DESIGN TO CONSTRUCTION

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pennsylvania
DEPARTMENT OF TRANSPORTATION

ASSET MANAGEMENT

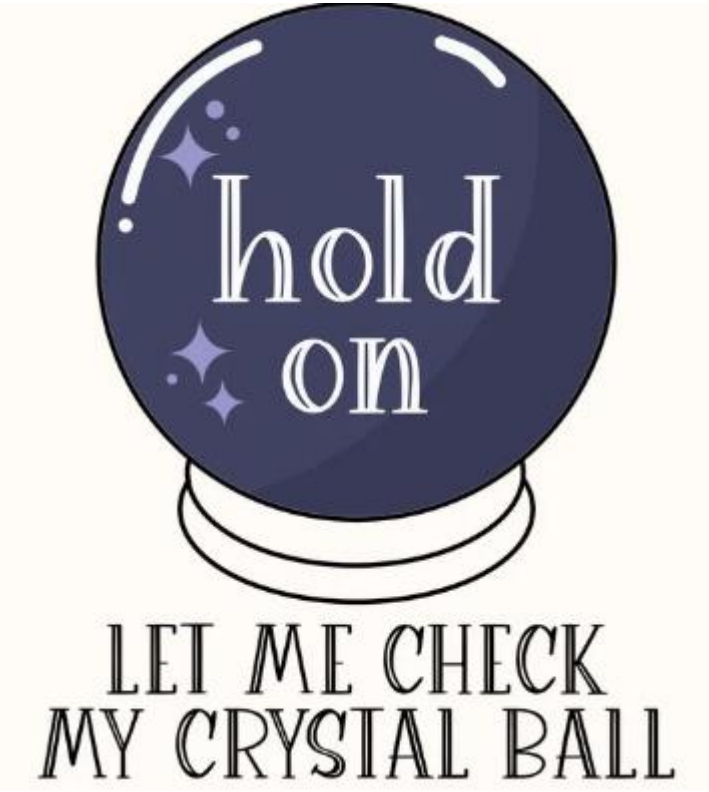
- District 11 Bridges
  - Number of Bridges: 1792 (8’ and over)
  - Total Deck Area: 15.169M SF

ASSET MANAGEMENT

- **Transportation Improvement Program (TIP)**
  - 4 Years
  - Updated Every Two Years
  - Provides funding to start and complete projects
- **Twelve Year Plan (TYP)**
  - First 4 years is the TIP
  - Last 8 years show projects ready for funding on future TIPs
- **Long Range Plan**
  - Mid-Term: Last 8 years of TYP
  - Long-Term: Forecasts additional 16 years of funding needs
  - Plans for Projects over $5M

