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

1200 New Jersey Ave., SE
Washington, D.C. 20590

April 18, 2016

In Reply Refer To:
HSST-1/HSSTWZ-343

Mr. Henry A. Ross
Plasticade
7700 N. Austin Avenue
Skokie, IL 60077

Dear Mr. Ross:

This letter is in response to your October 5, 2015 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number WZ-343 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:
• Plasticade 3200 Type III Barricade with Volcano Bases

Scope of this Letter

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

Eligibility for Reimbursement

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: Plasticade 3200 Type III Barricade with Volcano Bases
Type of system: Work Zone Traffic Control
Test Level: MASH TL-3
Testing conducted by: E-Tech Testing Services, Inc.
Date of request: October 5, 2015
Date initially acknowledged: November 5, 2015
Date of completed package: March 29, 2016

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within the attached form.

Full Description of the Eligible Device

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

Notice

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.
You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of the MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

Standard Provisions

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number WZ-343 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.

- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.

- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the 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.

Sincerely yours,

Michael S. Griffith

Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	March 28, 2016	◉ New ○ Resubmission
	Name:	Henry A. Ross	
	Company:	Plasticade	
	Address:	7700 N. Austin Avenue, Skokie, IL 60077	
	Country:	USA	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

Device & Testing Criterion - Enter from right to left starting with Test Level

! - ! - !

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zone Traffic Control Devices	◉ Physical Crash Testing ○ Engineering Analysis	Plasticade 3200 Type III Barricade with Volcano Base	AASHTO MASH	TL3

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Individual or Organization responsible for the product:

Contact Name:	Henry A. Ross	Same as Submitter ☒
Company Name:	Plasticade	Same as Submitter ☒
Address:	7700 N. Austin Avenue, Skokie, IL 60077	Same as Submitter ☒
Country:	USA	Same as Submitter ☒

Enter below all disclosures of financial interests as required by the FHWA `Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

The Plasticade 3200 Type III Barricade with Volcano Base is the commercial embodiment of intellectual property that is not protected by patents. Plasticade does not pay royalties for sales of the Plasticade 3200 Type III Barricade with Volcano Base. The Plasticade 3200 Type III Barricade with Volcano Base was designed and developed by engineers at Plasticade.
Plasticade sponsored certain crash tests of the Plasticade 3200 Type III Barricade with Volcano Base; such tests were conducted by E-Tech Testing Services, an independent, wholly-owned subsidiary of Trinity Highway. E-Tech Testing Services is an International Standards Organization ("ISO") 17025 accredited laboratory with American Association for Laboratory Accreditation (A2LA) Mechanical Testing certificate 989.01. Full-scale crash testing on the Plasticade 3200 Type III Barricade with Volcano Base was performed in accordance with testing criteria, as set forth by the Manual for Assessing Safety Hardware ("MASH"; 2009).

PRODUCT DESCRIPTION

(●) New Hardware or Significant Modification ( ) Modification to Existing Hardware

The Plasticade® 3200 Type III Barricade with Volcano Base is a work zone traffic control device used to regulate, warn, and advise road users to traverse a section of highway or street in the proper manner. The barricade consists of a rubber Volcano Base with plastic uprights and plastic boards extruded from white UV stabilized high density polyethylene plastic. The test article is fitted with three 1 in by 8 in (25 by 203 mm) boards which are available sheeted with retro-reflective tape in a variety of widths. The overall height of the test article is 60 in (1524 mm) when restored from its collapsed storage position. The "worst case" test article configuration was selected for testing. The widest 12 ft. (3.7 m) boards were used and the total test article weight was 115 lb. (52.2 kg) including (2) Volcano Rubber bases weighing 43 lb. (19.5 kg) each. The test article was also fitted with two Empco-Lite Model 2006 Type A and C LED Warning Lights weighing 2.0 lb. (0.9 kg) each. The plastic uprights of the barricade were pinned to the Volcano Bases.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH crashworthiness

