2017 PTI AWARDS

Recognizing Excellence in Post-Tensioning Applications

May 1, 2017 | Hyatt Regency Atlanta | Atlanta, GA

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May 1, 2017 • 6:00 p.m. to 9:00 p.m.

Schedule of Events

2017 PTI Awards Program
May 1, 2017 • 6:00 p.m. to 9:00 p.m.

6:00 p.m. Reception

7:00 p.m. Welcome—PTI President David Martin

Dinner

7:45 p.m. Presentation of TAB Awards

Presentation of Fellow Awards

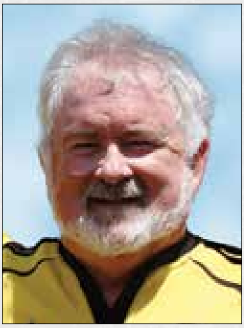
Presentation of Project Awards

- Buildings
- Bridges
- Parking Structures
- Slab-on-Ground
- Industrial/Special Applications
- Repair, Rehabilitation, & Strengthening

Project of the Year

Russell L. Price Award for the Most Active Committee Member

Jack Graves, Jr. is recognized for his outstanding contributions to PTI and the industry through his significant efforts in the re-writing of the Slab-on-Ground Construction and Maintenance Manual, as well as his work on the DC-10 Slab-on-Ground Committee.



Jack Graves started his career in the post-tensioning industry in 1973 after graduation from high school, working as a draftsman for John Abney at Post Tension Systems, Inc., Arlington, TX. Jack attended school at night and completed his associate in applied science degree in drafting and design technology from Tarrant County College in 1978. He later returned to school and completed his bachelor of arts degree (architecture/business, history minor), again taking night classes.

Jack worked for VSL Corporation from 1981 to 1993 starting out as a Commercial Project Coordinator, under the supervision of James L. Beicker, and worked his way up to US Monostrand Division Manager. During his tenure at VSL, he was privileged to work with and learn the business from many of the legends of the post-tensioning industry.

In 1993, Jack bought into GSI Post-Tension, serving as President/Managing Partner. Michael Williams joined the company in 1995. In 2000, TSG Strand Group, Inc. was formed to extrude unbonded post-tensioning material. Both companies were sold to Dywidag Systems International (DSI) in May 2006.

After the sale, Jack worked for this storied company, as SOG Business Unit Manager, until January 2009. While at DSI, Jack was again privileged to work with many of the legends of the post-tensioning industry.

In 2012, Jack, along with Michael Williams, opened an office for Greg Tomlinson and Brian Conley, owners of Builders Post-Tension, Inc., in the Dallas/Ft. Worth area.

As an active member within the Post-Tensioning Institute (PTI) for many years, he has regularly presented post-tensioning seminars and authored several articles on post-tensioning. He currently serves on the PTI Executive Board, Board of Directors, SOG DC-10 Committee (1991 to present), and as Chairman of SOG DC-10D Committee and the Marketing MKT-150 Committee. He has served on the Repair and Rehabilitation Committee, Chairman of the SOG Alternative Design Committee and Strategic Planning Conference (2005 and 2015) in the past. He was awarded a PTI Honorary Fellow in 2009.

Jack is an avid aviator, photographer, hunter, and played rugby internationally for 25 years. He has been married 42 years to his wife Becky and has three grown children, Korey, Kyle, and Katie.

James R. Cagley Medal for the Most Active Technical Committee Chair

Carol Hayek is recognized for her outstanding contributions to PTI and the industry as the Chair of DC-20, Building Design Committee. She has been a driving force on the committee to advance several initiatives including design seminar modules, dual banded PT slabs, and ACI 318-14 versus *318-11 PT section comparison. She has also been very actively contributing to the PTI Journal and to Convention Technical Sessions.*

Dr. Carol Hayek is the Chief Technical Officer for CCL International. She has worked on research and design projects in the post-tensioning field. She is a PTI Fellow and actively involved in committees at PTI, ACI, and *fib*, and is a lecturer at Johns Hopkins University, Baltimore, MD. She received her MSE and PhD in civil engineering from Johns Hopkins University and her MBA from ESA Business School, Beirut, Lebanon.

Kenneth B. Bondy Award for the Most Meritorious Technical Paper

Marcelino Aguirre, Trey Hamilton, and Alex Randell are recognized for co-authoring the PTI Journal paper "Effects of Low Reactivity Fillers on the Performance of Post-Tensioning Grout."

Marcelino Aguirre is a structural engineer with WSP | Parsons Brinckerhoff and is part of the movable and complex bridge group. In this role, Marcelino develops structural designs for new and the rehabilitation of bascule and vertical lift bridges and complex bridges. He is currently collaborating with the FHWA-Research and Development Long Term Bridge Performance Program to perfect data analysis, improve preservation methods, and optimize management strategies to improve bridge performance, durability, longevity, and safety. Marcelino has worked on post-tension (PT) research projects with the University of Florida under the direction of Trey Hamilton to investigate the underlying causes of post-tensioning grout degradation and the corrosive effects it has on structures several years after construction is complete. This project resulted in the publication of the Shelf Life Study of Post Tensioned Grouts for FDOT Materials Office Research, in collaboration with the PTI M-55 Grouting Committee.

Marcelino started his engineering career with another firm, working on a variety of design-build projects which included the I-4 Lee Roy Selmon Crosstown Connector, Veterans Memorial Bridge, and FLL Airport Runway 10R/28L Expansion. Currently, he is continuing post-tensioning research implementation in partnership with FDOT for the complex bridge preservations of Charles E. Bennett Memorial Bridge (Wonderwood), Interstate 95 (I-95) Southbound Ramp to I-295 EB, and Pensacola Bay Bridge. Marcelino received his master's degree from the University of Florida.

Dr. Trey Hamilton is Professor of Civil Engineering in the Engineering School of Sustainable Infrastructure and Environment at the University of Florida in Gainesville, FL. He received his bachelor's and master's degrees from the University of Florida and was in private practice as a design engineer for about 7 years prior to obtaining a PhD from the University of Texas at Austin in 1995. He was a faculty member at the University of Wyoming from 1995 to 2001 prior to joining the faculty at the University of Florida.

