POST-TENSIONING CONVENTION

PTI 2023 AWARDS PROGRAM

MAY 1, 2023

JW Marriott Marquis Miami | Miami, Florida, USA

For more information, please visit post-tensioning.org.

SAVE the DATE

April 14-17, 2024 | The Westin Indianapolis | Indianapolis, IN

For more information, please visit post-tensioning.org/events.

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Schedule of Events

2023 PTI Awards Program

Monday, May 1, 2022 | 6:00 p.m. - 8:30 p.m.

The 2023 PTI Awards Program will honor the members whose commitment, research, and service will continue to shape PTI and the post-tensioning industry for years to come.

6:00 p.m.	Reception
7:00 p.m.	Welcome - PTI President Gregory Hunsicker
7:05 p.m.	Dinner
7:45 p.m.	Awards Presentations: PTI Service Awards PTI Fellow Inductions PTI Project Awards

Master of Ceremonies

Anthony (Tony) Johnson

Executive Director, Post-Tensioning Institute

Anthony (Tony) Johnson, P.E., FACI currently serves as the Executive Director for the Post-Tensioning Institute (PTI), the foremost source for resources relating to the post-tensioning market. At PTI he is tasked with implementing the Institute's strategic plan for growing evolving, and improving the organization, while enhancing the value proposition to both members of the institute and the Post-Tensioning industry at large.

Previously, Johnson was a member of the Concrete Reinforcing Steel Institute's (CRSI) Regional Manager team, responsible for providing technical assistance, outreach, and education to engineers, architects, owners, contractors, as well as student groups.

Johnson is actively involved with many concrete and construction industry associations including the American Concrete Institute (ACI), Structural Engineering Associations across the United States, the National Council of Structural Engineers Associations (NCSEA), the Council on Tall Buildings and Urban Habitat (CTBUH), International Federation for Structural Concrete (fib), American Segmental Bridge Institute (ASBI), and the Precast/ Prestressed Concrete Institute (PCI). He is a Fellow of the American Concrete Institute, the recipient of the prestigious ACI Greater Michigan Chapter Moy Award for his contributions to the advancement of concrete technology, he is a Past-President of the ACI Greater Michigan Chapter where he also served as Secretary and Treasurer for numerous years, and the 2013 recipient of the ACI Chapter Activities Award.

Johnson graduated from the Michigan State University Eli Broad Graduate School of Management where he attained a Master of Business Administration. He graduated with honours from the University of Wollongong (Australia) with a Bachelor of Engineering in Civil Engineering.

Technical Advisory Board (TAB)

The Technical Advisory Board is responsible for all technical and research activities of the Institute, including all publications and promotional material with technical content; it provides a continuous flow of current and pertinent information to the professional membership of the Institute.

Current TAB Members:

Hamid Ahmady
Bryan Allred
Asit Baxi
Tim Christle
John Crigler
Martin Cuadra
Carol Hayek
Jonathan Hirsh
Don Illingworth
Don Kline
Andrea Schokker
Mike Schwager
Edgar Zuniga

Certification Advisory Board (CAB)

The Certification Advisory Board is responsible to initiate, develop, implement, and oversee the individual, plant, and product certification programs of the Post-Tensioning Institute.

Current CAB Members:

Fabrice Brugere
Dan Buck
Jack Graves
Thomas Helm
Neel Khosa
David Martin
Randy Plitt
Todd Stevens
Rod White
Coy Williams
Zuming Xia

Congratulations, 2023 PTI Service Awards Winners

Scott Greenhaus
Thomas H.-K. Kang
Ron Klemencic
Don Kline
Seung Heon Lee
Choong-Jong Lee
Jang Keun Yoon

2023 PTI Service Awards

The PTI Service Awards are presented annually by the PTI Technical Advisory Board (TAB) and the PTI Certification Advisory Board (CAB) to groups and individuals who have gone beyond the call of duty and provided PTI with time and resources that are out of the ordinary.

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

The James R. Cagley Medal is awarded annually for dedication and active leadership as Chair of a PTI Technical or Certification Committee to recognize the recipients outstanding contributions to the post-tensioning industry and to PTI.

Donald P. Kline, P.E.

Kline Engineering & Consulting

Mr. Kline has over 30 years experience in the design, construction, and repair of post-tensioned concrete structures. As founder and principal at Kline Engineering & Consulting, Mr. Kline specializes in the design of new post-tensioned concrete structures, and provides consulting services related to the evaluation, repair, and strengthening of existing concrete structures. Mr. Kline has designed numerous commercial and residential buildings, parking structures, as well as other types of structures such as tanks. Mr. Kline is a member of PTI, ACI, The National Capital Chapter for ACI, and SEA-Metropolitan Washington Chapter. He serves on PTI's Board of Directors, as well as technical committees for Building Design (DC-20), Repair, Rehabilitation, and Strengthening (DC-80), and the Code Change Task Group. He serves on ACI Committees 318 T (Structural Concrete Building Code – Post-Tensioning), ACI 320 (Post-Tensioning Code), ACI 423 (Prestressed Concrete), ACI 362 (Parking Structures), and ACI 301-I (PT Specifications). Mr. Kline has published papers in various periodicals including Concrete International, Structure Magazine, and the PTI Journal. He has presented papers at ACI, PTI, ASBI, and fib conferences.

2023 PTI Service Awards

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Russell L. Price Award for the Most Active Committee Member

The Russell L. Price Medal is awarded annually in recognition of active involvement and contributions to a PTI Technical or Certification Committee to recognize the recipients outstanding contributions to the post-tensioning industry and to PTI.

