

PTI Technical Committees: Reflecting on 40 Years as We Step to the Future

Don Kline, TAB Chair

Kline Engineering & Consulting, LLC

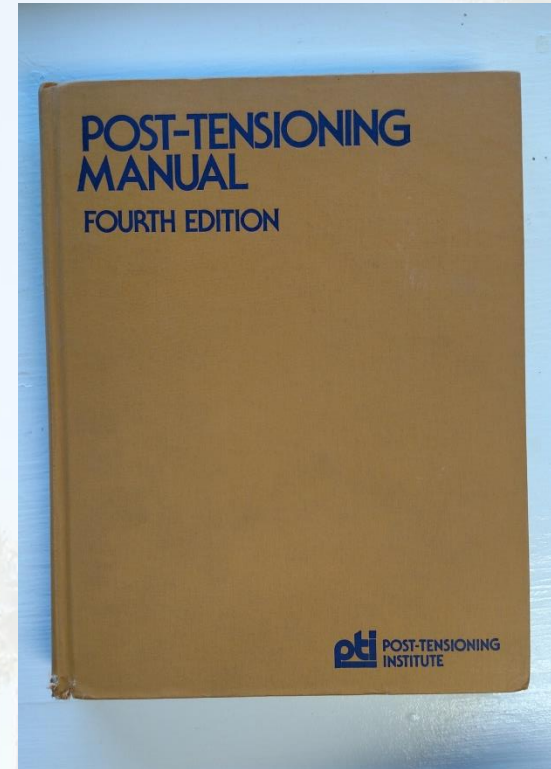
2016 PTI Convention
Long Beach, California

Presentation Topics

- Reflecting on PTI's Technical Influence over 40 Years
- The Great Knowledge Transfer
- Looking to the Future of PTI – from Technical Perspective

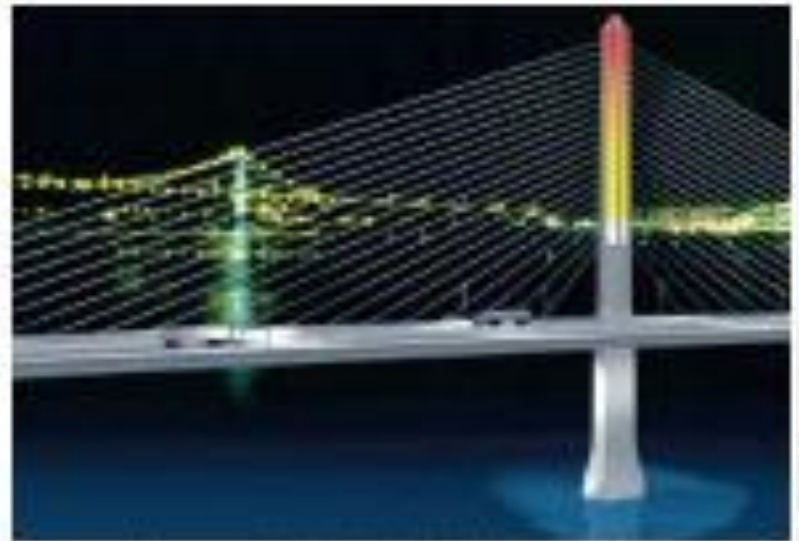
PTI Early Years

- PTI Established in 1976
- PT Manual 1st Edition Published by Post-Tensioning Division of PCI
- 2nd Edition Published by PTI in 1976
- Working on 7th Edition



Bridges

- Post-Tensioned Box Girder Bridge Manual – 1977
- Precast Segmental Box Girder Bridge Manual – 1978



