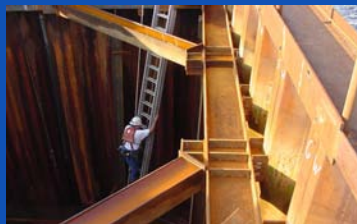
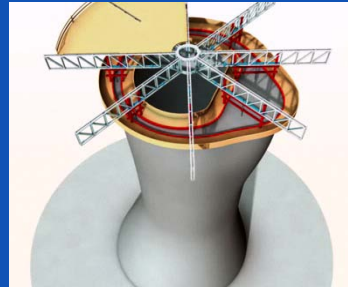


Construction Technologies & Engineering, Inc.

Engineering Your Success : Outstanding Solutions in Construction Engineering



- Structural Engineering
- Form Travelers
- Heavy Lifting
- Incremental Launching
- Arch Construction

- Segment Lifters
- Post-Tensioning
- Stay Cables
- Shoring
- Formwork

- Slipforming
- Trestles
- Falsework
- Structural Repairs
- R&D

The Company

CTE was established in 1992 and formally incorporated in 1995 by its Founder and Principal Engineer, Michael Veegh, P.E. MBA.

Our Mission is to help make your project a success.

As licensed professional engineers we are engaged in engineering and design as needed for the construction phase of demanding bridge and infrastructure projects, mainly in North America but also internationally, with experience in Puerto Rico, Taiwan and South Africa.

We specialize in bridge construction engineering and related enabling technologies such as post-tensioning, heavy lifting, self-launching form systems, bridge launching, shoring and more. Some of this know-how we also apply in other types of construction such as buildings, stadiums and energy infrastructure.

Bringing innovative solutions to difficult construction projects is what we do. We back this with thirty years of experience in advanced construction techniques and a passion for delivering exceptional solutions whenever possible.

Our Edge

We are driven to excellence in what we do, always searching long and hard for a better solution.

As hands-on engineers, we have a very good understanding of what happens in the field and how it is accomplished. We have built forms, tied rebar, welded steel, finished concrete and installed post-tensioning. This knowledge is very much reflected in our work as we mentally go through the individual field operations to make sure our designs are efficient, practical and constructible.

We understand that construction is a business with many risks. We aim to reduce risk in our designs, carefully weighing the costs and benefits of what we do. Not every decision we make is a technical decision. Simply because something is technically feasible does not mean it is prudent.

For 30 years, we have been helping contractors meet their challenges by developing construction systems and methods for some of their most demanding projects. Whether the work called for heavy lifting, incremental launching, post-tensioning, temporary works, form travelers, arch construction or forming and shoring, we have kept our clients on track and out of trouble with timely, effective and innovative solutions.

Contact Information

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Email mveegh@hispeed.ch
Web www.cteg.com



Common Services Provided

Construction Systems

- Form travelers for cast-in-place cantilever construction
- Segment lifters for precast segment erection
- Incremental launching of bridge structures
- Arch construction - form travelers and tie-back systems
- Moving shoring systems / MSS
- Launching trusses
- Temporary work trestles
- Shoring towers
- Falsework
- Rigging and spreader beams
- Custom forming systems
- Slipform construction

Heavy Lifting + Moving

- Strand and bar lifting
- 100 tons and upwards
- Precast segments
- Bridge spans
- Steel structures and vessels
- Equipment erection

Post-Tensioning / Stay Cables

- System development
- Technical assistance
- Engineering and drawings

Dispute Resolution

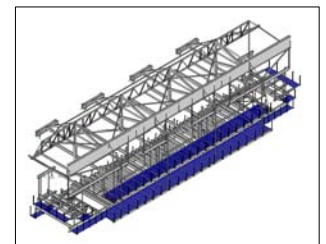
- Defense
- Investigative engineering
- Opinion papers

Structural Engineering

- Analysis and design
- Drawings and specifications
- Peer reviews
- Inspections and reports
- Repairs and rehabilitation
- Steel, concrete, wood, masonry

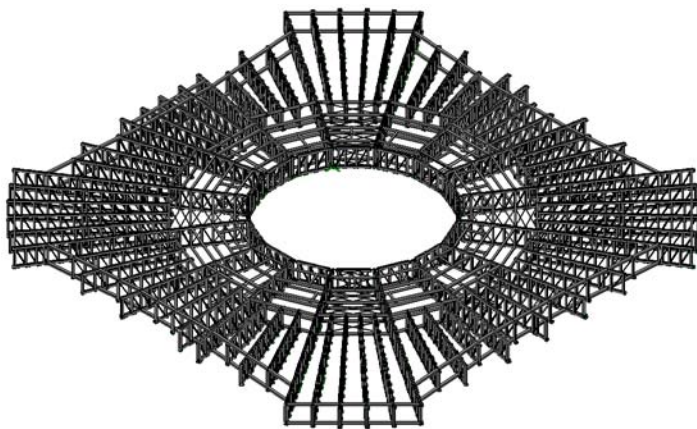
Technical Writing

- Copy and editing
- Specifications
- Manuals
- Research



Hebron Offshore Oil Platform

Gravity Base Structure built by the Slipform Method of Construction



Framework for slipforming
variable cross-sections

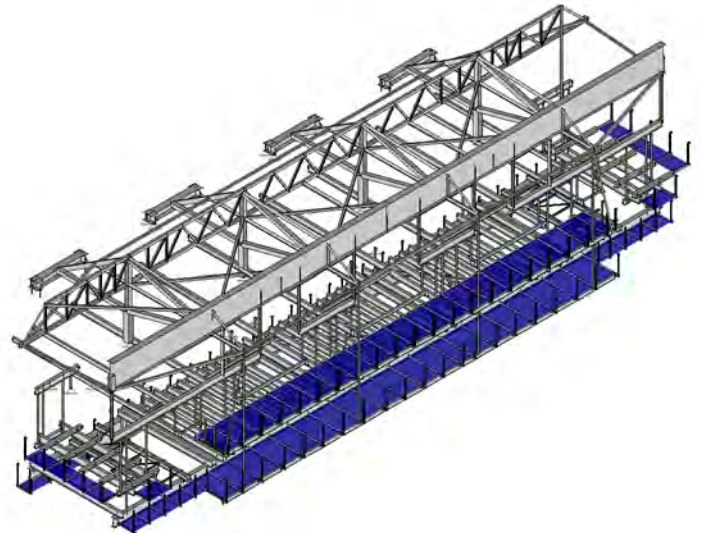
Structural modeling and design review of the slipform truss for crane erection and in-service slipforming conditions.