Scott Greenhaus

Structural Technologies, LLC

Scott is affiliated with Structural Technologies a construction technology and service provider specializing in concrete repair, strengthening, protection and new construction products, systems and services throughout the United States and the Middle East. Scott graduated with degrees in Civil Engineering and an MBA from the University of Maryland and has served as the Executive Vice President and Chief Risk Officer of Structural Technologies headquartered in Columbia MD. Mr. Greenhaus is Vice Chairman of the University Of Maryland Engineering Board Of Visitors and has been on the Board of Directors of the Post-tensioning Institute (PTI), International Concrete repair Institute (ICRI) and American Society of Concrete Contractors (ASCC) and served as the Chairman of the ASCC Safety and Risk Management Council. He is also a member of ASCE, ACI, ANS, and ASSE. Mr. Greenhaus was also the past president of PTI and has chaired many committees in these trade and technical associations.

2023 PTI Service Awards

Kenneth B. Bondy Award for the Most Meritorious Technical Paper

The Kenneth B. Bondy Medal is awarded annually in recognition of a significant impact of a published paper in the PTI *JOURNAL* or a paper presented at the PTI Convention to recognize the recipients outstanding contributions to the post-tensioning industry and to PTI.

The Kenneth B. Bondy Award is presented to Thomas H.-K. Kang, Seung Heon Lee, Jang Keun Yoon, Choong-Jong Lee, and Ron Klemencic for the paper "Design and Analysis of High-Rise Building with Post-Tensioned Outrigger Walls and Slabs" published in the first 2022 edition of the PTI *JOURNAL*.

Thomas H.-K. Kang

Seoul National University

Dr. Thomas Kang is a full-time professor in the Department of Architecture & Architectural Engineering at Seoul National University (SNU), Korea. Before that, he was a professor in the School of Civil Engineering and Environmental Science at the University of Oklahoma. He also has held various affiliated positions in the U.S., Japan and South Africa, including Adjunct Professor at the University of Illinois at Urbana-Champaign, University of Hawaii at Manoa, University of Tokyo and University of Cape Town. Prof. Kang received his PhD from UCLA in 2004, his MS from Michigan State in 2000, and his BS from SNU in 1998. He is a Fellow of Post-Tensioning Institute (PTI) and American Concrete Institute (ACI), and a member of National Academy of Engineering of Korea and EU Academy of Sciences. He currently serves as an Editor-in-Chief for Wind and Structures and as the Associate Editor for PTI Journal. He is also a founding and voting member of PTI Committee DC-20, Building Design, and a PTI TAB member. Prof. Kang published over 150 international journal papers, including over 50 in ACI Structural Journal and over 10 in PTI Journal. His research interests include the design and behavior of reinforced, prestressed and post-tensioned concrete structures, as well as dynamic effects (wind, seismic, fire, impact & blast) on structures.

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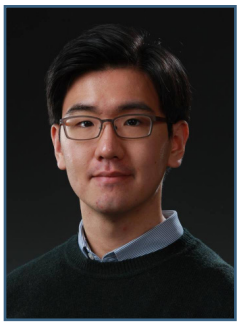

Seung Heon Lee

Seoul National University

Seung Heon Lee is a PhD Student in the Department of Architecture & Architectural Engineering at Seoul National University, where he received his BS and MS. His research interests include the design and behavior of post-tensioned buildings and nuclear containment structures.

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Jang Keun Yoon

DL E&C

Jang Keun Yoon is a Structural Engineer at DL E&C, Seoul, Korea. He received his BS and MS in Architectural Engineering from Hanyang University. He is a registered professional engineer in Korea. He has over 20 years of working experience in the field of structural engineering and post-tensioning technology. His specialty is providing cost-effective alternatives to a wide range of building projects from the early stage planning to the completion of construction.

His areas of experience and expertise include structural analysis and engineering of residential and commercial buildings, especially post-tensioned high-rise buildings, and structural design of reinforced and post-tensioned concrete buildings, as well as performance based seismic design of tall buildings. One of his noteworthy project portfolios is the iconic high-rise building ACRO Seoul Forest, which uses post-tensioned outrigger walls and post-tensioned slabs. The former is a unique application to enhance the shear strength of outrigger walls with unbonded diagonal post-tensioning single-strand system.

He received the 2012 Certificate of Appreciation from Post-Tensioning Institute (PTI) by making a presentation at the 2012 PTI Convention, and was awarded the 2021 Prime Minister Award from the Korea's Minister of Public Administration and Security.

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Choong-Jong Lee

Freyssinet Korea

Choong Jong Lee is a Director at Freyssinet Korea, Seoul, Korea. He has provided post-tensioning consulting service to building structural engineers in Korea for about 15 years. He also has extensive knowledge in the design and construction of prestressed concrete bridges, nuclear containment, high-rise buildings and heavy lifting technologies. His practice and research interests include structural analysis and design of prestressed and post-tensioned concrete buildings and bridges.

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Ron Klemencic

Magnusson Klemencic Associates

Ron Klemencic is Chairman and CEO of Magnusson Klemencic Associates (MKA), an award-winning, 195-person structural and civil engineering firm founded in 1920 with offices in Seattle, Washington, and Chicago, Illinois. An industry innovator and one of the preeminent high-rise structural engineers practicing today, Ron is sought by developers, [illegible]actors worldwide for his creativity, "big picture" approach, and unique ability to consistently produce cost-effective and inventive designs.

Through his roles as a Director of the Charles Pankow Foundation and the MKA Foundation, in addition to his daily work as a practicing structural engineer, Ron leads the research and development of many new technologies and systems that further the engineering profession. He has championed numerous innovations, such as Performance-Based Seismic Design for high-rise buildings, SpeedCore, Performance-Based Wind Design, and Performance-Based Structural Fire Design.

Ron has been a speaker and presenter at conferences and seminars for the American Concrete Institute, American Institute of Architects, American Institute of Steel Construction, ASCE/SEI, CTBUH, National Academy of Construction, National Council of Structural Engineers Associations, and other organizations.

