



U.S. Department
of Transportation

Federal Highway
Administration

June 6 , 2000

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

Refer to: HSA-1

Mr. John M. Pappas
Flex-0-Lite
Services and Materials Co.
2997 Clarkson Road
Chesterfield, MO 63017

Dear Mr. Pappas:

Thank you for your letter of December 28, 1999, requesting Federal Highway Administration (FHWA) acceptance of your company's drums, barricades, and portable sign stands as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). These devices were previously tested by Dicke Tool Company and are acceptable under FHWA Acceptance Letter WZ-17 dated July 20, 1999. Accompanying your letter was a report from the Midwest Roadside Safety Facility (MWRSF) and a detailed description and drawing of each device. You requested that we issue a separate letter to you indicating that the devices are 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.'

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled 'Information: Identifying Acceptable Highway Safety Features,' established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

The following devices were tested with successful results and are detailed in Enclosure 1. A drawing of each appears in Enclosure 2. A summary of the crash tests appears in Enclosure 3.

(Systems 1 and 2) A 626 mm wide x 984 mm tall Type I plastic barricade with a NightFlasher warning light mounted at the top. Your model number PRB-124

(System 3) A 318 mm wide x 1035 mm tall Type I plastic barricade with a NightFlasher mounted at the top. Your model number VPB-44

(System 4) A low density polyethylene 1500 series drum with a NightFlasher warning light mounted at the top.

(Systems 5 and 6) Your model number QLV-W. A rigid mounted portable sign support with a 1219 mm square vinyl sign mounted at a height of 356 mm and three wood-staffed flags mounted at 2076 mm

(Systems 9 and 10) Model number QFV60. A heavy-duty extension, spring mounted sign support with a 1219 mm square vinyl sign mounted at 1476 mm with three wood-staffed flags mounted at 3 194 mm

(System 15) Your model number QFV-W. A double-torsion, spring mounted sign support with a 1218 mm square vinyl sign at 356 mm and three wood-staffed flags at 2070 mm

(System 17) Model number QFV48. A heavy-duty extension, spring mounted sign support with a 1219 mm square vinyl sign at 324 mm and three wood-staffed flags at 2038 mm.

The test articles did not show potential for penetrating the occupant compartment. The results of the MWRSF testing met the FHWA requirements and, therefore, the devices listed in Enclosure 1 are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed 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. A quality assurance program, developed to suit your needs, is necessary to do this.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-38 shall not be reproduced except in full.

Some of your traffic control devices are patented products and considered “proprietary” products.

The use of proprietary work zone traffic control devices in Federal-aid projects is limited to

temporary nature. They are selected for use only when they are the most practical and

completion of the project.

“a” given below for the use of proprietary products on Federal-aid projects.

if proprietary devices are specified for use on Federal-aid projects, except except

projects, they: (a) must be supplied through the use of competitive bidding

unpatented items; (b) the highway department must be notified in writing of the proposed use

synchronization with existing highway facilities or that no equally suitable unpatented

(c) they must be used for research or for a distinctive type of construction on rural

sections of road for experimental purposes.

are contained in Title 23, Code of Federal Regulations, 23.101-10.

Enclosure 1, Summary of Crash Tested Work Zone Traffic Control Devices, Dicke Tool Co. and Services & Materials Co.

