



U.S. Department
of Transportation

**Federal Highway
Administration**

July 31, 2000

400 Seventh St., S.W.
Washington, D.C. 20590

Refer to: HSA-1

Mr. Jim Teller
Vice President, Traffic Products Division
Unistrut Distribution company
1140 West Thorndale Avenue
Itasca, Illinois 60142

Dear Mr. Teller:

Thank you for your July 28, 1999, letter to Mr. Nicholas Artimovich requesting acceptance of the Poletech Sign Support System using the Permanent Underground Base (PUB) as a breakaway support for use on the National Highway System (NHS). Accompanying your letter was a report of crash testing done at Texas Transportation Institute dated June 1999. Drawings of the PUB and videos of the crash tests were received in March 2000, in response to our request of September 28, 1999.

Introduction

Testing of the supports was in compliance with the guidelines contained in the National Cooperative Highway Research Program (NCHRP) Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials' (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

The test articles each consisted of a 1219-mm x 1219-mm metal sign supported by two 50-mm x 50-mm unistrut perforated square steel tube (PSST) posts. Each post had a wall thickness of 2.67-mm (12 gage). The sign was mounted at a height of 2160-mm to the bottom. The foundations consisted of two 300-mm x 300-mm x 508-mm deep concrete foundations. A metal PUB was installed 457-mm into each foundation with an upper and lower polymer bung inserted into the PUB. The polymer bungs helped to secure the posts inside the metal PUBs. The center-to-center distance between posts was 762-mm. Details of the tested system are shown in the enclosed drawings.

Testing

A summary of the crash tests is presented in the following table.

Test No.	4000001-UDC1	4000001-UDC2
NCHRP 350 Designation	3-60	3-61
Vehicle Mass	820 kg test inertial mass	820 kg test inertial mass
Vehicle Impact Speed	35.0 km/h	98.5 km/h
Soil Type	conc. footer in standard soil	conc. footer in standard soil
Impact Angle	0 degree	0 degree
Occupant Impact Speed	4.0 m/s	4.5 m/s
Vehicle Velocity Change	3.9 m/s	5.0 m/s
Windshield Damage	None	Cracking radiating from point of contact at roof line
Vehicle Deformation ¹	Floor pan torn and deformed 5 mm.	50 mm crush at roof line. Minor bumper & hood dents
Stub Height	(see note 2 below)	

Notes:

1. The left post formed an elbow when pulling out of the PUB during the 35 km/h test. This elbow struck the underside of the test vehicle, tearing open a 55-mm x 70-mm hole in the floor pan. There was no sign of penetration or intrusion into the passenger compartment. The 50-mm maximum deformation of the roof during the 98.5 km/h test is within the 125-mm tolerance allowed by Federal Highway Administration (FHWA) for roof deformation under impact by luminaire supports in a memorandum dated August 19, 1994.
2. In both tests one post pulled completely out of the PUB while the second was partially pulled out. The post that partially pulled out broke (35 km/h test) or bent (98.5 km/h test). The height of the resultant "stubs" were near the 100-mm allowed, but are not considered "substantial."

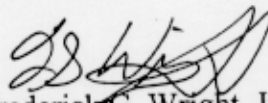
Findings

The tested supports met the change in velocity and stub height requirements of the AASHTO Standard Specifications and NCHRP Report 350. There were no excessive deformations of the passenger compartment and no penetration of the windshield. Therefore, the Politech sign support system using one or two 12-gage, 50-mm x 50-mm PSST posts and the PUB in a concrete foundation is acceptable for use in standard soils on the NHS within the range of conditions tested, when requested by a State.

Please note the following standard provisions which apply to FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-85, shall not be reproduced except in full.
- The PUBs are patented products and considered "proprietary." If proprietary devices are specified for use on Federal-aid projects, except exempt, non-NHS projects, they:
 - (a) must be supplied through competitive bidding with equally suitable unpatented items;
 - (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or;
 - (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,



Frederick G. Wright, Jr.
Program Manager, Safety

2 Enclosures

FHWA:HSA-1:NArtimovich:lb:x61331:7/27/00

cc: Chron 3407, Reader 3407
HSA-1(NArtimovich)

