

**ITEM 606.31 15 M - MEDIAN BARRIER REDIRECTIVE GATING END TERMINAL**  
**ITEM 606.3150 15 M - MEDIAN BARRIER REDIRECTIVE GATING END TERMINAL (COATED)**

**DESCRIPTION.** The Contractor shall furnish and install Median Barrier Redirective Gating End Terminals and Median Barrier Redirective Gating End Terminals (Coated) at locations shown on the plans or where directed by the Engineer, in accordance with the requirements indicated herein, the directions of the manufacturer, or the instructions of the Engineer.

**MATERIALS.** The Median Barrier Redirective Gating End Terminal shall be the Brakemaster 350 manufactured by Energy Absorption Systems, Inc., Chicago, IL.

**Note.** *The Brakemaster 350 system was successfully crash tested in accordance with NCHRP 350. Brakemaster 350s installed under this Contract must be equivalent to the successfully tested articles.*

The Median Barrier Redirective Gating End Terminal shall consist of a rigid front anchor assembly, a breakaway assembly, a brake/tension support, a cable/brake assembly, panel/strap assemblies, diaphragms, and transition straps. It shall be installed in a bidirectional configuration.

The End Terminal components shall meet the following requirements:

**Front Anchor.** The system shall be anchored at the front by a foundation tube anchor assembly. The top of the rigid front anchor shall have two steel tubes conforming to ASTM A36M for attaching the threaded end of the cable/brake assembly and for attaching the two threaded rods of the breakaway assembly. The threaded rods shall also attach the brake/tension support assembly to the anchor assembly.

**Breakaway Assembly.** The breakaway assembly shall consist of a galvanized sheet metal nose which bolts to a lever arm made of ASTM A36M material, and wraps around the arm to attach to the panels on the brake/tension support assembly. The lever arm shall have two steel tube ends connected by two threaded rods, conforming to ASTM A193M grade B7, to the rigid front anchor assembly.

**Brake Tension Support.** The brake/tension support (BTS) shall consist of a rigid channel structure made of ASTM A36M material at the front of the system and shall attach to the rigid front anchor with threaded rods.

**Cable Brake Assembly.** The cable/brake assembly shall consist of two brakes positioned on a galvanized wire rope cable that conforms to Federal Specification RR-W410A, Type III and supported within the brake/tension support.

One end of the cable shall attach to the rigid front anchor. The cable shall then pass through holes in the diaphragms, through holes in the downstream guiderail posts and shall be secured with a large plate washer and nut.

The brakes shall consist of spring plates and brake sleeves. The spring plates and brake sleeves shall provide a friction resistance which decelerates a vehicle impacting the system on the nose. The spring plates shall be made of high strength steel conforming to AISI 4140 alloy steel - AR 400.

**Panel/Strap Assembly.** The panel/strap assembly shall consist of twelve gauge ASTM A36M steel W-beam section panels provided with holes on each end for assembly. The tension straps shall be used to connect panels to diaphragm assemblies.

**Diaphragms.** The diaphragms shall consist of ASTM A36M tubular steel posts with feet, side plates and a cable grommet. Side plates shall be welded to the ends of the top cap of the posts.

**Transition Strap.** A transition strap shall consist of a flat bar strap made of ASTM A36M material which attaches to the diaphragm, panel/strap and downstream guiderail.

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**Galvanizing.** Galvanizing shall conform to §719-01 Galvanized Coatings and Repair Methods. After fabrication, all metal work except the brake assemblies and tension straps shall be galvanized. All welding shall be done prior to galvanizing and shall comply with the requirements specified in the New York State Steel Construction Manual, except that radiographic inspection will not be required.

All bolts, nuts and washers used within the Brakemaster 350 Systems shall be galvanized.

Brake assembly shall be coated with an epoxy coating. The tension straps shall be pre-galvanized sheet steel to prevent corrosion.

**Reflectorization.** The sheet metal nose shall have, in the front facing traffic, alternating 100 mm wide reflectorized stripes and black opaque non-reflectorized stripes diagonally at 45 degrees angle or in chevron formation as indicated on the plans or as directed by the Engineer. The reflectorized stripes shall conform to §730-05, Reflective Sheeting, class B or an approved equal. The pattern shall be at least 300 mm on a side. If no color is given for the reflectorized stripes, the color shall be yellow.

**Coated.** The Median Barrier Redirective End Terminal (Coated) shall comply with the above requirements except metal parts exposed to view, other than the cable brake assembly, shall be painted in accordance with Section 657 Painting Galvanized and Aluminum Surfaces. Unless specified otherwise in the Contract Documents the paint color shall be “Weathered brown” in §708-05 Standard Paint Colors.

**BASIS OF ACCEPTANCE.** Median Barrier Redirective Gating End Terminal will be accepted at the project site on the basis of the Terminal’s conformance to the manufacturer’s drawings and the manufacturer’s certification that the product delivered is in conformance with these specifications. The supplier shall provide two copies of the manufacturer’s drawings and installation instructions through the Contractor to the Engineer at least ten (10) business days prior to the installation of the product.

**CONSTRUCTION DETAILS.** The Contractor shall install the End Terminal only after receiving authorization from the Engineer.

The End Terminal shall bear upon a prepared surface as shown in the plans, or where directed by the Engineer. Necessary site preparation shall have been performed in accordance with the requirements under their respective items.

The Contractor shall be required to complete the Median Barrier End Terminal installation within 5 working days after installation of the HPBO median barrier or removal of the anchor or turned down end, so as to limit the exposure of vehicular traffic to impact with the exposed end of the barrier.

Traffic control devices which may include cones, signs, barricades, etc shall be provided as directed by the Engineer. Those devices shall not be removed until the End Terminal system is fully operational.

In the event the End Terminal or End Terminal (Coated) is damaged, the units shall be promptly repaired. Unless another period is indicated in the Contract documents, promptly repaired shall mean fourteen (14) calendar days from damage.

**METHOD OF MEASUREMENT.** Median Barrier Redirective Gating End Terminal or Median Barrier Redirective Gating End Terminal (Coated) will be measured as the number of End Terminals satisfactorily furnished and installed in accordance with the plans and specifications, directions of the Engineer, and the manufacturer’s instructions. The payment limits extend from the free end of the End Terminal to the center of the first HPBO post which is located approximately 9.95 m from the free end.

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**BASIS OF PAYMENT.** The unit price bid per Median Barrier Redirective Gating End Terminal or Median Barrier Redirective Gating End Terminal (Coated) shall include the cost of all labor, materials, and equipment necessary to satisfactorily furnish and install the units between the above described payment limits. The cost of earthwork, grading, top soiling, and seeding shall be measured and paid for separately. The cost to repair the End Terminal or End Terminal (Coated) damaged by public travel will be borne by the Contractor or by the State in accordance with the provisions of §107-09 Damage.

*Payment will be made under:*

<b>Item No.</b>	<b>Item</b>	<b>Pay Unit</b>
15606.31 M	Median Barrier Redirective Gating End Terminal	Each
15606.3151 M	Median Barrier Redirective Gating End Terminal (Coated)	Each