- 3D Modeling and analysis of the slipform star truss system
- 10,000 nodes, 8,000 members
- Detailed design review

Project	- Hebron Offshore Oil Platform
Location	- Newfoundland, Canada
Year	- 2015
Type	- Slipform Engineering
Owner	- Exxon Mobil
GC	- Kiewit-Kvaerner Contractors
Client	- Gleitbau GBG Salzburg

Pearl Harbor Memorial Bridge - Form Traveler with Four Main Frames

Extradosed, Cast-in-Place Bridge over the Quinnipiac River

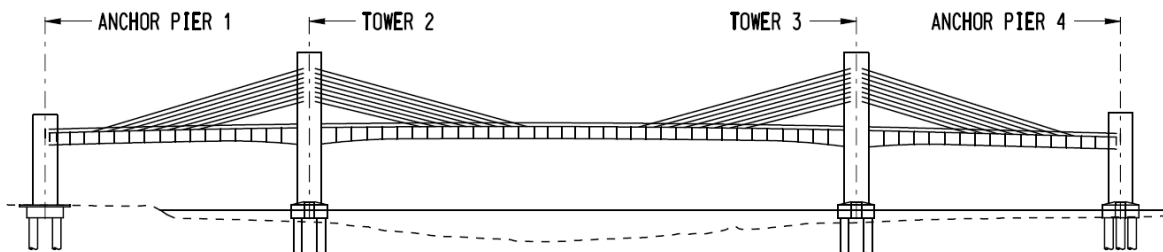


Structural analysis, design verification, pour deflections, loading on bridge, field inspections and technical assistance.

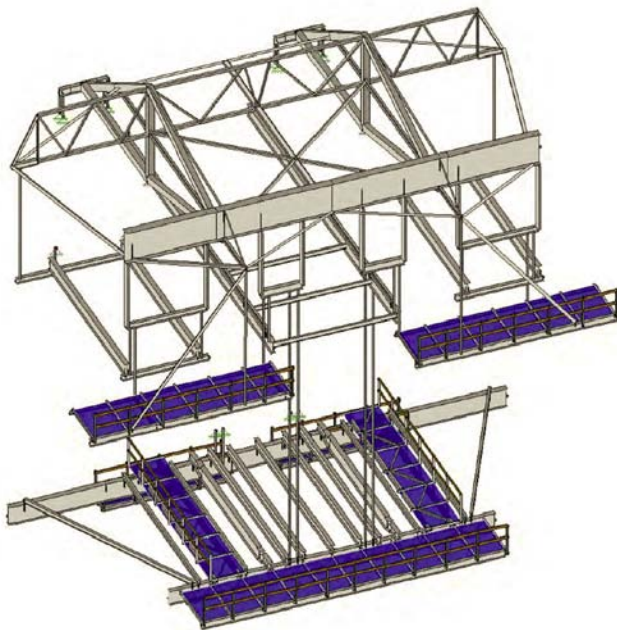
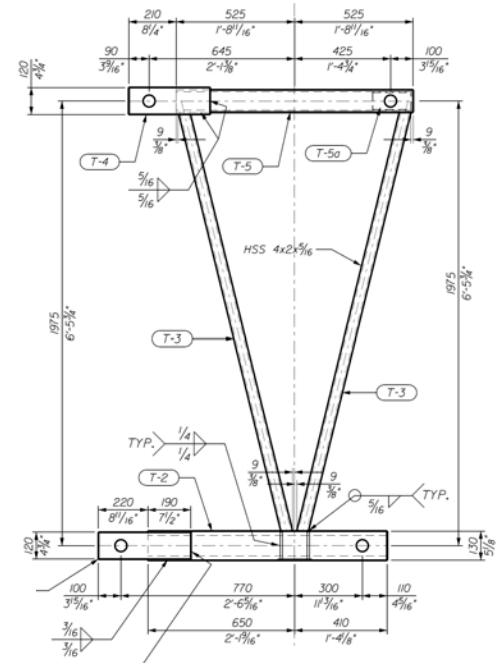
Segment Data:

Weight - 735 kip
Length - 14.3 ft ft
Width - 108 ft

Project - Pearl Harbor Memorial Bridge
Location - New Haven, Connecticut
Year - 2011
Type - Form Traveler
Owner - Connecticut DOT
GC - Walsh PCL JV II
Client - Schwager Davis Inc.



Modify Form Traveler for New Balanced Cantilever Bridge

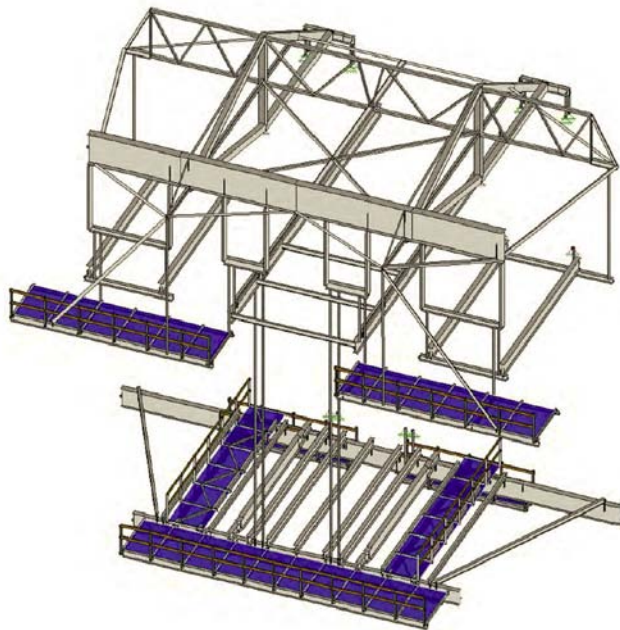


- Develop overall layout to suit new bridge
- Structural analysis and verification
- Sleeve layout
- Loading on bridge
- Pour deflections
- Modification drawings and calculations
- Field inspections
- Technical assistance

- Project - Broad Avenue Bridge over Flint River
- Location - Albany, Georgia
- Year - 2013
- Type - Form Traveler
- Owner - Georgia DOT
- GC - PCL Civil Constructors
- Client - PCL Civil Constructors

Clearwater Memorial Causeway

Form Traveler for Balanced Cantilever Bridge



Structural check and verification of form traveler for new cast-in-place balanced cantilever bridge

- Structural analysis and verification of form traveler
- Verification of formwork design
- Determine loading imposed on bridge
- Calculate pour deflections
- Field inspections
- Technical assistance

Project - Memorial Causeway
Location - Clearwater, Florida
Year - 2001
Type - Form Traveler
Owner - Florida DOT
GC - PCL Civil Constructors
Client - Schwager Davis Inc.

