractor started the on-site bridge rehabilitation work.

Rebar and internal prestressing cable detection

The internal steel rebars and prestressing cables were located by radar detection to prevent damaging them during the drilling operation in the girder web, flanges and top slab. All anchor plate holes and EPT steel block anchor hole locations were identified prior to the drilling operation (Fig. 3). This step was crucial since the CFRP strip locations were identified along with the required anchor holes for each plate.

Girder and slab repair

The areas to be repaired were prepared to an ICRI surface profile of CSP 6 to 10. Prior to concreting, an anti-corrosion coating was used on the previously exposed rebar. High performance mortar was then used for girder repairs (Fig. 4 and 5). Web thickening locations for future EPT steel blocks were made with self-leveling concrete using mixed packaged materials to avoid a long curing process. CFRP strips were applied within 36-48 hours after concrete placement.

Fig. 4: Typical lower flange girder concrete demolition

Fig. 5: Repaired girder using mortar concrete

Fig. 6: Underside heavy duty slab repair prior to adding forms, concrete and steel deck and transverse beams

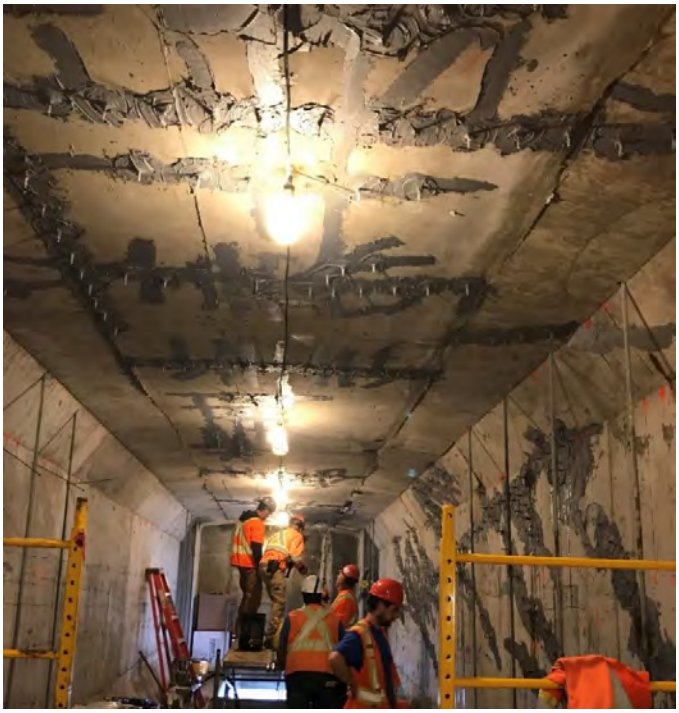

Fig. 7: Crack injection preparation

Fig. 8: Steel CFRP anchor plate horizontal hole drilling

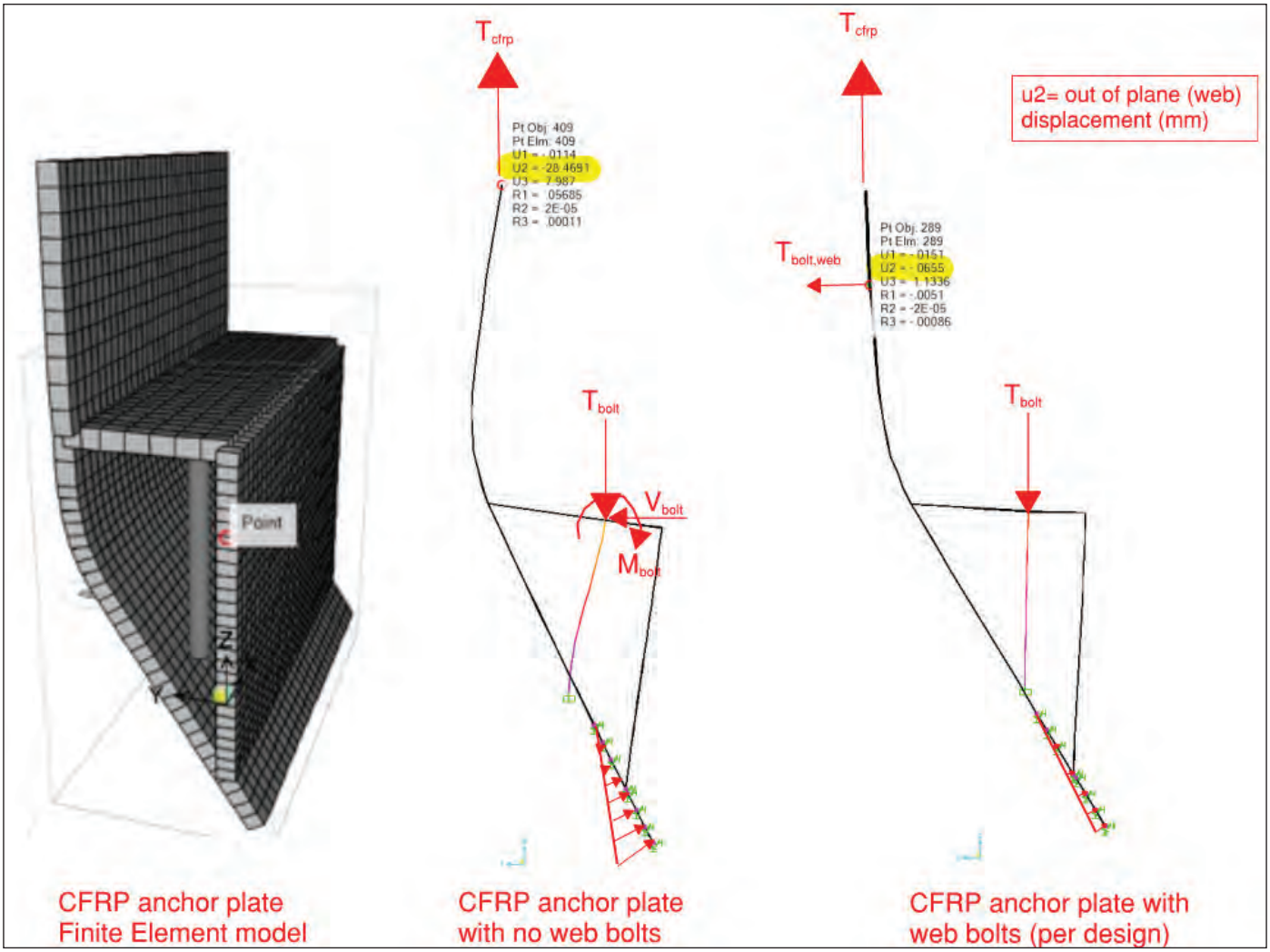

Fig. 9: 3D Steel CFRP anchor plate analysis model

Heavy-duty slab repair utilized ultra-fast hardening self-leveling concrete placed from the top of the deck. This limited the bridge lane closure at night to about 30 minutes. Several areas of the slab had to be repaired by creating an extra thickness on the underside of the slab (Fig. 6). Cracks in the bridge slab and girders had to be repaired before the low-viscosity epoxy crack injection (Fig. 7).

Anchoring plate and blocks

1-1/8 in (28.6 mm) diameter vertical holes were drilled into the girder top and lower flanges (Fig. 8) to insert 1 in (25.4 mm) diameter anchor rods (4 required per CFRP anchor plate). The vertical anchor rods were designed to carry the CFRP strip tension load while the horizontal anchor rods were designed only to prevent the CFRP plate from web normal displacement (secondary bending due to vertical rod offset from web plane). These horizontal holes were filled with grease to only carry tension loading with no shear loads from CFRP strips. A total of 1024 vertical anchor rods and 512 horizontal rods were required for the installation of all CFRP anchor plates. Holes were oversized to facilitate the on-site plate installation and were designed in tension only.

Plates were designed using the latest 3D technology, design software and 3D scanning to ensure proper fit in the field (Fig. 9 and 10). This step was important to assure that anchor plates matched the existing girder geometry which differed at many locations due to previous damage or repairs. Plates were bonded with a thixotropic epoxy to provide a contact surface to the CFRP fabric before torqueing bolts (Fig. 11).

It is important to note that the positive moment zone did not use any mechanical anchors. Various horizontal CFRP strips were used to create an anchor at various specific locations. This configuration was previously tested and showed shear capacity increase of more than 50% from the original girder condition and was found sufficient for the girder condition.

CFRP reinforcement

A very high density fabric (1385 g/sm) was used for shear strengthening in both negative and positive moments. The entire length of the two girders was reinforced with CFRP fabric (Fig. 12). The girder shear CFRP strengthening used 2 plies of fabrics while the dap ends used up to 6 plies due to the higher required load capacity.

External post-tensioning (EPT)

The EPT was provided to add the required flexure capacity for actual and assumed future girder deterioration and improved the girder shear capacity by adding axial beneficial compression (while not the main goal). The EPT was composed of two steel blocks with each carrying 22 x T15 greased sheath strands with multiple corrosion protection systems for high durability due to its primary function (Fig.13 and 14).

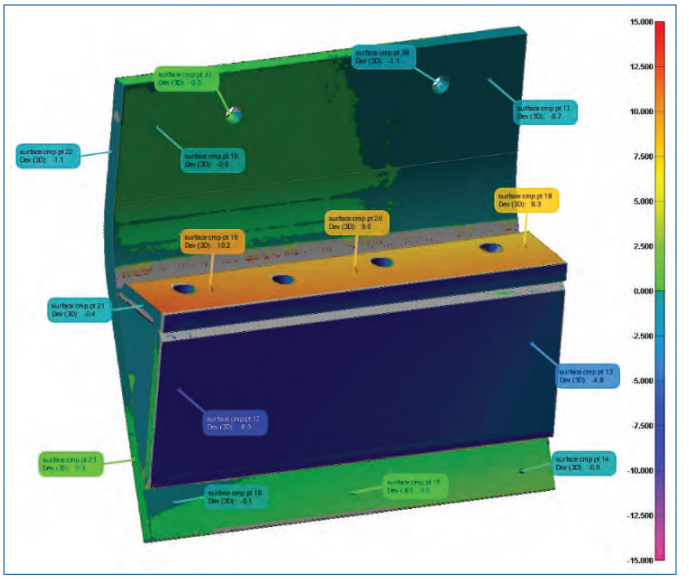

Fig. 10: 3D scanning of parts to generate 3D CAD models to correspond with girder profile

Fig. 11: Steel CFRP anchor plates

Fig. 12: Installed CFRP strips

Fig. 13: External post-tensioning system

Fig. 14: External view of girder after completion of work

Fig. 15: Spray applied waterproofing deck membrane application

Crack monitoring on side barrier

The side barrier at the pier location (maximum negative bending moment) had multiple cracks. This was the result of the loss in flexural capacity of the edge girders. The vertical cracks extended along the girder web and were monitored on a daily basis to assure the proper work steps. The anticipated initial design steps were changed on-site to accelerate the construction process and assure the final external post tensioning could be applied prior to an accelerating potential cracking mode.

Concrete slab waterproofing membrane

A liquid waterproofing membrane (Fig. 15) and new pavement was added to protect the new girder rehabilitation and avoid having de-icing salts from penetrating the new CFRP repair from deck cracks and preventing premature concrete delamination and additional internal prestressing cable corrosion. This assures the required dry surface condition for the CFRP installation on the girder webs and near the top slab location.

CONCLUSION

The Île-aux-Tourtes Bridge is an economically vital structure for Greater Montreal and the entire province of Québec since it is part of the Trans-Canada Highway and main entrance from/to the province of Ontario. On a sustainability point of view, the work has extended the life of the existing girders for an additional 15 years. A combination of the latest technologies in construction with the expertise of the concrete refurbishment industry made this project a success and an example for future bridge rehabilitation projects.

The Île-aux-Tourtes Bridge Rehabilitation

SUBMITTED BY
Sika Canada, Inc.
Pointe-Claire, Quebec, Canada

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Montreal, Quebec, Canada

PROJECT ENGINEER/DESIGNER
EXP
Laval, Quebec, Canada

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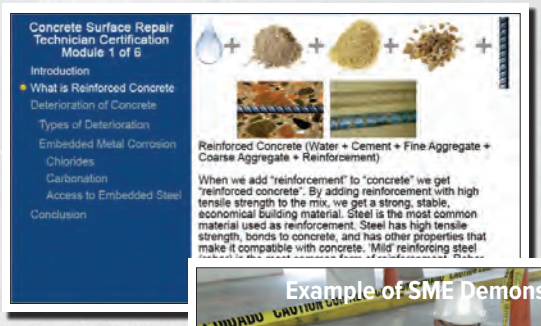

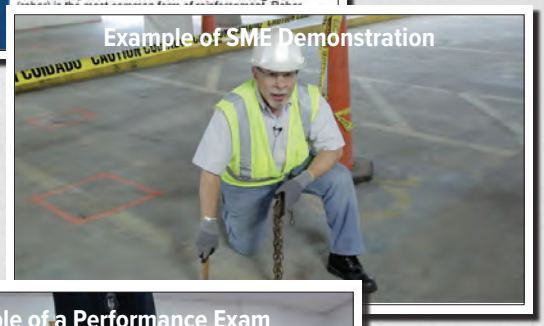
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FINALIST—2019 PROJECT OF THE YEAR
HISTORIC CATEGORY

Napa Valley Courthouse

NAPA, CALIFORNIA
SUBMITTED BY PULLMAN

Fig. 1: Napa Valley Courthouse after repairs

OVERVIEW

Constructed in 1878 in the high Victorian Italianate architectural style, the Napa Valley Courthouse is listed on the National Register of Historic Places (Fig. 1). The 18,000 sf (1670 sm), three-story building consists of a concrete foundation with a full basement, a brick and stucco wall assembly, and a metal roof. The outer walls consist of masonry assemblies covered in Rosendale cement, held in place by iron bands embedded in the foundation. A hipped roof frame is supported by brick walls and timber trusses. The cornice is galvanized iron supported by block modillions. Frieze and dentils wrap the building, along with a simple molding delineating the first and second story. The structure also boasts segmental arched hoods above the wooden windows and double door entrance.

EARTHQUAKE DAMAGE

The Courthouse suffered extensive damage after a 6.0 magnitude earthquake struck the region on August 24, 2014. The load bearing masonry walls, plaster, and wood trim exhibited severe damage from the excessive movement (Fig. 2). Shear cracks ran through many of the exterior and interior walls, coupled with diagonal cracking through many of the window spandrels. A gaping hole was visible at the southeast corner roofline, and portions of the interior walls were in danger of collapsing. HVAC, fire sprinklers, and electrical systems were also impacted.

The Courthouse was deemed unsafe and closed for repairs. County officials set up temporary spaces for court services to be held elsewhere, while a team was assembled to assess the extent of the damage and develop

recovery plans. After years of planning and coordinating with various parties to secure funding, Napa County started the project with rehabilitation work beginning in the summer of 2017, three years after the earthquake hit.

The project team assisted with stabilizing and preserving the historic structure. A key solution for the project involved a unique application of seismic retrofit technology that would minimize the destruction of the historic structure.

The design team's repair strategy enhanced the structure's resiliency by evaluating each structural element for deficiencies (Fig. 3). The seismic retrofit consisted of a multi-pronged approach to address these deficiencies. Since the original masonry was unreinforced, the walls that were completely destabilized needed to be demolished, shored, and rebuilt with grout filled and reinforced concrete blocks (Fig. 4). Load bearing brick walls that did not collapse received externally applied reinforcement. To stabilize walls that were only partially damaged, helical anchors were used to tie various wythes of bricks together.

IMPLEMENTING A SEISMIC UPGRADE SOLUTION AND OTHER REPAIR STRATEGIES

To upgrade the structure for seismic conditions in the event of another earthquake, all unreinforced masonry was repaired using a fabric-reinforced cementitious matrix (FRCM). A new technology in the United States, FRCM is an externally applied composite system which combines a carbon-fiber reinforcing grid into a layer of sprayable high strength mortar (Fig.5). The application is conceptually similar to traditional enlargements with additional concrete and steel reinforcement, but without adding significant weight or volume. The installation process is faster and requires less preparation than traditional shotcrete repairs. The system also withstands harsh environments and service conditions, including elevated temperatures, humidity, and ultraviolet (UV).

sprayed the walls with water and covered them with burlap to retain the moisture two days before applying the FRCM. The FRCM was completely concealed behind new plaster and salvaged wooden wainscot. These steps were taken to accurately reinstall the historical trims. Over 15,000 sf (1395 sm) of FRCM was installed on 43 different wall locations.

Localized damaged portions of the existing load-bearing masonry walls were rebuilt with existing brick. Walls that were beyond repair were demolished and newly constructed with grouted concrete masonry unit (CMU) blocks. All new walls were constructed with a specially designed expansion joint system to mimic the thermal expansion properties of

Fig. 3: The unreinforced masonry walls crumbled while the glass from the vaulted glass dome on the second floor was undamaged

Fig. 2: The unreinforced masonry walls crumbled while the glass from the vaulted glass dome on the second floor was undamaged

Fig. 4: The versatile building block enabled reconstruction in areas that were completely destabilized

To implement the FRCM application, the bricks were brought to the correct moisture content and nominal 1 in (25 mm) thickness for FRCM to properly adhere. Teams

Fig. 5: Reinforcing a wall with the FRCM system

Fig. 6: The Courthouse after removing the sheathing, and prior to exterior plaster and coating work

Fig. 7: The Courthouse construction near completion

the existing wall assemblies. Over 3,800 ft (1160 m) of crack injection with high strength grout was performed. Twenty-five wall assemblies were rebuilt with CMU blocks and over 300 cy (230 cm) of grout was placed within the blocks.

To ensure that all connections lined up, mock-ups were performed for each type of brick in both the horizontal and vertical planes. The team provided field verification to communicate the numerous conditions that required special detailing. The entire project required sensible material handling and efficient work flow. Moving over 10,000 different-sized CMU blocks and placing thousands of feet of reinforcement required careful staging. Building the segmented window and door arches required traditional masonry craftsmanship to repair the existing arches. In total, 28 precast concrete arches weighing over 1,000 lb (454 kg) were installed for lintels.

Refer to Figures 6 and 7 during Courthouse repairs after removing the sheathing and construction near completion.

RECOVERY AND RESILIENCY

By understanding the nuances and sensitive nature of historic restoration, the Napa Valley Courthouse project team was able to create a suitable repair program that maintained the structure's historical integrity while meeting the modern day needs of the community. With the help of ground breaking technology and ongoing research, knowledge of seismic design and retrofit continues to grow. New technologies like FRCM offer opportunities to repair and strengthen existing structures, which limit changing the original fabric of a building. The project was completed in early 2019 with zero workplace incidents. The town held a grand re-opening in January 2019 to celebrate the community's progress towards earthquake safety and getting back to business as usual.