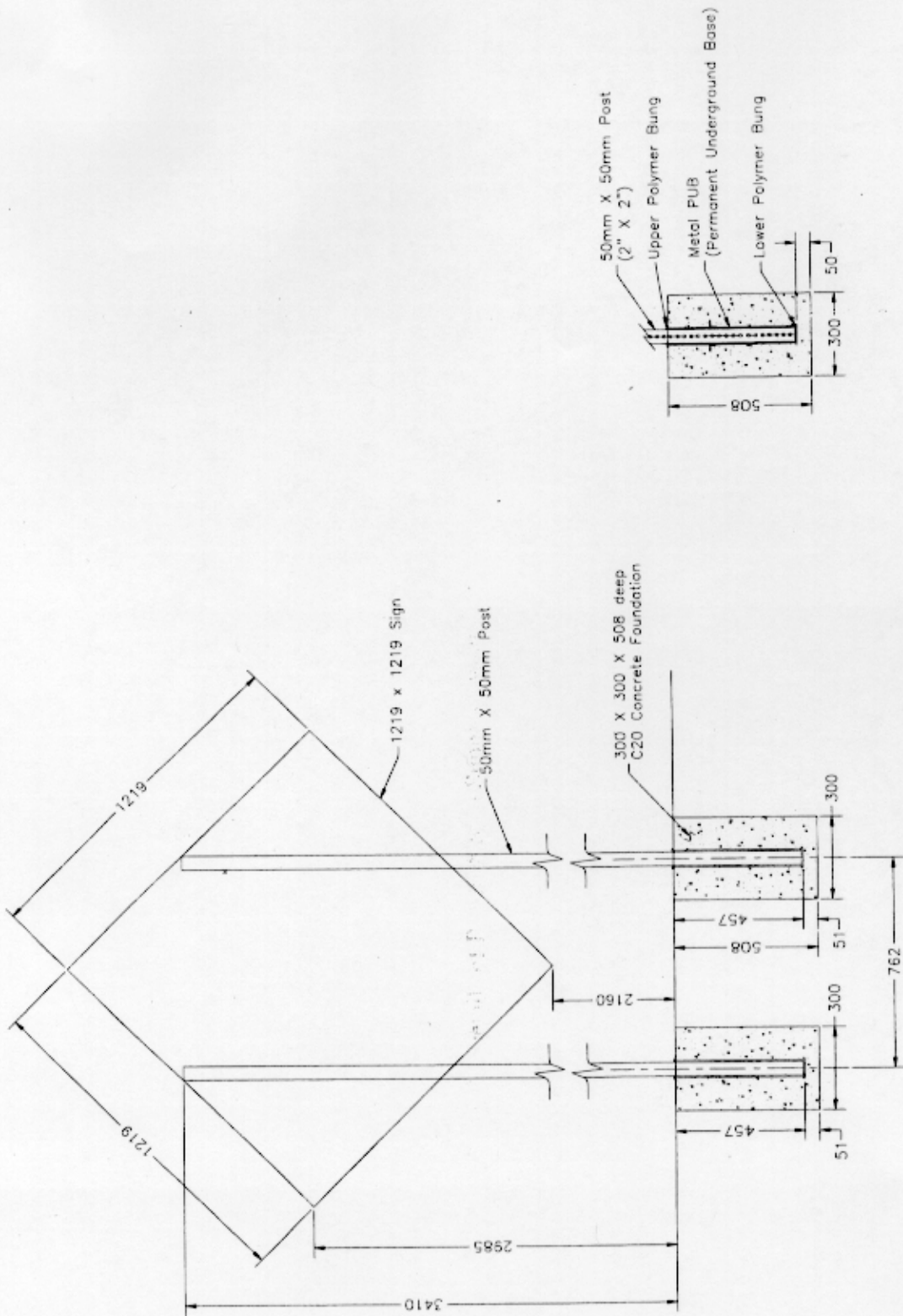
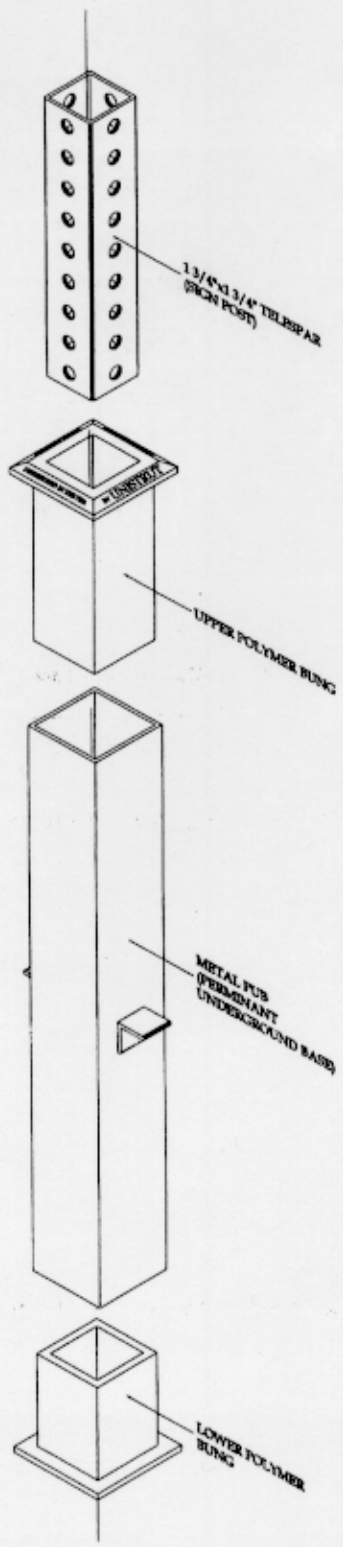


Figure 1. Details of Poletech Sign Support System for test 400001-UDC1 and 400001-UDC2.



1 3/4" x 1/4" TELESPAR
(OR CN POST)

UPPER POLYMER BUNG

METAL FIBER
(PERMANENT UNDERGROUND BOND)

LOWER POLYMER BUNG

OF -3

SHEET No.:

DRAWING INFORMATION	
DRAWING FILE:	TELESPAR3
DRAWN BY:	T. LINDGREN
CHECKED BY:	T. BEARD
ESTIMATED BY:	
DATE:	02/15/00
SCALE:	AS NOTED PLOTTING SCALE: 1=1
LAST REVISION:	

TITLE: POLETECH ANCHORING SYSTEM
FEDERAL HIGHWAY ADMINISTRATION

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Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

ENCLOSURE 3