PTI Early Years

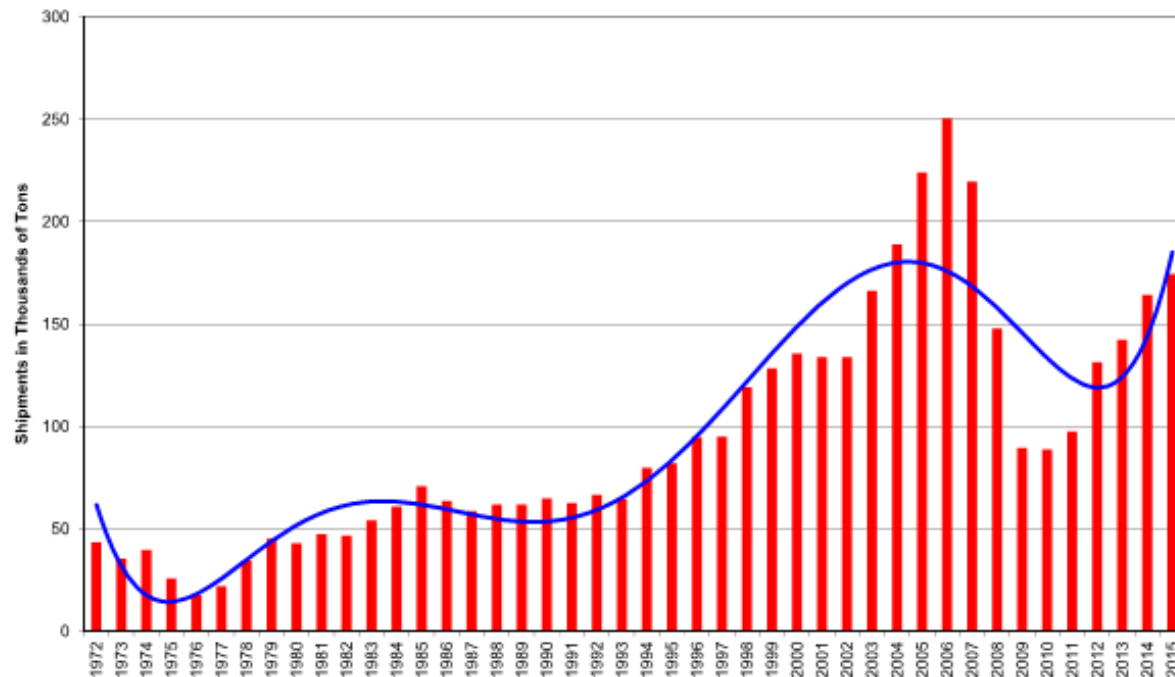
- Slab on Ground
- Developed Design Guide
- 100 Million SF by 1980