Hamilton's main research and professional interests involve structural concrete and masonry design and testing; durability and evaluation of existing bridge and building structures; and repair and strengthening with fiber-reinforced polymer composites. His scholarly work has focused on the development of methods and materials to improve the sustainability of structures, and his professional activities have focused on the implementation of those results in construction and rehabilitation.

Hamilton is currently a member of PTI M-55 Grouting Committee and M-50/ASBI Bonded Tendon Joint Task Group. He is also Chair of the Technical Activities Committee of ACI. He is a member and past chair of ACI Committee 423, Prestressed Concrete. Dr. Hamilton is a fellow of both the Post-Tensioning Institute and American Concrete Institute. In addition, he has won awards for papers from American Society of Civil Engineers, ASTM International, American Composites Manufacturer's Association, The Masonry Society, and International Concrete Repair Institute. Most notable of these is the J. James R. Croes Medal awarded by the American Society of Civil Engineers across all disciplines of civil engineering.

Alex Randell graduated from the University of Florida, where he received his masters of structural engineering. During his studies at the University of Florida as a Graduate Research Assistant, he worked for Dr. H. R. Hamilton on two different post-tensioning grout projects.

Alex's thesis "Segregation of Post-Tensioning Grout during Full Scale Mixing and Injection" investigated how the use of varying percentages of the filler material calcium carbonate in combination with varying amounts of water-cement ratios/HRWR admixtures affected the formation of soft grout and bleed water in full-scale grouting operations using the inclined test tube system.

"Alex has developed and conducted a unique set of experiments on plain grout that has helped to isolate one of the causes of the recent soft grout problems experienced in post-tensioning construction nationwide. The testing and specification requirements developed from this work will help ensure that our post-tensioned bridge structures have a long and durable service life. Alex's outstanding capabilities were apparent during his research work here at University of Florida. He was able to effectively utilize a combination of hands-on practical aptitude with a theoretical understanding of fundamentals to develop this test method. These tools will serve him well when he goes to work for FINLEY," said H.R. Hamilton, PhD, P.E. Associate Professor, University of Florida.

"While Alex was an intern at FINLEY in 2010 and 2011, he displayed a strong understanding of post-tensioning applications. FINLEY interns work at an entry level bridge engineer position and are given assignments that are suitable for their level of experience and education. We are delighted to have this promising young engineer work with us on the Bayonne Bridge project," said Craig Finley, P.E., President, FINLEY.

Since graduation, Alex has had the opportunity to provide engineering services including bridge design and construction engineering for multiple projects including precast/cast-in-place segmental box girder bridges, curved steel tub girder bridges, pre-cast spliced U-beam bridges, and many others.

PTI Fellow Awards

At the time of nomination, a **Fellow** shall have been a Member of the Institute for at least 5 years. A Fellow shall have made outstanding contributions to the post-tensioning industry in the areas of education, research, development, design, construction, or management. In addition, a Fellow shall have made significant contributions to PTI through committees and/or other involvement. A Fellow shall retain that membership rank as long as membership in the Institute is maintained.

James P. Donnelly, P.E., S.E., is a Principal at Wiss, Janney, Elstner Associates, in Northbrook, IL. During his more than 30 years at WJE, Donnelly has been involved with a wide variety of structural investigations and evaluations for the repair of existing concrete structures, including post-tensioned, precast, and conventionally reinforced structures. He has special expertise in the repair of various post-tensioning systems used in concrete structures, which has included projects involving the splicing and restressing or replacement of over 5000 monostrand, button-headed wire, and bar tendons. Significant concrete structural investigations have included the evaluation and repair of numerous post-tensioned and precast parking structures and buildings, the investigation of partial collapses of precast concrete structures and a failed post-tensioned bridge girder, the evaluation of reinforcing corrosion and deterioration in bridge decks, the evaluation and repair of significant shear cracking in a 64-story reinforced concrete tower, and many others.

Donnelly is a licensed structural and/or professional engineer in three Midwestern states; is a member of the PTI repair and strengthening (DC-80), field personnel certification (CRT-100 (TG-C)), and professional member (PM-200) committees; Chair of ACI Committee 362, Parking Structures; and is a member of Joint ACI-ASCE Committee 423; Prestressed Concrete.

Neel Khosa, BS, MBA, received his BS in civil engineer from the University of Illinois-Urbana and his MBA from the University of Chicago. As Vice President of AMSYSCO, based in Chicago, IL, he oversees the project management, engineering, and manufacturing departments. Since 2003, he has managed several hundred unbonded PT projects in the commercial construction segment. Several of those projects have won PTI Project Awards. Early in his career, he worked as a Project Engineer/Manager for a commercial construction contractor. (Really) early in his career during grade school, high school and college, he worked as a summer intern at AMSYSCO. Neel has followed in the footsteps of his father, Rattan Khosa, who is also a PTI Fellow and a past President of PTI.

He has been an active participant in PTI and ACI. He is the Chair of Committee CRT-30, Unbonded Field Certification; Vice Chair of CRT-140, Certification Advisory Board; voting member of M-10, Unbonded Tendon; and voting member of ACI Subcommittee 301-I, Specification for Structural Concrete – Post-Tensioned Concrete. He was formerly a voting member of the Unbonded Plant Certification Committee which developed the current unbonded plant certification program. Khosa has also presented several times at PTI Convention technical sessions, written articles for the *PTI JOURNAL* and was the primary author of the educational AMSYSCO Post-Tension Blog (2009-2015). Khosa was awarded the Russell Price Award for Most Active Committee Member in 2015.

William M. Klorman, FACI, is the President, CEO, and Founder of W.M. Klorman Construction Corporation, established in 1980 and located in Woodland Hills, CA. He is a licensed general contractor and structural concrete contractor, and a certified Special Inspector for Reinforced Concrete. He specializes in design-build concrete buildings and structures and has been involved in the design and construction of more than 300 existing commercial structures over 30 years, the majority of which are post-tensioned.

