



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

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

June 17, 2005

In Reply Refer To: HSA-10/WZ-211

Mr. Keith Callaway
MDI Traffic Control Products
38271 W. Twelve Mile Road
Farmington Hills, Michigan 48331-3041

Dear Mr. Callaway:

Thank you for your letter of April 13, 2005, requesting the Federal Highway Administration's (FHWA) acceptance of an aluminum rectangular sign with your company's 4860K Breakaway Stand as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter drawings of the stand with the various signs in place. You requested that we find these devices acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

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 are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. 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.

A brief description of the device follows:

Model 4860K, with breakaway feature, tested with Aluminum panel and light:

(This stand was originally accepted in the FHWA acceptance letter WZ-69 dated May 9, 2001, and was the subject of Test MDI 6)

This stand is manufactured with two vertically mounted steel coil springs to support 1219 x 1219 x 2 mm (48 x 48 x 0.080 inch) aluminum signs. The four legs of the stand are 32 x 32 x 2.5 mm (1.25 x 1.25 x 0.10 inch) square 6061-T6 extruded aluminum tubing. The coil



springs attach the 5 mm (0.19 inch) thick autophoretic coated steel base to the telescoping upright. The two-piece, upright, consisting of a 38 mm (1.50 inch)(bottom) and a 32 mm (1.25 inch)(top) square aluminum tube, supports the sign. The bottom upright has a scored “breakaway section” at 483 mm (19 inches) above grade when the stand is fully assembled. Rigid sign mounting brackets support the aluminum sign at top and bottom and a steel flag lock bracket is attached to the top upright supporting three hardwood dowel flags. A barricade light assembly, consisting of two a 6-volt battery batteries and a 178 mm (7 inch) polycarbonate lens, is mounted to the top upright above the flag bracket.

The overall height of the stand, with flags and light is 4115 mm (162 inches) and 3251 mm (128 inches) without the light and flags. The bottom of the sign is mounted 1524 mm (60 inches) above grade. The total weight of the sign stand is 31.6 kg (69.7 pounds) which includes the stand of 21.7 kg (47.7 pounds), the sign and flags of 8.4 kg (18.5 pounds) and the light of 1.6 kg (3.5 pounds) as tested in MDI 6.

Testing

Full-scale automobile testing was conducted on your company’ devices. As reported in WZ-69 there was no damage to the windshield as the mast separated at the base and the sign and mast components rotated up and impacted the roof.

Your request is that the 4860K Breakaway stand be found acceptable with the following 48 x 60 (vertical) sign substrates listed with their approximate weights:

1)	5/8” plywood	44 pounds
2)	0.080 aluminum	24 pounds
3)	0.100 aluminum	30 pounds
4)	0.125 aluminum	37 pounds
5)	5/8” Endurance	13.3 pounds
6)	Aluminum Laminate	13.3 pounds

The tested sign was a 20-pound 48 x 48 aluminum sign. Sign substrates 1) through 4) are heavier than the tested system and should, after impact, allow the sign and mast to rotate about its center of gravity, moving up and away from the windshield. Substrates 5) and 6) may also go over the roof, but are light enough that there should be no significant damage to the windshield should the mast or sign impact it.

Findings

We concur in your assertion that the 4860K Breakaway sign stand with a 48 x 60 sign will perform in a similar manner to the tested system, therefore, the devices described above and detailed in the enclosed drawings are acceptable for use on the NHS under the range of conditions the 4860K Breakaway Stand was tested, when proposed by a State.

Please note the following standard provisions that apply to the 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 the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-211 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The MDI 4860K Breakaway Sign Stand is a patented device and is considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are *selected by the contractor* for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if 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 for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

