WL-36

U.S. Department
of Transportation
Federal Highway Administration

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

May 24, 2000

Refer to: HSA-1

Mr. Alan Richter
Protection Services, Inc.
635 Lucknow Road
Harrisburg, PA 17110-1635

Dear Mr. Richter

Thank you for your letter of January 7, 2000, requesting Federal Highway Administration (FHWA) acceptance of your company's barricades as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter was a report of the testing, detailed drawings of each device, and videos of the crash tests. You requested that we find the listed devices acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." This letter will also serve as an acceptance letter for your "Bigfoot" vertical panel device.

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 as using live drivers and radar speed detection:

"**Bigfoot Self Ballasting Vertical Channelizer**" This 914 mm tall vertical panel is a flexible two-piece channelizer of recycled plastic friction fit into a 14.5-kg recycled rubber base. A "detachable head warning light"(meaning that the batteries were in a separate housing mounted in the low-profile base) was affixed to both devices struck. A drawing of the devices as tested is enclosed for reference.

"**Type One and Type Two Barricades**" Three variations of barricades with plastic panels were tested:

Type Two 305 mm x 610 mm (12 inches x 24 inches) with steel legs
Type Two 305 mm x 610 mm (12 inches x 24 inches) with plastic legs
Type One 305 mm x 915 mm (12 inches x 36 inches) with steel legs

The Type I and II barricades with metal legs perfomed similarly when struck head-on by wrapping around the front of the vehicle. The 90 degree impacts saw the metal legged barricades knocked up and over the vehicle. There was no windshield contact in the test of the Type I barricades. Minor cracking was seen after the test of the Type II barricade, presumably due to the lens of the warning light that broke off one of the barricades.

All barricades tested were affixed with 2.5 kg warning lights. The lexan lens was 178 mm in diameter, the high density polyethylene battery pack was 190 mm long. The unit was attached to the barricades using a 12.7 mm diameter bolt and nut. Although a cupped washer is typically used as a theft deterrent, no such washers were used in the testes. Because the cupped washers tend to strengthen the attachment of the light unit to the barricade, the tests lacking the cupped washers are a "worst-case" scenario. This indicates that the lighted barricades using cupped washers will also perform in an acceptable manner.

There was more extensive hood denting and windshield cracking after the test of the Type II barricade with plastic legs. Although this causes us some concern, the test results appear to be acceptable. Drawings of the tested Type One and Type Two barricades are enclosed for reference.

Conclusion:
Damage to the vehicle was limited to hood denting and moderate windshield damage. The test articles did not show potential for penetrating the occupant compartment. The results of this testing met the FHWA requirements and, therefore, the BigFoot Channelizer with warning light (light mounted on top and batteries located in the base) and your Type I and II barricades with conventional warning lights, as discussed and described above, are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State.

You also requested we find other barricades acceptable by virtue of the successful performance of the tested barricades. The following barricades are those you wish to have accepted by virtue of their being similar but lighter.

- Type I **12 x 24** Plastic Panels, Steel Legs or Plastic Legs
- Type I **8 x 24** Plastic Panels, Steel Legs or Plastic Legs

These two barricades are identical in construction to those tested except for the size of the reflectorized panel. They are also acceptable for use on the NHS.

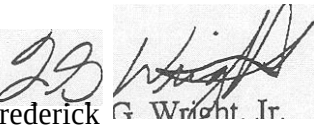
- **8 x 24** Vertical
- **12 x 24** Vertical
- **18 x 24** Vertical

These three devices are considered vertical panels and are shown on the enclosed drawings. The metal or plastic legs, connecting hardware, and reflectorized panels are identical to those used in the tested barricades but they are significantly narrower and shorter. Because we consider them even less likely to become hazards when struck, we find that they are also acceptable for use on the NHS.

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. Presumably, you will supply potential users with sufficient information on design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Protection Services 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. To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-36, shall not be reproduced except in full.

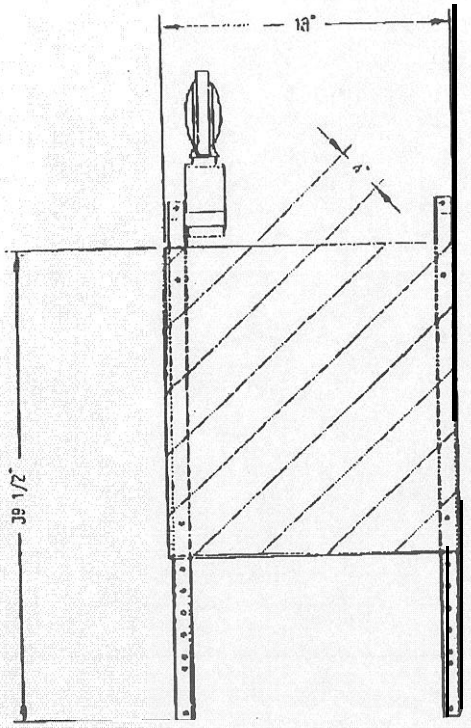
Some of your crash-tested products are patented and considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of the project. Under such 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 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 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, 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,