Klorman is a member of PTI Technical Advisor Board (TAB) and the inaugural and current Chair of Committee DC-110 Building Information Modeling (BIM). He has been a presenter and moderator at many PTI Conferences. He is a member of ACI Committees 131, Building Information Modeling of Concrete Structures; 132, Responsibility in Concrete Construction; 318, Structural Concrete Building Code; 349, Concrete Nuclear Structures; Joint ACI-CRSI Committee 315, Details of Concrete Reinforcement; and ACI Subcommittees 318-A, General, Concrete, and Construction, and 318-G, Precast and Prestressed Concrete. He previously served on the Construction Liaison Committee, the Joint ACI-ASCC Task Group to Address Contractor Needs, and the Strategic Development Council's ATI Team for Building Information Modeling; ACI Committee 350, Environmental Engineering Concrete Structures; and ACI Subcommittee 301-E, Post-Tensioned Concrete.

Klorman received ACI's Roger H. Corbetta Concrete Constructor Award in 2011. In 2014, he was named one of "The Five Most Influential People in the Concrete Industry" by *Concrete Construction* and received the Concrete Reinforcing Steel Institute's Honors Award for Leadership.

He was published in *Concrete International* for his case study of an internally post-tensioned concrete water reservoir for California Polytechnic State University, San Luis Obispo, CA, and contributed to *The Sustainable Concrete Guide—Applications*, published by the U.S. Green Concrete Council, in which he co-authored Chapter 9, Planning and BIM (Building Information Management). His article "BIM: Leveraging Integration—Modeling a Confederated BIM at LAX's New Tom Bradley International Terminal" was published in *Structure* magazine.

Klorman regularly lectures and is a guest speaker for various industry groups and universities around the United States, where he presents and teaches concrete construction and building information modeling.

Daniel (Dan) Moser is currently a Principal and Director for the Restoration Resource Group at Walker Restoration Consultants. Dan is a licensed professional engineer, as well as a licensed structural engineer. He is responsible for coordinating and managing restoration projects, as well as performing evaluation and design. Dan has over 28 years of experience with specialized expertise in structural evaluations, engineering design, and restoration on a wide variety of structures ranging from 800 ft tall reinforced concrete chimneys to buildings and bridges, as well as building façades and parking structures.

Prior to joining Walker, Dan had extensive experience in both evaluation and restoration, as well as designing numerous new structures. His experience in new structural design includes composite steel/concrete office buildings, precast and post-tensioned parking structures, structural steel and masonry buildings, and heavy timber-framed structures. Many of the structures used unusual foundation systems including mat foundations and foundations three stories below grade.

Dan's experience in structural evaluation, analysis, and repair/strengthening includes numerous low-strength concrete building elements; deteriorated post-tensioned slabs/beams; deteriorated structural steel framing; and deteriorated/deficient reinforced concrete slabs, columns, beams, balconies and chimneys. Additionally, Dan has evaluated and re-supported numerous settled foundations and columns, designed strengthening systems for existing structures of all types to carry new loads, developed and monitored load tests for existing structures, and designed numerous shoring/jacking systems.

Dan has performed new design of post-tensioned structures as well as evaluated, strengthened, and modified existing PT structures. Dan was the recipient of PTI's 2013 Award of Excellence in the category of Repair, Rehabilitation, and Strengthening for the significant structural modifications to an existing post-tensioned parking structure at RDU Airport. Dan is currently serving on PTI Committee DC-80 and helped author the popular publication "Guide for Evaluation and Repair of Unbonded Post-Tensioned Concrete Structures." Dan is also serving on PTI Committee CRT-100.

Todd Stevens began his career in the reinforcing industry in 1984. He was on his first post-tensioning job in 1985 and has been hooked ever since. Todd started off as a Field Ironworker, working his way up through the ranks from Ironworker to Foreman to General Foreman and then on to Superintendent. He has been involved in many different types of prestressed concrete structures throughout the Western United States. In the mid 1990s, his career took Todd into the post-tension repair direction, where he spent numerous years investigating and repairing damaged structures. In 2008, Todd was hired by a large reinforcing steel contractor on the West Coast and was tasked with building, staffing, and managing their post-tension operations, where he remains today. In his current career progression, Todd has been heavily involved in promoting and training field personnel in the area of proper field installation and safety of post-tensioning. He looks forward to many more years in the prestressed concrete industry and the varying possibilities that post-tensioning can bring to the construction industry.

The **PTI Project Awards** recognize excellence in post-tensioning applications. Any structure completed or rehabilitated in the past 7 years that uses post-tensioning as a structural component was eligible. Entries were submitted by owners, architects, engineers, contractors, and post-tensioning suppliers.

Awardees were selected by a jury of industry professionals and were judged based on creativity, innovation, ingenuity, cost-effectiveness, functionality, constructibility, and aesthetics.

Award of Excellence

Kellogg School of Management

Location:	Evanston, IL
Submitted by:	Thornton Tomasetti
Owner:	Northwestern University
Architect:	KPMB
Engineer:	Thornton Tomasetti
Contractor:	Power Construction
PT Supplier:	Dywidag-Systems International USA, Inc.
Other Contributors:	AEI Affiliated Engineers, Erikkson Engineering, Transsolar, Hoerr Schaudt, HJ Kessler Associates, Tillotson Design Associates, Construction Cost Systems, CM Architects, Threshold, Soberman Engineering, S20, Desman, Brian Ballantyne Specifications, Cini Little

Project Overview:

Northwestern University's Kellogg School of Management has been located in the Donald P. Jacobs Center since 1972. To maintain its status as one of the world's top graduate business schools, Kellogg will be relocating to a stunning new building located between the Allen Center and Lake Michigan in 2017. This architecturally ambitious new "Global Hub" helps to achieve Kellogg's goal of remaining first in class.

The structure aims to be an innovative, next-generation business school that inspires new forms of community building and adult learning by combining the physical and virtual in unprecedented ways. Project goals included providing a space for collaborative learning, providing accommodation for future flexibility, and designing a space that inspires.

The most prevalent use of post-tensioning is to support 169 transfer columns in the upper three levels of the building. These transfer columns, which are necessary due to the dissimilar column grids of the lower-level classrooms and the upper-level offices, are supported by a network of large, post-tensioned transfer beams behaving as "foundations in the air." The transfer columns at the perimeter of the upper levels are set outboard of the levels below resulting in dramatic PT transfer cantilevers up to 19 ft in length.

