

# Frangible Light Standard Installation Inspection Procedure

## Description

This procedure describes the requirements for the installation inspection of frangible light standards.

## General Structure Inspection

### 1) Obtain project plans.

- Upon receiving a work assignment from MDOT, the inspector must contact the project office to coordinate an inspection schedule and obtain the project plans for structure location information. Inspector must review the project plans to ensure all structures requiring inspection are completed. Record all observations on **MDOT form 1450**.

### 2) Establish and record structure location.

- Record MDOT Region, County, Route, GPS coordinates (minimum 10 decimal places) and brief location description.

### 3) Inspect and record structure information.

- Structure Coating
  - Record the type of coating (painted or galvanized) on the structure or whether it is aluminum.
- Arm Connection
  - Stainless steel arm connection bolts require a flat washer and a lock washer on the nut end. Using binoculars, visually inspect the arm connection to the upright. Note any gaps between the bolted flanges, loose or missing hardware, missing caps, cracked welds and cracks at the ends of gusset plates. As a minimum, each bolt end should be at least flush with the nut. If there is not at least a flush condition between the bolt end and the nut, record this in the inspection report. Record any hardware that are missing, damaged, or not in their proper location. All bolts, nuts and washers must be stainless steel or galvanized. Record the number of arms and the type of arm (single or double). Record any signs of corrosion.
- Upright Lean
  - Measure and record the distance the upright leans in relation to the roadway. This must be measured using a 4-foot level and recorded as inches per 4 feet and direction related to the roadway (i.e. upright leans ¼" in 4 feet away from traffic, towards traffic, with traffic or against traffic).

- 4) Inspect and record upright to frangible base bolts connection information (T1-T4).
- Upright to frangible base connection bolts (T1-T4) require a ½" thick flat washer on the bolt head end and a ½" thick flat washer and lock washer on the nut end. If nut or base covers are present, remove and do not replace. Visually inspect the connection for missing or damaged bolts, nuts, washers or lock washers (gouges, corrosion). Ensure connection is tight and lock washers are fully compressed. Also, document any bolts that have been bent to align with holes in the base plate. As a minimum, each bolt end should be at least flush with the top of the nut. If there is not at least a flush condition between the bolt end and the top of the nut, record this in the inspection report.
  - Bolt Plan
    - Mark the bolt numbers on the vertical support with a yellow permanent paint marker corresponding to the example on the inspection reference detail sheet at the end of this procedure for future reference.
  - Bolt Diameter (D1)
    - Measure and record the bolt diameter.
  - Bolt Circle Diameter (BC1)
    - Measure and record the bolt circle diameter.
  - Bolt Projection (P1)
    - Measure and record the distance between the top of the nut and the top of the bolt. Note any bolts that are lower than the top of the nut and measure the depth. Record the measurement as a negative projection.
- 5) Inspect and record frangible base to foundation anchor bolt information (B1-B4).
- Visually inspect the structure base looking for any damage or corrosion and any bolts that have been bent to align with holes in the base plate. Inspect welds in the base looking for cracks or unusual welds. Inspect the base plate, gussets, and vertical support for corrosion, cracks, gouges, dents, etc. Inspect the condition of the concrete foundation, noting any spalling, cracks, voids, and general deterioration.
  - **Prior to inspection of frangible base interior, verify that electricity is OFF using a voltage detector.** Frangible base to foundation anchor bolts require a ½" thick flat washer, lock washer, and nut. Visually inspect the structure base looking for missing or damaged anchor bolts, nuts, washers, or lock washers. Ensure connection is tight and lock washers are fully compressed. Note any damage or corrosion and any bolts that have been bent to align with holes in the base plate or cut off to allow for nut placement. Inspect welds in the base looking for cracks or unusual welds. Inspect the base, gussets, and vertical support for corrosion, cracks, gouges, dents, etc. Inspect the condition of the concrete foundation, noting any spalling, cracks, voids, shimming of the frangible base, and general deterioration.

- Anchor Bolt Plan
  - Mark the bolt numbers with a yellow permanent paint marker on the frangible base corresponding to the example on the inspection reference detail sheet at the end of this procedure for future reference. Attach a plastic tag to the number one anchor bolt including the date of inspection, structure number, and inspector's name and organization or company.
- Anchor Bolt Diameter (D2)
  - Measure and record the anchor bolt diameter.
- Anchor Bolt Circle Diameter (BC2)
  - Measure and record the bolt circle diameter.
- Anchor Bolt Projection (P2)
  - Measure and record the distance between the top of the nut and the top of the anchor bolt. Note any bolts that are lower than the top of the nut and measure the depth. Record the measurement as a negative projection.

6) Place structure ID label on upright.

- Structure Label
  - Install sticker label on structure noting Structure ID #. If sticker labels are not available, a stencil can be utilized in its place.

## Report Writing, Safety and Equipment

### Reporting Procedure

All reports must be detailed and accurate and will be used as evidence of work performed. All reports must have a minimum of one photo of the overall structure attached. Provide additional photos of deficiencies prior to submitting the report to MDOT. All reports must be uploaded to ProjectWise and submitted to [MDOT-Ancillary@michigan.gov](mailto:MDOT-Ancillary@michigan.gov). Files must be named as detailed below:

- 1450 Structure Number CS-JN Date
- Example: 1450 FPS-000001 82194-109971 2017-10-12

### Safety

All inspections and related work must be in accordance with the Department's Personal Protective Equipment (PPE) Policy as stated in the MDOT Guidance Document [10118](#) and MIOSHA safety standards (use of safety apparel and equipment safety guards). Safety apparel and equipment (hard hats, leather gloves, harnesses, lanyards, safety glasses, safety shoes, and safety vests) must be worn by all workers.

Any unusual or potentially dangerous conditions must be reported immediately to the Ancillary Structures Unit at [MDOT-Ancillary@michigan.gov](mailto:MDOT-Ancillary@michigan.gov).

### Equipment/Tool List

- 4 Foot Level
- Binoculars
- Identification Tags
- Yellow Paint Markers
- Tape Measure
- Voltage Detector
- Allen and Socket Wrenches
- *MDOT Form 1450, Frangible Light Standard Installation Inspection Report*

# Inspection Reference Detail