Segment Lifter for San Francisco Oakland Bay Bridge

Self-Launching Erection Device / SLED



A self-launching beam-and-winch system for erecting 800 ton precast segments.

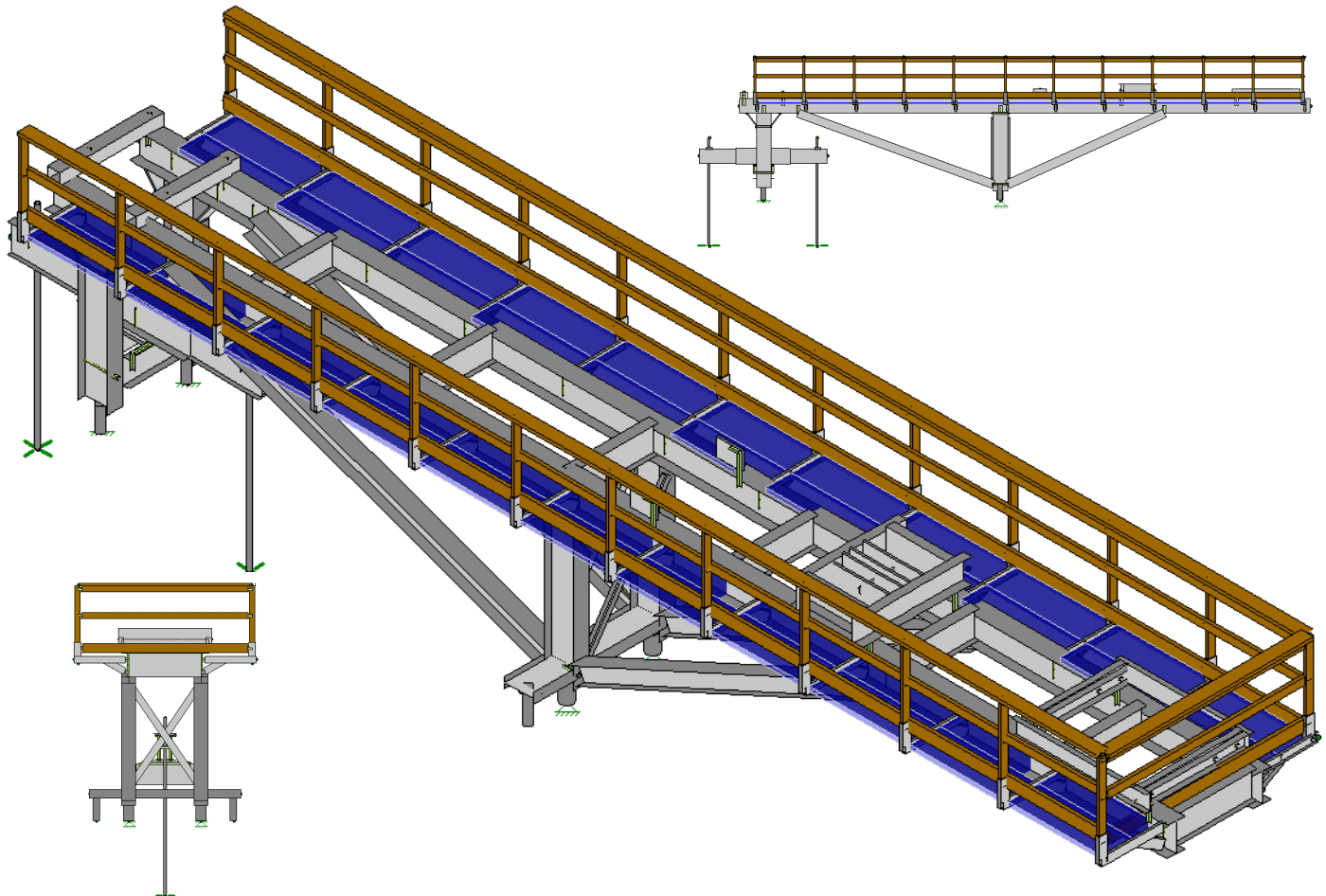
Four hydraulic winches were used, each with a 10-part line, to lift a total of 452 segments. The average lift time was about 20 minutes. After erecting a segment, the SLED was moved to a new lift position using its built-in hydraulic launch system.



Project - San Francisco Oakland Bay Bridge
Year - 2002 - 2005
Type - Segment Lifter
Owner - Caltrans
GC - Kiewit Pacific / FCI / Mansion JV
Client - Schwager Davis Inc.

Bonner Bridge Replacement Project

Segment Lifter for Balanced Cantilever Bridge



Development and design of a highly optimized segment lifter with a very low ratio of equipment weight to segment weight (0.25)

- Segment weight of 126 tons max.
- Hydraulic winches
- 10-part lines
- Self-launching
- Overall concept development
- Mechanical component selection and interface
- 3D analysis
- Final design and drawings

Project	- Bonner Bridge Replacement
Location	- Dare County, North Carolina
Year	- 2015
Type	- Segment Lifter
Owner	- North Carolina DOT
GC	- PCL Civil Constructors
Client	- Schwager Davis Inc.