Device	Test	System	Orientation	Legs	Base	Mast	Horiz. Spreader	Height(ex flags)	Flags
PRB-124Barricade	D 1	1	Head On	N/A	N/A	N/A	N/A	975 mm	(Light)
PRB-124Barricade	D 1	2	End On	N/A	N/A	N/A	N/A	975 mm	(Light)
VPB-44 Barricade	D2	3	Head On	N/A	N/A	N/A	N/A	975 mm	(Light)
LDPE 1500 Drum	D 2	4	Head On	N/A	N/A	N/A	N/A	u n k n o w n	
QLV-W Stand	D 3	5	Head On	Alum., telescoping	Rigid steel	Fiberglass, 6.35 mm	Fiberglass 4.76 mm	2076 mm	Wood
QLV-W Stand	D 3	6'	End On	Alum., telescoping	Rigid steel	I Fiberglass, 6.35 mm	Fiberglass 4.76 mm	2076 mm	I Wood
QFV60 Stand	D 5	9	Head On	Alum., rigid	Extension Spring	Alum., full height	Fiberglass 4.76 mm	3194 mm	Wood
QFV60 Stand	D 5.	10	End On	Alum., rigid	Extension Spring	Alum., full height	Fiberglass 4.76 mm	3194 mm	Wood
QFV-W Stand	D8	15	Head On	Alum., telescoping	Double Spring	Fiberglass, 9.53 mm	Fiberglass, 6.35 mm	2070 mm	Wood
QFV48 Stand	D 9	17	Head On	Alum., telescoping	Extension Spring	Alum., full height	Fiberglass. 5.03 mm	2083 mm	Wood

NOTES to Enclosure 1, Please refer to the individual drawings for the details of each device.

DEVICE: LDPE: Low Density Polyethylene. Stand: X-footprint portable sign stand holding roll-up sign.

LEGS: All legs are of square tubular aluminum. Rigid legs are 31.75 mm square. Telescoping legs are 31.75 mm and 25.45 mm square.

BASE: "Rigid Steel" are 4.76 mm flanges with a 38.1mm steel tube 633 mm or less in height.

"Extension Spring" are steel with a heavy duty extension spring system.

"Double Spring" are steel with a double torsion spring system.

MAST: "Alum., full height" are square tubular aluminum supports of one to three components, sizes vary. Mast extends from the base to the top of the sign panel

"Alum., extra height" is a square tubular aluminum support of three components. The mast extends above the top of the sign panel to support flags.

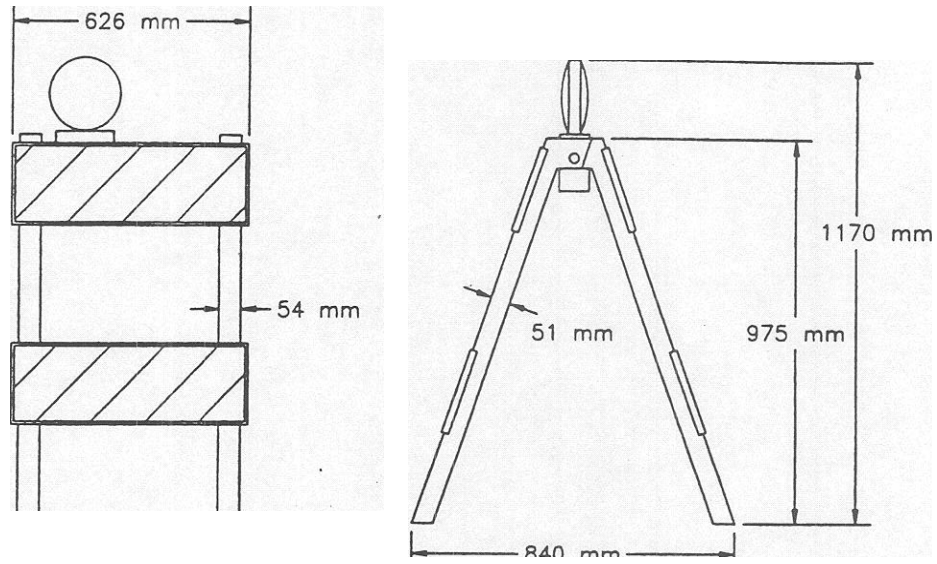
"Alum., half height" is a square tubular aluminum support of two components. The mast extends to the center of the sign panel.

"Fiberglass" is a flexible fiberglass piece approx. 31 mm wide, of thickness as noted. It attaches to a square steel tube upright 460 mm or shorter.

