

2010 DelDOT Winter Workshop



RTE 896 NB @ RTE 40 – Project Overview

Precast Prestressed Concrete Pavement (PPCP) System

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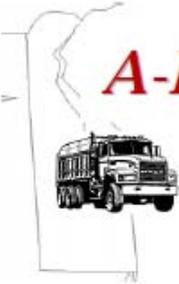
Bill Stewart – North District Pave & Rehab

Jim Pappas – Materials & Research

Project Overview

1. Project Team
2. Project Location
3. Project Development
4. Advertise, Bid & Award Process
5. Construction
6. Lessons Learned

1. Project Team

- Sponsor: 
- Owner: 
- Design Support:  THE TRANSTEC GROUP
- Construction Inspection: | 
- Prime Contractor:  *A-Del Construction Co., Inc.*

2. Project Location

- **Project justification**

- Location already a candidate for rehabilitation
- Poor pavement condition - ASR
- High AADT – High truck percentage
- Large quantity for PPCP replacement

2. Project Location

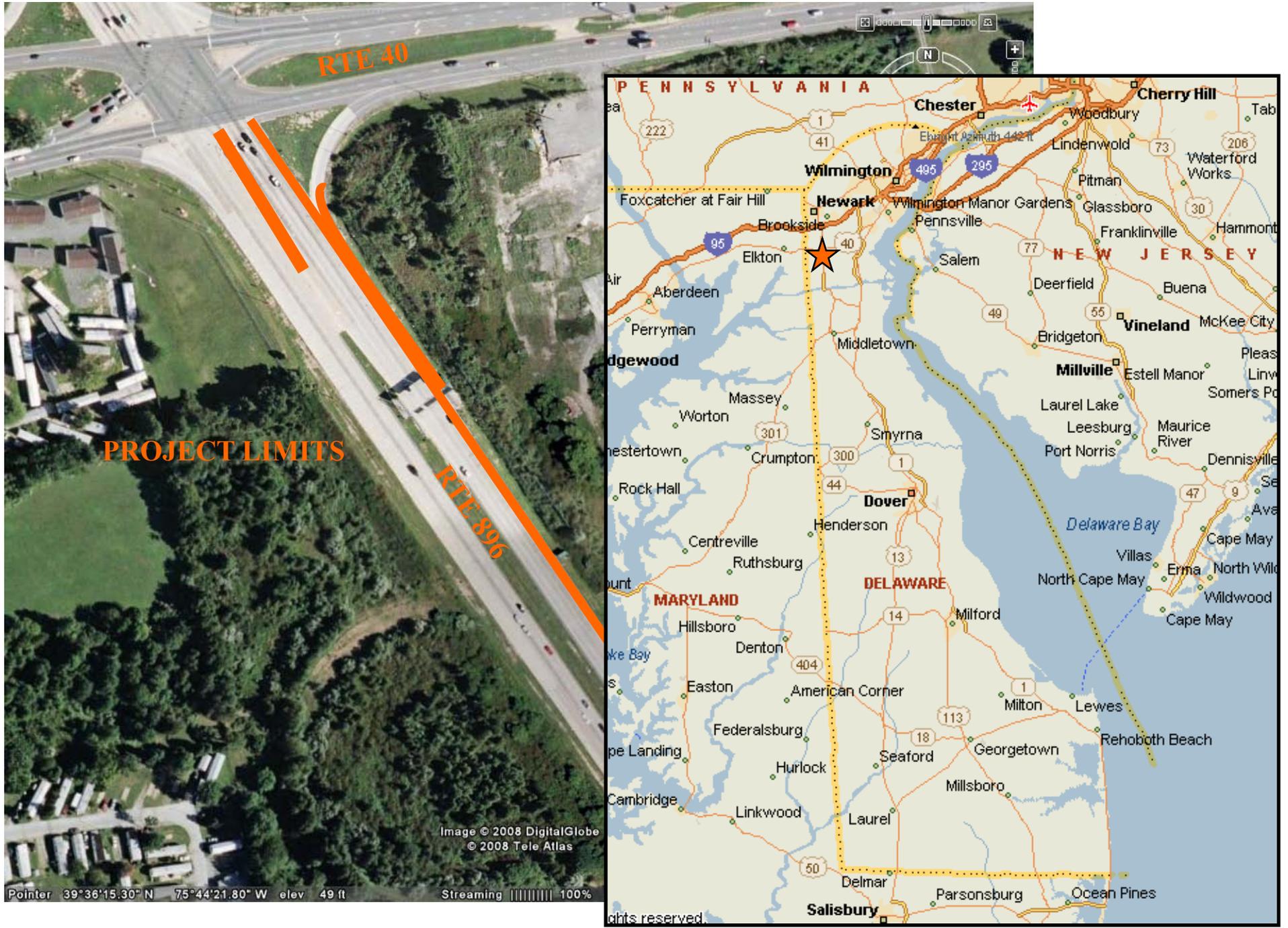
- **Reasons for using PPCP technology**
 - Technology is non-proprietary
 - Technology qualified for Federal Aid
 - Design support provided by FHWA (thru Transtec)
 - Progressive Department open to new technology
 - Innovative Project Team

