Overview of Illinois Tollway Precast Panel System

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Steve Gillen
Deputy Program Manager of Materials
The Move Illinois Program Initiated in 2011

**TAKE CARE OF EXISTING SYSTEM NEEDS**

- **JANE ADDAMS MEMORIAL TOLLWAY**
  - $2.5 billion
  - Phase one completed in 2014

- **ELGIN O’HARE WESTERN ACCESS**
  - $3.4 billion
  - Phase one completed in 2014

- **I-294/I-57 INTERCHANGE**
  - $719 million
  - Phase one completed in 2014

- **ILLINOIS ROUTE 53/120 PROJECT**

**OTHER EMERGING PROJECTS**

Presented by Steve Gillen on August 30, 2016
More Sustainable Concrete Pavement Rehabilitation is Needed

Get In

Get out

&

Stay out
First Precast Application in 2002 – Uretek Method
Fort Miller System Introduced in 2007
Fort Miller System is Proprietary
Competition Needed in More Ways than One

More than 1 precast concrete pavement system was proven to be needed in 2008

To some extent, precast concrete has to compete with high performance cast-in-place concrete
Tollway’s Generic System
Developed in 2009

Refer to:
Originally Designed With Sunny Side Up
Dowel Bar Connections
Standard Dowel Bar Retrofit Option

DETAIL C. Dowel Bar Placement Detail for all Custom Made Precast Panels and Optional for Standard Slabs

NOTES:
1. Place foam core boards to the top of patch
2. Upon completion, the finished surface of the concrete backfill material shall not be below existing concrete surface.
Pre-drill / Narrow Mouth Dowel Connections Now Apply

Top view  Cross Section
Benefits of Pre Drill / Narrow Mouth Option
First Step is Survey & Design
Mark Locations for Saw Cuts
Tollway System Allows for Longitudinal Joint Offsets with Isolated Patching

- Off interior longitudinal joints (3” max.)
- Any distance into asphalt shoulders
Saw Cut Precisely and Remove Slurry
Remove Pavement
Prepare and Compact Base
Options For Leveling – Customized Flat Slabs

- Flowable fill (≤ 1.5% cross slope) over restored subbase (no undergrout)
- Fine leveling sand over restored subbase (undergrout after retrofitting)
- Suspend slab over restored subbase in proper position (undergrout before retrofitting)
- High density poly urethane foam over restored subbase (no undergrout)
- Use leveling bolts followed by undergrout
Only Option for Leveling – Customized Slabs Placed at Non-Planar Locations

- Cast the slabs flat with additional thickness
- Set slabs with at least one corner flush with adjacent surface and other corners above adjacent pavement
- Use previously listed options for leveling
- Profile diamond grind over thickened slabs to obtain desired elevations
Pre-mark Dowel Bar Drill Locations
Pre-drill Dowel Holes with Tollway System (Gang Drills Preferred)
Set Slabs
Caulk the Joints with Tollway System
Epoxy the Predrilled Holes With Narrow Slots Either 1\textsuperscript{st} or 2\textsuperscript{nd} Night
Insert Dowel Bars
Grout the Dowel Bar Slots with the Tollway System
Undergrout the Slabs Through Port Holes
Grind or Overlay the Finished Surface
Video of Tollway System Panel Placement for Isolated Joint/Slab Repairs of JPCP
Rules for Local Agency Applications

- All slabs likely to be customized
- Forms are the responsibility of the fabricator
- Casting non-planar slabs can be a problem
- Any proposed system must be agency approved
- Upon completion of Contractor’s survey, design, & shop drawing approval - fabrication and construction can start
Applications

Isolated Joint / Slab Repairs
Applications

Large Area Repairs / Consecutive Slab Replacements
Applications

New Construction
Applications

Ramp Reconstruction / Large Area Replacements
Full Area Ramp Replacement Application

Laser controlled grading

≈ 100 slabs set over 4 weekends
Applications

Intersection Reconstruction Overnight
Also, Precast Approach Slabs for:

- Rehabilitating existing settled approach slabs, under traffic
- New construction of long span integral abutment bridges will require precast approaches
  - Stress cracking develops quickly as a result of bridge movement when cast-in-place concrete is green
- Accelerated Bridge Construction (ABC) with modular designs that will require precast approaches
Complete Generic Tollway System for Approach Slab Rehabilitation or New Construction

PRECAST APPROACH SLAB PLAN

APPROX. 100'-0" APPROACH SLAB

APPROX. 10'-0" TRANSITION APPROACH SLABS

APPROX. 10'-0" TRANSITION APPROACH SLABS

EXISTING CEMENT STABILIZED SUBBASE TO REMAIN

EXISTING AGGREGATE SUBGRADE TO REMAIN

EXISTING SLEEPER SLAB TO REMAIN

Cement Stabilized Subbase to remain.
Approach Slab Rehab Construction Sequence - - Permanent Slab Placement

Full removal

Set approach slab (30 ft. long)
Approach Slab Rehab Construction Sequence - - Level / Undergrout Slabs

Adjust height w/ leveling bolts

Undergrout slabs
THANK YOU