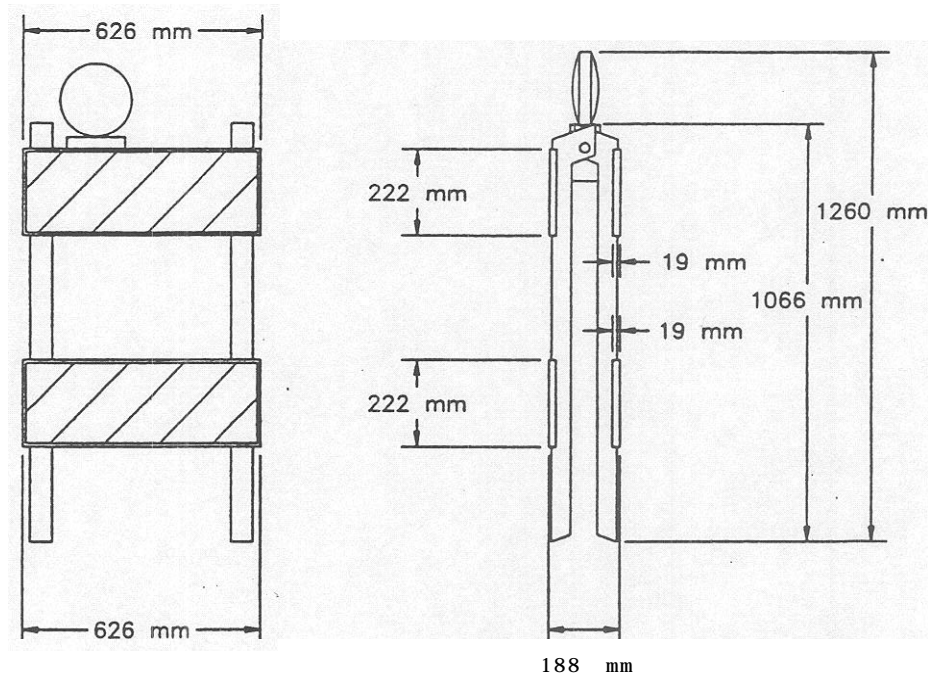
HEIGHT: This is the height from the ground to the top of the sign panel. In system # 12 the flags are elevated 331 mm above the sign. In all others the flag support is at the top of the sign,

FLAGS: Material of flagstaff: Wood = 610 mm long, 19 mm diameter wood rod. Fiber. = 559 mm long fiberglass

(Light) = No flags present, but light mounted on top of barricade or drum. Tested lights were "Service and Materials NightFlasher Light. Mass with batteries 1.77 kg. Light attached to top of drum with standard vandal-resistant hardware with "cupped" washer.

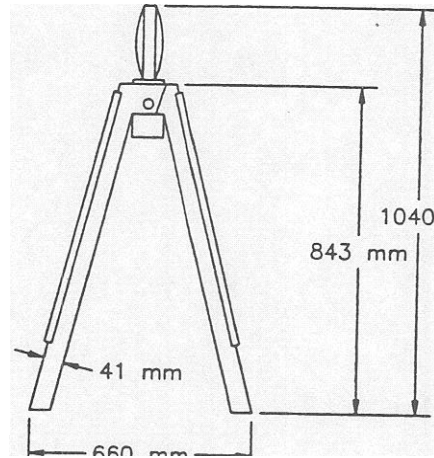
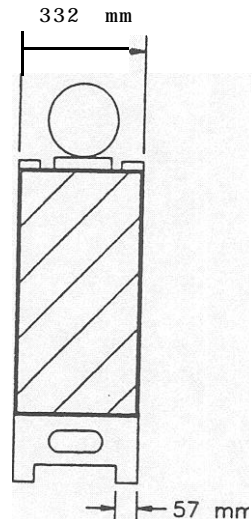