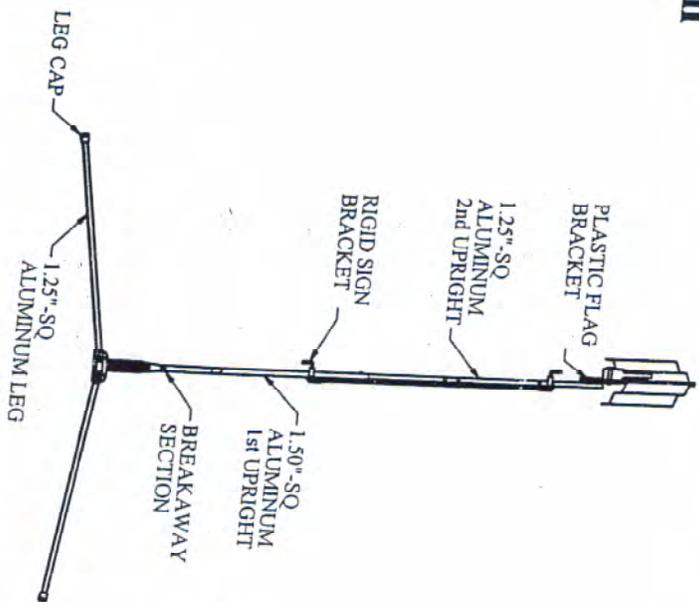
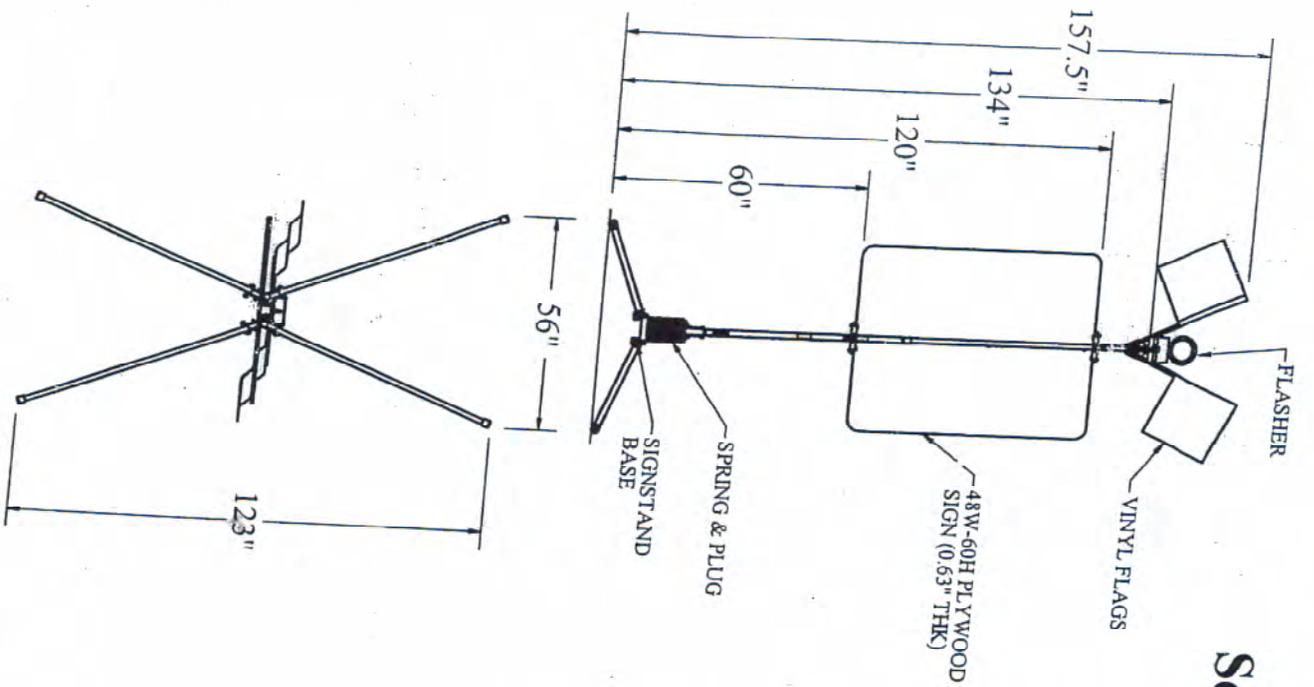
/original signed by/

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

Enclosures

FHWA:HSA-10:NArtimovich:tb:x61331:6/13/05
File: h://directory folder/artimovich/WZ211-midiFIN
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N.Artimovich, HSA-10)