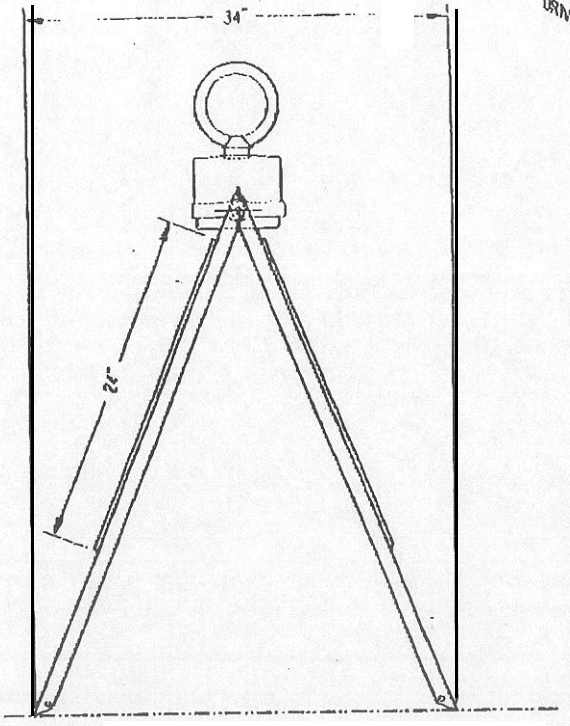


Frederick G. Wright, Jr.
ProgramManager, Safety

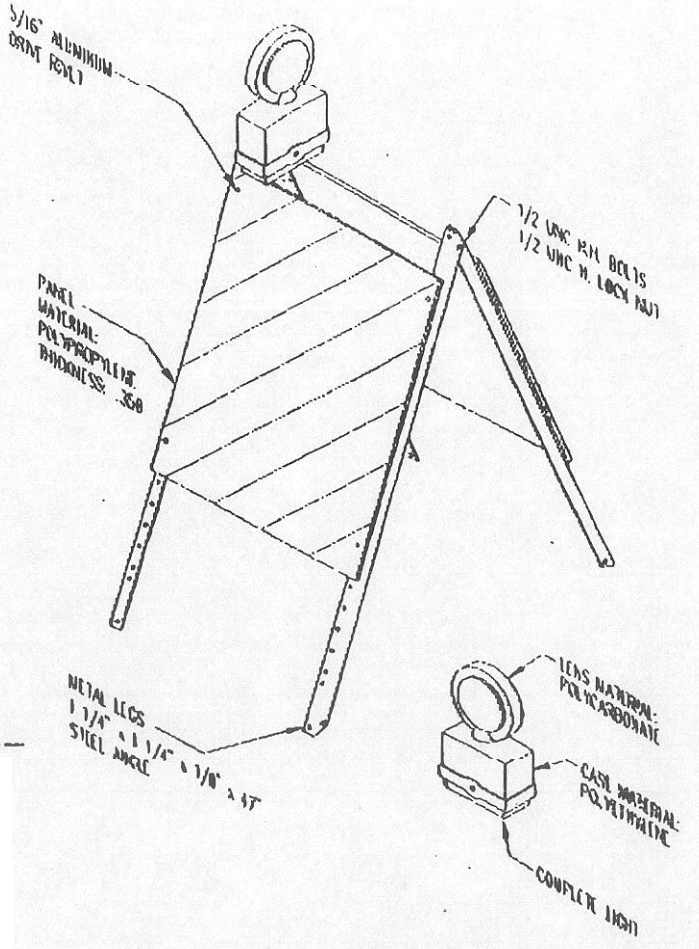
3 Enclosures



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



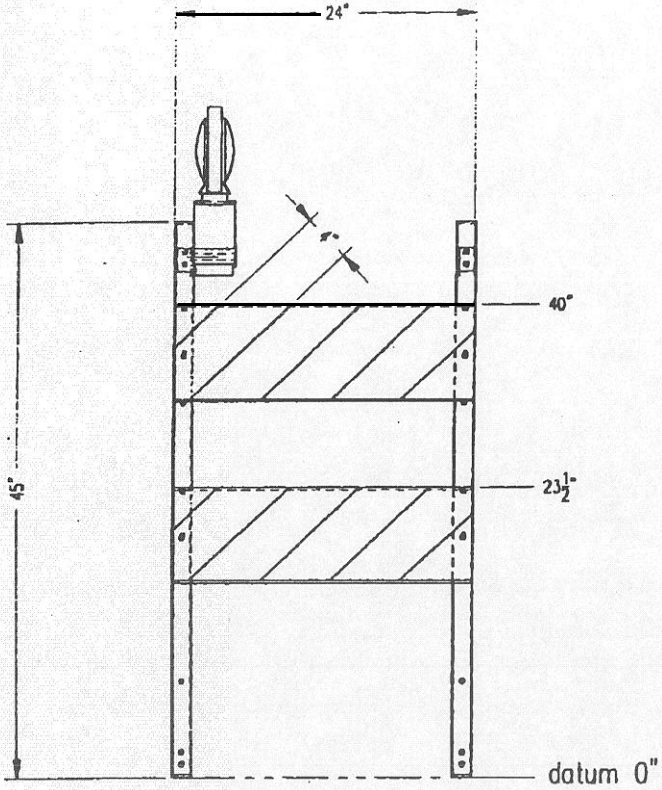
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
835 Linglestown Rd. Harrisburg PA 17110 ph (717) 236-1281

