

SP Scheryhill PCI

Pennsylvania Concrete Conference
January 29-31, 2008

Rapid Construction of the Route 70 Bridge Over Manasquan River

Monmouth and Ocean Counties, New Jersey

Troy M. Jenkins P.E.
CDS Engineers, Inc.

SP Scheryhill PCI Agenda

- Project Overview
- Project Team
- Architectural Considerations
- Environmental Considerations
- Traffic Control
- Precast Solution
- Construction Schedule
- Precast Fabrication / Construction
 - Cofferdams
 - Columns
 - Pier Caps
 - Girders
- Conclusions

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SP Scheryhill PCI Project Overview

- Existing Structure:
 - Built 1936
 - 625 ft long with 17 approach spans
 - 1 single leaf bascule span
 - Structurally deficient
 - Functionally obsolete




SP Scheryhill PCI Project Overview




SP Scheryhill PCI Project Overview

- Must meet the needs of EVERYONE!
 - Architectural Requirements
 - Environmental Restrictions
 - Keep the local community involved
 - Brick Township, Point Pleasant, Wall Township and Brielle
 - Minimize disruption to traffic
 - Automobiles, Pedestrians and Boats
 - Remove the need for a movable bridge



Project Overview

- The existing movable bridge will be replaced with a fixed, high-level, architecturally treated, precast concrete bridge (1).
- A public fishing pier will be provided at the northwest corner of the bridge (2).
- A temporary pedestrian walkway will be provided during stage construction (3).
- ITS improvements will be provided including a weather station, pavement sensors, a bridge-mounted closed circuit TV camera and a multi-dust conduit for future expansion of the statewide ITS system.
- Bulkheads will be reconstructed at the southwest, southeast and northeast corners of the bridge (4 and 5).
- Retaining walls will be provided at the four corners of the bridge to retain soil slopes and limit right of way acquisitions (6, 7, 8 and 9).
- A noise wall will be constructed along Route 70 eastbound in Brielle to mitigate noise impacts (10 and 11).
- A new fender system will also be provided (12).
- Two new ramps will be provided to facilitate traffic improvements at the intersection of Route 70 with River Road/Riviera Drive in Brick Township (13).
- A new traffic signal will be installed at the intersection of Route 70 and River Road/Riviera Drive in Brick Township (14).
- Drainage improvements will be constructed including pipes and inlets, two new basins and three-manufactured treatment devices to provide increased storm water storage capacity and to improve water quality.



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Project Team

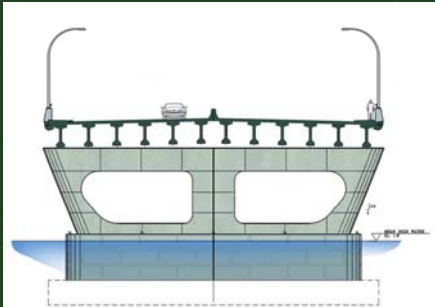
- Owner – New Jersey Department of Transportation
- Consultant Design Team
 - Arora and Associates, P.C. – Prime Consultant
 - H2L2 Architects / Planners, LLP
 - URS Corporation
 - Amy S. Greene Environmental Consultants, Inc.
 - Prestige Environmental, Inc.
 - Medina Consultants, P.C.
 - RBA Group, Inc.
- Contractor – George Harms Construction Co., Inc.
- Structural Precast Producer – Schuykill Products, Inc.
- Construction Cost – \$52 Million

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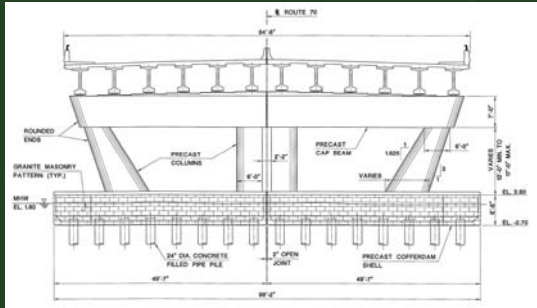
Architectural Considerations

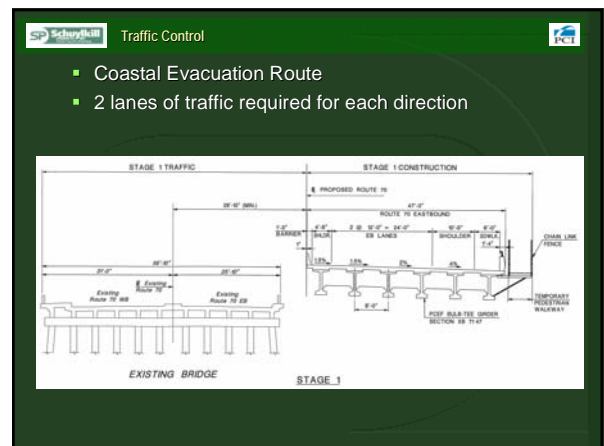
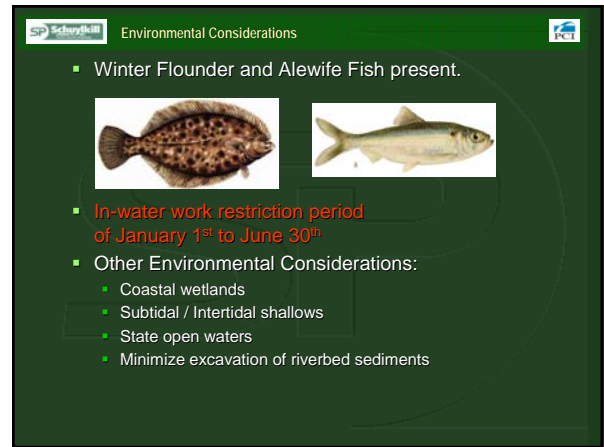
- Original Architectural Rendering:

