WZ-28

U.S. Department of Transportation
Federal Highway Administration

'loo Seventh St., S.W.
Washington D.C. 20590

March 3, 2000

Refer to: HSA-1

Mr. John Sarkisian
Marketing Displays International
38271 W. Twelve Mile Road
Farmington Hills, Michigan 48331-3041

Dear Mr. Sarkisian:

Thank you for your letter of November 8, 1999, requesting Federal Highway Administration (FHWA) acceptance of a number of your company's portable sign stands as a crashworthy traffic control devices for use in work zones on the National Highway System (NHS) Accompanying your letter was a copy of the crash test report by Safety Quest, Inc., and video documentation of the crash tests. You requested that we find the three tested devices, as well as certain devices of similar design, acceptable. for use on the National Highway System under the provisions of National Cooperative Highway Research Program Report 350 'Recommended Procedures for the Safety Performance Evaluation of Highway Features." You provided additional information on January 18, 2000, regarding specific product requests.

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 fied 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 latest memorandum lists devices that are acceptable under Categories I, II, and III.

Full-Scale automobile testing was conducted on a number of your company's Portable sign supports. Two examples of each device were tested in tandem, one head-on and the next at 90 degrees, as called for in our guidance memoranda.

All stands have square aluminum legs and aluminumupright masts and were tested with 1219 x 1219-mm roll-up signs. All signs were affixed with warning flags on either fiberglass staffs or wood dowels. The tested stands were: MDI 4814 CS Compact Sign Stand. This is a dual vertical spring mounted support for roll-up signs. The legs telescope to a maximum spread of 1800-mm (7 1 inches) in the direction of traffic, and the upright mast is 1260-mm (49.5 inches) high, It was tested with a sign mounted 368-mm (14 inches) from the pavement to the bottom of the sign

MDI 4884 CS Compact Sign Stand

This is a single vertical spring mounted support for roll-up signs. The rigid legs have a maximum spread of 2800-mm (110 inches), and the upright mast extends to a maximum height of 3030-mm (119 inches) to the top of the sign. It was tested with a sign mounted with its lowest point 2134mm (84 inches) above the pavement.

MDI 4860 KA

This is a dual vertical spriig mounted support for roll-up signs, The rigid legs have a maximum spread of 3124-mm (123 inches), and the upright mast extends to a maximum height of 3350- mm (132 inches) to the top of the sign. It was tested with a sign mounted with its lowest point 1524mm (60 inches) above the pavement.

Test Number	SQI99002-MDI4	SQI99002-MDI5	SQI99002-MDI6
Device Number	MDI 4814 CS	MDI 4884 CS	MDI 4860 KA
Test Article Mass (each)	13.8 kg	22 kg	23.1 kg
Ballast Used (each)	None	None	None
Sign Mounting Height	368 mm	2134 mm	1524 mm
Lights	None	None	None
Flagstaffs	2 Fiberglass	3 Fiberglass	3 Wood
Vehicle Test Inertial Mass	814 kg	814 kg	814 kg
Vehicle Impact Speed, Head – on	103 km/hr	101 km/hr	101 km/hr
Windshield Damage	Extensive localized cracking	Extensive localized cracking	Minor damage
Other Damage	Dents to bumper and hood	Dents to bumper, hood and roofline	Dents to bumper, hood, and roofline. Fuel leak
Vehicle Velocity Change	Judged Negligible	Judged Negligible	Judged Negligible

During the tests the most extensive windshield damage was significant cracking confined to the immediate vicinity of the impact. There were no holes through the glass, though both inner and outer layers of the windshield were cracked. There was no occupant compartment intrusion observed, and only minor deformation of the roofline occurred. No test article debris showed

potential for pentrating the occupant compartment. After the final test run, the fuel tank was found to be leaking. This may be the result of impacting six sign stands, as the same vehicle was used for all three tests with only the windshield being replaced between tests.

The results of this testing met the FHWA requirements and, therefore, the devices above, and illustrated in the enclosures are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

You also requested acceptance of certain portable stands by virtue of their similarity to the stands that were tested:

> Model 4860 was tested at 0 and at 90 degrees. This metal-masted support carried a roll-up sign mounted at 1524 mm. You requested acceptance for model 4850 with sign mounted as shown in the enclosed drawing, and model 4860 with sign mounted at 2.1-m (7 feet). Stand 4850 is comparable in design to the tested 4860, and holds the sign at the same height.

Although there are some differences in the layout of the legs and the manner in which the sign attaches to the stand we concur that performance would be similar. Stand 4860 was tested at 1524-m and we concur that the same stand would perform acceptably at 2. l- m because of the greater likelihood that the test article would go over the vehicle without further damage. Stand models 4.3 1 8 and 18 12 have similar bases and mast structure but do not hold the sign as high as the tested Model 4860.

However, your stand Model 50SM which holds signs at similar mounting heights has been tested successfully.

> Model 4814CS was tested at 0 and 90 degrees. This stand has an aluminum up to a point in the middle of the roll-up sign bracing.

It carries a sign mounted at 370-mm. You requested acceptance for model 4815 which only differs in the length of the legs and in the specific method of attaching the sign to the stand. We concur that the performance of the Model 48 15 stand would be comparable to the 4814 CS.

You also requested that we specifically mention sign stand Model 48 14K. This stand is identical to the 4814DLK stand previously accepted in a letter dated July 16, 1998, except it does not have the "drop-n-lock" feature, Because of the low mounting height this difference should not be significant, therefore, we concur in this request.

Finally you asked that we amend our acceptance letter WZ-20 , dated October 28, 1999, based on the results of the latest testing.

In the earlier letter- we had limited your sign stands to a vertical fiberglass upright of a thickness no greater than 6.35mm (1/4 inch), The Safety Quest testing showed that a 9-52-mmthick upright was acceptable. The Safety Quest testing also showed that your flag assemblies with fiberglass supports were acceptable when tested with roll-up signs. Therefore, We consider Your crash tested sign stands as acceptable with vertical fiberglass uprights with a maximum thickness of 9.52-mm and when using flag assemblies mounted on top.

In summary, the stands we find acceptable are the tested 4814 CS, 4884CS, 4860 KA and the similar stands 4850,486O with2.1 mmounting height, 4812,4818,4815,and 4814 K as shown in the enclosed drawings.

Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover structural features nor conformity with the Manual on Uniform Traffic Control Devices. presumabJy you yousupply potential users with sufficient information on design and installation requirements to ensure proper performance We anticipate that the States will require certification from MDI that the hardware furnished has essentially the same chemistry, mechanical properties and geometry as that submitted for acceptance- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-28 shall not be reproduced except in full.

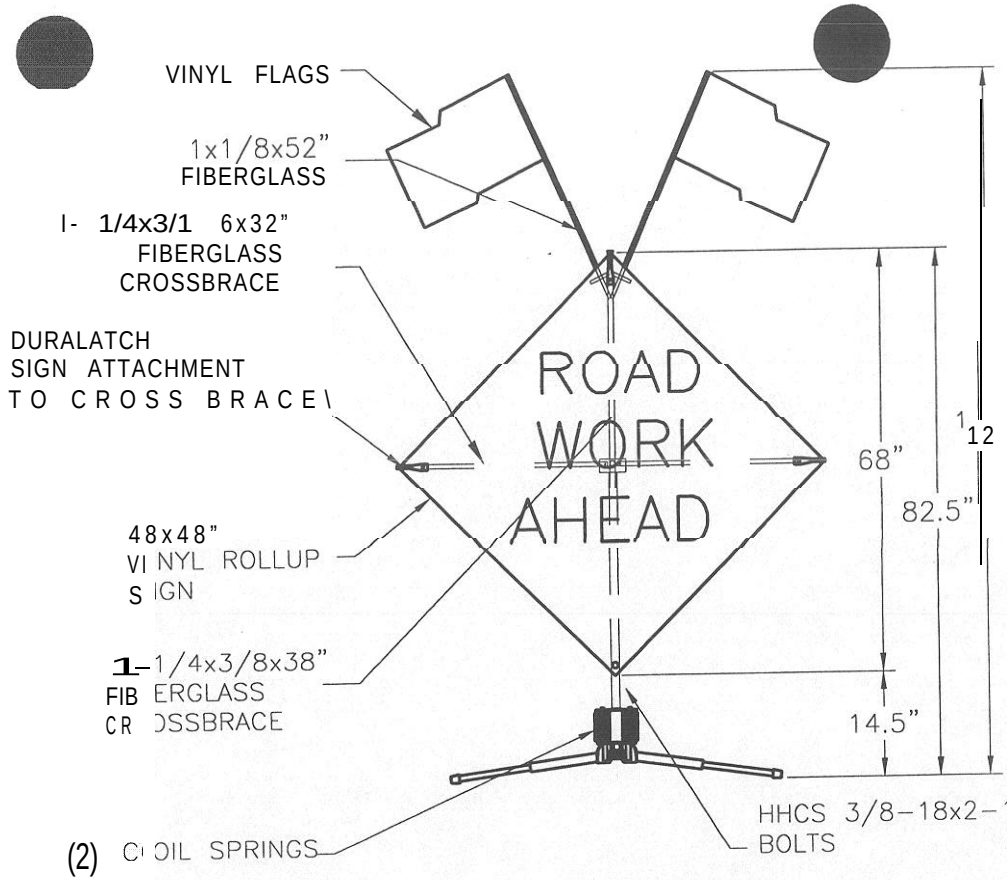
If components of your portable sign stands are patented products they may be considered "proprietary." The use proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of 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 for use on Federal-aid projects, except exempt non-NHS 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 synchronozation 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. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