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The Kenneth B. Bondy Award is presented to David Goodyear for the paper for the paper "Bridge Design and the Creep Conundrum" published in the first 2022 edition of the PTI *JOURNAL*.

David Goodyear

Consulting Engineering

David Goodyear is a consulting structural engineer with over 45 years of experience in bridge and heavy foundation design and construction engineering for long span bridges. David graduated from Cornell University in 1974 with a master's degree in Structural Engineering. David began his engineering career in the Structural Mechanics Group of Stone and Webster and entered the field of bridge engineering with Arvid Grant & Associates in Olympia, WA.

David's professional focus has been on integrating bridge design and construction, with much of his professional experience teaming with general contractors designing and building long span cable-stayed bridges. David has served as chairman for technical arbitration of bridge construction claims and as a member on several dispute review boards for major bridge contracts. David is a Beaver's Engineering Award winner and member of the National Academy of Engineering and the National Academy of Construction. He currently offers consulting to bridge contractors and engineers across the US.

PT RESEARCH FUNDRAISING MIXER

REGISTER TODAY!

Join PTI attendees and guests for an evening of networking, entertainment, and great food during the PT Research Fundraising Mixer. An assortment of food and beverages will be available. All proceeds collected will help continue the advancement of post-tensioning research.

Date: Tuesday, May 2, 2022
Time: 6:00pm - 8:00pm
Location: JW Marriott Marquis Miami (19th Floor)
Address: 255 Biscayne Boulevard Way, Miami, FL, 33131

This event requires an admission ticket to attend. If you are interested in attending, please see Michelle Stern at the PTI Registration desk.

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PTI Fellow

A PTI 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 PTI Fellow shall have made significant contributions to PTI through committees and/or other involvement and shall have been an active member of PTI for at least the most recent five consecutive years.

Current PTI Fellows:

Bijan Aalami
Hamid Ahmady
Rashid Ahmed
Fabio Albino de Souza
Bryan Allred
Florian Barth
Asit Baxi
Kenneth Bondy
Ron Bonomo
James Cagley
Gregory Chacos
Guy Cloutier
John Crigler
Martin Cuadra
James Donnelly
David Eastwood
David Goodyear
Jack Graves, Jr.
Scott Greenhaus
H.R. (Trey) Hamilton
Joe Harrison
Carol Hayek
Norris Hayes
Jonathan Hirsch
Gregory Hunsicker
Donald Illingworth
Terry Johnson
Brian Juedes
Thomas Kang
Neel Khosa
Rattan Khosa
Marc Khoury
Don Kline
William Klorman
Cary Kopczynski
Larry Krauser
Robert Lytton
David Martin
Richard Martter
Thomas Mathews
Brian Merrill
Raymond Messer
Andrew Micklus, Jr.
Dan Moser
Ted Neff
Harley Nethken
Homer Parker, Jr.
Randy Plitt
Randall Poston
Russell Price
Dean Read
Douglas Schlegel
Andrea Schokker
Guido Schwager
Charles Skarbrevik
Felix Sorkin
Tami Spicer
Todd Stevens
Ryne Stoker
Bob Sward
Merrill Walstad
Michael Williams
Edgar Zuniga

Congratulations, new PTI Fellows

Frank Malits
Coy Williams

New PTI Fellows

Frank Malits

Cagley & Associates, Incorporated

Frank is a senior principal engineer with Cagley & Associates, Inc., located in Rockville, Maryland. He has over 35 years of experience in providing structural engineering designs for a wide range of commercial building types, from early onset planning through the completion of construction. He is a registered professional engineer in 18 states and the District of Columbia.

Frank is a member of the PTI Board of Directors, representing professional members. He serves on DC-20 Building Design, and is the outgoing chair of DC-20A, the Building Information Modeling subcommittee. He also is a contributing member of the PTI Task Group advising ACI 318 Subcommittee T and the new ACI 320 code committee.

Frank is a Fellow of the American Concrete Institute, a member of ACI Committee 318 (Building Code Requirements for Structural Concrete) and Chair of 318 Subcommittee A (General, Concrete, and Construction). He is a member of ACI Committee 301 (Specifications for Structural Concrete), also serving on Subcommittee I concerning post-tensioned concrete. He is also a member of ACI Committee 329 (Performance Specifications for Concrete).

New PTI Fellows

Coy Williams

Consolidated Reinforcement

Coy Williams has an extensive background in the manufacturing industry. He has been employed by Consolidated Reinforcement since April 2006 where he was initially hired to build and operate an extrusion facility. He later became Operations Manager for five CRI locations. In October 2012, Coy helped develop and launch CRI's "Cable for the Cure", a charity initiative that supports breast cancer research.

Coy became involved in the Post-Tensioning Institute in the Fall of 2014. He has since taken on various committee positions, including serving on the Board of Directors, the PTI Executive Committee, and currently serves as Chair of the PTI Finance committee. Coy is also a voting member of PTI's Certification Advisory Board, Unbonded Tendon Plant Certification Committee (CRT-20), Unbonded tendon committee (M-10), Membership Committee, and is an associate member of the Unbonded PT Personnel Committee (CRT-30).

Coy is a resident of Bastrop, Texas, where he lives with his wife Britney and their three children: Luke, Avery, and Bailey. Together, Coy and Britney also own and operate two businesses, W2 Transport and Air Brush Tans of Bastrop Salon.

Thank You To Our 2023 PTI Convention Sponsors

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Tuesday

Coffee Breaks Sponsors

Monday Tuesday

Lunch Sponsors

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Monday Tuesday Wednesday

PTI Project Awards

The PTI Project Awards honors exceptional post-tensioning structures from around the world. Projects are recognized for the degree of innovation, complexity, cost-effectiveness, functionality, constructability, and aesthetics, while embracing the use of post-tensioning as the primary structural reinforcing system.

