

**TECHNICAL
BRIEF**

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Product Specifications

X-Lite
Redirective, Gating End Terminal

I. General

The X-Lite system is a Re-directive, Gating End Terminal in accordance with the definitions in the National Cooperative Highway Research Program Report 350 (NCHRP Report 350). The system has been tested in tangent and flared configurations and performs in an acceptable manner in accordance with the guidelines of NCHRP Report 350 at Test Level 3 (100 km/h).

II. Performance

The X-Lite system is designed to absorb or re-direct the impact energy of an errant vehicle in accordance with NCHRP Report 350 guidelines for Re-directive, Gating terminals and crash cushions. The system is designed to attach to the ends of guardrail systems. When installed in accordance with the manufacturer's instructions, the X-Lite system is capable of safely stopping or re-directing a 4,400 lb (2,000 kg) pickup truck impacting the system at 100 km/h (62.3 mph), 0 degrees and an 1,800 lb (820 kg) compact vehicle impacting the system at 100 km/h (62.3 mph), 0 degrees and with an offset of the vehicle and the system centerlines of one-fourth the vehicle width.

- A. When properly installed according to the manufacturer's recommendations, the system shall be able to meet the recommended structural adequacy, occupant risk, and vehicle trajectory criteria set forth in the NCHRP Report 350 for Test Level 3 (100 km/h) Re-directive, Gating terminals and crash cushions (NCHRP Report 350 TL-3). The NCHRP Report 350 TL-3 Test Matrix includes the following conditions:
1. A 2000 kg vehicle at 0 degrees and centered on the front of the system (3-31).
 2. An 820 kg vehicle at 0 degrees with an offset of the vehicle and the system centerlines of $\frac{1}{4}$ the vehicle width (3-30).
 3. A 2000 kg vehicle at 20 degrees impacting at the BLON (3-35).

- B. The impact velocity of a hypothetical front seat passenger against the vehicle interior as calculated from the longitudinal vehicle acceleration and 23 5/8 inches (600mm) forward displacement, and the lateral vehicle acceleration and 12 inches (300 mm) lateral displacement, shall be less than or equal to 39.3 ft/sec (12 m/s). The highest 10 ms average acceleration in the longitudinal and lateral directions subsequently to the instant of hypothetical occupant impact shall be less than or equal to 20 g's in the NCHRP Report 350 testing matrix of the X-Lite system.

Detached debris shall not show potential to penetrate the vehicle occupant compartment or present a hazard to other traffic, pedestrians, or workers in a work zone. The panels shall not deform in a manner that would present a hazard to adjacent traffic, pedestrians, or workers. The vehicle shall remain upright during and after the collision, although moderate roll, pitch, and yaw may occur. Vehicle deformations shall not cause intrusion into the occupant compartment in excess of 6 inches (150 mm).

III. Description of the System

- A. The X-Lite system shall be made up of the following components and the system shall be fabricated from materials conforming to the following specifications:
 - 1. Posts
 - a. The posts shall be fabricated using AASHTO M 270 / M 270M grade 36 steel and shall be hot dipped galvanized in accordance with ASTM A-123. Post should be W6x8.5 or W6x9.
 - 2. Rail Elements
 - a. The rail elements shall conform to AASHTO RWM02A or equivalent.
 - 3. Impact Head
 - a. The impact head shall be fabricated from hot rolled steel in accordance with ASTM A-36 steel or equivalent and hot dipped galvanized in accordance with ASTM A-123.
 - 4. Slider Assembly
 - a. The slider panel (front) shall be fabricated using a guardrail conforming to AASHTO M180 or equivalent.

- b. The slider panel (back) shall be fabricated using hot rolled steel in accordance with ASTM A-36 or equivalent and hot dipped galvanized in accordance with ASTM A-123.
- c. The slider bracket shall be fabricated using hot rolled steel in accordance with ASTM A-36 or equivalent and hot dipped galvanized in accordance with ASTM A-123.

5. Blockouts

- a. Composite blockouts shall be fabricated from polyethylene.
- b. Timber blockouts shall conform to AASHTO PDE01 or equivalent.

6. Ground Strut

- a. The ground strut shall be fabricated using ASTM A-36 steel or equivalent and hot dipped galvanized in accordance with ASTM A-153.

7. Soil Plate

- a. The soil plate shall be fabricated using ASTM A-36 steel or equivalent and hot dipped galvanized in accordance with ASTM A-123.

8. Cable Assembly

- a. The cable assembly shall conform to AASHTO FCA01 or equivalent.

9. Fasteners

- a. All fasteners shall be Class 5.8 (Grade 2) or greater and galvanized in accordance with ASTM 153. Washers shall be hardened and galvanized.

- B. The X-Lite shall be assembled and installed in accordance with the manufacturer's instructions.

IV. Application of Safety Appurtenances

Highway safety appurtenances should be applied to hazardous sites in accordance with the guidelines and recommendations set forth in the American Association of State Highway Transportation Officials (ASSHTO), "Roadside Design Guide," and other Federal Highway Administration and State Department of Transportation requirements. Placement of the X-Lite system must comply with these specifications and guidelines as well as those of the manufacturer.