Purpose and Background

In this two-day class Marco Rosignoli, an international expert of mechanized bridge construction, explores design, technology, productivity, structure-equipment interaction and industry trends of modern construction methods for prestressed-concrete bridges with extensive illustrations and case studies.

Mechanized bridge construction requires the use of specialized equipment – self-launching gantries and lifting frames for precast segmental bridges, beam launchers for top-down construction, form travelers for balanced cantilever casting, movable scaffolding systems (MSS) for span-by-span casting, ultra-heavy gantries for macro-segmental construction, span carriers with underbridge and tire trolleys for full-span precasting, and so on.

New-generation bridge construction equipment is expensive, complex and sophisticated. Some machines apply substantial loads to bridge piers and foundations, others apply traveling point loads or interact with their stiffness, others may be limited by the load capacity or stability of the bridge piers, and most types of equipment can cause locked-in stresses in the bridge. Safety of workers and bridge quality and durability depend on complex interactions between human decisions, structural, mechanical and electro-hydraulic components, control systems, and the bridge being erected. The risks of incorrect design assumptions and unanticipated interactions are not always evident in so complex and sophisticated structural systems.

Addressing the needs of bridge owners, resident and construction engineers, contractors, designers, manufacturers, inspectors, safety planners and bridge academics, the class delivers solid professional guidance for each stage of the design and construction of prestressed-concrete bridges with mechanized methods, and provides an exciting occasion for interacting with other bridge professionals and an expert in the field.

Seminar Instructor

Marco Rosignoli, Dr., Ing., P.E., M.ASCE, F.IABSE, has 34 years of experience in bridge design and construction in the US and abroad. Working with bridge constructors, designers, and owners in 22 countries on four continents, he has served as designer, reviewer, technical leader or technology consultant on six cable-stayed bridges, 34 incrementally launched bridges, multiple balanced cantilever bridges, and well over 30 miles of light-rail and high-speed railway bridges.

International expert of mechanized bridge construction and the incremental launching of bridges, he is the author of four bridge books published worldwide, three book chapters, over 90 scientific publications and presentations, and chapter 6.37.40 Bridge Erection Machines of UNESCO Encyclopedia of Life Support Systems, and he holds 32 patents on bridge construction methods.

Marco Rosignoli is serving as Bridge Technical Director at Dragados USA.

For group training, contact John Wyrick (JWyrick@asce.org) or Stephanie Tomlinson (STomlinson@asce.org)
Summary Outline

Day One

- Introduction to mechanized bridge construction
- Precast beam bridges
- Technology of segmental precasting
- Span-by-span construction of precast segmental bridges
- Balanced cantilever construction of precast segmental bridges
- In-place casting of balanced cantilever bridges

Day Two

- Technology of span-by-span casting
- Span-by-span casting with overhead MSS
- Span-by-span casting with underslung MSS
- Macro-segmental construction
- Incremental launching
- Full-span precasting
- Post test and evaluation forms

Seminar Benefits

- Acquire in-depth information on modern bridge construction methods from a recognized industry expert.
- Enhance the cost-effectiveness of bridge design.
- Discover new solutions for value engineering and design-build bidding of prestressed-concrete bridges.
- Acquire professional background on bridge construction methods commonly employed abroad.
- Understand the implications of mechanized construction on the design of new bridges.
- Compare alternative construction methods to optimize investments and site organization.
- Condition for learning outcomes: professional background of bridge engineering.
- Instructional method: the class delivers solid professional guidance on mechanized bridge construction and its design and technology requirements. The most recent books written by the teacher on the topic – Bridge Launching, 2nd Edition (2014, ICE Publishing) and Bridge Construction Equipment (2013, ICE Publishing’s best-selling US title), published worldwide by the Institution of Civil Engineers, London, UK – complement the class for a comprehensive treatment of the topic.

Who Should Attend?

- Bridge Owners, Designers, Construction Engineers
- Bridge Contractors and Subcontractors
- Designers and Manufacturers of bridge construction equipment
- Forensic Engineers, Graduate Students, Educators

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