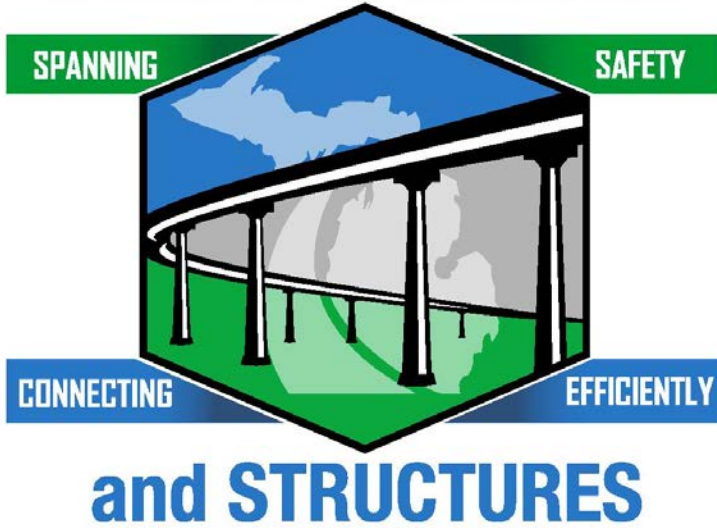


BUREAU of BRIDGES



Bridge Maintenance Scoping



2023 Michigan Bridge Week – Maintenance Track



Agenda

- What is Bridge Maintenance Scoping?
- Bridge Preservation Types
 - Scheduled Maintenance
 - Preventative Maintenance
 - Rehabilitation
 - Replacement
- Maintenance Scoping Bridge Elements
- Important Schedule Maintenance Activities
- Incorporating a Bridge Maintenance Program in your Region / LAP

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What is Bridge Maintenance Scoping?

The process that bridge inspectors would identify, prioritize, and provide guidance on preservation activities **BEFORE** potential distress areas occur on the bridge by integrating repair strategies and develop preliminary cost estimates.

This is broken down into these three categories:

- Inspection
- Evaluation
- Maintenance

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Inspection

Some of the bridge elements that I want to concentrate on

- Deck and Barrier appearance
- Deck Surface Condition
- Bridge Deck joints
- Approach Pavement Relief Joints (PRJ)
- Beam ends and bearings
- Pier Cap / Bridge seats

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Evaluation

- Reporting more schedule maintenance
- Prioritize Preventative Maintenance
- Minimizing minor maintenance frequency
- Minimizing rehabilitation schedules

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Maintenance

Bridge maintenance is defined as work meant to restore a bridge to an improved condition.

Bridge preservation is considered actions or strategies that prevent, delay, or reduce deterioration of bridge elements, restore the function of existing bridges, and keep bridges in good condition by extending their life.

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Maintenance

Bridge Preservation Components

- Schedule Maintenance (Keep current cond)
- Preventative Maintenance (address fairs)
- Rehabilitation (poor to fair / good)
- Replacement (poor to good)

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Schedule Maintenance

Below are a few items to consider:

- Deck Surface Washing
- Barrier and Joint Cleaning
- Silane Deck and / or Barrier
- Minor Joint Repair / Gland Repair
- Healer Sealer
- Pavement Relief Joints (PRJ)
- Painting - Spot

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Preventative Maintenance

Below are a few items to consider:

- Bridge Approach
- Deck Patching
- Bridge Barrier Railing Repair
- Joint Replacement
- Thin Epoxy Overlay
- Painting – Zone
- Substructure Patching - Minor

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Thin Epoxy Overlay

- Creates new wearing surface for bridge deck
- Seals surface by covering concrete deck



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Rehabilitation

Bridge components of:

- Bridge Barrier Railing Replacement
- Concrete Deep Overlay
- Substructure Repair - Major
- Widening
- Substructure Replacement
- Painting

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Replacement

Bridge components of:

- Deck Replacement
- Superstructure Replacement
- Bridge Replacement

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Maintenance Scoping Bridge Element