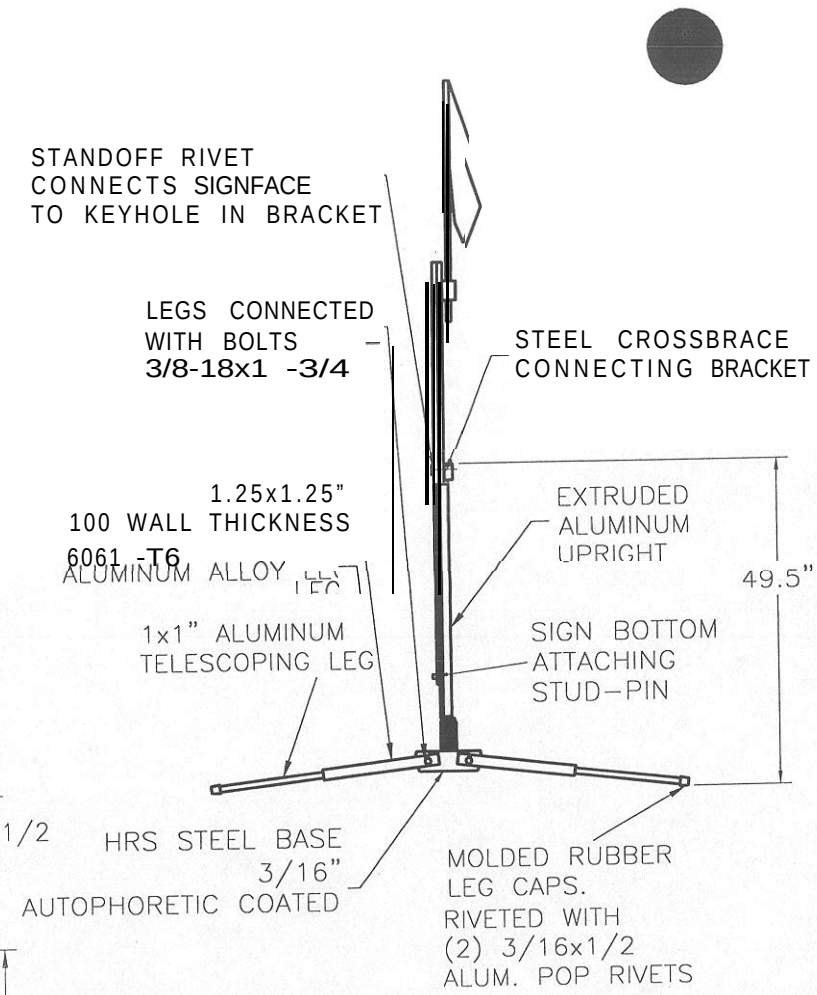
Sincerely yours

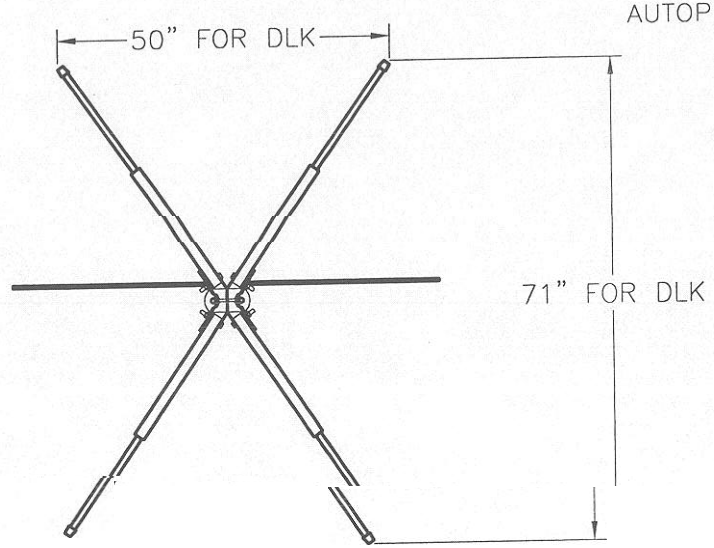
Dwight A. Horne

Dwight A. Horne
Director, Office of Highway Safety Infrastructure

2 Enclosures







SCHEMATIC DRAWING

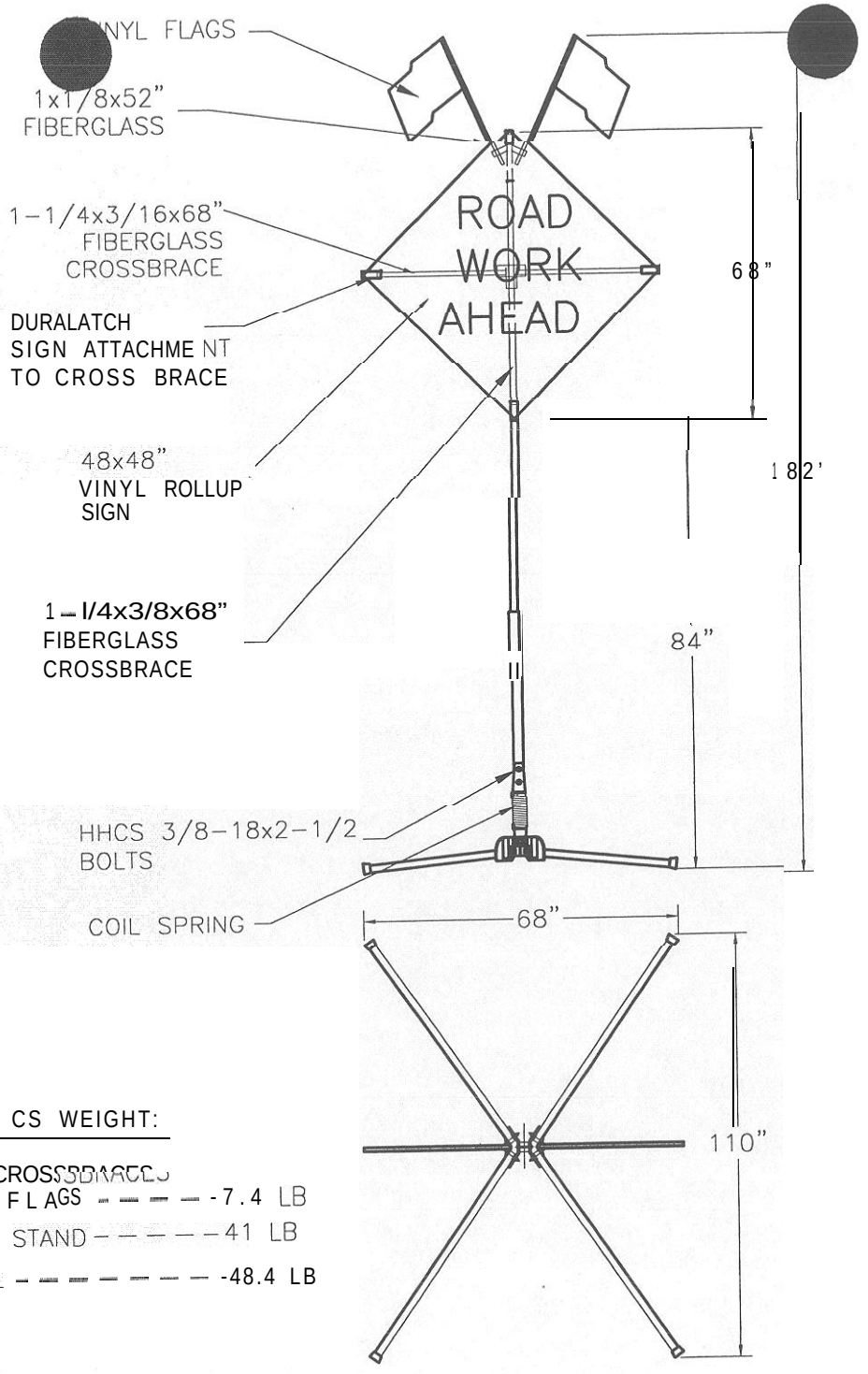
WEIGHT:4814CS

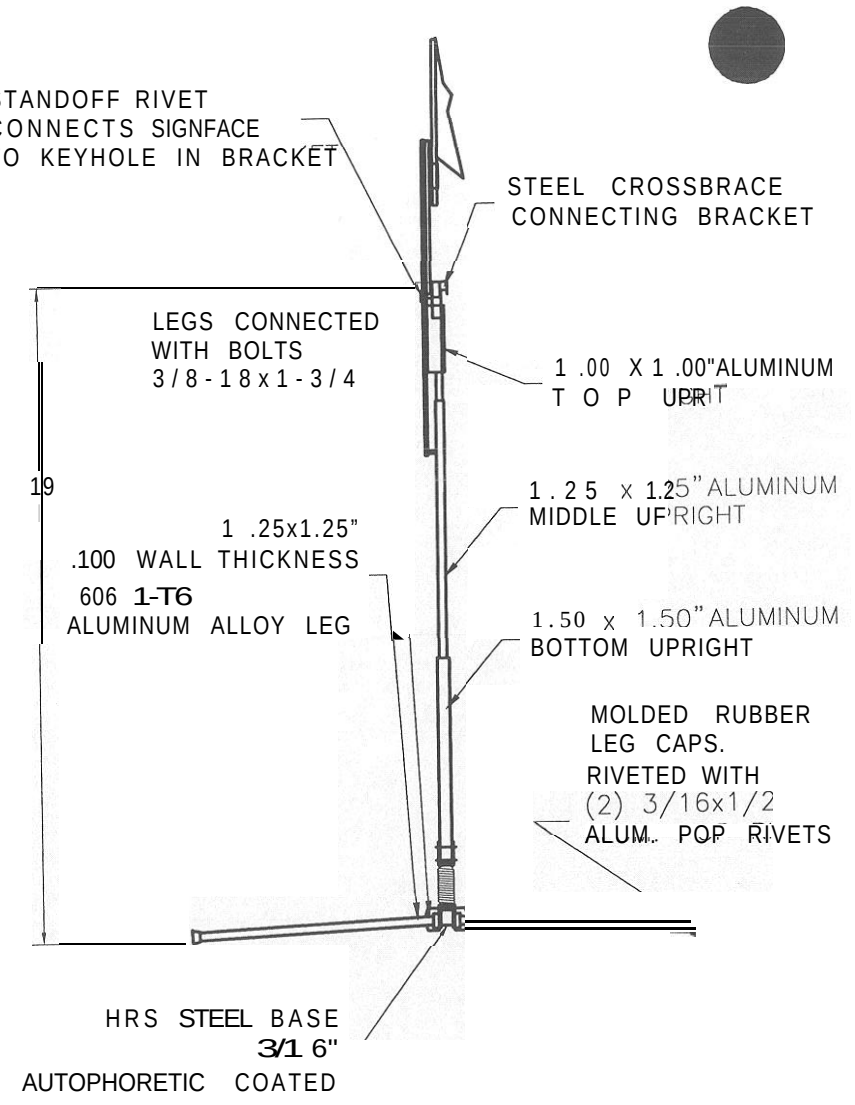
SIGN, CROSSBRACES & FLAGS — — — 7: 4 LB;
SIGN STAND- — 23 LB;
TOTAL — — - 3 0 .4 LB;

