

# **EASI-Cell<sup>TM</sup>**

## **General Specifications**

### **I. GENERAL**

All EASI-Cell systems shall be designed and manufactured by Energy Absorption Systems, Inc. of Chicago, Illinois.

### **II. DESCRIPTION OF SYSTEM**

#### **A. General**

1. The EASI-Cell shall consist of a matrix of vertically oriented energy absorbing cylinders and a steel or concrete backup. Each cylinder is attached to the adjacent cylinder. The EASI-Cell shall be 990 mm [39"] tall. The number and configuration of cylinders comprising a full system depends upon site configuration.
2. Custom configurations of EASI-Cell may be designed with input from the customer regarding the geometry of the site.

#### **B. Component Description**

1. The EASI-Cell shall be 990 mm [39"] tall and shall consist of High-Density Polyethylene (HDPE) cylinders. The cylinders shall have an outside diameter of 324 mm [12.75"]. The EASI-Cell system shall have cylinders with wall thickness of 19 mm [0.75"] and 10 mm [0.375"].
2. The cylinders shall be fastened to one another with galvanized fasteners. They shall be joined at the top and bottom wherever they contact another cylinder. Attachments to the structural backing system shall be accomplished with straps and/or fasteners as specified by the manufacturer.

#### **C. Material Specifications**

1. All structural steel and energy absorbing materials in the EASI-Cell shall be new and domestically manufactured. The cylinders shall be made from HDPE.
2. Metal work shall be fabricated from ASTM A-36 steel. After fabrication, metal work shall be galvanized in accordance with ASTM A-123. 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 Commercial Quality “American National Standard” unless otherwise specified.

### **III. PERFORMANCE CRITERIA**

- A. An EASI-Cell system measuring 1.30 m (51”) x 2.59 m (102”) not including the backup and consisting of four cylinders 19 mm (.75”) thick in the front row and 28 cylinders 10 mm (.375”) thick in the other rows, shall be tested per the recommended criteria set forth in National Cooperative Highway Research Program (NCHRP) Report 350, 1993, Test Level 1 for non-redirective terminals and crash cushions as follows:
  1. Test 1-41 Impact at 0 degrees into the nose of the device (centerline of the device) at 50 km/h with a 2000 kg vehicle.
  2. Test 1-43 Impact at 15 degrees into the nose of the device (at the centerline of the device) at 50 km/h with a 2000 kg vehicle.
  3. Test 1-42 Impact at 15 degrees into the nose of the device (at the centerline of the device) at 50 km/h with a 820 kg vehicle.
  4. Test 1-44 Impact at 20 degrees at the midpoint (L/2) of the device at 50 km/h with a 2000 kg vehicle.
- B. Evaluation Criteria
  1. For the applicable tests (Section III.A. above) the EASI-Cell shall meet the occupant risk criteria as recommended in NCHRP 350. For vehicles weighing between 820 and 2000 kg [1,810 and 4,410 lbs], the theoretical impact velocity of a hypothetical front seat passenger against the vehicle’s interior (calculated from vehicle acceleration and 600mm [24”] forward displacement) shall be less than 12m/s [39.4 ft/sec], and the vehicle’s highest 10 millisecond average acceleration subsequent to the instant of the hypothetical passenger impact shall be less than 20 G’s.
  2. The EASI-Cell 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.
  3. Configurations other than that described in Section III A. will not be tested to NCHRP 350.

4. The EASI-Cell will be able to withstand multiple impacts without cylinder replacement. However, all cylinders require replacement when the minor axis of the cylinders in the rear most row (against the backup) measures 230 mm or less (9" or less). Except due to impact damage, it's anticipated that the plastic cylinders will survive in a highway environment for a period ranging from 5 to 15 years from the date of installation.

#### **IV. STRUCTURAL BACKING SYSTEMS**

The vertical backup wall must be capable of resisting the imposed forces transferred through the EASI-Cell during impact. The backup wall may be reinforced concrete structure or a rigidly braced steel structure.

#### **V. DRAWING SITE DATA**

Engineering drawings shall be prepared by the manufacturer and submitted to the client for approval. All designs and drawings shall be based on design criteria specified by the client. Proposal and assembly drawings shall be submitted upon the client's request.

#### **VI. FIELD INSTALLATION**

Installation of the EASI-Cell shall be accomplished in accordance with the recommendations of Energy Absorption Systems, Inc.