Deck Appearance



Inspection: Cracking in the deck

Evaluation: Urgently needs a Preventative Maintenance

Maintenance: Healer Sealer

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Maintenance Scoping Bridge Element

Deck Appearance



Inspection: Spalls/ cracking / HMA patching

Evaluation: Needs major rehabilitation

Maintenance: Rehabilitation -Overlay / new deck

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Maintenance Scoping Bridge Element

Barrier Appearance



Inspection: Barrier is good but has dirt along the toe
Evaluation: Urgently needs a Schedule Maintenance
Maintenance: Schedule clean toe / silane if no coating

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Maintenance Scoping Bridge Element

Barrier Appearance



Inspection: toe is badly spalled, cracks in the barrier

Evaluation: needs major barrier repair

Maintenance: Rehabilitation barrier repair

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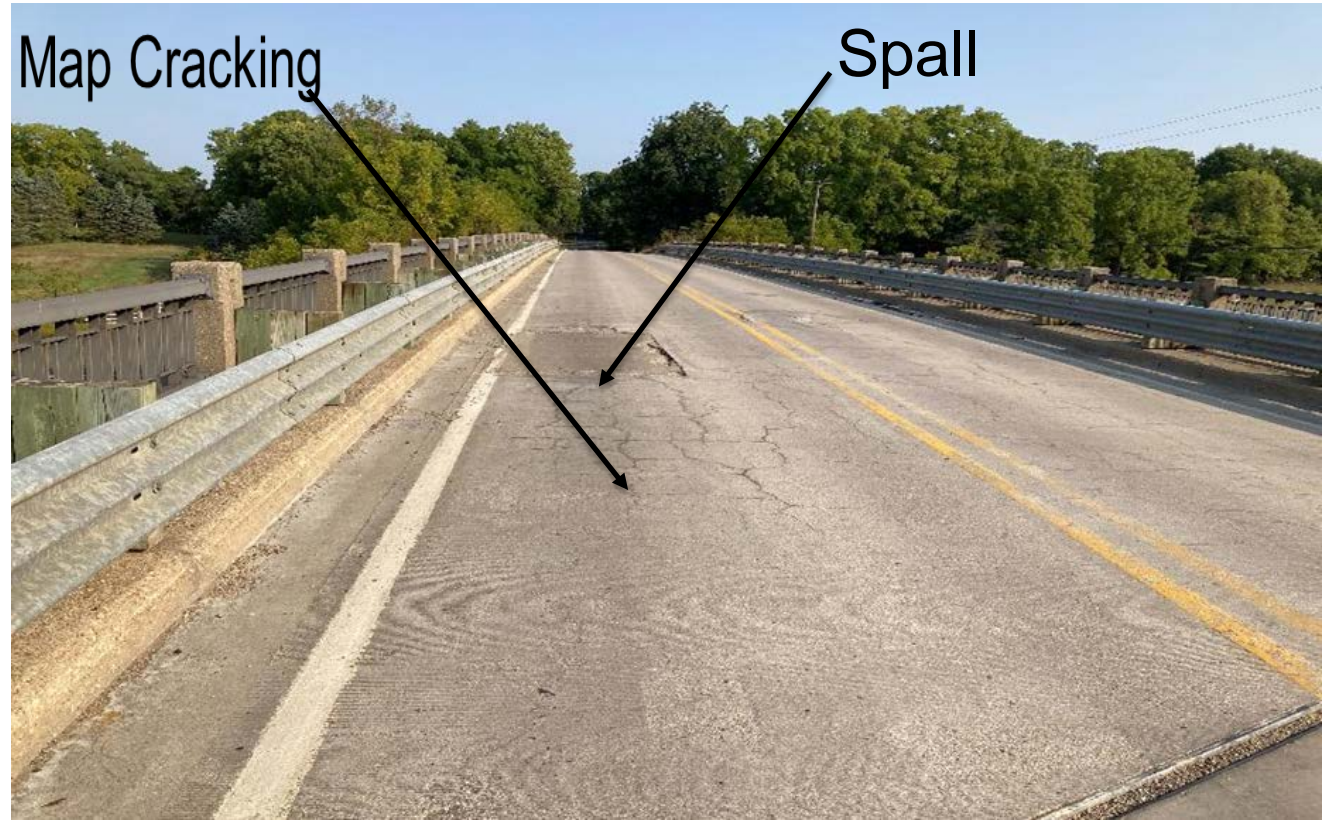
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Maintenance Scoping Bridge Element