CONSTRUCTION BARRICADE
Type I 2V Barricade
Meld legs complete light

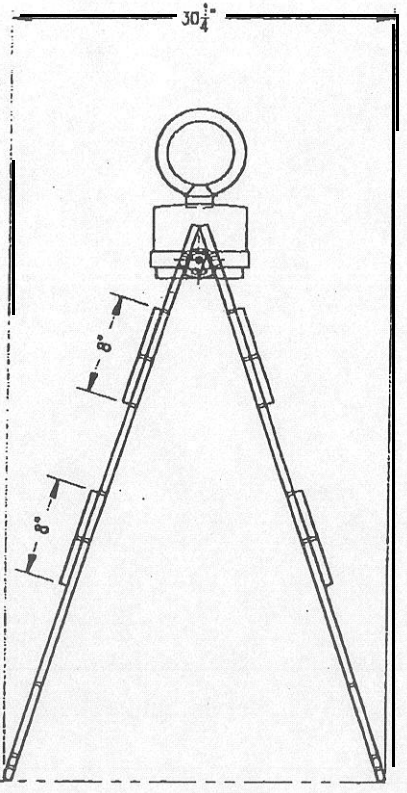
TYPE I 2V

ZONE	REV	DESCRIPTION	DATE	APPROVED

REVISIONS



FRONT ELEVATION VIEW



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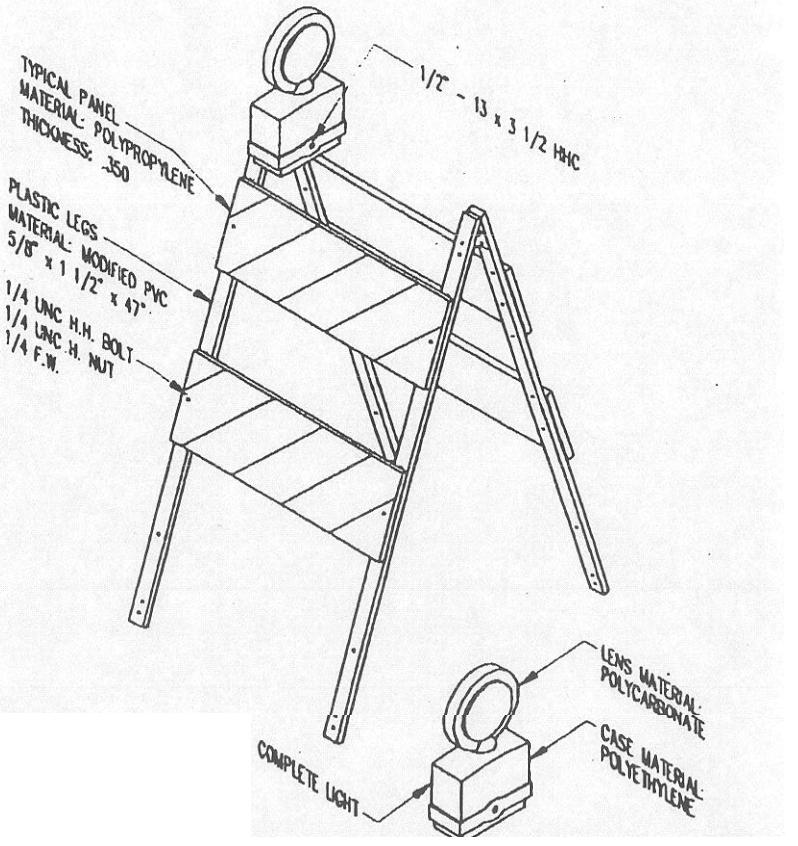


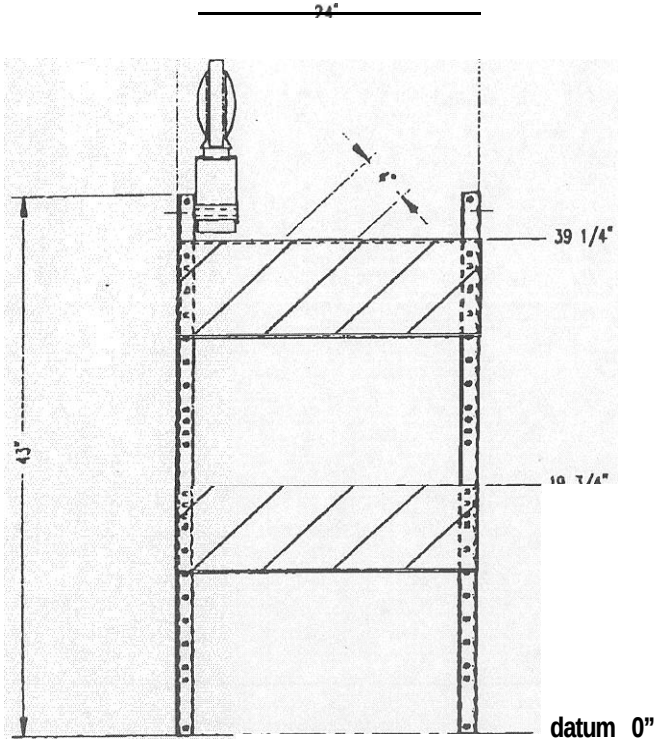
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N Sixth St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION BARRICADE
Type 2
Typical Plastic Legs, Complete Light

SIZE	FSCM NO.	DWG NO.	REV
C		TYPE 2B	

SCALE 1/8"-1'-0" SHEET 1 of 1

ZONE	REV	DESCRIPTION	DATE	APPROVED
		REVISIONS		



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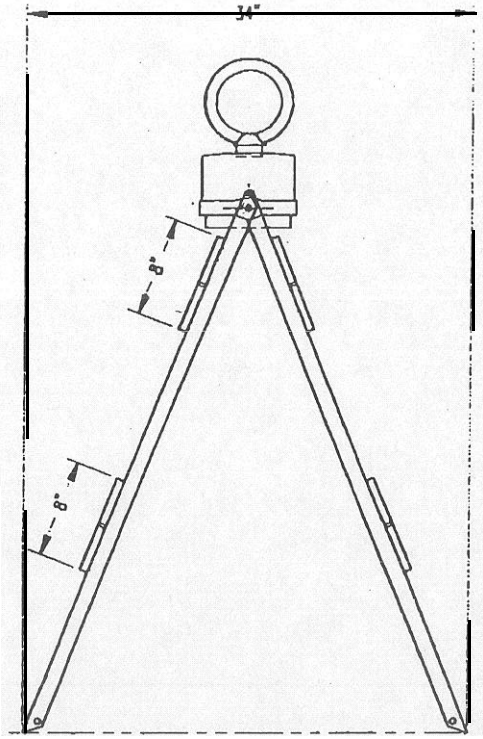