Caguanas River Bridge on Highway PR-10 in Puerto Rico

Curved Incrementally Launched Bridge



First curved incrementally launched bridge in North America

Length = 1271 ft / 387.5 m
Weight = 11,100 tons
Slope = 4%

Design, engineering and drawings:

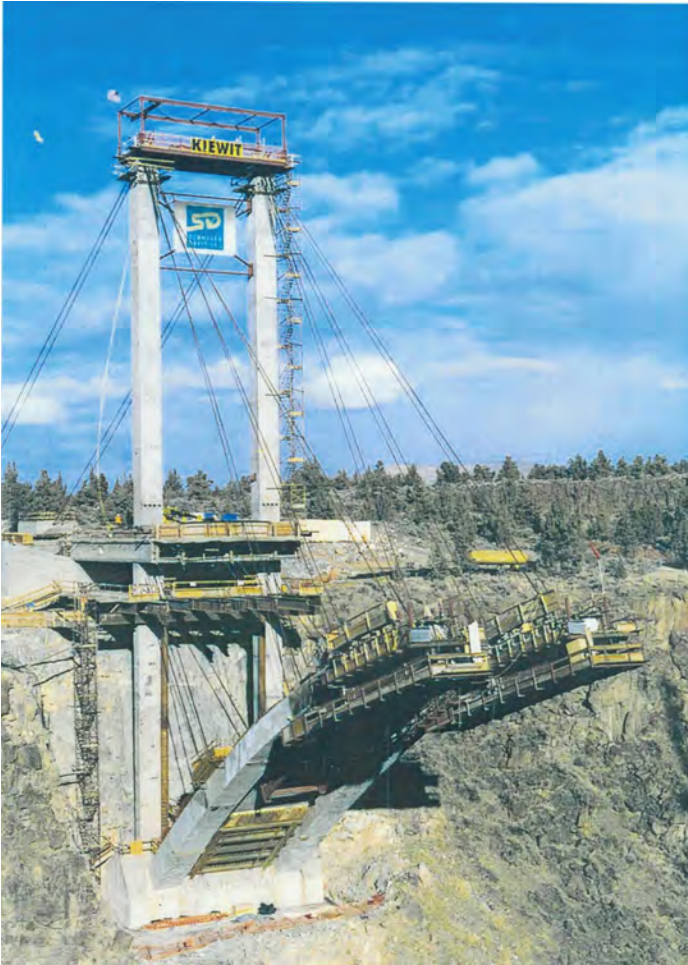
- Launching nose
- Temporary piers
- Pier tie-back system
- Sliding bearings and launching guides
- Superstructure modifications
- Launching mechanism (2 x 1000 ton jacks)
- Field supervision



Project - Caguanas River Bridge on PR-10
Location - Utuado, Puerto Rico
Year - 1989
Type - Incremental Launch
Owner - Puerto Rico DOT
GC - Las Piedras Construction Co.
Client - VSL Corporation

Crooked River Gorge Bridge Arch Construction

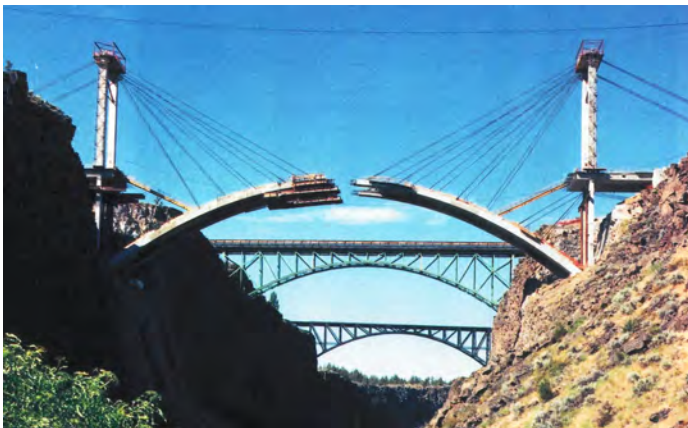
410 ft Concrete Arch Bridge over 330 ft Gorge



Segmental arch construction with (2) rib form travelers and (1) slab form traveler.

Design, engineering and drawings:

- Arch construction analysis to determine required pull on rib form traveler
- Rib form traveler supported by leading stay cable
- Slab form traveler
- Temporary precast concrete towers with stressing platform and jack trolley system
- Arch tie-back system and anchorage blocks
- Rock anchors
- First lift falsework
- Shop drawings
- Technical assistance



Project	- Crooked River Gorge Bridge
Location	- Bent, Oregon
Year	- 1999
Type	- Arch Construction
Owner	- Oregon DOT
GC	- Kiewit Pacific
Client	- Schwager Davis Inc.

Temporary Work Bridge for Foothills Parkway Bridge No. 2

790 ft crane and segment trestle on steep hillside



Temporary work bridge to facilitate the top-down construction and erection of a precast balanced cantilever bridge in the Great Smoky Mountain National Park.

- Sitting on micro-piles and precast pile caps
- 790 ft long, 7% grade, S-shaped (reverse curve)
- Adjustable deck width to suit equipment
- Switch between pinned and fixed foundations

Used for:

- Trestle foundation construction
- Trestle erection
- Bridge foundations and substructure construction
- Crane and truck traffic
- Segment delivery and erection
- Trestle removal

Project - Foothills Parkway Bridge No. 2
Location - Blount County, Tennessee
Year - 2011
Type - Temporary Work Bridge
Owner - Federal Highway Administration
GC - Bell & Associates Construction
Client - VStructural LLC

Span-by-Span Construction of the Jamestown Verrazzano Bridge

Precast, Post-Tensioned Spans floated in by Barge - 2400 tons



Heavy lift engineering, equipment design, permanent structure modifications, shop drawings, lifting procedures and onsite technical assistance.

Weight - 2400 tons (with added materials)
Span - 167 ft x 72 ft
Jacks - 12 x 1000 ton
Height - 130 ft (max.)
Lifts - 15 total

Project - Jamestown Verrazzano Bridge
Location - N. Kingstown-Jamestown, Rhode Island
Year - 1990
Type - Heavy Lifting
Owner - Rhode Island DOT
GC - Atkinson Kiewit JV
Client - VSL Corporation

Pier segments on final structure sliding bearings
Compound tie-down angles creating lateral loads

Marlins Ballpark Roof Beam Erection

Stadium with Retractable Roof



Heavy lift engineering, equipment design, permanent structure modifications, tie-down anchors and lifting procedures.