Deck Surface Condition



Inspection: Spalls & Map cracking in the deck
Evaluation: Perform the schedule maintenance
Maintenance: Schedule (deck patching and healer sealer)

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Maintenance Scoping Bridge Element

Deck Surface Condition



Inspection: Map cracking and several locations of delamination
Evaluation: Perform deck patching or epoxy injections
Maintenance: Schedule (epoxy deck injection and healer sealer)

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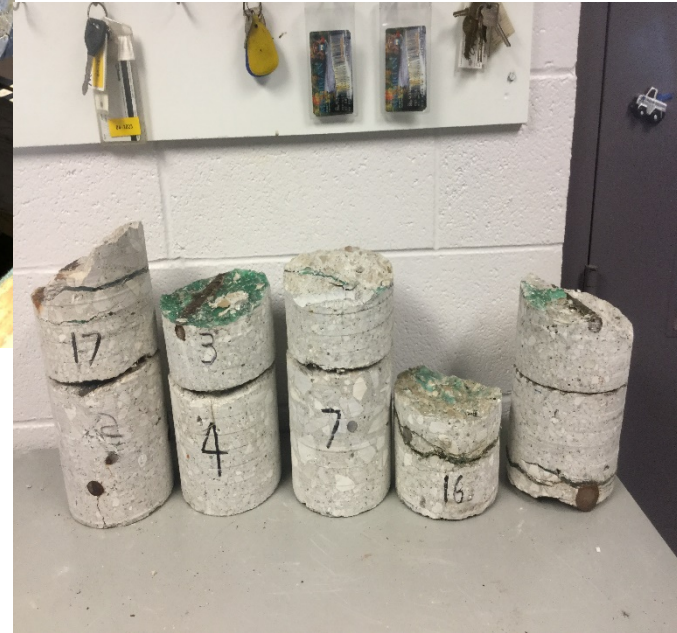
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Maintenance Scoping Bridge Element

Deck Surface – Deck Injection



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Inspection: Cracking in the concrete

Evaluation: Perform epoxy deck injections

Maintenance: Schedule (epoxy deck injection and healer sealer)

Maintenance Scoping Bridge Element

Bridge Deck Joints



Inspection: Minor deck patching at joint

Evaluation: Perform deck patching

Maintenance: Schedule – minor deck patching / clean joint

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Maintenance Scoping Bridge Element

Bridge Deck Joints



Inspection: Tear in the gland of the expansion joint

Evaluation: Urgent repair of the gland

Maintenance: Rehabilitation – Replace gland or replace the joint

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Maintenance Scoping Bridge Element