4860K Schematic Drawing Plywood Sign



4860K WEIGHT	
PLYWOOD SIGN	44 lbs
SIGNSTAND WITH RIGID BRACKETS	47.5 lbs
FLASHER LITE	3.5 lbs
TOTAL	95 lbs

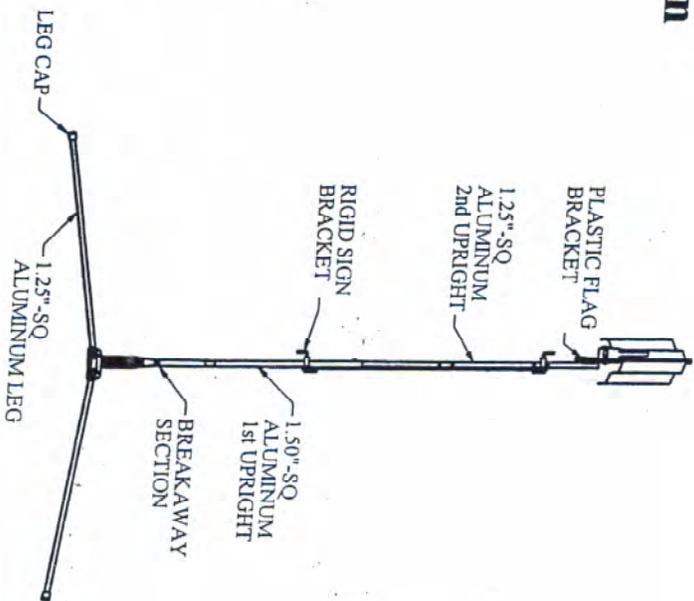
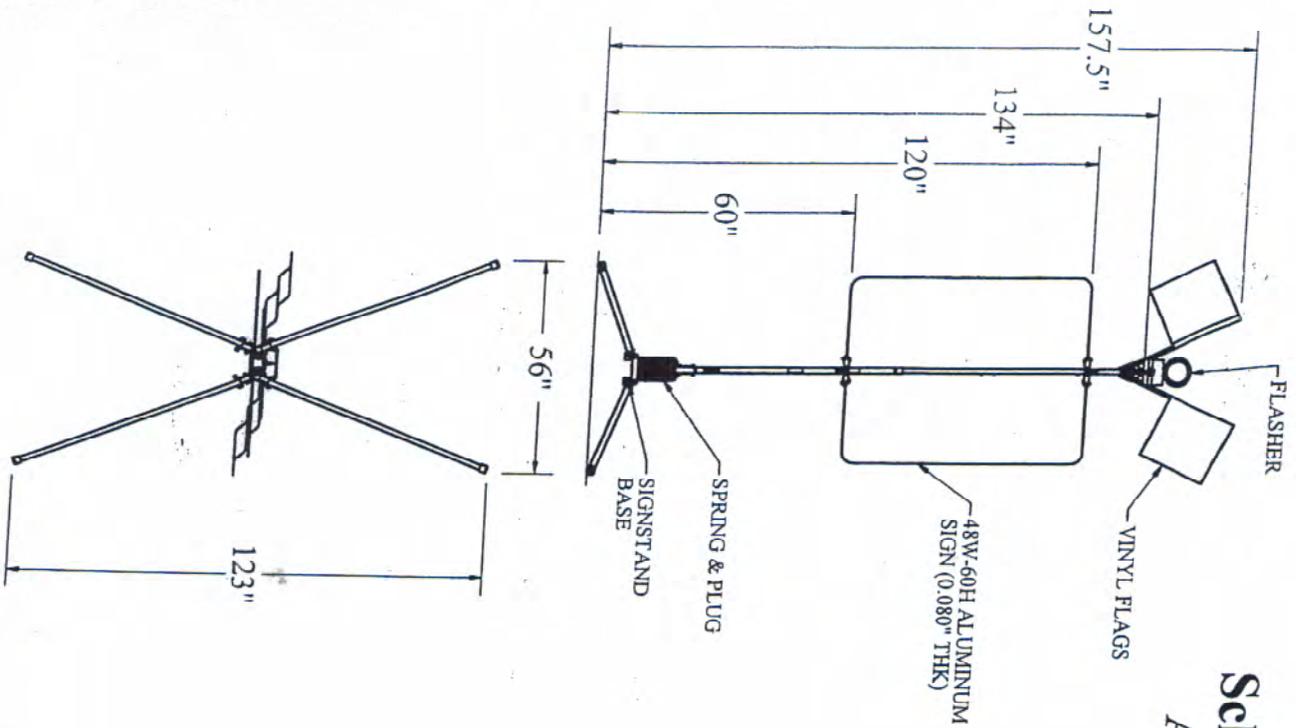