Any structure completed or rehabilitated in the past five years that uses post-tensioning as a structural component was eligible. Entries were submitted by either the owner, architect, engineer, contractor, or post-tensioning supplier.

Projects were juried by an independent panel of industry professionals for first place, "Award of Excellence," second place, "Award of Merit," and "Project of the Year" category awards.

Congratulations, 2023 PTI Project Awardees

PTI Award of Excellence: Bridge

Sixth Street Viaduct Replacement Project

Location:
Los Angeles, CA, USA

Completed:
July 10, 2022

Submitted By:
Cowbell Creative, LLC

PT Supplier:
DYWIDAG Systems International

Additional Contributors:
City of Los Angeles Bureau of Engineering;
Dissing+ Weitling;
HNTB Corporation;
Michael Maltzan;
Psomas
Skanska USA/Stacy and T.Y. Lin International Group;
Witbeck

Los Angeles' groundbreaking new structure pays tribute to the former 1932 double steel arch viaduct, which was demolished in 2016 due to continued degradation from the use of silica-alkali reactive aggregate when originally constructed. The new viaduct has 10 pairs of sculptural arches unspooling across an industrial lowland. The structure advances the field of seismic bridge engineering and the engineering profession with a series of innovations that set a new threshold for seismic safety and expand the functionality of urban bridges.

The 2,867-ft long cable-supported viaduct was divided into four frames, prestressing continuity achieved through use of the couplers. While the first frame included long tendons 905-ft in length and allowed for two-end stressing, the remaining frames (604-ft, 594-ft, and 767-ft in length) could only be stressed from one end.

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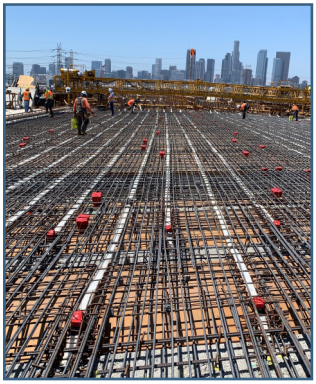
PTI Award of Excellence: Bridge

Sixth Street Viaduct Replacement Project

The construction of the first frame provided the opportunity for field friction tests of edge girder tendons to accurately estimate tendon friction losses and ensure adequate anchoring forces at couplers. All adjustments and final estimates of required post-tensioning forces in the continuous edge girders were based on as-built conditions and friction test results.

The viaduct is the first structure in California designed with multi-strand post-tensioning coupled anchorages. Providing continuity for the longitudinal tendons placed in each edge girder between frames, the couplers were an efficient connection for continuous post-tensioning along the length of the bridge while avoiding large anchorage zones between frames. The solution achieved the efficient, clean aesthetic the design team envisioned and presented a case study for other U.S. bridges where post-tensioning continuity is needed.

Designed to remain undamaged and operational after a seismic event with a 1,000-year return period, the viaduct is believed to be the world's longest, seismically isolated concrete tied arch bridge. It features the first U.S. application of seismic isolators within the verticality of a bent, the world's first use of triple-pendulum friction bearings modified to stiffen at a predetermined displacement, the first multistrand post-tensioning couplers in California, and the first use of grade 80 concrete reinforcement in a California bridge.



PTI Award of Merit: Bridge

The Rose Fitzgerald Kennedy Bridge Across the River Barrow Close to New Ross (Ireland)

Location:
New Ross, Ireland

Completed:
January 29, 2020

Submitted By:
Carlos Fernandez Casado

PT Supplier:
TENSA Gruppo De Eccher

Additional Contributors:
ARUP;
BAM;
Dragados-Iridium/BAM Concessions;
Dragados UK
Mott McDonald;
TENSA
Transport Infrastructure Ireland (TII);
Yee Associates

This nine-span, 887-meter-long bridge over the river Barrow, includes a three-tower extradosed bridge with two equals 230-meter-long main spans. The structure is impressive in scale and slenderness. It holds multiple records, including the longest concrete extradosed spans in the world and, during construction, the longest balanced cantilever for concrete deck extradosed bridges in the world.

The three towers have different heights, the central tower is slightly higher but only 27 meters high and 16 meters for the lateral ones, while the deck has deck slenderness of L/65 at midspan, L/35 at the lateral towers and L/27 at the central support. Proportioned to the golden ratio in height and span distribution, with a truly shallow single central plane of cables in a harp arrangement with cable numbers proportional to

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PTI Award of Merit: Bridge

The Rose Fitzgerald Kennedy Bridge Across the River Barrow Close to New Ross (Ireland)

the tower, the bridge blends into the gentle hilly landscape of the south-east of Ireland, minimizing the visual and environmental impact on the Barrow.

Its asymmetry and slenderness provide an iconic distinctive profile that has become already a symbol of engineering ingenuity. The deck, of a single box with the appearance of closed cross section, blending in-situ cast and precast elements, consciously designed as a full concrete deck to minimize maintenance, carries a dual motorway and ensuring safe fluvial ship traffic crossing the river with a vertical clearance of 36-meters.

As the River Barrow is a candidate Special Area of Conservation (SAC), due to rare habitats and species, and the River Barrow Estuary is a proposed Natural Heritage Area, careful consideration was given to the design of the scheme to ensure that it is sensitive to its surroundings. The design and construction of this bridge in the South-East of Ireland required world-class consultancy services in bridge and civil engineering and has re-defined the expectations for bridge engineering, both nationally and internationally.