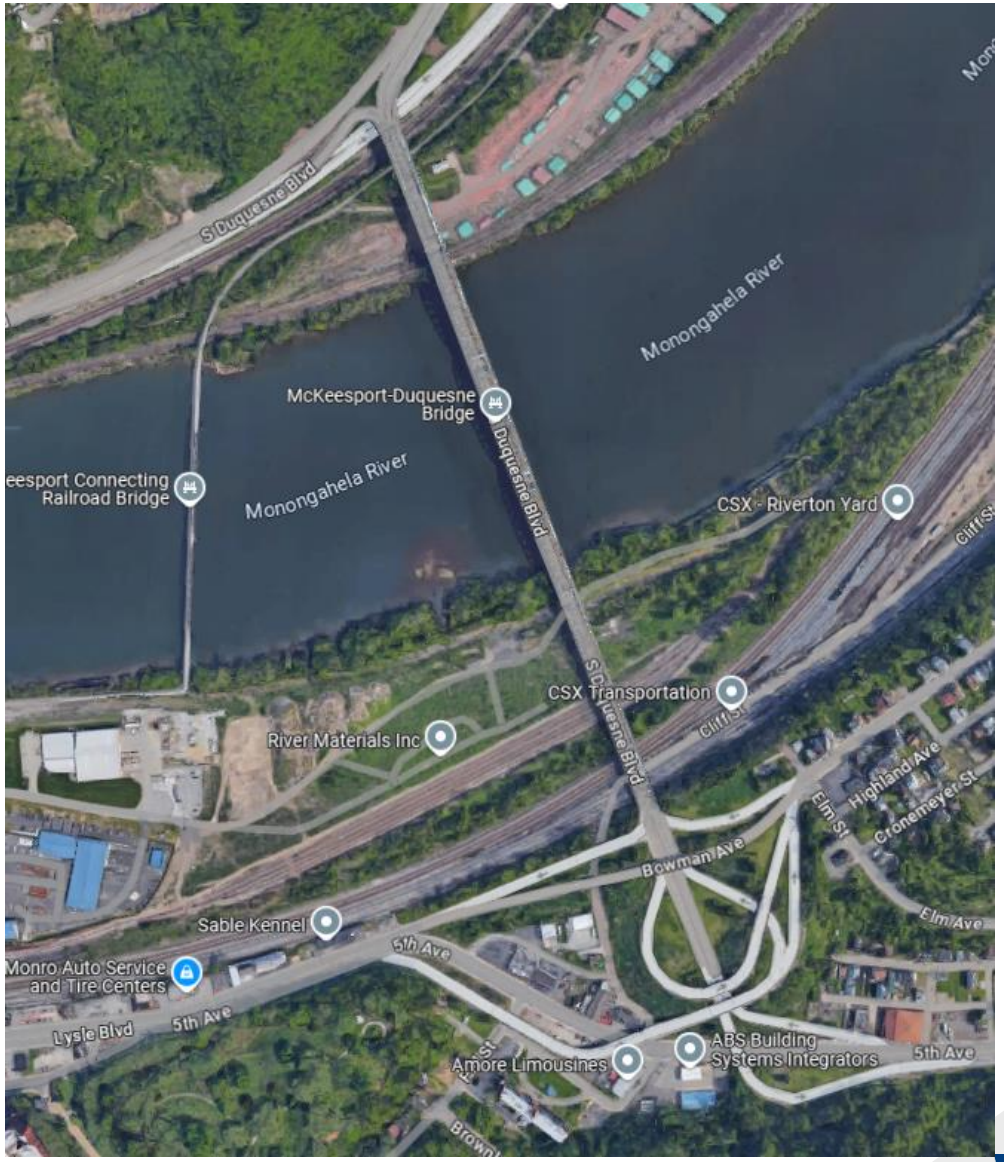
ASSET MANAGEMENT

- **Philosophy**
  - Lowest Life Cycle Cost vs. “Worst First”
  - 20, 40, 60
  - Balance Preservation, Rehabilitation, & Replacement
- **Selecting Project Candidates**
  - Master Spreadsheet
    - Review LRP
    - Includes previous TIP and TYP candidates
    - Includes future candidates flagged at priority meetings
    - Includes BridgeCare (BAMS) candidates
  - Prepare Top 40 List
    - Expect to get 10 or less new candidates on TIP
    - Carry-over projects absorb most funding
- **Estimating**



TYPES OF PROJECTS

- **Betterments**
  - Include Bridge Preservation work on paving projects
  - Sometimes include Rehab on Betterments
- **Standalone**
  - Larger Structures
  - Replacements
  - Multi-Structure Projects (i.e. interchanges, close proximity etc.)
  - Structures not on Betterment Routes



HALL STATION BRIDGE

- BRKEY: 1575
- Year Built: 1942
- Last Rehab: 1989
- Length: 1,252 LF
- Deck Area: 83,508 SF
- Included in Limits of SR2048 A14 Business 22 Betterment

HALL STATION BRIDGE

- Scope of Work
  - Replace Joints
  - LMC Overlay
  - Seal Barrier & Deflection Joints
  - Pier 2 Bearings

HALL STATION BRIDGE

- Priority 0 Bearing found during inspection.
- Construction Team got blocking in place quickly.
- Why was this not included in the project?

DESIGN PERSPECTIVE

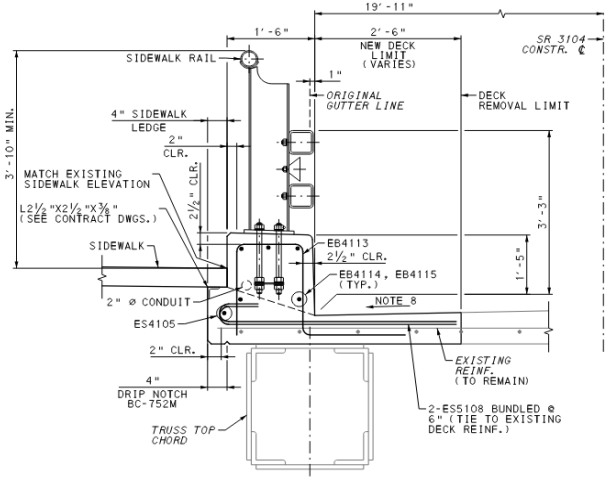
- **Are Construction and Maintenance providing input during Design?**
  - Provide designs that require minimal maintenance
    - Access to stormwater facilities
    - Properly armoring areas to avoid erosion issues
  - Provide buildable designs
- **Does Construction understand the intent of the project?**
  - Are we doing minimal work because of a future project?
- **Ensure quality work during Construction.**
  - Cornerstone in ensuring life cycles are met.
- **Is Extra Work being coordinated with Design**
- **Does Construction understand key decisions made during Design?**
  - Community Input, Utility, Railroad, Right-of-Way, Environmental Permitting
- **Are lessons learned being incorporated for future projects?**