Engineer Name:	Paul Kruse	
Engineer Signature:	Paul Kruse — Digitally signed by Paul Kruse Date: 2016.05.13 05:42:40 -07'00'	
Address:	3617B Cincinnati Ave, Rocklin, CA	Same as Submitter ☐
Country:	United States	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	Test 3-70 was omitted as MASH says it is optional for test articles that weigh less than 220 lbs. (100kg).	Non-Critical, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	E-TECH Test 76-0415-006 was MASH Test 3-71 with a 2009 Kia Rio weighing 2,447 lbs. impacting the test article at the Critical Impact Angle. It was impacted in both normal and perpendicular orientations. The test articles were placed 19.7 ft. (6 m) apart and the second was turned 90 degrees relative to the first. The test was conducted at a 0 degree angle with the center of the vehicle bumper aligned with the vertical centerline of the test articles. The first impact took place with a normally orientated barricade. The 1100C vehicle bumper impacted the test article approximately 18 in. (457 mm) above ground level. The bottom board deformed from the test vehicle's bumper while the middle and top boards slid up the hood and over the top of the test vehicle. The plastic upright supports fractured upon initial impact approx. 12 in (305 mm) above the pinned connection to the Volcano Base. The lights remained attached to the test article. There was minor scuffing to the vehicle's hood but no windshield damage. The second impact took place with a perpendicular orientated barricade. The 1100C vehicle bumper impacted the test article approximately 18 in. (457 mm) above ground level. The bottom board buckled upon impact with the vehicles bumper and the plastic upright on the leading edge fractured immediately. The middle and upper boards slid up the vehicle's hood and continued sliding up the windshield. As the vehicle passed over the Volcano bases, they engaged with the vehicle's undercarriage and travelled 48 ft. (14.6 m) and 53 ft. (16.2 m) downstream of the initial point of contact. One of the plastic upright supports fractured upon initial impact approx. 8 in (203 mm) above the pinned connection to the Volcano Base while the other plastic upright pulled out of the base entirely. The lights remained attached to the test article although one of the plastic lenses detached during the impact event. There was minor scuffing to the vehicle's hood and the top of the windshield exhibited minor cracking with no deformation or tearing of the liner. The device was judged to have successfully met all MASH evaluation criteria for Test 3-71 for work zone traffic control devices in both normal and perpendicular orientations.	PASS

3-72 (2270P)	Test 3-72, utilizing the 2270P test vehicle, was opted not to be conducted strictly based on the test article performance of the 1100C test vehicle used in Test 3-71. Due to the greater hood height of the 2270P, the test article components, including the optional Empco lights, are unlikely to travel onto the vehicle's hood and interact with the windshield. Additionally, after a thorough video analysis, the uprights attached to the rubber base fractured/ yielded immediately upon impact and the Volcano Bases remained on the sides of the vehicle during the entire impact event thus eliminating the possibility of floorboard deformation/penetration.	Non-Critical, not conducted

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	E-Tech Testing Services, Inc.	
Laboratory Signature:	Paul Kruse Digitally signed by Paul Kruse Date: 2016.05.13 05:42:24 -07'00'	
Address:	3617B CIncinnati Ave, Rocklin, CA	Same as Submitter ☐
Country:	United States	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA Certificate #989.01, November 20, 2016 thru November 30, 2017	

Submitter Signature*: Henry A. Ross Digitally signed by Henry A. Ross DN: cn=Henry A. Ross, o=Plasticade, ou, email=hross@plasticade.com, c=US Date: 2016.05.11 16:03:20 -05'00'

Submit Form

ATTACHMENTS

Attach to this form:

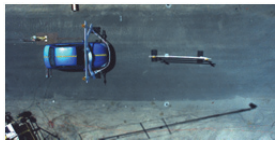
1) Additional disclosures of related financial interest as indicated above.
2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words
WZ-343	April 18, 2016	Work Zone Sign Stand

Normal Orientation

t = 0.000 sec



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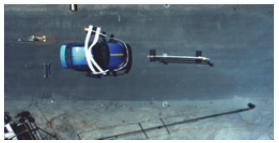