MDI

DATE:03/10/99

NAME: MODEL 4814 CS





4884 CS WEIGHT:

SIGN,CROSSBRACES & FLAGS - - - - -7.4 LB

SIGN STAND - - - - - -41 LB

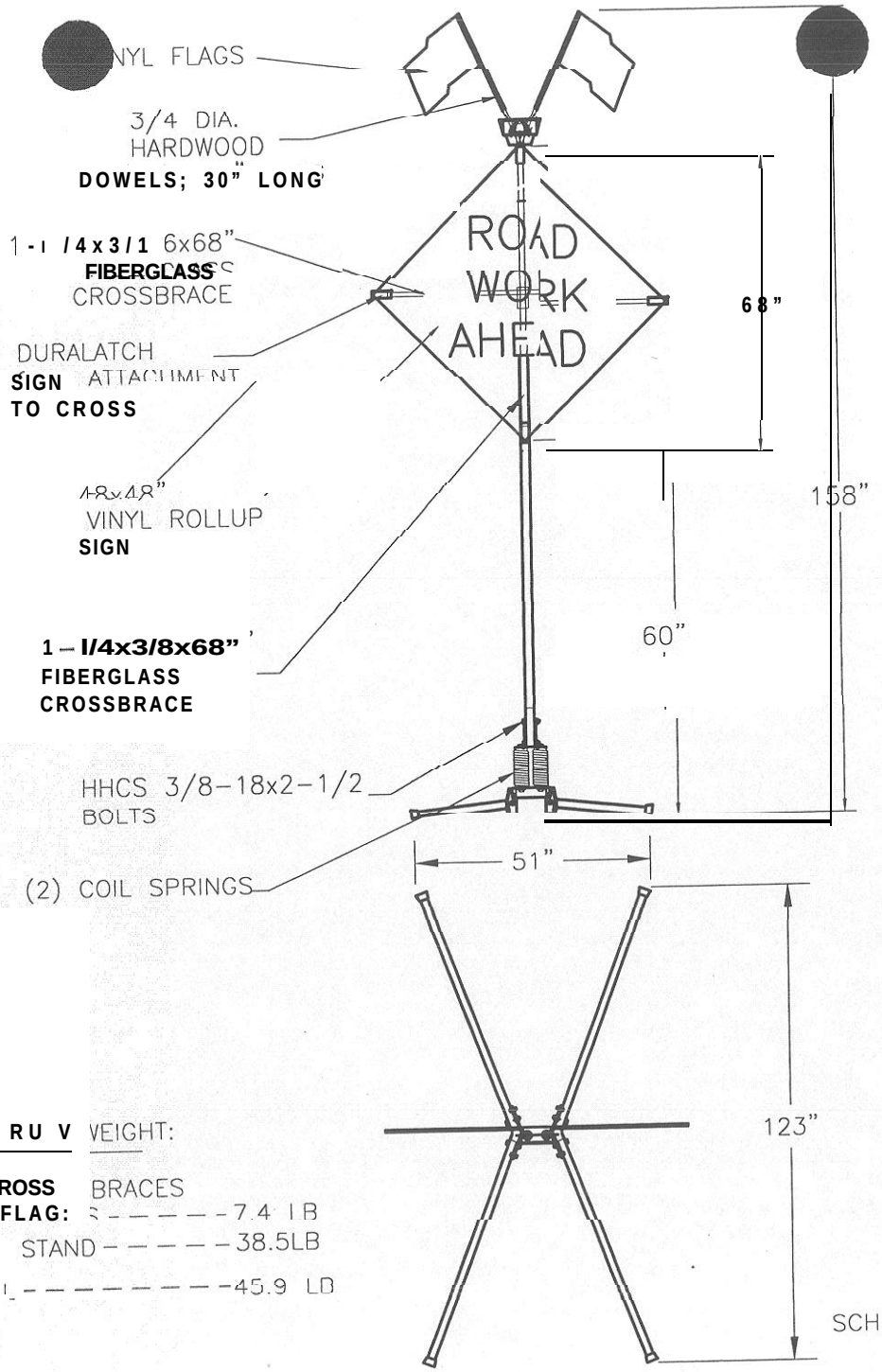
TOTAL - - - - - - - -48.4 LB

MDI

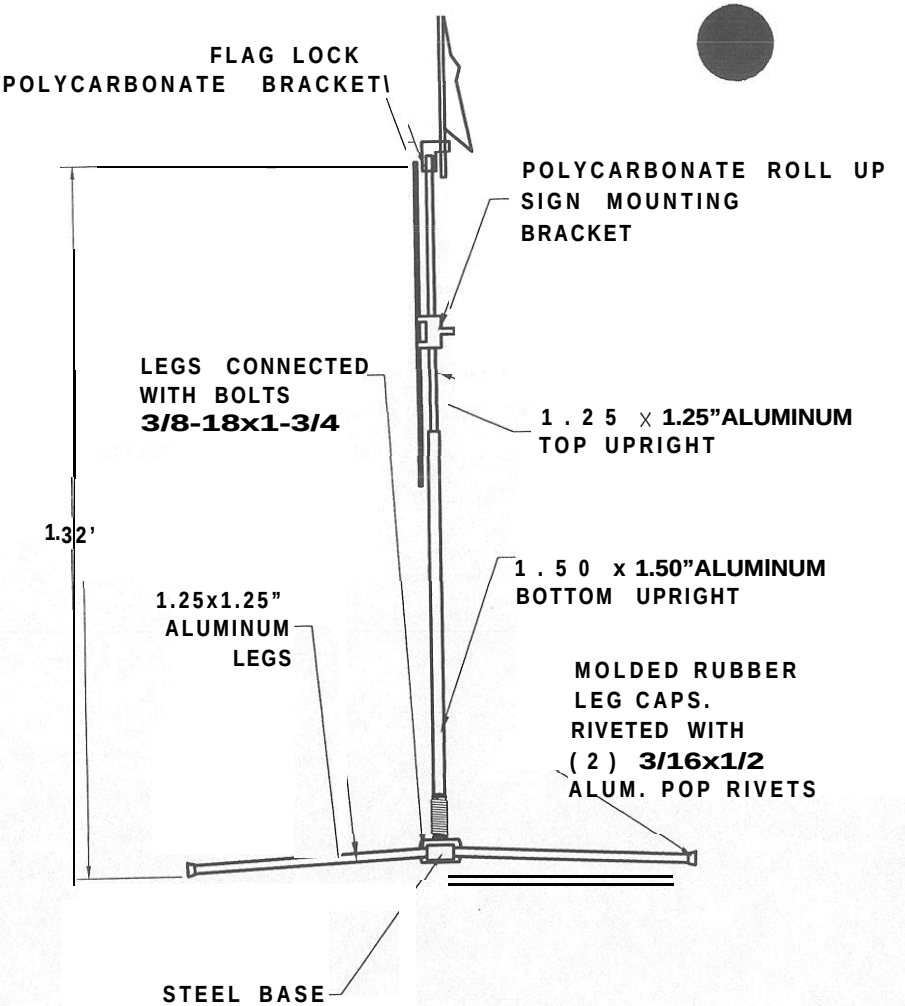
Date:03/10/99

NAME: MODEL 4884 CS

SCHEMATIC DRAWING



SCHEMATIC DRAWING



4860 RUV WEIGHT:

SIGN,CROSS & FLAG: BRACES ------ 7.4 LB

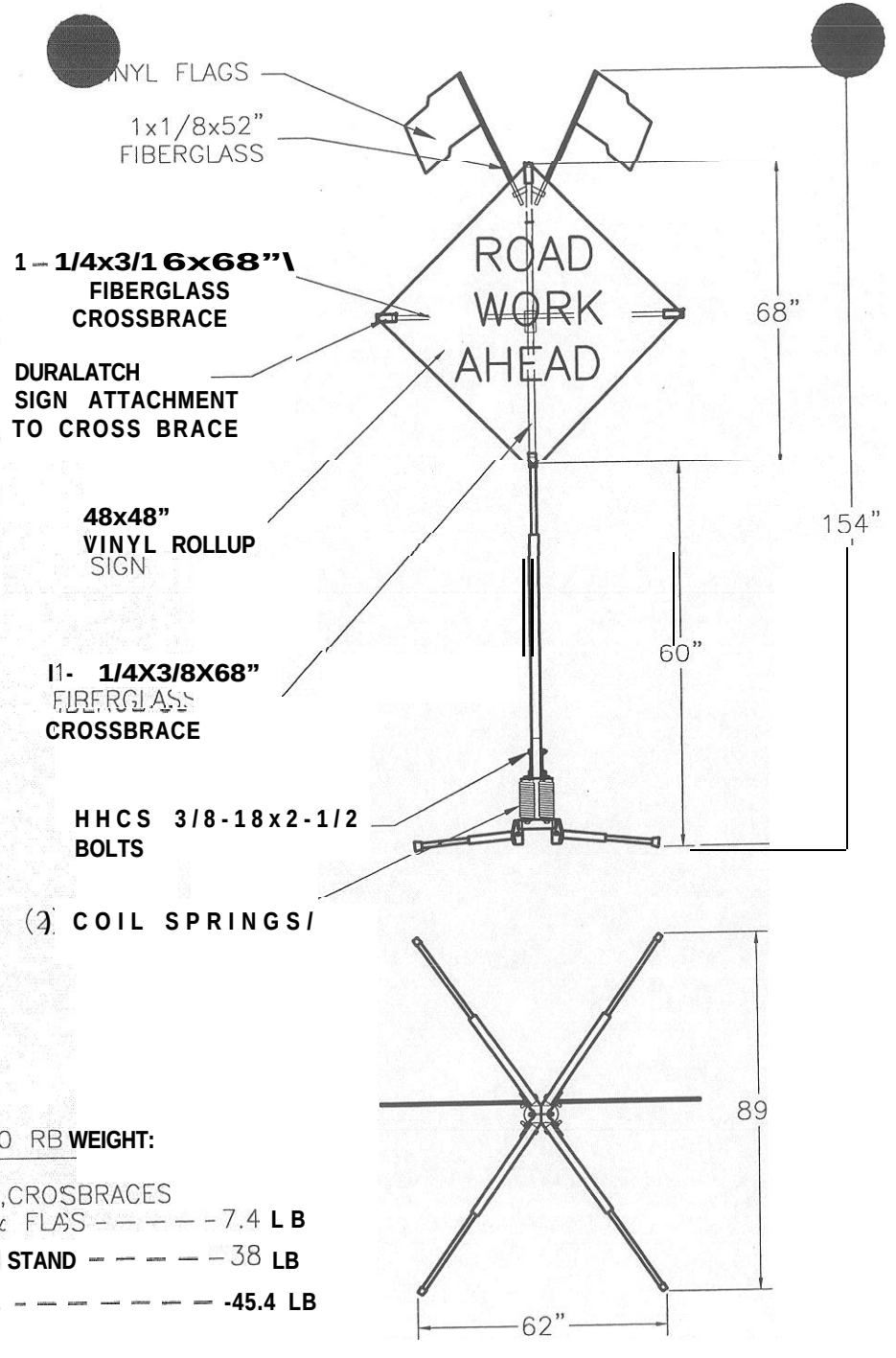
SIGN STAND ----- 38.5LB

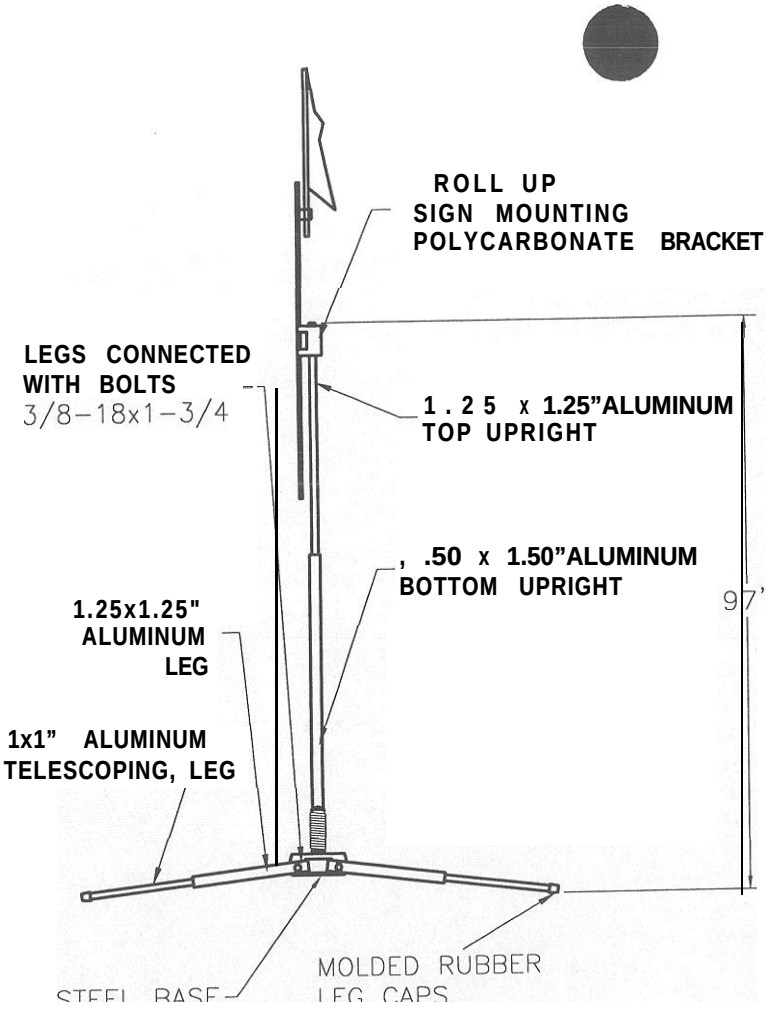
TOTAL ---------- 45.9 LB

MDI

DATE:03/10/99

NAME: MODEL 4860 KA





4850 RB **WEIGHT:**

SIGN, CROSSBRACES & FLAS – – – – – 7.4 **LB**

SIGN **STAND** – – – – – 38 **LB**