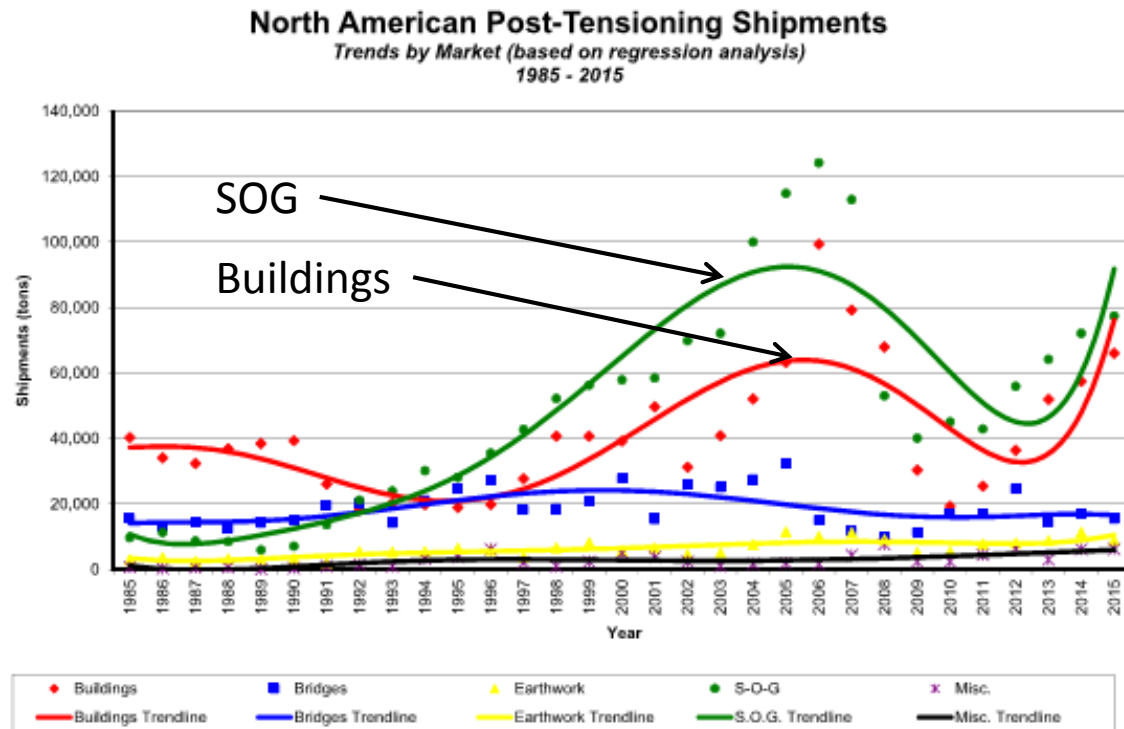
PT Industry Over 40 Years

North American Post-Tensioning Shipments

Summary for the years: 1972 to 2015



PT Industry Over 40 Years



Great Knowledge Transfer

- PT Design Knowhow Closely Held by Few PT Companies
- Reluctance to Educate Designers
- Big Change from 1980's to Present
- PTI Seminars (18 in one Year)
- PTI Publications
- Availability of Computer Design Software
 - PT Data, Posten, ADAPT

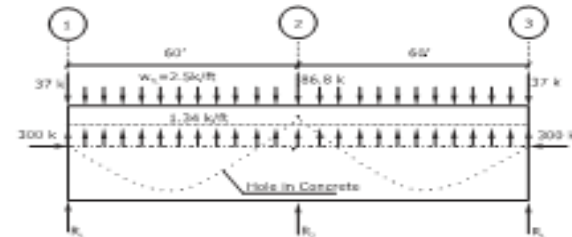


Fig. 7.18 Equivalent Load FBD

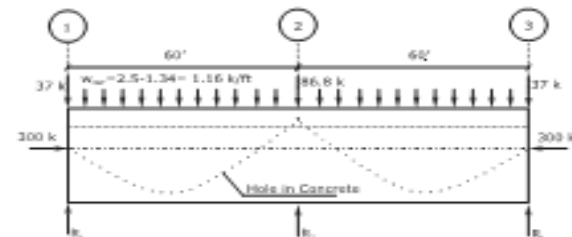


Fig. 7.19 Net Load FBD

For a two-span uniformly loaded beam, the maximum positive and negative moments, as well as their locations, are given by the following:

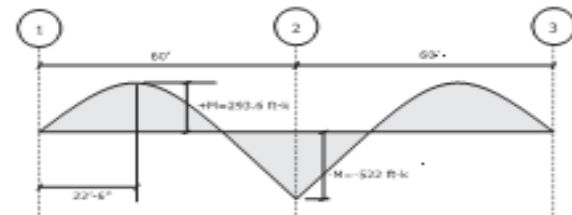


Fig. 7.20 Moment Diagram from Net Load

Great Knowledge Transfer

- At first consultants were taught the load balancing method for design
- Later they were taught how to use programs based on equivalent frame method