PTI Award of Excellence: Buildings

Centene Corporation East Coast Headquarters

Location:
Charlotte, NC, USA

Completed:
September 30, 2022

Submitted By:
Uzun+Case, LLC

PT Supplier:
Suncoast Post-Tensioning

Additional Contributors:
Centen Corporation;
Clayco;
Lithko;
LS3P;
Rafco Properties

This project is an 850,000 square feet corporate headquarters building located in the Southeastern United States. The building's design was influenced by its steeply sloped site and its forested environment. The grade change within the building footprint resulted in two seven story office blocks, one of which is founded two stories below the other. They are connected by a dramatic atrium structure.

Each of the office blocks have full height "tree house" atriums, which cantilever sixty feet above the landscape below. The building's canopies and skylights make reference to trees by mimicking the cellular structure of leaves. Other forest references include the grouping of exposed building columns to represent randomly placed tree trunks, and the use of architectural board-formed concrete finishes.

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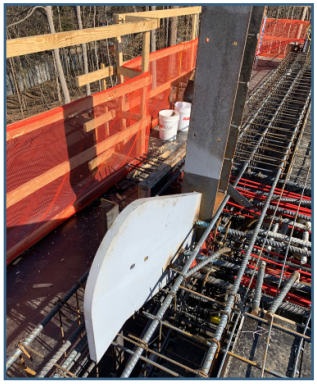
PTI Award of Excellence: Buildings

Centene Corporation East Coast Headquarters

Post-tensioning played a key role in the success of this project structurally, economically, logistically and aesthetically. Structurally, post-tensioning aided in achieving the project's 49 feet column free bays and its dramatic 60 feet cantilevers. PT concrete was selected as the most economical structural system to achieve these goals. Logistically, the PT system facilitated the project's fast track schedule and provided flexibility to accommodate change as the project developed (the project went from design initiation to topping out in a little over one year). Aesthetically, the structural system featured architectural board-formed surfaces and exposed concrete ceilings, which contributed to its naturalistic design intent and saved cost by eliminating expensive finish materials.

The result is a naturalistic and structurally expressive building which provides a superior environment for the next generation of office workers.



PTI Award of Merit: Buildings

Eleven

Location:
Minneapolis, MN, USA

Completed:
February 22, 2022

Submitted By:
Meyer Borgman Johnson

PT Supplier:
AMSYSCO, Incorporated

Additional Contributors:
Arcadia LLC;
Eleven Minneapolis LLC;
Robert A.M. Stern Architects;
Ryan A+E;
Ryan Companies

Transforming the Minneapolis skyline, the building is a 125-unit luxury condominium tower situated along the bank of the Mississippi River. The tallest residential building in the Upper Midwest, the 550-foot-tall, 42-story, flat-plate post-tensioned concrete art deco tower is also the tallest building built in Minnesota since 1992 and tallest concrete building built in the state since 1983.

This residential building is a 625,072-square-foot cast-in-place post-tensioned concrete structure that contains 36,000 cubic yards of concrete, 3,375 tons of mild reinforcing, and more than 580,000 pounds of post-tensioning. Twenty-five of the building's forty-five levels of post-tensioned concrete framing are unique, resulting in very little repetition in the structure. Even at typical floors, tenant's custom unit modifications resulted in design and coordination challenges, significant VDC coordination, and several sleeves requiring

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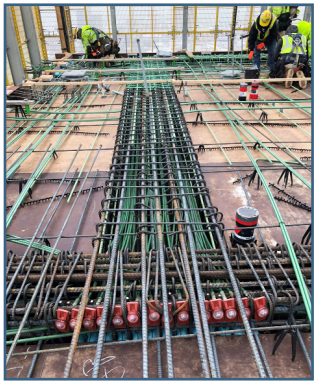
PTI Award of Merit: Buildings

Eleven

coring through completed post-tensioned slabs.

The tower emerges from the podium at the Level 8 amenities deck where a series of five 59′-0″ long post-tensioned concrete beams span over parking below and at up to 9′-6″ deep support heavy loading including a 74′-0″ long pool, spa, splash pad and planters with trees. The tower steps back again at Levels 15 and 16, with additional steps in the floor plate occurring at Level 32 and at Level 37 and each floor above. The tapered six-story crown is a signature architectural element at the top of the tower. The crown includes 45 column transfers and 95 post-tensioned concrete beams, more than six stories of residential units, and two additional levels of concrete framing that serve as a screenwall for the rooftop mechanical equipment.

The tapering of this residential building has resulted in a unique floor plate at each level and has created a series of significant outdoor terraces, making it one of the most unique and complex concrete structures ever constructed in Minneapolis. This one-of-a-kind residential tower has forever transformed the Minneapolis skyline for the city's residents and visitors while pushing structural engineering to new heights.



PTI Award of Excellence: Parking Structure

Transportation Hub New Administrative Capitol, Cairo, Egypt

Location:
Cairo, Egypt

Completed:
October 30, 2022

Submitted By:
ACE Consulting Engineer, Moharram & Bakhoum

PT Supplier:
Freyssinet, Floortec, and Tetra Engineering & Construction

Additional Contributors:
Armed Forces Engineering Authority (EAAF);
K&A Designs

The new integrated transportation terminal in Egypt's New Administrative Capital (NAC), constructed on a total footprint area of more than 440,000 square meters (4,520,842 feet squared) became one of the largest transportation terminals in the world. Since 2015, Egypt has embarked on a journey of constructing a new capital about 40 miles East of downtown Cairo.

As such, an integrated transportation terminal was required to house public transit between downtown Cairo and the New Capital while also offering services to commuters. The terminal consists of 23 different buildings, featuring commercial, retail, hotel, and office spaces, as well as a police and fire station and parking spaces. A unique architectural design was chosen for the terminal to match the New Capital's modern and pharaonic inspired style.