2. Project Location

- **Selection criteria**

- Minimal cross-slope changes
- Minimal profile changes
- No underground utilities (MHs) within PPCP limits
- Construction access – on-site staging area

2. Project Location – RTE 896 NB @ RTE 40



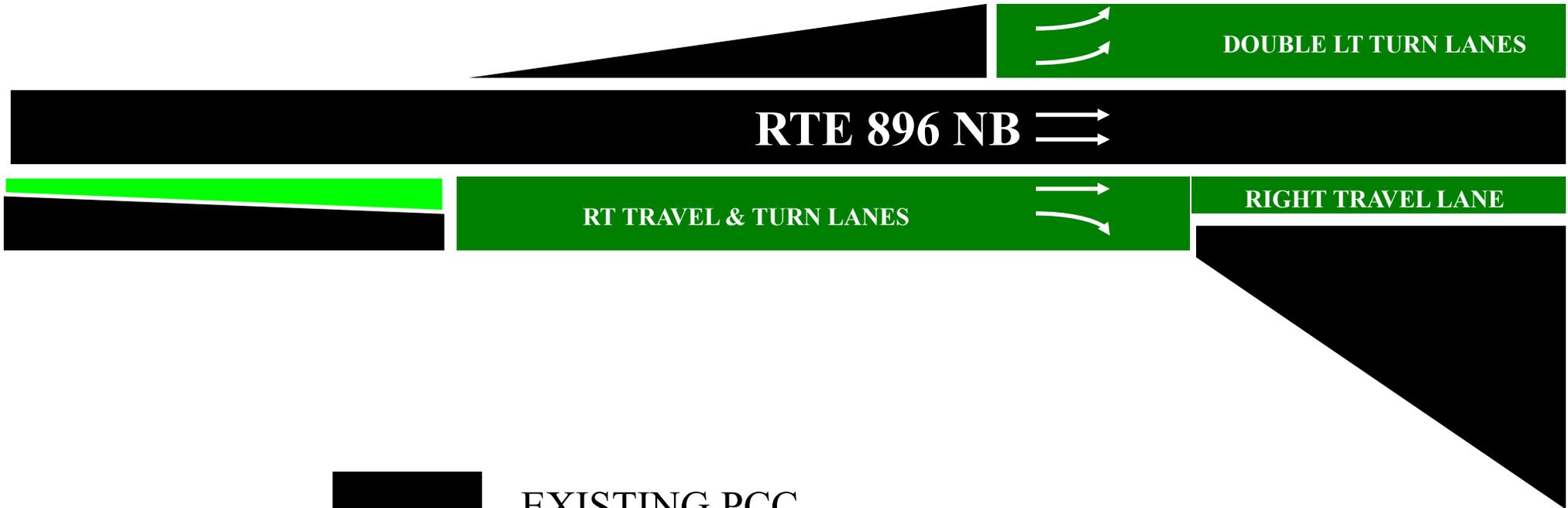
2. Project Location – RTE 896 NB @ RTE 40



