



# Department of Transportation

ENGINEERING  
INSTRUCTION

**EI**  
**22-017**

Title: **NYSDOT MID-TENSION CABLE BARRIER – DESIGN GUIDANCE**

**SUPERSEDED BY EI 23-029**  
**EFFECTIVE 5/1/24**

Approved:

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Date

## ADMINISTRATIVE INFORMATION:

- Effective Date: This Engineering Instruction (EI) is effective beginning with projects submitted for lettings on or after January 1, 2023
- Superseded Issuances: None
- Superseded Shelf Notes/Special Notes: None
- This EI is being issued in conjunction with EI 22-016 *New Standard Sheet 606-03, Revised Standard Sheet 606-19 and Revised Standard Specifications for Section 606.*
- Disposition of Issued Materials: The guidance will be incorporated into a future revision of Chapter 10 of the Highway Design Manual.

**PURPOSE:** To issue guidance on the use of NYSDOT's new, generic, 38-inch-tall, mid-tension cable guide rail.

## TECHNICAL INFORMATION:

### Overview:

- The Department has developed a MASH-compliant cable guide rail run. The NYSDOT 38-inch cable barrier is a non-proprietary medium-tension cable barrier for use in TL-3, TL-2, or TL-1 situations. Effectively, its use is not restricted by design speed.
- The run has four cables spaced 7 inches apart vertically with the top cable at a height of 38 inches. The normal post spacing is ten feet.
- The system is classified as a mid-tension system as the tension in each cable is to be 1370 pounds for temperatures between 70 and 79 degrees, while the tensions for proprietary high-tension cable systems in that temperature range are 3500 to 5200 pounds.
- The mid-tension cable guide rail will not use spring compensators.
- To handle the increased load due to the extra cable and the slightly increased tension in each cable, the anchor block has been increased in size to four feet wide, three feet deep, and six feet long. This volume is approximately 52% greater than the previous volume.

### Deflection:

- The mid-tension cable run has been successfully MASH tested to TL-3 and had a working width deflection of 9 feet for a 10-foot post spacing.
- Based on test results from the cable to box transition, a 7-foot deflection may be used for a 5-foot post spacing.

### Length:

- The minimum length of the total cable run, between the outer ends of the box terminal and anchor block at the far end should be no less than 500 feet.

- The maximum length of a cable run should be no more than 2,000 feet. In the past, longer were achieved by interlacing ends. However, such an interlaced transition has not yet been designed or crash tested.

### Terminals and Transitions:

- A MASH-compliant terminal is still under development. Until a MASH-compliant cable terminal is available for the NYSDOT mid-tension cable guide rail, ends exposed to approaching traffic should be started with a MASH-compliant box beam terminal and a transition should be made from box beam to the cable run. The transition has been successfully MASH-tested for traffic moving from box to cable.
- A transition for traffic moving from cable to box is in development. Until that becomes available, the transition should not be used where it will be within the clear zone for traffic moving in the direction from cable to box beam.
- On trailing ends not exposed to approaching traffic, a trailing-end terminal, as shown on new Standard Sheet 606-03, may be used.

### Changes to the Standard Specifications:

- The mid-tension cable guide rail will not use spring compensators.
- Eliminated reference to the WyBET (internal fiberglass pipes) as that product is no longer available.
- Revised the Payment Factors table to accommodate the tighter post spacing of the mid-tension cable guide rail.
- Recognize that special circumstances exist where backup posts are connected to the rails.

### Cost:

- Cost Impact: The 4-cable with box terminal and transition is estimated to be competitive with proprietary 4 cable systems and less than the cost of HPBO or box beam.
- As of this issuance, the cable for both generic and proprietary cable guide rail is in short supply. Designers should confirm availability when specifying the use of cable guide rail.

### 3 Cable Barrier:

- The 606-01 Standard Sheets show the previous 29-inch-tall, three-strand, three-cable NYSDOT cable design. This will remain acceptable for use on TL-2 and TL-1 highways, where the posted speed limit is 45 mph or less.
- The traditional transition may be used between box beam and three-cable guide rail for locations where the posted speed is 45 mph or less. The details are included in the 606-19 Standard Sheets.

**Cable Guide Rail Usage Guidelines:**

Activity/Project Type	Posted Speed ≤ 45 mph	Posted Speed > 45 mph
Impact Repair on 3-cable Run w/o Anchor Reset	Repair in kind	
Repair Needing Anchor Reset	Repair in kind	Use MASH-compliant system*
1R	Retain 3-Cable	
2R, 3R on Freeway	Use a MASH-compliant System	
2R, 3R Non-Freeways	Retain 3-Cable	AADT>2000, use MASH*
		New Anchor or 50% posts replaced, use MASH*
		Keep Anchor and <50% posts replaced, retain 3-Cable

\*Use MASH compliant system, whether cable or other.

**IMPLEMENTATION:** Three new cable barrier items have been added:

606.010605	Mid-Tension Cable Guide Rail – 5-foot Post Spacing	Feet
606.010610	Mid-Tension Cable Guide Rail – 10-foot Post Spacing	Feet
606.020101	Mid-Tension Trailing End Cable Terminal	Each
606.8401	Guide Rail Transition Box Beam to Mid-Tension Cable (One Way Only)	Each

**BACKGROUND:** Due to the higher impact energy with the MASH pickup truck, a non-proprietary cable guide rail design was desired that would have mild decelerations; be more robust than the 3-cable system; be more resistant to overrides and underrides; and have deflections similar to the traditionally anticipated values. The new barrier design has a reduced post spacing of ten feet, a fourth cable, and a slightly increased cable tension to limit deflections to that expectation.

**CONTACT:** Question on this issuance may be submitted to [Terry.Hale@dot.ny.gov](mailto:Terry.Hale@dot.ny.gov) or by telephone at 518-485-7009.