LS-33

U.S. Department of Transportation
Federal Highway Administration

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

OCT 12 1993

Refer to: HNG-14

John Shewchuk, P.E.
Manitoba Safe-T-Base
45 Trottier Bay
Winnipeg, Manitoba, R3T 3R3
CANADA

Dear Mr. Shewchuk:

Thank you for your letter of August 10 requesting Federal Highway Administration's (FHWA) acceptance of your company's breakaway couplings for use with luminaire supports. Your letter was accompanied by a test report from the Southwest Research Institute (SwRI) dated July 1993. Pendulum testing was conducted to assess the breakaway performance of the couplings with a steel pole. Requirements for breakaway supports are found in the 1985 American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. These specifications have been adopted, with minor modifications by the FHWA.

The tested couplings Model 34M, were made of ASTM A48 Class 30(S) cast iron and had axial strengths of 151 kN (34 kips). In 1987, the Federal Outdoor Impact Laboratory (FOIL) in McLean, Virginia, tested an earlier model coupling with axial strengths of 196 kN (44 kips) which just failed to meet our criteria in the low speed test. Your request for acceptance is for the 151 kN couplings based upon the SwRI tests and for the 178 kN (40 kips) couplings based upon interpolation between the results from testing at the FOIL and SwRI. A summary of all the crash testing is presented below:

Test Number	87F075	87F076	M-1	M-1 Extrap.*
Axial Strength, kN (kips)	196 (44)	196 (44)	151 (34)	151 (34)
Mounting Height, mm (ft)	13 810 (45.3)	13 810 (45.3)	13 720 (45)	13 720 (45)
Pole Mass, kg (wt, lbs)	238 (523)	238 (523)	241 (531)	241 (531)
Impact Speed, km/h (mph)	32.5 (20.2)	95.8 (59.5)	32.1 (19.9)	96.5 (60)
Velocity Change, m/s (fps)	5.1 (15.7)	3.6 (11.7)	2.3 (7.5)	3.4 (11.2)
Stub Height, mm (in)	64 (2.5)	64 (2.5)	58 (2.3)	n/a

Bolt diameter was 25.4 mm (1 in) in all tests.
Bolt torque was 544 N·m (400 ft-lb) in all tests.
*Extrapolation based on procedure in FHWA Notice 5040.20 July 14, 1976.

The results of the 151 kN coupling tests meet the change-in-velocity and stub-height requirements adopted by the FHWA. The Manitoba Safe-T-Bases Model 34M are therefore acceptable for use on projects on the National Highway Systems (NHS) within the range of conditions tested, if proposed by a State. The maximum mass of pole, plus mast arm, plus luminaire should not exceed 250 kg (550 pounds). A drawing of the tested coupler is enclosed.

You requested that couplings for 28.575-mm and 31.75-mm (1 1/8-inch and 1 1/4-inch) diameter anchor bolts also be found acceptable. As the larger bolts would increase the stiffness, and therefore concentrate the breaking force more rapidly, we find these larger anchor bolt sizes acceptable. (The top bolts, the mounting bolts, are to remain at 25.4-mm.)

We have also reviewed the material you submitted regarding the untested 178 kN couplings. You referenced the earlier FOIL tests of the 196 kN couplings which passed the high speed test, but failed the low speed test by just a small amount. We concur that since the 178 kN couplings have an axial strength of 9 percent less than the 196 kN couplings, it is likely that they would meet the test criteria. Therefore they are also acceptable, subject to the same limitations on the mass of the support structure and attachments as given for the 151-kN couplings.

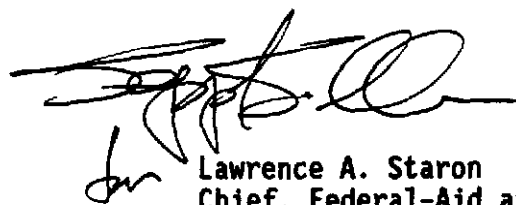
Our acceptance is limited to the breakaway characteristics of the couplings and does not cover their structural features. Presumably, you will supply potential users with sufficient information on structural design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Manitoba Safe-T-Base that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that used in the tests or the alternate materials as described above, and that it will meet the FHWA change in velocity requirements.