Fact Sheet:

- Scope of work: Replace jointed plain concrete pavement within the RT & LT turn lanes with PPCP
- Functional Class – Principal Arterial
- AADT – 37,679
- % Trucks – 9%
- Pavement Section – 12” PCC over soil cement (assumed)
- Proposed Replacement Area – 3,115 SY

2. Project Location – RTE 896 NB @ RTE 40



EXISTING PCC



CAST-IN-PLACE



PPCP REPLACEMENT AREA

3. Project Development

- **Verify Industry Interest**
 - “Kick-off” Meeting held on April 15, 2008
 - Precast Supplier Meeting held May 28, 2008
 - Positive feed-back from local contractors

3. Project Development

- **Preliminary engineering**
 - Coring existing pavement
 - FWD testing
 - Survey – cross-slope and profile data
 - Traffic Control Plans / Traffic Management Plans

3. Project Development

- **Preparation of plans**

- Keep it simple – 11” x 17” plan sheet format
- Bid on PPCP technology only – no design alternates
- Install slabs under “live traffic conditions”
- Complete fabrication & installation within 100 CDs

3. Project Development

- **Development of new specifications**
 - 501532 – Pervious Portland Cement Concrete
 - Demonstration requirement
 - 501533 – Precast Prestressed Roadway Pavement
 - “Fit-Test” requirement

4. Advertise, Bid & Award Process

- **Advertise**

- Final Plans submitted August 20, 2008
- Project Advertised on September 1, 2008
- Mandatory Pre-Bid Meeting on September 18, 2008
- Bids Received on October 16, 2008

4. Advertise, Bid & Award Process

- **Bid**

- Four Bidders: \$2,379,388.97 to \$3,059,506.72
- Engineers Estimate: \$1,827,070.72
- Low Bid: 30.32% above EE
- PPCP Bid Prices: \$505.00 SY - \$600.00 SY
- Engineers Estimate for PPCP: \$325.00/SY

4. Advertise, Bid & Award Process

- **Award process**

- Recommend to award to A-Del on 11/14/2008

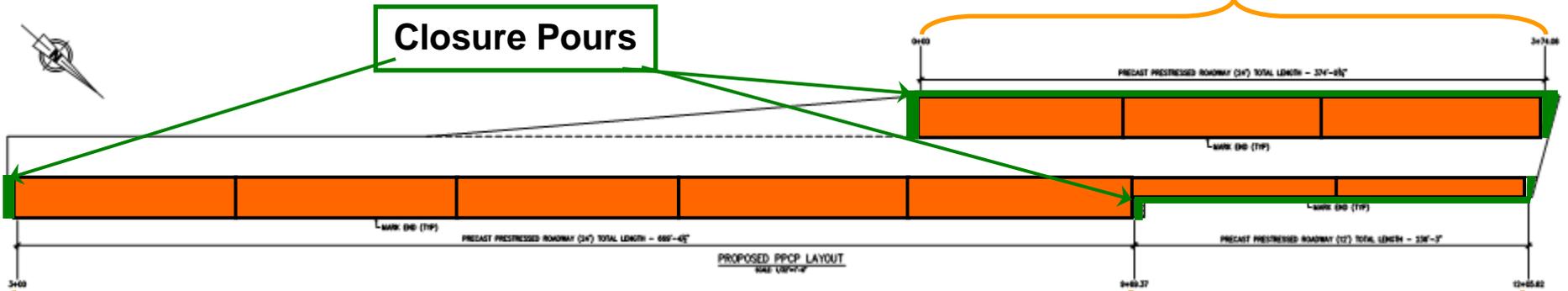
- Pre-construction Meeting held 12/10/2008

- Time charges began 05/01/2009

(First Production Day for Panel Fabrication)

5. Construction – Panel Layout

Left Turn Lanes
2 Sections @ ~118'
1 Section @ ~128'
Panel Dimensions: 24' x 9'-10" x 8"
(38 Panels)



Right Turn/Thru Lane
3 Section @ ~128'
2 Section @ ~138'
Panel Dimensions: 24' x 9'-10" x 8"
(68 Panels)