Napa Valley Courthouse

SUBMITTED BY
PULLMAN
Napa, California

OWNER
Napa County Public Works
Napa, California

PROJECT ENGINEER/DESIGNER
ZFA Structural Engineers
Napa, California

REPAIR CONTRACTOR
PULLMAN, A Structural Technologies Company
Benicia, California

MATERIALS SUPPLIER/MANUFACTURER
Simpson-Strong Tie
Pleasanton, California

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FINALIST—2019 PROJECT OF THE YEAR

WATER STRUCTURE CATEGORY

Repairs and Strengthening to Brick Arch Masonry Storm Water Drains for MCGM

MUMBAI, MAHARASHTRA, INDIA

SUBMITTED BY KASTURI PROJECTS PVT LTD

Fig. 1: Completed repair of the storm water drains in the City of Mumbai, India that are more than a century old and constructed of brick arch masonry during the British era

OVERVIEW

The storm water drains in the City of Mumbai, India are over 100 years old and were constructed in brick arch masonry during the British Era (Fig. 1). The storm water drains (hereafter referred to as SWD) were prone to frequent cave-ins. To prevent cave-ins, enhance their safety and maintain the SWD system, the Municipal Corporation of Greater Mumbai (MCGM), under the Central Government of India "BRIMSTOWAD" Scheme, initiated a detailed survey and mapping of the SWD for the City of Mumbai.

Many of the defects identified in the brick structures were related to breaks in the fabric, introducing the possibility of the surrounding soil being washed into the drain and resulting in voids in the soil. Voids behind brick arches and buried pipelines are detrimental to their structural performance that benefit from an even distribution of load to remain stable.

CAUSES OF DETERIORATION

Some of the causes of deterioration identified included:

- Brick arch failure due to surcharge loading. The overloading was due to additional structures constructed over these buried storm water drains;
- Imposed loadings from new roads constructed over buried structures, increasing the surcharge load;
- Surcharging when a drain is not watertight and water flows out of the drain into the ground that significantly increases the potential for soil erosion in the ground surrounding the drain;
- Deterioration and spalling of lining and

brickwork (Fig. 2), some due to scouring. There was also bond failure due to ingress of water, undermining the integrity of the lining through corrosive effluents;

- Erosion of mortar joints (Fig. 3) impaired the structural strength of the drain, which if not rectified, would result in misplaced bricks;
- Excessive loading was generally the cause of longitudinal cracking and circumferential cracking was infrequent;
- At one location, roots of an appreciable size penetrated the brick arch construction (Fig. 4). In this case, local collapse of the brickwork, must be considered a real possibility in the short term; and
- Hydrogen sulfide attack on concrete and mortar was observed over significant lengths of storm culvert, which receives foul sewage and storm water. The sulfuric acid attacks mortar, including the mortar matrix of concrete. In places, this form of corrosion attack penetrated to a considerable depth in the soffits. Attack at the waterline was observed much less frequently, but was severe.

Fig. 2: Delaminated and spalling of brick lining


Fig. 3: Erosion of mortar joints

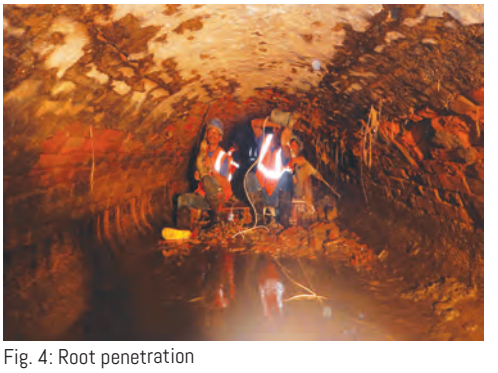
Fig. 4: Root penetration


Fig. 5: Demolition of deteriorated brick lining with lightweight breaker

STRUCTURAL REHABILITATION

Structural rehabilitation covered all aspects of upgrading the structural performance of existing SWD and drainage systems. Three approaches normally considered were:

Repair: Repair systems and methods are taken to mean the rectification of damage to the structural fabric or the reconstruction of short lengths of drain, but not measures affecting the whole or major part of the drain line. Repair techniques will form the more conventional approaches generally practiced already by the municipal body but with greater attention being paid to detail and quality of repairs.

Renovation: The concept of renovation embraces the potential for cost saving obtained by retaining as much as possible of the existing system. The application of renovation techniques in this project offered the most expedient and cost effective way of maintaining "the existing hole in the ground"; the means to stabilize and seal the structure where it is deficient; and the means to add strength to whatever is usefully available.

In Britain, renovation methods typically offer 50% -80% savings on replacement costs since savings are offered in the ability to restore the fabric of the drain without excavation, temporary support, back filling and reinstatement as well as significant reduction in the disruption and indirect costs incurred by the community.

Replacement: Replacement is frequently the solution for gross hydraulic under-capacity, complete structural inadequacy or, where other measures, such as reinforcement are impractical or uneconomic. In India where some techniques are unavailable or involve expensive imported technology, and where labor costs are cheaper, replacement is, in almost all cases, cheaper than the current cost of renovation options.

SUMMARY OF REHABILITATION SYSTEMS

Many methods are currently available for the repair, renovation and replacement of drains. As the rehabilitation of drains in this project was restricted to man-entry sizes generally larger than 48 in (1200 mm), those methods only suitable for smaller drains are not mentioned.

- Structural stabilization by grouting and repointing the brick lined arch drains;

Fig. 6: High-pressure waterjet washing

Fig. 7: Installed ports for injecting 2-component rigid polyurethane resin

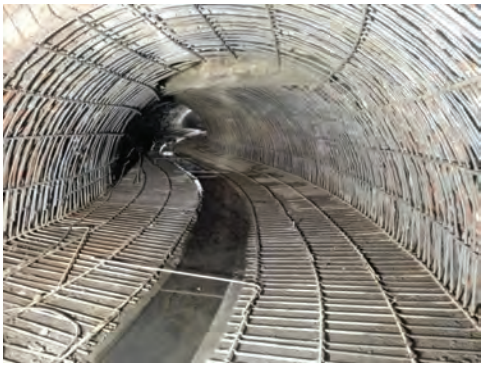

Fig. 8: Fixing reinforcement FE 500D

Fig. 9: Installing wet-mix shotcrete

- Preformed linings using pipe insertions, preformed segmental linings, precast gunite, slip lining, cured in-place soft lining, spiral lining, cement mortar lining, and sprayed epoxy lining; and
- Insitu reinforced sprayed concrete linings and protective coatings that results in the production of a monolithic, smooth bore concrete lining reinforced with the specialized protective coating providing adequate protection against extreme pH attack.

REPAIR SYSTEM SELECTION

After detailed analysis and various deliberations, the insitu reinforced sprayed concrete lining with protective coating, along with extensive 2-layer grouting of cementitious non-shrink grout and polyurethane resin grouts for water control was adopted by MCGM. This methodology was chosen considering the advantages of renovation rather than replacement.

SITE PREPARATION

The repair process began with diversion of traffic to access manholes, which are mostly on the road. The 24 in (600 mm) diameter manholes needed widening to facilitate entry for men and equipment. Creating temporary coffer dams to stop the flow of water (even during summer) at every 650 ft (200 m) length of the drain was needed as these drains where not only carrying storm water but also sewage water. Fixing submersible dewatering pumps on the inward side were augmented with separate 12 in (300 mm) diameter temporary pipes along the surface, to divert flow of water to the downstream side. The pumping operation continued 24/7 until the section of drain was completely repaired. Diesel operated “silent” generators, air compressors and receivers were installed for continuous operation to keep the working noise decibels within the permitted range as it involved working near residential area. H2S and other gas levels in the SWD were monitored daily before human entry. The drains were provided with an effective ventilation system, lighting system and emergency evacuation life lines along with oxygen cylinders.

SURFACE PREPARATION AND DEMOLITION

At most places, the lining on the internal brick masonry was eroded. Where present, the old lining was removed manually with 11 lb (5 kg) breaking hammers (Fig. 5). Lightweight hammers where used so as not to disturb the bricks and mortar lining. After removal of the lining, the debris generated was conveyed out of the drains manually. High-pressure (7250 psi [500 bars]) waterjet washing was performed to clean the brick surface and remove loose damaged mortar pointing (Fig. 6). Loose bricks, where removed, were re-constructed by replacement with new bricks.

REPAIR PROCESS

The repair process included the following:

- Longitudinal cracking at the crown was opened and sealed with non-shrink polymer and fiber reinforced mortar. Thereafter, a 4 in (100 mm) wide x 4 in (100 mm) deep x about 8 in (200 mm) length opening was made in the crown of the brick arch masonry and four to six No. 5 (16 mm) diameter T or FE 500 D grade steel reinforcement pins were fixed with mortar anchors and filled with polymer modified fiber reinforced mortar to have an effective “crack stitching” of the masonry crown. This was repeated for the length of the cracks at every 20 in (500 mm) length;
- Repointing the mortar joints wherever eroded;
- Injecting 2-component sealing rigid polyurethane resin to stop water ingress into the drains (Fig. 7);

- Fixing Reinforcement FE 500D per the structural drawings and anchoring the same to the brick arch masonry at sufficient interval with anchors and spacers (Fig. 8);
- Wet mix shotcrete, M-30 Grade, was applied to the entire brick masonry internal surface at a thickness ranging from 5 in (125 mm) to 9 in (230 mm) per structural requirements (Fig. 9). The application was completed in one or two passes per site conditions;
- Drilling 1 in (25 mm) diameter x 22 in (550 mm) long holes into the brick masonry (Fig. 10), fixing G.I packers, and grouting using a non-shrink cementitious, anti-washout grout, to the point of rejection (Fig. 11). The aim was to fill the voids behind the buried drain structure and into the mortar joints to strengthen the pointing; and
- Spray applying a 0.25 in (6 mm) thick two-component mineral based mortar system to form a lining that is resistant to aggressive environments (Fig. 12). The ceramic based mineral coating can withstand extreme pH (3-12), chloride and sulfate loading, biogenic sulfuric acid attack, and abrasion. In addition, the coating is breathable, preventing damage due to hydrolysis and osmosis.

SUMMARY

This rehabilitation model upon successful testing was adopted by the MCGM, and until 2018, over 3.1 miles (5000 Rm) of Storm Water Drains (SWD) have been successfully repaired.

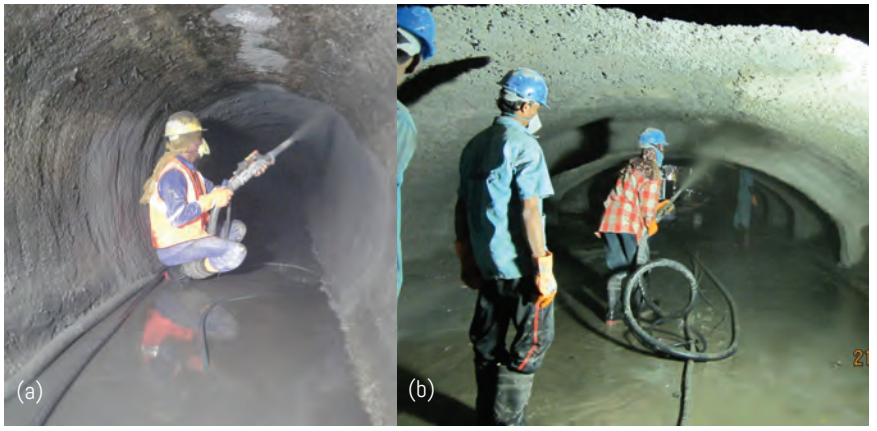

Fig. 12: Spraying 2-component mineral based mortar system to form a lining (a and b)

Fig. 6: High-pressure waterjet washing

Fig. 10: Drilling holes into the brick masonry

Fig. 11: Fixing packers and grouting using a non-shrink cementitious, anti-washout grout

Repairs and Strengthening to Brick Arch Masonry Storm Water Drains for MCGM

SUBMITTED BY
KASTURI PROJECTS PVT LTD
Thane, Maharashtra, India

OWNER
ME INFRAPROJECTS PVT LTD
Mumbai, Maharashtra, India

PROJECT ENGINEER/DESIGNER
S V Patel & Associates
Mumbai, Maharashtra, India

REPAIR CONTRACTOR
Kasturi Projects Pvt Ltd
Thane, Maharashtra, India

MATERIALS SUPPLIERS/MANUFACTURERS
MC Buachemie (I) Pvt Ltd
Ponda, Goa, India

Totale Global Pct Ltd
Thane, Maharashtra, IndiaPleasanton, California

AWARD OF EXCELLENCE

HIGH-RISE CATEGORY

Signature Place Condominium

ST. PETERSBURG, FLORIDA

SUBMITTED BY R. L. JAMES, INC. GENERAL CONTRACTOR

BUILDING DESCRIPTION AND HISTORY

Signature Place Condominium (Fig. 1) is in downtown St. Petersburg, Florida, and consists of a 36-story residential and two 5 and 7-story multi-use (retail and office) condominium buildings and a 5-story garage and recreational plaza deck and pool above the garage building. The property encompasses an entire city block and at the time of construction was the tallest building in St Petersburg. The high-rise structure tapers from west to east forming a pointed knife edge with prominent sail-like roof overhangs overlooking the bay, Rowdies soccer stadium, with views of Albert Whitted airport.

Construction began in 2005 at the peak of the real estate boom and neared completion in 2008 just as the market collapsed. Units originally selling in the range of US $400,000 - $1.5 million plus were sold by the developer at auction as sales slowed. Soon after occupancy, unit owners began experiencing water intrusion issues on the concrete masonry unit (CMU) constructed walls on the south and west elevations of the high rise and at other CMU constructed locations on the east and west liner buildings. Cracks in the stucco began to develop in consistent locations at floor to wall transitions. These issues along with many others resulted in the condominium association filing a construction defect claim against the developer.

INVESTIGATION AND DISCOVERY

An initial investigative effort was undertaken that was intended to repair stucco defects at two wall elevations – a shear wall and a broad wall. On the shear wall, horizontal cracking had developed at every floor line (Fig. 2) where the control joints were installed improperly. Stucco cracking was exhibited throughout the entire 6000 sf (560 sm) plus wall area (Fig. 3), facing westerly and constantly exposed to the Florida west coast hot sunny conditions and

Fig. 1: Signature Place Condominium

frequent afternoon thunderstorm and high winds.

lls at the joint locations, some of the CMU walls were broken and it was discovered that cells of the CMU were void of grout where they should have been reinforced (Fig. 4). Upon further investigation, it was discovered that the reinforcing was either missing or not properly connected to the structure. As the high-rise structure is a unique conventionally reinforced building with CMU shear walls connected at drop down beams which are adjacent to the balcony slabs, these repairs were deemed urgent and further investigations were performed (Fig. 5).

The results of the investigations were overwhelming conclusive that the structural reinforcement was inadequately installed throughout the building and immediate repairs

were required (Fig. 6 and 7). Noted defects included improper wall reinforcing and several additional issues.

REPAIR PLAN

Due to the costly and challenging requirements of accessing a 36-story high rise structure with many changes in direction in busy downtown St Petersburg, the difficult but wise decision was made to take advantage of economies of scale discounts and address other issues as well. A project scope of work was developed to also replace the thinly applied balcony waterproof membranes and paint the exterior envelope of all the buildings as well as address some roof coating issues.

Funding for the project was accomplished by a combination of unit owner assessments and bank financing. Unit owner assessments ranged from US $9,900 for the smallest units to US $132,000 for the three-story penthouse unit.

Structural Reinforcement

Repairing the reinforced cells at their existing locations was problematic as removing the existing grout and reinforcing was very time consuming, costly, and risked penetrating the living units on the opposing side of the walls. Therefore, a plan was developed where possible to relocate the reinforcing at cells adjacent to the original locations by cutting open the faces of the cells top to bottom, properly installing the reinforcement, applying bar coatings to improve longevity, and forming and grouting the cells. Upon removal of the forms, if the grout was not filled to the bottom of the tie beam, the voids were hand packed.

Exterior Stucco Cladding

For the stucco control joint and CMU repairs (Fig. 8), approximately 40% of the existing stucco required removal. Additionally, as it was discovered that most of the CMU were misaligned with the floor slabs resulting in noncompliant building code stucco applications in excess of 2 in (50 mm) and debonding in many locations. To avoid a patched appearance, it was determined that all the stucco cladding would be removed on the shear and broad wall elevations. Repairs on these walls included stripping all of the stucco from the walls, replacing missing/loose mortar, sealing the soft joints with sealant, installing control joints at proper locations, waterproofing the CMU, applying new stucco, and coating the walls with a waterproof coating. To resolve issues with the misaligned CMU, a vertical repair mortar was installed to build up the wall elevations prior to stucco application.

CONCLUSIONS

In total, over 2000 cells were reinforced and 60,000 sf (5575 sm) plus of stucco cladding was removed, walls were floated with repair mortar, and stucco was reinstalled during the course of the two plus year project. Balcony waterproof membranes were replaced, and the exterior walls were waterproofed. The water intrusion issues have been resolved and the building is structurally sound. The condominium association was successful in reaching a best as can be expected settlement due to the diligent investigation, documentation, and teamwork of all involved. With the repair work completed and mast climbers and swing stages removed from the property, Owners took

Fig. 2: Cracks in stucco on every floor at bottom of turndown beam to top of wall

Fig. 3: Stucco marked up for removal after sounding

Fig. 4: CMU reinforced cells missing grout

Fig. 5: Graphics showing shear wall elevations planned for repair – (a) south elevation, and (b) north elevation

pride in the fresh appearance of their homes and the market regained confidence as downtown St. Petersburg thrived. Property values have steadily increased and unit sales have turned over quickly. Signature Place continues to be a thriving community drawing marked interest from passersby due to its unique appearance, water wall and prominent knife edge over-looking the bay.


Fig. 6: Shear wall under various phases of repair


Fig. 7: Parking garage shear wall/barrier wall being reinforced


Fig. 8: Stucco replacement, CMU grouting, guardrail protection, overhead protection, and mast climber/ swing stage access

Signature Place Condominium

SUBMITTED BY
R. L. James, Inc. General Contractor
Fort Myers, FL

OWNER
Signature Place Condominium Association, Inc.
St. Petersburg, FL

PROJECT ENGINEER/DESIGNER
Ivy Group Consultants
St. Petersburg, FL

REPAIR CONTRACTOR
R.L. James, Inc. General Contractor
Fort Myers, FL

MATERIALS SUPPLIERS/MANUFACTURERS
Coastal Construction Products
Tampa, FL

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AWARD OF EXCELLENCE

LONGEVITY CATEGORY

Lake Merritt Boathouse: 10 Years Later

OAKLAND, CALIFORNIA

SUBMITTED BY SIKA CORPORATION

Fig. 1: Lake Merritt Boathouse in 2019

INTRODUCTION

The Lake Merritt Boathouse (Fig. 1) is located on Lake Merritt (a large body of in-land, salt-water) within the city of Oakland, California. It was built in 1909 to serve as an emergency pumping station in response to the 1906 earthquake. The building is U-shaped and has two stories, each approximately 8,500 sf (790 sm). The two wings were used to store canoes and sailboats used for recreational purposes and the midsection was used to house a pumping station for firefighters. The foundation piers, girders, beams and slabs are constructed of cast-in-place, reinforced-concrete. The exterior façade consists of cement plaster over reinforced concrete.

Voters approved a plan in 2002 to return the dormant historic boathouse to its original design. In addition to upgrading the lower levels to enhance the boating facilities, the upper levels were renovated and converted to a restaurant. The new design required installation of micro-piles for seismic upgrade of the building. After installing a coffer dam, dewatering the area and beginning to excavate and expose the foundation, it became evident that the building substructure had many problems.

INVESTIGATION AND EVALUATION

The investigation to assess the extent of damage yielded some ‘dramatic’ results:

- Most of the beams, girders, piles and slabs had cracking, spalling and signs of corrosion;
- Chloride contents in the concrete were very high, ranging from 0.4-0.9% by weight of concrete (20x theoretical threshold for corrosion to occur);
- Cover concrete over the reinforcing steel ranged from 0 – 1 in (0 – 25 mm); and

- Heavy corrosion was noted in many areas with complete loss of the stirrups and/or the longitudinal steel in several locations.

