U.S. Department of Transportation
Federal Highway Administration

400 Seventh St., S.W.
Washington, DC 20590

March 8, 2007

In Reply Refer To:
HSSD/CC-97

Dr. Chuck A. Plaxico
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

Dear Dr. Plaxico:

Thank you for your mail correspondence of January 15, 2007, requesting the Federal Highway Administration (FHWA) acceptance of the CrashGard Sand Barrel system developed by Plastic Safety Systems, Inc. (PSSI) for use on the National Highway System (NHS) under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features". Accompanying your letter was a report on analysis of PSSI's CrashGard Sand Barrel system using Finite Element Analysis conducted by your institute, full-scale crash test reports prepared by Transportation Research Center Inc., test videos and drawings.

Requirements
Crash cushions should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". The FHWA memorandum "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing of crash cushions.

Product description
The CrashGard Sand Barrel system is a non-redirective, gating crash cushion which consists of twelve sand-filled UV-resistant polyethylene barrels installed in array as shown in Enclosure 1. It consists of three components:

- Barrels of 36" (914 mm) diameter and 48" (1219 mm) in height. Each barrel is manufactured from High Density Polyethylene (HDPE) plastic. Each barrel weighs approximately 39 lb (17.7 kg) empty and can be filled with up to 2100 lb (952.5 kg) of sand.
- Inserts, which allow for ballast of either 200, 400 or 700 lbs (91, 182 or 318 kg) of washed concrete sand. These inserts are designed to maintain the proper center of gravity of the sand and are not used in the barrels filled with 1400 or 2100 lb (635 or 953 kg) of sand.
- Lids

Drawings of the CrashGard Sand Barrel system are provided in Enclosure 1.

Analysis and Testing
The NCHRP Report 350 requires that in order for non-redirective, gating crash cushions to meet test level 3 criteria they must successfully pass tests 3-40, 3-41, 3-42, 3-43 and 3-44.

In December 2005 you successfully conducted test 3-42 with the 820C vehicle and test 3-43 with the 2000P vehicle. All occupant risk and vehicle trajectory criteria were met. However, maximum roll angle in the test with the 2000P vehicle was 45.6 degrees.

In spring 2006 you conducted test 3-41 with a 2000P vehicle impacting the device head on at 100 km/h. This test was not successful. The vehicle overrode the lead sand barrels which caused it to ramp up on the downstream barrels and vault the vehicle over the target which constituted failure of your sand barrel system to successfully and safely contain and stop the vehicle upon impact. PSSI had stated that a possible cause for this override behavior was that the original position of the lead barrels' center of gravity (c.g.) might be too low. Your evaluation of the CrashGard Sand Barrel system centered on performance of the system in terms of barrel c.g. height using Finite Element Analyses (FEA) confirmed that conclusion. You further showed that the redesign of the system with a 2 inch (51 mm) increase in the c.g. height of the sand in the lead barrels accomplished by a simple change to the barrel's "insert" could resolve the problem.

In the meeting of Battelle and PSSI personnel with my staff you agreed on the best and most practical strategy for further testing and analysis of the redesigned CrashGard Sand Barrel system required for its acceptance for use on the NHS under the provisions of the NCHRP Report 350. From the documentation provided to support your request for acceptance of the CrashGard Sand Barrel I see that you closely followed this strategy.

First of all, you demonstrated that the FEA based analysis tool replicates the test event 3-41 for the initial sand barrel system design and that the redesigned CrashGard Sand Barrel system would perform successfully in test 3-41. I agree that FEA captured major events and general behavior of the vehicle and the device as reported in the actual test.

You further conducted a successful repeat of the physical test 3-41 with the redesigned sand barrel system. The test met all the NCHRP Report 350 evaluation criteria. As opposed to the previously failed test, the impacting vehicle remained upright during and after the impact and came to rest 16 inch (0.4 m) to the left of the device.

Having results of both the FEA and physical test you were able to further validate the FEA model. I agree that the comparison of simulated and physical 3-41 tests indicates that the model adequately captures major events and general behavior of the vehicle and the device.

You then proceeded to conduct the remaining physical tests 3-40 and 3-44 with the redesigned CrashGard Sand Barrel system. Both tests met all the NCHRP Report 350 evaluation criteria.

Full-scale crash tests 3-42 and 3-43 conducted on the initial design of the CrashGard Sand Barrel system in December 2005 were successful. Therefore, as it was agreed with my staff, new physical tests on the redesigned system were not required. I agree that a 2 inch (51 mm) increase in the c.g. height of the sand in the lead barrels will not deteriorate the performance of the system in these tests and may improve it. To verify that, and also because the roll angle in test 3-43 with the 2000P vehicle was too high, it was decided that you use your FEA model to simulate this test on the redesigned system. The results of the simulated test 3-43 met all the NCHRP Report 350 evaluation criteria. The pickup truck model remained stable throughout the impact event and the computed occupant risk factors were within the limits specified by the NCHRP Report 350. The roll angle did not exceed 3.1 degrees during the time of the simulation. As it can be seen from the test videos, even though the roll angle might increase after the end of the simulation period, such increase will not be as significant, which eliminates concerns related to somewhat high roll angle recorded in physical test 3-43 conducted on the initial design of the CrashGard Sand Barrel system.