Approach Slab



Inspection: Approach slab has settled

Evaluation: Several repair options

Maintenance: Inject or Rehabilitation – Remove and Replace

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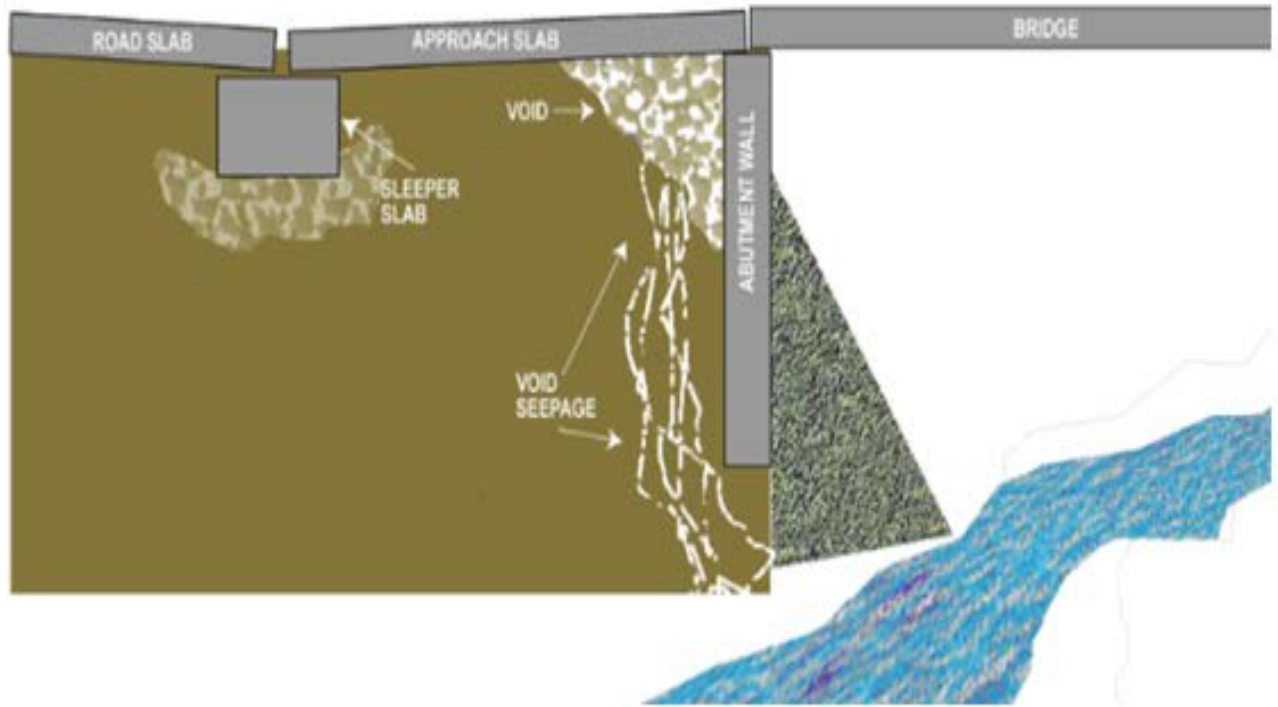


Maintenance Scoping Bridge Element

Approach Settlement

BEFORE

BRIDGE APPROACH



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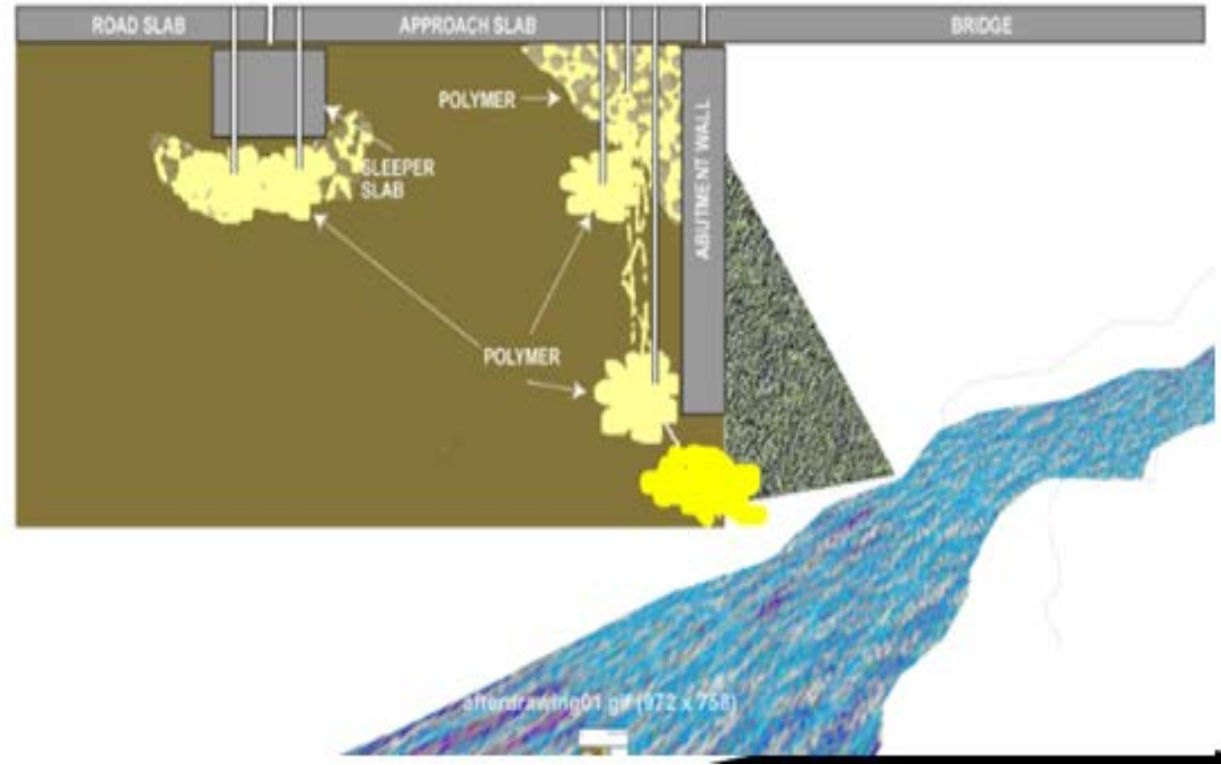


