



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

October 25, 2007

1200 New Jersey Ave., S.E.  
Washington, DC 20590

In Reply Refer To:  
HSSD/WZ-260

Mr. Peter J. Connors  
President  
Remcon Plastics Inc.  
208 Chestnut Street  
Reading, PA 19602-1809

Dear Mr. Connors:

In your letter received September 2007 you requested the Federal Highway Administration's (FHWA) acceptance of your company's AddGard barricade system as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter were a report from E-TECH Testing Services, Inc. and a video of the crash test. You requested that we find this barricade, with interchangeable signage, 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."

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 AddGard barricade system uses interchangeable sign panels and depending on use and system configuration it may be considered a Type I, Type II, Direction Indicator, and a Longitudinal Channelizing type of barricade (LCB) when the system links barricades together to create an enclosure or minimize openings between barricades that interlock. The individual barricades are injection molded High Density Polyethylene (HDPE) plastic. Each barricade weighs approximately 10 lbs (4.5 kg) and is 36 inches tall by 40 inches wide and 1.25 inches deep (914 by 1016 by 32 mm).



The AddGard barricade system was tested and evaluated using NCHRP 350 Test 3-71 impact conditions of 62 mph (100 km/h) using the standard 820C small car. The test article assembly consisted of two sets of four interlocking barricades in a complete enclosure equipped with interchangeable sign panels, one LED warning light, and one plastic ballast mat. The total mass of the four barricades (40 pounds) with the interchangeable panels (1 pound), light (3 pounds), and ballast (13 pounds) was 57 pounds (25.9 kg). Enclosed with this letter is the summary of test results and a drawing that shows the barricade configuration tested. The AddGard was tested in both normal and rotated (45 degrees) orientations since the configuration is symmetrical.

Upon impact the barricade system buckled and the plastic AddGard panels landed flat against the hood and shattered. Debris was distributed into the air and alongside the vehicle. The light remained attached to the panel. Overall, the test article damage was classified as not being repairable and risk to the occupant compartment was minimal. There was no damage to the windshield.

Based on the information submitted we agree that the AddGard barricade system as described above meets the appropriate evaluation criteria for NCHRP 350 Test Level 3 devices, and is accepted for use on the NHS as a barricade categorized as a Type I, Type II, Direction Indicator, and a LCB each with one light (not to exceed 3 pounds) when selected by a contracting authority, subject to the provisions of Title 23, Code of Federal Regulations, Section 635.411 as they pertain to proprietary devices.

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-260, 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.