The advantage of post-tensioning in these transfer beams is that long spans and cantilevers are achievable with minimum structural depth and deflection, which is a critical concern for transfer columns. The curving nature of the floor plates also creates complicated PT transfer beam intersections which were a key constructability consideration during the design phase. Many of the PT transfer beams were stressed in multiple stages to manage the varying loading conditions that occurred during construction without overstressing the beams.

Post-tensioning is also used in the lower levels in beams that enable large, column-free classroom space and extensive cantilevering of exterior terraces while minimizing structural depth.

Jury Comments:

- This building's visually striking appearance was accomplished only through the use of post-tensioning for the numerous transfer girders necessary to accommodate the geometric changes.
- This project had everything!
- This project had substantial structural challenges that post-tensioning solved just beautifully.

Roy and Diana Vagelos Education Center

Location:	New York, NY
Submitted by:	Leslie E. Robertson Associates
Owner:	Columbia University Medical Center
Architect:	Diller Scofidio + Renfro (lead designer), Gensler (executive architect)
Engineer:	Leslie E. Robertson Associates
Contractor:	Sciame Construction LLC
PT Supplier:	VSL/Structural Technologies
Other Contributors:	Urban Foundations/Engineering, Difama Concrete, Bethlehem Precast, Jenna Concrete, Raul Herrera, COLE Technologies, Steve Zimmerman, Titan America, STI Construction, Tilcon New York, Inc., Roanoke Sand & Gravel Corp., BASF the chemical company, Euclid chemicals, DOKA, EDC, CFS Steel, Weidlinger Associates Inc., Cobiax USA, United Structural Works

Award of Merit

Project Overview:

The 15-story, 107,000 ft^2 Roy and Diana Vagelos Education Center stands as a nearly identical realization of the architects' vision: a vertical campus of intertwined, cascading outdoor terraces and social and study spaces that fosters an environment of open collaboration. In contrast to the unconventional geometry of the southern façade, the northern half of the building is largely uniform floor-to-floor, and contains classroom and administrative space in addition to a mid-tower mechanical space that supports the building's Anatomy Labs.

To facilitate the openness and transparency of the Study Cascade, the various cascade slabs are cantilevered south by 15 to 25 ft off of a pair of architecturally exposed concrete columns with embedded steel shapes and Grade 97 rebar. A bonded post-tensioning system is utilized to accomplish the cantilevers, with a slab edge profile that tapers to as thin as 8 in. in depth.

The Roy and Diana Vagelos Education Center was built with the purpose of transforming the identity of Columbia University Medical Center's Washington Heights campus and embodying the University's commitment to revolutionizing the way modern medicine is taught. Its most prominent and aesthetically alluring feature, a southern-facing "Study Cascade" that contains vertically interconnected study and social spaces; encourages collaboration between students, teachers, and disciplines; and creatively blends function and experience. The cascade's highly articulated and transparent façade would not have been realized in its current form without the use of post-tensioning.

The predictable performance of post-tensioned concrete enabled the designers to support the cascade with long-span cantilevered slabs. Accordingly, post-tensioning was used to control the deflections of the cantilevers and gave the design team the ability—and confidence—to report and coordinate expected structural movements that met the strict requirements of the all-glass façade. The flexibility of the multi-strand bonded post-tensioning system greatly simplified detailing and coordination efforts at the various slab steps and transitions that were necessary to accommodate the façade embeds and to maintain a thin structural profile that extends beyond the face of glass.

Jury Comments:

- This project has an amazing structural system and appearance made possible only through the use of post-tensioning.
- This is perhaps one of the most spectacular buildings I have ever seen.
- This structure was tremendously technically challenging from an engineering standpoint and so aesthetically pleasing from an architectural standpoint.

Dresbach Bridge over Mississippi River

Location:	Dresbach, MN
Submitted by:	FIGG Bridge Group
Owner:	Minnesota Department of Transportation
Engineer:	FIGG Bridge Group
Contractor:	Ames Construction
PT Supplier:	Schwager Davis

Project Overview:

The new Interstate 90 Dresbach Bridge over the Mississippi River is a highly utilized river crossing serving as a gateway for regional and interstate needs and an enhanced local connection for the adjacent communities. The new Dresbach Bridge is designed to exceed current structural standards and greatly improves roadway geometrics on this important regional corridor. Combined with reconstruction of the adjacent TH61/I-90 Interchange, the overall project improves safety, capacity, and access with a long-life facility for MnDOT and travelers. The completed Dresbach Bridge was opened to traffic in October 2015.

A modern and ecologically conscious four-lane concrete bridge replaced the previous deficient steel structure. Over the main channel of the Mississippi River, the new four-span bridge features twin cast-in-place, post-tensioned segmental concrete structures with 508 ft main spans, built from above with form travelers in balanced cantilever. Building from above eliminated the need for large ground- and water-based equipment, allowed commercial and recreational river traffic to continue unimpeded throughout the duration of construction, and minimized environmental impacts. Construction was kept to the smallest footprint to protect the environment, adjacent recreational facilities, and the USACE Lock and Dam No. 7 just upstream.

This post-tensioned concrete segmental bridge solution met or exceeded all project constraints, criteria, and goals for the new crossing. Use of post-tensioned segmental concrete enabled the bridge to be built from above in balanced cantilever. Doing so minimized construction impacts to the environment and river users. The project's efficient, cost-effective long spans minimize its footprint. This beautiful post-tensioned structure is highly durable, low maintenance, and sustainable thanks to bi-directional compression of its superstructure. This reduces life cycle costs. It also allows the bridge to have graceful aesthetics—an issue very important to the community and area stakeholders. The use of concrete supported the local economy by taking advantage of local labor, materials, and resources.

Jury Comments:

- This structure is extremely graceful and very fitting for its location.
- This project is just very visually striking.
- This bridge is gorgeous aesthetically and one can imagine the construction challenges that were faced and overcome with the weather in this part of the country.

