



Precast Concrete

Pavements

~ California Style ~

Kirsten R. Stahl, P.E.
California Department of Transportation
District Materials Engineer
District 7 - Los Angeles

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

Current and Planned Use

Where

- # Mainline* *
- # Ramps
- # Intersections
- # Approach slabs
- # Deck repairs

What

- # Individual single slabs*
- # Multiple slabs, same lane *
- # Multiple slabs, adjacent lanes* *
- # Custom shapes, cross-slopes* *

Built in 2004, Pending 2009 & 2010

Types Used and Proposed



**“Fort Miller”
Super-Slab™**

Pre-stressed, Post
Tensioned “PPCP”



With Detailed Assistance by...

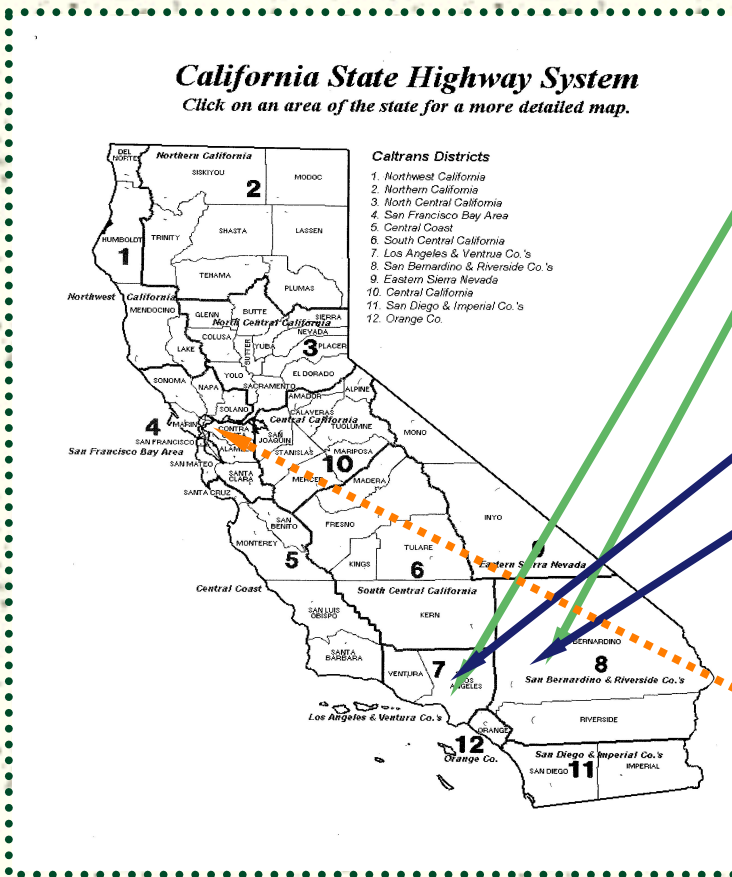
- # Fort Miller Co., Inc.
P.O. Box 98, Schuylerville, NY 12871
- # Tel. (518) 695-5000, Fax. (518) 695-4970
www.fortmiller.com

- # 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?

California State Highway System

Click on an area of the state for a more detailed map.



Constructed

EB I-10, El Monte

EB I-210, Fontana

Awarded

NB I-5/14 IC, Sylmar

NB I-15, Ontario

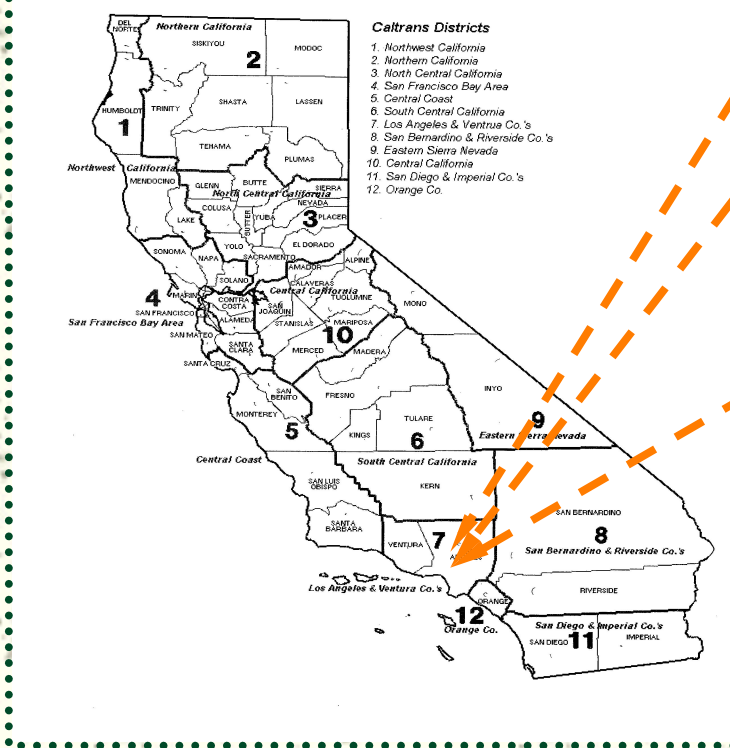
Planned

I-680, San Ramon,
Danville & Alamo

More in CA?