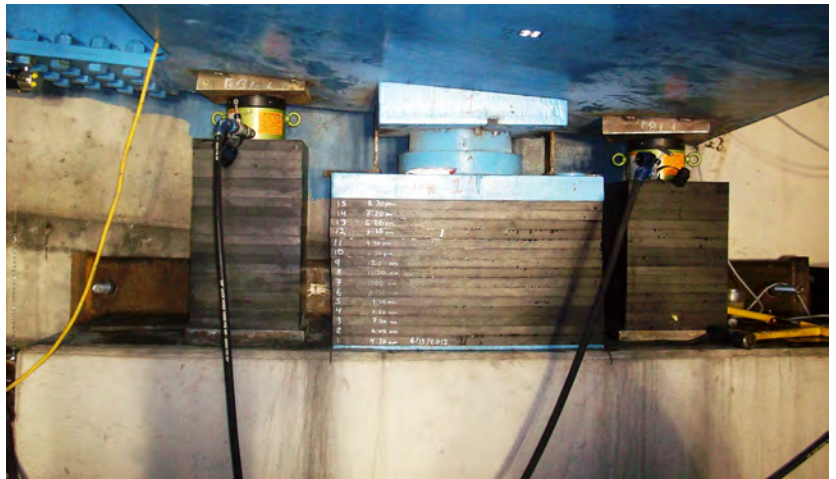
- Erection of (9) spans weighing up to 450 tons
- Technically complex lifts with unbalanced column moments
- Adjacent spans were used for tie-down reactions whenever possible



Project - New Marlins Ballpark
Location - Miami, Florida
Year - 2010
Type - Heavy Lifting
Owner - Miami Marlins
GC - Hunt / Moss JV
Client - VStructural LLC

Raising of Ramp N over I-595 with 10% Lateral Capacity

Avoiding demolition by increasing traffic clearance



Heavy lift engineering, design of shoring towers and lateral system, lifting procedures, onsite assistance.

Weight - 2600 tons
Length - 960 ft
Jacks - 36 (synchronized)
Height - 18 in.
Time - 30 hours



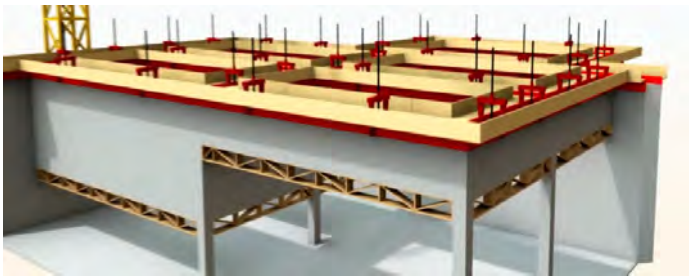
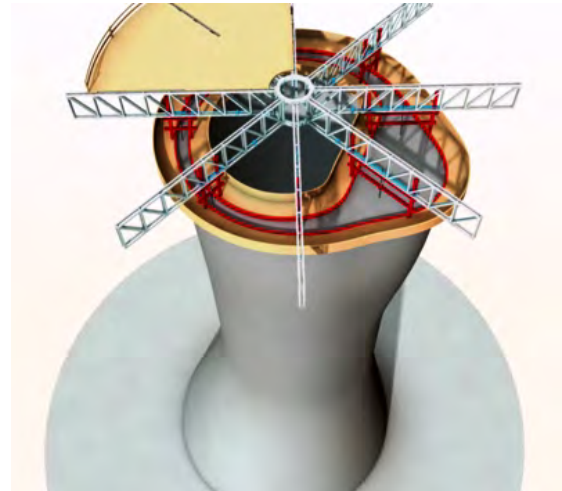
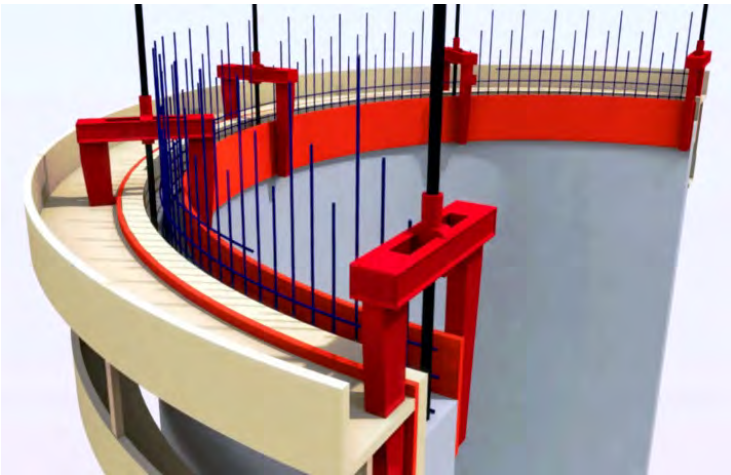
- The Owner declined our offer to lift the bridge by 18 inches in a single stroke
- The bridge was lifted in 1 in. increments over a 30 hour non-stop period
- Lateral capacity of 10% was maintained at all times during the lift by means of an innovative and new restraint system at every pier and abutment



Project - Ramp N over I-595
Location - Broward County, Florida
Year - 2012
Type - Heavy Lifting
Owner - Florida DOT
GC - Dragados USA
Client - VStructural LLC

Vertical Concrete Slipform Construction Services

State-of-the-Art Slipforming Services for Large-Scale Civil Engineering Projects



North American Agent for Gleitbau GBG, world-leader in slipform construction

- Slipform Consulting Services
- Slipform Equipment Rental with Expert Supervision
- Full Construction Services with Slipform Method
- Registered Engineers to support your Project
- Heavy Lifting Services



IU Health People Mover Guideway Structure

7400 ft Precast and Post-Tensioned Structure



Designer and Engineer-of-Record for this precast, post-tensioned elevated guideway structure.

Total length - 7400 ft

Average span length - 80 ft

Maximum span - 110 ft

Minimum radius - 100 ft



Project	- IU Health Automated People Mover
Year	- 2001 - 2003
Type	- Precast post-tensioned guideway
Owner	- IU Health (Clarian Health)
GC	- Schwager Davis Inc.
Client	- Schwager Davis Inc.

Brightman Street Bascule Bridge Cofferdams

Design Review and Inspection



Design review and inspection of the Brightman Street Bridge temporary cofferdams for constructing the pier foundations.



Project - Brightman Street Bascule Bridge
Location - Fall River, Massachusetts
Year - 2001
Type - Cofferdams
Owner - Massachusetts DOT
GC - Jay Cashman, Inc.
Client - Rusco Steel Co.

New Bar Lifting System without Split Nuts

Lifting Innovation



Developed from scratch - a new and innovative bar lifting system that does not require special fabrication split nuts.