Award of Merit

South Norfolk Jordan Bridge

Location:	Chesapeake & Portsmouth, VA
Submitted by:	FIGG Bridge Group
Owner:	United Bridge Partners
Engineer:	FIGG Bridge Engineers
Contractor:	Southland Contracting
PT Supplier:	VSL/Structural Technologies

Project Overview:

The new $90M South Norfolk Jordan Bridge linking Chesapeake and Portsmouth, VA, opened to traffic in October 2012, providing faster connections, more capacity, bigger clearances, and breathtaking views to enhance the quality of daily life in surrounding communities. This new, modern, post-tensioned segmental concrete bridge was built in less than 2 years to replace an 80-year-old structurally deficient steel lift-span bridge that had been closed to traffic. Since there was no funding available to repair or replace the aging bridge, the City of Chesapeake had no choice but to close the bridge, but realized that the effect on the traveling public was unacceptable. In January 2009, the City of Chesapeake entered into an agreement with the engineer for a new, privately funded Jordan Bridge. The new bridge is a high-level fixed span over the river allowing for the continuous flow of vehicles, cyclists, and pedestrians crossing over the bridge at the same time ships, trains, and other vehicles pass under the bridge. The final bridge is just over a mile long, 17 stories tall, and has a post-tensioned superstructure made of 533 segments and post-tensioned piers. The bridge piers reached heights up and were precast at an adjacent casting yard and barged to the site. They were then stacked, epoxied, and vertically post-tensioned. The 533 concrete segmental box girders of the superstructure were match-cast, barged to site, erected using span-by-span methods, and post-tensioned. The longest spans were built in balanced cantilever using a barge-mounted crane. The superstructure was post-tensioned in both directions and had vertical post-tensioning bars.

Post-tensioning allows the balanced cantilever construction methods used to build this award-winning, graceful bridge. This 5371 ft long bridge has a post-tensioned superstructure and substructure. Its constant-depth approach spans were match-cast, trucked to site over the previously erected spans, erected using span-by-span erection method, and post-tensioned. The superstructure was post-tensioned bi-directionally (transversely and longitudinally) to minimize micro-cracking and increase long-term durability. Crews were able to complete up to two approach spans per week. Using multiple erection headings, superstructure erection took just 14 months. Post-tensioning minimizes cracking, maximizes durability, and provides residual longitudinal compression of the deck under normal service loads. Its columns are vertically post-tensioned.

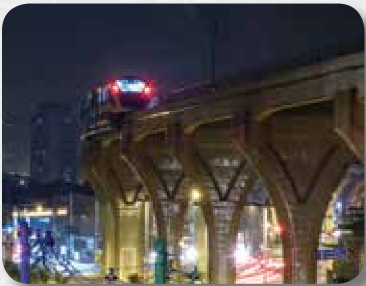
Jury Comments:

- The use of precast post-tensioning segments for columns and superstructure allowed for faster construction with better quality in a challenging location.
- This is a really impressive, monumental high bridge and just an excellent project all around.

Award of Merit

Metro Line 15 (Silver) Monorail

Location:	São Paulo, Brazil
Submitted by:	Innova Technologies, Inc.
Owner:	Metrô São Paulo, São Paulo, Brazil
Architect:	Metrô São Paulo, São Paulo, Brazil
Engineer(s):	Planservi, SP, Brazil; Proenge, SP, Brazil; Innova Technologies, Las Vegas
Contractor(s):	Bombardier Transportation; Construtora Queiroz Galvão, OAS Engenharia
PT Supplier:	Protende Sistemas e Métodos de Construções Ltda
Other Contributors:	Planvia, Setepla, Zamarion e Millen Consultores, ENGETI Consultoria e Engenharia, Condutix-Wampler, Helser Industries



Project Overview:

Metropolitan São Paulo, Brazil has a population of 21.1 million, and is the largest economy by gross domestic project in Latin America and the Southern Hemisphere. The São Paulo Metro system carries 4.7 million passengers daily. In 2009, the decision was made to use monorail technology in the extension of the Metro System for Line 15 (Silver Line) when the Government of the State of São Paulo and the Prefecture of the municipality of São Paulo signed an agreement of Technical and Financial Cooperation to substitute the original project for a monorail line.

The total project was divided in two large phases. The first goes until São Mateus with a length of 11 km (17.7 miles), and is a 10-station section with a expected ridership of 340,000 passengers per day. The second phase until Cidade Tiradentes has a length is 26.6 km (42.8 miles), 18 stations, and an expected ridership of 501,000 daily passengers using 54 trains consisting of seven cars per train.

Construction of infrastructure for the first 2.9 km segment began in 2009, prior to the selection of the vehicle supplier.

This type of structure is not possible without post-tensioning. Typical structures consist of elegant hollow beams with an average length of 30 m (100 ft), with a parabolic hunched profile consisting of cross sections varying from 2.05 x 0.69 m (7 x 2.26 ft) at the ends, to 1.6 x 0.69 m (5.25 x 2.26 ft) at midspan. The beams are cast with varying horizontal and vertical geometry, with horizontal curves as tight as 46 m (150 ft), which are ideal to be deployed in urban areas. The weight of the beams varies from 60 to 80 tons, and are fast to fabricate and erect. The beams are fabricated using intricate forms in a special casting yard, and the first stage post-tensioning is applied at the precast yard. The beams are transported to the jobsite, and lifted into position. The structures are made continuous by casting closure pours on top of the columns and a second stage post-tension is then applied. The resulting continuous frame provides a very versatile method to bridge long distances with an efficient structural system. The system is quite efficient in another way, the ratio for an empty/fully loaded train-to beam dead load is approximately 0.5:1 or 1:1 respectively.

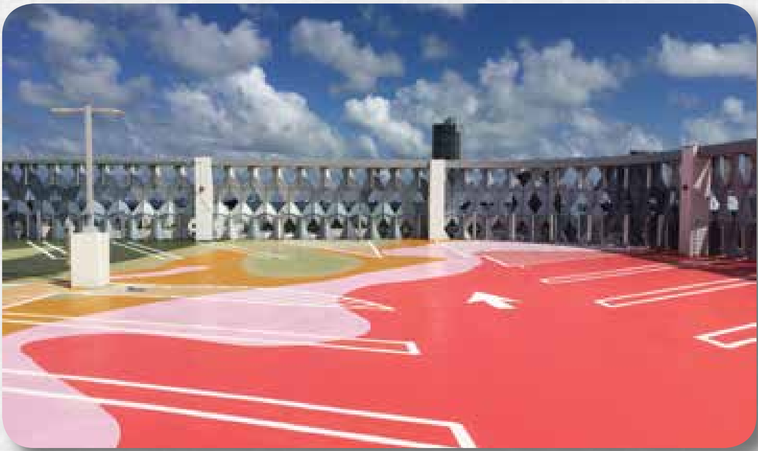
Jury Comments:

- This is an excellent example of the ability of post-tensioned structures to meet structural, functional, and aesthetics demands.
- This is spectacular; just the sheer magnitude of this project is quite impressive.