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,

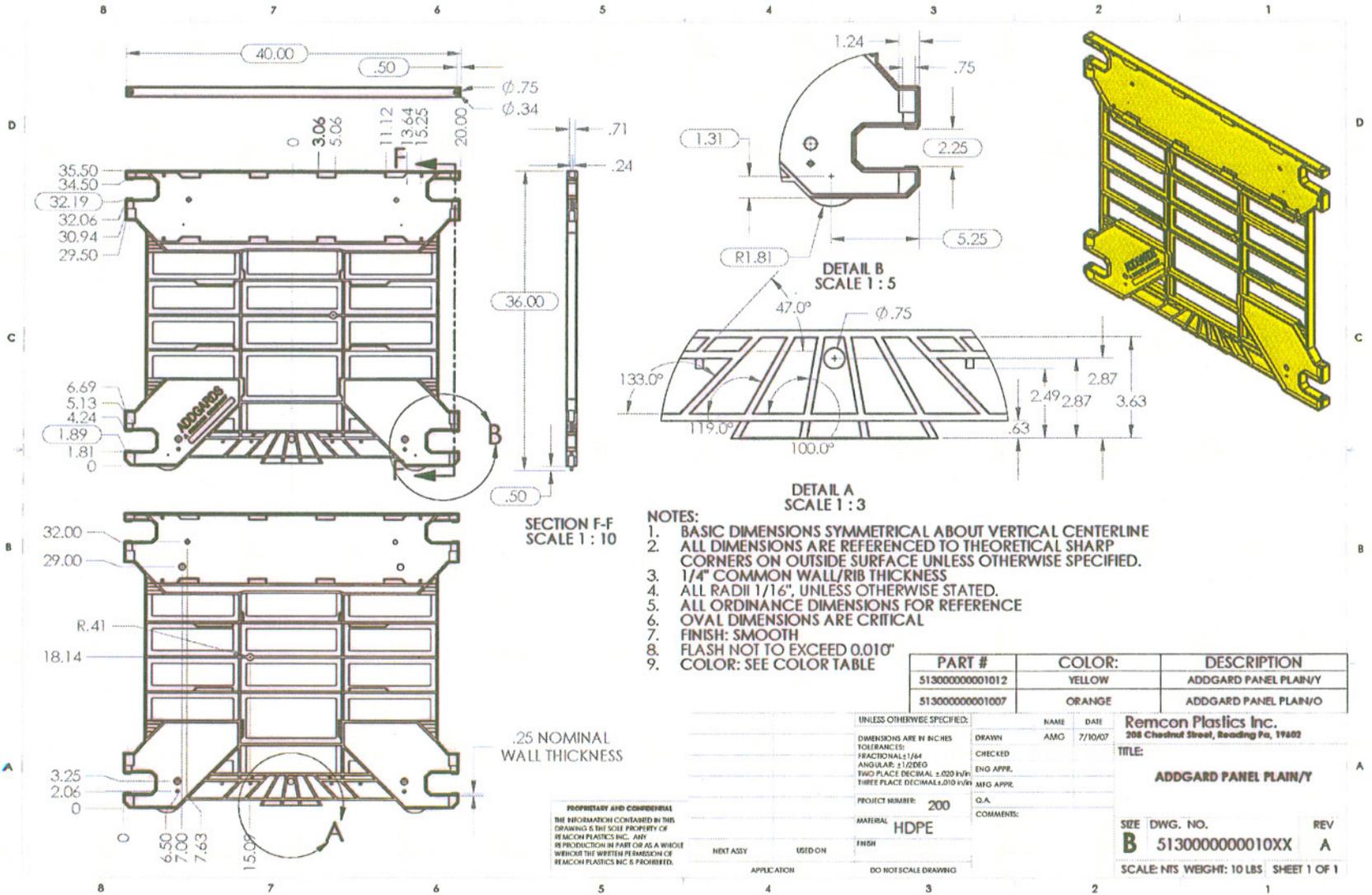
A handwritten signature in blue ink, reading "George E. Rice, Jr." with a stylized flourish at the end.

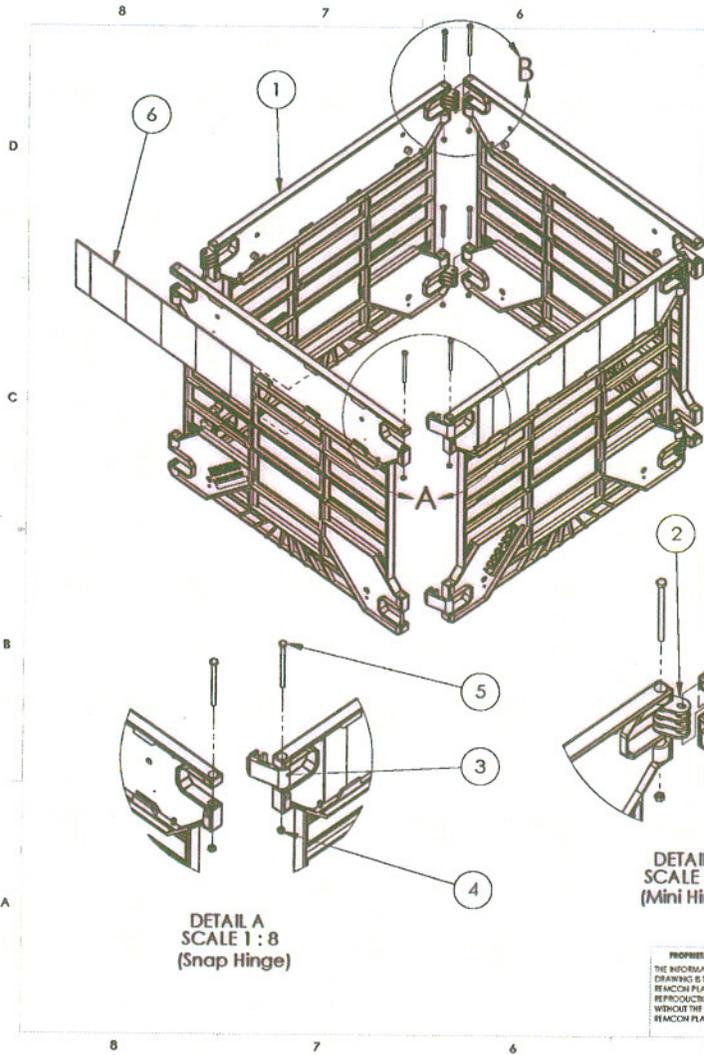
George E. Rice, Jr.  
Acting Director, Office of Safety Design  
Office of Safety