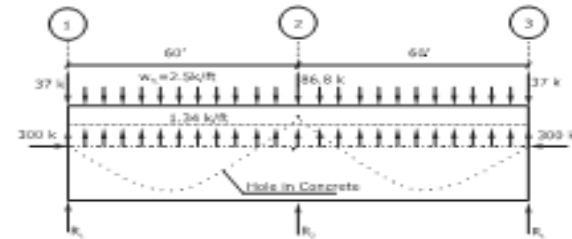


Fig. 7.18 Equivalent Load FBD

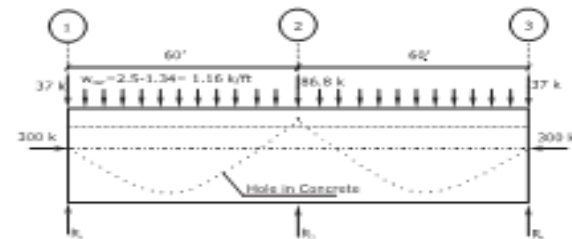


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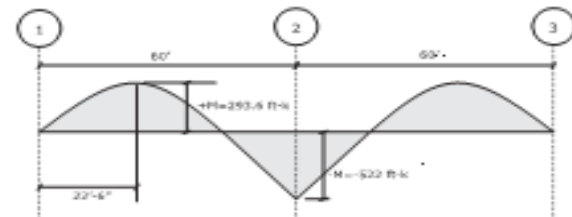
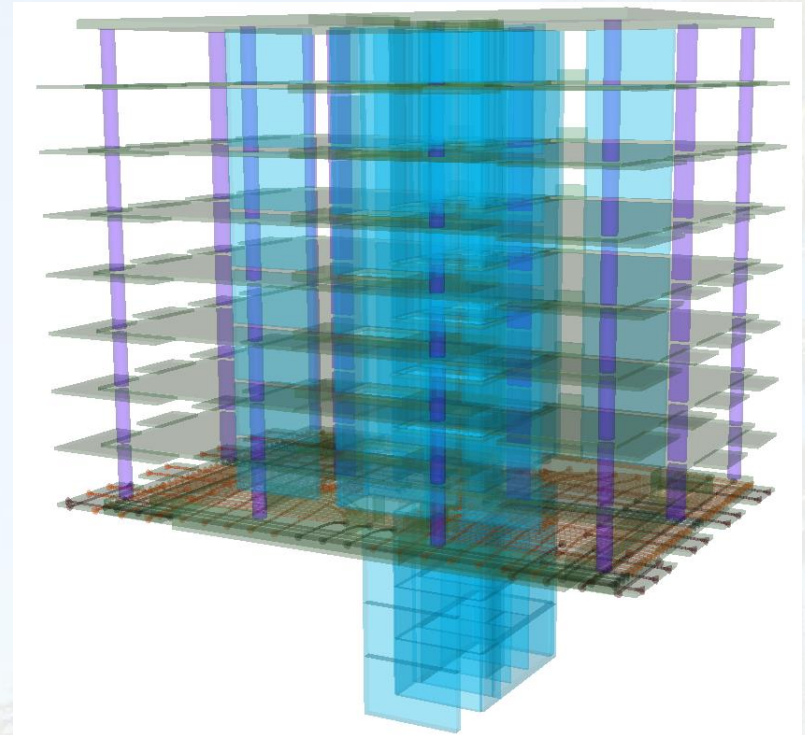


Fig. 7.20 Moment Diagram from Net Load

Great Knowledge Transfer

- Now they are using FE design tools
- Without proper training and experience engineers can get into trouble
- With training and experience they are very powerful



Evolution of PTI Technical Committes

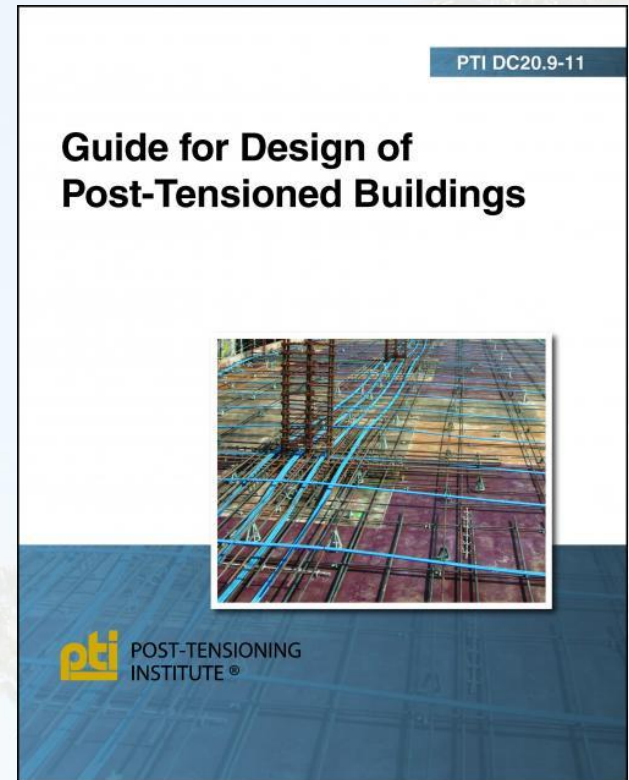
- PTI has produced over 150 technical documents
- Many written by individuals
- Documents were edited by small committees
- Documents were approved by PTI Board of Directors



Legends

Modern Technical Committee Organization

- New Committee Structure under Ted Neff in 2002
- TAB – Florian Barth, Chair
- Rashid Ahmed, Fadi Alkhairi, Joe Ales, Asit Baxi, Dirk Bondy, Ken Bondy, Jim Cagley, Greg Chacos, John Crigler, Cary Kopczynski, Merrill Walstad
- 18 Technical Committee
- 1st Technical Conference in San Antonio in 2002



What the Future Holds

- Goal 1: Grow and Expand PTI Knowledge Center
- Goal 2: Develop Codes that Allow for Innovation and New Markets

PTI Knowledge Center

- Traditional Publications
 - Post-Tensioning Manual
 - Published Guides, Specifications, Tech Notes, FAQs
- Transition to Web Based Learning
 - Electronic documents
 - Webinars
 - E-Learning Modules
 - Construction Training Videos



Foster Environment that Allows for Innovation

- Coordinated Effort with ACI and IBC
- Coordinated Effort with ASBI and FHWA
- Engage Academia
 - Invite professors to join PTI
 - Fund Research
 - Teach the professors how to teach PT



Watergate Built in 1969



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Future Innovation

- Highrise Buildings
- 1000 Museum in Downtown Miami
- New York City?