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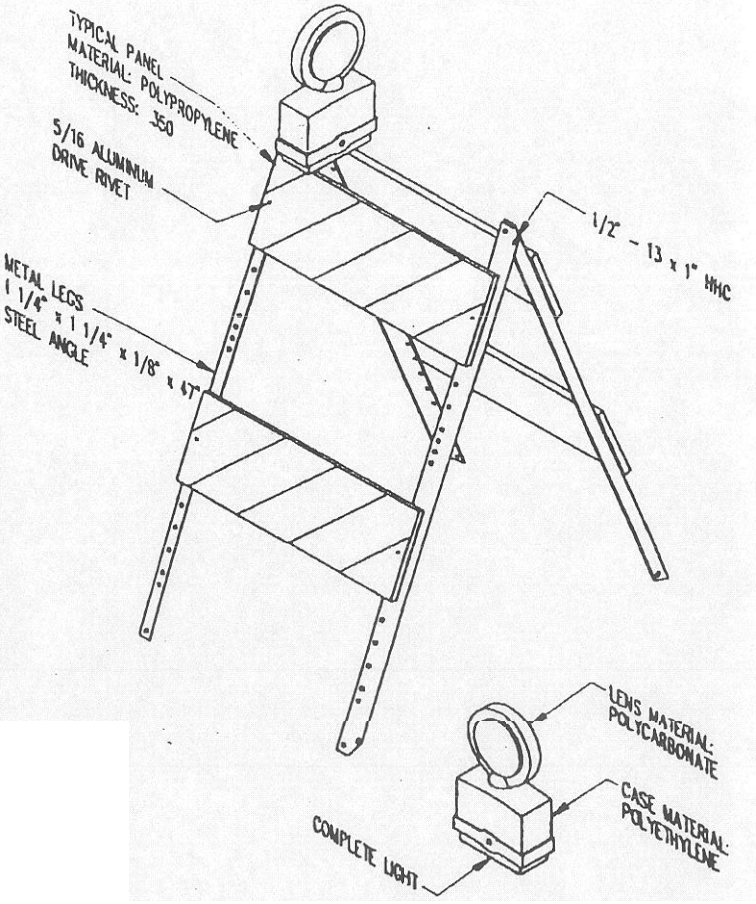


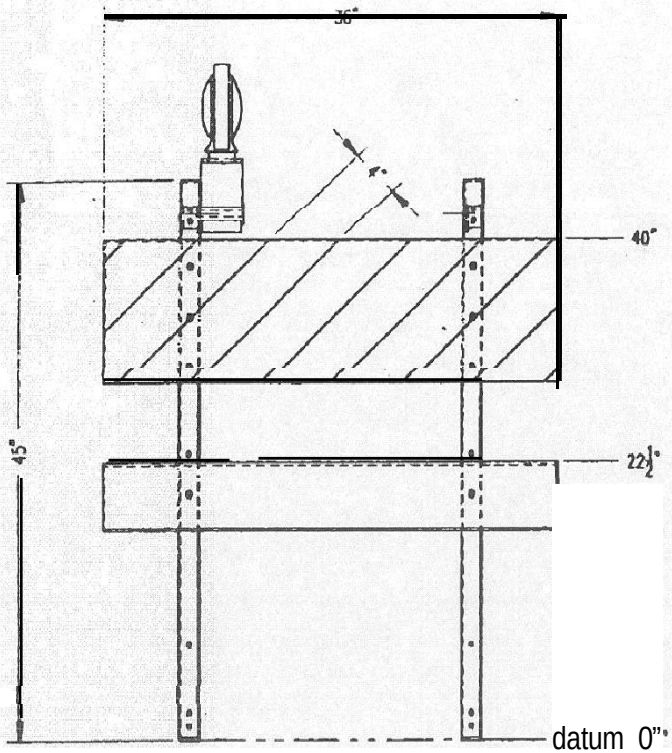
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. Sixth St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION BARRICADE

TYPE 2

Typical Metal Legs Complete Light

C TYPE 2A



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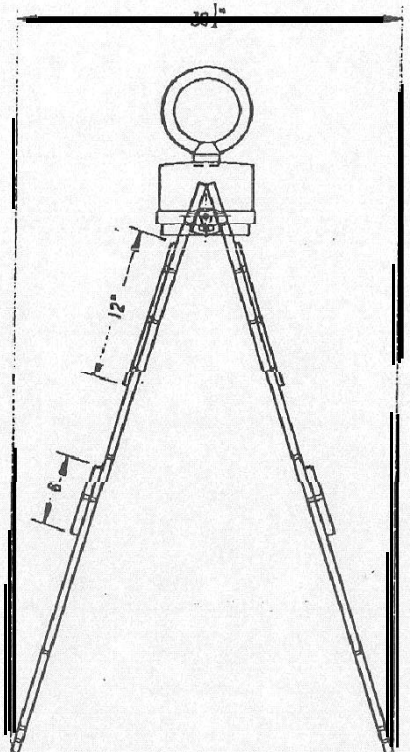

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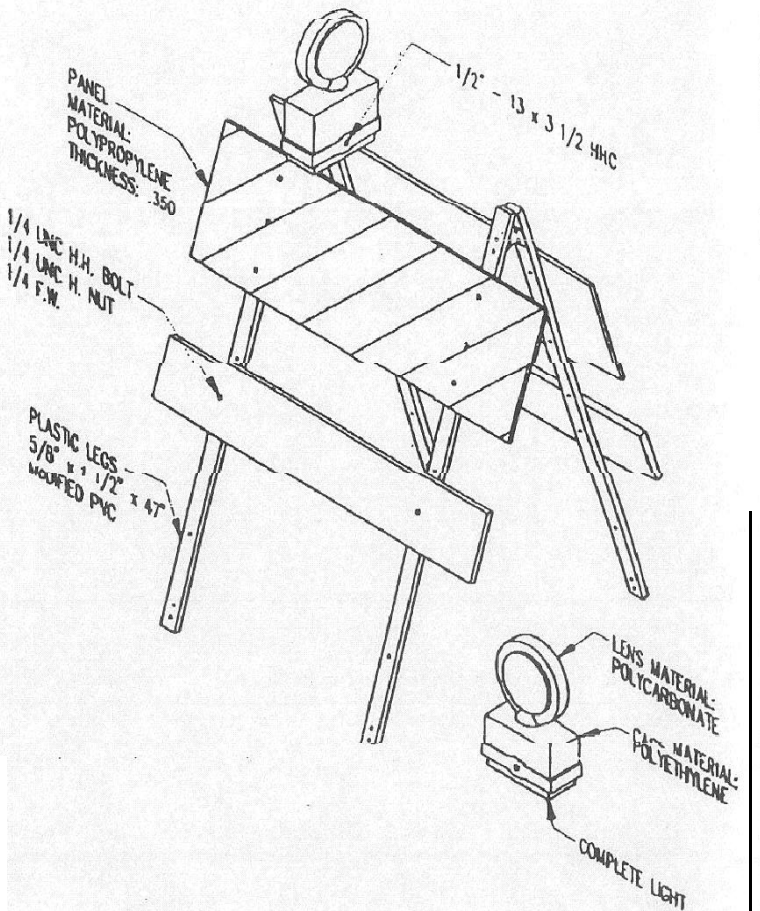