California State Highway System

Click on an area of the state for a more detailed map.



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

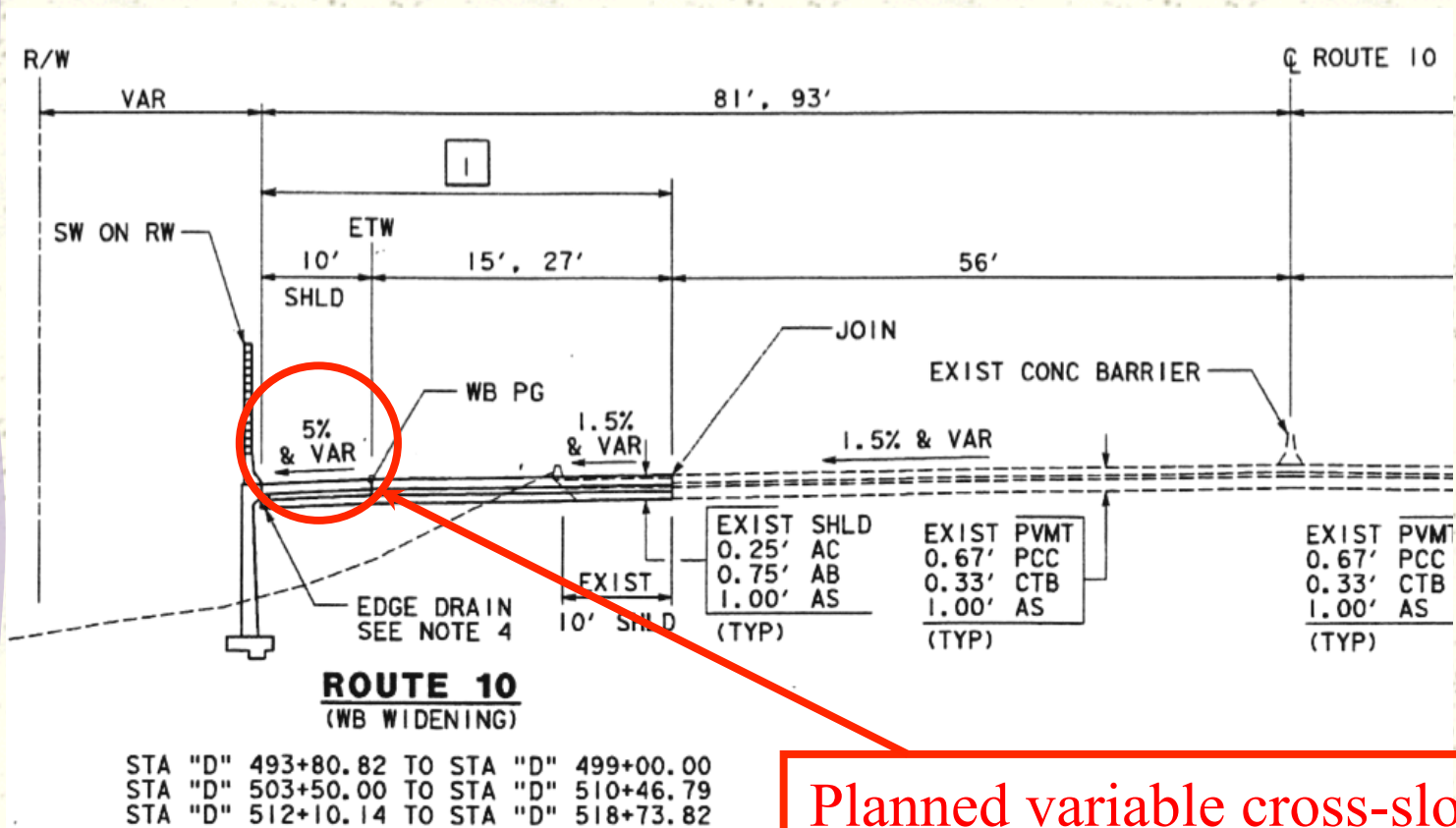
- # Contractor: # Skanska USA
- # Location: # EB I-10 Widen Two lanes and shoulder, near Peck Rd.
- # Nightly Closures: # 11 PM to 5 AM
- # Panels per Night: # 29 panels @ 8'x37'
- 15 in 3 hrs
- # Precast Co.: # Pomeroy, Perris, CA
- # Cost per CY: # \$700 approx.
- # Panel Thickness: # 10" & varies,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