The investigation concluded the concrete spalling was caused by corrosion of the reinforcing steel accelerated by insufficient cover and chloride ingress (Fig. 2).

REPAIR SYSTEM DESIGN AND IMPLEMENTATION

The Owner and Engineer had several goals to address the field conditions that included properly repairing the damaged concrete, protecting from moisture penetration and future steel corrosion, and structurally upgrading deficient members with minimal impact on the overall project schedule.

Site Preparation

Access to the work areas was a major challenge. Equipment was modified to excavate horizontally under the existing slab and substructure (Fig. 3). Because of the tight conditions and the requirement to replace all excavated fill with the original material, the project was completed in two phases. Once the earth was excavated, the work space was very tight, 3 ft (0.9 m) of clear head space.

Due to the muddy conditions and to ensure a clean, dry and safe work area, a working platform was built. Netting was laid down first, followed by a layer of styrofoam, then tongue and groove plywood installed to provide a good surface to work from. The workers had to work from their hands and knees and used dolleys to roll from one place to the next (Fig. 4).

Demolition and Surface Preparation

As the demolition began, the repair contractor inquired on the need to shore the slab during repairs. The engineer inspected the conditions and concluded it to be safe; however, shoring was installed as a measure of caution (Fig. 5). Not only did this add to the complexity of completing the repairs, it made a very tight work space even tighter. Old wooden piers were also found during excavation which required removal to gain access to the work area.

Significant demolition was required to remove spalled concrete and expose corroded reinforcing steel (Fig. 6). Sandblasting was not permitted and compressed air chipping guns were used for bulk concrete removal. All removals were reclaimed and recycled; thus the netting below the plywood and styrofoam ensured that debris was not left behind. Reinforcing steel was cleaned with wire brushes and grinders. Areas to receive carbon fiber reinforced polymer (CFRP) were grinded to remove surface laitance. Areas to receive a coating were powerwashed.

Fig. 2: Extensive spalling of the beams, girders, and slabs caused by severe corrosion of the reinforcing steel

Fig. 3: Modified excavation equipment to remove the mucky soil under the supported slab

Fig. 4: A worker works off his back on a mechanics crawler to grind and clean the reinforcing steel

Fig. 5: Work platform and shoring installed ahead of demolition (note corroded steel throughout and the tight working conditions)

Fig. 6: Significant demolition required to remove spalled concrete and expose corroded reinforcing steel

Fig. 7: Anodes installed throughout to combat the high chloride content in the concrete

Fig. 8: Girders after concrete placement and repair

Fig. 9: Girder after application of CFRP and slab after application of epoxy coating (note areas of shoring that required later touchup)

The work was performed in two phases and each phase was divided into smaller sections due to concern about the lack of slab strength. The work sequence consisted of the following:

- Installation of galvanic anodes in the repair and core drilled into the beams and piles (Fig. 7);
- Application of a rebar coating and bonding agent;
- Installation of formwork; and
- Placement of the concrete repair material (Fig. 8).

Once the entire phase was completed, the next steps entailed:

- Surface preparation and installation of the CFRP ('wet-layup' technique);
- Surface preparation of the exposed concrete substructure surfaces;
- Application of an epoxy coating;
- Removal of the shoring;
- Final clean up and removal of the temporary work platform; and
- Backfill.

SUMMARY

Severe corrosion problems and structural deficiencies were uncovered once excavation began and the substructure was exposed in December, 2006. Thorough investigations were immediately employed to determine the extent and causes of the deficiencies. Plans and specifications were developed by February, 2007. The repair contractor mobilized in April and started excavating in May and completed the repairs in September, 2007.

The project was awarded LEED Gold certified and uniqueness included sustainability / adaptive reuse of an historic landmark, coffer dam required to access submerged elements of the structure, excavation of saturated soil/soupy mud, tight access to the work space with 2 - 3 ft (0.6 – 0.9 m) headroom and shoring, load limits on the slab restricted storage and work sequence, possible liquidated damages if the project was not completed on time, and dewatering to maintain access.

The full system repair/strengthening/protection approach was designed to withstand for many years. Ten years later, the repairs are still performing while the residents continue to enjoy the upgraded boating facilities and restaurant.

Lake Merritt Boathouse: 10 Years Later

SUBMITTED BY
Sika Corporation
Lyndhurst, NJ

OWNER
City of Oakland
Oakland, CA

PROJECT ENGINEER/DESIGNER
Degenkolb Engineers
Oakland, CA

REPAIR CONTRACTOR
Alpha Restoration
South San Francisco, CA

MATERIALS SUPPLIERS/MANUFACTURERS
Sika Corporation
Lyndhurst, NJ

Vector Corrosion Technologies
Tampa, FL

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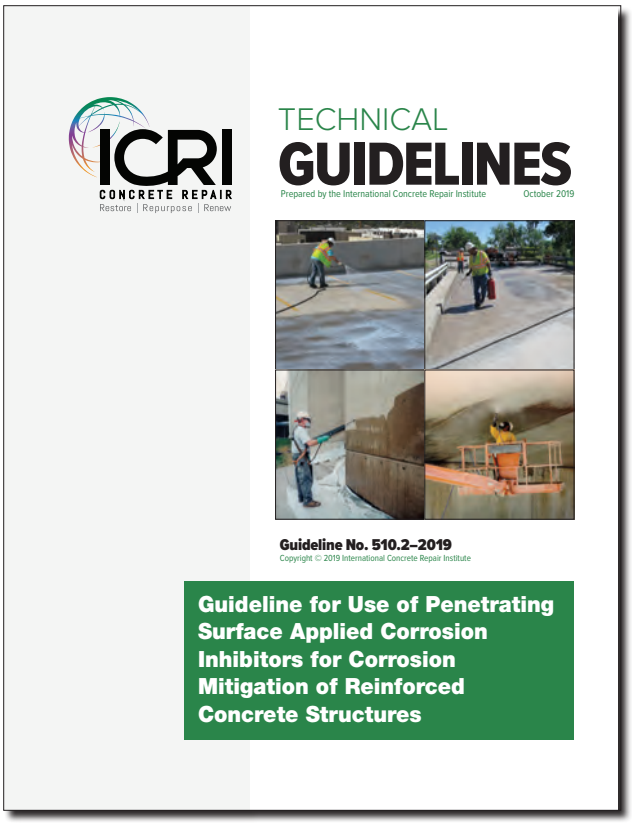

Provide information and guidance for the selection, evaluation, and use of surface applied corrosion inhibitors (SACI) for corrosion mitigation and supplement sound judgement by engineers, consultants or others specializing in the repair of reinforced concrete structures experiencing corrosion induced damage. Understanding the existing concrete conditions and corrosion levels in the structure, the function and limitations of SACI materials, requirements for proper application and quality assurance/control during application, and evaluation and monitoring the performance are addressed.

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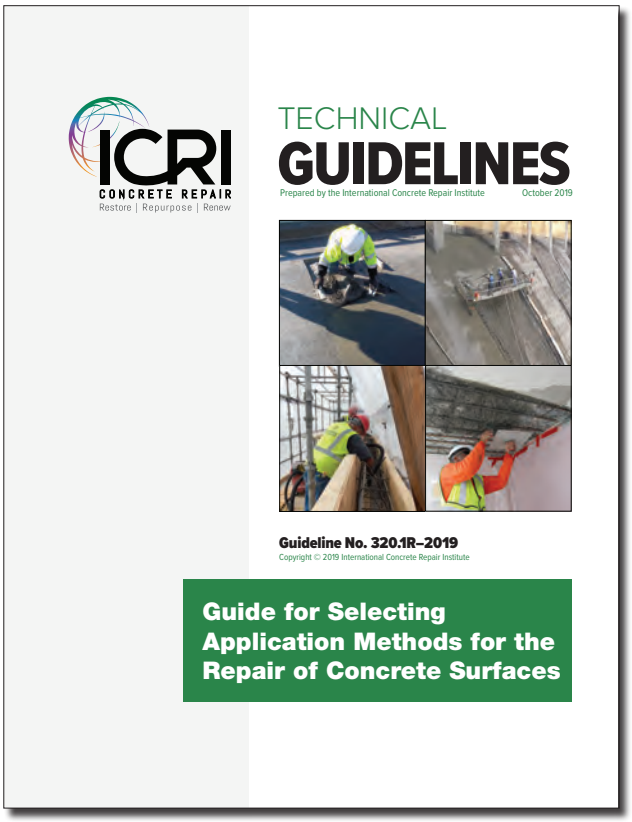
UPDATED! **Guideline 320.1R-2019**
Selecting Applicaton Methods for the Repair of Concrete Surfaces



Illustrates and describes the methods currently available for placement of concrete repair materials, along with material requirements and the best applications for each. In addition, engineering considerations, constructibility, and quality control are addressed.

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AWARD OF EXCELLENCE

PARKING STRUCTURES CATEGORY

University of Houston East Garage Fire Emergency Response

HOUSTON, TEXAS

SUBMITTED WALTER P MOORE & ASSOCIATES, INC.

Fig. 1: University of Houston East Garage (top) and fire-damaged area after repair (bottom)

BACKGROUND

To accommodate the growing population of students, the University of Houston's 2006 Campus Framework Plan included the addition of parking spaces. The East Garage (Fig. 1) was designed to meet the needs of students, faculty, visitors, and residents of the nearby campus lofts. Utilizing a "double zero" ramp configuration, the garage was designed to have "nested" visitor parking with the capability to use the upper levels for overflow parking.

The garage utilizes pay-on-foot machines for visitors with pay stations located on the ground floor, and is designed to accommodate future residential development on two sides. Traffic engineering services on this project included a traffic impact study, site circulation review, Texas Department of Transportation (TxDOT) driveway approval, and traffic control plans. Recommendations from the study included the installation of a traffic signal, the addition of turn bays, and improvements to existing pavement markings to improve safety for vehicles and pedestrians.

In April of 2018, The University of Houston (UH) suffered a multiple-vehicle fire on the third level of their four-level East Garage (Fig. 2). Significant structural damage occurred to two columns, the framing of the level above, and the exterior signage (Fig. 3). Before any testing could be performed, shoring was installed to prevent the risk of collapse (Fig. 4).

INSPECTION AND EVALUATION

Together with the Houston Fire Department, the Engineer performed a cursory visual review. The extent of the fire damage was confined within the two bays adjacent to the garage expansion joint on the east side. Shoring and cleaning requirements for the damaged members were provided on-site on April 26, 2018, the same day that the fire occurred.

Additionally, available background information and plans were reviewed, and a follow-up visual assessment of the damage was conducted on May 2, 2018. Prior to the second visual evaluation, the structural members within the fire-damaged area were cleaned using dry ice blasting that allowed a closer look at the extent of the damage. In addition to visual observations, a limited floor delamination survey was performed utilizing a chain dragging device to detect unsound concrete. An acoustical monitoring wheel and hammer sounding was used to detect delaminated concrete on the vertical and overhead elements.

Concrete testing was performed (compressive strength and petrographic examination) and non-destructive evaluation (NDE) was conducted to determine the severity of damage and repair approach. NDE methods included ground penetrating radar (GPR) survey, ultrasonic pulse velocity (UPV) testing, and pulse-echo scanning (Fig. 5).

The visual reviews and delamination survey indicated that fire-related distress had occurred in the form of concrete cracking and spalling, including delaminations identified in several crucial structural beams and columns. The concrete distress was more severe at members near the expansion joint. Core compressive strength testing did not show degradation of compressive strength as a result of the fire event. However, the petrographic examination of the concrete cores indicated the extent of surficial concrete damage as a result of exposure to fire elevated temperatures was up to a depth of 0.4 in (10 mm).

Significant carbonation and cracking were also observed in several core samples and correlated with the NDE (UPV and pulse echo) results at multiple locations at each structural member. GPR scanning of cracked double tee beams with significant longitudinal cracking showed that these cracks were located along the prestressing strands, thus indicating possible debonding between the strand and concrete with subsequent reduction in structural capacity. The petrographic examinations also indicated that the concrete members were exposed to elevated temperatures possibly reaching around 1400 °F (800 °C).

SITE PREPARATION, DEMOLITION AND REPAIRS

Repairs included replacement of members that experienced severe distress, along with localized repairs of members with moderate or minor distress. Repair drawings were issued on June 1, 2018.

Fig. 2: Fire damage on Level 3 of parking garage

Fig. 3: Fire damage at exterior of garage

Fig. 4: Shoring installed in affected area

Once mobilization took place, the perimeter of the precast double tees were saw cut, creating separation of each member to be replaced prior to removal. In preparation of hoisting the existing damaged precast double tees, cores were drilled at each of the four pick points, allowing a sling to be wrapped around the stem for each double tee. A 350-ton (317,500 kg) crane was used to bring down each damaged precast double tee, with a total of 6 removed and 4 new double tees reinstalled. Two of the damaged double tees were found to be salvageable, temporarily placed on the ground, and repaired after they were placed back in their final position. Two existing spandrel beams were hoisted down, hauled off, and replaced with new members (Fig.6). New replacement double tees were hoisted into place for final repairs (Fig. 7).

Fig. 5: Nondestructive testing performed at damaged column

Fig. 6: Spandrel beam replacement

Fig. 7: New double tee beams

Fig. 8: Column repair (a and b)

Other repairs included the concrete columns supporting Level 4 (Fig. 8), spandrel beams on Levels 3 and 4, double tee members on Level 4, topping slab replacement on Level 3, and waterproofing on Levels 3 and 4. The damaged expansion joint system on Level 3 was replaced and a new expansion joint system was installed on Level 4. Joints were tooled in the topping slab and sealed above the double tee flange-to-flange joints, and construction joints were routed and sealed. Cove sealant was installed at the perimeter bumper wall and columns.

SPECIAL FEATURES

Safety

Emergency shoring addressed initial safety concerns for assessing the damage and reducing the threat of a possible collapse. With student finals around the corner at UH, it was understood that the East Garage would need to remain in use on all undamaged levels. This presented another challenge to the construction team: safely making localized repairs to damaged elements with limited intrusion to occupants while considering the safety and comfort of students and staff during the construction.

Logistics

The highly public garage proved to be a limited jobsite space, leaving very little room for building materials and workspace. While the complexities were abundant, the project team worked efficiently to have the garage fully operational by the start of the fall semester. Ultimately, the team was able to come in under budget and ahead of schedule on repairs.

University of Houston East Garage Fire Emergency Response

SUBMITTED BY
Walter P Moore & Associates, Inc.
Houston, TX

OWNER
University of Houston
Houston, TX

PROJECT ENGINEER/DESIGNER
Walter P Moore & Associates, Inc.
Houston, TX

REPAIR CONTRACTOR
United Restoration and Preservation
Houston, TX

MATERIALS SUPPLIER/MANUFACTURER
BASF
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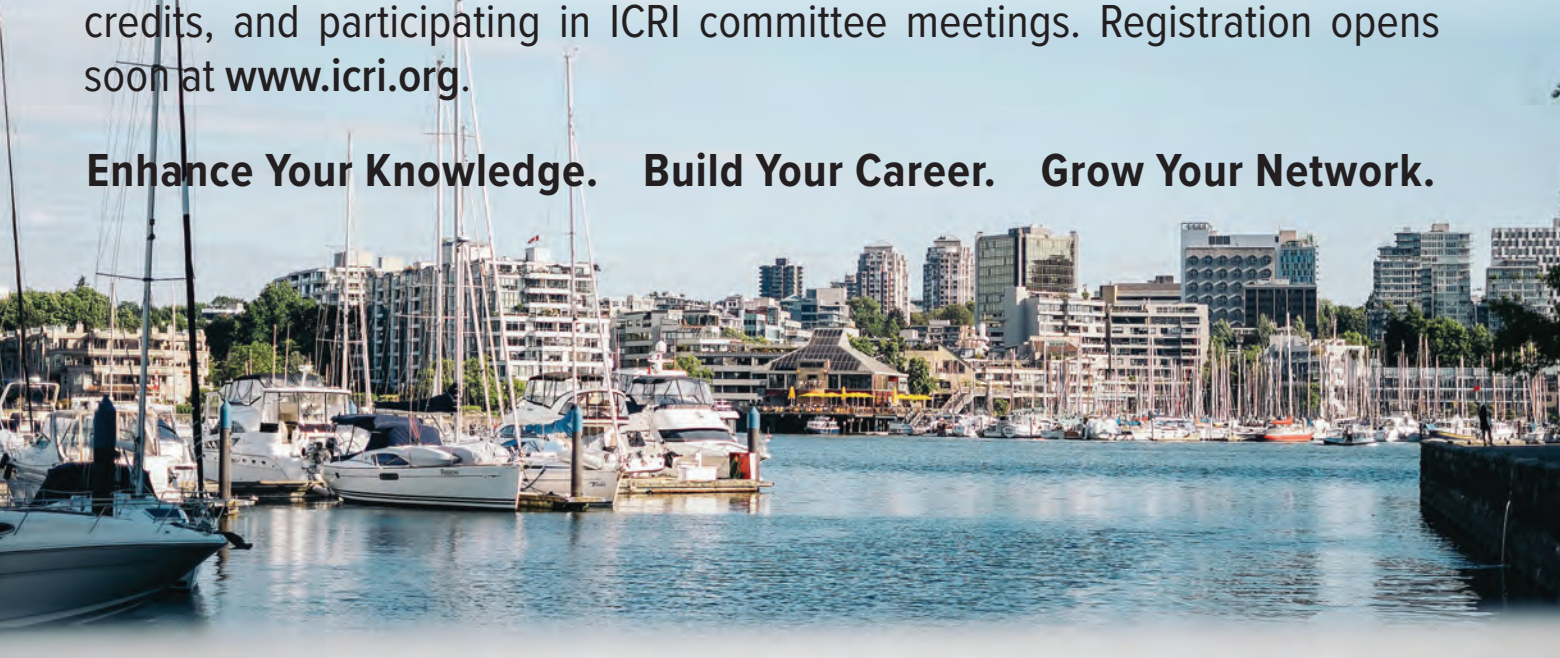

AWARD OF EXCELLENCE

PARKING STRUCTURES CATEGORY

Structural Repair and Renovation of the Plaza Deck and Parking Garage at The Promenade Apartments

MANHATTAN, NEW YORK

SUBMITTED BY SIKA CORPORATION

Fig. 1: The Promenade Apartment Building

INTRODUCTION

Few city addresses can boast of panoramic views that include green trees, views of multiple rivers, ornate bridge spans and picturesque bluffs. Even fewer can claim all those assets in addition to being within walking distance to mass transportation via train and subway that would place you in the middle of Manhattan in less than 20 minutes. Location alone makes this property a preeminent commodity, but before it could be considered a residence matching its excellent surroundings and view, a major overhaul of the building's plaza and parking garage was necessary.

Years of neglect had caused water infiltration throughout the structural decks. Significant deterioration of structural slabs and steel beams had taken place. Areas in the parking garage were repeatedly failing. The steel beams connecting the pedestrian bridge to the garage had rusted so significantly that the bridge needed to be supported just so people could continue to walk on it safely during repairs.

