CONSTRUCTION SPECIFICATION FOR
STEEL BOX BEAM BARRIER

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551.01 SCOPE

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

551.01.01 Significance and Use of Appendices

Appendices are not a mandatory part of this specification unless invoked by the Owner.

Appendix 551-A: is a commentary appendix to provide designers with information on the use of this specification in a Contract.
551.02 REFERENCES

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

Ontario Provincial Standard Specifications, Construction:

OPSS 552 Steel Beam Guide Rail and Cable 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:

CAN/CGSB-16.4-M89 Emulsified Asphalt, Cationic Type, for Road Purposes

American Society for Testing and Materials:

A 780-01 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

551.05 MATERIALS

551.05.01 Steel Box Beam Guide Rail and Median Barrier

Components and associated hardware shall be according to OPSS 1510.

551.05.02 Emulsified Asphalt

RS-1K emulsion shall be according to OPSS 1103.

RS-2K emulsion shall be according to CAN/CGSB-16.4M.

551.05.03 Concrete Anchor Blocks

Concrete in anchor blocks shall be according to OPSS 1350 with a nominal minimum 28 day compressive strength of 20 MPa. Blocks may be either cast-in-place or precast.

551.07 CONSTRUCTION

551.07.01 General

The work shall consist of the installation of the steel box beam barrier, including all anchor blocks, structure approach treatments and end treatments, any field fabrication required during installation, and any other work specified in the Contract Documents.
551.07.02 Post Location

Posts shall be set to the required alignment, spacing, and depth at the locations specified in the Contract Documents. Permissible tolerance for plumb and grade shall be 6 mm maximum.

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

Where a catch basin maintenance hole, 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 revise post spacing. Any revised spacing shall be approved by the Contract Administrator.

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.

551.07.04 Erection on Concrete Structures

When steel box beam guide rail or steel box beam median barrier is erected on a concrete structure or asphalt paved concrete structure, posts fitted with fabricated steel bases shall be used. These shall be mounted on the asphalt surface where applicable, and anchored into the concrete structure as specified in the Contract Documents.

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 Contract Administrator.

551.07.05 Erection on Horizontal Curves

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

Steel box beam guide rail or median barrier shall be restricted to a barrier radius of 580 m on curves of 580 m radii or greater. The necessary change in direction shall be accomplished by deflecting the box beam at each splice. Splice bolts shall be tightened uniformly along the curve in order to equalize the deflection at each splice.

551.07.06 Field Fabrication

Field fabrication at all locations necessary to complete the guide rail system shall be permitted. Field fabrication shall be carried out by mechanical methods such as sawing, drilling, reaming, or slotting. Flame cutting shall not be permitted.
551.07.07 Damage to Galvanizing

Precautions shall be taken to protect galvanizing against damage. Minor abrasions and cut ends shall be repaired according to ASTM A780. Components with major abrasions shall be repaired or replaced. Repairs or replacement shall be completed with no additional cost to the Owner.

551.07.08 Anchor Blocks

Anchor Blocks shall be according to OPSS 552.

551.09 MEASUREMENT FOR PAYMENT

551.09.01 Actual Measurement

551.09.01.01 Steel Box Beam Guide Rail

Measurement for payment shall be made along the centreline of the system in metres, from end to end of each steel box beam guide rail system installation.

551.09.01.02 Steel Box Beam Median Barrier

Measurement for payment shall be made along the centreline of the system in metres, from end to end of each steel box beam median barrier guide rail system installation.

551.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement.

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 to do the work.
Appendix 551-A: Commentary for OPSS 551, November 2001

Note: This appendix does not form part of the standard specification. It is intended to provide information to the designer on the use of this specification in a Contract.

Designer Action/Considerations

If any other work is required to install steel box beam guide rail or steel box beam median barrier, then this shall be specified in the Contract Documents.

Related Ontario Provincial Standard Drawings

OPSD 914.130, 914.131, 914.132, 914.133, 914.230, 914.231, 914.380, and 914.430.