CONSTRUCTION PERSPECTIVE

- **Is Construction participating during Design?**
  - Scoping Field Views
  - ProTeam Meetings
    - ACE, Structure Control Engineer, Constructability Review Manager
  - Traffic Phasing, Design, Construction, Traffic Meetings
  - Constructability
- **Is Construction involving Design?**
  - DPMC
  - Proposed changes by the Contractor
- **Is Construction involving Maintenance?**
  - Group Job Walk Throughs
  - On Demand Contracts
- **Is Construction relaying the things that go WELL?**

WORKING TOGETHER

- **McKees Rocks Sidewalk**
  - Design
    - Design phase funding limited
    - Limited inspectability for certain areas
  - Construction
    - Worked to maintained original scope
    - Unforeseen Issues developed
    - Coordinated field view
    - Determined New Scope
  - Large scale changes mid-project
    - Coordination between Design, Construction and Contractor
    - Planning for future phases



SCHEDULE CHANGES

- **New Kensington Overlay**
  - Pre-Bid Schedule
    - Showed Overlay Occurring Last
    - Overhead Painting Work to be complete
  - Construction Schedule
    - Contractor Schedule change request
    - Shifted all work to be completed
  - Change Impacts
    - Revised sequencing of work impacts following operations
    - Changes in means and method may need to take place
    - Unanticipated corrective actions may need to be completed

WATCHING PAINT DRY

- **Neville Island Bridge**
  - Work required to be completed within weekend
  - Accelerated curing required
  - Worked with Coating Manufacture
- **Contractor Concerns**
  - Slow production of steel repairs
- **Designer Concerns**
  - Not providing required mating surface per calculations
- **Updates**
  - District 11-0 Best Practice to differentiate SC and Non-SC Conditions
  - Coating season extended with approval of heating/dehumification

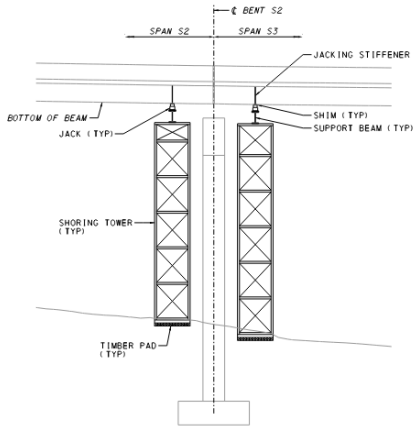
Drying Schedule @ 4.0 mils wet (100 microns):

	@ 35°F/1.7°C	@ 50°F/10°C	@ 77°F/25°C 50% RH	@ 100°F/38°C
To touch:	30 minutes	30 minutes	20 minutes	5 minutes
To handle:	120 minutes	100 minutes	60 minutes	15 minutes
To recoat:				
minimum:	4 hours	2 hours	30 minutes	20 minutes
maximum*:	unlimited	unlimited	unlimited	unlimited
*Maximum Recoat: Unlimited. Must have a clean, dry surface for topcoating. "Loose" chalk or salts must be removed in accordance with good painting practice.				
To cure:	7 days	7 days	5 days	3 days
Drying time is temperature, humidity, and film thickness dependent.				
Pot Life:	8 hours	8 hours	4 hours	2 hours
Sweat-in-Time:	none	none	none	none

SC DENOTES SLIP-CRITICAL REPAIR
NSC DENOTES NON-SLIP-CRITICAL REPAIR

BRIDGE JACKING

- **Localized or Line Jacking**
  - Localized issue
  - Structure Constraints limited jacking ability
  - Field adjustment for Line Jacking
- **Conceptual Jacking**
  - Conceptual Shown during design
  - Contractor Bid alternate that is not preferred
  - District 11-0 best practices to provide language limiting method of jacking when needed

