CONSTRUCTION SPECIFICATION FOR
STEEL BOX BEAM BARRIER

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551.01 SCOPE

This specification covers the requirements for the erection of galvanized steel box beam guide rail and median barrier.

551.02 REFERENCES

This specification refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, Construction:
OPSS 552 Guide Posts, Cable Guide Rail and Steel Beam Guide Rail

Ontario Provincial Standard Specifications, Material:
OPSS 1103 Emulsified Asphalt
OPSS 1350 Concrete (Materials and Production)
OPSS 1510 Steel Box Beam Barrier

Canadian General Standards Board:
CGSB CAN 2-16.4-M81a - Asphalt, Emulsified, Cationic Type, for Road Purposes

551.05 MATERIALS

551.05.01 Steel Box Beam Guide Rail and Median Barrier

Components and associated hardware shall conform to OPSS 1510.

551.05.02 Emulsified Asphalt

RS-1K emulsion shall conform to OPSS 1103.
RS-2K emulsion shall conform to CGSB CAN 2-16.4-M.

551.05.03 Concrete Anchor Blocks

Concrete in anchor blocks shall conform to OPSS 1350 for 20 MPa concrete at 28 d. Block may be either cast in place or precast.
551.07 CONSTRUCTION

551.07.01 General

The work shall include installing the guide rail and/or barriers, including all anchor blocks, structure approach treatments and end treatments, any field fabrication required during installation, and any other necessary work conforming to the contract requirements.

551.07.02 Post Location

Posts shall be set to the required alignment, spacing and depth at the locations shown in the contract. Permissible tolerance for plum and grade shall be 6 mm maximum.

Posts shall be driven where driving is feasible. The driving shall be accomplished with approved methods and equipment that leave the posts, free of distortion, burring or any other damage.

Where a catch basin, manhole or other structure prevents driving the post in its planned location, the spacing of the posts shall be adjusted and the necessary slots cut into the underside of the steel box beam at the revised post spacing. Any revised spacing shall be approved by the Engineer.

551.07.03 Erection in Paved Median or Shoulder

Where the posts are installed in asphalt pavement, the erection of posts shall be carried out only after all courses of the pavement have been placed and compacted.

The gaps between post and paving, including the split in the paving caused by the ground plate attached to the post, shall be sealed with RS-1K or RS-2K Emulsion conforming to CGSB Can 2-16.4M.

551.07.04 Erection on Concrete Structures

When guide rail or median barrier is erected on a concrete structure or asphalt paved concrete structure, posts fitted with appropriate base plates shall be used. These shall be mounted on the asphalt surface, where applicable, and properly anchored into the concrete structure. Anchors of the length specified shall be used to ensure correct minimum embedment through the asphalt and into the concrete.

The gap between the asphalt and the anchor bolt shall be sealed by filling with RS-1K or RS-2K Emulsion. Where necessary galvanized shims shall be used to ensure that the posts are erected vertically.

Post spacing on structure decks shall be adjusted to ensure that anchor bolts are located at least 100 mm away from any joint in the concrete deck. Any revised post spacing shall be approved by the Engineer.

551.07.05 Erection on Horizontal Curves

Box Beam Guide Rail or Median Barrier required to be set on a horizontally curved alignment shall be restricted to a minimum radius of curvature of 580 m. The necessary change in direction will be accomplished by deflecting the box beam at each splice, the available side clearances for the splice plates being reduced at these locations. Splice bolts shall be tightened uniformly along the curve in order to equalize the deflection at each splice.

For barrier radii between 580 m and 175 m, the necessary changes in direction shall be accomplished by using the splice plate designed for this range in curvature.

551.07.06 Field Fabrication

Field fabrication may be necessary at locations where the post spacing requires adjustment.
The Contractor shall carry out any required field fabrication at the above and any other locations necessary to complete the guide rail or median barrier. Field fabrication shall be carried out by mechanical methods such as sawing, drilling, reaming or slotting. Flame Cutting will not be permitted.

Wherever an ungalvanized surface of the steel box beam barrier is exposed during fabrication the exposed steel shall be immediately cleaned of all oil or grease and coated with a zinc rich paint. After erection, the surface shall be given a second coating of zinc rich paint.

551.07.07 Damage to Galvanizing

The Contractor shall take all precautions necessary to protect galvanizing against damage. Minor abrasions shall be coated with two coats of zinc rich paint. Major abrasion shall be regalvanized.

The method to be used for repair of any damage shall be approved by the Engineer before such work is commenced. The Contractor shall carry out the repair or replace components to the satisfaction of the Engineer.

551.07.08 Anchor Blocks

Anchor Blocks shall conform to OPSS 552.

551.09 MEASUREMENT FOR PAYMENT

551.09.01 Actual Measurement

551.09.01.01 Steel Box Beam Guide Rail - Item
      Steel Box Beam Median Barrier - Item

Measurement for payment will be made in metres of the actual length installed, measured from end to end of each installation.

551.09.02 Plan Quantity Measurement

551.09.02.01 Steel Box Beam Guide Rail - Item
      Steel Box Beam Median Barrier - Item

Measurement for payment is by Plan Quantity, as may be revised by Adjusted Plan Quantity, of the horizontal length in metres along the centre line of the guide rail or barrier from end to end of each installation.

551.10 BASIS OF PAYMENT

551.10.01 Steel Box Beam Guide Rail - Item
      Steel Box Beam Median Barrier - Item

Payment at the contract price for the above tender items shall be full compensation for all labour, equipment and material required to do the work.

551.10.02 Damaged Galvanizing

The costs to repair or replace components because of damaged galvanizing shall be deemed to be included in the contract price for the tender items listed.