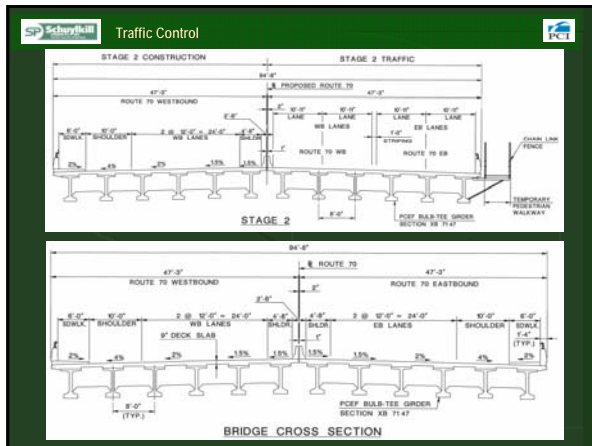


Architectural Considerations

- Proposed Bridge:







Agenda

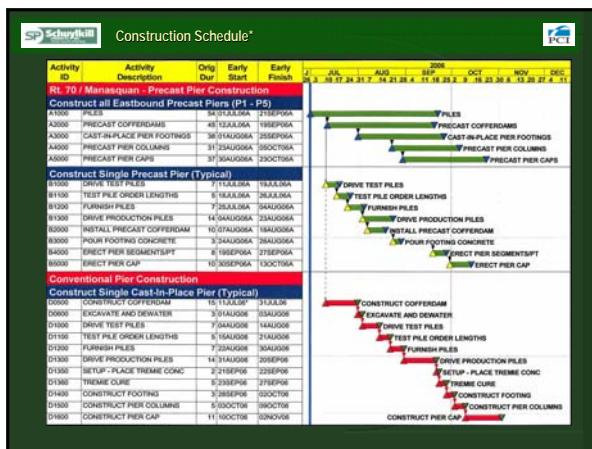
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Precast Solution

- Why use precast?
 - Time
 - Environmental Restrictions
 - Limit Traffic delays
 - Reduce need to be in water
 - Quality
 - High Performance Concrete
 - High Strength Concrete – 8000 PSI
 - Plant Quality Assurance Plan
 - Aesthetics
 - Sloped Columns
 - Long Pier Caps
 - Jobsite Safety
 - Reduced manpower in air
 - No Steel sheeting for Cofferdams

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Construction Schedule*

- Typical precast pier can be constructed in 63 working days.
- Typical CIP pier can be constructed in 78 working days.
- 5 eastbound piers were constructed in 96 working days.
- Average duration of 19 working days per pier (including foundations).
- Precast pier construction allowed for Accelerated Bridge Construction and was a major contributing factor in the project being over 700 calendar days ahead of schedule.
- Anticipated completion date – December 29, 2008.
- NJDOT Website original completion date – December 2010.

*Special Thanks to Eric Yermack with Arora and Associates for scheduling data.

SP Schrybill PCI Agenda

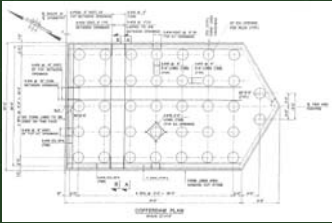
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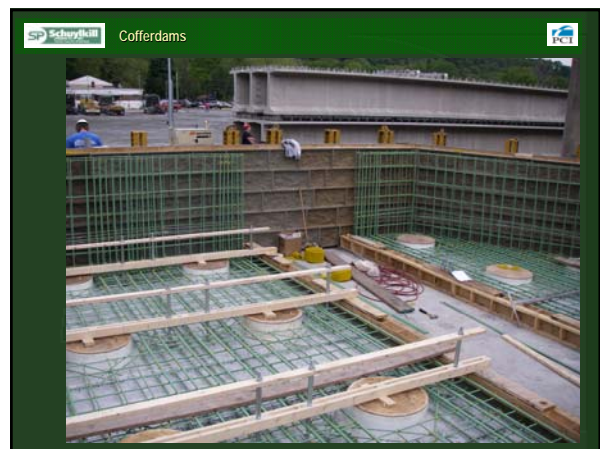
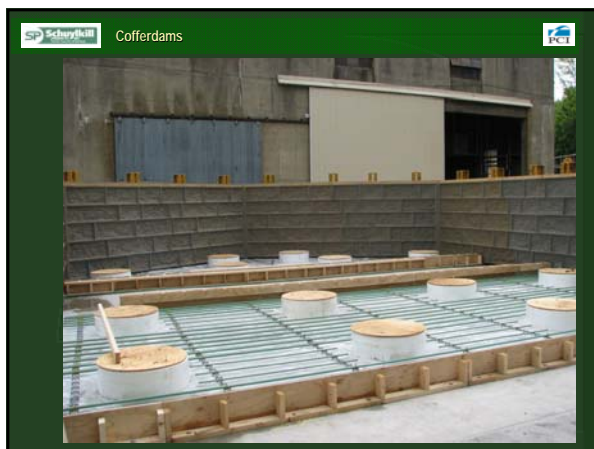
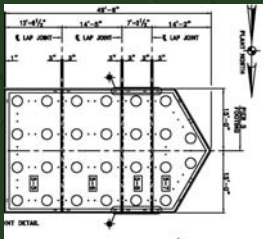
SP Schrybill PCI Cofferdams