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ESR00198-01

ESR00198-01

4860K Schematic Drawing Aluminum Sign



4860K WEIGHT

ALUMINUM SIGN 24 lbs

SIGNSTAND WITH RIGID BRACKETS 47.5 lbs

FLASHER LITE 3.5 lbs

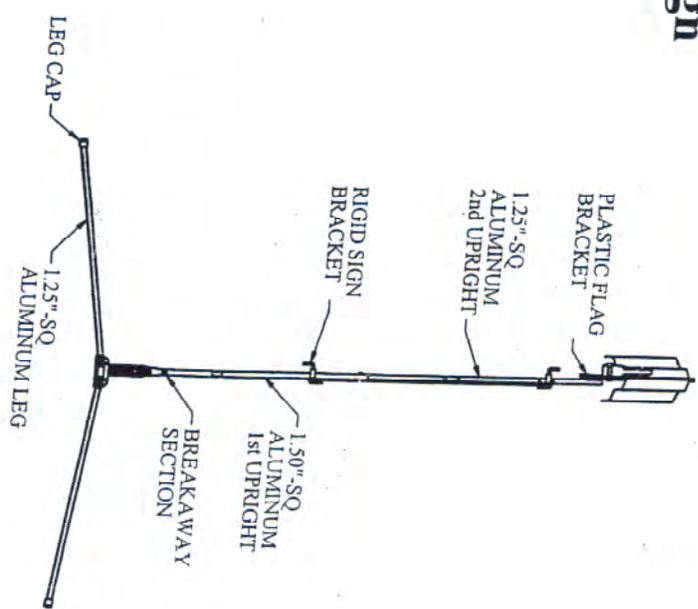
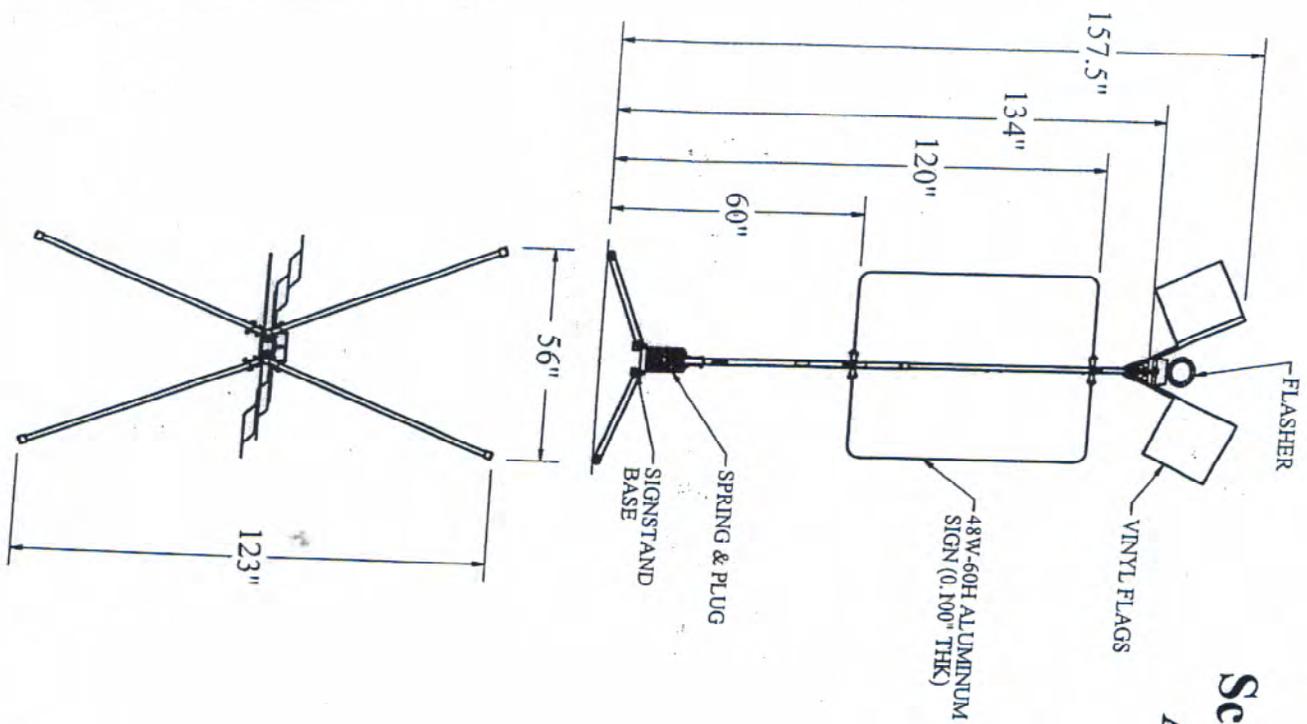
TOTAL 75 lbs