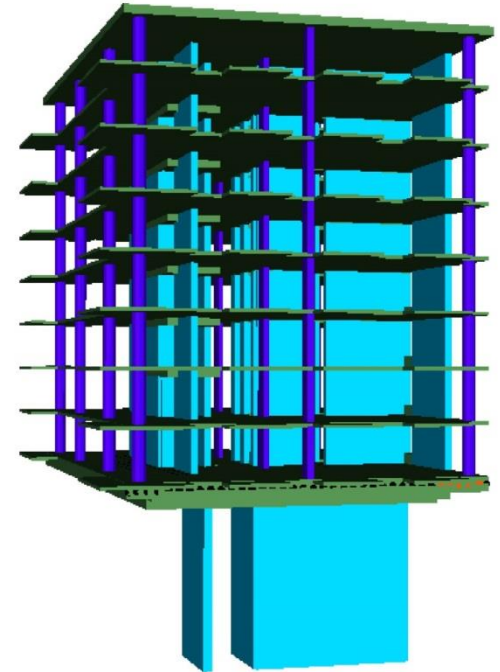


Future Innovation

- Transfer Mats and Podium Slabs
- Surf Club – Miami Beach



Photo Courtesy of VSL



Future Innovation

- Shark Tank – Miami Science Museum
- Three directional bonded PT

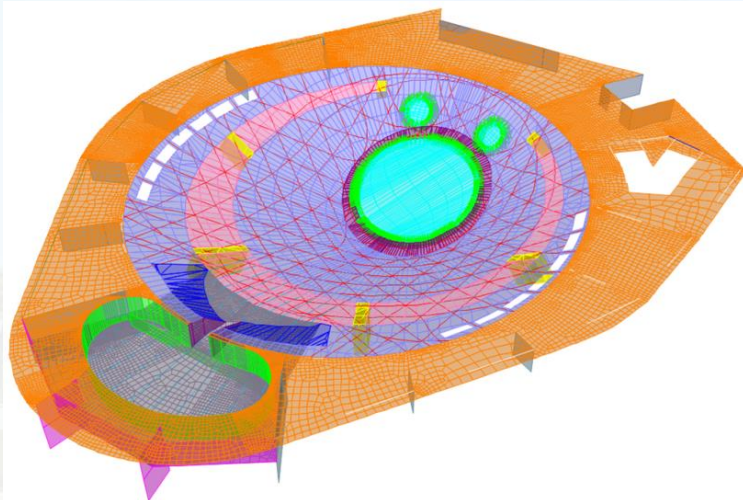


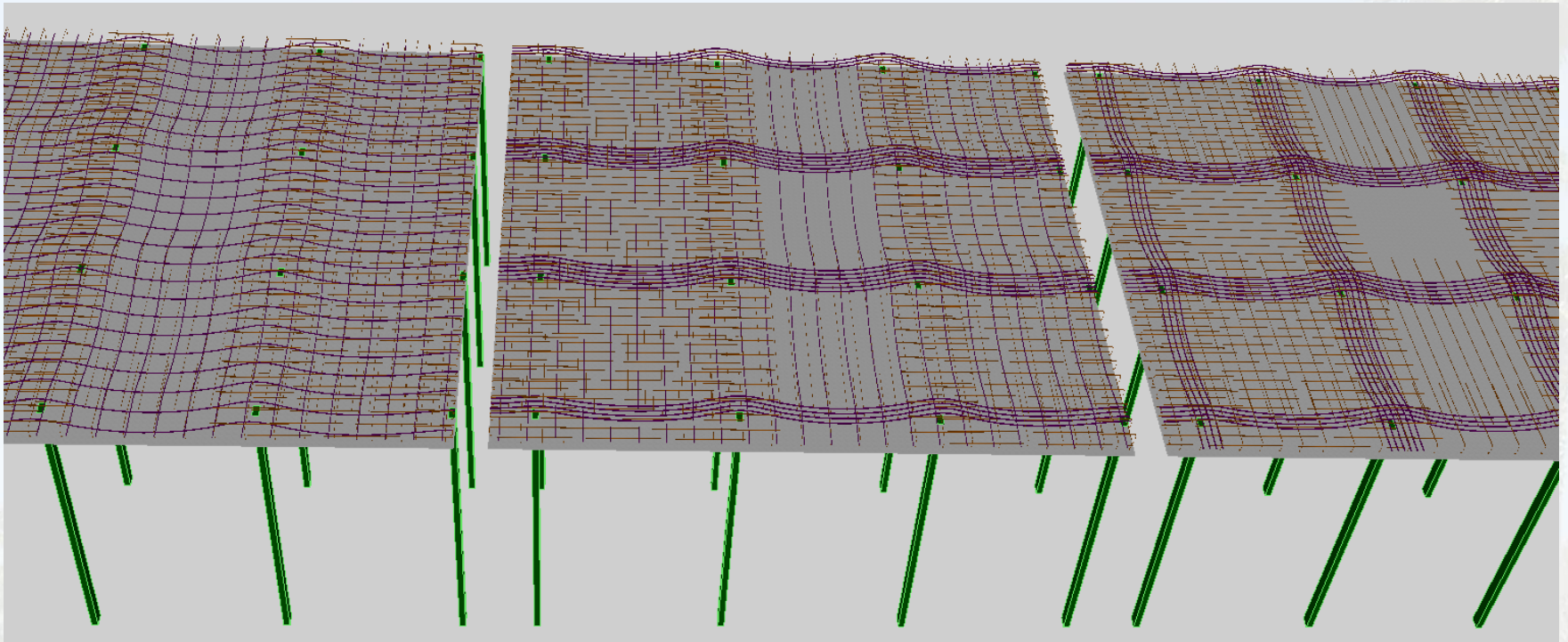
Photo Courtesy of VSL

Future Innovation

Basket Weave

Banded / Distributed

Banded / Banded



Future – External PT

- Strengthening of 2 Way Flat Plate