El Monte, CA

2003-2004



El Monte, CA Project Layout



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



Base Preparation



Lean Concrete Base
Approx. 4-sack rapid-setting mix

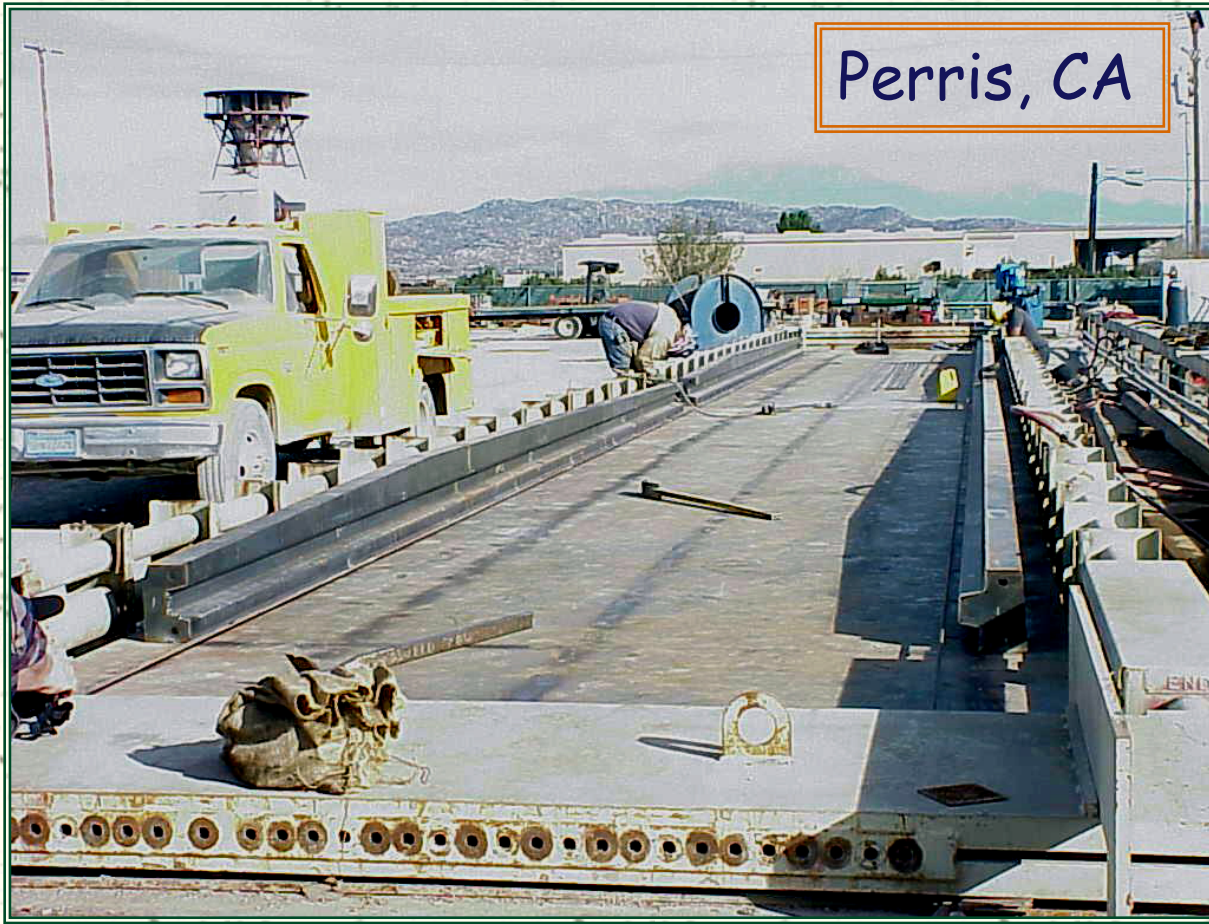
San Ramon*, CA 2009-2010

*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



