Precast Concrete Pavements

~ California Style ~

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California Summary

- **Precast Panel Concrete Pavement (PPCP) is:**
  - An excellent emerging technology
  - To repair and reconstruct existing PCCP
  - To widen, and construct new pavements

- **Constructed on:**
  - I-10 in El Monte
  - I-210, Fontana

- **Awarded or Planned on:**
  - NB I-5/14 IC, Sylmar (awarded 2008)
  - NB I-15, Ontario (awarded 2009)
  - I-680, San Ramon, Danville, Alamo
California’s On-going Efforts

**Develop:**
- Standard Plans
- Construction Details
- Special Provisions

**Identify and Build Projects:**
- Slab & Lane Replacements
- Reconstruction & Rehabilitation
- Emergency Maintenance Repairs
- New long lasting pavements

**Apply Lessons Learned**
- Overcome resistance to new strategies
- Reduce perceived risk and cost concerns
<table>
<thead>
<tr>
<th>Where</th>
<th>What</th>
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</thead>
<tbody>
<tr>
<td>Mainline</td>
<td>Individual single slabs*</td>
</tr>
<tr>
<td>Ramps</td>
<td>Multiple slabs, same lane *</td>
</tr>
<tr>
<td>Intersections</td>
<td>Multiple slabs, adjacent lanes * *</td>
</tr>
<tr>
<td>Approach slabs</td>
<td>Custom shapes, cross-slopes * *</td>
</tr>
<tr>
<td>Deck repairs</td>
<td></td>
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</tbody>
</table>

Built in 2004, Pending 2009 & 2010
Types Used and Proposed

Pre-stressed, Post Tensioned “PPCP”

“Fort Miller” Super-Slab™
With Detailed Assistance by...

- **Fort Miller Co., Inc.**
  P.O. Box 98, Schuylerville, NY 12871
  Tel. (518) 695-5000, Fax. (518) 695-4970
  www.fortmiller.com

- **The Transtec Group, Inc.**
  6111 Balcones Dr., Austin, TX 78731
  Tel. (512) 451-6233, Fax. (512) 451-6234
  www.thetranstecgroup.com
Where in CA are they?

**Constructed**
- EB I-10, El Monte
- EB I-210, Fontana

**Awarded**
- NB I-5/14 IC, Sylmar
- NB I-15, Ontario

**Planned**
- I-680, San Ramon, Danville & Alamo
More in CA?

More Planned?
- I-5 Burbank
- I-210 Pasadena /Montrose
- I-710 Los Angeles
Why use Precast Panels?

- Need for **RAPID** return to service
- Traffic-ready upon installation
- Curing & strength gain occurs at the casting yard under controlled conditions
- Precast panels are extremely durable
  - No panel failure after HVS testing of >150,000,000 ESALS
- Conventional materials = less $$$
  - Comparable to costs of specialty cements & admixtures
Why use Precast Panels?

Courtesy of Vince Perez, CTS Cement
El Monte, CA  2003-2004

- **Contractor:** Skanska USA
- **Location:** EB I-10 Widen Two lanes and shoulder, near Peck Rd.
- **Nightly Closures:** 11 PM to 5 AM
- **Panels per Night:** 29 panels @ 8′x37′
  - 15 in 3 hrs
- **Precast Co.:** Pomeroy, Perris, CA
- **Cost per CY:** $700 approx.
- **Panel Thickness:** 10” & varies, 13” at “crown”
- **Base Type:** Lean Concrete Base (LCB)
El Monte, CA 2003-2004

Opened to traffic in October 2004.
El Monte, CA Project Layout

Planned variable cross-slope
Sylmar, CA 2008-2009

- Contractor: MCM Construction
- Location: NB I-5 Interchange Connector to NB I-14
- Nightly Closures: 11 PM to 5 AM
- Panels per Night: 36 @ 8’x18’ & 6 @ 8’x29’ panels - Rate TBD
- Precast Co.: Pomeroy, Perris, CA
- Cost per M³: $2900 approx.
- Panel Thickness: 8”
- Base Type: Existing CTB & AB, replaced with LCB (Rapid Setting)
Sylmar, CA 2008-2009

Cast in January 2009
Base Preparation

Lean Concrete Base
Approx. 4-sack rapid-setting mix
San Ramon*, CA  2009-2010

*including Danville & Alamo, CA

- SB I-680 Replace Lane & Auxiliary Lane (2, 3, & 4)
- 12’x15’ panels – 2225 est.
- Nightly closures 9 PM to 5 AM, 9 PM to TBD at Contract Award
- $TBD – Contractors Bid
- Existing PCCP thickness = 8” & 9”
- Existing CTB, replaced with LCBRS
Fabrication Bed

Perris, CA
Joint Panel Fabrication
Central Stressing Panel
Casting Base Panel
Lifting New PPCP Panel
Demonstration Installation
Nightly Installation
PPCP Panel Assembly

- Existing base or pavement
- AC or Grout Leveling Course
- Joint Panel
- Base Panel (Multiple)
- C.S. Panel
- Base Panel (Multiple)
- Joint Panel

Duct Access Pockets
Duct Holes

Traffic Flow
Fontana*, CA  2005-2006

*Bordering Rancho Cucamonga, CA

Caltrans Heavy Vehicle Simulator “SUZY”

> 150,000,000 ESALS, no failed slabs
Fontana*, CA  2005-2006

*Bordering Rancho Cucamonga, CA

- **Contractor:** Riverside Construction
- **Location:** EB I-210 Gore Area near Cherry Ave. Off-ramp
- **Daytime:** Daytime, no traffic
- **Panels per day:** 10 @ 12’x15’ panels (incl. base prep.)
- **Precast Co.:** Jensen Precast, Fontana, CA
- **Cost per CY:** $ Lump sum with HVS testing
- **Panel Thickness:** 8”
- **Base Type:** 4” CTB, 1½” stone dust leveling course
Ontario, CA  2009-2010

- **Contractor:** Security Paving Co. Inc.
- **Location:** I-15 Lane Replacement (Lanes 2, 3, & 4)
- **Nightly Closures:** Number TBD
- **Panels per night:** ~720 @ 12’ & 13\(\frac{1}{2}\)’x alt. joint spacing (12’ 15’ 13’, 14’) - rate TBD, Est. @ 20 per night
- **Precast Co:** TBD
- **Cost per CY:** $285 per sq. meter, plus removal, transportation, installation, + + +
- **Panel Thickness:** 8”
- **Base Type:** Existing CTB, with rock dust leveling course
Proprietary Features

Bedding Grout Port

Dowel Grout Port

Inverted Dovetail Detail
Base Preparation

Laser Plane Leveler
Super-Slab™
Acknowledgements

http://tig.transportation.org/?siteid=57&pageid=1826
Acknowledgements

...and Members of Caltrans/Industry Committee