Right Thru Lane
1 Section @ ~118'
1 Section @ ~108'
Panel Dimensions: 12' x 9'-10" x 8"
(24 Panels)

5. Construction

- **Fabrication**

- **Coordination with Post-Tensioning Supplier**
 - ✓ Adjust bar and strand spacing to accommodate ducts
 - ✓ Don't forget the instrumentation!
- **Shop Drawing Submittal Process**
 - ✓ Electronic submittal/review process
- **Panel Sizes**
 - ✓ Plan sizes changed by supplier – 10' L x 12' or 24' W
- **Fit-test Requirement**
 - ✓ 3-panel demonstration

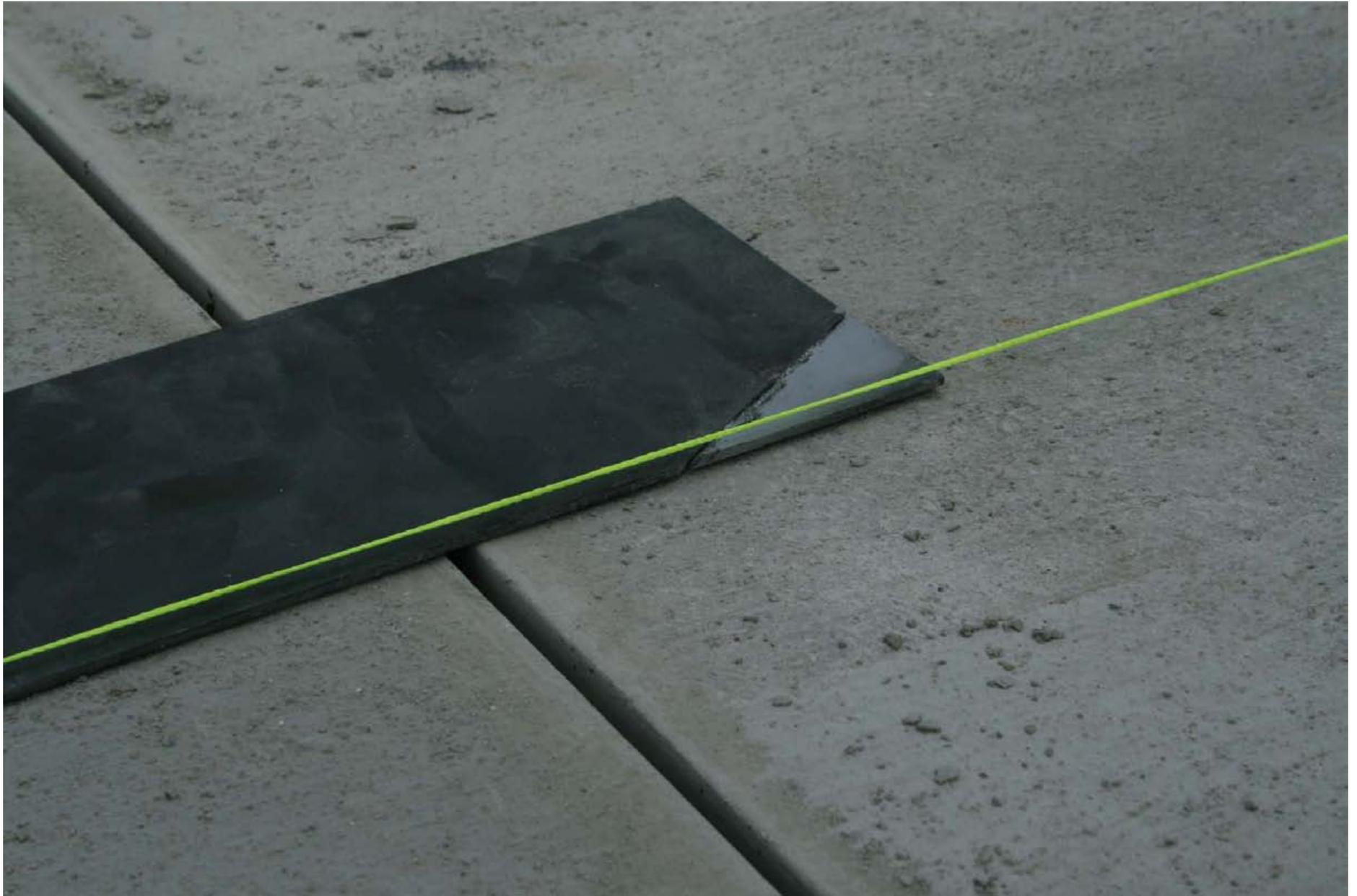
PPCP Fabrication – Fit Test – 04/29/2009