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ESR00198-02

4860K Schematic Drawing Aluminum Sign



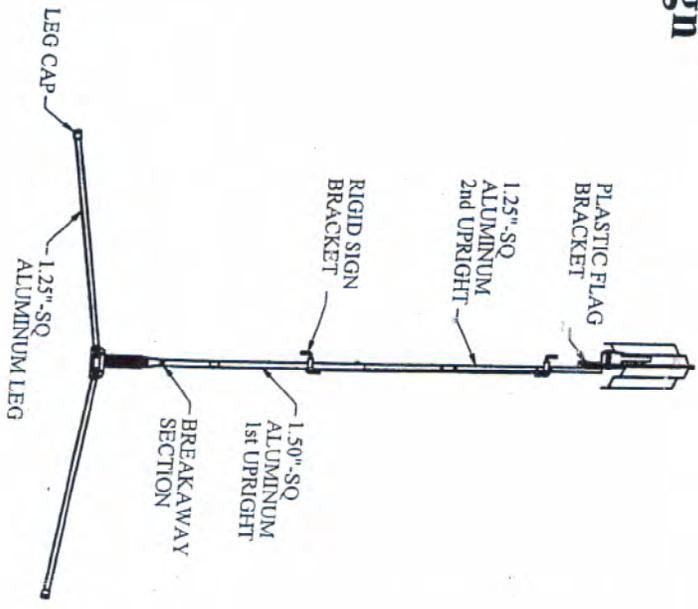
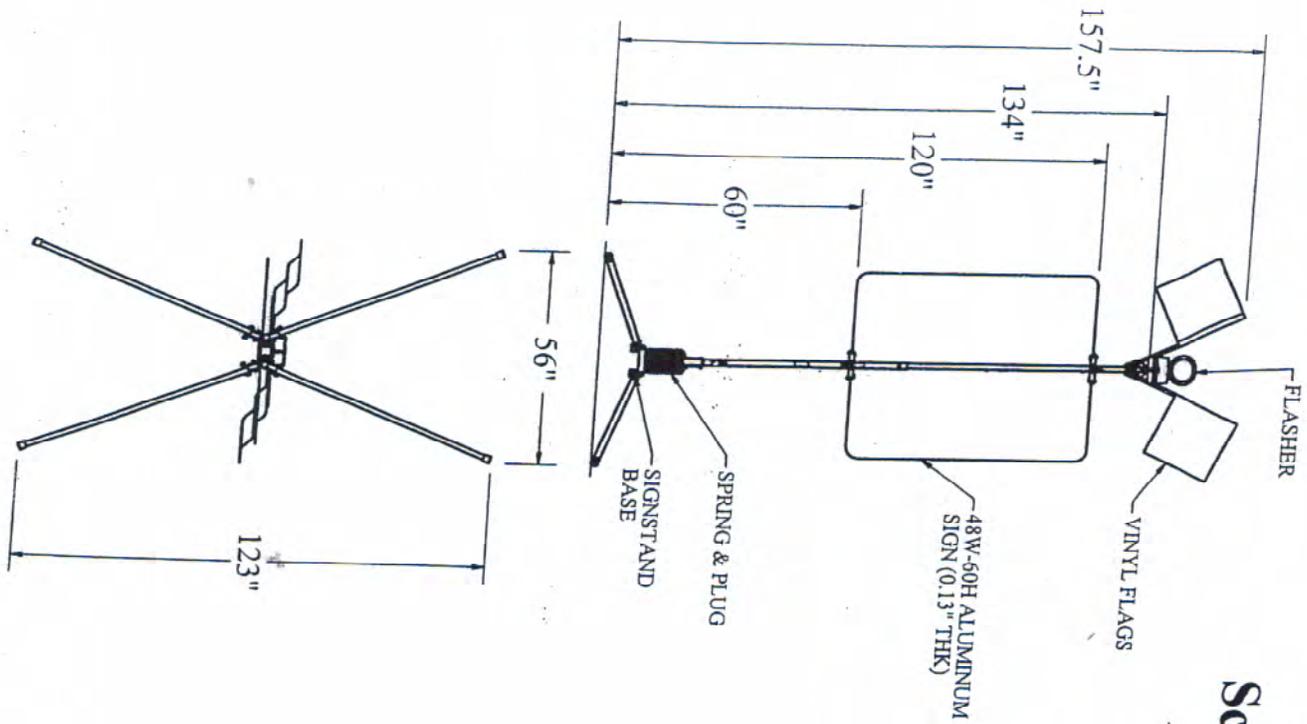
4860K WEIGHT	
ALUMINUM SIGN	30 lbs
SIGNSTAND WITH RIGID BRACKETS	47.5 lbs
FLASHER LITE	3.5 lbs
TOTAL	81 lbs