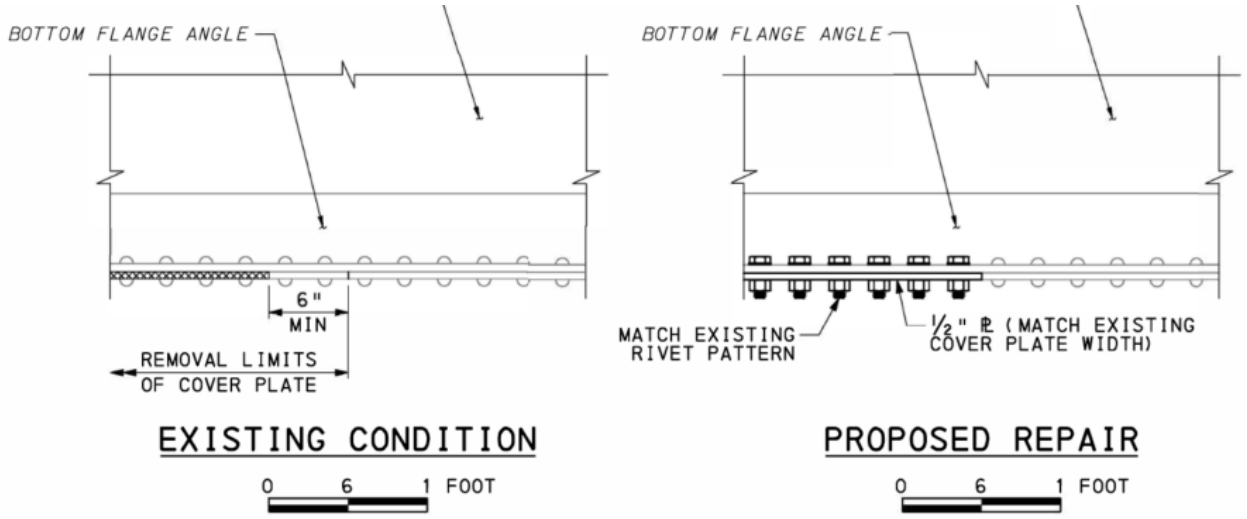


GLAND REPLACEMENTS

- **Scope of Work**
  - Remove existing gland
  - Clean and prep track
  - Install new gland
- **Construction**
  - Opening too narrow to install
  - Track damaged
  - Track deteriorated
- **Best Practices**
  - Detailed review during design
  - Schedule in cool temps and before surface treatment
  - Replace dam when uncertain

TYPICAL STEEL REPAIRS

- **Steel Repair Determination**
  - Review project as a whole
  - Look for ability to set standard repairs
  - Be conservative in repair
  - If variability discuss if poundage pay item more applicable