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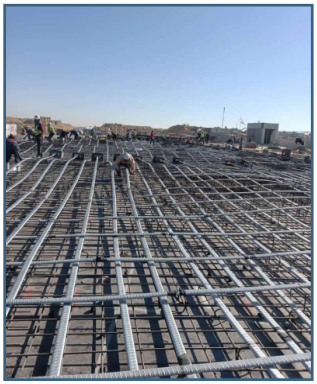
Award of Excellence: Parking Structure

Transportation Hub New Administrative Capitol, Cairo, Egypt

During the design stage, an extensive study was undertaken to assess and compare three different possible structural systems, namely precast double/single T beams, composite slabs with steel beams, and post-tensioned flat slabs. Given the significantly large, superimposed loads from the car parking, the repetitive column grid used throughout the project, as well as the value engineering benefits and the reduced cost, post-tensioned flat slabs stood out as the most structurally efficient and cost-effective option.

Post-tensioned slabs were a key success factor in this project, leading to its timely construction completion in around eight months, enabling the use of innovative construction methods and value engineering. The project's floor system consists of 2-way flat slabs with 2-way post-tensioning and an average slab thickness of 57 centimeters (22 inches). In the longitudinal direction, 12 strands at average intervals of 0.8 meters (30 feet) were used with strand diameters of 0.6 inches. In the transverse direction, 5 strands at average internals of 1 meter (40 feet) were used with a strand diameter of 0.5 inches. Throughout the project, more than 550,000 meters cubed of concrete (719373 cubic yards) were poured with a total of 1500 tons of post-tensioning cables installed.



PTI Award of Merit: Parking Structure

Children's Hospital Medical Center Parking Garage

Location:
Omaha, NE, USA

Completed:
December 20, 2019

Submitted By:
HDR

PT Supplier:
Structural Technologies, LLC

Additional Contributors:
Children's Hospital & Medical Center;
Kiewit Building Group

The owner of a parking garage in Omaha was concerned about the durability and maintenance of the new garage due to the harsh winters and de-icing salts used on city streets. The garage needed to be designed to provide an economical and durable garage while minimizing the owner's maintenance costs.

The parking garage is constructed of cast-in-place, bonded, post-tensioned concrete slabs and beams. It is supported on 3- and 4-foot-diameter drilled piers, extending approximately 100 feet to bedrock. Moment frames resist lateral loads in one direction while the garage ramping acts as a truss for the other direction. To facilitate construction, one of the stair tower foundations was designed to support the tower crane used to build the parking garage.

Most parking garages built today use unbonded

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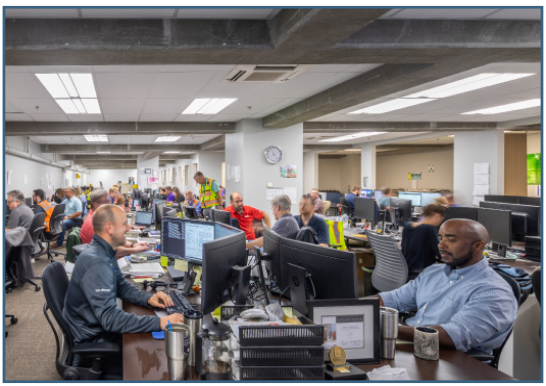
Award of Merit: Parking Structure

Children's Hospital Medical Center Parking Garage

post-tensioning tendons. For this parking garage, the structural team evaluated the cost of a bonded versus a typical unbonded post-tensioning system. The advantage of a bonded system is that when the prestressing tendons are bonded to the slab using grout in the post-tensioning duct, the building codes do not have a minimum rebar requirement. The bonded system thereby reduces field labor by eliminating the rebar. Removing the rebar also eliminates the potential for corrosion of the rebar caused by de-icing salts on the garage floor slabs, which increases the durability of the garage.

The parking garage project was located on a tight urban site with minimal lay down space, which created challenges for the construction of the parking garage. To facilitate coordination and speed up the project, the design team was co-located on-site with the contractor and worked closely together throughout the design process. With limited access for material deliveries and debris removal, the construction team received approvals from the city and Nebraska Department of Transportation to temporarily alter traffic lanes. After removing the center island between eastbound and westbound traffic, they shifted eastbound traffic to the north, which provided space to create a single entrance and exit to the job site. Accurate and on-time material deliveries became crucial.



PTI Award of Excellence: Repair, Rehabilitation, & Strengthening

Resorts World Last Vegas Hotel Tower

Location:
Las Vegas, NV, USA

Completed:
June 1, 2021

Submitted By:
Superior Post Tension

PT Supplier:
Superior Post Tension

Additional Contributors:
Desimone;
Genting Group;
Lochsa Engineers;
Next Century Rebar;
Steelman Partners;
W.A. Richardson Builders

Beginning construction in 2007 with completion scheduled for mid-2010, a Las Vegas Strip Resort Tower was under construction for only 13 months before progress abruptly halted due to funding restrictions related to the 2008 Global Financial Crisis. With only eleven levels of concrete placed, the structure and its 87-acre project site stood unimproved until 2014 when new ownership broke ground on the redesigned resort project.

When the property changed ownership in 2013, new priorities faced the design team as the final resort tower would need to blend the five-year old skeleton structure into the new ownerships' vision, both aesthetically and functionally. Because the financial solvency of the project required utilizing and building upon the existing construction progress, modifications to the structure were required to accommodate new slab openings on

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PTI Award of Excellence: Repair, Rehabilitation, & Strengthening

Resorts World Last Vegas Hotel Tower

the existing post tension decks above Level 6.

Engineers performed a site evaluation to determine the condition of the structure. Though the structure had stood uncompleted for years, the environmental conditions of Las Vegas reflect an annual rainfall of 4.2" and approximately 75 days of 100-degree weather annually. These conditions proved beneficial during evaluation as the PT system was found to be sound and unaffected by the incompletion of the project. During demolition, tendon exploration, and renovation, newly exposed tendons were visually evaluated for quality. The steel was inspected for lubricant presence, signs of rust/corrosion, and sheathing damage. Local repairs were made, and lubricant/sheathing replaced, as needed when the PT steel was undamaged. The results of the exploration during on-site demolition activities found the existing PT system was not damaged by environmental exposure.