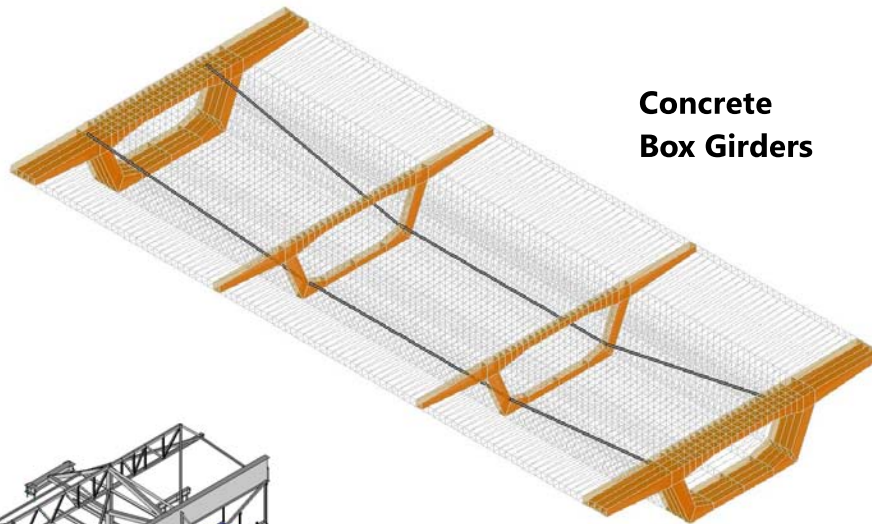
This system was developed in response to the contractor's decision to use a bar lifting system for erecting the extremely wide and flexible form traveler bottom platforms on the new Pearl Harbor Memorial Bridge in New Haven, Connecticut. The system proved very effective and was quickly re-deployed for other jobsite lifting work such as for raising and lowering formwork and falsework. The design was based on off-the-shelf components in conjunction with a special jack chair and related accessories.



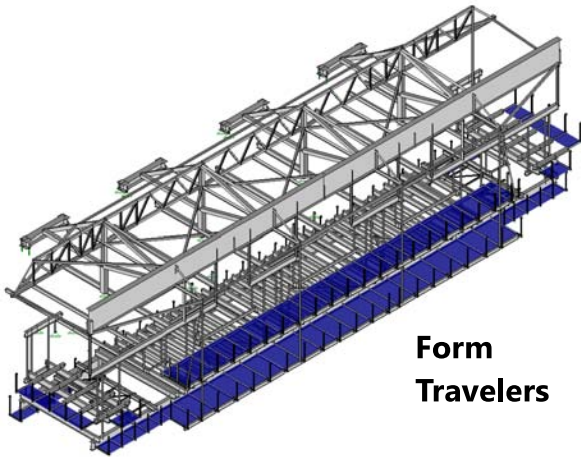
Project	- Pearl Harbor Memorial Bridge
Location	- New Haven, Connecticut
Year	- 2011
Type	- Equipment Design
Owner	- Connecticut DOT
GC	- Walsh / PCL JV II

Structural Analysis

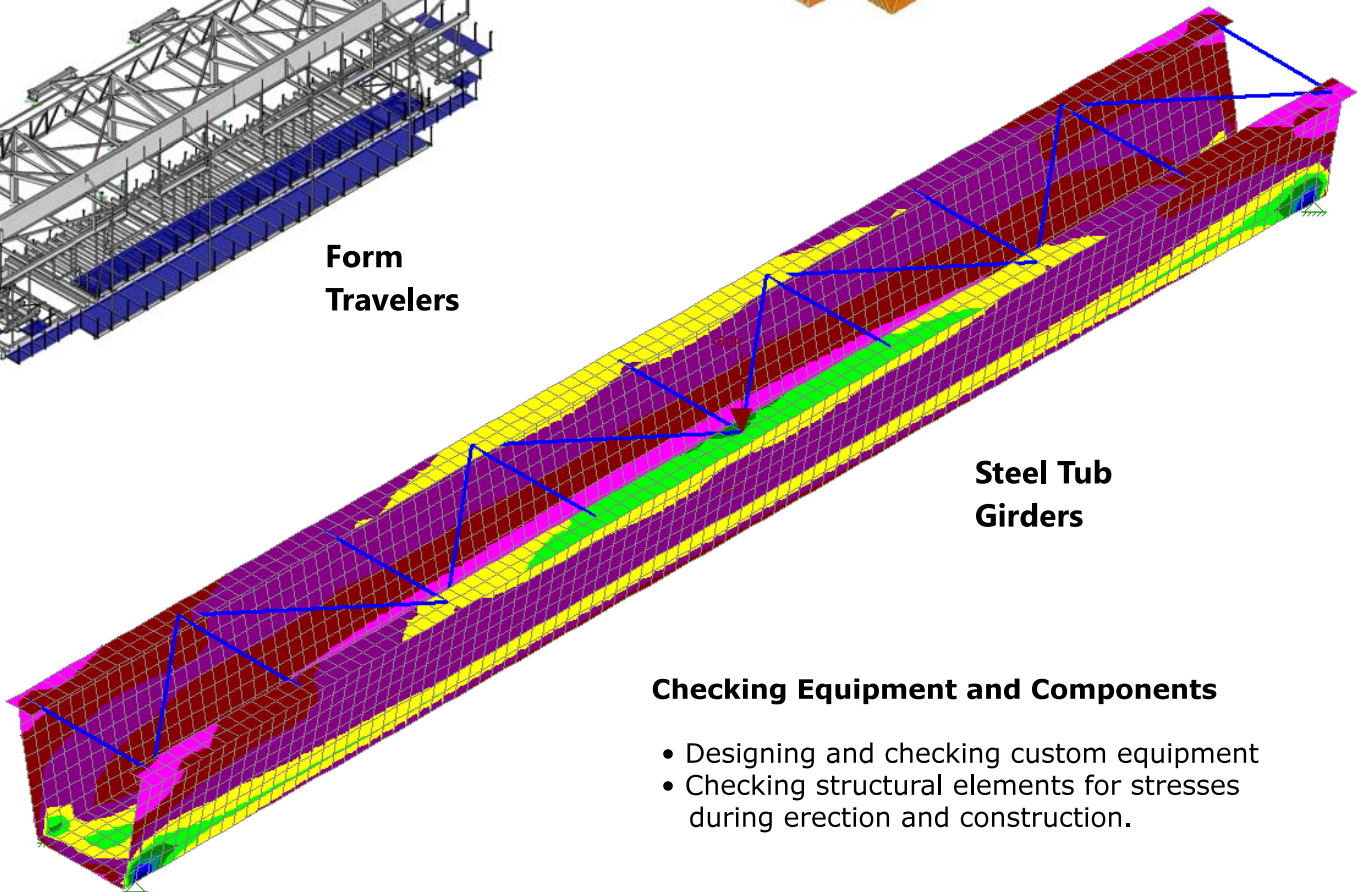
Checks and Verifications for Heavy Lifting and Construction Applications