The Renovation of The Promenade Apartments at 150 West 225th Street in Manhattan, NY was a complete transformation of the former Mitchell Lama building (Fig. 1). Developers purchased the 33-story building in 2013 and completed a full scale refurbishment of the building, including a newly renovated lobby, new security system, an electronically monitored package delivery system, and full renovations of the apartments and hallways. The focus of this project is on The Structural Repair and Renovation of the Plaza Deck and Parking Garage.

PLAZA DECK

The building boasts a separate elevated structural deck immediately along the river that runs the entire length of the main plaza, accessible from a staircase that comes down off the main plaza. This veranda places the viewer right alongside the water, albeit 50 ft (15 m) in the air above the river and the Metropolitan Transportation Authority (MTA) train tracks on the ground below.

With active train service nearly 24 hours of the day, and with a significant portion of the plaza cantilevering over these riverside rails, the protection of these tracks with the installation of a protective platform was a major work item for this project (Fig. 2). It was on this work platform that full-depth and overhead concrete repairs were performed; new electrical conduit and lighting installed; drain pipes installed, connected and insulated; and steel cleaned, plated and painted.

As is the case with many metropolitan buildings, this project did not have a significant amount of space to move materials in or out. From the top level plaza deck, a large diameter corrugated plastic pipe debris chute ran down the 2 levels of the garage and onto the ground level below the garage. Once the debris was on the ground level, it was safely loaded into trucks and disposed.

After the concrete topping was removed, the old waterproofing membrane was removed from the structural concrete surface utilizing 3 ft (0.9 m) diameter planetary grinders attached to large dust collecting vacuums. Structural repairs then took place and new drains installed. The plaza parapet wall required stabilization, and new parapets and curbs were installed. Next, the new polyurethane, polyester reinforced waterproofing membrane system was applied (Fig. 3).

The design included the installation of a beautifully landscaped plaza (Fig. 4 and 5), which consisted of aluminum powder coated planter boxes throughout the entire space; a playground with compressive play mat; a wood deck with a steel framed pergola; built-in chaise lounge; two large lawn areas; concrete pathways; a modern privacy fence along two sides; and a decorative fencing for ground level tenants with patios. The entire plaza was also fully lamped with sleek, modern light fixtures.

PEDESTRIAN BRIDGE

The steel framed, concrete pedestrian bridge served as the primary entrance for tenants to access the building main lobby. The steel beams connecting the bridge to the plaza structural steel had deteriorated significantly, mainly due to the failed expansion joint between the bridge and plaza, and years of utilizing snow ice melt. The entire pedestrian bridge was deemed unsuitable for service and demolished and removed (Fig. 6). New steel beams were brought in for the elevated bridge spans, and the connecting girder and support column at that corner of the

Fig. 2: Work platform suspended under the building

Fig. 3: Waterproofed promenade deck along the river

Fig. 4: Planters and landscaping along the length of the plaza

Fig. 5: Play area, planter boxes and landscaping

Fig. 6: Pedestrian bridge demolition

Fig. 7: Concrete placement at the pedestrian bridge

Fig. 8: Tennis court waterproofing membrane

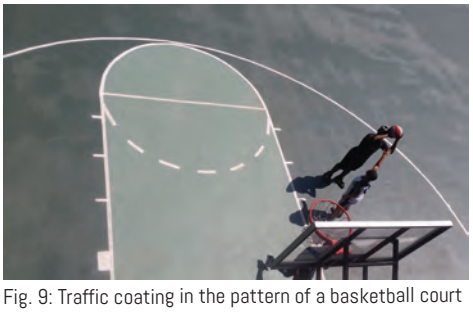

Fig. 9: Traffic coating in the pattern of a basketball court

plaza were spliced with new steel sections. The pedestrian bridge was widened to maximize the width of the entry (Fig. 7).

The pedestrian bridge was completed with traffic coating for extended service life. A new aluminum guard wall was installed using anodized aluminum railings and decorative panels to match the ones throughout the plaza. New aluminum light posts were also incorporated into the fence design.

PARKING GARAGE

The parking garage project included full-depth concrete repairs throughout the 100,000 sf (9,290 sm) garage and were executed while maintaining occupancy for the buildings tenants. Numerous drains were also added throughout the garage.

Once the structural repairs in the garage were complete, new expansion joints with cover plates were installed at all joint locations. Vertical repairs along the perimeter spandrel beam/curb were also performed, and new bollards and fencing installed. Finally, a traffic coating was installed to preserve the repairs and give the garage an extended service life.

In another area adjacent to the garage, a recreational space was created on one of the structural decks, also located over the train tracks. After removing the existing topping and waterproofing, executing the structural slab repairs and installing new deck drains, the structural deck was prepared for a traffic coating where a custom color (forest green) in conjunction with an accent color (light green) were utilized to designate a full size tennis court (Fig. 8) and half-court basketball (Fig. 9).

SUMMARY

This project gave the building a look and finish worthy of its distinctive location. Once completed, residents at The Promenade can now enjoy the outdoors while still being in the middle of the city, all while taking in the extensive water views and natural scenery not common for a Manhattan address, and should provide recreational enjoyment to the tenants for many years to come!

Structural Repair and Renovation of the Plaza Deck and Parking Garage at The Promenade Apartments

SUBMITTED BY
Sika Corporation
Lyndhurst, NJ

OWNER
Nelson Management
Forest Hills, NY

PROJECT ENGINEER/DESIGNER
Lawless and Mangione
Yonkers, NY

REPAIR CONTRACTOR
Infrastructure Repair Service, LLC
Lincoln Park, NJ

MATERIALS SUPPLIER/MANUFACTURER
Sika Corporation
Lyndhurst, NJ

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AWARD OF EXCELLENCE

SPECIAL PROJECTS CATEGORY

Eisenhower Barracks at West Point

WEST POINT, NEW YORK

SUBMITTED BY STRUCTURAL, A STRUCTURAL TECHNOLOGIES COMPANY

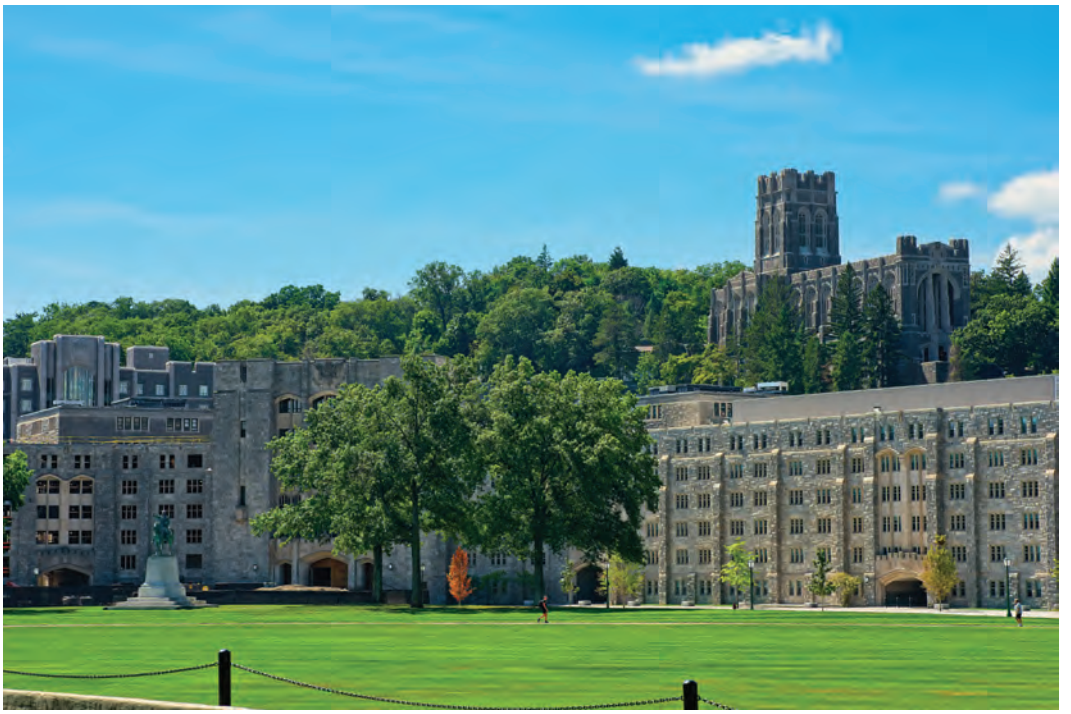

Fig. 1: Eisenhower Barracks

BACKGROUND

The United States Military Academy at West Point developed the Cadet Barracks Upgrade Program to address the housing units on campus. The purpose of this initiative was to modernize the existing barracks to attract the right candidates to the academy, one of which is the Eisenhower Barracks (Fig. 1). Originally built in 1968, the Eisenhower Barracks were beginning to succumb to the universal factors that plague buildings in need of repair – time and use.

For five decades, the housing unit had served well under its current load and use; however, dramatic signs of deterioration began to appear. The overstress from heaving moment, punching shear, and localized beam shear caused cracking. The cracking, concrete delamination and spalling, and other aesthetic modifications adjusted the way the building reacted when supporting new loads. With the modifications and the updated mechanical, electrical, and plumbing systems, the owner needed to ensure that the building had suitable strength to support the new renovation. For the project to be successful, the building needed strengthening for the new loads.

CONDITIONS AND EVALUATION

While general inspections were performed by others, the project team completed their own internal inspections. This gave the QA/QC team more insight into the issues of the building, which helped the team to develop better and unique solutions to the problems. Most of the concrete deterioration and cracking could be determined visually. The delaminations were identified by using a geology hammer and chains to sound the surfaces.

Based on the evaluation, the primary task for the project team was to restore and strengthen the structure's load capacity. This included strengthening six floors of slab with concrete repairs, penetration and crack infills, shear capitals, and CFRP installation. The renovation also included concrete repairs to the walls, ceiling, and beams, in addition to strengthening the beam's shear with CFRP.

PREPARATION AND CONSTRUCTION

Prior to demolition, the existing interior fixtures were completely removed by the general contractor. The project team utilized a laydown area and containment unit on-site. Then, crews hydro-blasted the column tops and shotblasted the slabs (Fig. 2 and 3). Ultra high-pressure hand lances were also used to create the required surface profile and strengthen the punching shear drop panels. Once the site was prepared for construction, the repairs started on the sixth floor and worked downward to the basement and were performed from ceiling to floor.

The shear capitals were reconstructed not only by using a CFRP solution, but also incorporating formwork and utilizing versa pumps that put pressure on the shear capitals to ensure an integral bond between the new and existing concrete (Fig. 4). By utilizing the pressurized form and pump method of concrete placement for the overhead drop panels, structural integrity was restored.

Prior to installing the CFRP solution, standard QA/QC tests were conducted (Fig. 5). By setting and pulling bare concrete "pucks" on each floor, a map of all crack repairs was developed and updated daily to stay ahead of installation.

Once the strengthening work was complete, deteriorated wall and column slabs were restored and included over 2100 sf (195 sm) of spall repairs and crack, wall, and slab infills. Once everything cured, the CFRP was installed on the floor slabs, and included the installation of 8 in (200 mm) and 50 in (1270 mm) of CFRP (Fig. 7, 8 and 9).

During repairs, it was discovered that the basement also required a new plumbing system. For the system to be installed, the concrete placement work, wall infills, and CFRP installation had to be performed on required beams in the basement trenches.

CHALLENGES

As a design-build project, the team had to come up with a design that incorporated the engineer's requirements and general contractor's limited budget. Establishing the line of communication for this project proved to be challenging, as the initial set up for the process was geared towards a bid-build project, rather than design-build.

Another unique challenge was working on the West Point campus. As a military academy, everyone on the project was required to undergo a background check,

Fig. 2: Barrack slabs prepared by shotblasting before installing the crack infills and CFRP

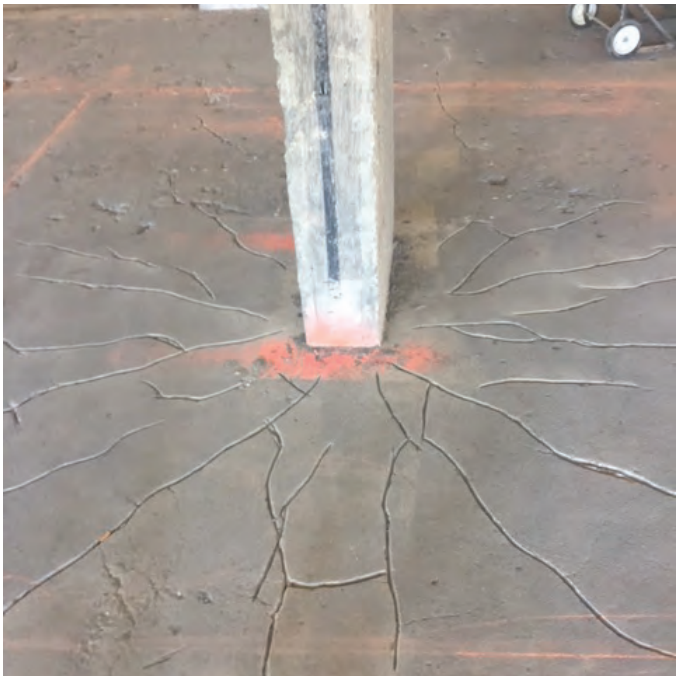

Fig. 3: Waterproofed promenade deck along the river

Fig. 4: Shear capital repair - (a) preparing and reinforcing the concrete surface, and (b) installed formwork prior to concrete pumping

Fig. 5: Witness panels and epoxy resin cups for the QA/QC plan

Fig. 6: Installing the final epoxy resin layer for CFRP (also performed to "knock down" any fiber edges)

Fig. 7: The hallway and room slabs after the CFRP installation, focusing on the 8 in (200 mm) wide application

Fig. 8: The hallway and room slabs after the CFRP installation, focusing on the 50 in (1270 mm) wide application

a security screening process, and coordinate site visits prior to beginning work. In addition, the campus was active throughout the renovation, which required advanced notices for all deliveries. Special occasions also required mandatory shut downs that would range from hour long events to multiple day celebrations.

CONCLUSION

The Eisenhower Barracks at West Point is a good example of how the design-build process can effectively restore a deteriorating structure. By developing unique solutions, using new technologies and equipment, and leveraging a repair and installation team, the Eisenhower Barracks were restored.

Throughout the entire project, the team collaborated on the design, material supply, and creation of a specialized strengthening solution for the historical barracks on the military campus. The team was able to strengthen 99 beams in total by adding new shear capitals and installing roughly 90,000 sf (8360 sm) of CFRP. In addition to the strengthening work, the wall, ceiling, and beam slabs were also repaired.

Eisenhower Barracks at West Point

SUBMITTED BY
STRUCTURAL, A Structural Technologies Company
Long Island City, NY

OWNER
US Army Corps of Engineers
Washington, DC

PROJECT ENGINEER/DESIGNER
Mason & Hanger
Lexington, KY

REPAIR CONTRACTOR
STRUCTURAL, A Structural Technologies Company
Long Island City, NY

MATERIALS SUPPLIER/MANUFACTURER
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AWARD OF MERIT

HIGH-RISE CATEGORY

The Ritz-Carlton Naples Façade Repair

NAPLES, FLORIDA

SUBMITTED BY TADJER-COHEN-EDELSON ASSOCIATES, INC.—MCLEAN, VIRGINIA

The Ritz-Carlton Naples is a luxury beachfront resort located in Naples, Florida. The property is situated on a parcel of land adjacent to Vanderbilt Beach and Pelican Bay along the Gulf Coast of Southwest Florida. The five star resort was opened in December 1985 and is approximately 34 years old. The resort contains 450 guest rooms, numerous restaurants, ballrooms, meeting rooms, spa and fitness facility, swimming pools, tennis courts and beachfront amenities. The main hotel tower is thirteen- stories with a U-shape footprint consisting of three wings (center, north and south) with the open section of the U facing west toward the Gulf of Mexico providing water views for all guest rooms. The building frame consists of 6.5 in (170 mm) reinforced concrete slabs over reinforced concrete beams and columns supported by a grade beam and pile foundation.

Damaging storms and prolonged exposure to the elements over many years in service subjected the façade to coating failure, caulking deterioration, corrosion of metal stucco corner beads and control joints, stucco cracking and stucco delamination. In addition, prolonged water migration caused deterioration of the cold-formed steel wall studs supporting the façade and leakage into rooms. The reinforced concrete balcony slabs experienced cracking and spalling slab edges.

A repair program was developed to restore structural and water resisting components to their intended original integrity. The repair program consisted of four main components:

- Façade repairs (stucco repairs, hammerhead walls, balcony slab repairs, coatings, sealants)
- Lobby door and window replacement (hurricane impact systems)
- Roof replacement (3rd floor flat roof and Vanderbilt Ballroom roof)
- Waterproofing repairs (covered arcades and rear planters, spa terrace)

Various challenges during this repair project included restraints from strict schedule requirements, magnitude of repairs, scope complexity, severe weather during work and unforeseen conditions.

The Ritz-Carlton Naples Façade Repair

OWNER
Host Hotels & Resorts
Bethesda, MD

PROJECT ENGINEER/DESIGNER
Tadjer-Cohen-Edelson Associates, Inc.
McLean, VA

REPAIR CONTRACTOR
Complete Property Services Inc.
Tampa, FL

MATERIALS SUPPLIER/MANUFACTURER
STO Corporation
Atlanta, GA

AWARD OF MERIT

HISTORIC CATEGORY

Northeastern State University Wilson Hall Renovation

TAHLEQUAH, OKLAHOMA

SUBMITTED BY RESTEK, INC.—EDMOND, OKLAHOMA

Wilson Hall, originally constructed as a women's dormitory on the main campus of Northeastern State University (NSU), is one of NSU's oldest buildings. Constructed in 1936 with an addition to the north side of the building built in the 1960s, the 75,000 sf (6970 sm) building consists of a basement, three floors and an attic space. A recommendation in the 2012-2013 campus master plan prompted NSU to move forward with a decision to renovate the facility and design a new space for the College of Liberal Arts, complete with offices for both faculty and administration, classrooms, an event space and a new dining venue. The motivation behind renovating Wilson Hall instead of reconstructing stems from the sentimental attachment to the building from NSU alumni and current students alike.

The dormitory had been out of use for the last 10 years and had deteriorated heavily since its closure. Necessary architectural changes like removing and adding walls, egress path modifications and increased live loads resulted in the entire building needing structural upgrades to meet current building codes. Wilson Hall is a multi-wythe masonry structure with reinforced concrete beams, slabs, and columns, so strengthening the system while preserving the integrity of the building was challenging. Various strengthening strategies were evaluated for the deficient beams and slabs and an externally bonded fiber-reinforced polymer (FRP) system was selected as the least intrusive and most aesthetically-pleasing approach to maintain the historical look and feel of the building. In locations where the loads were too high for the FRP solution to work, steel beams were used.

The final phase of this project will include new walls for office spaces, mechanical systems and electrical systems. The fundraising for this project is continuous with funding from the university, the state and the community.

Northwestern State University Wilson Hall Renovation

OWNER
Northeastern State University
Tahlequah, OK

PROJECT ENGINEER/DESIGNER
Guernsey
Oklahoma City, OK

REPAIR CONTRACTOR
Restek, Inc.
Edmond, OK

MATERIALS SUPPLIER/MANUFACTURER
Milliken Infrastructure Solutions, LLC
Spartanburg, SC

AWARD OF MERIT

HISTORIC CATEGORY

The Lancaster Hotel

HOUSTON, TEXAS

SUBMITTED BY WALKER CONSULTANTS—HOUSTON, TEXAS

The Lancaster Hotel is a twelve-story historic structure, built in 1926. Originally known as "The Auditorium Hotel," the Lancaster was designated a Recorded Texas Historic Landmark by the Texas Historical Commission (THC) in 1984. The hotel was also accepted into the Historic Hotels of America Program of the National Trust for Historic Preservation, representing the Jazz Age, in 2010.

