NJTA Sign Structure Inspection Procedures

New Jersey Turnpike Roadway:

- **Four Chord Truss Overhead Sign**: Inspection of these sign structure types shall be performed preferably during daytime hours utilizing a bucket truck in a Maintenance installed daily shoulder closing for access to the truss members and inspection of the nearest end frame.

For the purposes of inspecting the truss, the “fully tethered” Team Leader (TL), with support from an Assistant Team Leader (ATL) for longer spans, will climb through the truss over live traffic, from the near end frame to the far end frame, providing hands-on inspection of all truss member welds on the all sides of the truss and attached signs. The weldments include connections between cross members (vertical, horizontal, and diagonal) to chord, and connections from the chord(s) to flanges. A small handheld telescopic stick mirror should be utilized where welds are on outside faces of members and not easily visible while climbing. All attachments including end frame to chord, flange to flange, hanger to chord, hanger to stringers stringer to sign panel, and panel to panel shall also receive a hands-on inspection.

Inspection of the sign walkway should also be performed during this shoulder closing, when there is one present. This shall involve the “fully tethered” TL walking the full length of the walkway while raising / pinning sections of the Speed Rail railings.

Access to the far end frame may be achieved after climbing through the length of the truss and climbing down the far end frame, but not when the far end frame is located along a median where the TL or ATL is in close proximity to the travelling vehicles.

A short duration shoulder closing (with of one hour of inspection work allowed within a two hour window in accordance with Drawing TP-7) may be used to inspect the far end frame when climbing down is not possible, but can only be utilized if the shoulder width is 10’ or greater.

An overnight or off-peak Maintenance installed lane closing may be required for a handful of signs where no shoulders are present (typically at toll plazas). These closings will need to be approved by the Authority’s Operations Department.

Note, the Authority requires that a **daily** shoulder closing be installed by maintenance forces for any shoulder closings over a 2-hour duration and will
accommodate a closing up to 5 miles long depending on location and other work being performed on the roadway.

A TMA must be present on the roadway for all overhead sign structure inspections for the full duration of the inspection while the TL is climbing across the roadway. If an ATL is providing support to the TL by also climbing the truss, then a third inspector (spotter) shall be included in the team to remain on the ground in the event anything should occur when climbing the overhead sign trusses.

- **Cantilever / Butterfly Signs:** Inspection of these sign structure types shall be preferably performed by parking behind guide rail, however, utilizing a daytime short duration shoulder closing (one hour of work allowed within a two hour window in accordance with Drawing TP-7) may be required when off roadway access is not available. Inspection of these signs, especially cantilever signs, requires the use of an articulating bucket truck in order to access the portion of the truss over the adjacent travel lane. The articulating bucket truck allows the bucket / arm to stay within the profile of the sign while reaching over the travel lane (see photo). At no point in time shall the bottom of the bucket or arm go below the elevation of the sign panel over live traffic. A demonstration on the use of the articulating bucket truck, particularly to emphasize the need to stay within the profile of the sign and explain the required measurement of mast lean or arm sag, will be provided to the awarded Consultant(s) as deemed necessary. This demonstration MUST be attended by all project approved TLs, ATLs and inspectors. The Authority's Bridge Inspection Program Technical Manager will arrange this demonstration prior to the start of any awarded sign inspections. All truss member welds and attachments on the rear face of the sign shall receive a hands-on inspection.

- **“A” Frame VMS/Hybrid Overhead Sign:** For this type of structure, accessing the structure by parking behind the guide rail is preferred. However, inspection of these sign structures may need to be performed utilizing a daytime short duration shoulder closing (one hour of work allowed within a two hour window in accordance with Drawing TP-7), in order to gain access to the structure’s fully contained maintenance inspection walkway via the caged access ladder and inspection of the end frames. In addition, an eight-point binocular inspection at each end frame shall be performed at high and low vantage points at the front and rear side for the inspection of the outside upper and lower chords of the box truss, and all its attachments.
Use of a short duration shoulder closing will be necessary to conduct an eight-point binocular inspection at the far end frame and for the inspection of the remainder of the outside upper/lower chord of the box truss sign and all its attachments when a closure is not required for inspection of a sign in an adjacent roadway. The inspection of the far end frame may need to be conducted utilizing the shoulder of the adjacent roadway if the sign spans a roadway with a shoulder narrower than 10’ in width at the far end frame. The inspection shall include the use of the fully contained maintenance inspection walkway, utilizing the 8’ step ladder (stored flat on the walkway) at all cross beam locations to assist in the inspection of the chords. When chord flanges are present, a small handheld telescopic stick mirror should be utilized from and through the maintenance walkway. Note: coordination with the Authority’s Operations Department will be needed for a State Police assisted slow-down in order to perform a hands-on inspection for any areas of concern found during the inspection.

**Garden State Parkway Roadway:**

- **Four Chord Truss Overhead Sign:** Inspection of these sign structures requires use of a bucket truck in a daytime short duration shoulder closing (one hour of work allowed within a two hour window in accordance with Drawing TP-7) or in a daily lane closure installed by a vendor for inspection of both end frames, and for an eight point binocular inspection (high and low vantage points from each corner) of the upper/lower truss chord and attached sign panels.