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ESR00198-03

4860K Schematic Drawing Aluminum Sign



4860K WEIGHT

ALUMINUM SIGN 37 lbs

SIGNSTAND WITH RIGID BRACKETS 47.5 lbs

FLASHER LITE 3.5 lbs

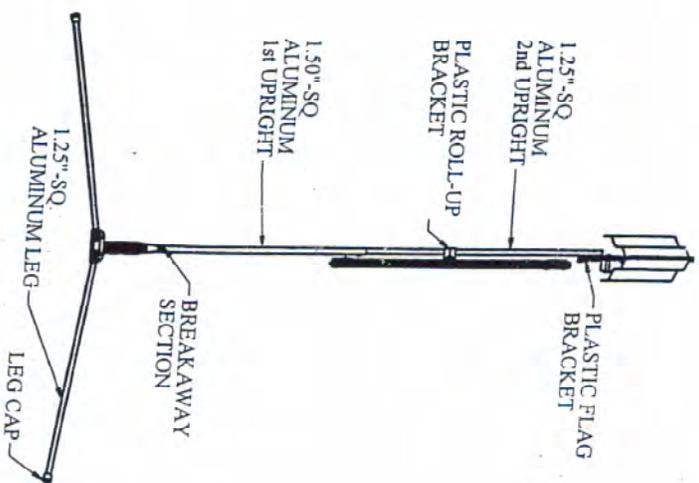
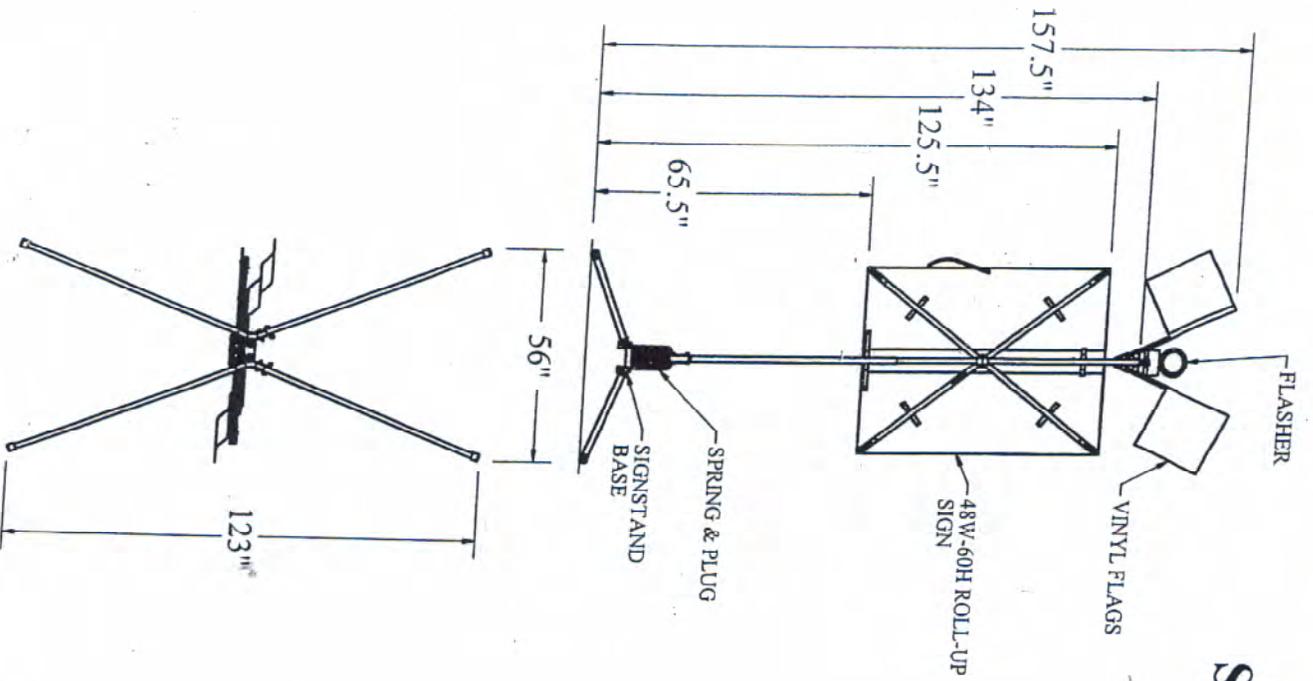
TOTAL 88 lbs



