

# ABC Terminal

## General Specifications

### I. GENERAL

All ABC Terminal systems shall be manufactured for, or on behalf of, Energy Absorption Systems, Inc. of Chicago, Illinois, in accordance with standards and specifications of Energy Absorption Systems, Inc.

### II. DESCRIPTION OF SYSTEM

#### A. General

The ABC Terminal shall consist of steel 'directional' breakaway posts. Each breakaway post shall consist of a Lower Post and an Upper Post which are joined using a Shear Pin.

During a head-on impact, longitudinal forces break the Shear Pin, releasing the Upper Post from the Lower Post. Energy absorption is achieved through friction and deformation as the rail sections slide rearward.

During a side impact along the ABC Terminal the Upper and Lower Posts are designed to remain together, laterally supporting the rail sections, so that the impacting vehicle is smoothly redirected.

#### B. Component Description

1. The Lower Post shall be an 'H' Section to be driven into the ground. The Upper Post shall be a U section that shall slide into the Lower Post and shall be secured to the Lower Post using a stainless steel Shear Pin.
2. The ABC Terminal rail shall consist of a Rear Rail Section, Intermediate Rail Sections and an End Rail and Head Assembly. The rail sections shall be formed W-shape guardrail and shall attach to the posts with Guardrail Spacers. The Intermediate Rail Sections shall have longitudinal slots.
3. The system shall contain a Cable Assembly to provide tension to the downstream rail during side impacts. The tension provided by the Cable Assembly shall be released during head-on impacts.

#### C. Material Specifications

1. All structural steel and energy absorbing materials in the ABC Terminal shall be new and manufactured in accordance with Energy Absorption Systems' standards and specification.

2. Metal work shall be fabricated from Fe 430B (UNI-EN10025) steel or approved equivalent, except for the Shear Pin and Breaking Plate which shall be stainless steel conforming to AISI 316 or approved equivalent. After fabrication, metal work shall be galvanized in accordance with UNI5744/66 to a minimum weight of 300 g/m<sup>2</sup> of zinc applied to each surface, unless otherwise specified. All welding shall be done by or under the direction of a certified welder.
3. The system shall be assembled with galvanized fasteners. All bolts, nuts and washers shall be as specified by Energy Absorption Systems, Inc.

### **III. PERFORMANCE CRITERIA**

A. An ABC Terminal system shall be tested to the European criteria as described in part 4 of EN 1317 - "Road Restraint systems".

1. Test TT 2.1.100: Impact at 0 degrees into the nose of the device (at a ¼ offset towards roadside) at 100 km/h with a 900 kg vehicle.
2. Test TT 1.3.110: Impact at 0 degrees into the nose of the device (centerline of the device) at 110 km/h with a 1500 kg vehicle.
3. Test TT 4.3.110: Impact at 15 degrees into the side of the device (at 2/3 L) at 110 km/h with a 1500 kg vehicle.
4. Test TT 5.1.100: Impact at 165 degrees into the side of the device (at ½ L) at 100 km/h with a 900 kg vehicle.

B. Evaluation Criteria

1. For the applicable tests (Section III.A. above) the ABC Terminal shall meet the occupant risk criteria as recommended in part 4 of EN 1317. For vehicles weighing between 900 and 1500 kg, the Theoretical Head Impact Velocity (THIV), shall be less than 44 km/h for tests 1 and 2 and 33 km/h for tests 3 and 4 as shown above in Section III.A. The Post-impact Head Deceleration (PHD) shall be less than or equal to 20 g. The Acceleration Severity Index (ASI) shall be less than or equal to 1.4.
2. The ABC Terminal shall be designed and constructed so there is no solid debris that separates from the system which can create a hazard on the roadway after either head-on or side angle design impacts.

### **IV. FIELD INSTALLATION**

Installation of the ABC Terminal shall be accomplished in accordance with the recommendations of Energy Absorption Systems, Inc.