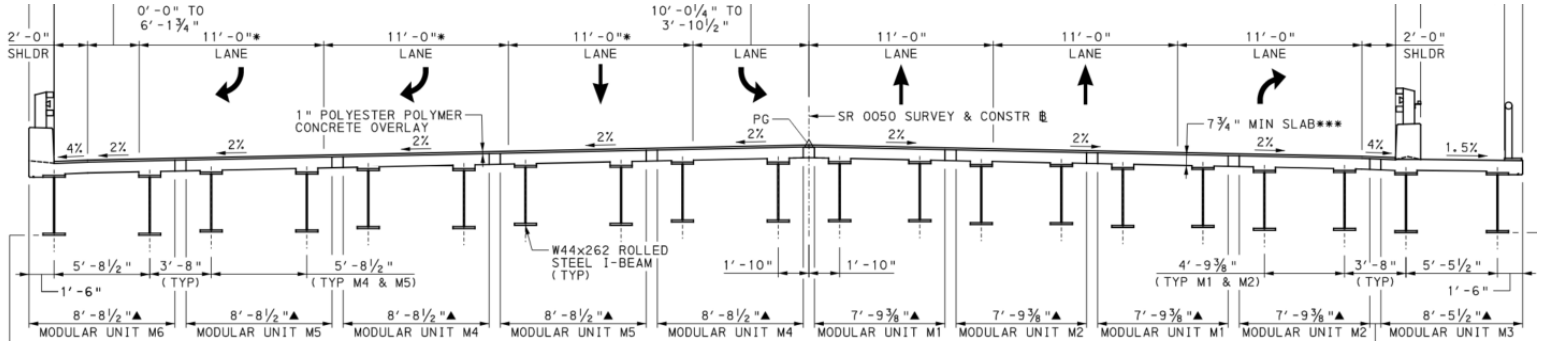


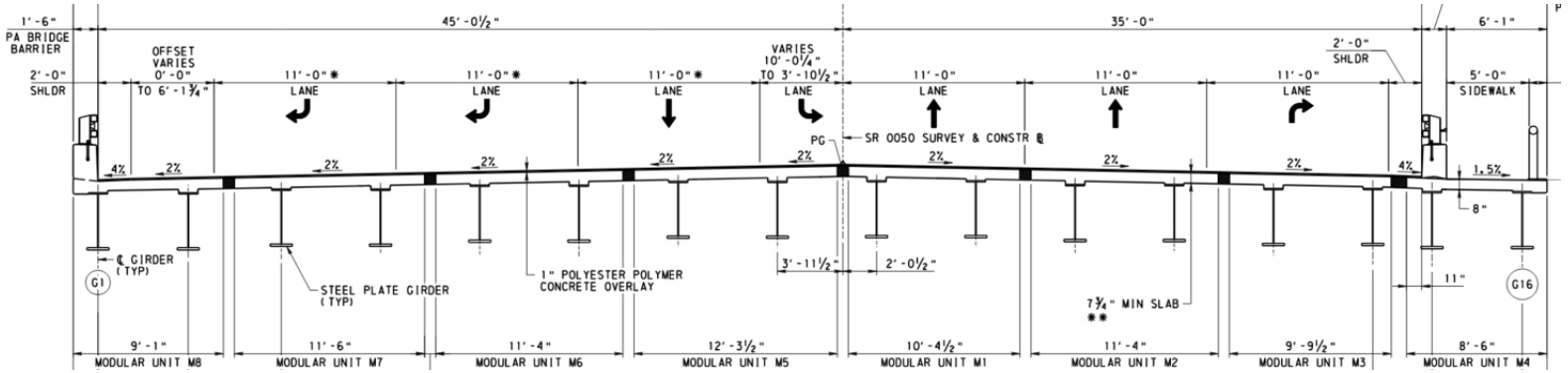
OLDER OVERLAYS

- **2nd Gen Overlays**
  - Design
    - Review previous scope of work
    - Perform detail design inspection
    - Utilize destructive and non-destructive testing
    - Reach out to previous project personnel
  - Construction
    - Document condition via as-builts of previous overlays
    - Coordinate early when conditions different than anticipated

FABRICATION COORDINATION

- **Coordination in Construction**
  - Precast Concrete Deck Modules
  - Alternate Design changed to non-symmetric sections
  - Final configuration specified in alternate contract plans
  - Fabricator may not have recognized challenges
  - Non-typical design may require enhanced coordination/Meetings