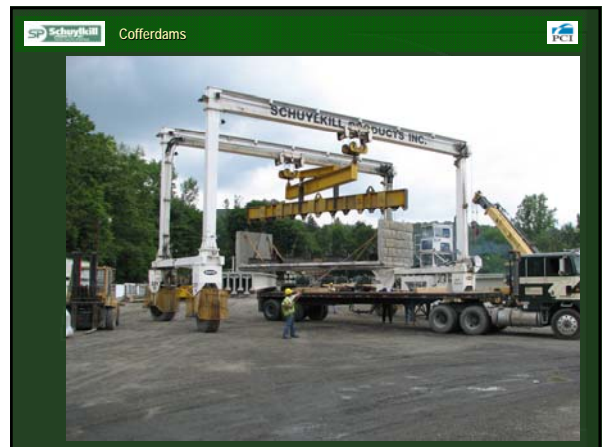
- Precast Cofferdam Shells
 - As-Designed: 49'-8" long, 30' wide, 6'-6" tall shell with 10" thick bottom and 12" thick side walls.
 - 5 Piers with 2 cofferdams per pier.
- Contractor / Fabricator Permitted to add joints

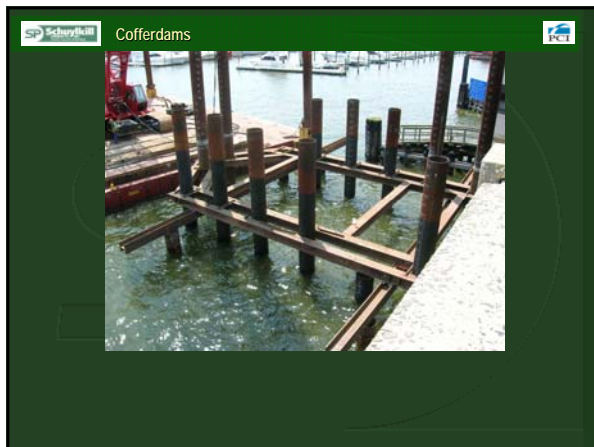
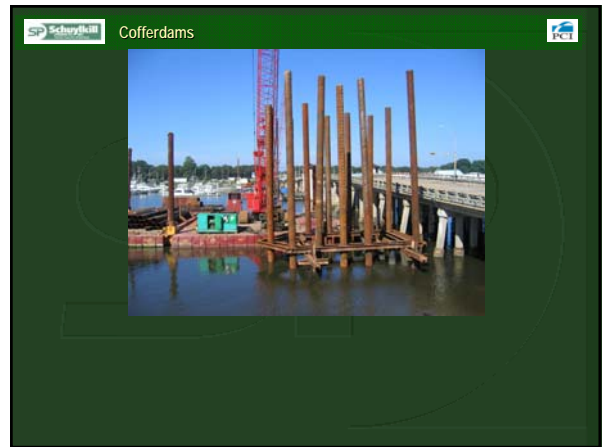
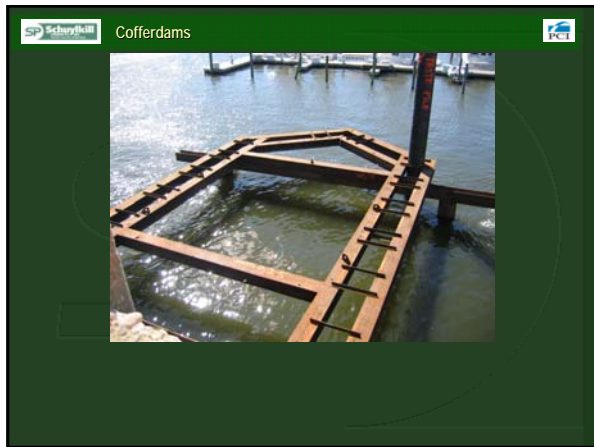
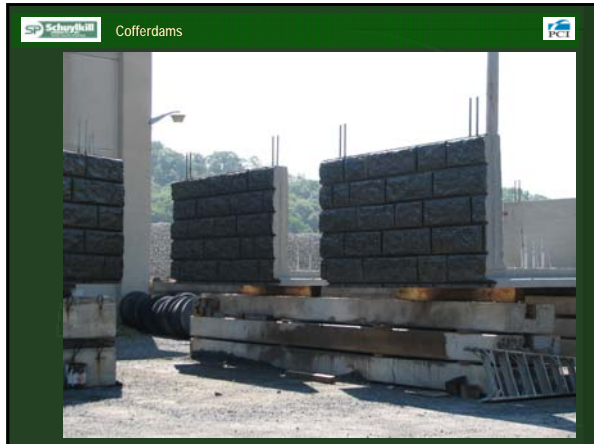