OPEN POSITION

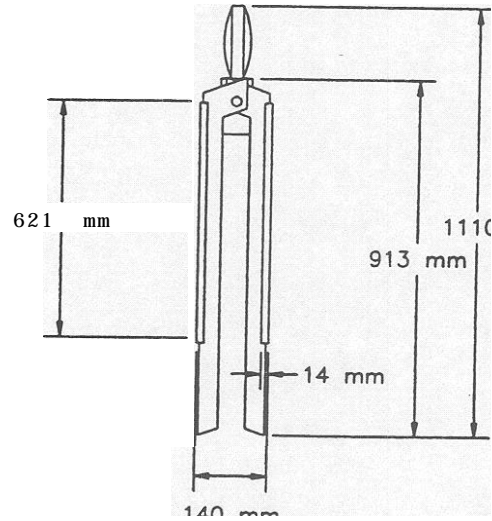
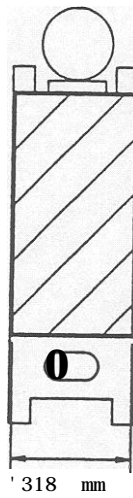


CLOSED POSITION

Figure D-1. Plastic Barricade Model PRB



OPEN POSITION



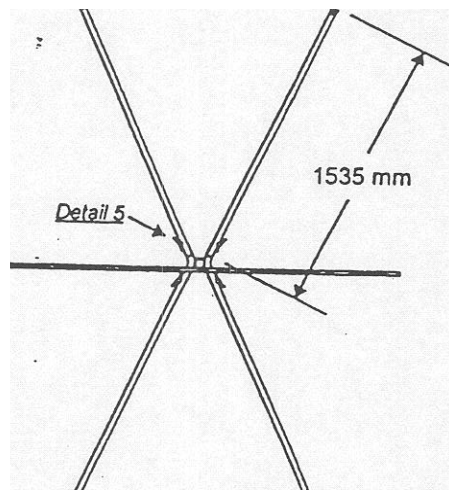
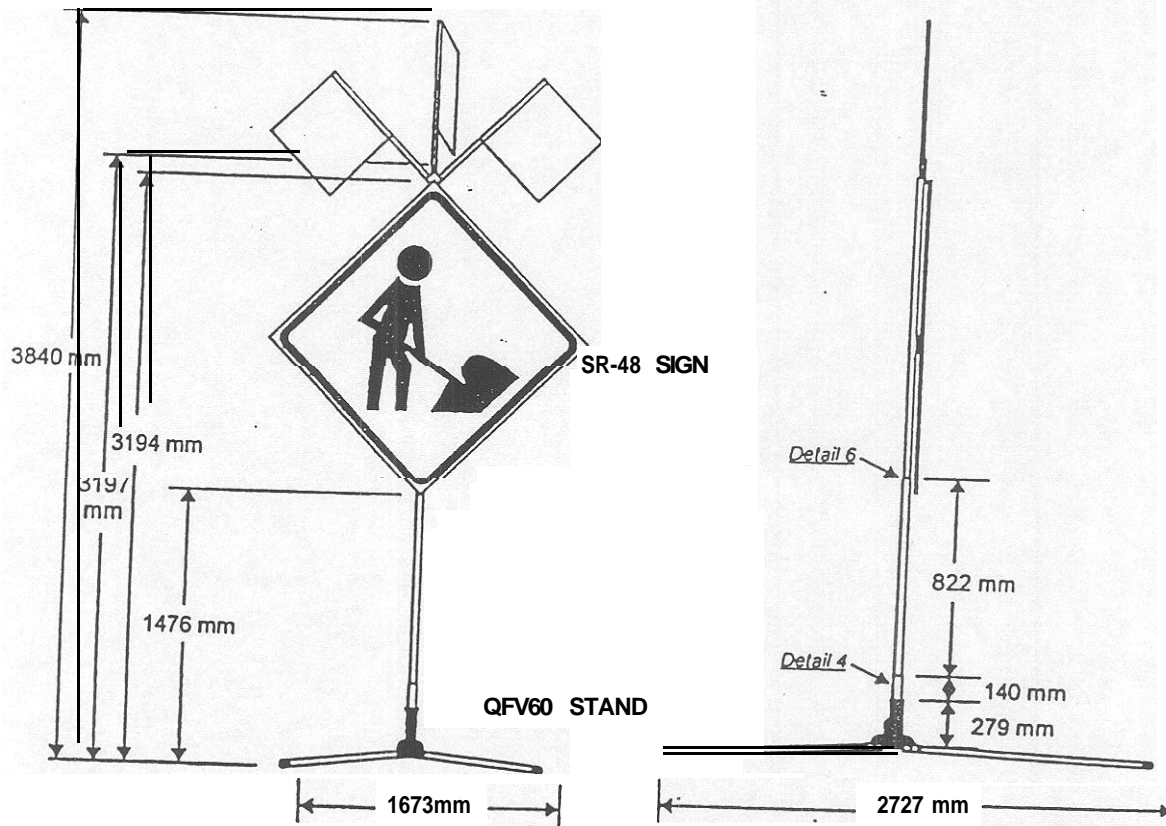
CLOSED POSITION

