



U.S. Department
Of Transportation
**Federal Highway
Administration**

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

October 3, 1986

Refer to: HNG-14/SS-03

Mr. Ronald C. Steininger
Senior Market Manager
Mechanical Tube Division
Allied Tube and Conduit Corporation
16100 South Lathrop
Harvey, Illinois 60426

Dear Mr. Steininger:

Your September 10 letter requested FHWA acceptance of several sizes of Allied Tube and conduit Corporation's QWIK-PUNCH sign supports for use on Federal-aid highway projects. You enclosed a copy of an Ensco report dated June 1986 containing information on a series of 12 full-scale crash tests. The results were evaluated based on impact performance specifications for small sign supports contained in the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" (Specifications) and the National Cooperative Highway Research Program Report (NCHRP) No. 230.

Your tests were conducted on two types of QWIK-PUNCH post installations. Your yielding breakaway system type consists of a square anchor having either knockouts or perforations on all four tube faces placed inside an 18-inch long square sleeve also having either knockouts or perforations on all four tube faces and driven into the soil with only three inches of material remaining above ground. A square tube post was then placed in the above so the bottom of the post was 12 inches below the ground. The post was anchored to the foundation with a grade 2 bolt. Your direct embedment type consisted simply of a square tube having knockouts or perforations on all four tube faces directly embedded in the ground to a depth of 48 inches. We note the posts were tested in both S-1 (strong) and S-2 (weak) soils as defined in NCHRP Report 230. The tests were conducted with 1,800-pound vehicles. You have stated the steel posts conform to the Standard Specifications for Hot-Rolled Carbon Sheet Steel, structural quality ASTM Designation A-570-79.

Based on our review of the information you supplied, we find the QWIK-PUNCH sign supports listed in the enclosure meet the provisions on the new, but yet unpublished, 1985

AASHTO specifications. We also inter this system meets the 1975 AASHTO specifications since the 1985 AASHTO specification is more demanding.

At the present time, FHWA has not yet adopted the 1985 AASHTO specification. Once the AASHTO publishes their specification, we intend to proceed with the process to officially adopt a new specification. We will issue a Notice of Proposed Rulemaking (NPRM) in the Federal Register, providing a public comment period, review and evaluate any comments we receive, and then issue a Final Rule. The effective date of implementing a new specification for Federal-aid highway work is not expected to be until at least mid 1987.

This acceptance is limited to breakaway characteristics of the system and does not cover its structural features. Presumably, Allied Tube and Conduit, will supply potential users with sufficient information on structural design and installation requirements, including the need to size the sign panel and support for expected wind loading, to ensure proper support performance.

We anticipate that the States will require certification from Allied Tube and Conduit, that materials furnished have essentially the same chemistry, mechanical properties, and geometry as the materials used in the tests and that the support will meet the change in momentum requirements of the AASHTO specification.

Sincerely yours,

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

Enclosure

Allied Tube and Conduit Corporation
QWIK-PUNCH Tube Sizes Acceptable for use on
Federal-Aid Projects when requested by a State

A. Yielding Breakaway Type

<u>POST</u>		<u>ANCHOR</u>		<u>SLEEVE</u>		Number Permitted Within 8-foot path
Size O.D. (Inches)	Gauge	Size O.D. (Inches)	Gauge	Size O.D. (Inches)	Gauge or Wall Thkns.	
1. 2 ¼	12	2 ½	12	3*	3/16"	One
2. 2 ¼	14	2 ½	12	3*	3/16"	One
3. 2	12	2 ¼	12	2 ½	12	Two
4. 2	14	2 ¼	12	2 ½	12	Two
5. 1 ¾	12	2	12	2 ¼	12	Two
6. 1 ¾	14	2	12	2 ¼	12	Two
7. 1 ½	12	1 ¾	12	2	12	Two

B. Direct Embedment Type

Post Size O.D. (Inch)	Gauge	Number Permitted Within an 8-foot Path
1. 2 ¼	12	One
2. 2 ¼	14	One
3. 2	12	One
4. 2	14	Two
5. 1 ¾	12	Two
6. 1 ¾	14	Two
7. 1 ½	12	Two

*This sleeve has solid, unpunched walls below ground level.

TABLE 2-1**1758 ALLIED TEST MATRIX**

Test Number	Date	Vehicle	Target Speed (mi/hr)	Actual Speed (mi/hr)	V (ft/s)	Sign Type	Soil Type
1	2/17/86	1980 Renault LeCar	20.0	19.8	-10.4	Test Series 1(1)	Weak
2	2/17/86	1980 Renault LeCar	20.0	20.0	-9.7	Test Series 1	Strong
3	2/19/86	1980 Renault LeCar	60.0	60.9	-5.5	Test Series 1	Weak
4	2/20/86	1980 Renault LeCar	60.0	60.7	-6.1	Test Series 1	Strong
5	3/6/86	1980 Renault LeCar	20.0	19.0	-11.5	Test Series 2 (2)	Weak (5)
6	3/6/86	1980 Renault LeCar	60.0	58.6	-6.4	Test Series 2	Strong (6)
7	3/7/86	1980 Renault LeCar	20.0	19.9	-8.2	Test Series 3 (3)	Weak
8	3/7/86	1980 Renault LeCar	20.0	20.3	-8.9	Test Series 3	Strong
9	3/17/86	1980 Renault LeCar	60.0	62.2	-8.5	Test Series 3	Strong
10	3/18/86	1980 VW Rabbit	60.0	60.6	-6.3	Test Series 3	Weak
11	3/21/86	1980 Dodge Colt	20.0	20.9	-12.4	Test Series 4 (4)	Strong (7)
12	3/21/86	1980 Dodge Colt	60.0	62.3	-7.0	Test Series 4	Strong (8)

- 1 Single Leg Telescoping Square Sign
- 2 Dual Leg Telescoping Diamond Sign
- 3 Single Leg Direct Embedment Square Sign
- 4 Dual Leg Direct Embedment Diamond Sign
- 5 Test Run in Soil which Yielded Higher V (Test 1, Test 2)
- 6 Test Run in Soil which Yielded Higher V (Test 3, Test 4)
- 7 Test Run in Soil which Yielded Higher V (Test 7, Test 8)
- 8 Test Run in Soil which Yielded Higher V (Test 9, Test 10)