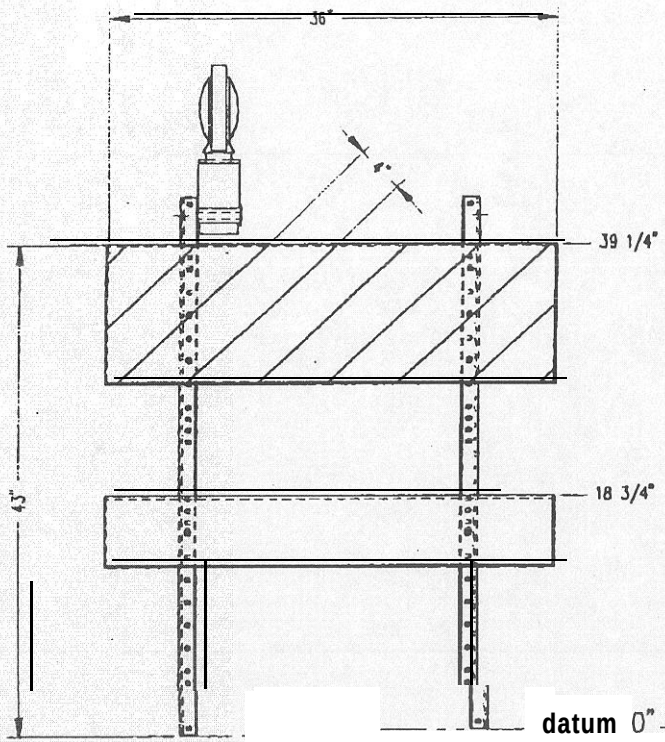
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. Sixth St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION BARRICADE
TYPE I

Typical Plastic Legs Complete Light

C TYPE 1D

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



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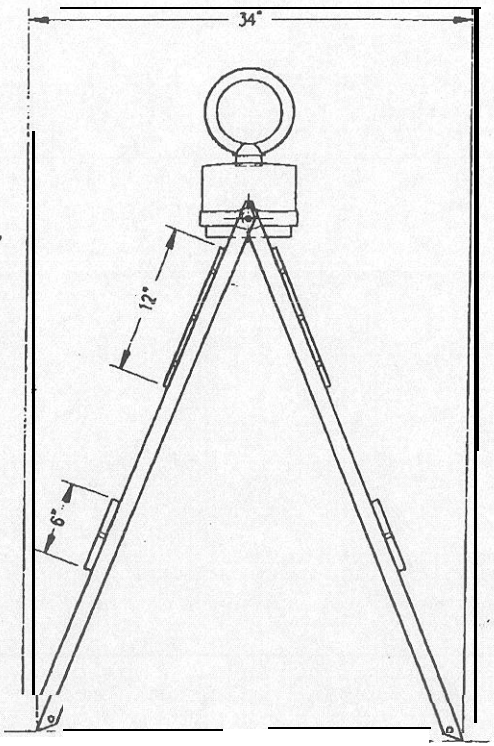
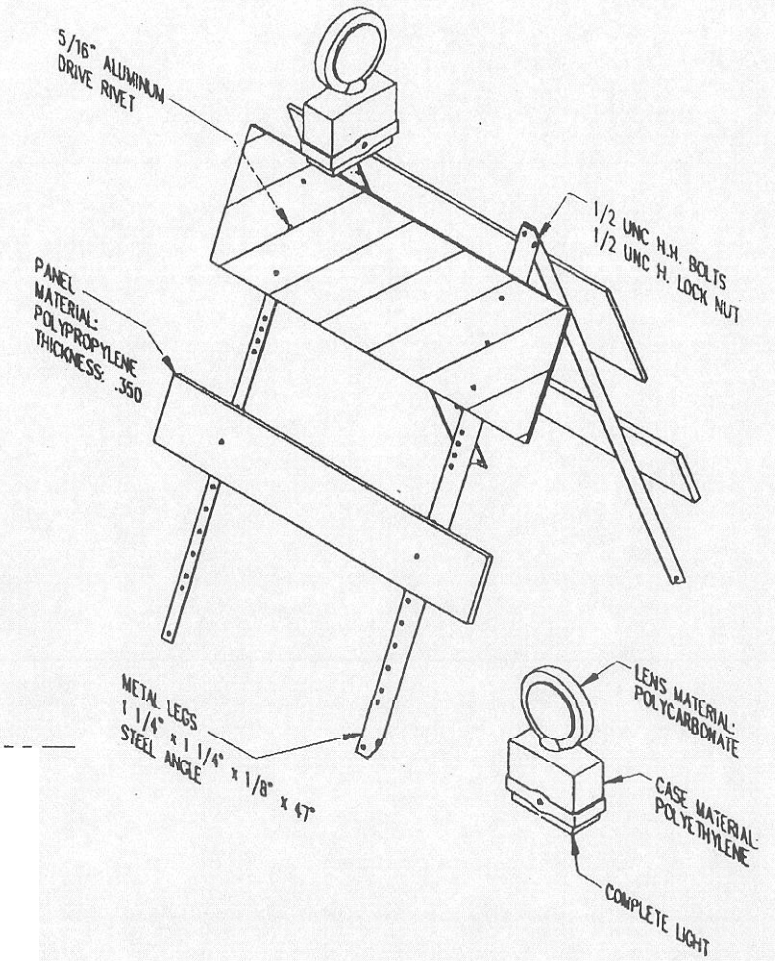