Maintenance Scoping Bridge Element

Approach Settlement

AFTER

BRIDGE APPROACH



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Important Schedule Maintenance

Surface Washing

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Important Schedule Maintenance

Joint Cleaning

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Important Schedule Maintenance

Silane Deck and Barrier



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Important Schedule Maintenance

Healer Sealer



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Healer Sealer

- You can see the crack is sealed



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Healer Sealer

This was a year later



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Important Schedule Maintenance

Pressure Relief Joints

What they are



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Pressure Relief Joints

How they happen

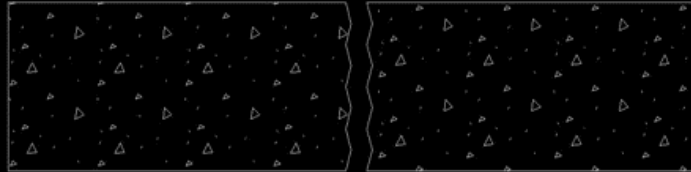
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Pressure Relief Joints

When they are not applicable

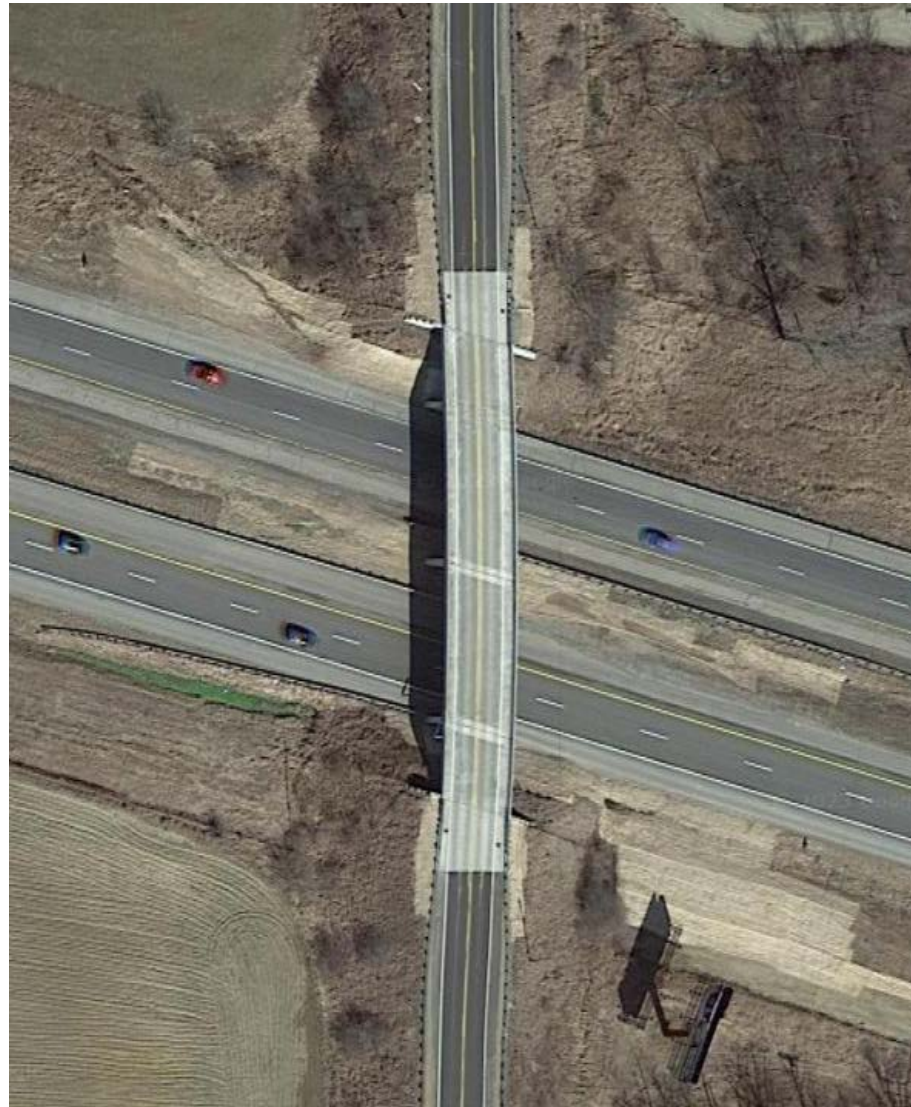
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Pressure Relief Joints

When they are not applicable



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Pressure Relief Joints

When they are applicable

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Pressure Relief Joints

When they are applicable



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Pressure Relief Joints When they are applicable

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Pressure Relief Joints

When they are applicable & when not

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Pressure Relief Joints

When they are applicable & when not