Figure D-2. Plastic Barricade Model VPB-.



2486 mm

The image shows a technical drawing on a light gray background. A horizontal line is drawn across the top. Below it, a diamond shape is drawn, tilted at an angle. A horizontal line is drawn below the diamond. To the left of the diamond, two vertical dimension lines are shown. The longer one starts from the top horizontal line and ends at the shorter one. The text '2486 mm' is positioned to the left of the longer dimension line.



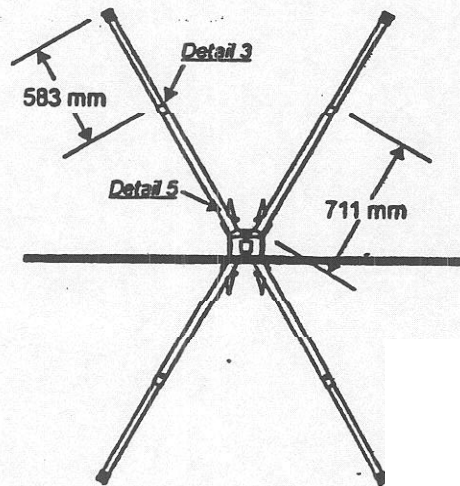
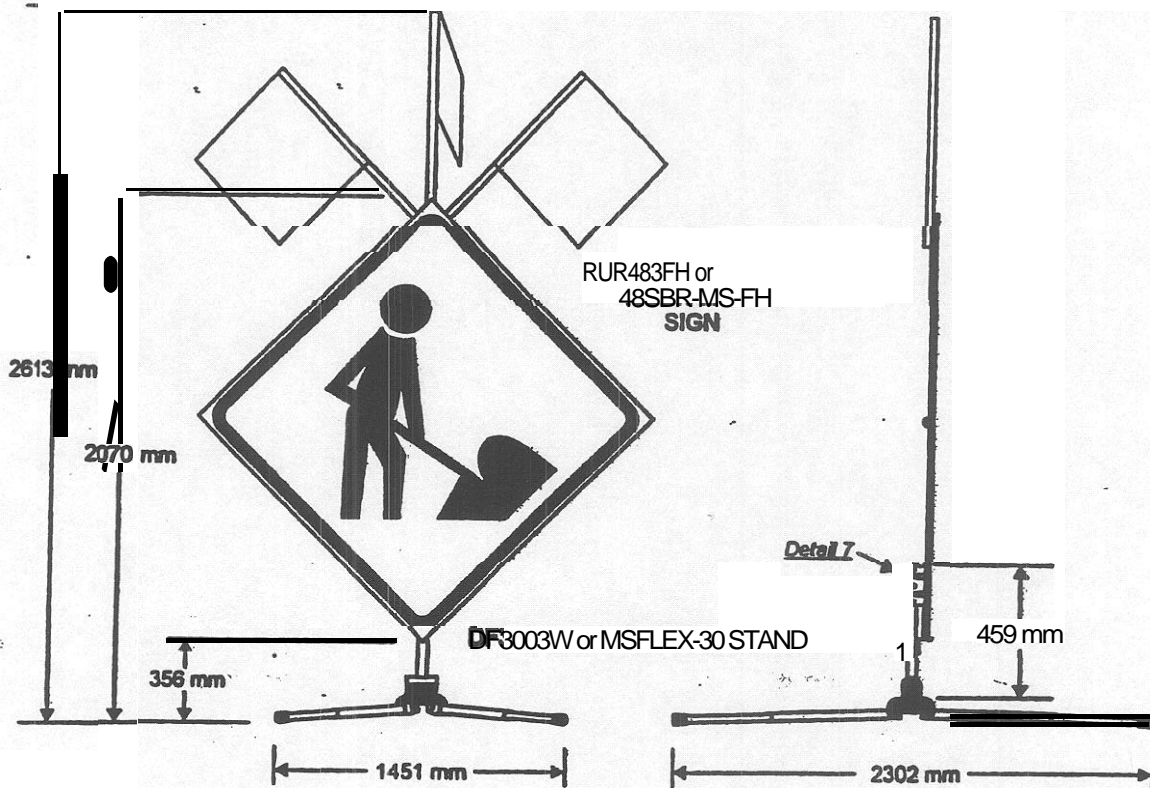
QFV60 STAND

