To:		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 97-004
SUPERSEDED BY EI 04-035 EFFECTIVE 1/13/05			

Title: **BREAKAWAY WOODEN SIGN POSTS**

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Approved:

P. J. Clark, Deputy Chief Engineer, Design Division — Date: 2/3/97

Administrative Information: This Engineering Instruction will be effective with the letting of 6/12/97. It transmits specifications for breakaway wooden sign posts, and guidelines on when and when not to use these specifications. For consistency with other metric sign specifications, the metric version of this specification is for posts only, with the panel being paid for separately. The non-metric version of this specification, however, includes payment for the panel, as do the other non-metric sign specifications.

Background: Wooden sign posts are frequently desired for their aesthetic qualities, especially on parkways. The wood post sections described in the attached specifications are all off-the-shelf sizes, and have all been satisfactorilly crash tested and approved by the FHWA. The design tables included in these specifications are based on the Group 2 overload allowance of 140% of the basic allowable design stress of 1200 psi (8268 kPa), according to Section 1.2.6 of the Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO, 1994. The wind pressures were also taken from that AASHTO specification, and the panel shape coefficient was assumed to be 1.2.

Usage Guidelines: Wooden sign posts may be used wherever desired, but the following considerations should be kept in mind when deciding whether or not to use these posts. The usual reason for selecting wooden sign posts is for aesthetics on parkways or on scenic roads, but wooden sign posts are more difficult and time consuming to maintain (ie, replace). Wood post sign structures would probably require complete replacement after impact, which could take a considerable amount of time during which the sign would be out-of-service. Therefore, breakaway wooden sign posts may be appropriate either where the requirement for aesthetics is high, or where the possibility of impact is low. However, designers should consider weathering steel slip base sign posts as a compromise alternative for maintenance purposes and minimum down time.

Contact Person: Any questions on this EI may be addressed to Richard Stempel of the Design Quality Assurance Bureau at (518) 457-5440.

woodpost.ei, disk 26

ITEM 15645.17 - TRAFFIC SIGNS WITH BREAKAWAY WOODEN POSTS

DESCRIPTION. This work shall consist of furnishing and erecting traffic signs using breakaway wooden sign posts at the locations shown on the plans. The sign post installation shall be in accordance with Section 645, Guide Signs, Traffic Signs and Special Devices, except as modified herein.

MATERIALS. Wood posts used for traffic signs shall comply with the requirements of §712-14, Stress Graded Timber and Lumber. The lumber shall be Southern Pine, grade 2 (as designated by the National Design Specification for Wood Construction) or equivalent, and use the clear wood properties of ASTM D2555. The bending stress (Modulus of Rupture) shall not be less than 4000 psi.

All timber and lumber shall be dried to a maximum moisture content of 15% before and after pressure treating. All timber and lumber shall be pressure treated in accordance with § 708-31, Wood Preservative - Water Borne. The bottom 50 inches of the posts shall be sealed with a heavy coat (10-20 mils dry film thickness) of coal-tar bitumin conforming to AASHTO Designation M 118-79.

The dimensions of the posts shall be a nominal 4X4, 4X6, or 6X8, with the longer dimension installed perpendicular to the face of the sign. The 4X6 posts require two 1.5" diameter holes drilled perpendicular to the flow of traffic, located at the center of the post 4" and 18" above ground level, and filled with flexible caulking as per §705-06. The 6X8 posts require two 3" diameter holes drilled perpendicular to the flow of traffic, located at the center of the post 4" and 18" above ground level, and also filled with flexible caulking.

The sign panel shall meet all the requirements of Item 645.07, Guide Sign-Aluminum.

CONSTRUCTION DETAILS. Wood sign posts shall be installed at the locations shown on the plans in accordance with Subsection 645-3 and the table below. Each sign panel stringer to post attachment point shall be bolted completely through the post using two $^{3}/_{8}$ inch diameter aluminum alloy bolts with nuts and washers. The posts shall be embedded in the ground 5' for the 4X4 post, 6' for the 4X6 post, and 7' for the 6X8 post; and backfilled with compacted material meeting the requirements of cushion sand or stone screenings and/or a mixture of Portland Cement Type 2 and water in the ratio of 5.5 gallons per bag.

The Geotechnical Engineering Bureau and the Structures Division should be consulted under the following circumstances:

A. Post is placed in soft clay or organic deposit, **or**

B. Groundwater elevation is within minimum embedment.

METHOD OF MEASUREMENT: Work shall be measured as the number of square feet of sign panel fabricated and erected. The area of sign panel shall be measured as the product of the plan height and width. The area shall be computed to the nearest 0.1 square foot with no reduction for rounded corners.

BASIS OF PAYMENT: The unit price per square foot of sign panel shall include the cost of all labor, materials and equipment necessary to complete the work as detailed in the specification.

