Overview of Illinois Tollway Precast Panel System

August 11, 2016

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The *Move Illinois* Program Initiated in 2011

TAKE CARE OF
EXISTING SYSTEM
NEEDS

JANE ADDAMS
MEMORIAL TOLLWAY
\$2.5 billion

ELGIN O'HARE
WESTERN ACCESS
\$3.4 billion

I-294/I-57
INTERCHANGE
\$719 million

ILLINOIS ROUTE
53/120 PROJECT

OTHER EMERGING
PROJECTS

PHASE ONE
COMPLETED
in 2014

PHASE ONE
COMPLETED
in 2014

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:

http://www.illinoistollway.com/documents/10157/378808/PDF_ISTHA_GBV_SectionA_02072012.pdf

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.

SHEET 11 OF 16

CHAIR DETAIL

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 ($\leq 1.5\%$ 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 1st or 2nd 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

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

Right click on photo,
“Change Picture” as
needed

THANK YOU