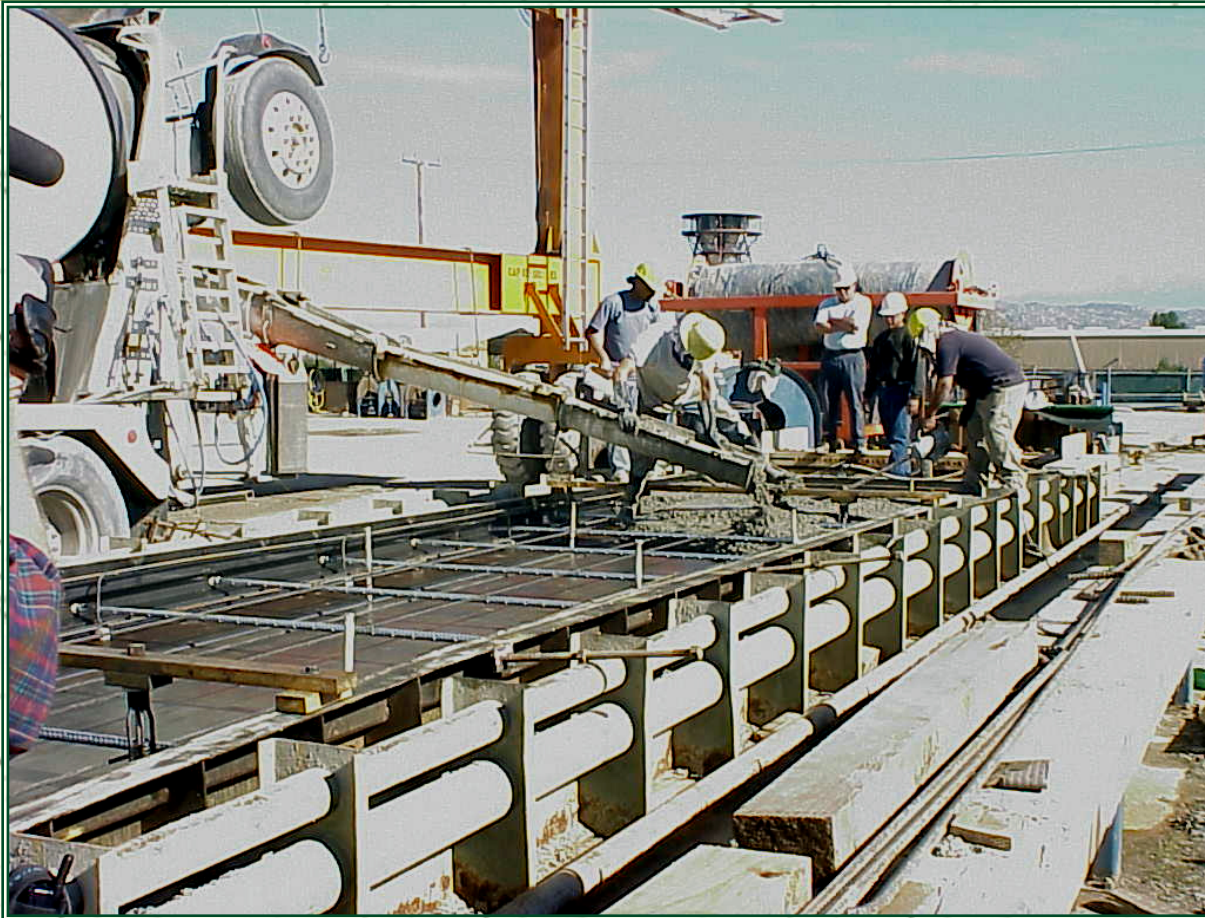
Joint Panel Fabrication



Central Stressing Panel



Casting Base Panel



Lifting New PPCP Panel



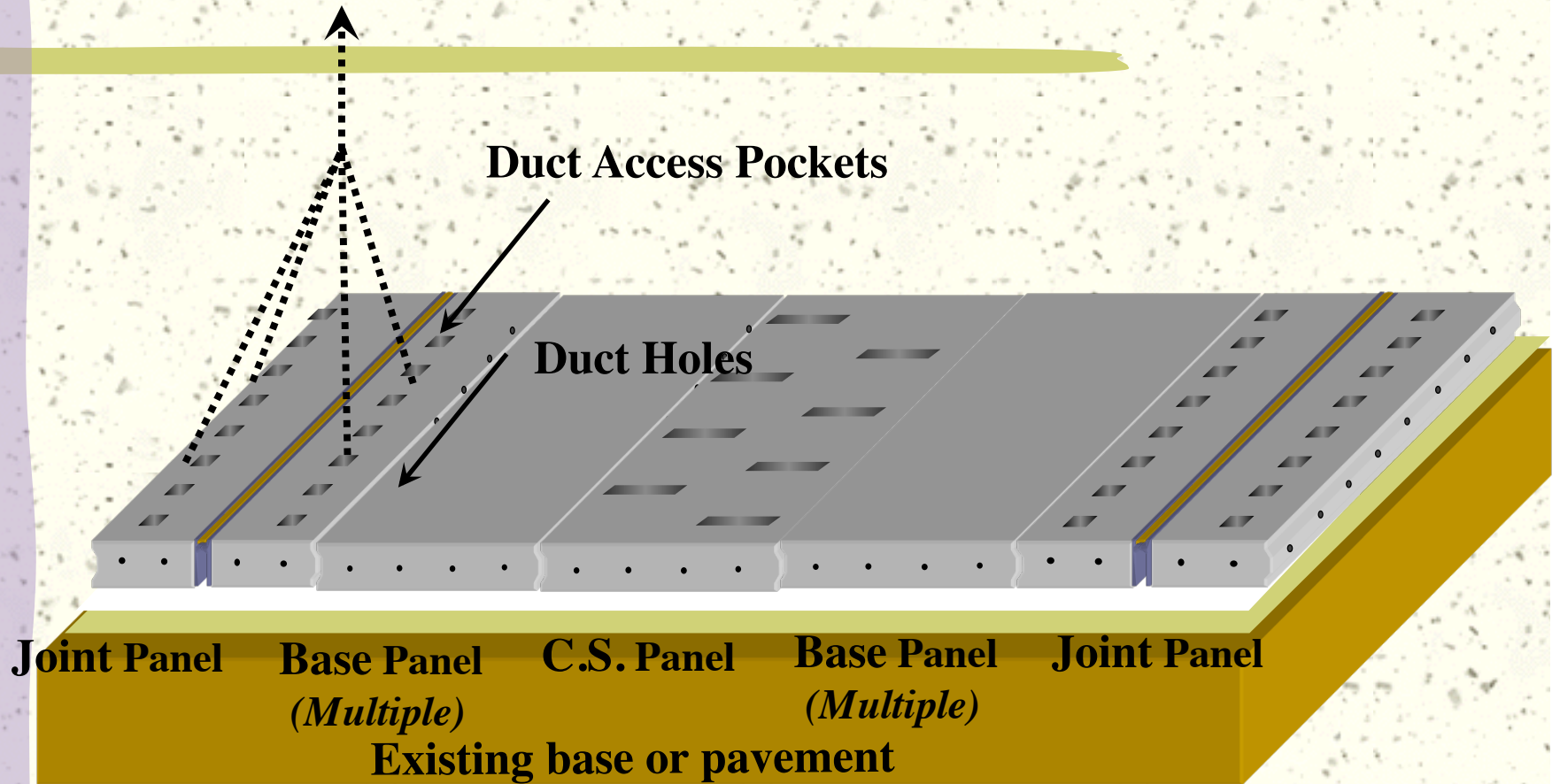
Demonstration Installation



Nightly Installation



PPCP Panel Assembly