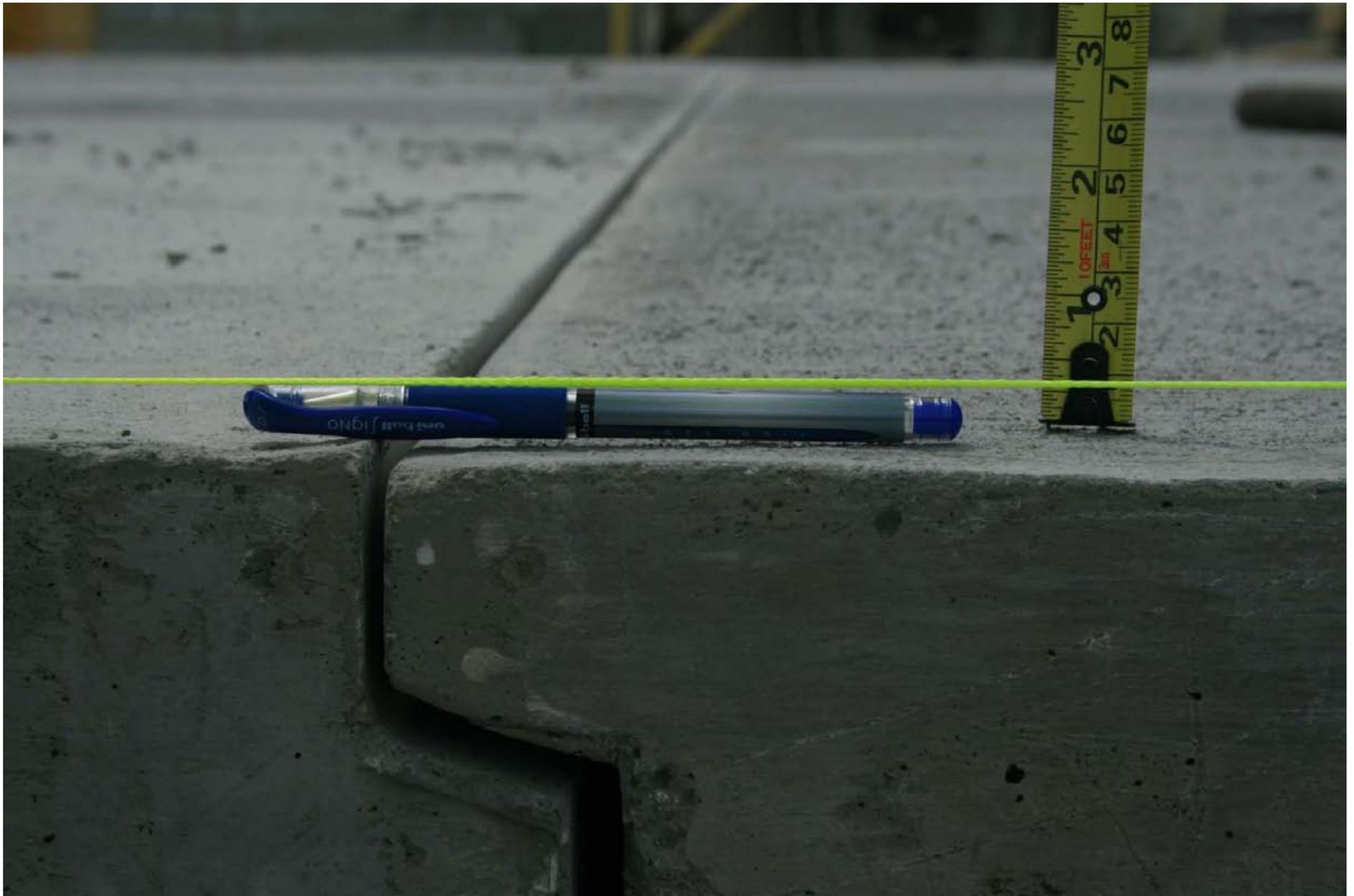
PPCP Fabrication – Fit Test – 04/29/2009