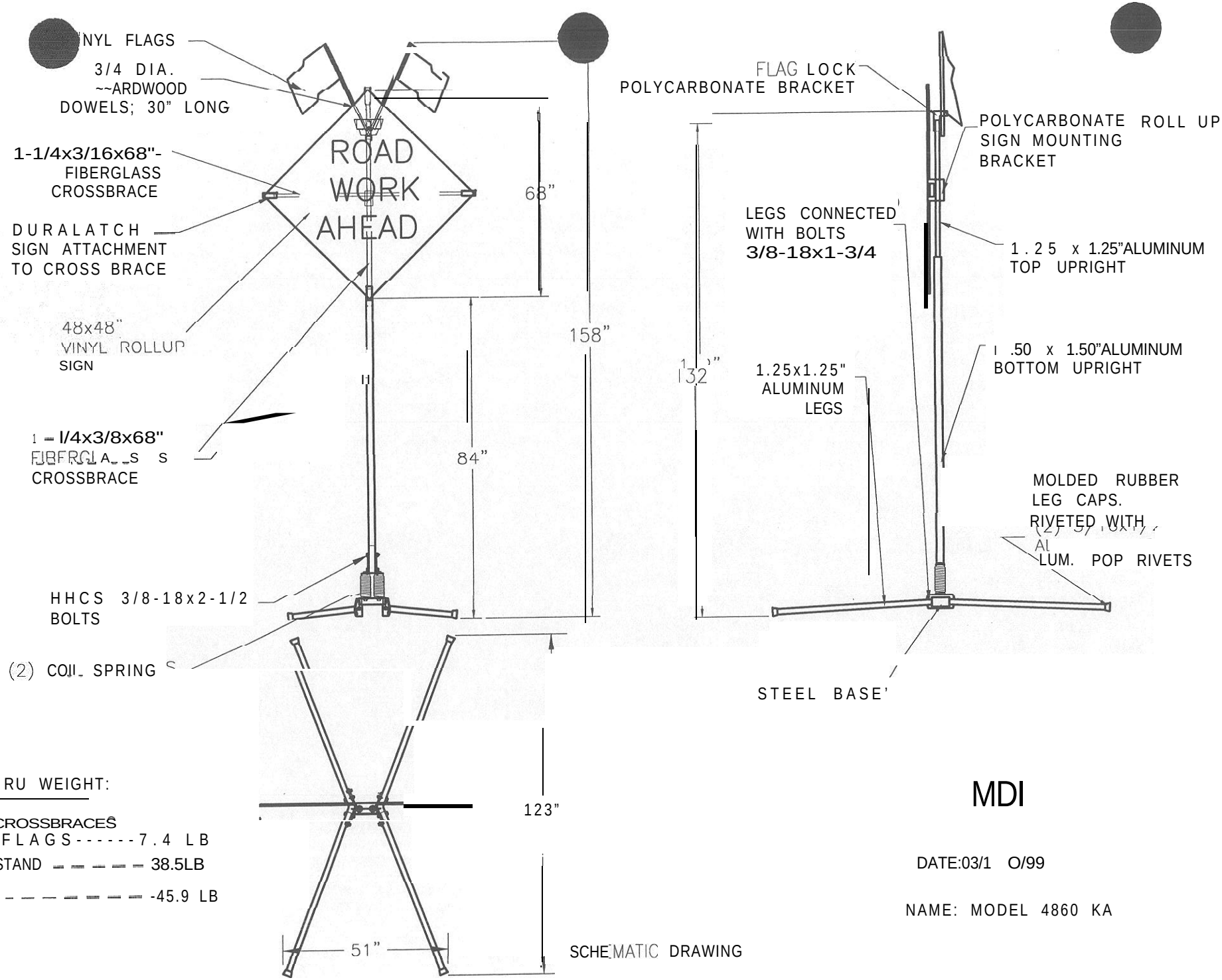
TOTAL – – – – – – – – **-45.4 LB**

MDI

DATE:03/1 I/99

NAME: MODEL 4850 RB

SCHEMATIC DRAWING



4884 RU WEIGHT:

SIGN,CROSSBRACES & FLAGS------7.4 LB

SIGN STAND ----- 38.5LB

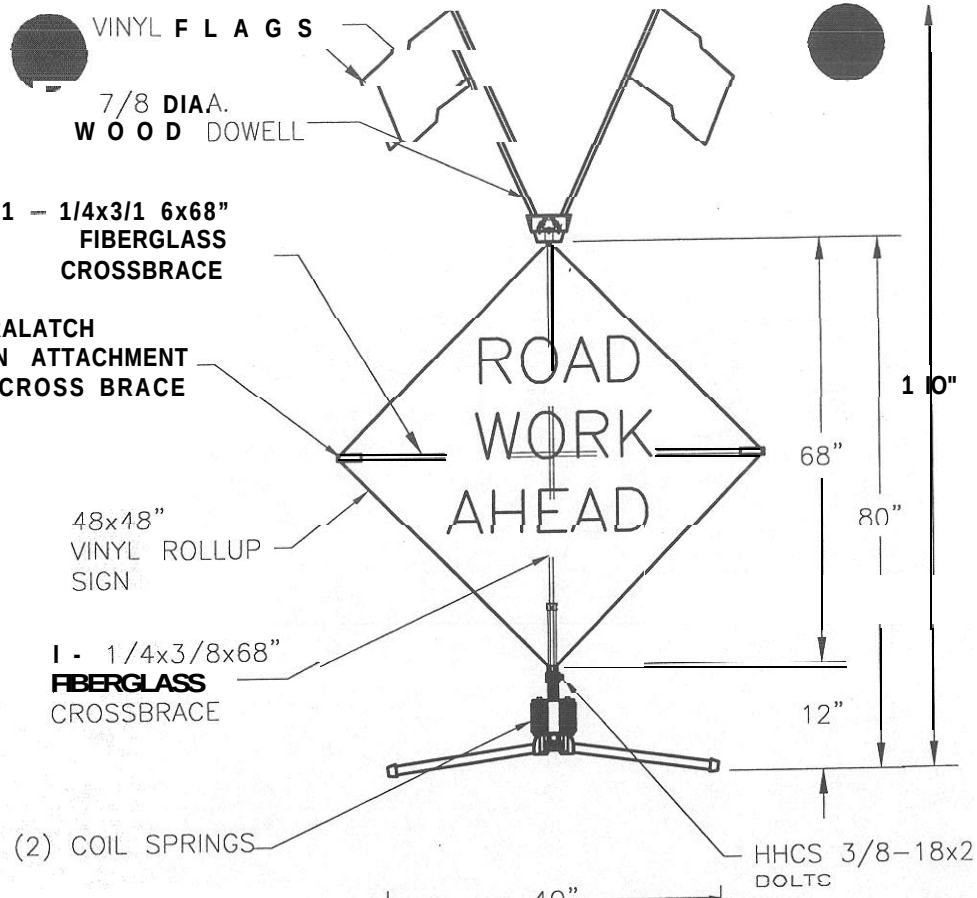
TOTAL ------- -45.9 LB

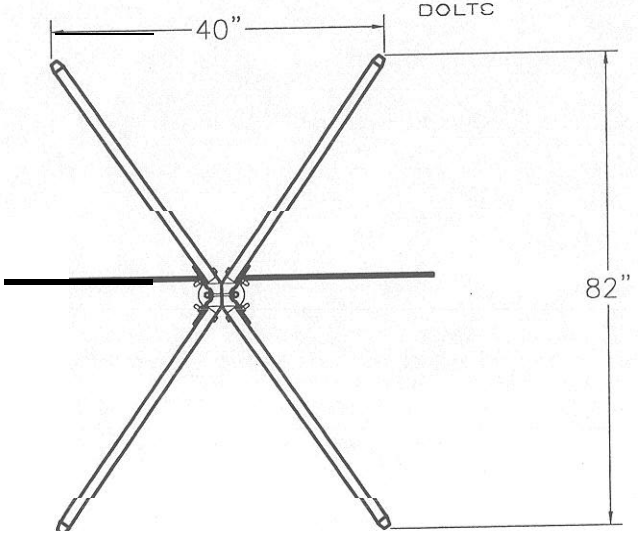
SCHEMATIC DRAWING

