SECTION 347113- VEHICLE BARRIERS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section includes furnishing and installing vehicle barriers as indicated on the Drawings and as specified herein, including but not limited to the following:

   1. Steel beam guardrail with steel posts.
   2. Concrete-filled steel pipe bollards.

1.2 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:

   1. Section 310000 – EARTHWORK.
   2. Section 321215 – ASPHALT PAVING.
   3. Section 033055 - CAST-IN-PLACE CONCRETE (SITE).

1.3 SUBMITTALS

A. Submit to the Engineer for approval, six complete sets of shop drawings for materials. No materials shall be fabricated or shipped prior to approval of shop drawings by the Engineer.

B. A certificate of wood treatment shall be furnished to the Engineer upon delivery of the treated wood products. Treated wood shall bear the appropriate American Wood Protection Association (AWPA) quality mark for the treatment employed. The certificate shall indicate acceptability of treated wood to receive field-applied stain.

C. Submit layout plan for single faced wood guardrail showing post locations, including end and closure posts.

1.4 QUALITY ASSURANCE

A. Posts and offset blocks that contain unsound knots and shakes, excessive checking, or other defects that may be detrimental to the structural integrity of the completed guardrail system will be rejected and shall not be used.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Beam Guardrail with Steel Posts

1. The steel rail elements and terminal sections shall conform to AASHTO M 180, Class A, Type 1 and shall be zinc coated in accordance with the requirements of AASHTO M 111. Steel I-Beam Posts shall conform to AASHTO M 183 and be zinc coated in accordance with AASHTO M 111.

2. All bolts, nuts and washers shall conform to ASTM A307 and galvanized in conformance with ASTM A153. Driven posts shall be steel I-beam section, 6 ft. – 3 in. in length, weighing 8.5 lbs. per lineal foot.

3. All holes field drilled in the galvanized steel post sections shall be cleaned and painted, before bolts are installed with two coats of paint having a high zinc dust content, for galvanizing repair.

4. Where railing are to be constructed on curves which have a radius of 150 feet or less, the rail elements shall be fabricated to the required radius.

5. The projecting heads of all connection and splice bolts shall be rounded and shallow so that no appreciable projection will obstruct a vehicle sliding along the rail.

B. Bollards

1. Bollard pipe material shall be six (6) inch diameter standard steel pipe, unless otherwise indicated on the Drawings, filled and anchor encased with 3,000 psi cement concrete.

PART 3 - EXECUTION

3.1 STEEL BEAM GUARDRAILS WITH STEEL POSTS

A. Posts shall be installed plumb, in manually or mechanically dug holes, or driven at the required post spacing. Posts set in excavated holes shall be backfilled with gravel borrow, placed in layers, and compacted.

B. A suitable cap shall be used when driving posts to prevent battering of the posts. Posts damaged or distorted as a result of driving shall be removed and replaced with approved posts.

C. The rail shall be erected to form a smooth continuous rail conforming to the required line and grade. The rail elements shall be spliced by lapping in the direction of the traffic or by other approved methods. The holes in the rail element nearer the posts
shall be slotted to facilitate erection and to permit expansion. The rail elements shall make full contact at each splice.

D. The rail elements shall be attached to, and shall make satisfactory contact with each post, by means of a bolt, 5/8 inch in diameter, inserted through the rail elements and the post, with the threaded end of the bolt at the back of the front flange of the post. The rail elements at a splice shall be attached by means of 5/8 inch diameter bolts. A cut steel washer of required size shall be placed beneath the nut. All bolts shall be drawn tight and shall be sufficiently long to extend at least 1/4 inch beyond the nuts after tightening.

3.2 CONCRETE-FILLED STEEL PIPE BOLLARD

A. Install concrete-filled steel pipe bollards at locations indicated on the Drawings in accordance with the applicable details.

END OF SECTION 347113