

<b>Project Title:</b>	<b>#26 Testing Type III Barricades with Aluminum Panels and Mounted Sign on Top.</b>
<b>Project Synopsis:</b>	There is a need to place Type III Barricades across or along publicly travelled roadways to protect road users from potential hazards created by road work. This need requires the availability of a non-proprietary Type III Barricade with Aluminum Panels and Sign mounted to be successfully crash tested to MASH compliance so that state Department of Transportations (DOTs) have an available design to provide to approved suppliers to produce a crashworthy Type III Barricade for deployment. MASH testing will be conducted to aide in the development of a crashworthy Type III Barricade with Aluminum Panel and Sign mounted on top for road work (temporary) applications.
<b>Project Goal(s):</b>	Develop a design for a Type III Barricade with Aluminum Panels and Sign mounted on top so that it can be placed across or along a publicly travelled roadway. Sign sizes needed to be mounted on top of the barricade range from 30" x 30" (6.25 square feet) to 48" x 48" (16 square feet).
<b>Project Background:</b>	<p>The utilization and deployment of Type III Barricades is a widespread practice for most state DOTs across the country. Type III Barricades are required for a variety of Temporary Traffic Control (TTC) applications for work zones. Of these applications, the two most common scenarios are as follows: 1) Placing and extending the barricades entirely across the roadway due to a complete closure of the roadway. 2) Placing advance warning signs for TTC along the side of the roadway at times with a sign mounted to the top of a Type III Barricade for long-term operations (This is done for portability, elimination of "one calls" as the signs would not need to be anchored into the ground, and for better conspicuity during dark or inclement weather conditions). While many Type III Barricade designs had been previously accepted under the guidelines of NCHRP-350, an adequate number of Type III Barricade designs are not currently available under the MASH standards. Many of the limited designs available under MASH appear to be proprietary in nature thus limiting the availability of barricades needed to accommodate the massive amount of road work currently underway and/or expected to begin nationwide. The proprietary designs also primarily use plastic panels and state DOTs are concerned with the long-term durability of these devices. With the December 31<sup>st</sup> deadline fast approaching, the availability of non-proprietary crashworthy Type III Barricades is of great concern to the state DOTs.</p> <p>Attachments (see below):</p> <ul style="list-style-type: none"> <li>• Pennsylvania Department of Transportation standard drawing (NCHRP 350 Approved Type III Barricade)</li> </ul>

