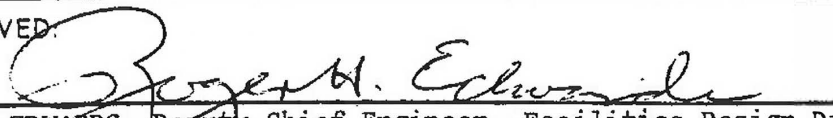


TO: SUPERSEDED BY EI 95-013 EFFECTIVE 3/7/95	<h1>ENGINEERING INSTRUCTION</h1> <p>NEW YORK STATE DEPARTMENT OF TRANSPORTATION</p>
Distribution: <input checked="" type="checkbox"/> Main Office <input checked="" type="checkbox"/> Regions <input checked="" type="checkbox"/> Special	SUBJECT: OMNI-DIRECTIONAL BREAKAWAY BASE AND HINGE ASSEMBLIES Subject Code: 7.27-1-645
APPROVED:  R. H. EDWARDS, Deputy Chief Engineer, Facilities Design Division	Code: <u>82-58</u> Date: <u>10/4/82</u> Supersedes:

This Engineering Instruction establishes guidelines for the use of omni-directional breakaway base and hinge assemblies for sign posts and transmits Standard Sheet 645-30, Omni-Directional Breakaway Base and Hinge Assembly, and Special Specification 15645.42XX, Omni-Directional Breakaway Base and Hinge Assembly. An omni-directional breakaway base and hinge assembly provides satisfactory crash impact performance when hit from any direction. It consists of a breakaway device at the base of the post and a hinge device near the bottom of the sign panel.

Present policy is to use slip base sign posts for all of the larger ground mounted signs except those behind guide rail. Our standard slip base functions satisfactorily for impacts from the front within about 30° of its axis. Sometimes there are situations where impacts are likely from angles greater than 30° for which the standard slip base will not be effective. In order to provide better protection in such situations the Omni-Directional Breakaway Base and Hinge Assembly should be used for ground mounted signs requiring posts larger than Type A Sign Supports when the sign is likely to be struck at angles of 30° or greater such as: close to intersections, opposite T intersections, and islands.

Suitable omni-directional breakaway bases and hinge assemblies are covered by the attached special specification and standard sheet. Designers should determine the appropriate post section by using the sign area wind load charts on the standard sheet. Where larger post sizes are needed, the posts will be placed behind guide rail in accordance with the fixed object protection requirements of Chapter 10 of the Highway Design Manual.

It is anticipated that approved proprietary breakaway bases and hinge assemblies covering a wider range of post sizes will be available in the future. You will be notified when such bases are approved.

This Engineering Instruction will take effect with the letting of March 3, 1983.

15645.42XX OMNI-DIRECTIONAL BREAKAWAY BASE AND HINGE ASSEMBLY

Description: This work shall consist of furnishing and installing omni-directional breakaway base and hinge assemblies at the locations indicated on the plans and where directed by the Engineer. An omni-directional breakaway base and hinge assembly shall provide satisfactory impact performance when struck from any direction.

Materials: Materials shall satisfy the requirements of Subsection 645-2 except as modified by this specification. The omni-directional breakaway base and hinge assembly shall be either as shown on the standard sheets or as approved by the Director, Materials Bureau. Acceptable products will be placed on an approved list.

The following information shall be submitted to the Director, Materials Bureau, by the Manufacturer when requesting approval:

1. ASTM or other generally accepted standard designation for all of the materials used.
2. Results of tests or other documentation acceptable to the Director, Materials Bureau that the assembly of breakaway base, post, hinge assembly, and sign panel satisfies crash impact requirements for any impact direction as determined by either of the following test procedures:
 - a. Testing shall satisfy the testing requirements given in Transportation Research Circular, Number 191, for breakaway or yielding supports, for 2250 lb. vehicles at 20 and 60 MPH with a maximum change of momentum of 1100 lb. sec.
 - b. Testing shall satisfy the testing procedure requirements and evaluation criteria given in National Cooperative Highway Research Program Report 230, for breakaway or yielding supports, for either a 2250 or 1800 lb. vehicle.

Manufacturers considering tests shall submit their test proposal to the Director, Materials Bureau for approval before conducting the tests.

3. Either design calculations or test results demonstrating that the breakaway base, and post develops the full strength of the post section without yielding or buckling and that the hinge develops a moment of more than 50 percent and less than 75 percent of the post yield moment before releasing. Calculations shall be based on the allowable unit stresses given in AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals". Manufacturers considering demonstration by testing shall submit their test proposal to the Materials Bureau for approval before conducting the tests.
4. Specifications and drawings containing all pertinent construction details and materials. The drawings shall be neatly drawn and approximately 18 by 12 inches. The drawings and specification sheets shall be dated and uniquely identified by the manufacturer by number and/or letter.

Assemblies approved by the Materials Bureau will be placed on the Department's Approved List titled "Omni-directional Breakaway Bases and Hinge Assemblies". The listing will identify the manufacturer and the approved drawings and specifications.

Omni-directional Breakaway Bases and Hinge Assemblies shall be accepted by the Engineer at the contract site based on compliance with either the details on the standard sheets or listing on the Department's Approved List and conformance with the manufacturer's approved specifications and drawings.

Construction Details: The requirements of Subsection 645-3 shall apply, together with the following:

The breakaway base and hinge assembly supplied shall be fabricated and installed in accordance with the standard sheets or the Approved Drawings and specifications which appear on the Department's Approved List titled "Omni-Directional Break-away Base and Hinge Assembly". For assemblies on the Approved List, the Contractor shall submit 2 copies of the manufacturer's drawings and specifications to the Engineer at least 10 working days prior to the date the Contractor erects the materials. The specifications and drawings shall be clear, legible and neatly drawn. The Engineer shall review the submitted drawings and specifications and verify that they comply in all respects with the approved drawings and specifications on the Approved List.

Method of Measurement: The unit to be measured for payment will consist of one breakaway base assembly with hinge assembly satisfactorily furnished and installed.

Basis of Payment: The unit price bid shall include the cost of furnishing all material, labor and equipment necessary to complete the work. Post and footing will be paid for under another item.

Payment will be made under:

<u>Item No.</u>	<u>Item</u>	<u>Pay Unit</u>
15645.4201	Omni-directional breakaway Base and Hinge Assembly - W6X9 Post	Each
15645.4202	Omni-directional Breakaway Base and Hinge Assembly - W6X12 Post	Each