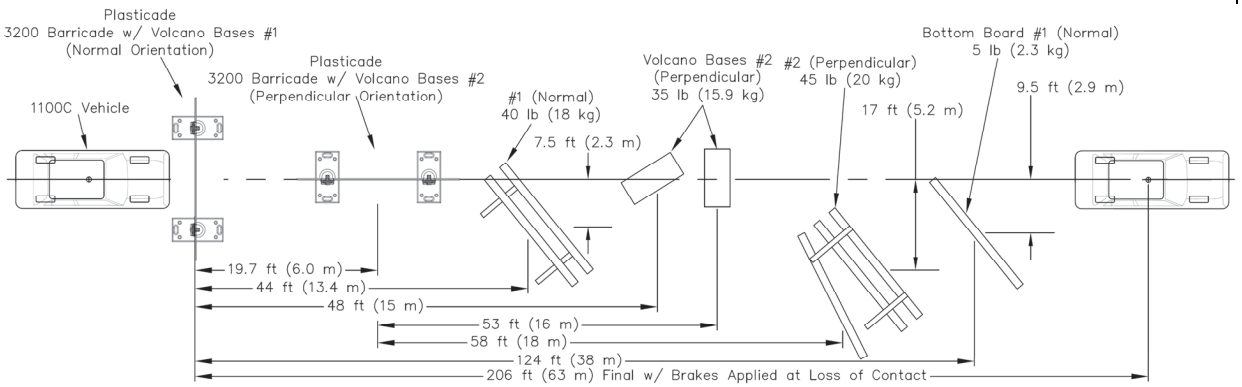
t = 0.084 sec

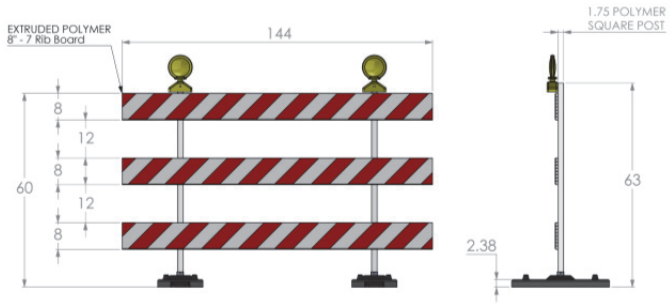
Perpendicular Orientation

t = 0.000 sec

t = 0.042 sec

t = 0.084 sec





Plasticade® 3200 Type III Barricade with Volcano Base

General Information

Test Agency ..... E-TECH Testing Services, Inc.
Test Designation ..... MASH Test 3-71
Test No. 76-0415-006
Date 04/14/2015

Test Article

Type ..... Plasticade
3200 Type III Barricade with Volcano Base
Dimensions ..... 60 in OA Height x 144 in boards
(1524 x 3658 mm)
Material and Key Elements ..... 115 lb (52.2 kg) Total including
(2) Volcano Rubber Bases weighing 43 lb (19.5 kg) ea;
(2) Empco-Lite Type A and C LED Warning Lights
weighing 2 lb (0.9 kg ea)
Foundation Type and Condition ..... Asphalt, clean and dry

Test Vehicle

Type ..... Production Model
Designation 1100C
Model ..... 2009 Kia Rio
Mass
Curb ..... 2447 lb (1110 kg)
Test Inertial ..... 2423 lb (1099 kg)
Dummy ..... N/A
Gross Static ..... 2423 lb (1099 kg)

Impact Conditions

Speed (Normal Orientation) ..... 63.1 mi/h (101.5 km/h)
Speed (Perpendicular Orientation) ..... 62.6 mi/h (100.7 km/h)
Angle (deg) 0
Impact Severity (Normal Orientation) ..... 322.5 ft-kip (437.2 kJ)
Impact Severity (Perpendicular Orientation) .. 317.2 ft-kip (430.0 kJ)