Enclosures

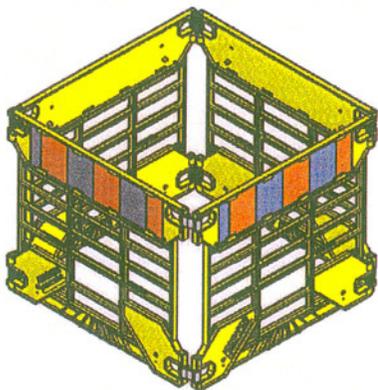


Illustration 2. Addgard Panel Plain/Y (1 of 1)





ITEM NO.	PART NUMBER	DESCRIPTION	WEIGHT (LBS)	4 PANEL QTY.	3 PANEL QTY.	1 PANEL QTY.
1	513000000010XX	Addgards Panel Plain	10	4	3	1
2	551150400006000	Hinge,Mini,Fixed,Black,ADD	0.086	6	4	0
3	551150400005000	Hinge,Snap,Black,ADD	0.143	2	2	2
4	551600400010000	Insert-Nut,Hex,5/16-18,Nylon-S	0.011	16	12	4
5	552150400014000	Screw,HexHdCap,5/16-18x5" SII	0.110	16	12	4
6	552300400028000	*ACCESSORY* VERTICAL STRIPED PANEL	0.242	4	3	1



- NOTES:**
- DRAWING SHOWS COMPLETE ASSEMBLY OF ADDGARD FINISHED 4 PIECE UNIT WITH ACCESSORY PANEL
  - FOR 1 OR 3 PANEL ASSEMBLIES SEE QUANTITY COLUMN IN B.O.M. FOR NUMBER OF COMPONENTS

**INSTRUCTIONS:**

- ASSEMBLE UNIT AS SHOWN, TIGHTEN 5/16 HARDWARE SECURELY, MAKE SURE NYLON NUT IS FULLY ENGAGED WITH BOLT IN ALL 16 LOCATIONS

DETAIL A  
SCALE 1 : 8  
(Snap Hinge)

DETAIL B  
SCALE 1 : 6  
(Mini Hinge)

**PROPRIETARY AND CONFIDENTIAL**  
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF REMCON PLASTICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF REMCON PLASTICS INC IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:		NAME	DATE	Remcon Plastics Inc. 200 Chestnut Street, Reading Pa, 19602
DIMENSIONS ARE IN INCHES	DRAWN	AMG	7/10/07	
TOLERANCES:	CHECKED	TITLE: <b>ADDGARDS X PANEL ASSEMBLY</b>		
FRACTIONAL: 1/64	ENG APPR.			
ANGULAR: ±1/2DEG	AMG APPR.			
TWO PLACE DECIMAL: ±0.00 IN/IN	Q.A.	SIZE DWG. NO. REV		
THREE PLACE DECIMAL: ±0.010 IN/IN	COMMENTS:	B 51300000X0010XX A		
PROJECT NUMBER: 200	MATERIAL: SEE B.O.M.	SCALE/IN: WEIGHT: 44LBS SHEET 1 OF 1		
FINISH: SEE INDIVIDUAL COMPONENT SPECS	DO NOT SCALE DRAWING			

Illustration 1. Addgards X Panel Assembly (1 of 1)