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ESR00198-04

4860K Schematic Drawing Roll up Sign



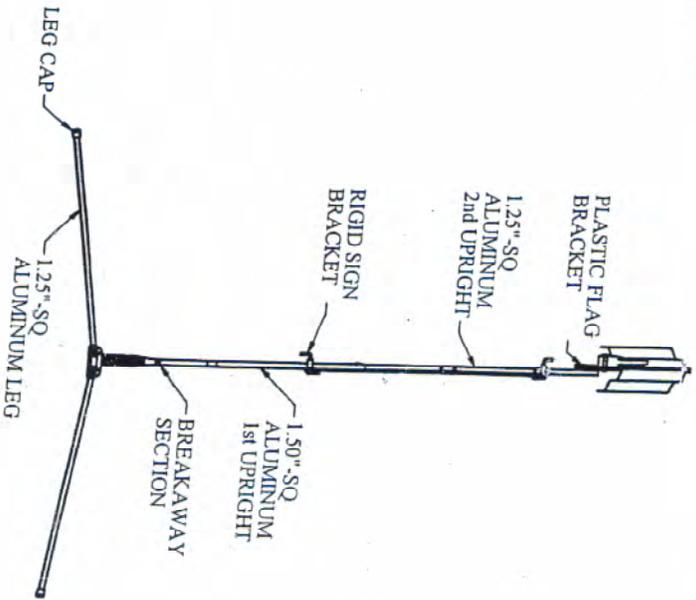
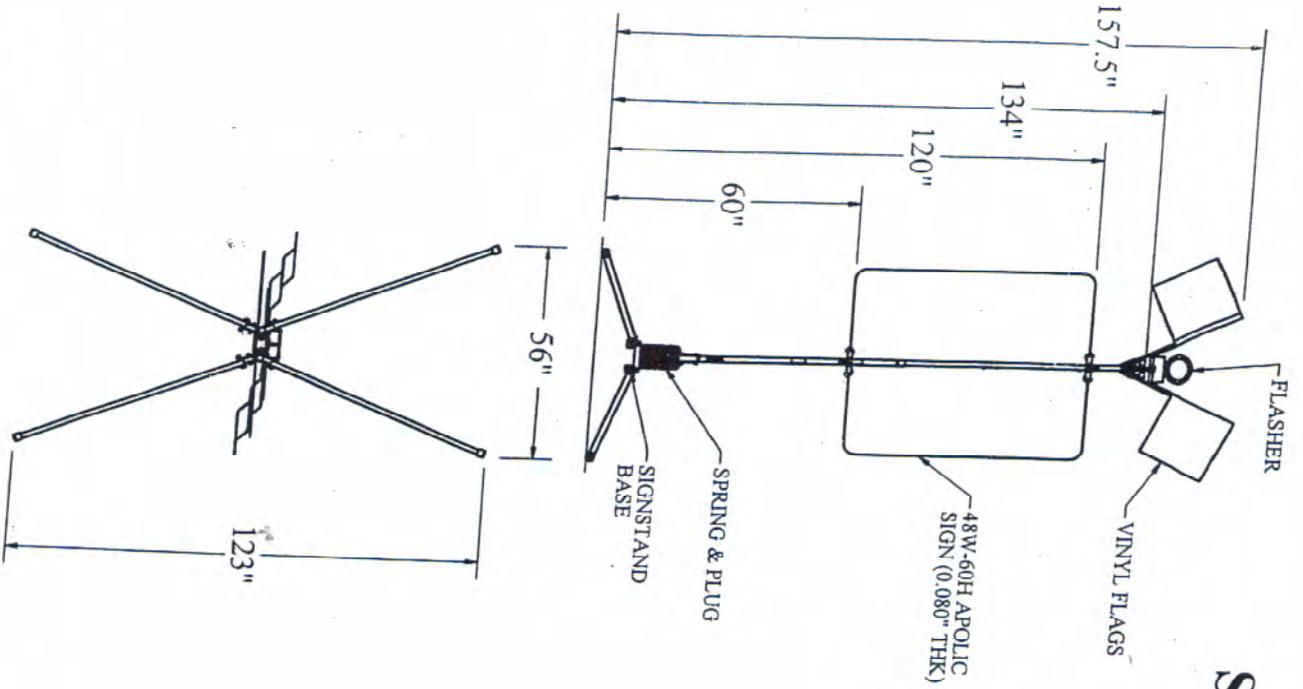
4860K WEIGHT	
ROLL UP SIGN	8 lbs
SIGNSTAND WITH R-U BRACKETS	45 lbs
FLASHER LITE	3.5 lbs
TOTAL	56.5 lbs