Exit Conditions

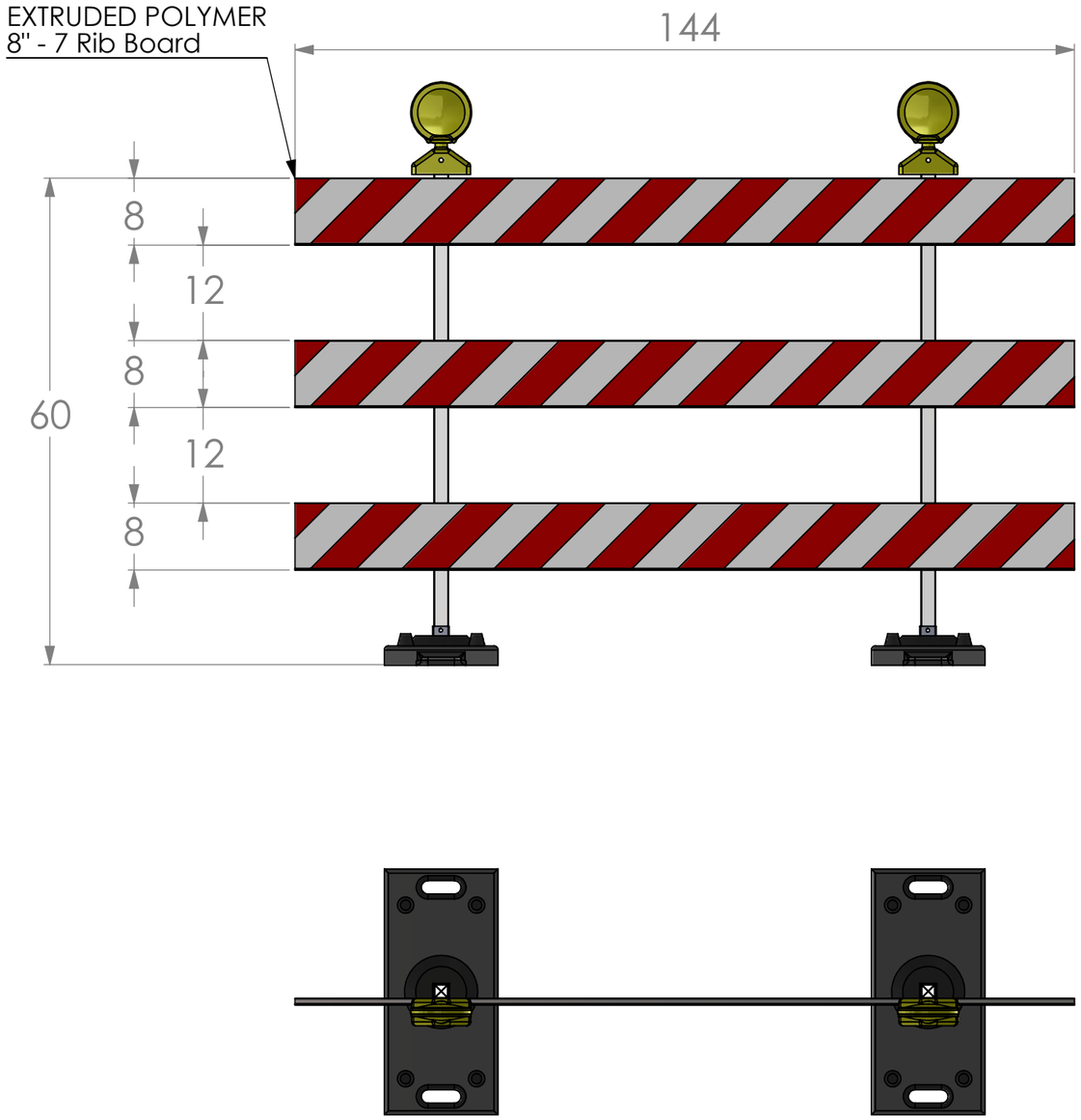
Speed (Normal Orientation) ..... 62.6 mi/h (100.7 km/h)
Speed (Perpendicular Orientation) ..... 62.1 mi/h (100.0 km/h)
Angle (Deg – veh. c.g.) 0

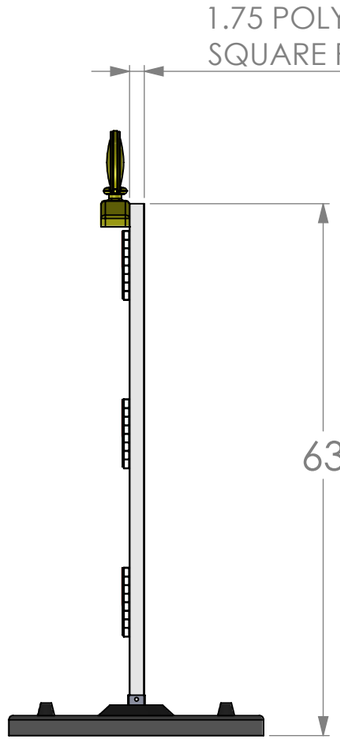
Occupant Risk Values*

Vehicle Damage

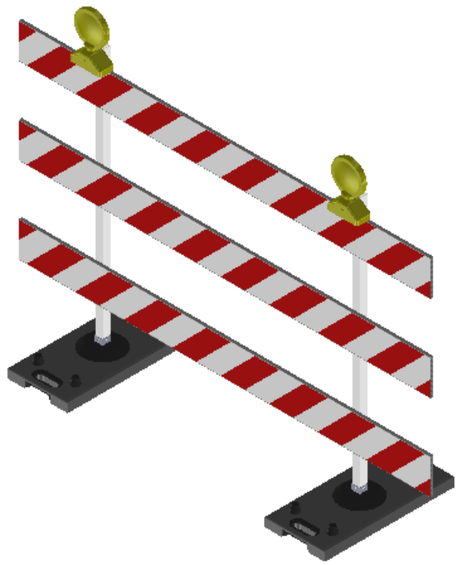
Exterior
VDS FC-1
CDC 12FCEN1
Interior
VCDI AS0000000
Maximum Deformation ..... Negligible
Windshield ..... Minor cracking (no penetration, deformation or tearing)