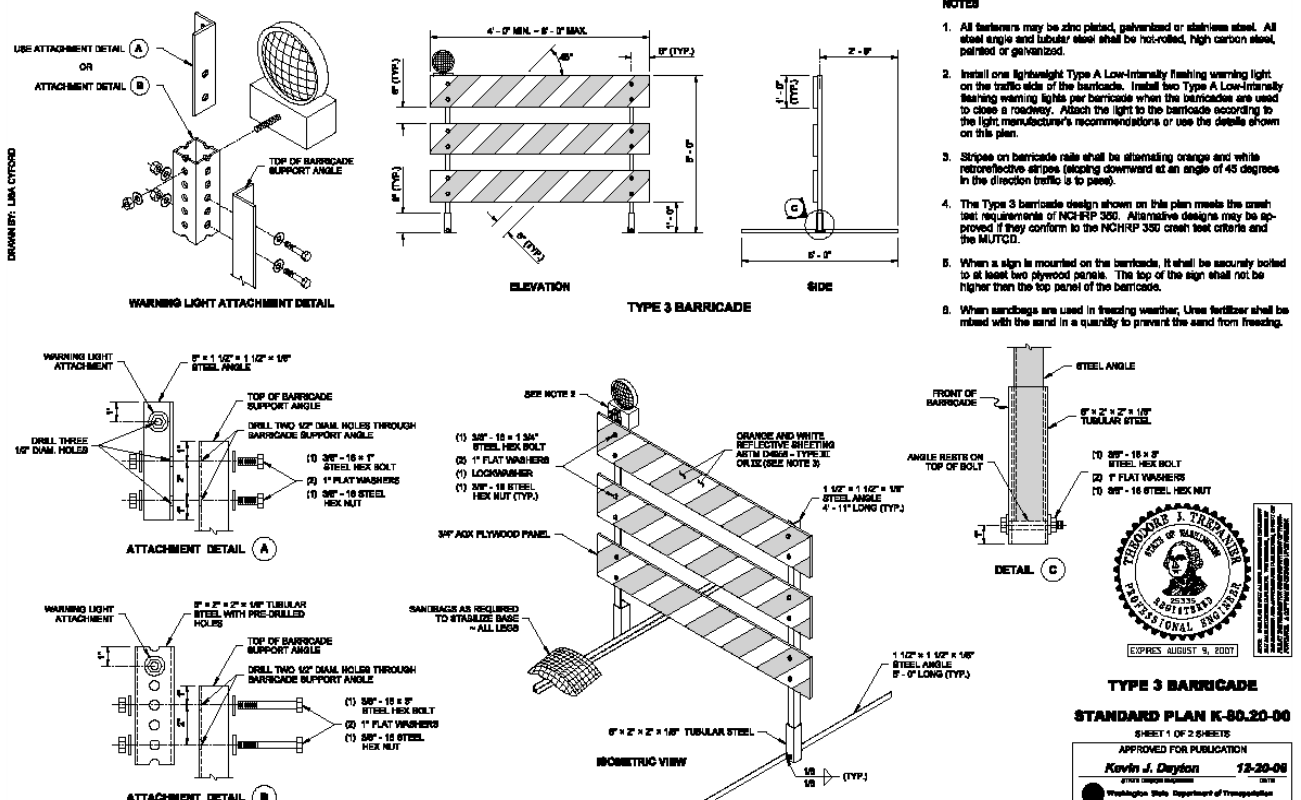
SKID-MOUNTED METAL SIGN SUPPORT

NOTES:

7. PROVIDE SIGN MATERIALS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 1103.4.
8. DIMENSIONS OF RECTANGULAR, OCTAGONAL AND TRIANGULAR SIGNS ARE PERMITTED. WHILE HAVING NO MAXIMUM AREA, THE MAXIMUM HEIGHT OF THE SIGN MAY NOT EXCEED:
  - A. WHEELED MOUNTING HEIGHT TO TOP OF ALL SIGNS IS 128".
  - B. SUPPLEMENTAL PLACARD IS TO BE MOUNTED AS SHOWN.
9. BATTERY CASE MUST BE PLACED EITHER ON THE GROUND OR ATTACHED TO MAXIMUM ABOVE THE GROUND TO THE POST OR BASE LEG.
10. SIGN SUBSTRATE MAY BE PLYWOOD, ALUMINUM, FLEXIBLE (ROLL-UP), ABS, ALUMINUM / PLASTIC LAMINATE, CORRUGATED POLYPROPYLENE OR POLYETHYLENE.
11. SANDBOX BALLAST SHALL BE PLACED ON THE END OF EACH LEG TO PROVIDE STABILITY.
12. SIGNS AND RAILS ARE TO BE ATTACHED TO BOLTS AND NUTS.
13. IF TURNED OR RETROREFLECTIVE CLEARLY MUST BE PLACED ON THE SIGNS TO ADVISE THAT THE SIGN IS NOT A "DEAD END" APPROACH DRIVERS.
14. MAXIMUM OF TWO (2) WARNING LIGHTS ON ALL SIGNS ARE ALLOWED WITH 24" SEPARATING LIGHTS ON ROAD CLOSED SIGNS.
15. FLASHING LIGHTS ARE OPTIONAL. WHEN USED, LIGHTS SHALL BE ATTACHED AS SHOWN AND PLACED TO THE SIDE OF THE SIGN (ON THE NEAREST TO TRAVEL DIRECTION).
16. SIGNS SHALL REMAIN IN THE VERTICAL POSITION WHEN LOCATED WITHIN THE HIGHWAY RIGHT-OF-WAY.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
TRAFFIC CONTROL SIGNING TYPE III BARRICADE		
RECOMMENDED JUN. 13, 2013 <i>[Signature]</i> CHIEF OF TRAFFIC ENGINEERING AND SAFETY SECTION	RECOMMENDED JUN. 13, 2013 <i>[Signature]</i> CHIEF OF HIGHWAY SAFETY AND TRAFFIC	SMT. 1 OF 1 TC-8716