The structure is a reinforced concrete frame with clay tile in-fill, single-wythe brick veneer and ornamental cast stone accents. Deterioration was exhibited on the brick façade, stucco façade, and cast stone units, primarily at the top level of the structure on the south and west elevations. In addition, the structure included cracks at the spiral columns and mortar joints and localized surface spalling of the cast stone trim and spandrel panels with missing ornamental cast stone spiral columns and brackets and corroded steel lintels and shelf angles.

A condition assessment was performed that included a binocular survey from the ground and adjacent structures, close-up observation from suspended scaffolding, and laboratory analysis of selected exterior wall materials. The deterioration was determined to be a result of the lack of adequate cover of the cast stone reinforcement and water infiltration into the exterior wall which resulted in corrosion of the façade anchors.

A restoration program was developed to address façade distress and waterproofing issues meeting the Texas Historical Commission requirements. Severely corroded lintels were replaced, spalled brick façade restored, and in-place cast stone architectural columns and brackets repaired. Molds were manufactured from physical spiral column and bracket samples using photogrammetry technology (the science of making measurements from photographs) to develop 3D physical models of the spandrel cast stone units, and was effective in replacing ornate historical building features without damaging the existing conditions of the facade, reducing design and construction costs.

The Lancaster Hotel

OWNER
Lusk Properties, Inc.
Houston, TX

PROJECT ENGINEER/DESIGNER
Walker Consultants
Houston, TX

REPAIR CONTRACTOR
Western Specialty Contractors
Garland, TX

MATERIALS SUPPLIER/MANUFACTURER
Precision Development Cast Stone
Houston, TX

AWARD OF MERIT
LONGEVITY CATEGORY

Sound of the Sea II Condominiums

EMERALD ISLE, NORTH CAROLINA

SUBMITTED BY SSRG, STRUCTURAL SYSTEMS REPAIR GROUP—CINCINNATI, OHIO

Sound of the Sea II Condominiums were constructed in 1984, and consist of a 6-level reinforced concrete building with 36 individually owned units. It is located on the 3/4 mile (1.2 km) wide Bogue Banks barrier island within a few hundred feet of the Atlantic Ocean in Emerald Isle, NC. The facility includes exterior common access corridors (walkways) on the front side of the building and private balconies at each unit.

A $1.2M repair and cathodic protection project was undertaken in 2007 to address corrosion-related distress and deterioration of corridors, balconies, roof parapets and other components at the condominium building. Structural concrete repairs included replacement of balcony slab edges and repairs at slabs, columns and walls. A number of challenges were encountered during the project, including coordination for reuse of guardrails, budgetary constraints, repair of extensive unknown damage, coordination to leave balcony sliding glass doors in place and protected during the project, and time constraints.

The project included impressed current cathodic protection (ICCP) on approximately 4660 sf (435 sm) of balconies and local galvanic protection in other areas. Depolarization testing conducted in 2008 and 2019 at embedded reference cells in balconies has shown that the impressed current system is effectively protecting steel. Coatings have also performed well and are still in use. Owners have communicated that a relatively low amount of maintenance has been needed over the past 10 years. Review of the building has confirmed that repairs have held up well and the cathodic protection system is providing protection, despite a number of hurricanes that have impacted the area since 2008.

This project is an excellent example of how ICCP can provide long-term service-life extension and that strategically selecting different preservation strategies on a building can provide an economic, effective long-term benefit.

Sound of the Sea II Condominiums

OWNER
Crossroads
Cincinnati, OH

PROJECT ENGINEER/DESIGNER
Model Group
Cincinnati, OH

REPAIR CONTRACTOR
SSRG, Structural Systems Repair Group
Cincinnati, OH

SUBCONTRACTOR
Southern Cathodic Protection
Atlanta, GA

MATERIALS SUPPLIER/MANUFACTURER
Western Hills Building Supply
Cincinnati, OH

AWARD OF MERIT

PARKING STRUCTURES CATEGORY

Poff Federal Building

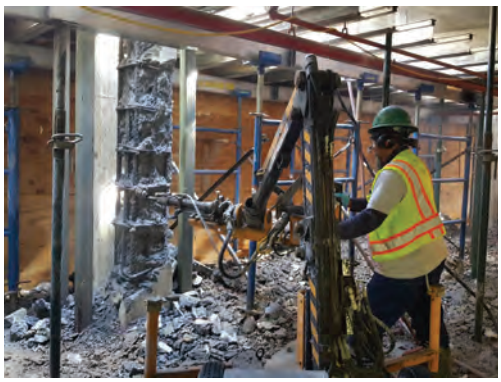
ROANOKE, VIRGINA

SUBMITTED BY CONCRETE PROTECTION & RESTORATION INC.—BALTIMORE, MARYLAND

The Poff Federal Building, located in Roanoke, Virginia, is a 14-story high-rise building that houses 400 to 500 government employees and offices for the General Services Administration (GSA) and the Circuit Court. Weathering over the last 40+ years had taken its toll on the parking garage. Visual spalling and deterioration of the concrete sparked concerns regarding the structural integrity of the garage and was a portion of a major renovation to the facility.

The garage repairs were split up into two phases; each phase being approximately half of the garage. In order to keep the building fully functional and the project on schedule, protective measures were implemented to allow for continued use of the garage and office building. The existing 32,000 sf (2975 sm) upper level of the parking garage consisted of an elevated 6 in (150 mm) concrete slab with an additional 6 in (150 mm) asphalt topping. In order to complete the concrete repairs, the asphalt topping and 3 to 3.5 in (75 to 90 mm) of concrete slab surface was removed using hydrodemolition. Exposed rebar was cleaned, rebar that was severely corroded and had reduced sectional area was replaced, and an additional mat of rebar was installed. A concrete overlay was installed to match the previous elevations.

In addition, 508 lf (155 m) of full beam replacement was completed and six columns were replaced due to extensive concrete spalling and corrosion in the existing reinforcement. The underside of the beams that support the upper level of the parking structure were protected with a corrosion inhibitor treatment and a traffic membrane system and expansion joint were installed on the upper level of the garage. The Owner was also able to incorporate security enhancements to the garage/facility during construction while repairing the garage for continued use.



Poff Federal Building

OWNER
Hoar Construction
Birmingham, AL

ROJECT ENGINEER/DESIGNER
MTFA Architecture, Inc.
Arlington, VA

REPAIR CONTRACTOR
Concrete Protection & Restoration Inc.
Baltimore, MD

MATERIALS SUPPLIERS/MANUFACTURERS
Boxley Materials Company
Blue Ridge, VA

HD Supply
Atlanta, GA

AWARD OF MERIT

SPECIAL PROJECTS CATEGORY

Trinity Stadium Rehabilitation

HAVERHILL, MASSACHUSETTS,

SUBMITTED BY SIMPSON GUMPERTZ & HEGER, INC..—WALTHAM, MASSACHUSETTS

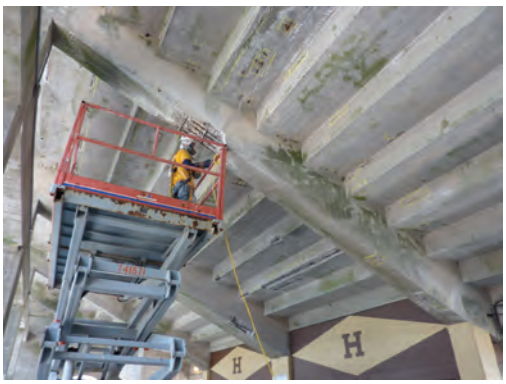
Trinity Stadium (formerly Haverhill Stadium), first opened in 1916, has a rich history spanning from its grandstand reconstruction in 1935-1937 as part of President Roosevelt's Works Progress Administration to the hosting of legendary sports greats, such as Babe Ruth and Lou Gehrig.

The grandstand experienced severe and widespread concrete deterioration due to nearly seventy years of exposure to weather, resulting in half of the stadium being removed from service approximately twenty years ago. In 2007, the City of Haverhill, Massachusetts, started planning the rehabilitation of the grandstand to restore full use of the stadium and extend its useful service-life.

Deterioration was predominately due to cyclic freezing and thawing action. While some damage was severe and required repair or replacement, there was little to no damage in other locations. By repairing the deteriorated concrete and protecting the remaining concrete, the useful service-life of the grandstand was restored, while allowing the majority of the existing concrete to remain in place.

The rehabilitation program for the Trinity Stadium grandstand integrates various technical features to maximize preservation of the original fabric, while also upgrading the structure with additional desired functions. The project not only included small-scale localized concrete repair, large-scale complete reconstruction, application of a new waterproofing membrane, and repair of the joints, but also incorporated the addition of an accessible seating area at the front of the grandstand.

The City of Haverhill undertook years of fund raising to support the grandstand's rehabilitation. With 83 years of civic history, personality, and character, it is a special place deserving respect and appreciation. By undertaking a phased rehabilitation program the city was able to accomplish the necessary repair work within their budget, reopen portions that were previously closed due to the severe deterioration, and preserve the grandstand for years to come.



Trinity Stadium Renovation

OWNER
City of Haverhill
Haverhill, MA

PROJECT ENGINEER/DESIGNER
Simpson Gumpertz & Heger, Inc.
Waltham, MA

REPAIR CONTRACTOR
The Aulson Company LLC
Methuen, MA

MATERIALS SUPPLIERS/MANUFACTURERS
Sika Corporation
Lyndhurst, NJ

Willseal
Hudson, NH

AWARD OF MERIT

WATER STRUCTURES CATEGORY

Innovative Repairs Restore Northern Spillway Pier

MANITOBA, CANADA

SUBMITTED BY VECTOR CONSTRUCTION LTD.—WINNIPEG, MANITOBA, CANADA

The Slave Falls Generating Station is located on the Winnipeg River, about 35 km (22 miles) east of Lac du Bonnet, Manitoba. The first unit went into service in 1931, three years after initial construction began on the $8.3 million-dollar facility. By the time construction was completed in 1948, eight vertical propeller type turbine generators were in service with a combined capacity of 68 MW. Today, the generating station has an average annual generation of 499 million kWh.

After 87 years of service in an aggressive northern environment, the structure needed some maintenance. Yearly safety inspections between 2008 and 2017 showed an escalation in deterioration and spalling at the base of the pier, suggesting freeze-thaw damage and corrosion of the reinforcing steel. Of primary concern was the increasing risk of structural failure, which could result in an uncontrolled flow of water.

To fully assess the integrity of the existing concrete, a combination of destructive (concrete cores) and non-destructive testing (hammer sounding and sonic/ultrasonic testing) was conducted. The results of the evaluation indicated that one of the piers (Pier 1) had concrete defects beyond the original scope of the project, requiring far more work than concrete "chip-and-patch" repairs. The results prompted an immediate project shut down to develop a new scope of work to address safety concerns. A concrete containment wall - or "jacket" - was devised as a temporary stabilization solution which would allow the spillway to operate normally, along with containing the pier in the event of a failure.

After safe access to the work area was established and water control measures had been completed, heating and hoarding on Pier 1 was necessary to allow it to warm above freezing to ensure the existing concrete sluiceway was safe to construct the concrete containment wall.

Innovative Repairs Restore Northern Spillway Pier

OWNER
Manitoba Hydro
Winnipeg, Manitoba, Canada

REPAIR CONTRACTOR
Vector Construction Ltd.
Winnipeg, Manitoba, Canada

MATERIALS SUPPLIER/MANUFACTURER
NDT Corporation
Sterling, MA

CONCRETE REPAIR CALENDAR

NOVEMBER 11-13, 2019
2019 ICRI Fall Convention
Historic Restoration: The Art and Science of Preserving Structures
Philadelphia, PA
Website: **www.icri.org**

NOVEMBER 14, 2019
ICRI Certification: Concrete Surface Repair Technician Live Performance Exam
Philadelphia, PA Area
Hosted by ICRI Delaware Valley Chapter immediately following the ICRI Fall Convention
Website: **www.icri.org**

FEBRUARY 3-7, 2020
World of Concrete 2020
Las Vegas, NV
Website: **www.WorldofConcrete.com**

MARCH 23-25, 2020
2020 ICRI Spring Convention
Repairs in New Construction
Vancouver, BC, Canada
Website: **www.icri.org**

MARCH 29-APRIL 2, 2020
The ACI Concrete Convention and Exposition - Spring 2020
Chicago, IL
Website: **www.aciconvention.org**

OCTOBER 4-6, 2020
2020 ICRI Fall Convention
Minneapolis, MN
Website: **www.icri.org**

OCTOBER 25-29, 2020
The ACI Concrete Convention and Exposition - Fall 2020
Raleigh, NC
Website: **www.aciconvention.org**

ICRI CONCRETE REPAIR
Restore | Repurpose | Renew

INTERESTED IN SEEING YOUR EVENT LISTED HERE?

Events can be emailed to editor@icri.org. Content for the January/February 2020 issue is due by December 1, 2019 and content for the March/April 2020 issue is due by February 1, 2020.

ICRI COMMITTEES

Administrative Committees

ICRI Board of Directors
Chair: Chris Lippmann, HDSupply

Awards Committee
Chair: Brian MacNeil, Kryton International Inc.

Certification Committee
Chair: Thomas Donnelly, Sika Corporation

Chapters Committee
Chair: Michelle Nobel, Sika Corporation

Conventions Committee
Chair: Ingrid Rodriguez, Ingrid Shawn Corp.

Education Committee
Chair: Bryan Heery, Everclear Enterprises, Inc.

Executive Committee
Chair: Chris Lippmann, HDSupply

Fellows Committee
Open to attend, must be a fellow to join.
Chair: Peter Golter, 3M

Finance Committee
Chair: John McDougall, Baker Restoration

Marketing Committee
Chair: Jessi Meyer, Cortec Corporation

Membership Committee
Chair: Jeff Barnes, Barnes Consulting

Nominating Committee
Contact chair with questions, open only to those elected.
Chair: Brian Daley, C.A. Lindman of South Florida LLC

Publications Committee
Chair: Jerry Phenney, MAPEI

Technical Committees

Technical Activities Committee (TAC)
Chair: Mark Nelson, Nelson Testing Laboratories

TAC-A Technical Programs
Chair: Peter Golter, 3M

Committee 110—Guide Specifications
Chair: Liying Jiang, Simpson, Gumpertz & Heger

Committee 120—Environmental Health and Safety
Chair: Paul Farrell, Carolina Restoration and Waterproofing

Committee 130—Procurement Methods and Relationship Arrangements
Chairs: Jeffrey R. Carlson, Consulting Engineers Group, Inc., and Michael Saulnier, ABC Supply

Committee 160—Life Cycle and Sustainability
Chair: I-Wen Huang, BASF

Committee 210—Evaluation
Chairs: Charles Mitchell, Eastern Testing & Inspection and David Rodler, Smislova, Kehnemui & Associates, P.A.

Committee—310 Surface Preparation
Chair: Pete Haveron, Texas Concrete Restoration, Inc.

Committee 320—Concrete Repair Materials and Methods
Chair: Mark Kennedy, Simpson Strong-Tie Company, Inc.

Committee 330—Strengthening and Stabilization
Chair: Tarek Alkhrdaji, Structural Technologies

Committee 410—Masonry
Chairs: Jason Coleman, O'Donnell & Nacarrato, Inc.

Committee 510—Corrosion
Chair: Jorge Costa, Durability, Inc.

Committee 710—Coatings and Waterproofing
Chair: Mark Nelson, Nelson Testing Laboratories

Advisory Committees

Coordination Committee
Chair: Rick Edelson, Edelson Consulting Group LLC

Secretariat
Chair: Jeffrey S. Barnes, Barnes Consulting Group, LLC

Special Interests

Women in ICRI
Organizers: Katherine Blatz, BASF South East Asia Pte Ltd, and Monica Rourke, MAPEI

ICRI committees are open to **all** and they are looking for **your** involvement. Lend your expertise and help improve the industry! For more information on ICRI committees visit the committee page at **www.icri.org**.

INDUSTRYNEWS

CONCRETE INDUSTRY MANAGEMENT PROGRAM SEEKS DONATIONS FOR 2020 AUCTION AT WORLD OF CONCRETE

The Concrete Industry Management (CIM) program – a business intensive program that awards students with a four-year Bachelor of Science degree in Concrete Industry Management – is seeking donations for their 2020 CIM Auction to be held at World of Concrete. The auction is scheduled for Wednesday, Feb. 5 at the Las Vegas Convention Center. The silent auction will be held from 11 a.m. to 1 p.m. and the live auction begins at 1 p.m.

The proceeds from the 2020 CIM Auction will benefit the CIM National Steering Committee (NSC) and support the current CIM programs at Middle Tennessee State University, New Jersey Institute of Technology, Texas State University and California State University – Chico.

CIM Auction organizers are hoping for another record event in 2020. The 2019 auction was the best ever, raising a record-breaking $1.2 million in gross revenue.

Previous auction items have included concrete mixer trucks, cement, skid steers, concrete saws, drills, mixers, vibrators, scaffolding, safety equipment, screeds, fiber transport systems, dust collectors, NDT equipment, decorative concrete tools, water meters, pumps, generators, training sessions, reference books, advertisements, laptop computers, mobile computers, sports memorabilia, sports travel packages, golf packages and vacation travel packages.

Interested in making a donation? Contact CIM Auction Committee Chairman Ben Robuck at ben.robuck@cemex.com or (404) 456-6867.

AUSTRALIAN CARPET & TILE STANDARD NOW INCORPORATES IN SITU RELATIVE HUMIDITY TEST

Contractors can comply with AS 2455.1 using in situ RH test to measure concrete slab moisture.

Wagner Meters announced the update to AS 2455.1 (Textile floor coverings - Installation practice - General) allowing the use of the in-situ relative humidity (RH) probes to test the moisture condition of concrete subfloors below the surface. The nationwide Australian standard was approved on April 15, 2019, by the members of the TX-009 Joint Technical Committee on behalf of the Council of Standards Australia.

The Australian Standard AS 2455.2 (Textile floor coverings - Installation practice - Carpet tiles), which specifies the requirements for the installation of carpet tiles, defers to AS 2455.1 for standards on how to prepare a floor for secure installation.

Thus, in situ RH testing now joins the hood test, as one of only two test methods accepted for concrete testing during floor preparation.

Use of the in situ RH test in Southern Hemisphere Pacific Rim countries accelerated in the 1980s when a New Zealand trade association provided its members with the Edney gauge hygrometer. Later, research in Sweden in the 1990s identified the proper depth at which an RH probe could yield the most accurate indication of the moisture condition of the concrete when the flooring will be installed. This and other bodies of research formed the foundation of the American ASTM F2170 Standard (Standard Test Method for Determining RH in Concrete Floor Slabs Using in situ Probes).

The hood test, withdrawn from American ASTM standards in December of 2014, measures moisture vapor emissions from the slab surface, the hood test was proven unreliable from a preliminary Precision and Bias conducted in 2013 by ASTM members.

In situ RH probes, which are inserted into the slab to get readings below the surface, are now stipulated to get an accurate measure of concrete moisture condition in compliance with Australian AS 2455.1 and AS 2455.2 standards.