Because the Manitoba Safe-T-Base couplings are proprietary, to be used in Federal-aid highway projects on the NHS: (a) they 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 alternate 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.

Another consideration you may wish to take into account involves the Buy America provisions in the Intermodal Surface Transportation Efficiency Act of 1991. Section 1048 (a) included iron as a material subject to the Buy America

requirements. These requirements, including waiver provisions, are found in Title 23 of the Code of Federal Regulations, Section 635.410, a copy of which is enclosed. Please note that all manufacturing processes of steel and iron materials, including the application of coatings for these materials must occur in the United States.

Sincerely yours,



Lawrence A. Staron
Chief, Federal-Aid and Design Division

3 Enclosures

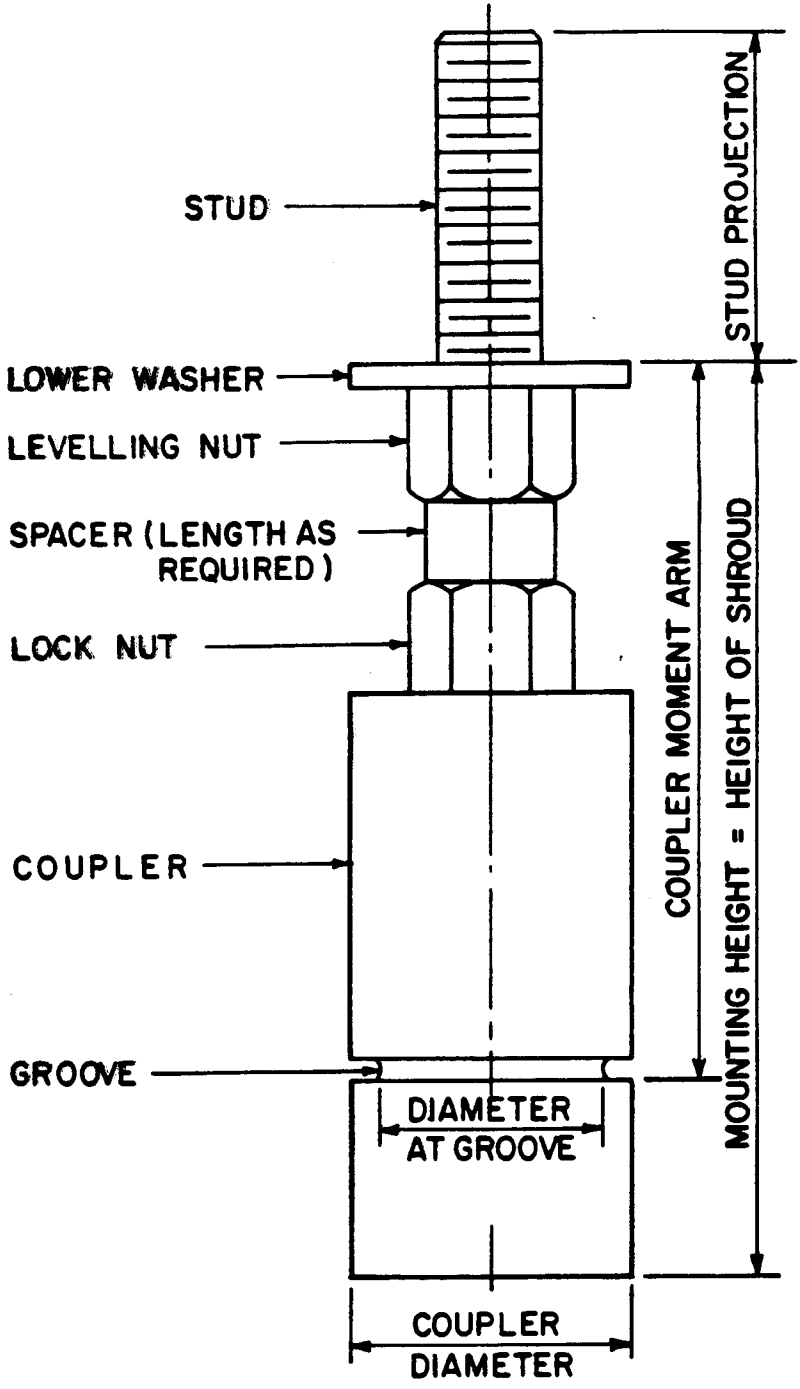


Figure 2. Manufacturer's Drawing of Test Article

THE FOLLOWING IS EXCERPTED FROM TITLE 23 CODE OF FEDERAL REGULATIONS (HIGHWAYS) SECTION 635.410 AS AMENDED TO INCORPORATE CHANGES MADE BY THE 1991 ISTEA (FEDERAL REGISTER, JULY 21, 1993; 58 FR 38973):

Sec. 635.410 Buy America requirements.

(a) The provisions of this section shall prevail and be given precedence over any requirements of this subpart which are contrary to this section. However, nothing in this section shall be construed to be contrary to the requirements of Sec. 635.409(a) of this subpart.

(b) No Federal-aid highway construction project is to be authorized for advertisement or otherwise authorized to proceed unless at least one of the following requirements is met:

(1) The project either: (i) includes no permanently incorporated steel or iron materials, or (ii) if steel or iron materials are to be used, all manufacturing processes, including application of a coating for these materials must occur in the United States. Coating includes all processes which protects or enhances the value of the material to which the coating is applied.

(2) The State has standard contract provisions that require the use of domestic materials and products, including steel and iron materials, to the same or greater extent as the provisions set forth in this section.

(3) The State elects to include alternate bid provisions for foreign and domestic steel and iron materials which comply with the following requirements. Any procedure for obtaining alternate bids based on furnishing foreign steel and iron materials which is acceptable to the Division Administrator may be used. The contract provisions must (i) require all bidders to submit a bid based on furnishing domestic steel and iron materials, and (ii) clearly state that the contract will be awarded to the bidder who submits the lowest total bid based on furnishing domestic steel and iron materials unless such total bid exceeds the lowest total bid based on furnishing foreign steel and iron materials by more than 25 percent.

