Self Consolidating Concrete

The NY Experience

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NYSDOT – Materials Bureau

Earth First.

We'll strip mine the other planets later.

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SCC

- What is SCC:
  - Workable
  - Passable
  - Stable
- Benefits of use:
  - Improved quality
  - Aesthetics
  - Reduced labor
  - Safety

SCC

- Measures of quality / consistency:
  - Spread
  - Visual Stability Index
  - J-ring, L or U-box, V-funnel
  - Column segregation
- NY Goals:
  - Keep it simple!!!

SCC uses in NY

- Materials precast
  - Box culverts, drainage, walls, barriers
- Structural precast
  - 3 sided arches, beams
- Cast-In-Place construction
  - Substructure repairs, re-facing, aesthetics
- Future considerations
  - Drilled shafts, new construction, others???

Materials Precast

- Consideration began w/ Industry request
  - Experience with commercial production
- DOT trials:
  - Spread / VSI
  - F/T
  - Air content

Materials Precast

- Routine uses:

Materials Precast

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Materials Precast

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Materials Precast

- Routine uses:

Materials Precast

- Current usage
  - SCC used for 70% of all the Materials precast produced for NY DOT
  - Totals > 18,000 cubic yards of product
- Performance
  - Air content – plastic vs. hardened < 1.5%
  - F/T – 50 cycles < 0.5% loss

Structural Precast

- More recent consideration of use
- Frequently tied to HPC (10,000+ psi)
  - Quality measures:
    - Spread
    - J-ring
    - Air content
    - Strength gain
    - Shrinkage
    - permeability
- Trials ongoing

Structural Precast

- SCC uses
  - Most notable project: Roslyn Ave Viaduct
    - Segmental construction, HPC, >10,000 psi
    - Substructure and Segmental beams

Structural Precast

- Other notable uses:

Structural Precast

- Other notable uses:

Structural Precast

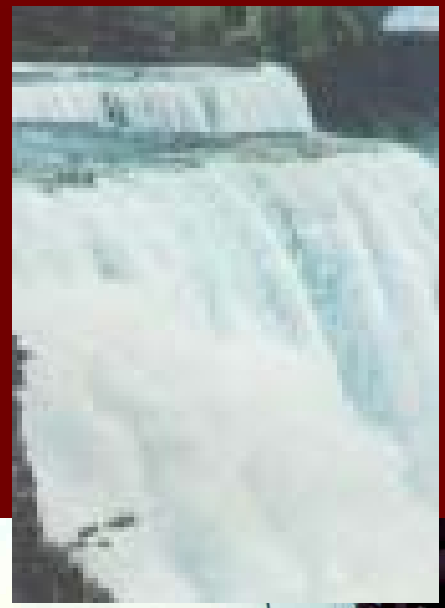
- Other notable uses:

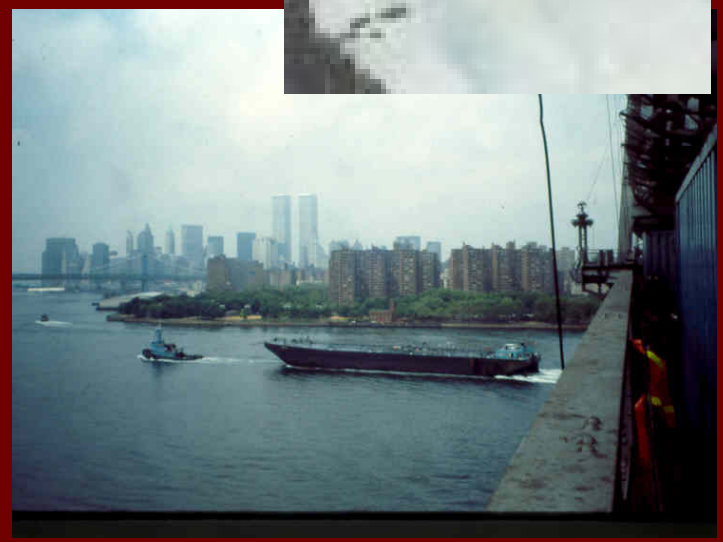
Cast-In-Place Construction

- Trials ongoing in many locations
- Progressing via:
  - Special Note
  - Performance specification
  - Partnering process
- Require pre-placement trials
  - Contractor / Producer to supply:
    - Strength and strength gain rate, spread targets, action points, proposed VSI rating, target air

Cast-In-Place Construction

- Most prominent applications
  - Substructure repairs
- Notable projects:
  - Rte 198, Buffalo
  - FDR Drive, Manhattan





Cast-In-Place Construction

- Considerations for use:
  - Solid / secure forming necessary
  - Shorter loads
  - Water content susceptible – wash out!
  - Continuous flow of material needed
    - Consider pumping
  - Reduced labor / no vibration
  - Aesthetic considerations

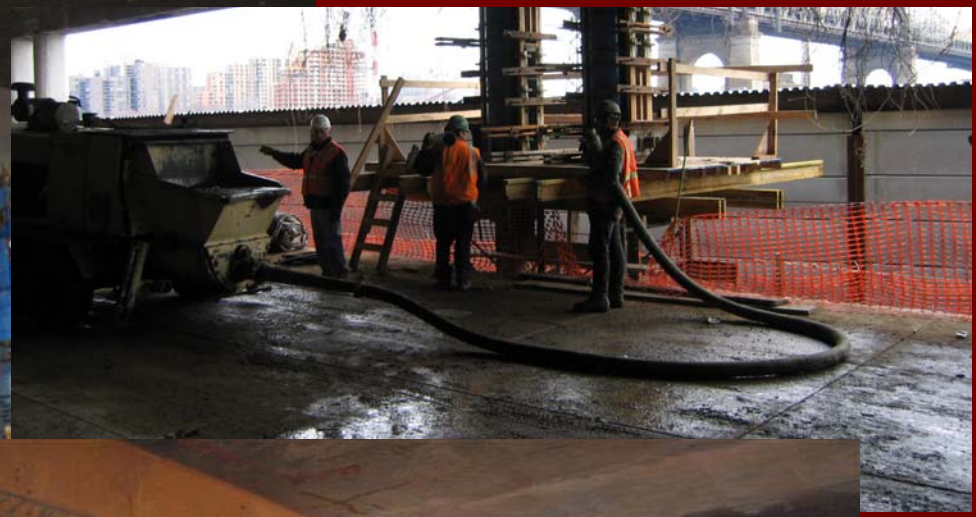
Cast-In-Place Construction

- Mirror-like finish
- Replicates forms

Cast-In-Place Construction

Cast-In-Place Construction

Cast-In-Place Construction



Drilled Shafts

- SCC yet to be used…
- Concerns with:
  - Compatibility w/ bentonite & polymer slurries
  - Tremie / underwater applications
  - Mixture stability for the application
- Proceeding cautiously
  - Following FHWA lead / guidance

SCC

- SCC is good tool
  - Limitations related to raw materials, mixture, and specific application
  - Following others research activities
    - VA trials w/ fibers
    - FHWA drilled shaft study
  - Expect further uses

Thank You!!!