ALLOWABLE SIGN AREAS* (SQUARE FEET) ON 2-POST SUPPORTS

NOMINAL WOOD POST SECTION	60 MPH WIND ZONE				70 MPH WIND ZONE			
	HEIGHT TO PANEL CENTROID				HEIGHT TO PANEL CENTROID			
	6'	**8'**	**10'**	**12'**	**6'**	**8'**	**10'**	**12'**
4 X 4	23.1	17.4	13.9	11.6	16.3	12.3	9.8	8.2
4 X 6	56.0	42.0	33.6	28.0	39.6	29.7	23.7	19.8
6 X 8	156.4	117.3	93.8	78.2	110.4	82.8	66.2	55.2

* For 3-post supports, outer posts shall be separated more than 8 feet, and allowable sign areas may be increased by 50%. For 1-post supports, allowable sign areas shall be decreased 60%.

ITEM 15645.1701 M - BREAKAWAY WOODEN SIGN POST, 89 X 89 SECTION
ITEM 15645.1702 M - BREAKAWAY WOODEN SIGN POST, 89 X 140 SECTION
ITEM 15645.1703 M - BREAKAWAY WOODEN SIGN POST, 140 X 190 SECTION

DESCRIPTION. This work shall consist of erecting roadside traffic signs using breakaway wooden sign posts at the locations shown on the plans. The sign installation shall be in accordance with Section 645, Guide Signs, Traffic Signs and Special Devices, except as modified herein.

MATERIALS. Wood posts used for roadside traffic signs shall comply with the requirements of §712-14, Stress Graded Timber and Lumber. The lumber shall be Southern Pine grade 2 (as designated by the National Design Specification for Wood Construction) or equivalent and, using the clear wood properties of ASTM D2555, the bending stress (Modulus of Rupture) shall not be less than 27000kPa.

All timber and lumber shall be dried to a maximum moisture content of 15% before and after pressure treating. All timber and lumber shall be pressure treated in accordance with § 708-31, Wood Preservative - Water Borne. The bottom 1.25 meters of the posts shall be sealed with a heavy coat (0.3-0.5 mm dry film thickness) of coal-tar bitumin conforming to the AASHTO Designation M 118-79.

The actual dimensions of the posts shall be 89 X 89 or 89 X 140 or 140 X 190 mm, with the longer dimension installed perpendicular to the face of the sign. The 89 X 140 mm posts require two 38 mm diameter holes drilled perpendicular to the flow of traffic, located at the center of the post 100 mm and 450 mm above ground level, and filled with flexible caulking. The 140 X 190 mm posts require two 75 mm diameter holes drilled perpendicular to the flow of traffic, located at the center of the post 100 mm and 450 mm above ground level, and also filled with flexible caulking.

The sign panels shall meet all the requirements for Ground Mounted Sign Panels, Item 645.71XX M or Item 645.73 M.

CONSTRUCTION DETAILS. Wood sign posts shall be installed at the locations shown on the plans in accordance with §645-3 and the table below. Each sign panel stringer to post attachment point shall be bolted completely through the post using two 10 mm diameter aluminum alloy bolts with nuts and washers. The posts shall be embedded in soil 1.5 m for the 89X89 post, 1.8 m for the 89X140 post, and 2.1 m for the 140X190 post; and backfilled with compacted material meeting the requirements of cushion sand or stone screenings and/or a mixture of Portland Cement Type 2 and water in the ratio of 21 liters per bag of cement.

The Geotechnical Engineering Bureau and the Structures Division should be consulted under the following circumstances:

A. Post is placed in soft clay or organic deposit, **or**

B. Groundwater elevation is within minimum embedment.

METHOD OF MEASUREMENT. This item shall be measured as the number of wooden sign posts, of the specified section, furnished and erected in accordance with these specifications.

BASIS OF PAYMENT. The unit price per sign post shall include the cost of all labor, materials and equipment necessary to complete the work as detailed in the specification. The sign panels shall be paid for separately under Item 645.71XX M or Item 645.73 M - Ground Mounted Sign Panels.

ITEM 15645.1701 M - BREAKAWAY WOODEN SIGN POST, 89 X 89 SECTION
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ALLOWABLE SIGN AREAS* (SQUARE METERS) ON 2-POST SUPPORTS

WOOD POST SECTION mm	97 KPH WIND ZONE				113 KPH WIND ZONE			
	HEIGHT TO PANEL CENTROID				HEIGHT TO PANEL CENTROID			
	1.8 m	**2.4 m**	**3.0 m**	**3.6 m**	**1.8 m**	**2.4 m**	**3.0 m**	**3.6 m**
89 X 89	2.15	1.61	1.29	1.08	1.52	1.14	0.91	0.76
89 X 140	5.21	3.90	3.12	2.60	3.67	2.76	2.20	1.84
140 X 190	14.53	10.90	8.72	7.26	10.26	7.69	6.15	5.13

* For 3-post supports, outer posts shall be separated more than 2.4 meters, and allowable sign areas may be increased by 50%. For 1-post supports, allowable sign areas shall be decreased 60%.