(4) When steel and iron materials are used in a project, the requirements of this section do not prevent a minimal use of foreign steel and iron materials, if the cost of such materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or $2,500, whichever is greater. For purposes of this paragraph, the cost is that shown to be the value of the steel and iron products as they are delivered to the project.

(c) (1) A State may request a waiver of the provisions of this section if;

(i) The application of those provisions would be inconsistent with the public interest; or

(ii) Steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality.

(2) A request for waiver, accompanied by supporting information, must be submitted in writing to the Regional Federal Highway Administrator (RFHWA) through the FHWA Division Administrator. A request must be submitted sufficiently in advance of the need for the waiver in order to allow time for proper review and action on the request. The RFHWA will have approval authority on the request.

(3) Requests for waivers may be made for specific projects, or for certain materials or products in specific geographic areas, or for combinations of both, depending on the circumstances.

(4) The denial of the request by the RFHWA may be appealed by the State to the Federal Highway Administrator (Administrator), whose action on the request shall be considered administratively final.

(5) A request for a waiver which involves nationwide public interest or availability issues or more than one FHWA region may be submitted by the RFHWA to the Administrator for action.

(6) A request for waiver and an appeal from a denial of a request must include facts and justification to support the granting of the waiver. The FHWA response to a request or appeal will be in writing and made available to the public upon request. Any request for a nationwide waiver and FHWA's action on such a request may be published in the Federal Register for public comment.

(7) In determining whether the waivers described in paragraph (c)(1) of this section will be granted, the FHWA will consider all appropriate factors including, but not limited to, cost, administrative burden, and delay that would be imposed if the provision were not waived.

(d) Standard State and Federal-aid contract procedures may be used to assure compliance with the requirements of this section.