- Base- Sled With heavy duty extension spring system
- Mast-38.10 mm sq. aluminum tubing with 2.54 mm wall thickness
- Legs-31.75 mm sq. x 2.54 mm wall x 1535 mm long aluminum legs

SR-48 SIGN

- 3M Reflexite
- Panel- Reflective vinyl. 1219 mm x 1219 mm
- Crossbrace-Vertical members are 31.75 mm sq. x 2.54 mm wall x 1727 mm aluminum tube and also 6.35 mm th x 31.75 mm w x 1651 mm long fiberglass
- Crossbrace- Horizontal member is 4.76 mm th x 31.75 mm w x 1651 mm long fiberglass
- 3 Flags- 451 mm x 464 mm vinyl wth 611 mm long (lg.05 mm dia) wood staff

Figure | System Nos. 9 and 10 Sign Support Details, Test-D-j



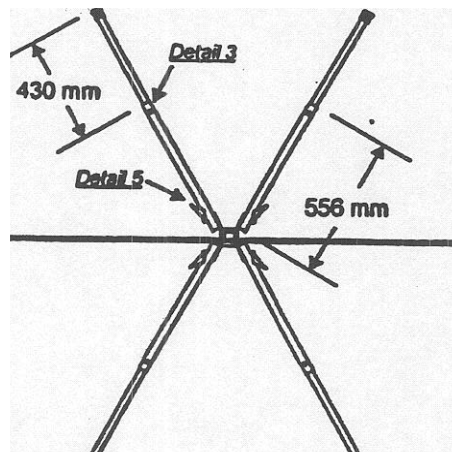
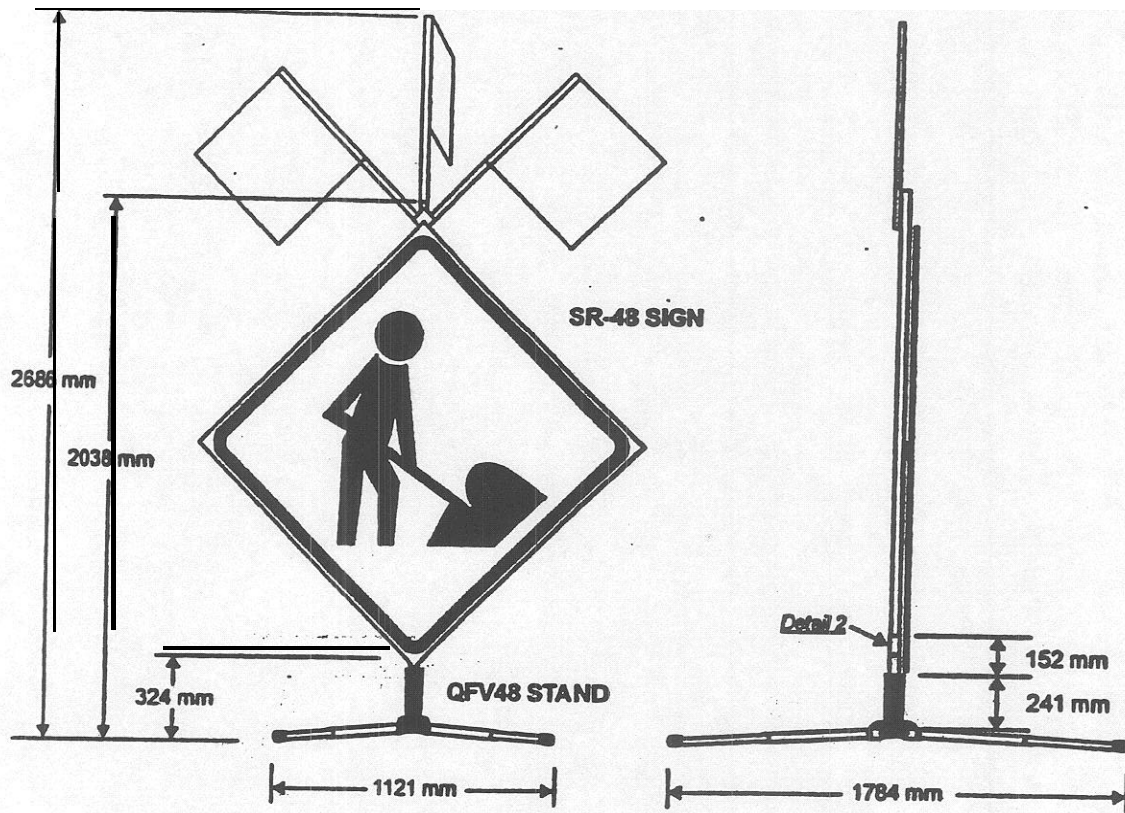
DF3003W or MSFLEX-30 STAND

- Base Steel with double torsion spring system
- Legs- Telescopic 31.75 mm and 25.27 mm sq. aluminum tubing with 2.57 mm and 2.59 mm wall thickness respectively

RUR483FH or 48SBR-MS-FH SIGN

- Vinyl Roll Up – super bright
- Panel-Reflective 1218 mm x 1218 mm