Award of Excellence

Miami Design District City View Garage

Location:	Miami, FL
Submitted by:	Timothy Haahs & Associates
Owner:	DACRA
Architect:	Timothy Haahs & Associates
Engineer:	Timothy Haahs & Associates
Contractor:	KVC Constructors
PT Supplier:	Suncoast Post-Tension



Project Overview:

The engineer worked on the design of a mixed-use parking facility to serve the Miami Design District. One of the most unique characteristics of the garage design is the use of multiple façade architects on the project. This allowed for numerous artistic schemes to be prevalent throughout. Two internationally renowned architectural firms worked on the garage façade designs.

The engineer was able to achieve long-span, column-free parking modules while keeping the concrete slab thickness and beam depth to a serviceable minimum dimension. This in turn resulted in a highly efficient parking layout, lighter structural framing, and smaller foundation members. In addition, better visibility and user-friendly structure is achieved with slender columns, the absence of solid obtrusive shear walls that improve passive security, and patron's confidence in using the garage. Overall, it resulted in a highly efficient and cost-effective parking structure.

Jury Comments:

- Post-tensioning allowed longer spans and thinner elements resulting in a very open garage structure.
- This project bodes a very visually striking exterior in keeping with the Miami scene.

Award of Excellence

James Pascoe Group Distribution Centre

Location:	Auckland, New Zealand
Submitted by:	BBR VT International Ltd.
Owner:	James Pascoe Group
Architect:	TSE Architects
Engineer:	BGT Structures
Contractor:	James Pascoe Group
PT Supplier:	BBR Contech
Other Contributors:	Conslab Ltd., Concrete Structures

Project Overview:

James Pascoe Group required a state-of-the-art national distribution center to consolidate, warehousing for all of the groups retail brands, which include Farmers, Whitcoulls, Stevens, and Pascoes. They set out with a long-term goal to minimize costs and maximize value for customers. This was supported by introducing the absolute latest warehousing systems and technology, including 16 m (52.5 ft) high very narrow aisle (VNA) racking—the highest level installed to date in the southern hemisphere. The cutting-edge VNA racking and material handling equipment (MHE) required a level of floor flatness that is considered the highest in the world, existing on the margins of what had been achieved globally.

The floor was constructed as a series of large bay post-tensioned floors, coupled together so that there were only two opening joints located within the 25,000 m^2 (267,500 ft^2) ground floor. Combined with the use of a new system for concrete floor jointing—the Rhino joint—this creates a surface that would require little to no maintenance during the life of the structure.

The use of post-tensioning allowed for an efficient and relatively thin 240 mm (9.4 in.) thick floor to cater to the 120 kN (28,100 lb) back-to-back rack loading, thereby reducing the volume of concrete compared to a traditional floor system. As the key working surface in the facility, the 25,000 m^2 post-tensioned concrete high-performance ground floor played a pivotal role in the success of the project.

Traditionally, a VNA floor would be constructed in narrow strips one aisle at a time to ensure the exacting flatness standards were achieved. Traditional construction processes would slow down program, thicken the floor, and make it weaker and more prone to maintenance. A hybrid, large-bay post-tensioned solution was developed, which minimized joints, allowed fast construction, and provided a more sustainable solution by reducing concrete volumes. The combination of faster construction time and a more efficient use of materials resulted in an approximate 25% reduction in cost.

Jury Comments:

- The use of post-tensioning significantly minimized the number of construction and expansion joints and allowed for precise control of floor flatness.
- A facility such as this one really benefits from the advantages of post-tensioning.

Award of Merit

Truck Maintenance Facility

Location: Elkford, BC, Canada

Submitted by: DSI Canada Civil, Ltd.

Owner: Teck

Engineer: J.R. Spronken & Associates

Contractor: Graham Construction

PT Supplier: DSI Canada Civil, Ltd.

Project Overview:

It was determined that the final structure configuration would be not less than four bays x 66 ft in width, with a minimum clear height of 75 ft, incorporating 75 ton overhead cranes with interstitial bays of 30 ft to permit access by specialized equipment to manipulate and change the 12 ft diameter tires used by these off-road earthmovers.

The slab itself consisted of a base slab 20 in. in thickness which has no other reinforcement component but the uniform, equally spaced two-way post-tensionned grouted cables centered in the slab with little or no deviations to produce the maximum post-tensioned force possible.

The wash bay incorporates a fully integrated large tank (approximately 20 x 100 ft) to both store the water resulting from the wash operation and also to partially contain some of the residue that is dislodged from the truck carriages. The larger mud and rock debris is cleaned off with a front-end loader (see photographs of wash bay grates).

This tank made use of three forms of post-tensioning. The base of the tank consisted of post-tensioning cables in the longitudinal direction because of the ability to follow the base contour. Stressing bars 1.4 in. in diameter were used transversely across the base and for the vertical walls of the tank due to the ability to be both self-standing and to be accurately tensioned over short lengths. Horizontally, the walls were post-tensioned using 0.6 in. fully encapsulated strands placed in pairs, one each side of the vertical 14 in. bars. All post-tensioned elements were grouted following the tensioning operation save the self-encapsulated strands. All walls and tank base are a nominal 23.6 in. in thickness for sake of simplicity and water retention requirements. The average post-tensioned stress is equal in all three axis of the tank. The entire tank is equally supported on the compacted tailings and is fully integrated with the raft slab.

The walls of the wash bay are lined with 11.8 in. prestressed solid concrete planks incorporating viewing/lighting windows capable of resisting impact produced by debris being dislodged by the water cannons. Entrance to the area is limited and carefully monitored. Additionally, the wash bay incorporates an exterior, fully heated dripping for post-washing pad.

There are many more aspects and benefits to the building but suffice to say that without the use of post-tensioning of the base slab, this structure would have never benefitted, or even been constructed, so economically or successfully.

