

Deck Bridge Preservation Activities

Section A. Eligibility and Federal Requirements – These items address whether FHWA will compensate NCDOT for these activities.

1. Is the bridge candidate on/over the Interstate System?
The bridge must be on or over the interstate.
2. Is the proposed activity for the bridge candidate part of another program? (TIP, etc.)
A Federal requirement is the bridge cannot be programmed elsewhere. Avoid “like activities.” For example, a bridge programmed for a deck replacement would not be eligible for an overlay, but painting steel beam ends could be an appropriate activity.
Verify with the STIP:
<http://www.ncdot.gov/planning/development/TIP/TIP/>
3. Is ASR present in structural members?
If ASR (Alkaline Silica Reactivity) is present in structural members (beams, caps, columns) the bridge should be programmed for replacement not preservation.
Review the Bridge Inspection Report notes and photos.
4. Is bridge coded structurally deficient or functionally obsolete?
Structurally deficient or functionally obsolete bridges with a sufficiency rating below 50 are likely to be programmed for replacement in the not too distant future.
Review the Bridge Inspection Report.

Section B. General Requirements – These items address program needs, and considers potential impacts of not preserving structures.

1. Is bridge candidate one of a planned corridor of bridges?
Preference is for projects that are part of an overall preservation strategy by coordinating work on multiple structures in a corridor. A corridor of painting projects or joint replacement projects is preferred over bridges in spot locations.
2. Number of verified citizen/ city/ county complaints.
Verified (written) complaints are located in the Local Bridge File or Internal Division Files.
3. Traffic control as % of project cost.
In order to maximize preservation work accomplished, preference is given to projects with lesser traffic control costs.

Deck Bridge Preservation Activities

4. Stream sensitivity issues.
The goal is keeping bridges in service longer to minimize environmental impacts and potentially much longer and more expensive replacements.
Major stream impacts for construction– major
Minor stream impacts for construction – minor
Grade crossing impacts for construction – none
5. Improvements needed to detour as % of project cost.
Preference is to minimize amount of improvement needed on detour route.
Assume greater than 10% for offsite detour onto secondary road.
Assume less than 10% for offsite detour onto primary route.
0% if known no improvements needed.
6. Detour length.
Preference is to preserve bridges that would result in longer detour routes should replacement be necessary.
Review the Bridge Map.
7. Estimated Remaining Life Extension (after preservation activity).
The life extension is the anticipated improvement to the remaining life of the component, measured in years.

Section C. Deck Joints – Replacing damaged or non-functioning joints increases the life of the structure by reducing water penetration and preventing corrosion.

1. 10% or more of Joint Length Leaking or Missing Glands.
Leaking joints contribute to corrosion.
2. Loose Mechanical Joints/Modular Joint Failure
Loose joint elements contribute to noise, imminent failure, reduce ride quality and safety concerns. Metal joints include finger joints, bolted down metal components with glands. Modular joints are typically cast in the deck.
3. Part of or ahead of Painting Project (Steel superstructure).
High consideration should be made to coordinating joint replacement/repair with painting structural steel.

Section D. Deck Preservation General Information – Deck Preservation activities increases the life of the structure by addressing chlorides, cracks, delaminations and improves ride quality.

Deck Bridge Preservation Activities

1. Superstructure Condition
Higher score for better beam/girder condition, indicating longer remaining life can be expected.
Review the Bridge Inspection Report.
2. Substructure Condition
Higher score for better substructure condition, indicating longer remaining life can be expected.
Review the Bridge Inspection Report.
3. Concrete Strengths (All Overlays).
Compressive strength of concrete is an indicator of the quality of concrete.
Assume 3500-4500 unless real values are known.

Section D.1. Deck Preservation – Sealers

1. Deck Condition Rating for Sealers ≥ 7 .
Preference is to seal decks in good condition. (Sealing should be applied to higher quality decks.)
Review the Bridge Inspection Report.
2. Deck Evaluation shows delaminations and patches no greater than 1% of Deck Area.
Preference is to seal decks in good condition. (Sealing should be applied to higher quality decks)
Review the Bridge Deck Evaluation Report (BridgeDocs Program).
3. Chloride Content #/CY < 1 at top mat of steel.
Preference is to seal decks in good condition. (Sealing should be applied to higher quality decks)
Bridge Deck Evaluation Report (BridgeDocs Program)
Chloride Sampling Report

Section D.2. Deck Preservation - Chloride Extractors

1. Deck Condition Rating for Chloride Extractors ≥ 6 .
Preference is to treat decks in good condition. (Treatment should be applied to higher quality decks.)
Review the Bridge Inspection Report.
2. Chloride Content at top mat of steel.

Deck Bridge Preservation Activities

Preference is to treat decks in good condition. (Treatment should be applied to higher quality decks) Not recommended for chloride content greater than 2 #/CY.

Bridge Deck Evaluation Report (BridgeDocs Program)
Chloride Sampling Report

3. Coordinated with sealing or Concrete Overlay.
Preference is to coordinate chloride extractors with sealing or concrete overlays.

Section D.3. Deck Preservation - Epoxy Overlays

1. Deck Condition Rating for Epoxy Overlays.
Preference is to overlay decks in good condition. (Epoxy Overlay should be applied to higher quality decks.)
Review the Bridge Inspection Report.
2. Deck Evaluation shows delaminations and patches no greater than 1% of Deck Area.
Preference is to overlay decks in good condition. (Epoxy Overlay should be applied to higher quality decks)
Review the Bridge Deck Evaluation Report (BridgeDocs Program).
3. Chloride Content #/CY ≤ 1.5 at top mat of reinforcing steel.
Preference is to overlay decks in good condition. (Epoxy Overlay should be applied to higher quality decks)
Bridge Deck Evaluation Report (BridgeDocs Program)
Chloride Sampling Report

Section D.4. Deck Preservation - Concrete Overlays

1. If paved, AWS inspection grade > 5 .
Preference is to keep good Asphalt Wearing Surface (AWS) in service and postpone removal. Review the Bridge Inspection Report.
2. Deck Condition Rating for Concrete Overlays.
Preference is to overlay decks in fair condition.
Review the Bridge Inspection Report.
3. Deck Evaluation shows delaminations and patches (% of Deck Area).
Preference is to overlay decks $> 3\%$ delamination and patching.
Review the Bridge Deck Evaluation Report (BridgeDocs Program).
4. Chloride Content #/CY at bottom mat of reinforcing steel.

Deck Bridge Preservation Activities

Chloride test results should be between 1 and 3 #/CY at bottom mat of reinforcing steel for optimal benefit. Greater than 3#/CY indicates deck replacement may be needed. It may be beneficial to look at other options if less than 1 #/CY.

Bridge File Deck Evaluation.
Chloride Sampling Report