In June 2021, the renovated and completed structure opened, debuting the 59-story hotel, 3,500+ room resort tower as the cornerstone of the first ground-up resort built on the Las Vegas Strip in over a decade. In a city where reinvention is constant, the project stands as a 700+ foot testament that PT remains a viable option for construction projects and provides significant durability as well as cost-effective renovation options.

PTI Award of Merit: Repair, Rehabilitation, & Strengthening

External Post-Tensioning Column Strengthening

Location:
Chicago, IL, USA

Completed:
October 31, 2022

Submitted By:
WJE

PT Supplier:
Precision Surveillance Corporation

Additional Contributors:
AECOM, Hunt, Clayco Joint Venture;
Chicago Department of Aviation;
Golf Construction;
Precision Surveillance Corporation

The primary parking structure serving a metropolitan airport was opened for use in 1973 with over 2,600,000 square feet of supported slabs. The six-story concrete structure was primarily reinforced using button-head post-tensioning. In 2019, a condition assessment identified structural and waterproofing deterioration consistent with its age and exposure conditions in the Midwest. The resulting multi-year restoration program to extend the service life of the structure was completed in 2022.

Typical concrete and post-tensioning repairs were performed at the floor system, but a unique structural repair was needed at one of the columns that supports a signature helical ramp. The ramps were constructed by cantilevering four levels of sloped floor slabs from six central columns. The 60-foot-tall columns are cantilevered from their

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PTI Award of Merit: Repair, Rehabilitation, & Strengthening

External Post-Tensioning Column Strengthening

foundations and are reinforced with three internal vertical button-head tendons, each consisting of 42-wires. The tendons resist the significant moment imposed on the column by the cantilevered floors.

During the initial condition assessment, 10 broken wires were observed protruding from the top of one column. Failure was caused by water intrusion at the stressing anchorage on the exposed top of the column. Considering the severe exposure conditions and high potential for further deterioration, the design team recommended that the column be strengthened to alleviate reliance on the original compromised post-tensioning for strength.

The strengthening concept consisted of installing new vertical, draped, external post-tensioning (EPT) tendons on the subject column. The innovative detailing and implementation of the EPT alleviated the need to shore all of the supported floors of the ramp and avoided de-tensioning the existing tendons, thereby significantly reducing the schedule and cost, and utilized modern post-tensioning systems to elegantly provide a more resilient and robust structure. This innovative approach to strengthening a deteriorated button-head post-tensioned cantilevered column utilized modern post-tensioning technology and analysis techniques to provide an efficient and durable solution to a difficult structural challenge.

PTI Award of Merit: Repair, Rehabilitation, & Strengthening

West Seattle Bridge Rehabilitation

Location:
Seattle, WA, USA

Completed:
September 17, 2022

Submitted By:
RS&H

PT Supplier:
Structural Technologies, LLC

Additional Contributors:
Jimale Technical Service, LLC;
KBA Engineering, Incorporated;
Kraemer North America;
Seattle Department of Transportation;
WSP USA, Incorporated

A critical connection for over 125,000 daily users in Seattle, Washington, as well as the nation's freight corridor, opened to traffic in September 2022 following an extensive bridge rehabilitation using post-tensioning technology.

The two-and-a-half-year closure began in March 2020 and was a result of severe cracking in the three main spans of the iconic post-tensioned concrete segmental structures. The owner conducted an initial Phase 1 Emergency repair using post-tensioning to stabilize the structure and prevent collapse. However, the bridge remained closed while engineers developed a long-term solution. Impacts of the closure extended to the local community with increased commute times and reduced access to neighborhood businesses.

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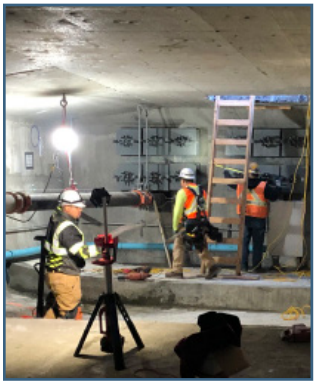
PTI Award of Merit: Repair, Rehabilitation, & Strengthening

West Seattle Bridge Rehabilitation

After stabilizing the structure, the owner evaluated options to both replace and repair the structure. The rehabilitation option made possible by post-tensioning technology offered significant cost-savings compared to a full replacement and could be completed in one-fifth of the time, making it the preferred solution.

The Phase 2 Rehabilitation project for permanent repairs and strengthening began in January 2022 and is expected to extend the life of the bridges by 40 years. Delivered using GC/CM methods to encourage innovation, collaboration, and cost-savings, the fast-paced rehabilitation encompassed 60 miles of new post-tensioning, 100,000 square feet of carbon fiber wrapping (CFRP), and 240 gallons of epoxy injection to repair the aging concrete bridges. The post-tensioning and strategic placement of carbon fiber work in tandem to strengthen the bridge.

The new post-tensioning system also included installation of the concrete infrastructure required to support and anchor the new tendons. To navigate the existing post-tensioning system within the 1980s-era bridge, complex locating of existing reinforcement was performed prior to coring each structural element. Field staff collaborated with design engineers to adjust the path and stressing force for each tendon to achieve the required strength while maintaining the bridge's structural integrity.



PTI Award of Excellence: Slab-on-Ground

Francis T. Maloney High School Running Track

Location:
Meriden, CT, USA

Completed:
July 15, 2020

Submitted By:
Classic Turf Company

PT Supplier:
Builders Post-Tension, Inc.