BEST PAPER AWARD AT THE CONCRETE 2019 CONFERENCE VINSI PARTNERS AND PORT OF NEWCASTLE

Vinsi Partners are proud to announce that in conjunction with its co-authors the Port of Newcastle they have been awarded the inaugural Best Paper Award at the recent Concrete 2019 conference by the Concrete Institute of Australia. The paper and presentation was chosen from 230 entries.

SIMPSON STRONG-TIE SUPPORTS HABITAT'S ANNUAL CARTER WORK PROJECT

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, renewed its sponsorship of Habitat for Humanity's yearly Jimmy & Rosalynn Carter Work Project. The Carter Work Project is a week-long build alongside former President Jimmy Carter and former First Lady Rosalynn Carter. The 36th annual project took place in Nashville, TN, October 6-11, 2019.

Along with monetary and product donations, Simpson Strong-Tie sent 17 volunteers from its Gallatin, TN, and Columbus, OH, facilities to help 21 families build their new Habitat homes in cooperation with hundreds of other volunteers.

INDUSTRYNEWS

Since 1984, President and Mrs. Carter have been champions and strong voices for affordable, decent housing for all, donating their time and leadership each year to build and improve homes through Habitat for Humanity's Jimmy & Rosalynn Carter Work Project. The Carters have worked alongside 103,000 volunteers in 14 countries to build, renovate and repair over 4,000 homes.

SIMPSON STRONG-TIE SUPPORTS HURRICANE DORIAN RELIEF EFFORTS

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, donated $10,000 to the American Red Cross Disaster Relief Fund to assist relief efforts in the Bahamas and southeastern United States after Hurricane Dorian struck earlier this month.

Hurricane Dorian was the first major hurricane of the 2019 season in the Atlantic, and is on record as the most powerful tropical cyclone ever to hit the Bahamas. Many structures in the Bahamas were destroyed or swept out to sea, leaving approximately 70,000 people homeless throughout the islands.

At least 53 people died from the hurricane, and over a thousand people have been reported missing in the Bahamas. Property damage is estimated at a staggering $7 billion.

INDUSTRYNEWS

IAPMO UES EC 038 – EVALUATION CRITERIA FOR DIAPHRAGM STRENGTHENING USING FIBER REINFORCED POLYMERS

Fyfe Co., an Aegion company, is pleased to announce the International Association of Plumbing and Mechanical Officials (IAPMO) has established the first ever evaluation criterion to address the seismic strengthening of concrete floor and roof diaphragms using fiber-reinforced polymer (FRP) systems.

The inventory of non-ductile concrete buildings and the requirements for seismic upgrades set forth in California's Seismic Retrofit Ordinances has created an urgent need to provide owners with more cost-effective solutions. Fyfe has been working with industry professionals, building officials and other stakeholders for over two years to establish an engineering criterion that will allow designers to use FRP systems as an alternate to conventional reinforcing schemes, which in most cases require more time and money to install than an FRP system.

Fyfe is preparing to receive certification from IAPMO and expects its Tyfo® system will become the first FRP system listed by the building code for seismic strengthening of concrete floor and roof diaphragms.

SIMPSON STRONG-TIE® TEAM WINS CALIFORNIA PRESERVATION FOUNDATION AWARD FOR SEISMIC RETROFITTING OF NAPA COUNTY COURTHOUSE

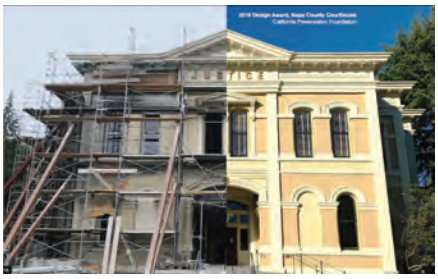
Simpson Strong-Tie, as part of a collaborative reconstruction, seismic retrofitting, and historic restoration project team, has been awarded a 2019 Preservation Design Award for Restoration from the California Preservation Foundation for the restoration of the Napa County Courthouse, which was critically damaged by the South Napa earthquake on April 14, 2014.

Registering 6.0 on the moment magnitude scale, the South Napa earthquake was the strongest to hit the San Francisco Bay Area since the 1989 Loma Prieta earthquake. In addition to damaging the plaster finishes, HVAC, and finish carpentry, the earthquake caused significant structural damage to the courthouse's existing unreinforced masonry walls.

Repairs and seismic retrofitting on the courthouse began in 2017, conducted by a team including AECOM as the project and construction manager, Carey & Company (now TreanorHL) as the historic architect, ZFA Structural Engineers, and TLCD Architecture. Simpson Strong-Tie participated in or served as an advisor on various aspects of the restoration.

Although several construction methods were considered for the repair of the courthouse structure, concrete masonry unit (CMU) walls were rebuilt to replace the most heavily damaged masonry walls, while fabric-reinforced cementitious matrix (FRCM) technology was selected instead of more traditional repointing and grout injection as a repair solution for the less damaged walls with their countless small cracks.

FRCM systems are currently being introduced in the structural repair and rehabilitation industry as a new, effective strengthening technology offering reduced thickness, excellent durability, superior performance in high temperatures, and ease of installation versus traditional strengthening and repair methods. Because FRCM systems add less weight to the structure, they provide an excellent solution for strengthening concrete and masonry substrates, particularly in seismic retrofit applications.



The grand reopening took place January 22, 2019.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your 150-200 word industry news to editor@icri.org. Content for the January/February 2020 issue is due by December 1, 2019 and content for the March/April 2020 issue is due by February 1, 2020. ICRI reserves the right to edit all submissions.

ASSOCIATIONNEWS

ACI UPDATES FLATWORK FINISHING CERTIFICATION PROGRAM NAMES AND REQUIREMENTS

Updated names include ACI Concrete Flatwork Associate, ACI Concrete Flatwork Finisher, and ACI Advanced Concrete Flatwork Finisher

The American Concrete Institute (ACI) has updated the names and requirements for its Flatwork Finishing Certification program. ACI Concrete Flatwork Technician has been renamed as ACI Concrete Flatwork Associate; ACI Concrete Flatwork Tradesman has been renamed as ACI Concrete Flatwork Finisher; and ACI Concrete Flatwork Finisher and Technician has been renamed as ACI Advanced Concrete Flatwork Finisher.

To earn a new ACI Concrete Flatwork Associate certification, individuals need to pass a written exam. To earn a new ACI Concrete Flatwork Finisher certification, individuals need to pass a performance exam and have 1,500 hours of documented work experience. To earn a new ACI Advanced Concrete Flatwork Finisher certification, individuals need to both pass a written exam and either have 4,500 hours of work experience or have 1,500 hours of work experience and pass a performance exam. Additionally, the ACI Concrete Flatwork Finisher and ACI Advanced Concrete Flatwork Finisher programs will have an optional re-certification method through submittal and verification of approved continuing education and work experience.

To learn more about ACI Certification, visit whyACIcertification.org.

TACA HOSTS ENVIRONMENTAL & SUSTAINABILITY SEMINAR

Industry Panel Explores the Financial and Community Value of Conservation Easements

The Texas Aggregates & Concrete Association (TACA)—the leading state trade association for the aggregate, concrete, cement and associated industries—welcomed more than 90 attendees to its Environmental & Sustainability Seminar on Sept. 10-12 at the Marriott Riverwalk in San Antonio, Texas.

At the conference, TACA's "WIN-WIN-WIN: The Financial and Community Power of Conservation Easements" panel, explored what happens when mining companies consider their post-mining land uses, and—in concert with land trusts—seek to capture the land's remaining value. Panel thought leaders included Jim Bradbury, attorney-at-law; Tim Mallicoat, president and CEO, Rasmussen Group that operates the Hallett Materials Company in Texas; and Lori Olson, executive director, Texas Land Trust Council. Jill Boullion, executive director, Bayou Land Conservancy, moderated the discussion.

Olson kicked off the panel by defining just what a conservation easement is: "a written, legal agreement between a property owner and a 'holder' of the conservation easement, under which a landowner voluntarily restricts certain uses of the property in order to protect its natural productive or cultural features." In 90 percent of the cases, she said, the holder is a land trust, of which there are 33 operating in Texas. The other 10 percent of holders would be a government entity.

Bradbury, who has handled many of these contracts, said conversation easements go well beyond the initial transaction. "The ability to plan for a piece of property and define its uses in advance is invaluable to a landowner and the surrounding community."

According to the Texas Land Trust Council, more than 85 percent of residents live in urban areas and more than 95 percent of the state's land is privately owned. With a conservation easement, landowners retain ownership of the land, but manage the property in partnership with the land trust. Panelists agreed that all parties involved—the landowners (many of whom are aggregate mining operators), land trusts and local communities – can realize significant benefits from conservation easements. These include tax benefits to the landowner in the form of IRS tax breaks, appraisal reductions and, in some cases, cash back. And, of course, preserving natural habitats.

Mallicoat, whose group operates sand and gravel companies in the Houston area, said conservation easements have been beneficial. "We are able to preserve and mitigate wetlands on our properties, which are monitored by the Bayou Land Conservancy land trust, along with our own environmental specialists. With the conservation easement, we are doing what we want to and are supposed to be doing." Bradbury concluded with some advice. "The best thing to do if you have a valuable piece of land on your property is to have the land trust check it out."

For more information on how TACA member companies enhance our daily lives, please visit www.tx-taca.org.

ACI'S NEW POST-INSTALLED CONCRETE ANCHOR INSTALLATION INSPECTOR CERTIFICATION PROGRAM

The American Concrete Institute (ACI) announces the launch of its Post-Installed Concrete Anchor Installation Inspector certification program. ACI will use the program to certify individuals who have demonstrated the knowledge required to properly inspect the installation of post-installed adhesive and mechanical anchors in concrete.

This new program builds upon the ACI Adhesive Anchor Installation Inspector certification program, and includes inspection of post-installed mechanical anchors. Both the new Post-Installed Concrete Anchor Installation Inspector program and existing Adhesive Anchor Installation Inspector program are cited in the new ACI 318-19: Building Codes Requirements for Structural Concrete and Commentary, released in June 2019.

ACI has discontinued admitting candidates into the Adhesive Anchor Installation Inspector program.

Additional information on the ACI Post-Installed Concrete Anchor Installation Inspector certification program, including a detailed job task analysis, is available at ACICertification.org.

ACI TO DEVELOP PRECAST STRUCTURAL CONCRETE CODE

The American Concrete Institute (ACI) announces the formation of a new committee whose mission is to develop and

maintain structural concrete code requirements unique to the design of precast concrete. ACI Committee 319, Precast Structural Concrete Code, will host its inaugural meeting at the ACI Fall Convention on October 21, 2019, in Cincinnati, OH, USA.

Under the leadership of chair Andrea Schokker, Professor and Head of Civil Engineering at The University of Minnesota Duluth, the committee will work in direct response to an expressed industry need for building code requirements that address the unique aspects of precast and prestressed concrete design. Although guidance documents for the unique design of connections and members can be found in the industry, code officials often require code documents that delineate minimum requirements in mandatory language that have been developed using an open consensus process. It is expected that ACI's new precast structural concrete code requirements will complement the requirements in ACI 318: Building Code Requirements for Structural Concrete.

This committee and its future code document set a precedent for additional ACI code documents geared toward specific segments of the industry or construction types. An additional new committee, ACI Committee 320, Post-Tensioned Structural Concrete Code, is in the process of being developed.

Additional information at concrete.org.

ACI CONCRETE CONFERENCE ON MATERIALS & DESIGN TO BE HELD IN AMMAN, JORDAN

Under the patronage of HRH Princess Sumaya bint El Hassan, President of the Royal Scientific Society, the American Concrete Institute (ACI), and Jordan Concrete Association, in collaboration with the Royal Scientific Society and Jordan Engineers Association, announce the ACI Concrete Conference on Materials & Design to be held 17-18 November, 2019, in Amman, Jordan.

This two-day conference will be held at the Royal Scientific Society and will convene leading experts along with concrete professionals to discuss topics such as fiber-reinforced polymer composites for reinforced-concrete construction, mass concrete, and troubleshooting concrete construction. ACI president & past chair of ACI Committee 318, Dr. Randall Poston, will lead a full-day session on the newly-released ACI 318-19 Building Code Requirements for Structural Concrete.

Additional details can be found at www.aci-amman.com.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your 150-200 word association news to editor@icri.org. Content for the January/February 2020 issue is due by Decembr 1, 2019 and content for the March/April 2020 issue is due by February 1, 2019. ICRI reserves the right to edit all submissions.

PEOPLE ON THE MOVE

INFRASTRUCTURE ADVANCEMENT INSTITUTE APPOINTS MIKHAYLOVA OF RINKER MATERIALS™ TO BOARD

The Infrastructure Advancement Institute (IAI) recently named Alena Mikhaylova, Technical Promotions Engineer with Rinker Materials™ to its Board of Directors. Mikhalova joins 11 other industry leaders on the Board fostering IAI's mission of collaboration between contractors, engineers and owners on public and private infrastructure construction, operation, and maintenance projects.

Responsible for the oversight of Rinker Materials™ on stormwater management systems using concrete pipe, culverts and related products across the South Central U.S., Mikhaylova also serves the industry through roles with a variety of organizations including the Transportation Research Board Standing Committee and American Society of Highway Engineers. Prior to joining Rinker Materials, Mikhalova performed advanced finite element analysis of mobile offshore drilling units operating in Gulf of Mexico, Canada and North Sea for Global Maritime. She holds a master's degree and doctorate in Civil Engineering.

"It's an honor to be selected to the Board by peers that share the same passion, enthusiasm and commitment to enhancing industry collaboration for the good of Texas infrastructure," said Mikhalova. "I look forward to helping the Infrastructure Advancement Institute become an even more effective and powerful vehicle for the exchange of technology, innovation and best practices between agencies and municipalities."

TREY HAMILTON TO JOIN ACI STAFF

The American Concrete Institute (ACI) is pleased to announce that Trey Hamilton joined the staff as Senior Engineer on October 1, 2019.

In this new position, Hamilton will provide technical and administrative support to ACI's technical committees and assist with the development of technical resources, educational programs, and the adoption of ACI's consensus-based standards.

Hamilton has 35 years of experience in structural engineering research, practice, and teaching. For the past 28 years he has been conducting applied research and teaching with a focus on structural concrete and masonry. Prior to entering academe, he was in private practice as a design engineer for seven years designing commercial and institutional buildings, as well as municipal and industrial facilities.

Hamilton is past chair of ACI Technical Activities Committee and ACI Committee 423 Prestressed Concrete. Recently retired from the University of Florida, Hamilton is a registered professional engineer in Florida and Wyoming and is a Fellow of both the American Concrete Institute and Post-Tensioning Institute.

Hamilton obtained a Bachelor of Science and Master's Degree in Civil Engineering from the University of Florida. He received his PhD in Civil Engineering from University of Texas, Austin, TX, USA. Hamilton can be reached at Trey.Hamilton@concrete.org.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your 150-200 word news to editor@icri.org. Content for the January/February 2020 issue is due by December 1, 2019 and content for the March/April 2020 issue is due by February 1, 2020. ICRI reserves the right to edit all submissions.

ICRI**CHAPTER**NEWS

CHAPTER CALENDAR

BALTIMORE-WASHINGTON
November 7, 2019
OUTSTANDING REPAIR PROJECT AWARDS
Location: TBD

December 5, 2019
FALL TECHNICAL SEMINAR
CP&R Main Office
Baltimore, MD

BRITISH COLUMBIA
November 21, 2019
CHAPTER TECHNICAL SEMINAR
Topic: Traffic Deck Coating 101
BCRCC Training Facility on Annacis Island
Delta, BC

CHICAGO
November 7, 2019
JOINT ICRI/SEAOI SEMINAR
Topic: Concrete Restoration
WJE Northbrook Office
Northbrook, IL

November 19, 2019
CHAPTER DINNER MEETING
Topic: Terra Cotta and GFRC
Westwood Tavern
Schaumburg, IL

December 12, 2019
CHAPTER HOLIDAY SOCIAL
Pyramid Pizzeria
Addison, IL

FLORIDA WEST COAST
November 15, 2019
CHAPTER SPORTING CLAY EVENT
Tampa Bay Sporting Clay
Land O' Lakes, FL

December 4, 2019
CHAPTER HOLIDAY HAPPY HOUR
The Canopy at The Birchwood Hotel
St. Petersburg, FL

GEORGIA
December 6, 2019
ANNUAL HOLIDAY PARTY
Terrapin Taproom at Suntrust Park
Atlanta, GA

INDIANA
December 5, 2019
HOLIDAY PARTY
AJ Foyt Wine Vault
Indianapolis, IN

METRO NEW YORK
November 6, 2019
WINTER TECHNICAL MEETING
Topic: Structural Assessment Club 101
New York, NY

December 12, 2019
HOLIDAY PARTY
Ruth's Chris Steak House
New York, NY

MICHIGAN
November 7, 2019
CHAPTER ANNUAL MEETING
MotorCity Casino Hotel
Detroit, MI

MINNESOTA
January 9, 2020
MINNESOTA MEGA DEMO
Local 633 Training Center
New Brighton, MN

NEW ENGLAND
November 12, 2019
CHAPTER DINNER MEETING
Topic: Chemical Attacks on Concrete Structures
Ferncroft Country Club
Middleton, MA

December 12, 2019
CHAPTER HOLIDAY SOCIAL
Granite Links Golf Club
Quincy, MA

January 8, 2020
JOINT MEETING WITH CSI
Topic: Dynamic Wall Systems
University of Massachusetts Club
Boston, MA

NORTH TEXAS
November 7, 2019
MEMBERSHIP MEETING
Las Colinas Corporate Center
Irving, TX

NORTHERN CALIFORNIA
November 19, 2019
MEMBERSHIP MEETING
Scott's Seafood at Jack London Square
Oakland, CA

NORTHERN OHIO
December 10, 2019
CHAPTER MEETING
Speaker: James Wamelink – WR Restoration
Crown Plaza Cleveland South
Independence, OH

SOUTH CENTRAL TEXAS
November 14, 2019
JOINT CASINO NIGHT WITH SEAoT
Topic: Learn about ICRI and SEAoT
Austin
Mercury Hall
Austin, TX

VIRGINIA
November 7, 2019
CHAPTER DEMO DAY
Topic: Full Day of Presentations and Demos
Richmond Primoid Warehouse
Henrico, VA

2020 CHAPTER CALENDAR DEADLINES

JANUARY/FEBRUARY 2020
November 10, 2019

MARCH/APRIL 2020
January 10, 2020

Send your Chapter News by the deadlines to Dale Regnier, Director of Chapter Relations, daler@icri.org

GET INVOLVED

ICRI CONCRETE REPAIR CHAPTERS

CONTACT:
Director of Chapter Relations
Dale Regnier at daler@icri.org

The International Concrete Repair Institute (ICRI) chapters are organized and operated by a dedicated group of volunteers, who work together and to what they can to enhance the industry and support their local colleagues. ICRI chapters take great pride in their industry knowledge and quality of services they provide to other chapter members, and the local communities.

ICRI Chapters draw support from both local and national experts to provide up-to-date educational programming, technical demonstrations, networking events and social outings.