**Concrete
Box Girders**



**Form
Travelers**



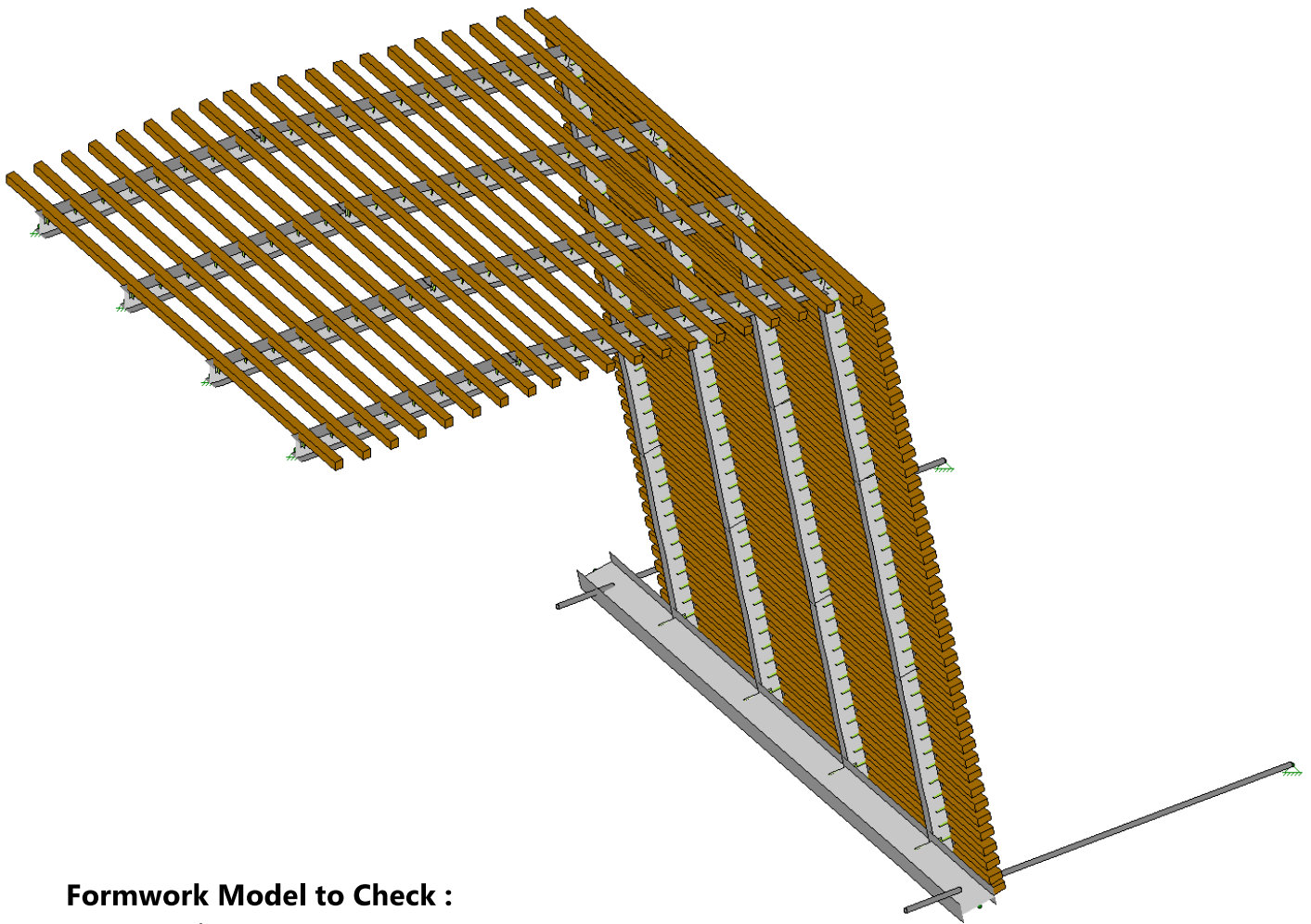
**Steel Tub
Girders**

Checking Equipment and Components

- Designing and checking custom equipment
- Checking structural elements for stresses during erection and construction.