SIDE ELEVATION VIEW



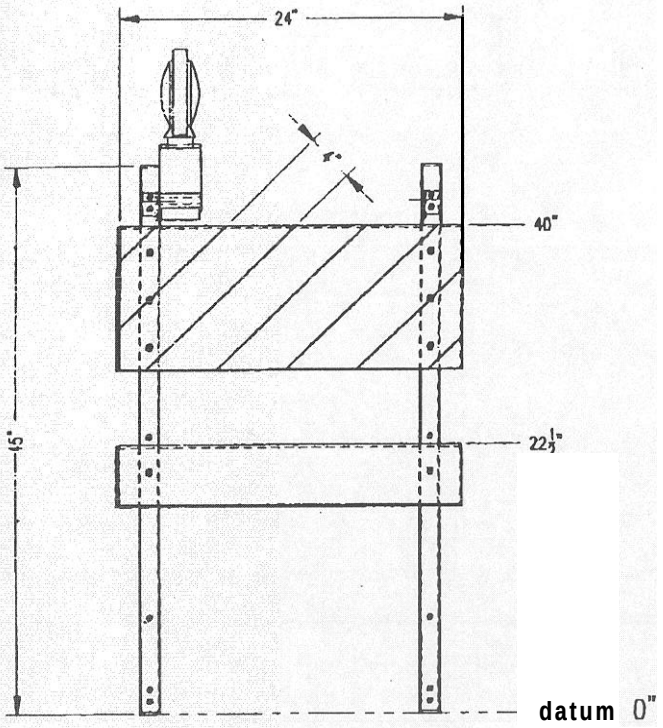
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. Sixth St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION BARRICADE

Florida, Type. Metal **Legs, Complete** Light

SIZE	FSCM NO.	DWG NO.	REV
C		TYPE 1C	

SCALE 1/8"=1'-0" SHEET 1 of 1



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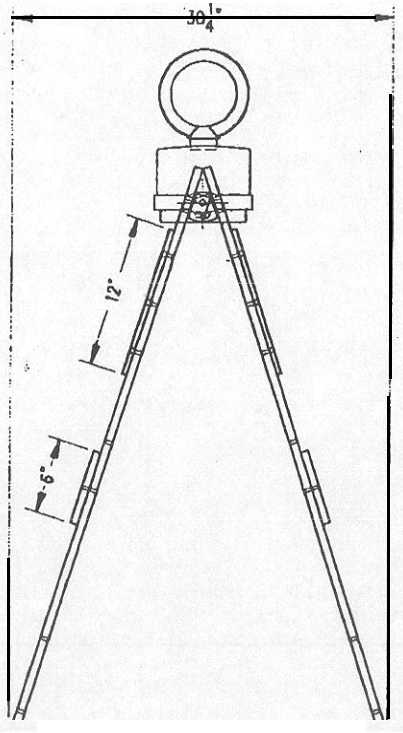
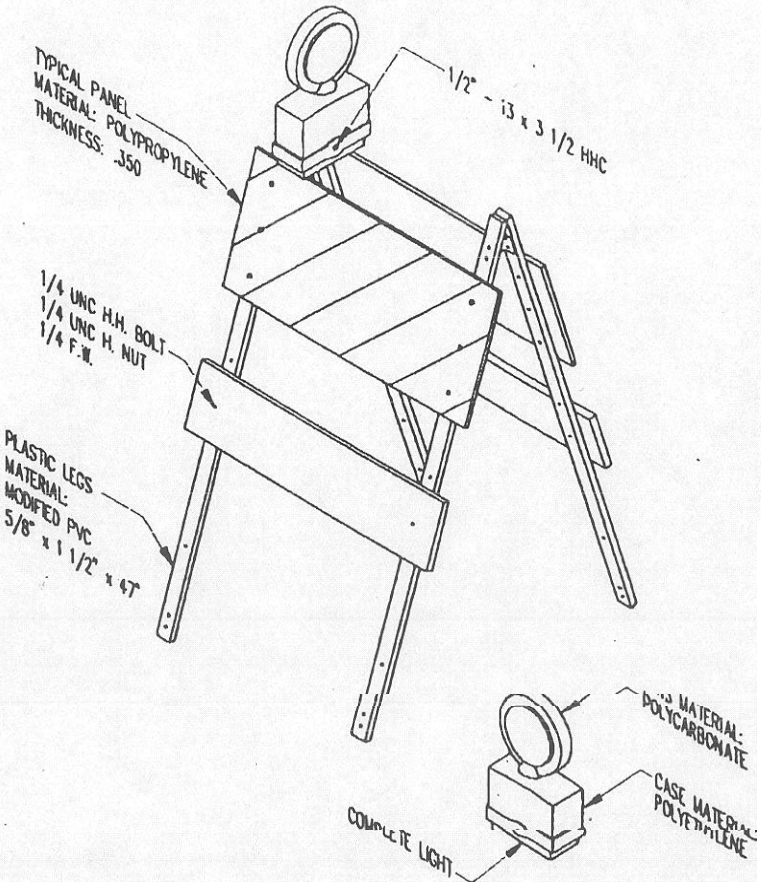


SIDE ELEVATION VIEW



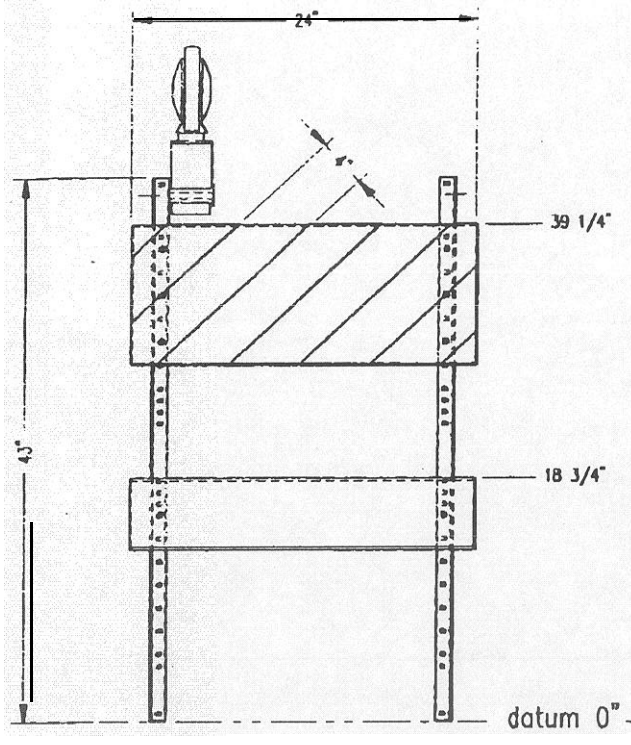
PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. State St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION BARRICADE