Jury Comments:

- This is not your typical slab-on-grade!
- The use of post-tensioning made possible the wash bay and other building features and all of it supported on a large raft-type post-tensioned foundation.

Award of Excellence

Manhattan West Platform

Location: New York, NY
Submitted by: TENSA America
Owner: Brookfield Properties, Inc.
Architect: SOM
Engineer(s): McNary Bergeron Associates, Entuitive Corp.
Contractor: Rizzani de Eccher USA Ltd.
PT Supplier: TENSA America

Project Overview:

The Manhattan West Platform is a 110,000 ft^2 segmental post tensioned platform made of 16 adjacent bridges with a record length of 240 ft. The platform covers a 240 x 480 ft hole over active rails taking around 800,000 people a day in and out from Penn Station. Brookfield Properties is the Owner and is planning to build 7 million ft^2 of mixed residential and commercial use.

The use of post-tensioning has been crucial for the erection of the No. 16 precast segments spans. Each of the spans has a medium length of 262 ft, a total weight of 2.200 MT and it is provided with about 90MT of post-tensioning, made with 37 and 31 – 0.6 in. strands longitudinal and nine 0.6 in. transversal tendons.

The PT ratio for this project—that is, (kg of PT steel strand)/(m^2 of deck top surface)—is three times higher than standard PT applications.

The use of PT has been brought to the highest achievable limit to allow a complete covering of the railway area as required by The Client. Such project would have not been possible without the use of PT.

Jury Comments:

- Only through the use of post-tensioning was this platform able to be built over 15 live Metro tracks without needing any supports between the tracks.
- The coordination involved in this project was incredible and the span of it is amazing.
- What a feather in the cap of the world of post-tensioning!

Award of Merit

Adams Precast Segmental Tower

Location:	Adams County, IA
Submitted by:	Wind Tower Technologies LLC
Owner:	MidAmerican Energy Company
Architect:	Wind Tower Technologies LLC
Engineer:	Wind Tower Technologies LLC
Contractors:	Siemens Wind Energy, Baker Concrete
PT Supplier:	Schwager Davis
Other Contributors:	EFCO Forms, Thornton Tomasetti Engineers, International Bridge Technologies

Project Overview:

The tower is the first precast segmental concrete wind tower constructed worldwide and is the highest tower in the United States. The tower supports a Siemens 2.3 MW turbine. Also unique to the tower structure is that its segments were fully precast on site at a central casting yard, installed into the tower before being stressed in place without the use of temporary post-tensioning.

On-site fabrication eliminated the disruptions and costs inherent with transporting large steel tower sections over roads and bridges from remote locations to the project site. Using on-site concrete fabrication, the tower base diameter was unrestricted. This benefit of larger base diameters allowed the engineer to optimize the tower diameter for the 115 m (377 ft) height. Additional benefits to the projects' on-site concrete precasting include the use of local labor and locally sourced concrete.

To achieve the required speed of construction, the concrete tower segments were match cast together, resulting in a tight fit between segments when installed. The geometry of the tower was largely set in the precasting yard with no alignment adjustments required on the project during erection.

The foundation was cast-in-place and incorporates an annular pedestal wall that supports the precast tower. The connection, located close to ground level, is the only grouted joint in the tower. By separating the cast-in-place foundation activities from the precast tower activities, the project owner maintained the flexibility to procure the foundation contact separately from the tower contractor.

The post-tensioning system consists of 19 strand external tendons equally spaced around the inside perimeter of the tower. Tendons are stressed over 100 m (328 ft) in height, enabling all precast segments to be installed prior to stressing. This provided significant advantages to the construction speed and costs by taking the installation and stressing of the tendons of the critical path. The external post-tensioning located inside the tower enabled the wall thickness of the tower to be optimized. The post-tensioning is designed to terminate in the base of the tower, where the forces can transition into the foundation structure. This post-tensioning design allowed the foundation to be constructed independently of the towers, enabling the cast-in-place foundation to be constructed in advance.

All post-tensioning tendons were prefabricated off-site and installed full height. This solution minimized the time required to install and stress the tendons inside the tower.

Jury Comments:

- This project displays a unique and potentially game-changing use of post-tensioning for wind tower applications.
- This project has the potential to shed some light on a new market for post-tensioning in wind towers.
- This is a trend-setting structure in the U.S.

Award of Excellence

Dolphin Tower Emergency Structural Repairs and Rehab

Location:	Sarasota, FL
Submitted by:	Concrete Protection & Restoration, Inc.
Owner:	Dolphin Towers Condo Association
Engineer:	Morabito Consultants
Contractor:	Concrete Protection & Restoration, Inc.
PT Supplier:	PTE Systems International, LLC
Other Contributors:	Karins Engineering Group, CEMEX

Project Overview:

The building is a 15-story condominium with the first three levels devoted to parking. The fourth floor is designed to be a 24 in. thick column transfer slab, distributing the 12-story column loads above to the non-aligning columns below.

On June 24, 2010, the resident manager who lived on the fourth floor observed the walls within their unit were buckling and the tile floors were cracking. A structural engineer was contacted whom confirmed a major failure and incipient collapse. It was arranged for a contractor to install emergency shoring immediately and the building was evacuated.

An effort was made to identify the cause of the failure and determine feasibility/methods of repair. The building was intensely scrutinized and no "trigger" was identified; the failure was determined to be punching shear. A side-effect of the intense analysis of the building was the discovery of vulnerabilities in addition to the failed transfer slab. These included inadequate lateral design for hurricane wind resistance and inadequate punching shear capacity at the upper level slabs.

To address the identified issues, remedial measures were designed including replacement of the failed fourth-floor transfer slab, column enhancements, installation of new lateral force resisting elements and associated foundations, enhancement of existing lateral force resisting elements, and enhancement of upper floor slab/column joints.

In an effort to bring down the cost of the project, the design evolved from removal and replacement of the fourth-floor slab and installation of exterior shear walls to installation of post-tensioned drop panels combined with a structural overlay and interior shear walls. This approach resulted in a cost saving of approximately $3 million, completion of the $9 million structural repair on time, and a cost reduction of more than $500,000 at the end. The project was completed on time and under budget!

Jury Comments:

- Post-tensioning saves the day and the building.
- Only through the innovative use of post-tensioning was this building salvaged.
- What they did here was just spectacular.

