

 MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION	Office of Structures <i>Guidelines and Procedures</i> <i>Memorandum</i>	INSPECTION
		Number: OOS-GPM-SI-107
		Date: 08-06-2026
Non-Redundant Steel Tension Member (NSTM) Inspection		Approval: 

A Non-Redundant Steel Tension Member (NSTM) is a primary steel member fully or partially in tension, and without load path redundancy, system redundancy or internal redundancy, whose failure may cause a portion of or the entire bridge to collapse. The primary causes of NSTM failure involve fatigue related issues due to live loading, temperature changes and wind loading. In addition, material and construction defects, damage due to transportation and erection, in-service flaws and general overall deterioration due to corrosion may also seriously affect a NSTM. Therefore, NSTM inspections should focus on tension zones and fatigue sensitive details most susceptible to cracking.

NSTM's are trusses, two and three girder systems, pin and hanger assemblies, and floorbeams that are spaced fourteen (14) feet or more. Gusset plates connected to NSTM's are also considered NSTM's. Bridges with NSTMs are identified by the appropriate category of SIA Item 92. For MDOT SHA owned bridges with NSTMs, the inspection reports are maintained in blue folders.

All NSTM's shall have regularly scheduled inspections with intervals not to exceed 24 months unless deemed to require a more frequent inspection as specified in Increased Inspection Frequency, OOS-GPM-SI-105. A hands-on inspection (HOI) of all NSTMs is required by the NBIS and shall be performed in accordance with Hands-On Inspection, OOS-GPM-SI-104. If these areas cannot be reached through the use of the available access equipment, the Lead Inspector must bring this to the attention of the Senior Project Team Leader, SIRE or the LA Program Manager so that efforts can be made to provide rigging or free climbing by trained personnel. A modified hands-on inspection (MHOI) may not be used for NSTMs. However, a MHOI is acceptable for other non-NSTMs on the bridge as approved per the requirements of OOS-GPM-SI-104.

For new or rehabilitated NSTM's, the first NSTM inspection must occur within 12 months of the bridge opening.

For NSTM's over railroads, advance preparation is required to ensure there is adequate time to complete the necessary coordination and permitting with Amtrak, Norfolk Southern, CSX, etc. These preparations shall be made as early as necessary to ensure the designated NSTM inspection frequency is met.

The locations of all NSTM's shall be clearly shown and identified on sketches within the inspection file. It is the responsibility of the Lead Inspector to understand the NSTM details and arrange for the necessary access equipment prior to the inspection. Reference to previous inspection reports will aid the inspection team in determining the condition of the NSTMs.

In addition to the requirements in Routine Inspection, OOS-GPM-SI-106, the inspection team shall use the FHWA's Fracture Critical Inspection Techniques for Steel Bridges manual when inspecting NSTM members.

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All cracks found on a NSTM shall be immediately phoned in to the respective MDOT SHA engineer or LA Program Manager, followed by the procedures specified for documenting an Engineer's Request in Defects, OOS-GPM-SI-118. If the defect has previously been identified, the inspector will follow the procedure determined by the MDOT SHA engineer or LA Program Manager found within the inspection file. If there is any confusion as to the direction needed to be taken by the inspection team, the defect must be immediately phoned in to the MDOT SHA engineer or LA Program Manager.