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

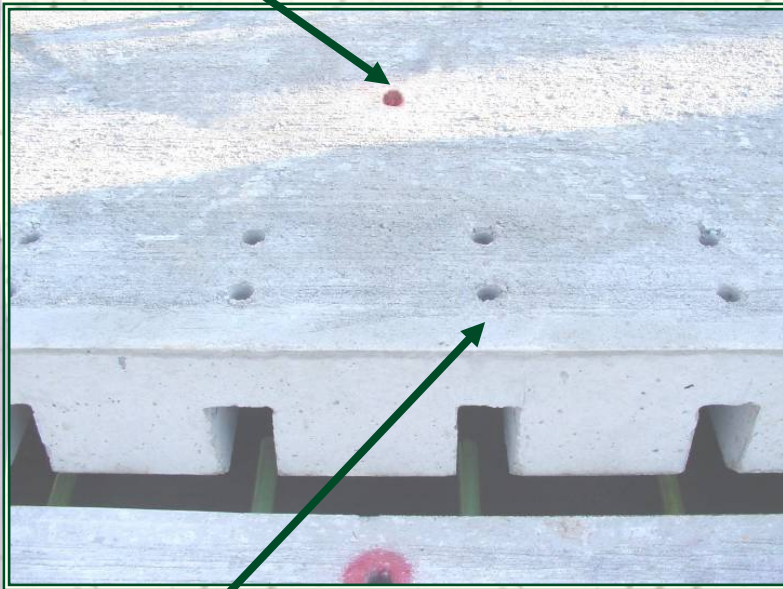
Ontario, CA

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' & 13½' 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
Super-Slab™



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**