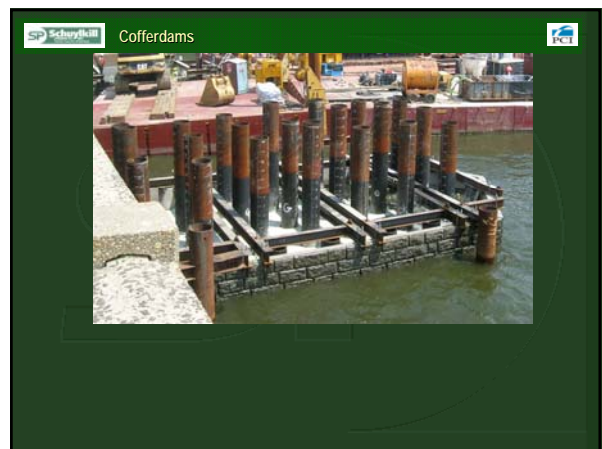
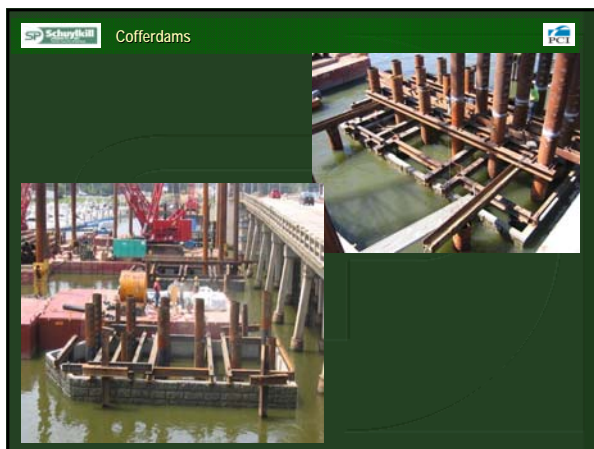
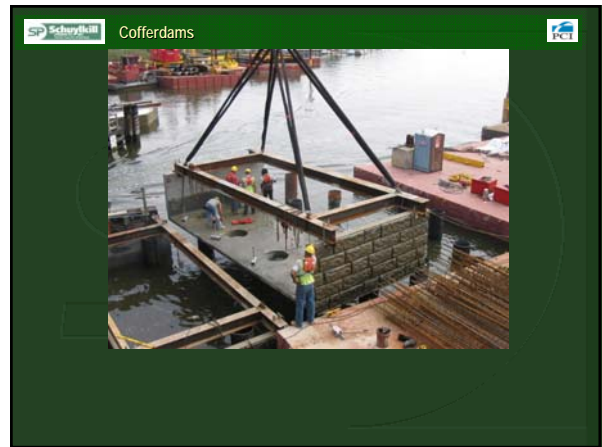
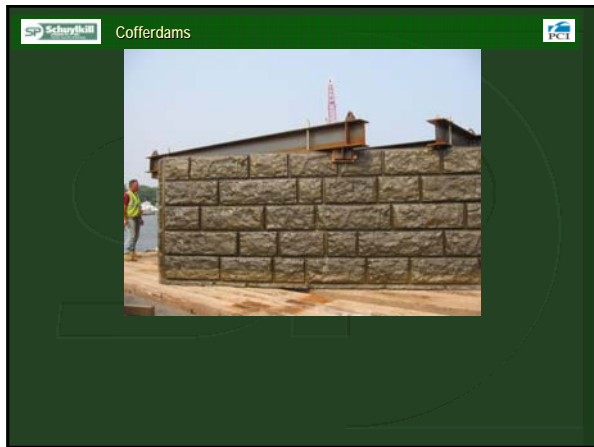
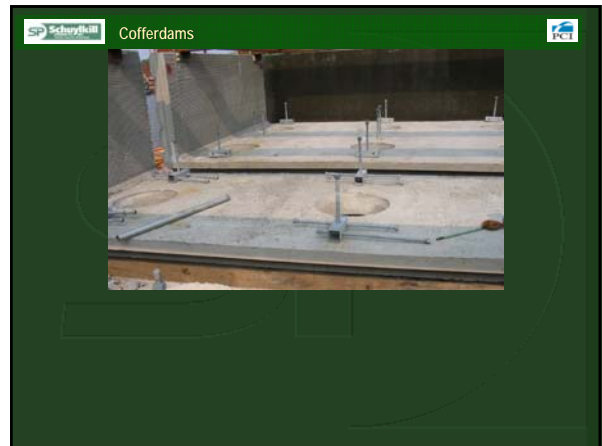
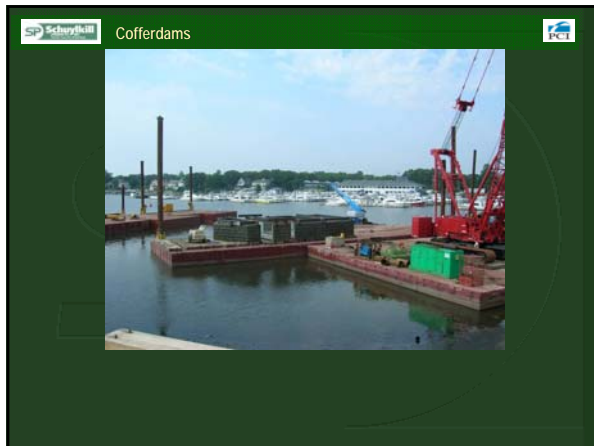
SP Schrybill PCI Cofferdams