PPCP Fabrication – Fit Test – 04/29/2009



PPCP Fabrication – Fit Test – 04/29/2009



5. Construction

- **Installation**

- **Work Hour Restrictions**

- ✓ 7:30 PM to 5:30 AM
 - ✓ Work Monday evening through Saturday morning only
 - ✓ Restore traffic to unrestricted use at the end of each shift

- **No Impact Removal**

- ✓ Full-depth perimeter saw cut
 - ✓ Remove existing PCC by lift-out technique

- **Pavement Section**

- ✓ Existing pavement section 12" PCC
 - ✓ Replace with 8" PPCP over 4" pervious concrete
 - ✓ Blanket diamond grinding for pavement smoothness

Pervious Concrete – Placement Demonstration – 05/13/2009



PPCP Panel Delivery to Staging Area – 05/14/2009



PPCP Panel Delivery to Jobsite – 05/20/2009



Epoxy Application – 05/20/2009



PPCP Panel Installation with Crane – 05/20/2009



PPCP Panel Installation with a Crowd – 05/21/2009



PPCP Panel Installation with Loader – 09/09/2009



PT Bars & Gaskets – 05/20/2009



Stressing Jacks – 05/20/2009

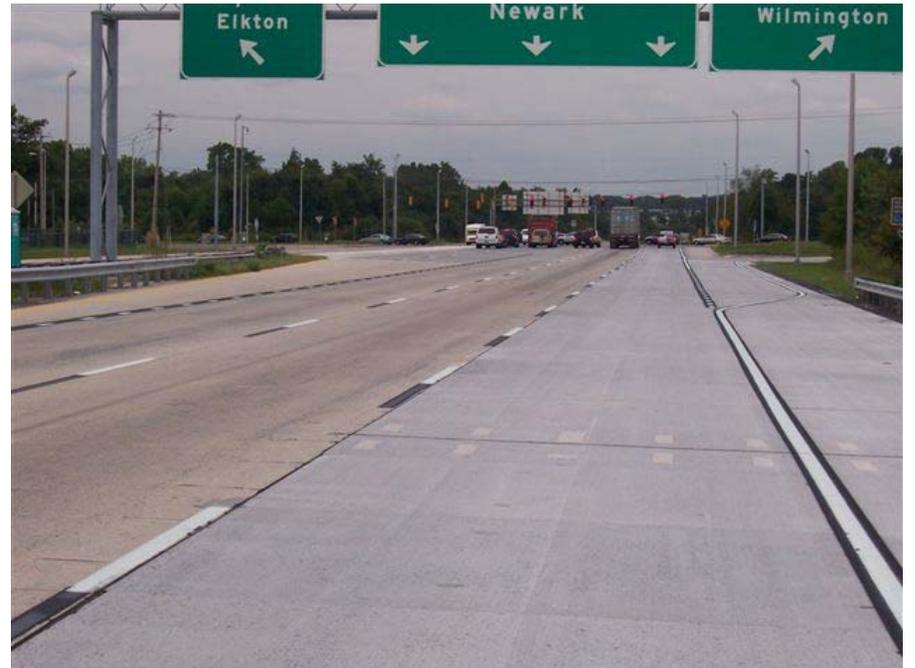


Completed Project – 09/08/2009



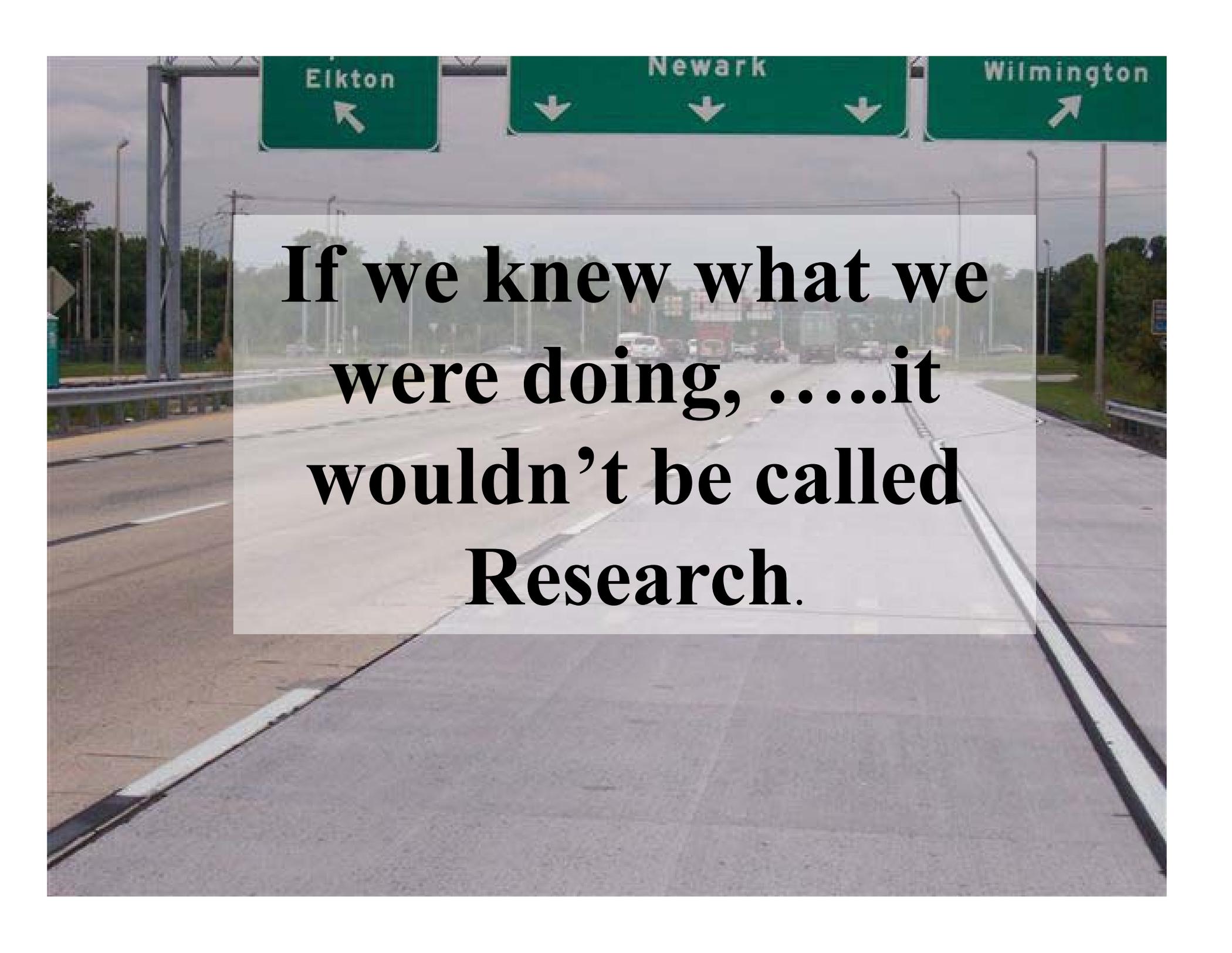
Before – 05/15/2008

After – 09/08/2009



6. Lessons Learned

- **Don't be afraid!**
- **PPPPP** – allow at least a year from concept to completion
- **Texas Toast** – a little thicker slab is better
- **Don't rush the fabricator**
- **Good joints are the “key” to success**
- **Be Wary of the Warp** – survey, survey & survey!
- **Unfamiliar materials = unexpected results**
- **Every good project was built by a good team**



**If we knew what we
were doing,it
wouldn't be called
Research.**



**Thank you for your time and
attention.....**

Questions / Comments