Inspection of the far end frame may need to utilize the left or right shoulder of the adjacent roadway if left shoulder access is not possible in the roadway spanned by the sign. Coordination with the Authority’s Operations Department will be needed for a State Police assisted slow-down in order to perform a hands-on inspection for any areas of concern found during the inspection. **Climbing over live traffic is not allowed for inspection of any sign structures on the Parkway.**

- **Single / Double Plane Vierendeel Overhead Sign:** Inspection of these sign structures requires the use of a bucket truck in a daytime short duration shoulder closing (one hour of work allowed within a two hour window in accordance with Drawing TP-7) for inspection of both end frames and for an eight point binocular inspection at the high and low vantage points from each corner viewing the upper/lower chord and attached signs. Inspection of the far end frame may need to utilize the left or right shoulder of the adjacent roadway if left shoulder access is not possible.
in the roadway spanned by the sign. Coordination with the Authority’s Operations Department will be needed for a State Police assisted slow-down in order to perform a hands-on inspection for any areas of concern found during the inspection. Climbing over live traffic is not allowed for inspection of any sign structure on the Parkway.

• **Cantilever / Butterfly Signs:** Inspection of these sign structures requires the use of an articulating bucket truck in a daytime short duration shoulder closing (one hour of work allowed within a two hour window in accordance with Drawing TP-7). Inspection of these signs, necessitates the use of an articulating bucket truck in order to access the portion of the truss over the adjacent travel lane. The articulating bucket truck allows the bucket / arm to stay within the profile of the sign while reaching over the travel lane (see photo). At no point in time shall the bottom of the bucket or arm go below the elevation of the sign panel over live traffic. Permission must be sought through the Authority’s Operations Department for shut-down of any toll lanes in order to access any cantilever signs at or in the toll plazas.

A demonstration on the use of the articulating bucket truck, particularly to emphasize the need to stay within the profile of the sign and explain the required measurement of mast lean or arm sag, will be provided to the awarded Consultant(s) as deemed necessary. This demonstration MUST be attended by all project approved TLs, ATLs and inspectors. The Authority's Bridge Inspection Program Technical Manager will arrange this demonstration prior to the start of any awarded sign inspections. All truss member welds and attachments on the rear face of the sign shall receive a hands-on inspection.

• **Sign Structures Mounted atop Toll Plaza Canopy:** Inspection of these sign structures requires the use of a ladder / bucket truck from outside of the toll plaza lanes to access the canopy of the toll plaza. Inspectors should walk along the center of the canopy to gain access to the sign(s) and tether off to the sign structure framing while inspecting. The Inspectors must gain permission from the Toll Plaza Sergeant for access. Preservation of the roof membrane / materials is mandatory.

• **“A” Frame VMS/Hybrid Overhead Sign:** See above for procedures for inspection listed under Turnpike “A” Frame VMS/Hybrid overhead sign bridge.
General Provisions

- Hands-on inspection of elevated components of all Sign Structures shall include the following:

  **Inspection of welds including:**
  - All cross member (vertical, horizontal, and diagonal) to chord connections
  - All chord to flange connections
  - All sign structure attachments which shall include end frame to chord and flange to flange connection details

  **Inspection of the sign panels including:**
  - Hanger to chord connections
  - Hanger to stringer connections
  - Stringer to sign panel connections
  - Sign panel to sign panel connections

- For hands-on climbing inspection of four chord trusses on the Turnpike Roadway, “fully tethered” shall mean use of an approved double lanyard harness which is continuously tied off to the top chord of the truss using one or both of the attached lanyards. Where the TL and ATL will be inspecting the truss over live traffic, all clothing, safety equipment, inspection equipment, and other materials shall be securely tethered to the inspector to prevent anything falling onto the active roadway below.

- Shoulder width must be at least 10 feet in order to provide adequate clearance for any TMA or bucket truck used during the inspection.

- Inspection of butterfly or cantilever signs can be performed by parking the articulating bucket truck behind the guide rail (preferred) to minimize exposure of inspection equipment and MPT vehicles to the travelling public. Please note: As mentioned earlier, any kind of climbing over live traffic will require the use of a daily shoulder or lane closing and a TMA in the roadway at all times with an operator in the vehicle.

- Climbing over live traffic is allowed over the Turnpike roadway ONLY.

- No lanyard more than a 6’ long is allowed.

- Lengths of daily shoulder / lane closings can be between 3 to 5 miles (3 mile closing are the preferred limit) in order to inspect as many structures as possible in a single closing, and also minimize the number of closings.
• Minimum required photos are to be taken for each type of sign:

  - **Cantilever / Butterfly:**

    1. Overall general view of the front side of the sign structure (looking in direction of traffic)
    2. Overall general view of the back side of the sign structure.
    3. Close-up view of the sign panel(s) (front face of panel)
    4. General view of the column (showing foundation and any electrical equipment including and/or other attachments)
    5. Close-up of end frame base plate anchorage to pedestal or foundation

  - **Overhead Sign:**

    1. Overall general view of the front side of the sign structure (looking in direction of traffic)
    2. Overall general view of the back side of the sign structure
    3. General view of the nearest end frame (ground level showing foundation and electrical equipment and/or other attachments)
    4. Close-up of end frame base plate (anchorage to pedestal)