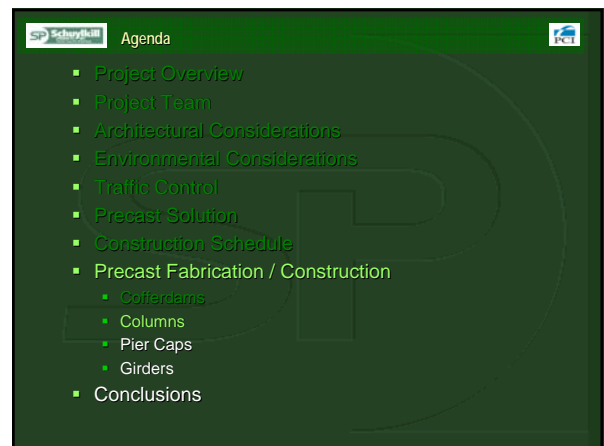
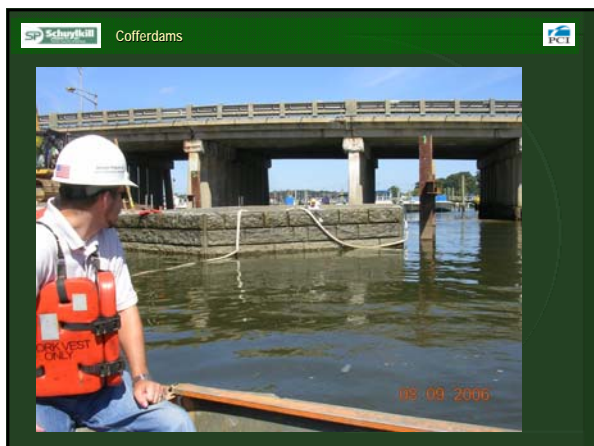
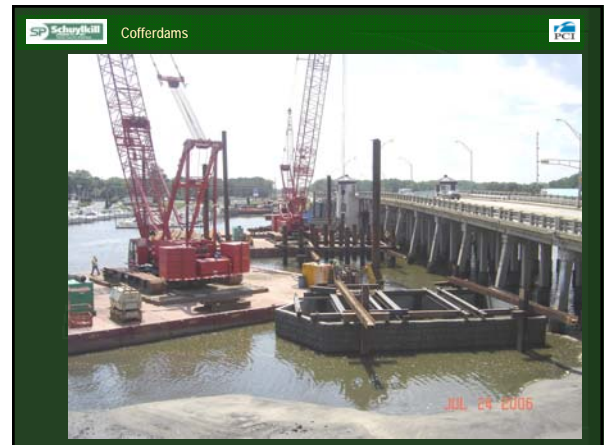
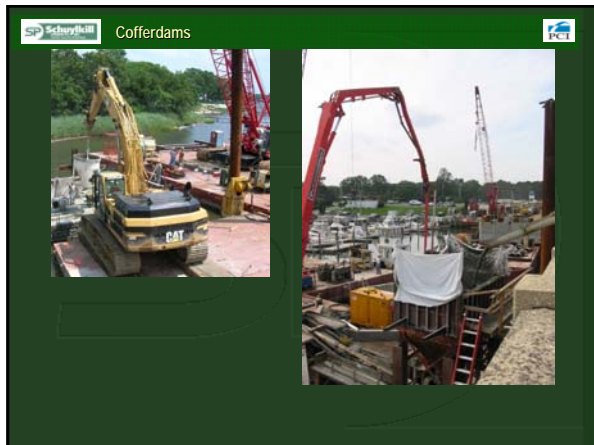
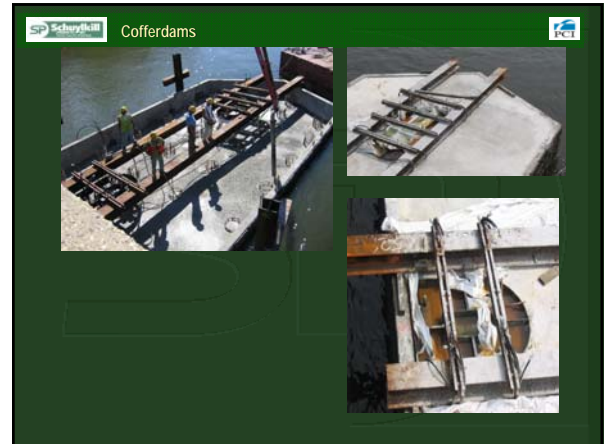
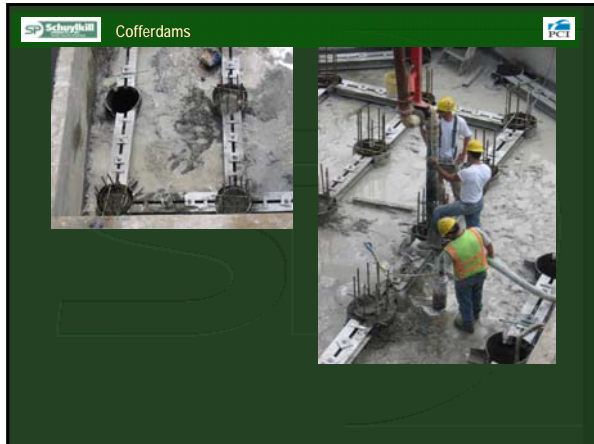
- Shiplap joints added
- Joints spaced to aid shipping and handling





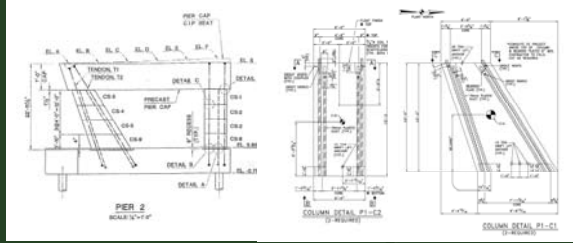




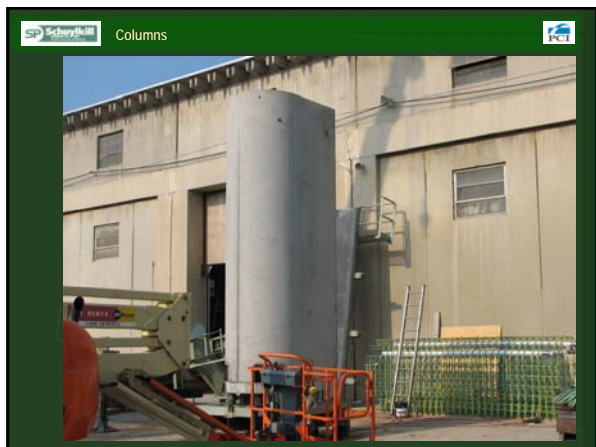
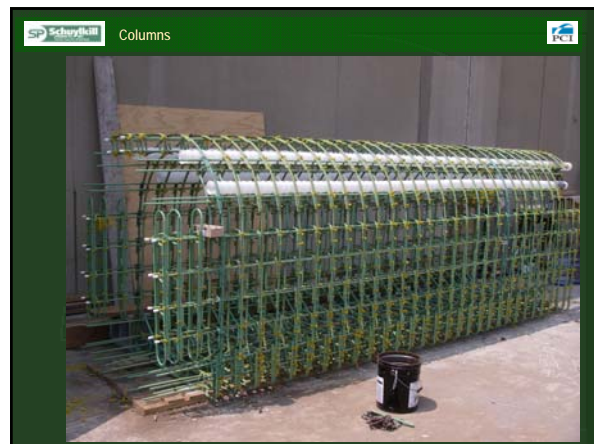