- Crossbrace- Vertical member is 30.99 mm w x 1663 mm long fiberglass
- Crossbrace Horizontal member is 6.35 mm w x 30.73 mm wx 1663 mm long fiberglass
- 3 Flags-451 mm x 465 mm vinyl with 610 mm long (16.54 mm dia.) wood staff

Figure 23. System No. 15 Sign Support Details, Test D-8



QFV48 STAND

- Base- Steel with extension spring system
- Legs Telescopic 31.75 mm and 26.30 mm sq. aluminum tubing with 2.57 mm and 2.59 mm

SR-48 SIGN

- Reflexite-super bright
- Panel Reflective vinyl, 1219 mm x 1219 mm
- Crossbrace Vertical members are 31.67 x 2.59 mm wall x 17.34 mm long aluminum tube and also 4.76 mm th. x 30.73 mm w x 16.54 mm long fiberglass
- Crossbrace Horizontal member is 5.03 mm th. x 30.73 mm w x 1664 mm long fiberglass
- 3 Flags 445 mm x 462 mm vinyl with 610 mm long (19.18 mm dia.) wood staff

Figure 27 System No. 17 Sign Support Details, Test D-9

Enclosure 3, Summary of Crash Tests for Work

Device	Test
PRB-124 Barricade	D 1
PRB-124 Barricade	D 1
VPB-44 Barricade	D 2
LDPE 1500 Drum	D 2