- Washington Department of Transportation standard drawing (NCHRP 350 Approved Type III Barricade)



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- ROAD CLOSED**
- Vertical mast
- Approx. 87"
- 73.75"
- 9"
- Boards are aluminum "dog bone" extrusions
- 1.5"
- 6"
- 12" max.
- 48" minimum
- 10"
- 24-26"
- B-B Detail
- 0.24"
- 0.25" R.
- 0.625" R.
- 0.094"
- 9"
- 0.812"
- 0.12" R.
- Stub
- Welded on all 4 sides
- BASE
- Horizontal leg
- Ballast - Approx. 45lb. sandbag at end of each leg
- A-A DETAIL
- 3/8" Steel washer
- 5/16" Nut
- Square tube
- 5/16" Carriage Bolt
- 3/8" Steel washer
- Board
- Parts List:**  
 All square tube galvanized steel with 0.4375" (7/16") holes on either 1" centers or drilled as needed.  
 (2) horizontal legs - 12 gauge 1.75" x 1.75" x 48" long.  
 (2) vertical stubs - 12 gauge 1.75" x 1.75" x 6-12" long.  
 (2) vertical masts - 12 gauge 1.5" x 1.5" x 72" long.  
 Fastening hardware: 5/16" (0.3125") stainless steel or grade 5 zinc plated bolts and washers, nylon insert lock nuts, and nylon washers.
- |                    |              |  |   |
|--------------------|--------------|--|---|
| APPROVED<br>5/3/06 | DATE OF REV. | TYPE III BARRICADE<br>1.75" SQUARE TUBE BASE<br>1.5" SQUARE TUBE MASTS | MINNESOTA<br>DEPARTMENT OF TRANSPORTATION |
|--------------------|--------------|--|---|

- Photos of Type III Barricade with sign



**Proposed Work Plan:**

*Task 1: Engineering Review*

This task will review current standards regarding signs mounted on Type III barricades used by the Roadside Safety Pooled Fund. This task will also develop a critical design(s) that will be crash tested in Task 2.

*Task 2: MASH Crash Testing*

This task will crash test one or two critical designs of Type III barricades which include signs mounted on top.

**Deliverables:**

Compile summary report to document research effort, including literature review, CAD details, crash testing, and recommendations for further research in the event of the system failing testing criteria.

<b>Urgency and Expected Benefit:</b>	<p>Successful MASH evaluation of a non-proprietary <b>Type III Barricade with Aluminum Panels and Mounted Sign on Top</b> will improve safety in work zones. This will allow for state DOTs to continue a consistent work zone environment for road users as there will be familiarity to the road user with existing or similar Type III Barricades deployed within work zones. This will also provide for better availability of crashworthy Type III Barricades that will be non-propriety thus allowing for greater production by multiple approved suppliers.</p>
<b>Problem Funding and Research Period:</b>	<p><i>\$175,000</i> <i>12 month project</i></p>
<b>Developer(s) of the Problem Statement:</b>	<p>Name: Brian Crossley / Steve Haapala / Hassan Raza / Ken Johnson / Filiberto Sotelo  Email: <a href="mailto:bcrossley@pa.gov">bcrossley@pa.gov</a> / <a href="mailto:HaapalS@wsdot.wa.gov">HaapalS@wsdot.wa.gov</a> / <a href="mailto:hraza@pa.gov">hraza@pa.gov</a> / <a href="mailto:Ken.johnson@state.mn.us">Ken.johnson@state.mn.us</a> / <a href="mailto:Filiberto.Sotelo@illinois.gov">Filiberto.Sotelo@illinois.gov</a>  Phone: 717.265.7562 / 360.705.7241 / 717.783.5110 / 651.234.7386 / 217.557.2563</p>