Precast Infrastructure
Renewal

84th Annual NESMEA Conference
October 7, 2008

Peter J. Smith, P.E.
The Fort Miller Co., Inc.
Infrastructure Renewal

*Implies replacement of structures currently in use*
Major Advantages of Precast Elements

- Elements are fabricated in an ideal environment
  - Better control of curing, re-bar cover, etc.
  - Promotes higher quality
- More efficient inspection
  - Bad or marginal concrete never gets to the job site
- Facilitates faster construction
  - Enables more efficient scheduling
- Permits year-round construction
- Reduces delays associated with job-site curing
Commodity Products

- Manholes
- Septic Tanks
- Curbing
- Wet Wells
- Catch Basins
- Drywells
- Pump Stations
- Custom Castings
Highway (Asymmetrical) Barrier

- Temporary Barrier
- Permanent Barrier
- Asymmetrical Barrier
- Vari-Wall
- Bridge Parapet
Retaining Walls

T-Wall
Piles between T-Wall stems carry vertical loads (above).

Attractive T-Wall units retain soil loads (right).
Bridge Parapet

Brown Exposed Aggregate

Sagamore Resort Hotel Bridge

Albany River Walk
Roadway Parapet

8’ Long Sections

Pick Out the Joint

Route 86, Lake Placid NY
Culvert-Type Structures

- Twin Cell
- Under Traffic
- Colored End Section
- Arched Roof
Hy-Span® Bridge System

Adjacent Cells

Precast Invert

Maintaining Flow During Installation

Elliptical Roof
Re-Lining Existing Arch Culvert

Cast-in-Place Base

Installing Precast Liner

New York State Thruway
(I-90) 45’ Above
Notable Infrastructure
Products & Projects
Inverset Bridges

Precast Precompressed Concrete/Steel Composite Superstructure Units

(718-61)

Horse Shoe Bridge

Rt. 23A, Catskill, NY

1988

First in North East Region 1
Central Artery North Area
CANA
Emergency!
In 37 Days!
Tappan Zee Bridge
I-87 over the Hudson River

Overnight
80 Spans (All Overnight)

Removing old unit (11:00 PM)

Installing new Inverset unit

Next Day at 6:00 AM
(Pushing the Envelope)

LIE over 58th Street
Queens, NY
Two Weekends in November

Pre-Assembly

Demolition

Erection – Sat. Night

Live Traffic on Level 3 and Half of Level 2
Design-Build Project

Belt Parkway Over Ocean Parkway
The Hyperbuild Initiative
NJ DOT

Route 1 Over Olden Avenue

Route 1 Over Mulberry Street
Cross Westchester Expressway (I-287)

Owner:
NYSDOT

Contractor:
Halmar Builders

$8 Million Value Engineering Project

* Changed from Cast-in-Place to:
  - Precast post tensioned segmental piers
  - Precast post-tensioned deck slabs (300,000 SF)
Precast Segmental Pier (left)

Match cast, post tensioned

Erection time - 1 day each

Post Tensioned Deck Panels

Entire deck in compression

High density wearing course
BQE Connector Ramp to Williamsburg Bridge

Owner: NYSDOT
Contractor: Perini Corporation

Precast Segmental Box Girder

* $5 Million in precast units
* First Segmental box girder for NYSDOT
* 278 units installed in 2001
* Vertical and Horizontal curves
* No fit up problems
* Featured in ENR
Top-down Erection

Units are rolled in place after erection (below)

Units are adjusted for final alignment (above)
Spaan-Span Bridge System
Hook Road
Super-Slab™

Precast Pavement Slabs for J RCP

Warped Slabs
(for three-dimensional surfaces)

Bedding Grout Port

Dowel Grout Port
Continuous Replacement

This (3,000 SF Per Eight Hour Shift)
(Within ± 3 mm)

In 2001 and 2002

While Maintaining

This (135,000 Vehicles per Day)
Continuous Replacement

Route 7 - Watt St. Intersection Schenectady, NY

Completed in 18 Nights (2006)

158 Slabs - 28, 500 SF
Intermittent Replacement

Eight to Ten Slabs per Five Hour Work Window!

I-95, New Rochelle, NY

Eight to Ten Slabs per Five Hour Work Window!

(538 Slabs - 55,000 SF - Completed in 2007)
How Precast Concrete Affects Job Site Environment

- Reduces on-site construction activity
  - Eliminates noise, dust, debris associated with forming, pouring, vibrating, curing, stripping activity
  - Improves air quality
- Reduces yard and storage area requirements at job site
- Reduces on-site service and delivery truck activity
  - 150 loads of precast products vs 350 + loads of conventional construction materials

Less noise + fewer loads + less time = less disruption
How Precast Concrete Affects Safety

- Significantly less traffic restriction
  - Reduces risk for workers
  - Reduces risk for users of Belt and Ocean Parkways
- Fewer workers on site = less exposure
- Fewer delivery trucks entering and leaving traffic
- More work done during off peak hours
  - means fewer people around
How Precast Concrete Improves Community Relations

- Precast units go in quickly
- Maintains job site environmental qualities
- The community sees rapid progress

Promotes:
“get in, stay in,
get out, stay out”
“I Wonder”

“If?”
State-of-the-Art Precast Concrete Plants

Manufacturing Facilities for Imagination