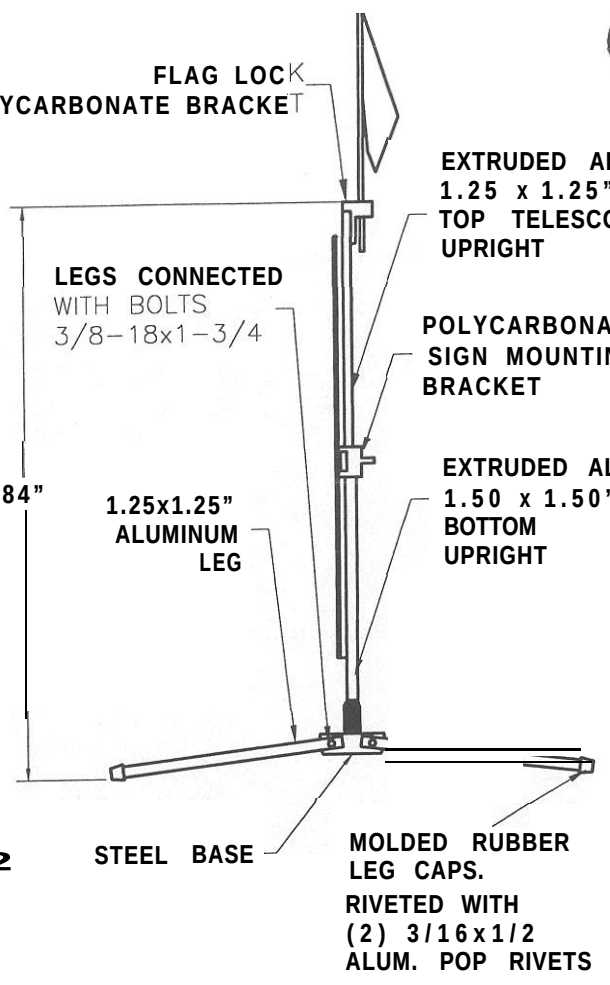
MDI

DATE:03/1 O/99

NAME: MODEL 4860 KA







4812 WEIGHT:

SIGN, CROSSBRACES & FLAGS-------7.4 LB

SIGN STAND - - - - - - 24 LB

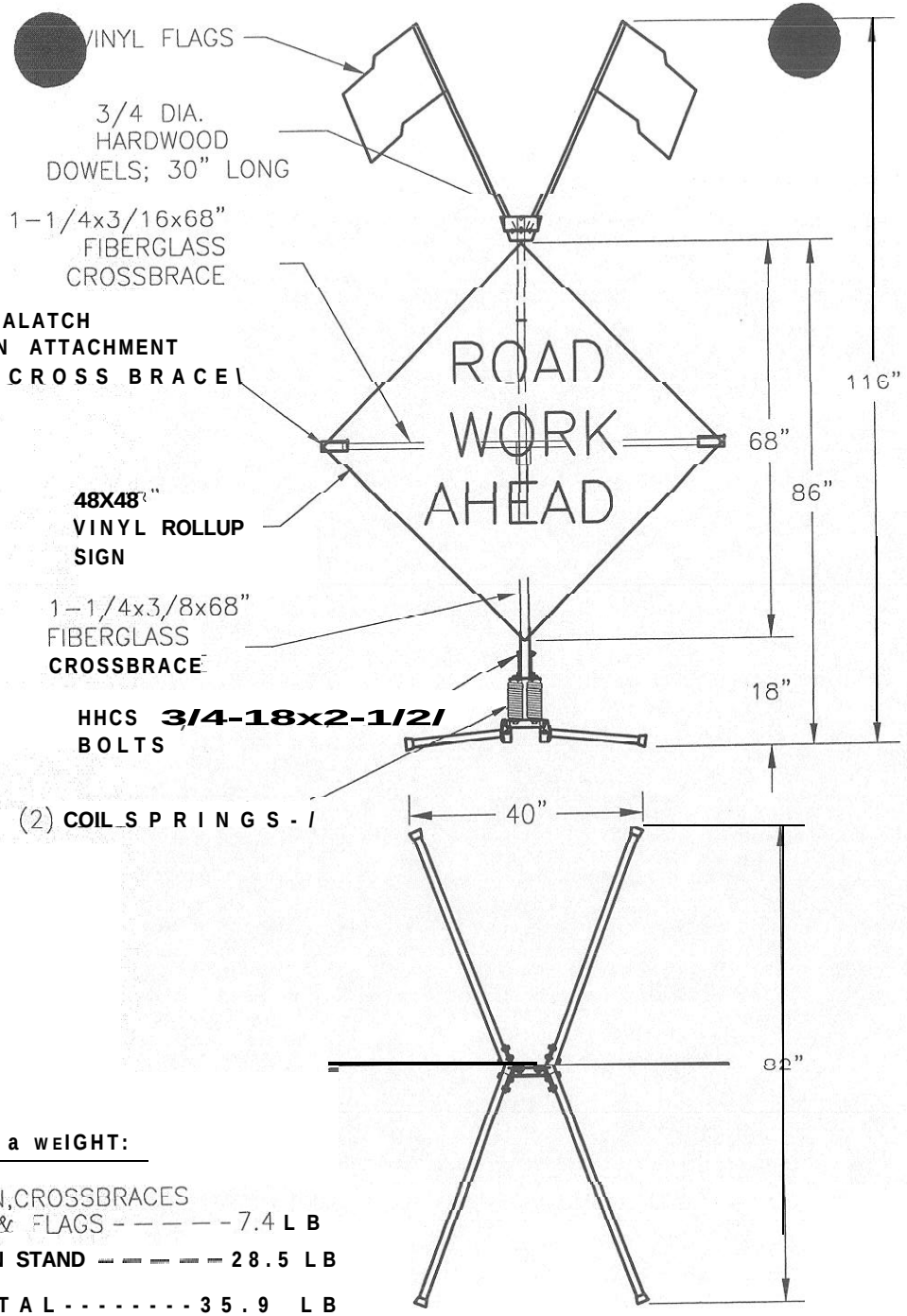
TOTAL - - - - - - - -3 1.4 LB

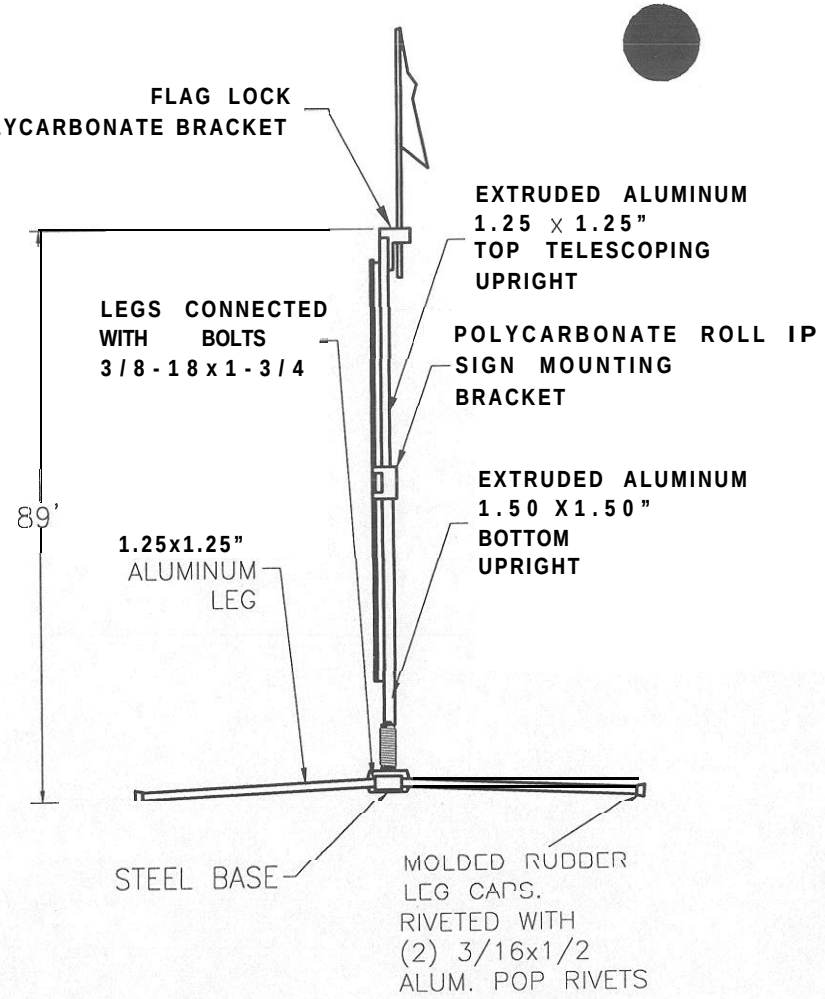
SCHEMATIC DRAWING

MDI

DATE:06/16/98

NAME: MODEL 4812





481 a WEIGHT:

SIGN,CROSSBRACES & FLAGS - - - - - 7.4 LB

SIGN STAND - - - - - 28.5 LB

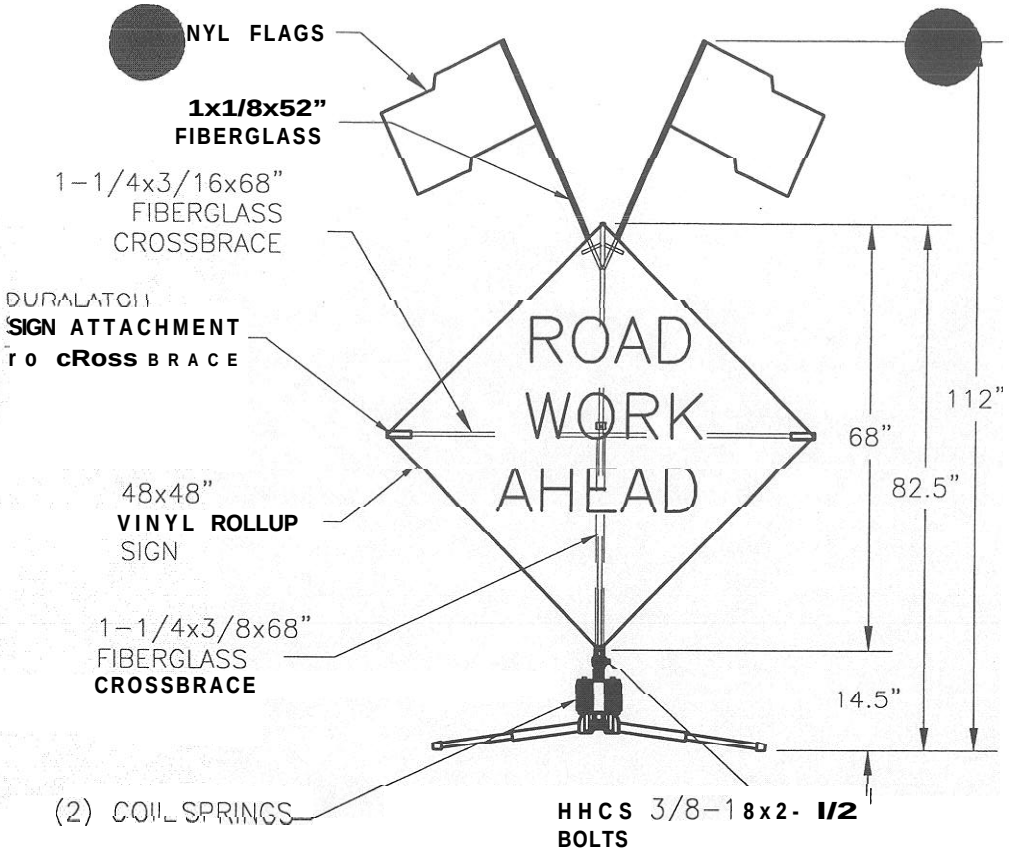
TOTAL - - - - - - - 35.9 LB

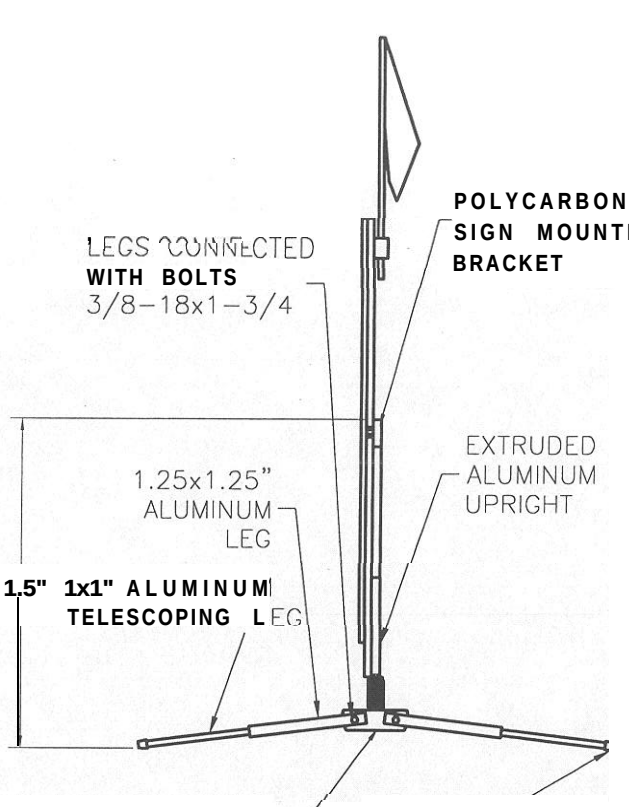
MDI

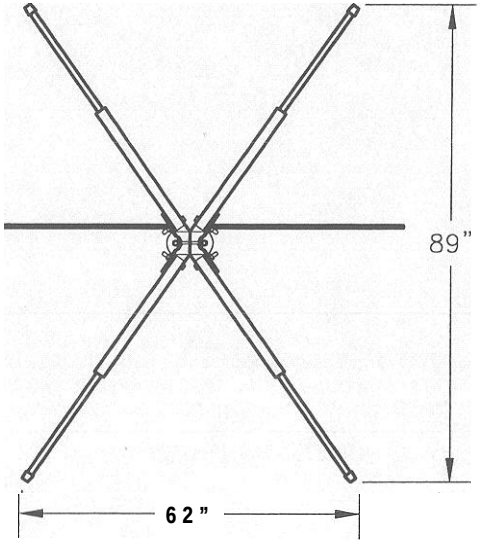
DATE:06/16/98

NAME: MODEL **4818**

SCHEMATIC DRAWING







4815RB WEIGHT:

SIGN,CROSSBRACES & FLAGS------7.4 LB

SIGN STAND-----24 LB

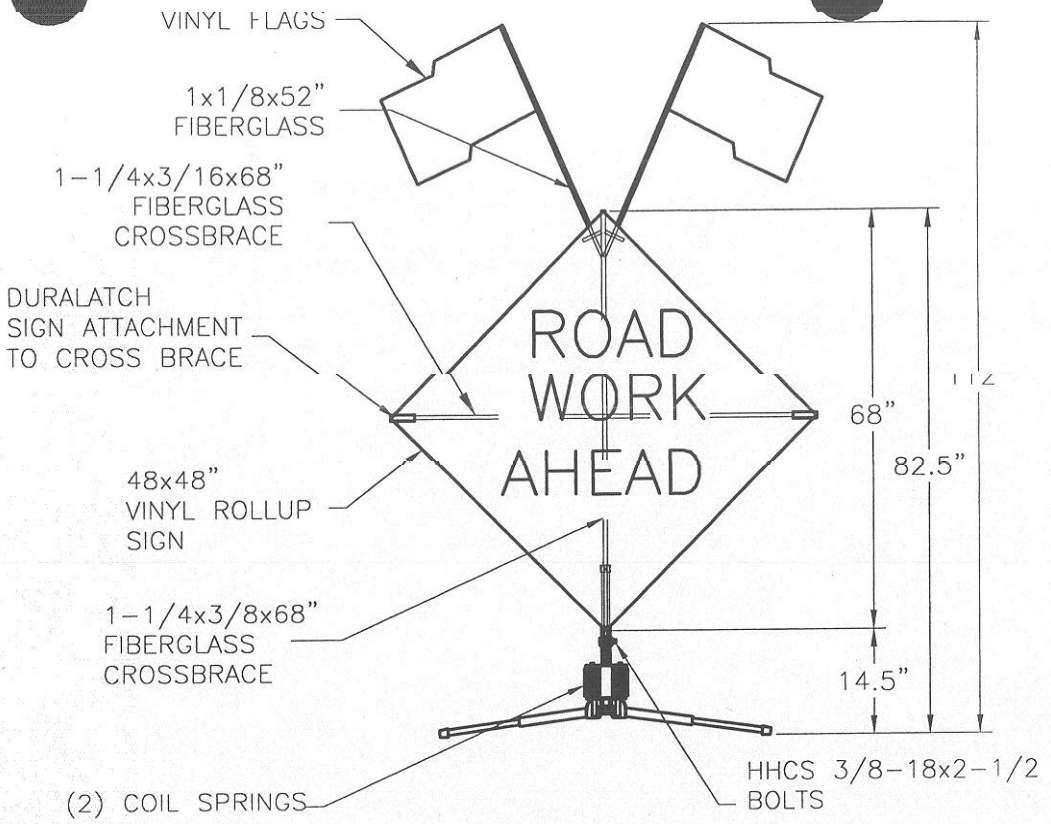
TOTAL--------31.4 LB

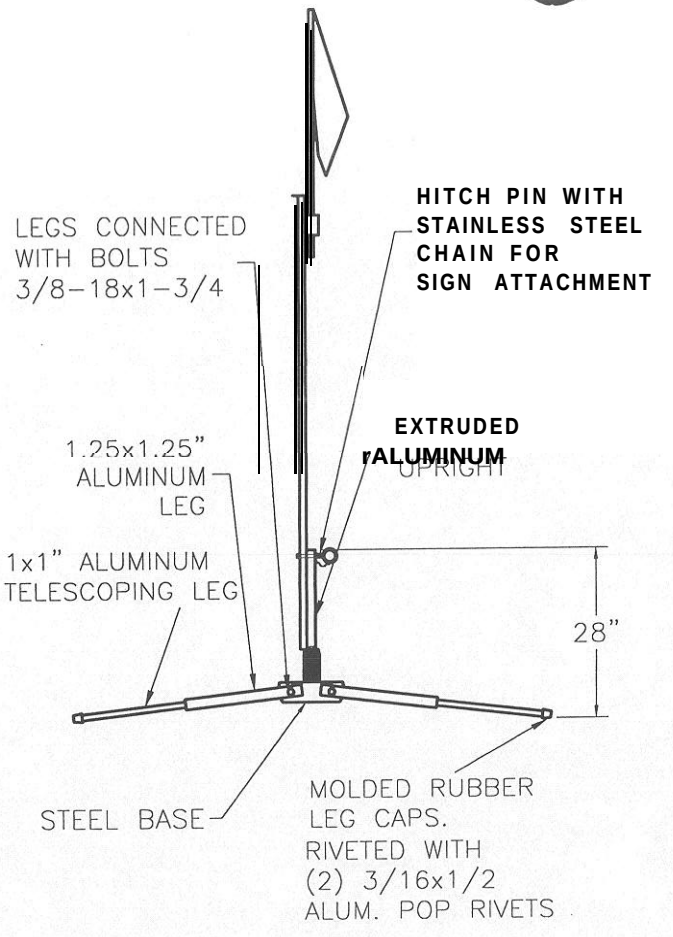
MDI

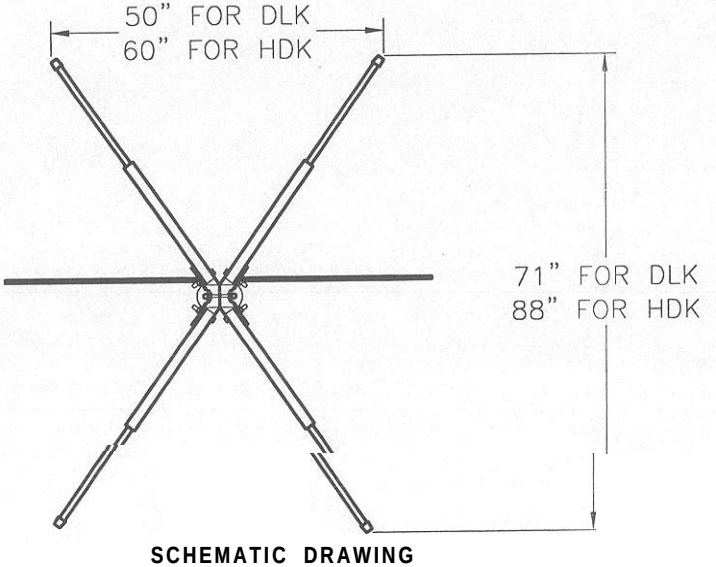
DATE:06/16/98

NAME: MODEL 4815 RB

SCHEMATIC DRAWING







WEIGHT:4814K

SIGN, CROSSBRACES & FLAGS - - - 7.4 LB;
SIGN STAND- - -20 LB;
TOTAL - - - -27.4 LB;

SCHEMATIC DRAWING

MDI

DATE:11/29/99

MODEL 4814 K WINDMASTER

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 i n 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 aadministratively 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 tc support the granting of the waiver. The FRWA response to a request or appeal will be in Writing and made available to the public "PC" 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) I" determining whether the waivers described in paragraph (c)(1) of this section will be granted. the FHWA will Consider all apprpriate factors including, but not limited to. cost, administrative burden. and delay that would be imposed i f t h e provision were n o t waived.

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

[48 FR 53104, NO". 25, 1983, es amended at 49 FR 18821, May 3, 1984 58 FR 38975, July 21, 1993]

EDITORIAL NOTE: For a waiver document affecting §635.410, see 60 FR 154478 Mar. 24, 1995.

§635.411 Material or product selection.

(8) Federal funds shall not participate, directly or indirectly. in payment for any premium or royalty on any patented or proprietary material. specification, or process specifically set forth in the plans and specifications for a project ""leas:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable ""patented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities. or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material. semifinished or finished article or product that will fulfill the requirements for a" item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same. the PS&E for the project shall either Contain or include by reference the specification* for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in a" increase in costs. there will not be Federal-aid participation in any increase I" costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products. when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding Procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid partici-Patio" will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification Of alternative types Of culvert pipes, and (2) the "umber and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and c" plans to single trade "*me materials will not be approved on Federal-aid contracts.

§635.413 Warranty clauses.

The SHA may include warranty provisions in National Highway System (NHS) construction 00*t***Ls in accorance with the following:

(a) Warranty provisions shall be for a specific construction product or feature. Items of maintenance not eligible for Federal participation shall not be covered.

(b) A,, warranty requirements and subsequent revisions shall be submitted to the Division Administrator for advance approval.

(c) No warranty requirement shall he *""roved which. in the judgment of the Division Administrator, may place an undue obligation on the contractor for items over which the contractor has no control.

(d) A SHA may follow its own procedures regarding the inclusion of warranty provisions in non-NHS Federal-aid contracts.

[60 FR 44274, Aug. 25, 1995]

§635.417 convict produced materials.

(a) Materials produced after July 1, 1991, by Convict labor may only be incorporated in a Federal-aid highway contruction project if such materials have been:

(1) Produced by convicts who are on parole supervised release. or probation from a prison or

(2) Produced in a qualified prison facility end the cumulative annual Production amount of such materials for use in Federal-ais highway contruction does not exceed the amount Of such materials produced in such facility for "se in Federal-aid highway construction during the 12-month period ending July 1, 1981.

(b) Qualified prison *facility means* any prison facility in which convicts. during the 12-month period ending July 1, 1987, produced materials for "se in Federal-aid highway construction projects.

[53 FR 1923 Jan. 25, 1988, es amended at 58 FR 38975, July 21, 1993]

APPENDIX A TO SUBPART D—SUMMARY OF ACCEPTABLE CRITERIA FOR SPECIFYING TYPES OF CULVERT PIPES

Type of drainage installation	Alternatives required			AASHTO designations to be included with alternatives	Application	Remarks
	Yes	No	Number			
Cross drains under high-type pavement.[1]	.....	X	.....	.....	Statewide	Any AASHTO-approved material.[2]
Other cross-drain installations.	X	.....	3 minimum	M–170 and M–190.	.....do	Do.[2]
Side-drain installations	X	.....	.....do	M–36	.....do	Do.[2]
Special installation conditions.	.....	X	.....	.....	Individual installation.	Specified to meet special conditions.
Special drainage systems (storm sewers, inverted siphons, etc.).	.....	X	.....	.....	.....do	Specified to meet site requirements.

[1] High-type pavement is generally described as FHWA construction type codes I, J, K, L, and plant mix and penetration macadam segments, respectively shown in the right-hand columns of type codes G and H having a combined thickness of surface and base of 7 in or more (or equivalent) or that are constructed on rigid bases.

[2] Types not included in currently approved AASHTO specifications may be specified if recommended by the State with adequate justification and approved by FHWA.

Subpart E-Interstate Maintenance Guidelines

SOURCE: 45 FR 20793, Mar. 31, 1980, unless otherwise noted.

§635.501 Purpose.

To prescribe Interstate maintenance guidelines and establish the policy and procedures to insure that the condition of Interstate routes is maintained at the level required by the purposes for which they were designed.