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Pressure Relief Joints

When to replace them?

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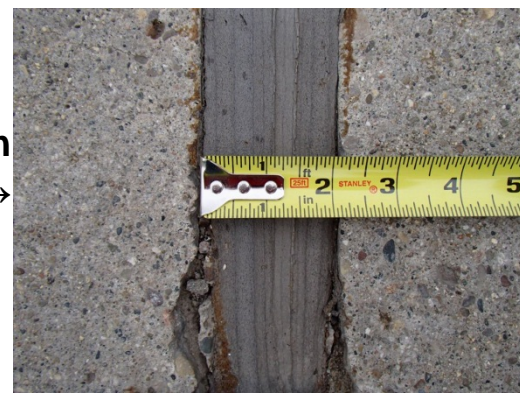
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Condition State 2 →



Condition State 3 →



Condition State 4





Pressure Relief Joint

New Method?



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Incorporating a Maintenance Program



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No Maintenance, right?

How about Proactive Maintenance



Incorporating a Maintenance Program



We need to start changing our state of Maintenance process from being reactive to being planned, scheduled, and controlled.

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Incorporating a Maintenance Program

Performing Schedule and Preventative Maintenance

Start small:

- Maybe look at starting in one county and try 5 to 10 bridges where you do this maintenance and then increase this by 25% more each year.
- Look at the total days that you have a Bridge Crew and then break down your Maintenance work for your Bridge crew. You can start of with doing 75% reactive and 25 % scheduled and preventative maintenance. Increase your scheduled and preventative maintenance by 5% each year until you can flip it to 75% proactive and 25% reactive.

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- Look at breaking down the Maintenance budget in your region on Maintenance work for the year. See if you can put forth a small percentage of schedule and preventative maintenance in contracts. Bridge Bundling is a good way to maximize your budget.

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Questions?????

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