### Normal Impact



t = 0.000 sec



t = 0.096 sec



t = 0.192 sec

### 45 deg Impact



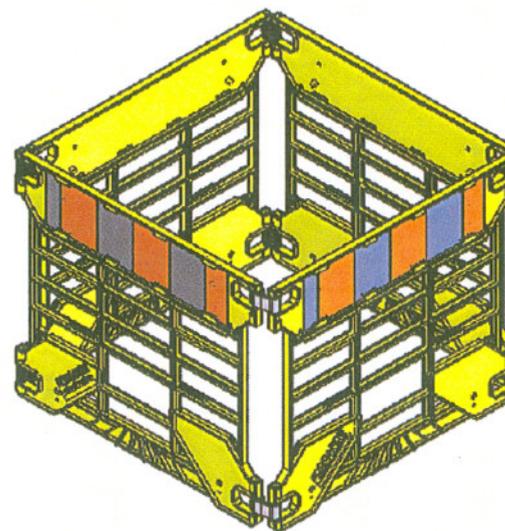
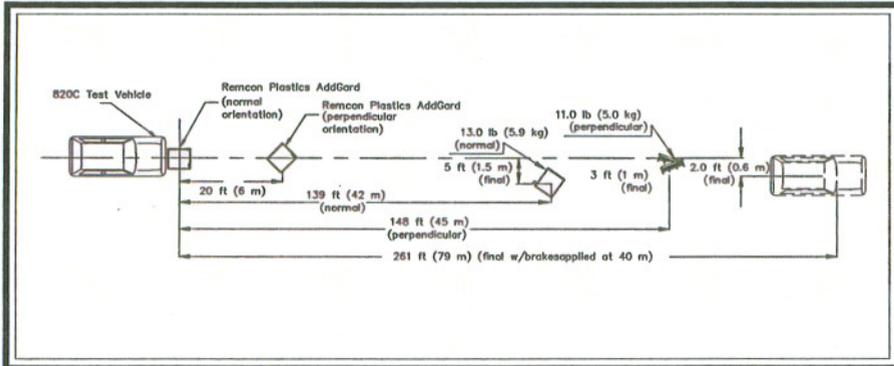
t = 0.000 sec



t = 0.144 sec



t = 0.288 sec



Test Article: Remcon Plastics AddGard Pedestrian Barricade

#### General Information

Test Agency ..... E-TECH Testing Services, Inc.  
 Test Designation ..... NCHRP 350 Test 3-71  
 Test No. .... 56-4898-001  
 Date ..... 07/31/2007

#### Test Article

Type ..... Remcon Plastics AddGard  
 Impact Orientation ..... Normal and 45 deg Rotation  
 Size and/or dimension and material of key elements .....  
 (4) HDPE interlocking AddGard panels with sign panels, LED warning light, and plastic ballast.  
 Height - 36" ( 914 mm)  
 Width - 40" ( 1016 mm)  
 Thickness - 1-1/4" ( 31.7 mm)  
 Mass - Panels 40 lbs (18.2 kg), Light 3 lbs (1.4 kg), Sign Panels 1.0 lb (0.5 kg), Ballast 13.0 lb (5.9 kg)

#### Test Vehicle

Type ..... Production Model  
 Designation ..... 820C  
 Model ..... 1990 Ford Festiva  
 Mass  
 Curb ..... 1811 lb (823 kg)  
 Test inertial ..... 1824 lb (829 kg)  
 Dummy ..... 165 lb (75 kg)  
 Gross Static ..... 1989 lb (904 kg)

#### Impact Conditions (Normal/Rotated)

Speed ..... 64.1 / 61.1 mi/hr (103.2 / 98.3 km/h)  
 Angle ..... 0 / 0 deg  
 Impact Severity ..... 251.3 / 205.9 ft-kip (340.8 / 279.2 kJ)

#### Exit conditions (Normal/Rotated)

Speed ..... 61.1 / 58.0 mi/h (98.3/ 93.4 km/h)  
 Angle ..... 0 / 0 deg

#### Vehicle Damage (Normal/Rotated)

Exterior  
 VDS ..... FD-1 / FC-1  
 CDC ..... 12FDEW1 / 12FCEN1  
 Interior  
 OCDI ..... AS0000000 / AS0000000  
 Windshield  
 per FHWA ..... No damage: Pass

Figure 1. Summary of Results - Remcon Plastics AddGard Test 56-4898-001

Remcon Plastics AddGard Crash Test Results - 9 of 24



E-TECH Testing Services, Inc.  
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 FAX (916) 645-3653