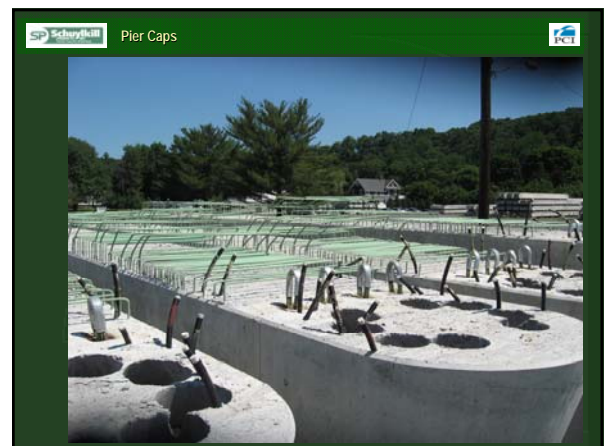
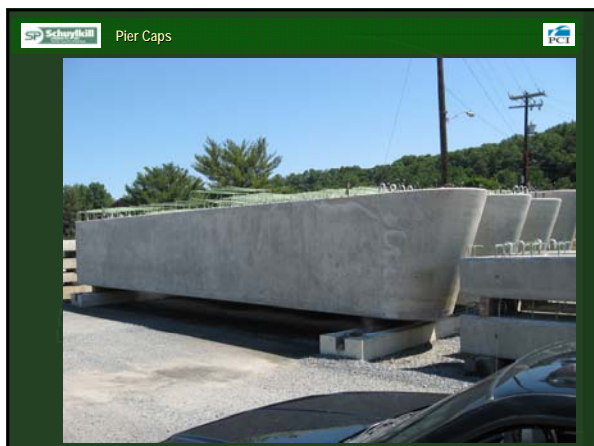
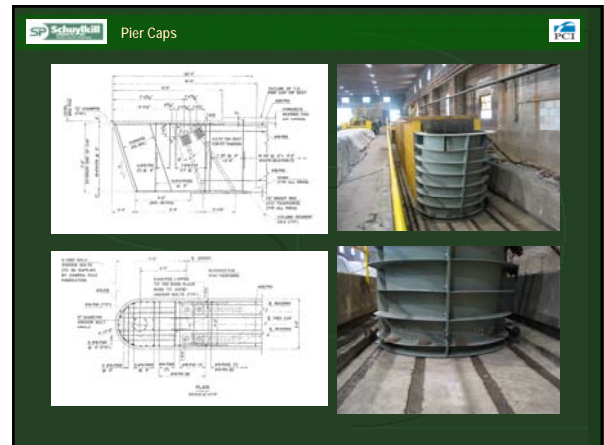
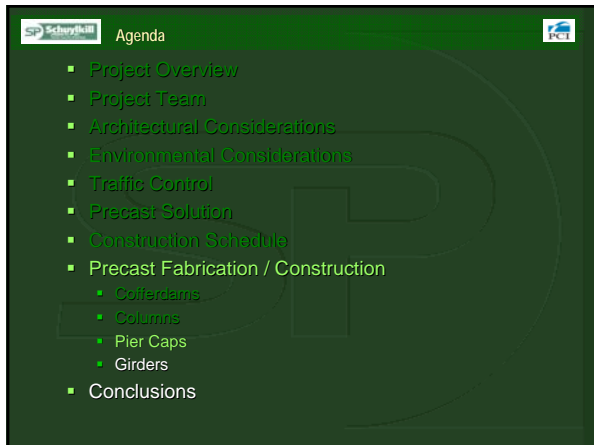
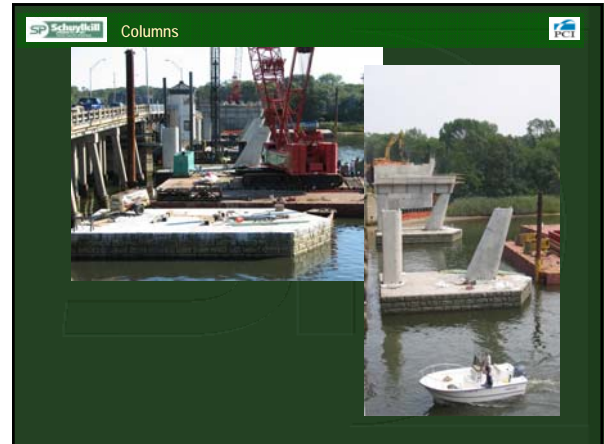
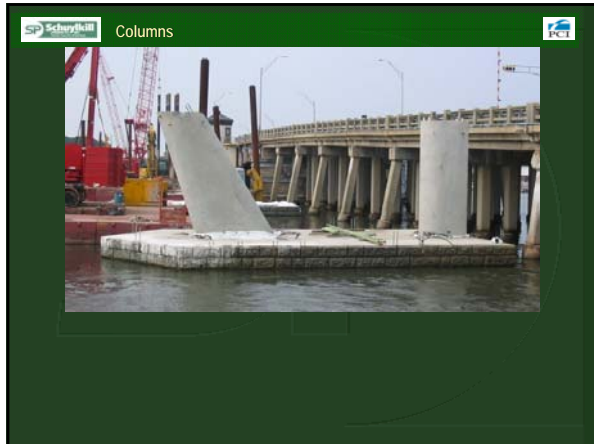
SP Schrybill Columns