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ESR00198-05

4860K Schematic Drawing Apolic Sign



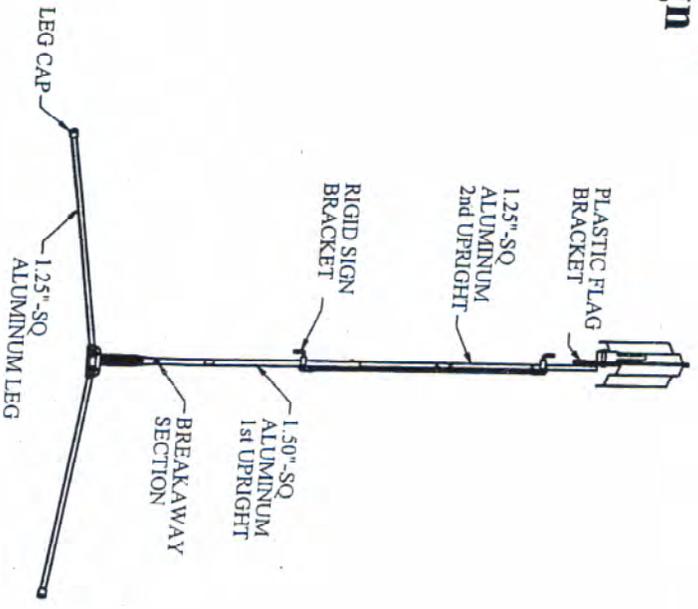
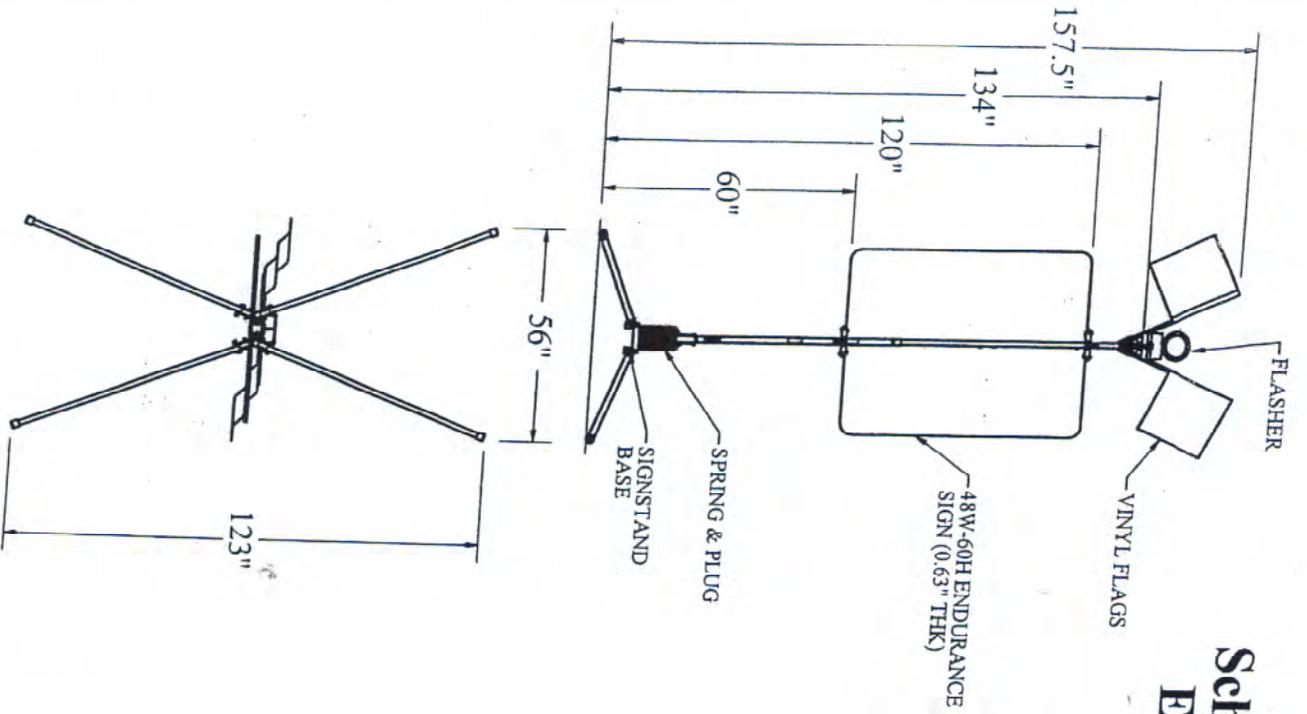
4860K WEIGHT	
APOLIC SIGN	13.3 lbs
SIGNSTAND WITH RIGID BRACKETS	47.5 lbs
FLASHER LTTE	3.5 lbs
TOTAL	64.3 lbs



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ESR00198-06

4860K Schematic Drawing Endurance Sign



4860K WEIGHT

ENDURANCE SIGN 13.3 lbs

SIGNSTAND WITH RIGID BRACKETS 47.5 lbs

FLASHER LITE 3.5 lbs

TOTAL 64.3 lbs



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ESR00198-07