As an ICRI member, you can join a single chapter or several. By joining and actively participating in local chapters activities, you can:

- Stay on top of local and national issues facing the industry
- Build important relationships
- Increase your presence in your area
- Increase awareness of the industry and provide support for the entire organization

ROCKY MOUNTAIN DONATES TO A WORTHY CAUSE

The Rocky Mountain chapter donated $4,000 to the Women in Construction Management Summer Institute—a summer program for high school-aged girls interested in construction management programs and the construction industry through Colorado State University in Fort Collins, CO. The Chapter's donation will be used to fund tools, lodging, education and course material. The Chapter was pleased to reach out to this particular age group and introduce them to the trades and opportunities within the construction industry. A representative from the program will be speaking at the Chapter's next lunch-and-learn. Participation from Rocky Mountain members at sponsored events throughout 2019 made this donation possible and we are grateful to be able to fund opportunities like the Women in Construction Management Summer Institute within our community.

From the Women in Construction Management Summer Institute website: Construction Managers take the designer's vision and make it a reality. With one of the highest job placement rates and starting salaries of any major, a degree in Construction Management is a great choice for young women who enjoy teamwork, solving tangible problems, critical thinking, and creating the world around them. In this institute, young women will develop confidence in their abilities and gain an understanding of their opportunities in construction management through field trips, classroom sessions, and hands-on activities. In this institute, young women will develop confidence in their abilities and gain an understanding of their opportunities in construction management through field trips, classroom sessions, and hands-on activities.

NORTHERN OHIO DISCUSSES WATERPROOFING

On August 13, 2019, the Northern Ohio Chapter hosted its August Chapter Meeting. The meeting was attended by more than 30 chapter members and featured John Lukas, Business Development Leader for the Building Envelope Systems, for MAPEI. The topic of the meeting was Cold-Fluid Applied Waterproofing. The presentation started with a baseline of knowledge related to waterproofing and then built on cold fluid-applied waterproofing types, their typical substrates, necessary site preparation, substrate preparation, membrane installation, and concluded with a review of common waterproofing details for cold fluid-applied waterproofing membranes. The presentation was followed by a Q&A session.

Joh Lukas, the Business Development Leader for the Building Envelope Systems for MAPEI is seen here presenting on Cold-Fluid Applied Waterproofing to the Northern Ohio Chapter

GREAT PLAINS HOSTS EXPANSION JOINT PROGRAM

On September 5 the Great Plains Chapter hosted a Lunch & Learn Seminar in Omaha, NE, at the Strategic Air and Aerospace Museum

The Great Plains Lunch & Learn was all about expansion joints and there were 33 attendees. Speakers included Ivan Romo from Situra and John Harder from Balco

INDIANA HOSTS GOLF OUTING FOR CHARITY

On September 11, 2019, the Indiana Chapter held its annual charity golf outing at Plum Creek Golf Club in Carmel, Indiana. It was a great day with a strong turnout of more than 80 golfers. The attendees had a lot of fun and raised money for a worthy charity. The group raised funds for a local charity called Anna's Celebration Of Life Foundation (www.acolf.org) which provides life enhancing gifts for kids with special needs.

Golfers had a great day with a strong turnout at Plum Creek Golf Club

Golfers took a moment in the clubhouse for a quick photo

The Indiana chapter thanks it sponsors for some great raffle prizes

BALTIMORE WASHINGTON HOSTS 3rd QUARTER DINNER MEETING

The members of the Baltimore-Washington Chapter of ICRI assembled for their 3rd Quarter Dinner meeting once again at Maggiano's Little Italy restaurant at the Tyson's Galleria in McLean, VA. They have held several meetings at this location over the years and think it has become a favorite among the members. Geographically it is fairly easy for everyone to get to and from, and the food is always a hit. Thanks to Brian Baker (PPSI) who coordinated and made the arrangements for the event. As always, the evening began with a social hour providing the opportunity for all members to catch up with old friends, network with new contacts and chat about the Redskins 0-2 start to the season.

The dinner kicked-off with opening statements and announcements from President, Kevin Kline (CP&R). He reminded everyone of the upcoming events, and the 3 open positions on the Board of Directors for 2020. Afterwards, Dave Bickel (CP&R) also provided a short standup routine and gave some information on the upcoming annual golf outing.

Kevin then introduced the speaker for the evening, Gary Schue. Gary has worked in construction since the summer of 1969 and graduated from George Mason University in 1974. In 1974 Gary began working in masonry with United Masonry and went on to open his own masonry company, GC Schue Inc. in 1985. In 2009 Gary decided to close GC Schue Inc. to work as a masonry consultant for large masonry companies completing marquis masonry projects all around the Mid-Atlantic region. In 2018 Gary brought his unique skillset in both new and historic masonry to United Building Envelope Restoration working as General Superintendent.

In his presentation, Gary discussed a brief overview of historic masonry and techniques as well as a deeper discussion of "Old vs. New" in which we discovered how technology in masonry construction has evolved over time. Specific examples of real-world repair techniques will be related neatly within the confines of historic masonry. He showed photos and examples from several unique historical restoration projects he has worked on throughout his career. A very interesting presentation.

ICRI CONCRETE REPAIR CHAPTERS

ICRI CONCRETE REPAIR CHAPTERS

Arizona
Baltimore-Washington
British Columbia
California State University, Chico Student Chapter
Carolinas
Central Florida
Central Ohio
Chicago
Connecticut
Delaware Valley
Florida First Coast
Florida West Coast
Georgia
Great Plains
Greater Cincinnati
Gulf South
Houston
Indiana
Iowa/Illinois
Metro New York
Michigan
Mid-South
Minnesota
New England
New Jersey Institute of Technology Student Chapter
North Texas
Northern California
Northern Ohio
Pacific Northwest
Pittsburgh
Quebec Province
Rocky Mountain
South Central Texas
Southeast Florida
Southern California
Southwest Florida
Toronto
Virginia

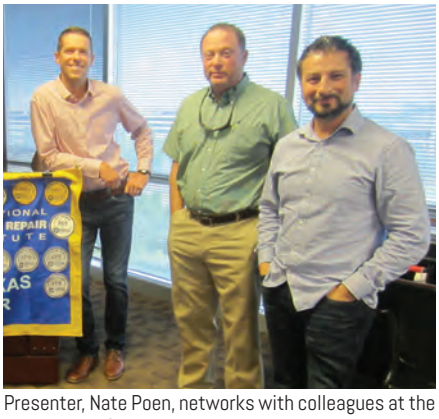
ICRI**CHAPTER**NEWS

CHAPTER ACTIVITIES

NORTH TEXAS CHAPTER HOSTS SEPTEMBER MEETING

The North Texas Chapter welcomed Nate Poen, Manager of Strengthening Solutions Group for Structural Technologies, LLC, to their September membership meeting held at the Las Colinas Corporate Center in Irving, Texas. Following some quality networking time and a bountiful barbeque buffet, Nate provided a brief history of post tensioning (P/T) systems, beginning in the mid-1950s with paper-wrapped, button-head systems. By placing the concrete in compression with the P/T systems, increased strength could be obtained allowing for longer spans, fewer columns, thinner and lighter slab sections and reduced shoring/reshoring time. In the 1960s the button-headed systems gave way to 7-wire, push-through strand systems in plastic sheaths. In the 1980s, heat-sealed strand systems came into common use, followed by the current encapsulated, extruded and grease-filled systems.

Nate reviewed the common modes of deterioration of P/T systems, including corrosion, design or construction defects, damage to tendons by cutting, impact or overloading, or by modifications made to the P/T system such as at slab openings, MEP penetrations, or due to a change in use for the structure. Pitting classifications to the strands can range from none to severe. Nate outlined the typical locations where failures occur, such as a exposed slab edges, slab cracks, expansion and construction joints, high points, and at the first low point from the slab edge. Nate then described the various means and methods used to repair P/T systems, including barrel spices, “dog bone” splices, temporary block lock offs, and torque stressing couplers. Because P/T systems are highly stressed once completed, safety was stressed as a critical factor in any repair of post-tensioned systems.



Presenter, Nate Poen, networks with colleagues at the North Texas September meeting

Guest speaker Nate Poen reviews the evolution of post-tensioning systems

North Texas members enjoy a BBQ buffet at their September meeting

North Texas Chapter President, Stephen Grelle, PE (right), thanks Nate Poen (left) for his presentation

ICRI has 38 chapters, including 2 student chapters, in metropolitan areas around the world. Chapters hold technical presentations, educational meetings, symposiums, and local conventions on repair-related topics.

Chapters also provide an outstanding opportunity to meet and build relationships with repair specialists in your area. In addition to the technical meetings, chapters also host golf outings, social evenings, dinner cruises, and other networking events.

NORTH TEXAS CELEBRATES WITH 18th ANNUAL JESSE POINTS MEMORIAL GOLF CLASSIC

While much of the USA was rapidly racing into Fall, the North Texas Chapter celebrated the continuing hot weather on what was dubbed "July 71st" with the 18th Annual Jesse Points Memorial Golf Classic at Waterchase Golf Club in east Fort Worth. Named for NTX Charter Member and longtime golf committee chairperson, Jesse Points, NTX members and guests enjoyed some lunchtime networking, and competed in the free putting and chipping contests. NTX Board Member and BASF Rep Eddie De Haro came within 1' 4" of the hole to win the downhill, right to left putting contest. Fellow BASF team member Shane Bryant stopped his chip 5' 9" from the hole to win the chipping competition.

The first place team of Bryce McCarthy, Brax McCarthy, Jaime Pelayo and Mark LeMay posted a sizzling score of 57—15 under par. Second place honors went to the Sunbelt Rentals team of Austin Emerson, Patrick Thornhill, Scott Russell and Travis Rawcom with a score of 61. The George D. Alan team of Andy Bautz, Don Moore, Mike Minear and Tim Hicks placed third with a score of 62. Walter P Moore's team of NTX board member Abhishek Aggarwal, Jeff Michael, Jon Pevey and Gerard Moulzolf took home the "Most Honest Team" trophy with a score of 71.

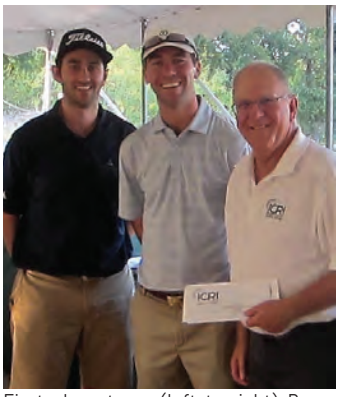
Closest to the pin winners were Bryce McCarthy (hole #2), Craig Porter (hole #7), Eli Babb (hole #12), and NTX board member, Jon Carrier (hole #16). Long drives were cranked out by Shane Bryant on hole #6 and by Justin Cooper on hole #18.

The NTX event helps to fund the Chapter's scholarship program, which, so far in 2019, has awarded $2,000 to the Civil Engineering Department at the University of Texas at Arlington, and $4,000 in individual scholarships.


North Texas Chapter Treasurer Pete Haveron works the registration table behind the "Most Honest Team" trophy


Putting contest winner and North Texas board member Eddie De Haro


North Texas board member Jon Carrier—closest to the pin winner on hole # 16


First place team (left to right) Bryce McCarthy, Brax McCarthy, and Mark LeMay (Jaime Pelayo not pictured)


Chipping contest and long drive winner, Shane Bryant


Second place Sunbelt Rentals team (left to right) Austin Emerson, Patrick Thornhill, Scott Russell, and Travis Rawcom


Third place George D Alan team (left to right) Andy Bautz and Don Moore (Mike Minear and Tim Hicks not pictured)

"As someone relatively new to the concrete restoration industry, one of the very first things I did after starting my new job was join my local ICRI chapter. It immediately gave me access to best-in-class training documents (especially the ICRI Guidelines). ICRI also offered informational videos and a peer network that accelerated my knowledge and confidence out of the gate. I highly recommend membership to anyone new thinking about entering the field."

Jeff Konkle, MAK Construction Products Group

VIRGINIA SYMPOSIUM BREAKS RECORDS

The Virginia Chapter had a record-breaking turnout at its annual Fall Symposium and Golf Tournament at Colonial Heritage Golf Club of Williamsburg. Set against the breathtaking beauty of rolling terrains and luxurious landscape, the symposium was a tremendous venue for our members to learn about different aspects of precast concrete. A most heartfelt thank-you goes out to our event speakers: Claude Goguen, Technical Services Engineer, National Precast Concrete Association; Kiley Marcoe, Precast Restoration Specialist, Metro Precast; Lawrence Keenan, PE, Director of Engineering, Hoffman Architects; and Neil Savitch, Construction Specialties Group. The chapter is grateful to these fine presenters who brought to light different aspects of the precast concrete industry and the repair & restoration of precast concrete.

Special thanks to event sponsors KGS Construction, Guaranteed Supply, Richmond Primoid, Euclid, and Freyssinett. Thanks, also to golf hole sponsors CPR Ram Tool, Euclid, and Dunbar, Milby, Williams, Pittman, & Vaughan. And of course, all who helped make the day a success. Following the symposium, the golf tournament allowed for some lighthearted competition and many networking opportunities. Kudos to all the golf foursomes who played in the golf tournament and helped bring the championship home!

Members and guests filed in for the ICRI Virginia Chapter Fall Symposium

Speaker Lawrence Keenan, P.E., Director of Engineering for Hoffman Architects giving his presentation

Virginia hospitality was on full display all day for the program on precast concrete

A record-breaking turnout filled the room at the Colonial Heritage Golf Club

The chapter threw in a promo for its upcoming Demo Day

After a morning of presentations, golfers prepare for the afternoon golf tournament

The club offered the breathtaking beauty of rolling terrains and a luxurious landscape

For the latest ICRI Chapter information, visit www.icri.org

MINNESOTA HOSTS FALL TECHNICAL SESSION

The Minnesota Chapter of ICRI hosted its most recent program at the Cement Masons Local 633 Training Center in New Brighton, MN on October 10, 2019. The theme for the 2019 Fall Technical Session was Surface Preparation. The presentation explored surface preparation for concrete building repair and coating application. An education and hands on demonstration was presented by Josh Jones. Josh is the president of Substrate Technology, Inc.—a flooring specialty supplier. Josh offers a unique perspective as one of the very few who grew up in the surface preparation industry. Through his more than 30 years in the industry, Josh has experienced numerous process and equipment evolutions, some good, some bad, however Josh's candid objectivity and innate knowledge provide a neutral and educated assessment of our industry.

The presentation was delivered to a crowd of 40 contractors, design professionals and suppliers/manufacturers. The presentation started in the classroom with a brief educational background on surface preparation from our Membership Committee chair PJ Vaughan. PJ, a representative for Ardex, shared his knowledge on what a manufacturer is looking for from the contractor prior to placement.

After the classroom session attendees went into the training centers hands-on area to observe what was just learned. Josh discussed in more detail the ways to achieve the different surface profiles. From a diamond grinder to a bush hammer, shotblaster and scarifier, the difference between a CSP-3 and CSP-7 were demonstrated using the ICRI Concrete Surface Profile chips. The end goal of a clean, roughened, well bonded, and strong concrete surface is what to achieve before applying material.

A special thanks to Josh for delivering this educational and technical demonstration that allowed attendees to get a real-life experience of how surface preparation is performed and achieved.

Attendees at Minnesota Chapter meetings get an introduction to the benefits of membership in ICRI


A crowd of more than 40 members and guests were eager to learn more about surface preparation


This technical session included some informative demonstrations....

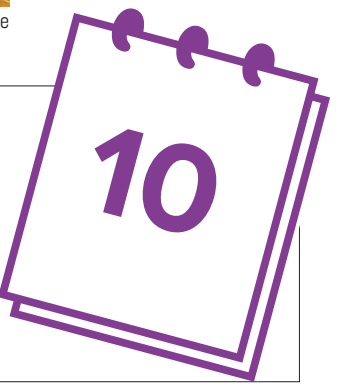

....as well as some valuable education on surface preparation equipment and technology

2020 CHAPTER NEWS DEADLINES

JANUARY/FEBRUARY 2020
November 10, 2019

MARCH/APRIL 2020
January 10, 2020

Send your Chapter News by the deadlines to
Director of Chapter Relations Dale Regnier, at daler@icri.org



ICRI**CHAPTER**NEWS

CHAPTERS COMMITTEE CHAIR'S LETTER

MICHELLE NOBEL
Chapters Chair

It's time set the clocks back as we head into Fall—the days go by faster and faster each year! I hope everyone had a spooktacular Halloween and that you're ready for the holiday slide! As we head into the last months of the year, remember all the good things that you have in your life and take time to appreciate them.

"I wonder if the snow loves the trees and fields, that it kisses them so gently? And then it covers them up snug, you know, with a white quilt; and perhaps it says, 'Go to sleep, darlings, till the summer comes gain.'" Lewis Carroll, Alice's Adventures in Wonderland & Through the Looking-Glass

Are you signed up to go to the ICRI Fall Convention in Philadelphia? It is proving to be one of our most popular and well attended conventions. With all the events planned, you don't want to miss out!

We had our ICRI Chapter Rountable in Chicago September 23-24. It was a very spirited and insightful meeting with representatives from each of the following chapters: Chicago, Central Ohio, Greater Cincinnati, Great Plains, Iowa/Illinois, Indiana, Mid-South, Michigan, Minnesota, and Northern Ohio. Also, in attendance were ICRI President Chris Lippmann, as well as Regional Representatives Jon Connealy—Region 5, Dan Wald—Region 8; and David Marofsky—Region 6. We also welcomed ICRI staff members Interim Executive Director David Ewald, Director of Chapter Relations Dale Regnier, and Technical Director Ken Lozen.

As with every Chapter Roundtable, we shared many great ideas on how to improve the chapters, and how to gain and retain new members and leaders. Thanks to all who traveled to be there with us. Dale and I always come away with new ideas and great input from all who attend. If you're interested in coming to one of the ICRI Chapter Roundtables, reach out to Dale or myself. I promise, it's worth the trip!

We were reminded about how ICRI supports its chapters. Following are just some of the ways ICRI supports chapters:

- Chapter Web pages
- Monthly Chapter Update
- Dues Collection/Monthly Rebate Check/Deposit
- Membership Record Keeping
- Coverage in *Concrete Repair Bulletin*
- Staff Support – any question, any time
- Publications Discounts
- Bulk CRB / Publications
- Additional resource for ALL chapters:
- Template for a Chapter Program Tracking Sheet - Date, Topic, Speaker, Company, Attendance
- Template for a Chapter Calendar

Each chapter should be taking advantage of these resources that are provided by the ICRI national office to help us learn and grow.

Remember to sign your delegates up for all the conventions. It's one of the benefits of being an ICRI chapter member and it adds points toward the ICRI Chapter Awards. Besides, you know you want to find out who's going to get the "Project of the Year Award"!