- Strengthening of Precast Parking Garage



Photo Courtesy of VSL



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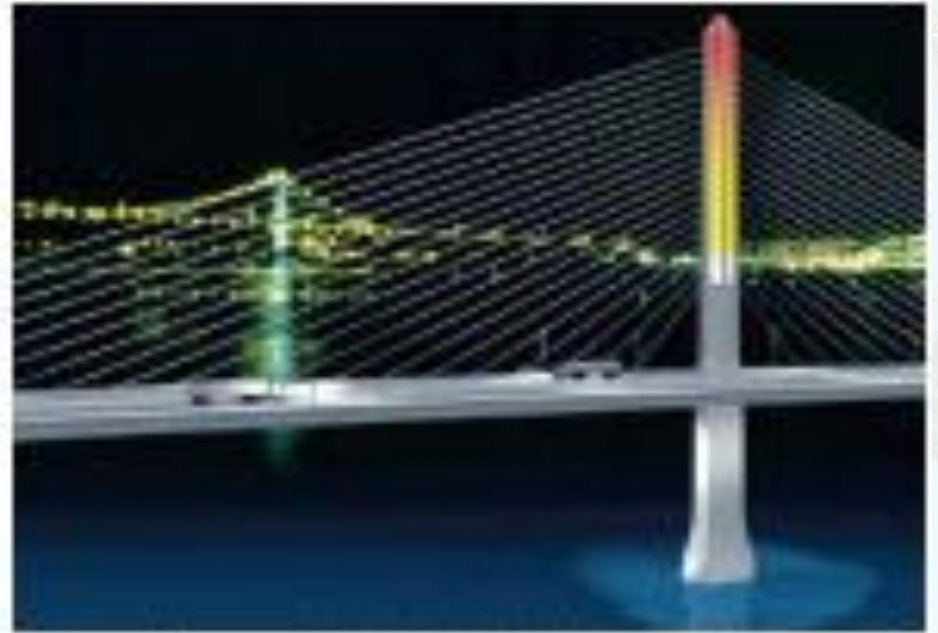
Future – External PT

- Fallingwater
- Used PT to arrest sag in cantilevered slabs



Future – Bridges

- Coordinated Effort with ASBI and FHWA
- Push Envelope in Design and Quality
- Recognized as the International Authority for Stay Cable Design and Construction



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Thank You!

Questions ?