Custom Formwork Design

Form Traveler Outside Formwork Shown

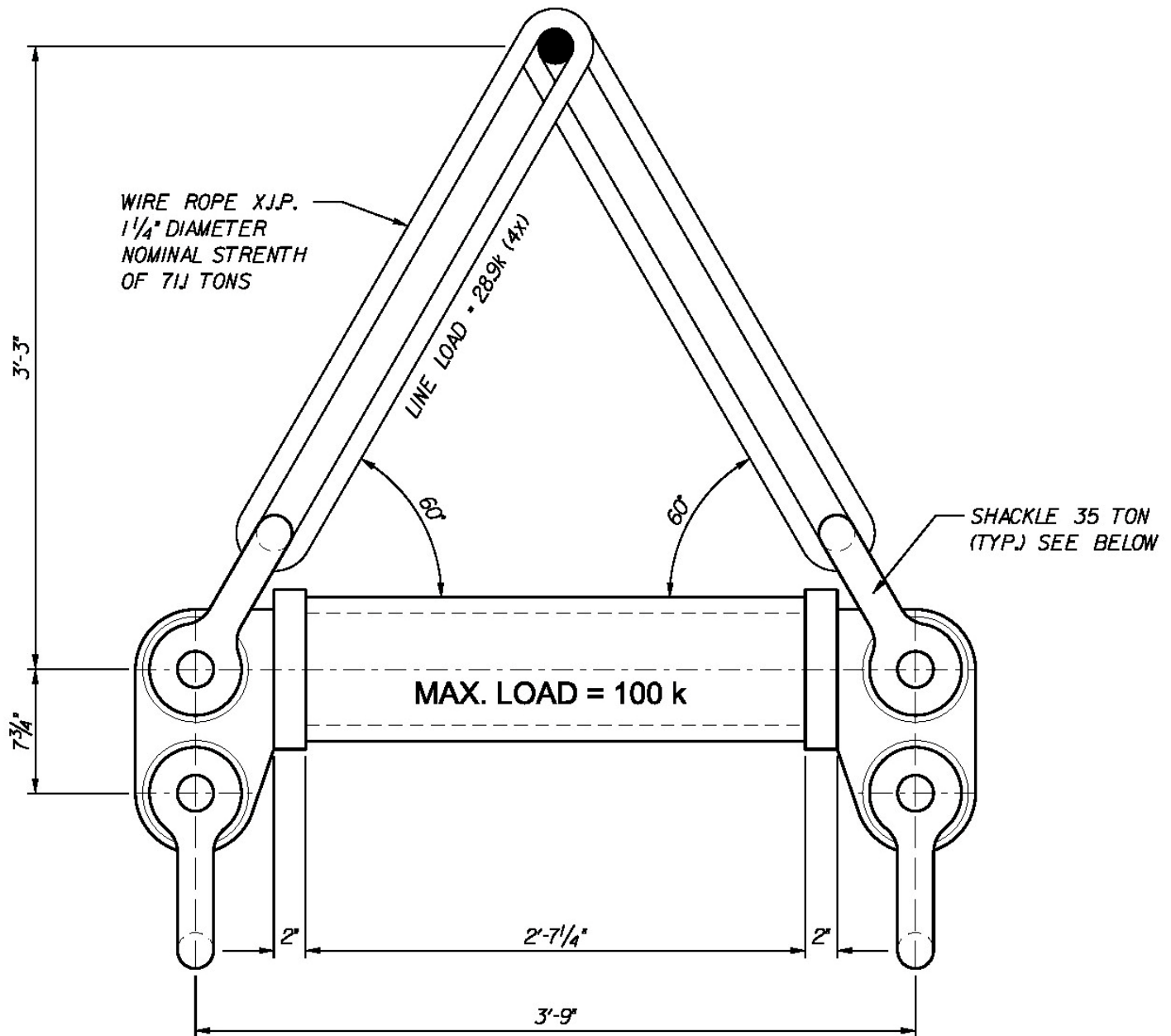


Formwork Model to Check :

- Strength
- Deflections
- Form tie forces
- Strong-back beam
- High-strength bars

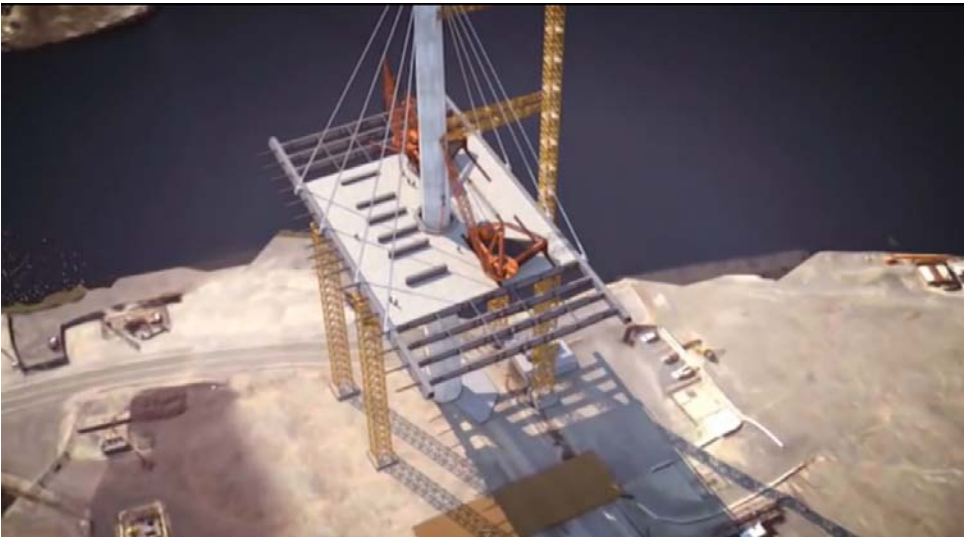
Rigging and Spreader Beams

Typical Example Below



Construction Animation Videos

Cable-Stayed Bridge Erection

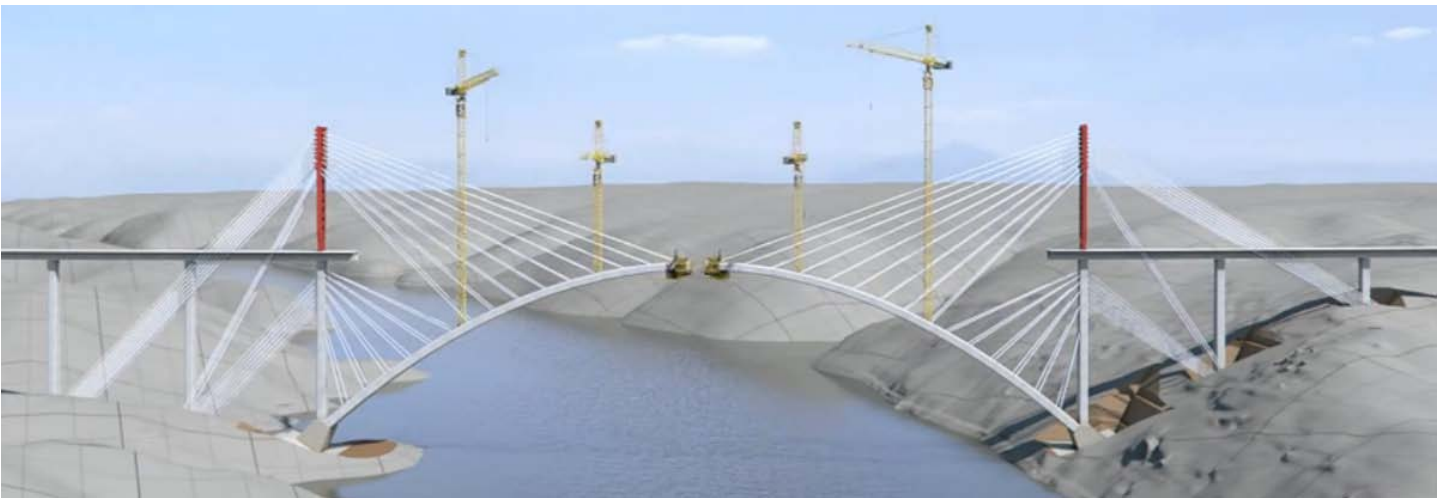


Design/Build

**Value
Engineering**

PPP Projects

Arch Construction with Temporary Towers



Need to explain your design? We offer animated construction videos to help you sell your concepts and ideas to decision makers and stakeholders. There is no better medium to hold people's attention and to get your points across than a striking video presentation. We will work hand in hand with your estimators and planners to develop the kind of presentation that will put you out in front.