TYPE 1

Typical Plastic Legs, Complete Light

SIZE	FSCM NO.	DWG NO.	REV
C		TYPE 1B	



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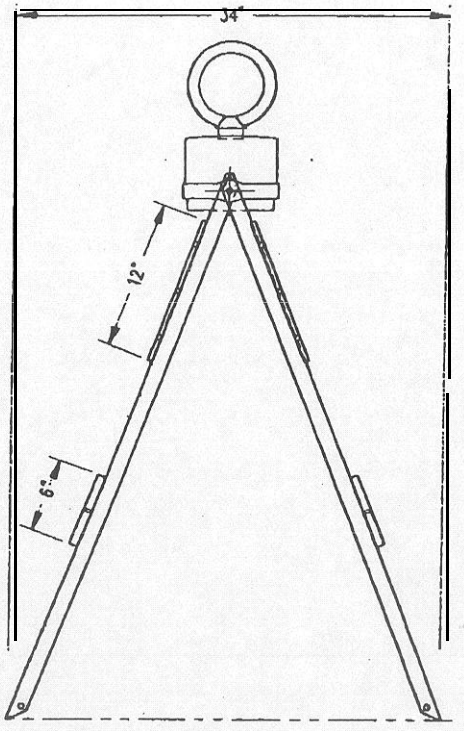
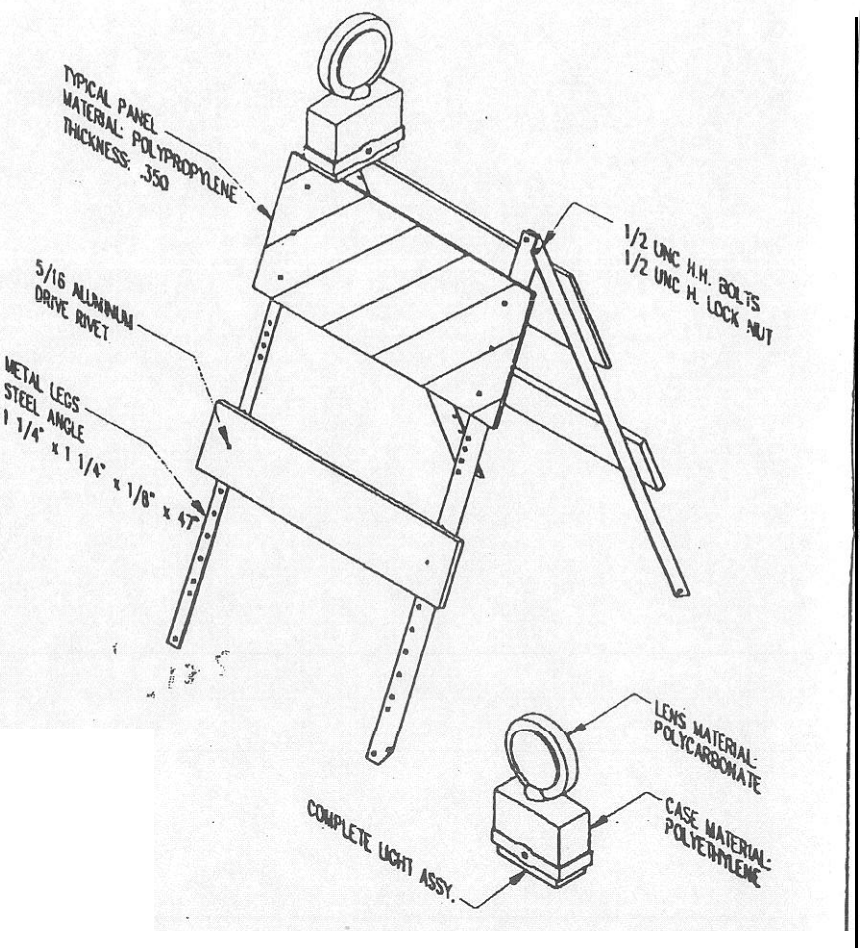


SIDE ELEVATION VIEW



Traffic Control Equipment & Services
4025 N. Sixth St., Harrisburg, PA 17110 tel. (717) 238-554

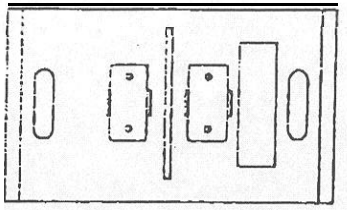
CONSTRUCTION BARRICADE

TYPE I

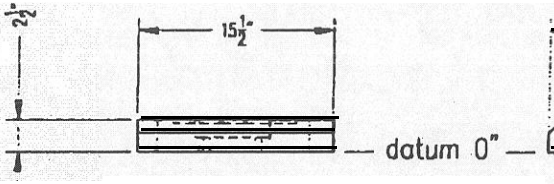
Typical Metal **Legs** Complete Light

C **TYPE. 1A**

35 L E . BASE



P L A N VIEW



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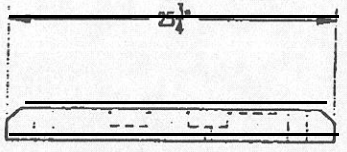
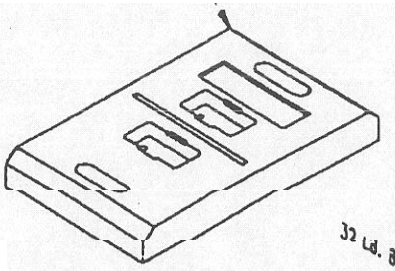
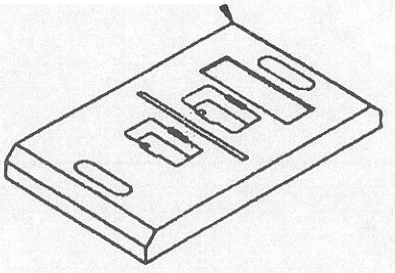