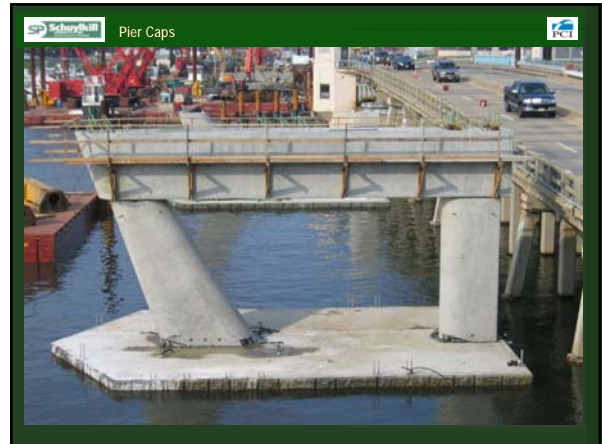
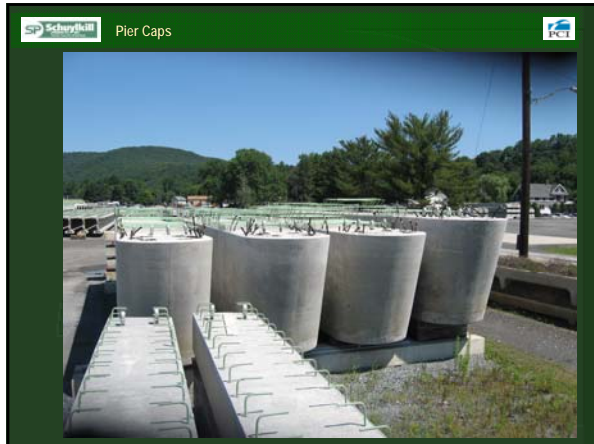
- Precast Columns
 - As-Designed: Segmental Type construction
2 Columns for each cofferdam.
- Contractor Requested single piece columns



The technical drawings include a plan view showing the segmental construction of a column with labels for 'TENSION T1', 'PRECAST PIER CAP', and various reinforcement bars (e.g., #4, #5, #6, #8, #10). It also includes two vertical cross-sections labeled 'COLUMN DETAIL #1-C1' and 'COLUMN DETAIL #1-C2' showing the internal reinforcement layout.







