

 Office of Structures <i>Guidelines and Procedures</i> <i>Memorandum</i>	DESIGN
	Number: D-84-28(4)
	Date: 03-16-2018
Structure Inspection for Input in Rehabilitation Contract	Approval: 

It is imperative that when an existing structure is being incorporated into a construction project that all problem areas with that structure be addressed in the proposed contract. If the project is being prepared by a consultant, all these measurements, reviews and report shall be their responsibility.

Field Conditions and Geometrics to Be Verified

Field conditions and geometrics need to be checked before finalizing work. Geometric data should be made a part of the survey request. Other data must be verified by MDOT SHA or consultant engineer at the time of the Preliminary Field Investigation or In-depth Inspection.

The items to verify in the field for all projects are:

- (1) Type of every roadway joint
- (2) Opening of every roadway joint (be sure we evaluate variations along each joint)
- (3) Approximate size of every joint seal
- (4) Number, locations and condition of joint troughs
- (5) Clear roadway width
- (6) Type and condition of traffic barrier and/or sidewalk
- (7) Type of fencing or railing
- (8) Endpost transitions to traffic barrier
- (9) Bridge length (including individual span lengths)
- (10) Bridge width (including shoulder widths and lane widths)
- (11) Utilities being carried by the bridge
- (12) Location of overhead and underground utilities

Additional items to verify in the field for a bridge deck replacement, superstructure replacement and widening job are:

- (1) Skew angle of piers and abutments
- (2) Stringer spacing
- (3) Elevations at gutter line, crown of roadway and along roadway joint
- (4) Attachments to bridge (signs, lights, etc.)
- (5) For dual bridges, evaluate sister bridge for any work necessary that can be incorporated into as planned work.

Additional items to verify in the field for a superstructure replacement and widening job are:

- (1) Distance between centerline of bearings of all existing supports
- (2) Dimension checks on all substructure units
- (3) Dimensions necessary to verify underclearance
- (4) Location and length of approach slab
- (5) For dual bridges, open distance between bridges

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In-depth Inspection Guidelines

The in-depth inspection shall consist of but not be limited to:

All Exposed Substructure Elements: A visual inspection shall be made to detect any cracks, their depth, location and extent. This review shall include a check for spalling or deterioration of concrete as well as the condition of any exposed reinforcement. A check with a hammer for unsound concrete shall be made. If visual and hammer inspection indicate deteriorated concrete of significant size and depth, cores shall be requested from SHA Geotechnical Exploration Division to determine if major repair or total replacement is required.

Piling: All exposed piling shall be carefully evaluated above the water line and all areas with problems shall be identified.

Bearings: Each bearing shall be checked for rust, corrosion, tilting, alignment, condition of elastomeric pads, if used, or any other material or components in the bridge bearings. Check for any missing or bent anchor bolts, make sure that bearings are functioning properly and are free to move or rotate. Indicate work proposed for each bearing - i.e. leave as is and paint, remove and replace portion, remove and replace entire bearing, etc.

Superstructure Steel: Every member, stringers, floor beams, diaphragms, etc. shall receive visual inspection to check for rust, cracks, corrosion or any defects. Removal of wood planking may be required for adequate inspection. This should be coordinated prior to the inspection. If corrosion is noticed, measurements should be made to determine the loss of section and the capacity of the reduced section. If cracks are noticed or suspected, U.T. inspection should be requested from MDOT SHA Metals Section to detect any existing defects. Identify the location of all cracks.

Concrete Stringers: The same inspection procedure used for substructure concrete should be followed.

Bridge Deck: If the bridge deck is to remain, conduct inspection similar to that for deck evaluation for deck replacement program. The visual inspection should include the wearing surface, if any, the top of deck slabs and bottom of deck slabs where no SIP forms were used, the sidewalks and the parapets. Check for cracking, spalling, delamination, deterioration, etc. If necessary, request testing (i.e. cores, GPR, etc.) from MDOT SHA Office of Material Technology, and based on their recommendations, include any rehabilitation work.

Roadway Joints: If the bridge deck is to remain, check for rusting, leakage and joint condition, and, depending on the type joints, determine whether modification such as adding compression seal would be needed. Trough to be added where none exists, if possible.

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Safety Features: Evaluate roadway under, if applicable, as to protection of piers, etc., need for fencing, approach traffic barrier, etc.

Report on Findings

A report shall be prepared describing the existing structure condition and indicating a definite repair procedure and sketches for any deficiencies found in the structure. The recommendations shall be detailed and not general, i.e. Remove and replace 16 feet of Pier 2 cap, replace bearing #5 on Abut A, etc.

The report should include photographs, illustrating any problems. All suggested repair work shall be evaluated and, if approved by the Director, incorporated in the construction contract.

If work for contract has been previously determined, i.e. deck is to be totally replaced, then that portion of inspection and report shall be eliminated. However, a statement should appear in the report indicating these previous decisions.