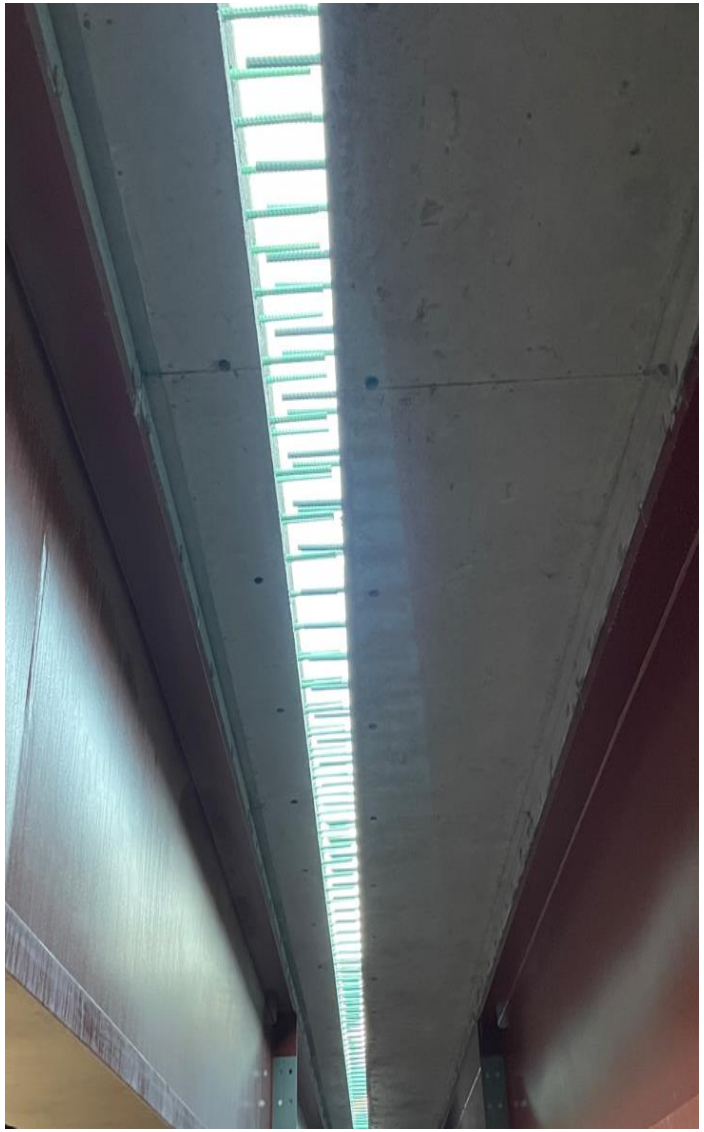




DETAIL AND FABRICATE THE STEEL SUPERSTRUCTURE FOR TOTAL DEAD LOAD FIT (TDLF). GIRDER WEBS TO BE PLUMB UNDER THE FULL DEAD LOAD EXISTING AT THE END OF CONSTRUCTION.

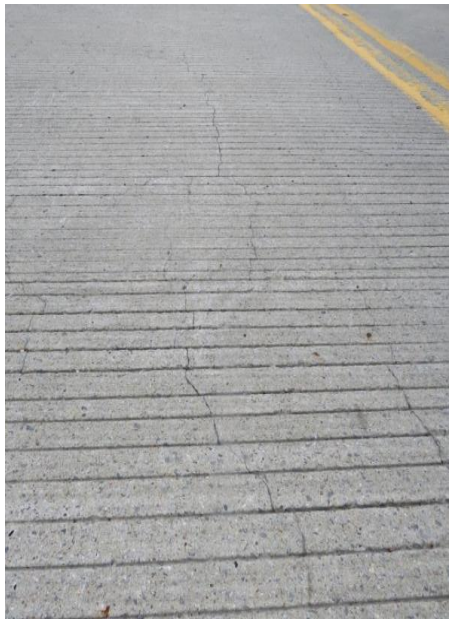
PRECAST SUPERSTRUCTURE MODULES AND SLEEPER SLAB UNITS TO MEET THE FOLLOWING TOLERANCES, UNLESS OTHERWISE SHOWN ON THE PLANS:

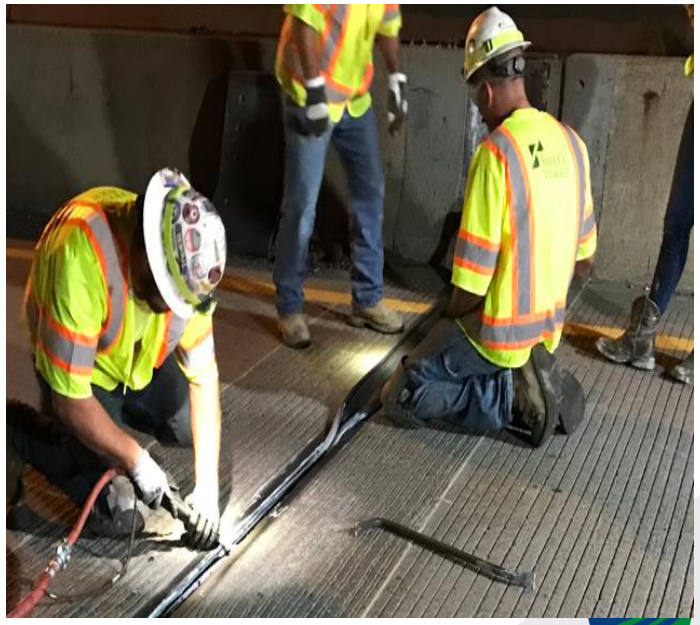
FABRICATION COORDINATION



PREVENTATIVE MEASURES

- **District Best Practices**
  - Epoxy Resin Binder
  - Penetrating Sealers
  - HMWM Sealer
  - Gland Replacements





ACCELERATED STRUCTURAL CONCRETE

- **ASC Lessons Learned**
  - Hauling Distance
  - Time of Day
  - Size of Placement
  - Finished Surface
  - Curing Requirements
  - Opening Strengths