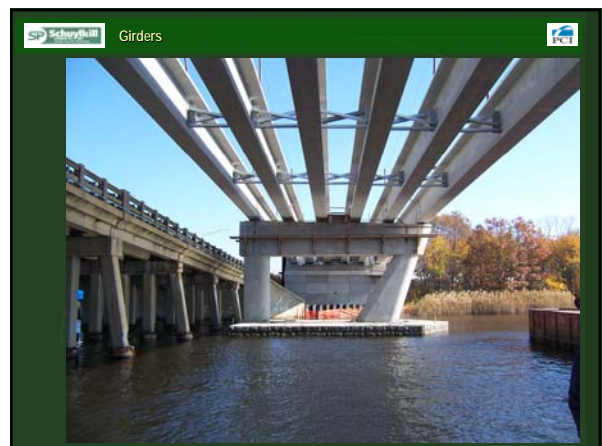
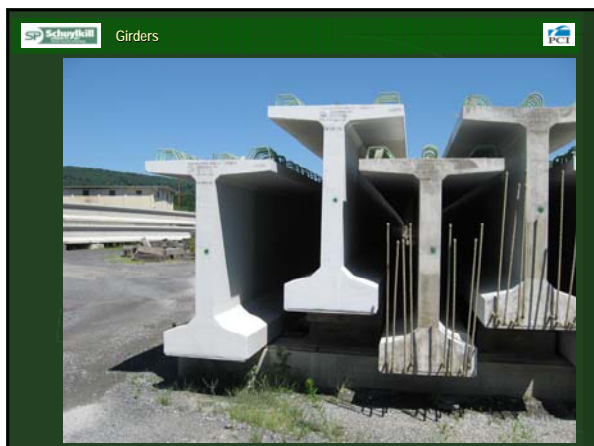
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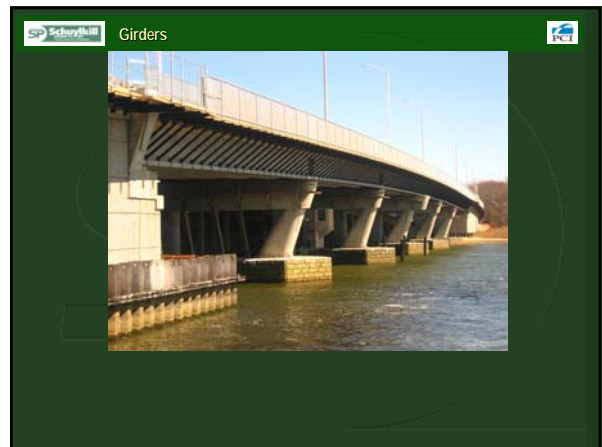
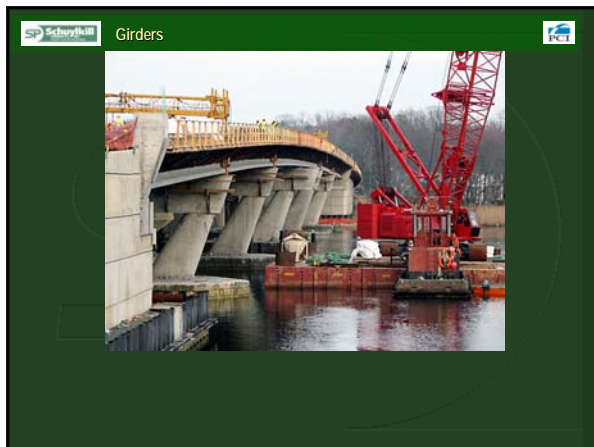
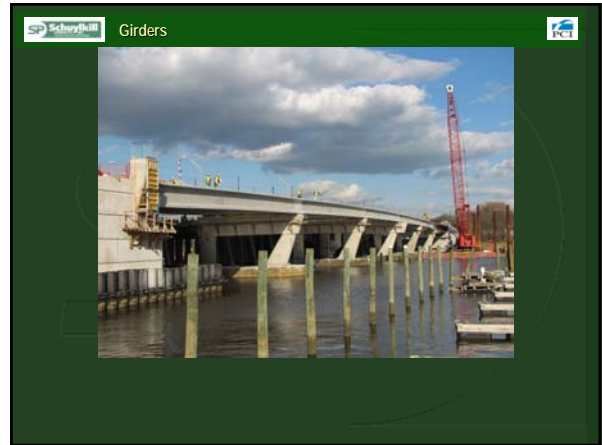
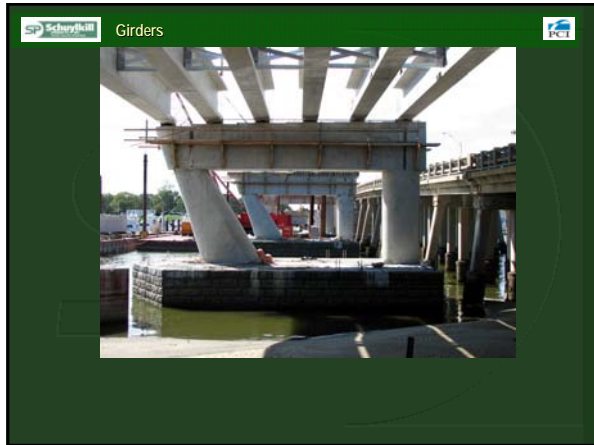
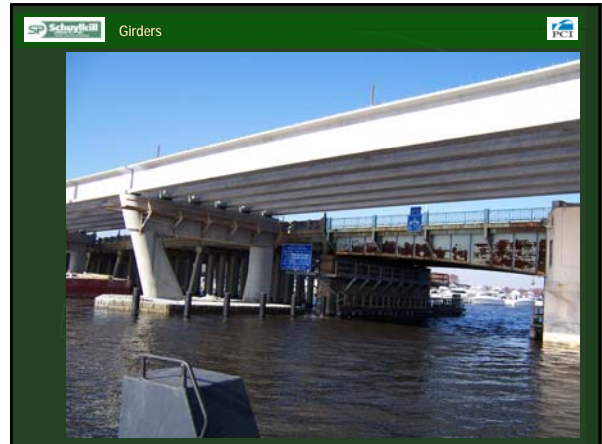
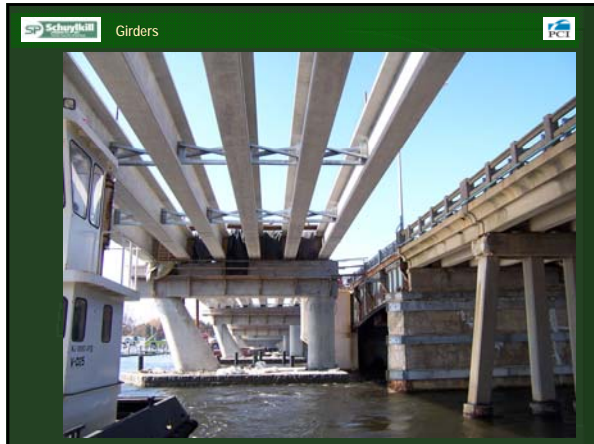
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Girders

- 71" Deep PCEF Bulb Tee Beams
- 119.25' Long / 63.7 tons
- 6 Spans with 12 beams per span

TYPICAL SECTION AND STRAND PATTERN (FASCIA BEAMS)



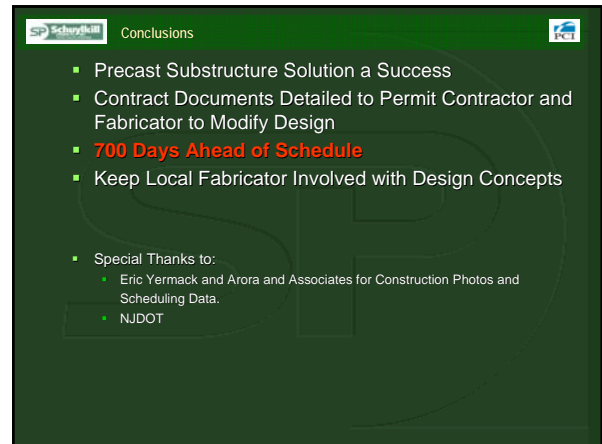




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Conclusions

- Precast Substructure Solution a Success
- Contract Documents Detailed to Permit Contractor and Fabricator to Modify Design
- **700 Days Ahead of Schedule**
- Keep Local Fabricator Involved with Design Concepts
- Special Thanks to:
 - Eric Yermack and Arora and Associates for Construction Photos and Scheduling Data.
 - NJDOT