Other dates to mark on your calendar are:

2020 ICRI Kick-Of Party
February 3, 2020
The Strasphere
Las Vegas, Nevada

World of Concrete 2020
February 3-7, 2020
Las Vegas, Nevada

2020 ICRI Spring Convention
March 23-25, 2020
Vancouver, British Columbia

2020 ICRI Fall Convention
October 4-6, 2020
Minneapolis, Minnesota

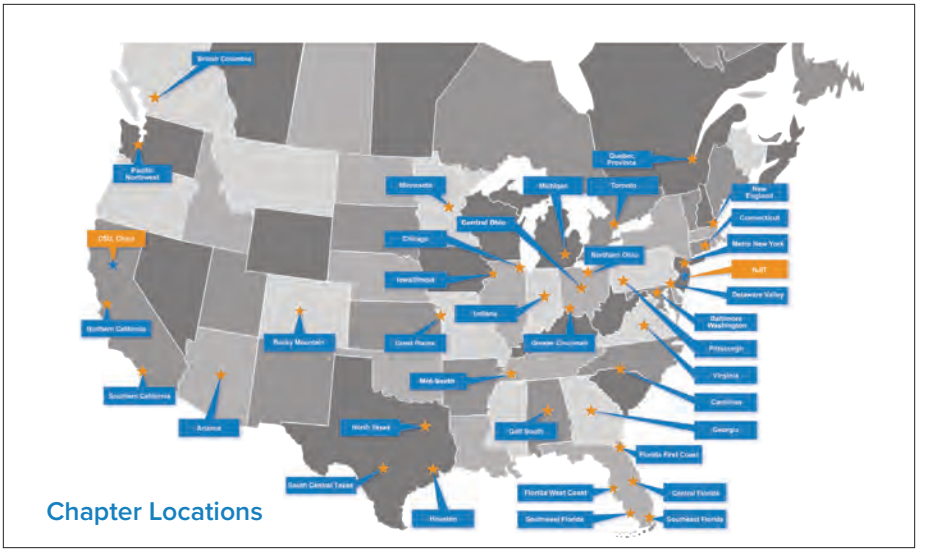
For ICRI Chapter and other events, visit: https://www.icri.org

Remember to submit your chapter events and information by using the "Submit a Chapter Update" link found on your chapter's national webpage, so your events and information can be listed on the ICRI national website.

Please remember to turn in your chapter events so they can be listed on the ICRI website. At ICRI, we encourage every member to support each other and their chapters, you never know where your next lead for a project will come from. It's the relationships that you build that help build your own success. In the inspiring words of Henry Ford, *"Coming together is the beginning; keeping together is progress, working together is success."* When we go out and get people interested in ICRI, we all help make ICRI a success!

Please always remember to be kind, travel safe, and I'll see everyone in Philly for the 2019 ICRI Fall Convention!

Sincerely,
Michelle Nobel
2019 Chapters Committee Chair



Chapter Locations

PRODUCTINNOVATION

SIMPSON STRONG-TIE INTRODUCES FX RAPID-SETTING MORTAR FOR FASTER, EASIER, MORE COST-EFFECTIVE CONCRETE REPAIRS

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, has announced the launch of FX Rapid-Setting Mortar, a single-component, rapid-hardening, cement-based mortar designed for horizontal and formed vertical repairs where a quick turnaround with minimal downtime is required.

Ideal for projects on a tight schedule or a set budget, FX Rapid-Setting Mortar provides the increased durability, setting speed and installation ease of rapid-hardening cement in a formulation easily extended with the addition of an equal amount of washed nominal 3/8" pea gravel.

Concrete contractors are increasingly turning to rapid-hardening cement products as a cost-effective alternative to Portland cement. Since rapid-hardening cement does not require special mixing equipment, contractors can begin and complete work faster. Available in 50 lb. bags and 2,500 lb. bulk bags, FX Rapid-Setting Mortar comes ready to use with the simple addition of potable water.

Formulated with corrosion inhibitors, FX Rapid-Setting Mortar provides superior resistance to freeze-thaw cycles and is shrinkage compensated for a wide variety of field uses, including partial- and full-depth concrete repairs, on-grade and below-grade repairs, and horizontal and formed vertical applications.

"FX Rapid-Setting Mortar is a versatile formulation that contractors can use neat or extend with coarse aggregate for fast, economical repairs," says Ryan Kaelin, director of Concrete Construction Products for Simpson Strong-Tie. "Easy to mix, easy to extend, and easy to use, FX Rapid-Setting Mortar provides high early strength for fast turnaround in the field to help boost productivity and efficiency."

FX Rapid-Setting Mortar provides a total yield of 0.40 cubic feet per 50 lb. bag and an enhanced yield of 0.68 cubic feet per 50 lb. bag when extended with 50 lb. of pea gravel. For more information, including technical and safety data sheets and installation notes, visit the FX Rapid-Setting Mortar product page at strongtie.com.

SIMPSON STRONG-TIE INTRODUCES FIRST ASSEMBLY-TESTED COLD-FORMED STEEL STRUT DESIGNED FOR BOTH SLIDE- AND FIXED-CLIP INSTALLATIONS

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, has introduced the HYS hybrid strut, the first cold-formed steel (CFS) strut to be assembly tested for both slide- and rigid-clip applications. Commonly used at the bottom of steel beams to accommodate standoff conditions, the HYS can be attached with screws, power-actuated fasteners or welds, allowing erectors flexibility for improved jobsite efficiency and productivity.

Input from CFS erectors in the field was central to the development of the HYS, which also included comprehensive component-to-steel-fixture, assembly and anchor testing. Real-world assembly testing further allowed Simpson Strong-Tie to tabulate accurate loads based on both strength and deflection to assist in mitigating design risk.

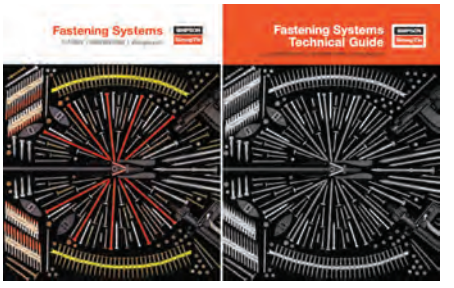
For installation as a slide connection, the HYS easily attaches with shouldered screws driven through the slotted holes. The clip comes with shouldered screws specially designed and precision-manufactured to prevent over-driving and to ensure that the connection functions properly in slide applications. For installation as a rigid connection to support gravity and lateral loading, the clip can be attached with No. 10 screws through the small predrilled holes. Additional features of the HYS include the following: A Simpson Strong-Tie® No-Equal® stamp marking the center of the HYS slots to help ensure correct placement of shouldered screws

HYS slots positioned to minimize eccentric loads and maximize capacities
Up to 1" of vertical moment in each direction when shouldered screws are centered in the vertical slot for slide applications
Availability in standard lengths of 12", 15", 24" and 30"

For more information about the assembly-tested HYS cold-formed steel hybrid strut, visit strongtie.com/hys.

SIMPSON STRONG-TIE INTRODUCES ENHANCED 2019–2020 FASTENING SYSTEMS TECHNICAL GUIDE AND CATALOG

Pleasanton, Calif. — Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, has announced the release of its 2019–2020 Fastening Systems catalog, a comprehensive yet streamlined reference guide designed to aid customers in quickly identifying the right products for the job from across the company's extensive line of fasteners, fastener systems and productivity solutions.



Created for dealers, engineers and contractors, the Fastening Systems catalog makes it easy to specify project-appropriate fastener solutions, with robust product pages that include detailed features and benefits, installation sequence visuals and notes, associated tools and products, and information tailored to help designers and builders work smarter and faster.

The 2019–2020 Fastening Systems catalog also contains comprehensive information for several recent Simpson Strong-Tie innovations, including the Deck-Drive™ DCU screw plug solution, a complete Hidden Deck-Fastening System®; the Quik Stik™ rafter and truss fastening system for attaching overhead assemblies from a standing position; and the Strong-Drive® SDWS Timber SS screw, ideal for making structural connections in coastal and other severely corrosive environments.

2019-2020 Fastening Systems catalog enhancements:

- A table of contents along with two separate indexes alphabetized respectively by product name and by model number, in addition to chapter subindexes
- Color-coded product categories for Screws, Nails, Collated Nails and Staples, Quik Drive® Systems and Collated Screws for Quik Drive

2019-2020 Fastening Systems technical guide highlights:

- Table of contents and chapter subindexes
- Organization by application rather than by product
- Detailed installation illustrations, spacing diagrams and load tables

For more information, or to view or download a PDF of the Simpson Strong-Tie® 2019–2020 Fastening Systems catalog, visit strongtie.com/fastenercatalog.

NEW DESIGN FOR ECOAIR MRO SPRAY PRODUCTS

Cortec is excited to unveil its newly revamped EcoAir line of surface prep and rust prevention products packaged in air-powered spray cans!

The fresh new EcoAir package design and labeling make it straightforward and easy for users to know how each product is applied and whether it is intended to "Clean," "Protect," and/or "Preserve" metals.

The portable cans are convenient for a variety of cleanup, rust removal, and rust prevention activities around the shop, on the production floor, or in remote preservation conditions!

Learn more about the great options from this refreshed MRO (maintenance, repair, operations) product line here:

KRYTON INTERNATIONAL ADDS WIRELESS REAL-TIME CONCRETE MONITORING TO ITS SMART CONCRETE® PRODUCT OFFERING THROUGH A PARTIAL ACQUISITION OF SENSOHIVE TECHNOLOGIES APS OF DENMARK

Kryton International Inc., a world leader in innovative concrete technology, announced the company has acquired a 30 percent interest in Sensohive Technologies ApS of Odense, Denmark. The acquisition makes Kryton Sensohive's largest shareholder. Kryton will also be the exclusive North American distributor of Sensohive's award-winning Maturix ™ technology, which uses advanced sensors and software enabling contractors and engineers to wirelessly monitor the concrete hardening process in real time from virtually any internet-connected device.

Real-time monitoring of structures is an evolving field in the construction industry made possible through the rapidly expanding Internet of Things (IoT) – the interconnected digital network allowing everyday objects to be embedded with electronics collecting and sharing data. Maturix™ technology runs on the Sigfox 0G network, the world's largest IoT network covering 1 billion people in 65 countries. Sigfox's long-range and low-power demand network allows Sensohive's sensor batteries to last for up to 10 years. No other concrete sensor can claim such a long life, reliability, reusability and be completely wireless.

Conventional single-use concrete sensors on the market today collect data through Bluetooth NFC transmitted to a phone or device or through a wireless gateway. This typically requires a person to visit the jobsite and be near the sensor to take the Bluetooth reading and send updates.

Maturix™ uses thermocouples and reusable temperature sensors providing real-time connectivity and remote monitoring of concrete maturity and strength. Data is automatically collected every ten minutes and transmitted wirelessly to the cloud with information available in various report formats.

Sensohive's wireless sensors have been used in numerous European construction projects including major projects built by PASCHAL GmbH, VolkerWessels, Heidelberg Cement, NCC, Skanska and Kruse Smith, among others.

With the advent of smart buildings and smart cities, planners, designers and engineers are now taking an evidence-based approach to urban design and construction, which this type of technology can provide.

WAGNER METERS INTRODUCES NEW C555 CONCRETE MOISTURE METER

Wagner Meters, manufacturer of wood and concrete moisture measurement instrumentation since 1965, announces the release of a handheld electronic concrete moisture meter for comparative measurement of concrete and other surfaces. The C555 Concrete Moisture Meter is designed to be in full compliance with ASTM F2659 to assist in preliminary evaluation of the comparative moisture condition of concrete, gypsum, and other floor slabs and screeds.

The versatile C555 also features an onboard ambient temperature and relative humidity sensor as well as a "Relative Measurement" mode for comparative measurement of other smooth surface materials such as brick or cement block. The C555 comes with an "On-Demand Calibrator" platform to perform fast and easy calibration to factory settings while in the field.

The C555 features an abrasion-resistant Teflon sensor surface and a protective rubber boot for durability as well as a 1-year warranty.

For more information visit www.wagner-meters.com.

SIMPSON STRONG-TIE LAUNCHES LINE OF SUBFLOOR AND SHEATHING SCREWS RE-ENGINEERED TO DRIVE FASTER AND REDUCE SQUEAKS

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, has introduced a new line of Strong-Drive® WSV Subfloor screws designed to reduce driving torque, increase installation speed and nearly eradicate the squeaking caused by poorly fastened subfloor sheathing.

Re-engineered from head to point, Strong-Drive WSV Subfloor screws feature a ribbed head design to countersink screws for a clean, finished appearance and a variable thread to ease driving torque and speed fastening jobs when used with the Quik Drive® auto-feed screw driving system.

For contractors, fastening subflooring with WSV screws provides the power necessary to hold the sheathing to the joists, eliminating gaps that can lead to squeaking and costly callbacks on newly installed floors.

Available in 1¾", 2" 2½", and 3" lengths, Strong-Drive WSV Subfloor screws have a yellow zinc coating for interior applications and are the only fasteners to be dual-evaluated per ICC-ES AC233 and ICC-ES AC120. Additional features of the Strong-Drive WSV Subfloor line of screws include:

Redesigned point and thread pattern provide easy starts and up to 25% less torque, which translate to faster driving.
Lower installation torque also means less wear on tools.

Deep-recessed 6-lobed ribbed head provides clean countersinking and more secure bit retention for easier installations.
The holding power of WSV screws reduces the gaps between the joist and subfloor that cause floor squeaks.
WSV screws can be backed out easily, facilitating future access to floor cavities.

For more information on the Strong-Drive WSV Subfloor line of screws, including technical notes, installation notes, driver bit requirements and load tables, please visit strongdrive.com/wsv.

IRION-AMERICA ANNOUNCES NEW "XP-DELTA" CAULKING GUN FEATURING ADJUSTABLE THRUST RATIO (12:1 OR 25:1)

Irion-America, LLC (www.irion-america.com), manufacturer of dispensing tools and caulking gun products, introduces new "XP-DELTA" Caulking Gun featuring innovative design with adjustable thrust ratios, 12:1 or 25:1, and 'drip control' technology.

The XP-DELTA is ideal for trade professionals. When set to a 12:1 thrust ratio, the gun dispenses standard materials such as acrylic, latex, and silicone caulks or similar compounds with extreme ease. When switched to a 25:1 thrust ratio, the gun becomes ideal for dispensing thicker adhesives and is perfect when working in cold weather.

The XP-DELTA offers several additional features including a rubber-coated handle and trigger, anti- rust/scratch proof barrel, rotary carriage/ladder hook and extremely tough and durable catch plate. The Drip Control Technology can be turned on & off with your thumb and when on the gun becomes completely Drip Free. It is compatible with 10oz or 310ml cartridges.

All Irion Caulking and Sausage gun products can be found on www.irion-america.com.

SIMPSON STRONG-TIE EXPANDS HIGH-WIND RESOURCE CENTER WITH NEW HURRICANE PREPARATION VIDEO AND EDUCATIONAL OFFERINGS

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, announced today the expansion of its High-Performance Solutions for High-Wind Forces online resource center to include video content and additional building design information for contractors, inspectors, specifiers and homeowners looking for the latest high-wind information and construction guidance.

The recently added video Preparing for a Hurricane: the Engineering Behind Your Home features interviews with structural engineers, academic researchers specializing in resilient construction, and other building industry experts providing an insider's look at new, groundbreaking research on high-wind construction being conducted at universities and by the Insurance Institute for Business & Home Safety.

Since the beginning of this year, the US National Oceanic and Atmospheric Administration reports that the North Atlantic has already weathered 12 named storms (events involving winds of 39 mph or higher), of which five have become hurricanes (with winds of 74 mph or higher), including three major hurricanes (category 3, 4 or 5, with winds of 111 mph or higher). Most hurricanes also contain individual supercell thunderstorms that typically create tornadoes as well.

For reference, in 2018 Hurricane Michael's wind speeds peaked at 155 mph, a devastating reminder of the forces tropical storms can exert on homes and buildings. Extreme tornadoes can achieve even higher wind speeds, sometimes above 300 mph. Homes built to withstand high winds often emerge with relatively little damage compared to neighboring buildings built to lesser standards, which in many cases are completely destroyed.

INTERESTED IN SEEING YOUR NEW PRODUCT IN THIS COLUMN?

Email your 150-200 word product information to editor@icri.org. Content for the January/February 2020 issue is due by December 1, 2019 and content for the March/April 2020 issue is due by February 1, 2019. One (1) high resolution product photo may be included. ICRI reserves the right to edit all submissions.

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United States

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Canada

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Kenneth Hunt
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United States

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United States

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Smislova Kehnemui & Assoc. (SK&A)
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United States

Frank Krech
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Martin Lavictoire
Leads 2 Construction
Montreal, Quebec
Canada

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The Sherwin-Williams
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New England Leak Detection
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Southeastern Resources
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Richard Neville
Tremco Commercial Sealants & Waterproofing
Easton, Pennsylvania
United States

Matt Peterson
Moffatt & Nichol
Raleigh, North Carolina
United States

Brian Peyton
Professional Floor Inspection & Testing
Houston, Texas
United States

Scott Plummer
HP Civil, Inc.
Stayton, Oregon
United States

Jason Pollard
CCD Technologies Limited
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Canada

Chris Quinn
AK Industrial Services LLC
Salisbury, Massachusetts
United States

Robert Rampetsreiter
Black & Veatch
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United States

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Karins Engineering
Sarasota, Florida
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Fyfe Co. LLC
New York, New York
United States

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Renovia
Tampa, Florida
United States

Dale Sloman
Brawco, Inc.
Bartlett, Tennessee
United States

Zach Stanton
Blastrac Global
Denver, Colorado
United States

Kerry Sutton
American Concrete Institute
Farmington Hills, Michigan
United States

Colin Swaysland
Walker Consultants
Denver, Colorado
United States

Russell Thurston
StructureTec
Kalamazoo, Michigan
United States

Rebecca Tien
Wiss, Janney, Elstner Assoicates, Inc.
Cary, North Carolina
United States

Michael Towne
The Euclid Chemical Company
painesville, Ohio
United States

Philip Trigg
Vee-Jay Cement Contracting
St. Louis, Missouri
United States

Virginia Triplett
Coastal Construction Products
Charlotte, North Carolina
United States

Jay Tyiska
Valcourt Exterior Building Services
Lanham, Maryland
United States

Volkan Uzunoglu
Neogard - Hempel (U.S.A - Inc.)
Northridge, California
United States

Ryan Wagner
American Structurepoint
Aurora, Illinois
United States

NEWMEMBERS

GOVERNMENT MEMBERS

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LCRA
Austin, Texas
United States

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Power and Water
Stuart Park, Northern Territory
Australia

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Université Laval
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STUDENT/APPRENTICE MEMBERS

Mohanad Abdulazeez
Missouri University of Science and Technology
Rolla, Missouri
United States

Tony Ferland
ÉTS - École de Technologie Supérieure
Carignan, Quebec
Canada

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Princeton University
Miami, Florida
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EastPoint Engineering
Halifax, Nova Scotia
Canada

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XJTLU
Suzhou, Suzhou
China

RETIRED MEMBERS

Peter Brownrigg
Building Restoration Consultants
Hudson, Florida
United States

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INTERNATIONAL CONCRETE REPAIR INSTITUTE
1000 Westgate Drive, Suite 252 | St. Paul, Minnesota 55114
P: 651-366-6095 | F: 651-290-2266 | E: info@icri.org | W: www.icri.org

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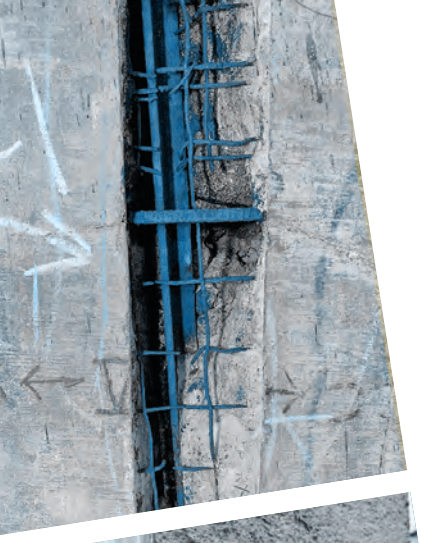

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