SIDE ELEVATION VIEW

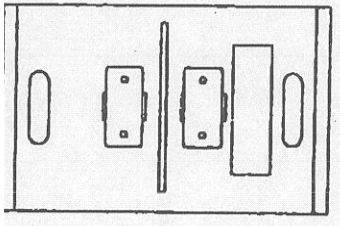
45 base



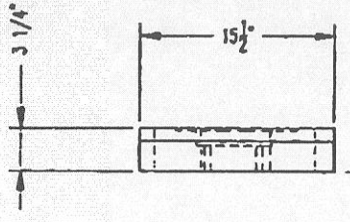
32 Ld. BASE



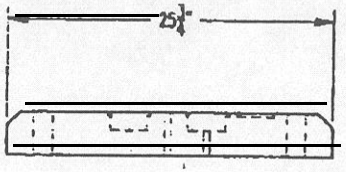
45 LB. BASE



PLAN VIEW.



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW

PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. State St. Harrisburg, PA 17110 Tel. (717) 236-5341

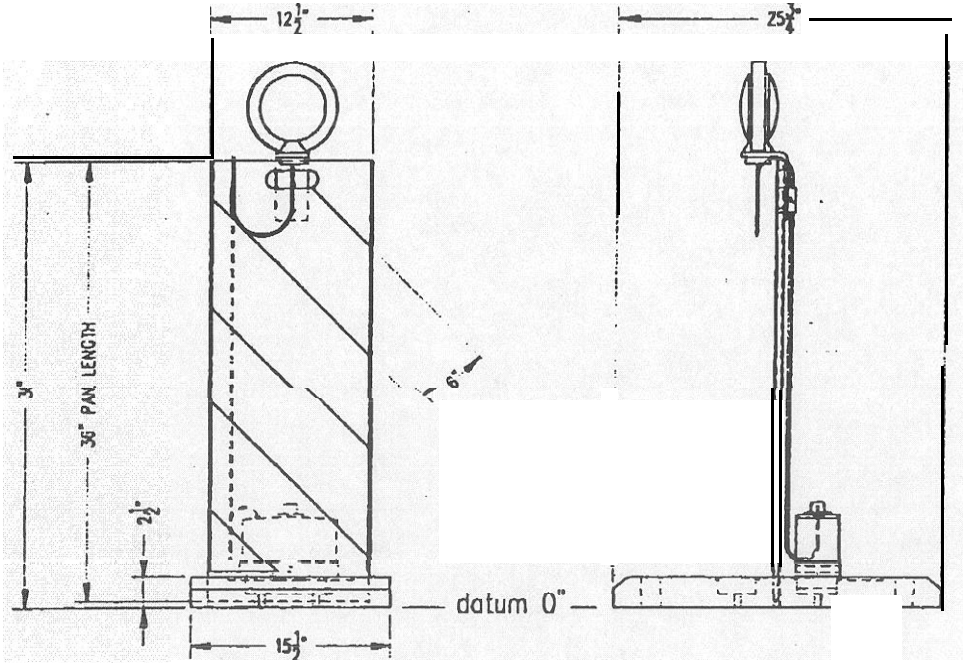
BASE, BIG FOOT

Big Foot Base Detachable Lighi

TYPE 2C

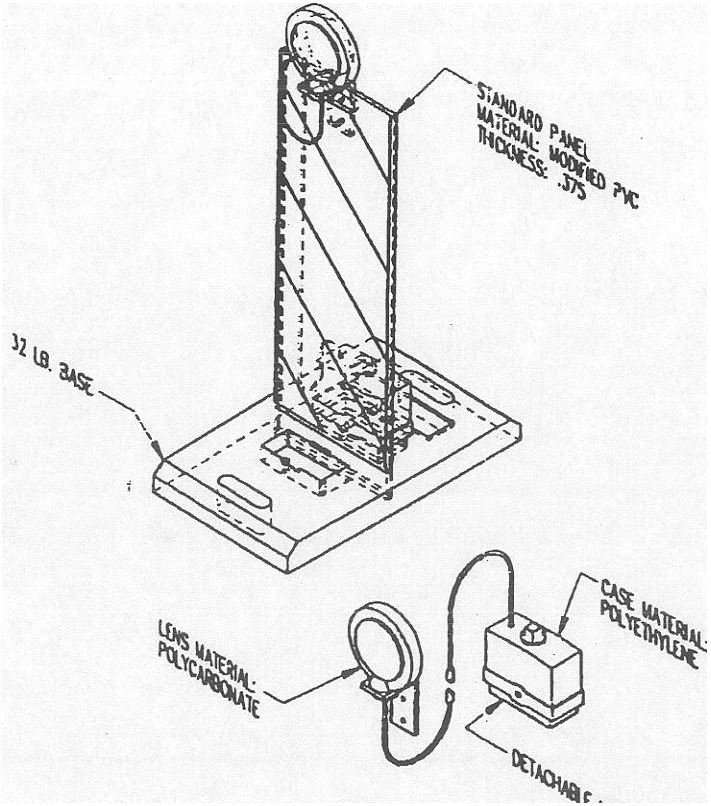
4 3 2 1

ZONE	REV	DESCRIPTION	DATE	APPROVED



FRONT ELEVATION VIEW

SIDE ELEVATION VIEW



PROTECTION SERVICES INC.
Traffic Control Equipment & Services
4025 N. Sixth St., Harrisburg, PA 17110 tel. (717) 238-5541

CONSTRUCTION CHANNELIZER
BIG FOOT – 32 LB. BASE
Base, Std. Panel, Detachable Light

SIZE	FSCM NO.	DWG. NO.	REV