Award of Merit

GMBC Daffodil Garage Emergency Repairs & Waterproofing

Location:	Towson, MD
Submitted by:	Concrete Protection & Restoration, Inc.
Owner:	Greater Baltimore Medical Center
Engineer:	Morabito Consultants, Inc.
Contractor:	Concrete Protection & Resotration, Inc.
PT Supplier:	DYWIDAG Systems International, USA Inc.

Project Overview:

After years of neglect and due to some odd design features and questionable decisions on the part of the facilities management, the garage was in poor condition and in serious need of repair. The work included concrete slab, beam, and column repairs and the installation of a new epoxy leveling coat and traffic-bearing waterproofing membrane coating. The focus of the 2015 repairs was to make the garage water-tight by November. These repairs would ensure continued use of the parking structure and prevent further damage to structural elements on the lower levels until additional phases of repair could take place. Phase 1 was to make repairs to the post-tensioned support beam that supports the former access ramp P-T infill slab at column line 15. The scope was to remove the existing deteriorated steel angles and add a concrete corbel to the east side of the existing concrete beam which would support the slab. The repair work included repairing 43 P-T cables that were also damaged from water penetration. Phase 2 involved repairs to the P-T beam and east P-T slab located at the expansion joint on column line 9, which were both severely damaged due water penetration. During demolition of the spalled beam concrete, it was discovered that five 0.5 in. diameter P-T cables were broken which required replacement with three 0.6 in. diameter P-T cables which needed to be placed along the entire 120 ft length of this P-T beam. Phases 3, 4, 5, and 6 involved over 2400 ft^2 of partial-depth and full-depth concrete repairs to the top-level slab, which also included over 100 repairs to damaged/broken P-T cables. The final phase was to install the new water-tight expansion joint gland on column line 9 and at the entrance bridge and the heavy duty vehicular traffic coating.

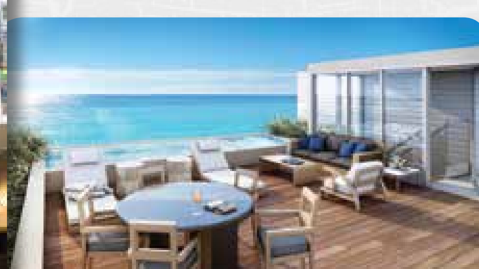
The repair of the P-T beam and east P-T slab located at the expansion joint on column line 9 were a key component of this restoration project. Both the P-T beam and slab sections were both severely damaged due to water penetration and a failure to properly construct a sliding slab connection for the expansion joint to properly function. These repairs took place in two separate phases to allow continuous flow of traffic in the levels of the garage below. During demolition of the spalled beam concrete, it was discovered that five 0.5 in. diameter P-T cables were broken and would need to be repaired. To do this, the contractor would have to demolish and remove 100% of the beam to replace the broken cables. However, the repair engineer and contractor came up with a different solution. The broken cables could be left in place, and the beam would be enlarged to make room for three 0.6 in. diameter P-T cables which were installed along the entire 120 ft length of this P-T beam and matched the existing cable profile. This approach saved time and money for both the contractor and owner.

Jury Comments:

- The use of post-tensioning for repairs and strengthening extended the service life of this structure for another 25 years, as opposed to complete replacement.
- The repair work presented was just so great and really showed off the power of post-tensioning.

The Ritz-Carlton Residences Waikiki Beach, Phase 1

Location:	Honolulu, HI
Submitted by:	Baldridge & Associates Structural Engineering (BASE)
Owner:	PACREP, LLC
Architect:	Guerin Glass Architecture
Engineer:	Baldrige & Associates Structural Engineering (BASE)
Contractor:	Albert C. Kobayashi, Inc.
PT Supplier:	Suncoast Post-Tension
Other Contributor:	Associated Steel Workers, Ltd.



Project Overview:

The Ritz-Carlton Residences Waikiki Beach, Phase 1, which recently opened its doors to the public, is a 38-story, 350-foot tall, 459-unit luxury tower in the center of bustling Waikiki. The tower sits atop an eight-story podium. This tower is Phase 1 of a two phase project and both towers will share common spaces at the podium floors.

The project and unique site was encumbered by numerous easements, extensive access to loading zones for adjacent retail space, and an underground electric utility power station. Offset foundations and columns, as well as sloping columns were incorporated to avoid impacting various utility and private easements around and within the site, and also to allow for large open spaces at the ground floor for drop-off and loading dock areas. The eight-level podium uses a number of transfer girders at level 8 to transfer the tower walls and columns onto a different set of podium level columns and walls. This transition of vertical elements at level 8, with the use of deep post-tensioned transfer girders, allowed for the most efficient design of sellable spaces at podium and tower levels. 7 in. thin post-tensioned slabs used in the parking and tower levels allowed the project to maximize the number of floors within the 350 ft height limit in Waikiki.

The project was encumbered by height limits, numerous easements, and truck maneuvering areas under the building. The only way for the building to meet all project requirements was through the use of post-tensioning.

First, the majority of the floors were 7 in. thick post-tensioned slabs to stay within height limits. Second, to meet the goal of optimizing sellable residential area the podium used 17 post-tensioned transfer girders to transfer tower walls and columns onto a different grid of podium and parking level columns and walls. Third, the ground floor truck maneuvering areas also had constraints that would not allow the podium's vertical elements over the loading dock to extend down to the foundation level. The solution to this was a two-story, post-tensioned concrete truss spanning 120 ft. Lastly, the penthouse levels were designed with some spectacular large double-story atrium spaces. The atrium openings were achieved by hanging partial floor post-tensioned slabs with steel hanger columns from the roof level. The roof slab not only had to support the loads from the hanging columns, but also the loads from heavy mechanical loads in the center and landscaped rooftop terrace loads on the perimeter. The roof level transfer slab could only be achieved using post-tensioning.

Jury Comments:

- The designers were able to use post-tensioning to mitigate the height restrictions by using thinner post-tensioning slabs and transfer girders.
- This building is a wonderful example of the advantages of post-tensioned concrete in tall buildings.
- Without post-tensioning, this building would be much taller, much heavier, much more expensive, and would present many more architectural challenges.


Save the Dates!
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