

Refer to: HSA-10/SS-121

Ms. Linda Lee
MTC SAFE Project Manager
Joseph P. Bort Metro Center
101 Eighth Street
Oakland, California 94607-4700

Dear Ms. Lee:

Thank you for your letter of November 13, 2003, requesting Federal Highway Administration (FHWA) acceptance of the MTC SAFE ITS Callbox support as a breakaway sign support system for use on the National Highway System (NHS). Accompanying your letter was a report from the Texas Transportation Institute and videos of the crash tests. You requested that we find the MTC SAFE ITS Callbox breakaway supports acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

Testing of the supports was in compliance with the guidelines contained in 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 MTC SAFE ITS Callbox support includes the callbox main housing constructed of Lexan polycarbonate. The support poles were manufactured by A.B. Chance. Each pole was 102 mm (4 inch) outside diameter by 6096 mm (240 inches) long, schedule 40, galvanized steel pipe with a four-bolt unidirectional slip base welded to the base of the pole. The pole was attached atop a 1524 mm (60 inch) long galvanized steel auger foundation in NCHRP Report 350 strong soil. The height from the ground surface to the top of the auger foundation slip plate was 76 mm (3 inches). Four 16 mm x 76 mm (5/8 inch x 3 inch) long Grade 2 bolts with nuts, lock washers and three SAE wide Type A flat washer (one washer between the slip planes) per bolt, torqued to 58 Nm (48.2 ft-lb), were used to attach the support to the foundation stub.

Two 762 mm x 914 mm (30 inch x 36 inch) call box sign panels and two 254 mm x 508 mm (10 inches x 20 inches) TTY sign panels were attached back to back to the support pole. At the top of the support was a pole cap with a 20 watt solar panel (34 mm x 430 mm x 530 mm) and antenna. A simulated CCTV camera, weighing 3.8 kg (8.4 pounds) was mounted to the support 5793 mm from the ground. A drawing of the tested system is enclosed for reference.

The weights of the components and of the total system are listed for reference below:

ITS Call Box Item Description	Mass in kg	Weight in pounds
6 m (20 ft) steel pole	83.1	183
ITS Call Box (battery removed)	20.4	45
Call Box Signs (2)	4.9	11
Solar Panel	4.0	9
Camera (simulated)	3.8	8
TOTAL	116.2	256

Testing

Full-scale automobile testing was conducted on the commission's devices. The mass of the test vehicle was 820 kg in all tests. The complete devices as tested are shown in the Enclosures.

Test #	NCHRP 350	Speed	Occup. Speed	Delta V
474240/08-6	3-60	34.5 km/h	1.0 m/s (3.3 ft/sec)	4.2 km/hr
474240/08-7	3-61	99.2 km/hr	1.9 m/sec (6.2 ft.sec)	7.6 km/hr

Occup. Speed: Occupant Impact Speed: Speed at which a theoretical front seat occupant will contact the windshield. Delta V: Change in speed of the test vehicle.

Findings

Damage was limited to the front bumper, hood, radiator, roof, and rear hatch, with no windshield contact occurring in either test. Velocity changes were all within acceptable limits, and the only stub remaining was the 76-mm tall lower slip plate. The results of testing met FHWA requirements and, therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State. Because the occupant impact speed was well below the "desirable" limit of 3 m/s, the additional weight of the battery will not have a significant effect on the breakaway performance of the system.

Please note the following standard provisions that 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 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.
- Vendors 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-121 shall not be reproduced except in full. As this letter and the supporting documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The A.B. Chance auger foundation portion of the ITS Call Box is a patented device and is considered "proprietary." When proprietary devices are *specified by a highway agency* for use on Federal-aid 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. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device. Patent issues are to be resolved by the applicant and the patent owner.

Sincerely yours,

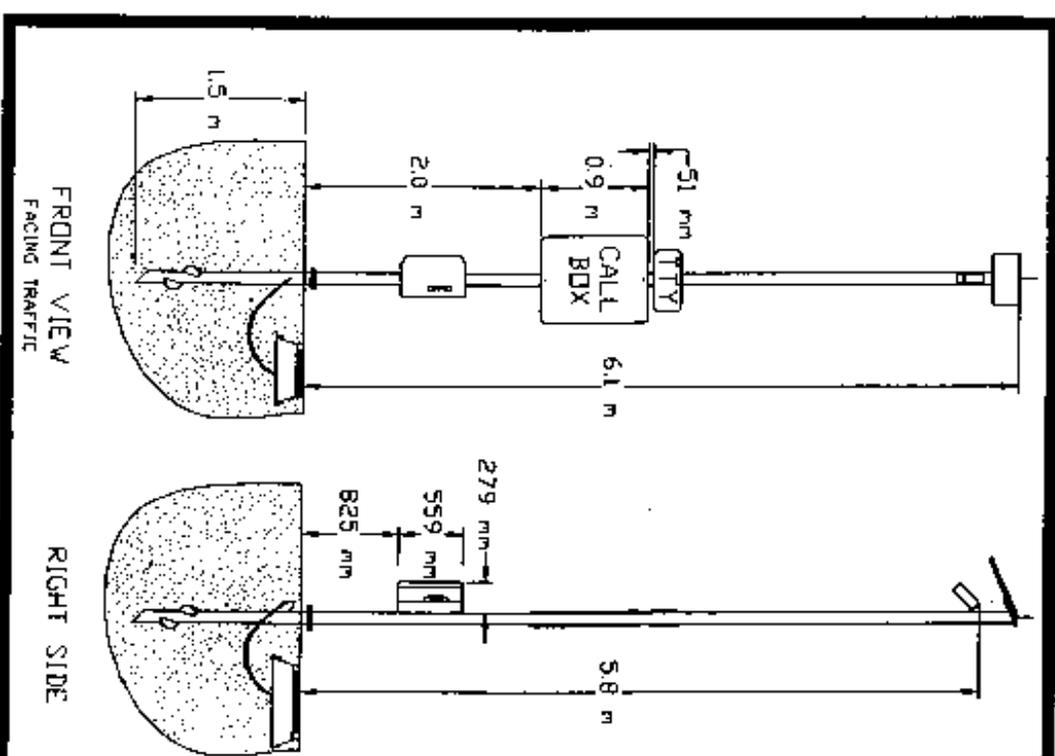
John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosure

FHWA:HSA-10:NArtimovich:tb:x61331:12/23/03

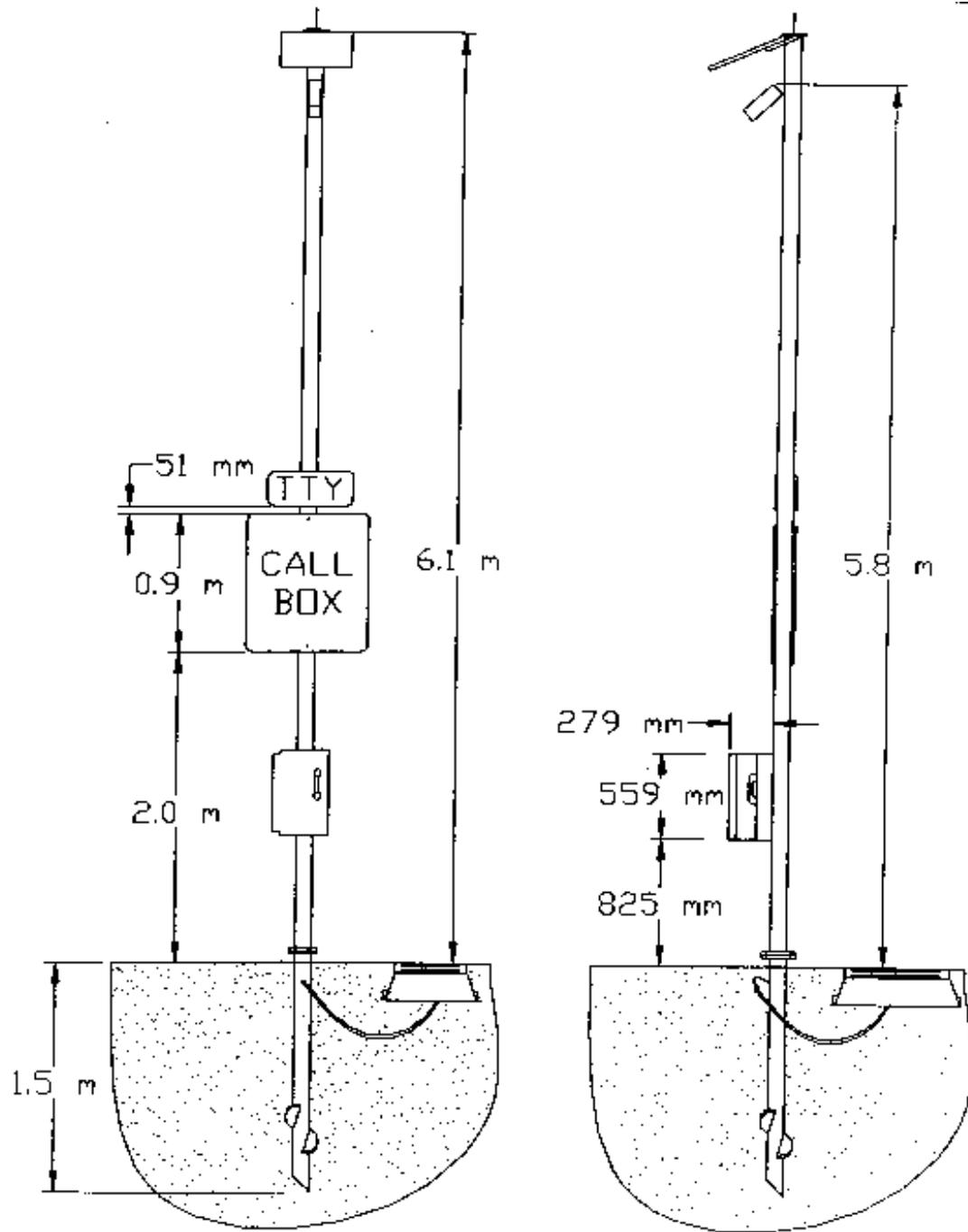
File: h://directory folder/nartimovich/SS121-MTCSafeFIN

cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)



The Texas A&M University System									
TEXAS TRANSPORTATION INSTITUTE									
COLLEGE STATION, TEXAS 77843									
Designed		By		Project No.		Date		Drawn By	
No.		Date		474240/08119/031		CRM		Scale	
1.									
2.									
3.									
4.									
5.									
CALL BOX								Sheet No.	
								1 of 1	

Figure 1. Details of the ITS Call Box.



FRONT VIEW
FACING TRAFFIC

RIGHT SIDE