Additional Contributors:
Civil1;
Francis T. Maloney High School - Meriden Board of Education;
F&F Concrete;
Milone and Macbroom

Typically, in the Northeastern United States running tracks and athletic courts are constructed using asphalt as the base for the synthetic running track surface or acrylic paint surfaced to be installed. The existing track and field facility at Francis T. Maloney High School consisted of a natural grass athletic field and asphalt running track. The facility was at the point of its life when it required complete reconstruction.

Using asphalt for the base in the Northeastern area results in structural issues of cracking, heaving, and settling of the running tracks and athletic courts. These structural issues usually occur prior to the full life expectancy of the synthetic track surface itself (typical expectation of about 20 years). Even when the asphalt remains structurally acceptable for the life of the synthetic track surface, when it comes time to remove the

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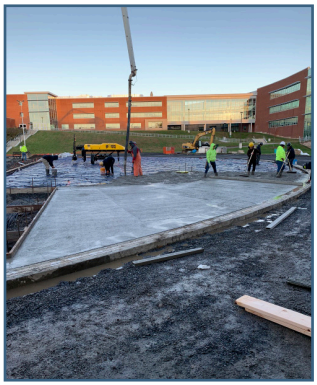
Award of Excellence: Slab-on-Ground

Francis T. Maloney High School Running Track

track surface for replacement, asphalt damage occurs because is brittle and weak due to drying/aging. This results in both the asphalt and the synthetic track surface requiring complete replacement.

When post tension concrete is used in lieu of asphalt, all the issues mentioned above are eliminated. The track or court will not heave, settle, or crack and when it's time to replace the track surface, little to no damage will occur to the post tension concrete base. This will allow the owner to reduce future maintenance costs on the facility and allow them to develop and maintain a long term maintenance budget without another complete, ground up, reconstruction every 15 to 25 years.

This project is unique since this is the second installation in New England using post tension concrete for an athletic running track with the continuous cable design, two full D-ends, a synthetic field in the middle, and a perimeter channel drain along the inside of the track oval. The use of post tension concrete will result in a structurally sound base that will never need replacement, unlike asphalt, saving the owner future reconstruction costs of the track.



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2023 PTI Project of the Year

Sixth Street Viaduct Replacement Project

Overview:

At 3,060 feet long and 100 feet wide, the new viaduct includes 10 network arch spans, with a total of 388 hangers supporting the bridge deck. The typical span between bents is 300 feet. The bridge deck area is approximately 306,000 square feet. Eighteen Y-shaped bents support the viaduct's clean aesthetic and flow upward seamlessly into 10 pairs of sculptural arches, a design element intended to pay tribute to the original 1932 double steel arch viaduct seen in numerous movies and on TV.

Unique Features:

The bridge superstructure utilizes fully bonded internal post-tensioning systems in both the longitudinal and transverse directions. Ten 24-25-0.6" diameter multi-strand post-tensioned tendons placed in each edge girder comprise the main longitudinal tendons, and two 101-ft long smaller 16- to 18-strand tendons are placed in each of the 294 transverse intermediate floor beams. In addition, four large 33-strand tendons are utilized in each Y-bent's transverse arch rib floor beam and nine smaller 15-strand tendons at abutment diagrams. Draped 23-strand tendons over 100-ft long in the edge girders are used for the initial stage of Y-bent construction. Finally, the 8.25-inch-deep superstructure deck is

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longitudinally stressed with twenty 4-0.6" diameter mono-strand tendons in flat ducts.

The viaduct is the first structure in California designed with multi-strand post-tensioning coupled anchorages. Providing continuity for the longitudinal tendons placed in each edge girder between frames, the couplers were an efficient connection for continuous post-tensioning along the length of the bridge while avoiding large anchorage zones between frames. The solution achieved the efficient, clean aesthetic the design team envisioned and presented a case study for other U.S. bridges where post-tensioning continuity is needed.

Innovation:

The 2,867-ft long cable-supported viaduct was divided into four frames, prestressing continuity achieved through use of the couplers. While the first frame included long tendons 905-ft in length and allowed for two-end stressing, the remaining frames (604-ft, 594-ft, and 767-ft in length) could only be stressed from one end. The construction of the first frame provided the opportunity for field friction tests of edge girder tendons to accurately estimate tendon friction losses and ensure adequate anchoring forces at couplers. All adjustments and final estimates of required post-tensioning forces in the continuous edge girders were based on as-built conditions and friction test results.

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Project Challenges:

The sequence of concrete closure pours between the adjacent previous frame required the post-tensioning strand be installed into the coupled anchorage prior to concrete placement of the closure pour, which prevented the addition of strand if measured forces were low. The sequence of construction and compression of the construction schedule often required a 24-hour work schedule. All transverse floor beam tendons within a frame required stressing and grouting prior to longitudinal edge girder post-tensioning. To allow for initial curing of the grout without vibration from equipment, grouting was often performed during weekends when construction activity on the viaduct was minimal. Similarly, maintaining fresh grout properties for the thixotropic mix, grouting operations were frequently performed at night during the sizzling summer months. Special protection measures during post-tensioning operations were followed in this urban environment. Safety was a concern as stressing and grouting was performed over live highway traffic, city streets and within a heavily used railway corridor. The flat-duct deck tendons were in the range of 350-ft to 717-ft in length. Initially the contractor intended to install the strand using the pull method for the 4-strand group after deck concrete placement. However, duct profile variances due to multiple reasons resulted in an extreme degree of difficulty in installation, ultimately requiring strand installation one-by-one.

Have Post-Tensioning Questions? We Have Reinforced Answers.

PTI has engineering staff available to assist you with any post-tensioning related technical questions you might have about a document or a project.

If you have a technical question, issue, or challenge to be met with post-tensioning, our team can provide assistance and answer. Contact us via e-mail at *technical.inquiries@post-tensioning.org*.

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