** Not Applicable, device weighs less than 220 lb (100 kg).*





ITEM NO.	DESCRIPTION	Default/ QTY.
1	Base - Angle Iron 1.5 X 1.5 X 60 Long	2
2	Post 1.75 X 1.75 X 63 Long	2
3	Breakaway Board with 7 Internal Ribs	3
4	Board Mounting Hardware	12
5	Reflective Sheeting	3
6	Light Assemblies	2
7	Light Mounting Hardware	2
8	Barricade Type III Base	2



FILE: Barricade Type III RUBBER BASE

PLASTICADE
7700 N. AUSTIN AVE
SKOKIE, IL 60077
773-470-3300

MATERIAL: N/A

FINISH: N/A

DRAWN BY: NAME SDK DATE 052213

THIRD ANGLE PROJECTION

INTERPRET DRAWING ANSI Y14.5M-2009

DO NOT SCALE DRAWING

TITLE: TYPE III BARRICADE RUBBER BASE

SIZE B | DWG. NO. 3200 SERIES | REV A

NTS | WEIGHT: | SHEET 1 OF 2

3204-EG-KIT	4' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting
3204-HIP-KIT	4' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (One Side)
3204-DG-KIT	4' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting
3206-EG-KIT	6' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (One Side)
3206-HIP-KIT	6' Type III- Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (One Side)
3206-DG-KIT	6' Type III- Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (One Side)
3208-EG-KIT	8' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting
3208-HIP-KIT	8'Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (One Side)
3208-DG-KIT	8'Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (One Side)
3210-EG-KIT	10' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (One Side)
3210-HIP-KIT	10' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (One Side)
3210-DG-KIT	10' Type III - Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (One Side)
3212-EG-KIT	12' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (One Side)
3212-HIP-KIT	12' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (One Side)
3212-DG-KIT	12' Type III-TPower Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (One Side)

3204-EG-LR-KIT	4' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (Both Sides)
3204-HIP-LR-KIT	4' Type III-Power Post 63" Uprights and Volcano Rubber Bases High Intensity Prismatic Grade Striped Sheeting (Both Sides)
3204-DG-LR-KIT	4' Type III- Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (Both Sides)
3206-EG-LR-KIT	6' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (Both Sides)
3206-HIP-LR-KIT	6' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (Both Sides)
3206-DG-LR-KIT	6'Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (Both Sides)
3208-EG-LR-KIT	8' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (Both Sides)
3208-HIP-LR-KIT	8' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (Both Sides)
3208-DG-LR-KIT	8' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (Both Sides)
3210-EG-LR-KIT	10' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (Both Sides)
3210-HIP-LR-KIT	10' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (Both Sides)
3210-DG-LR-KIT	10' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (Both Sides)
3212-EG-LR-KIT	12' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Engineer Grade Striped Sheeting (Both Sides)
3212-HIP-LR-KIT	12' Type III-Power Post 63" Uprights and Volcano Rubber Bases with High Intensity Prismatic Grade Striped Sheeting (Both Sides)
3212-DG-LR-KIT	12' Type III-Power Post 63" Uprights and Volcano Rubber Bases with Diamond Grade Striped Sheeting (Both Sides)

FILE: Barricade Type III RUBBER BASE

PLASTICADE
7700 N. AUSTIN AVE
SKOKIE, IL 60077

MATERIAL: RUBBER
FINISH: N/A
DRAWN BY: NAME SDK DATE 032113
THIRD ANGLE PROJECTION
INTERPRET DRAWING ANSI Y14.5M-2009
DO NOT SCALE DRAWING

TITLE: TYPE III BARRICADE RUBBER BASE

SIZE B | DWG. NO. 3200 SERIES | REV A
NTS | WEIGHT: | SHEET 2 OF 2