The summary results of crash tests of the redesigned system (#061111, test 3-41; #061120, test 3-40; #061025, test 3-44) and of the initial design (#051277, test 3-42; #051228, test 3-43) are provided in Enclosure 2 in the order matching the actual sequence of the above test events. Also, Enclosure 2 contains summary results of the FEA of test 3-43 conducted on the redesigned system.

In summary I agree that the CrashGard Sand Barrel system, as described above, meets the appropriate evaluation criteria for the NCHRP 350 test level 3 for non-redirective, gating crash cushions and may be used at all appropriate locations on the NHS when selected by the contracting authority, subject to the provisions of Title 23, Code of Federal Regulations, Section 635.411 as they pertain to proprietary products. This acceptance is based on the reported crash performance of the CrashGard Sand Barrel system and is not intended to address the long-term durability of the unit. Further, I am assuming that production models will be identical to the prototype test units.

Standard provisions

Please note the following standard provisions that apply to the FHWA letters of acceptance:

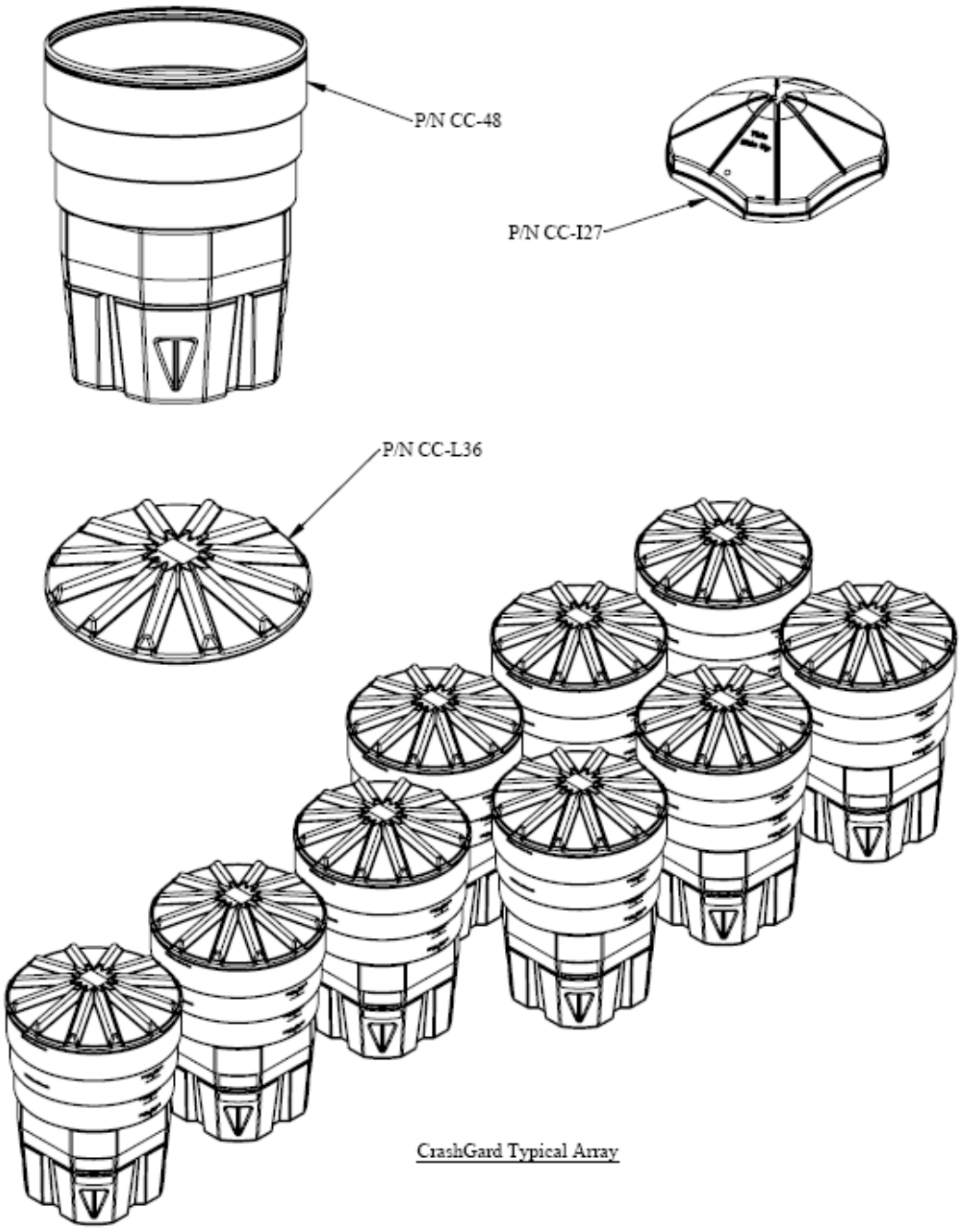
- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the MUTCD.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover 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 CC-97 shall not be reproduced except in full. As this letter and the documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The CrashGard Sand Barrel system is a patent pending device and is considered "proprietary". The use of proprietary devices specified on Federal-aid projects, except exempt, non-NHS projects: (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.
- 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. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures



CrashGard Typical Array

CrashGard Sand Barrel

Plastic Safety Systems, Inc.	Designator to be assigned	
	SHEET NO.	DATE:
	1 of 6	1/19/07

Intended Use

The Plastic Safety Systems, Inc. (PSS) CrashGard™ Sand Barrel System is a non-redirective, gating sand barrel, or crash cushion. Sand barrels are designed to protect fixed objects, whether permanent or temporary. Sand barrels are designed to reduce the likelihood of a vehicle impacting the object.

The CrashGard Sand Barrel System meets NCHRP-350, Test Level 3 requirements.

Properly designed arrays will decelerate the vehicle within the parameters described in NCHRP-350.

CrashGard Sand Barrels shall be filled with Washed Concrete Sand, ASTM C-33 or equivalent.

System Design and Configuration

The CrashGard Sand Barrel System consists of three (3) components:

- **Barrel, P/N CC-48:**
  - Overall dimensions: 36" [914mm] diameter, 48" [1219mm] height.
  - Features:
    - Designed so that one barrel satisfies all weight requirements: 200, 400, 700, 1,400 and 2,100 lbs.
    - Barrels nest easily when empty.
    - Easily transported by forklift or with CrashGard Hoist Lift Ring.
    - Accommodates reflective sheeting.

- **Insert, P/N CC-I27:**
  - Overall dimensions: 27" [686mm] square, 10.4" [264mm] height.
  - Features:
    - The insert, when installed, allows for ballast of either 200, 400, or 700 lbs. of sand.
    - The insert is not required to fill barrels to 1,400 or 2,100 lb. levels.
    - Inserts will nest.

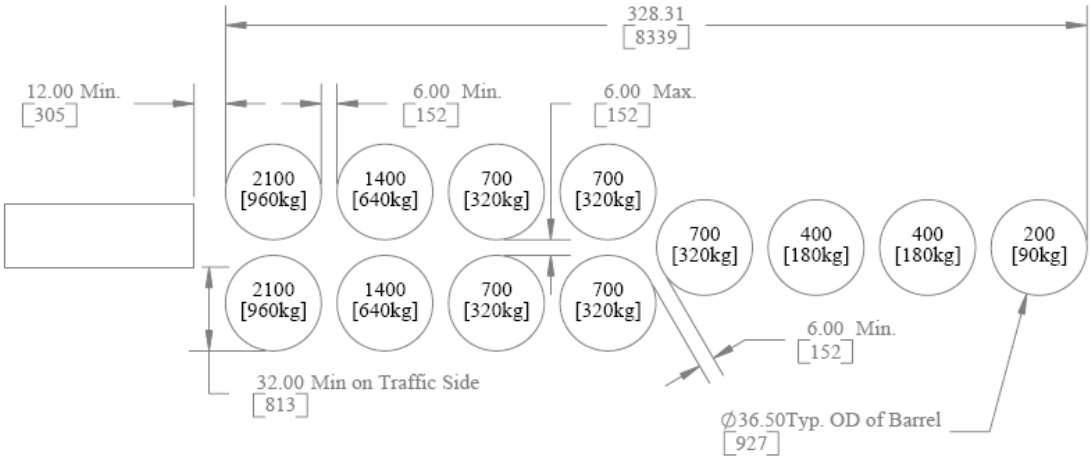
- **Lid, P/N CC-L36:**
  - Overall dimensions: 36.5" [927mm] diameter, 6.6" [168mm] height.
  - Features:
    - The lip of the lid snaps into a groove in the top of the barrel and provides a tamper-proof fit.
    - May prevent water infiltration and vandalism.
    - Lids will nest.

Contact Information:

Plastic Safety Systems, Inc.
2444 Baldwin Rd.
Cleveland, OH 44104
800-662-6338 / www.plasticsafety.com

CrashGard Sand Barrel

Plastic Safety Systems, Inc.	Designator to be assigned	
	SHEET NO.	DATE:
	2 of 6	1/19/07



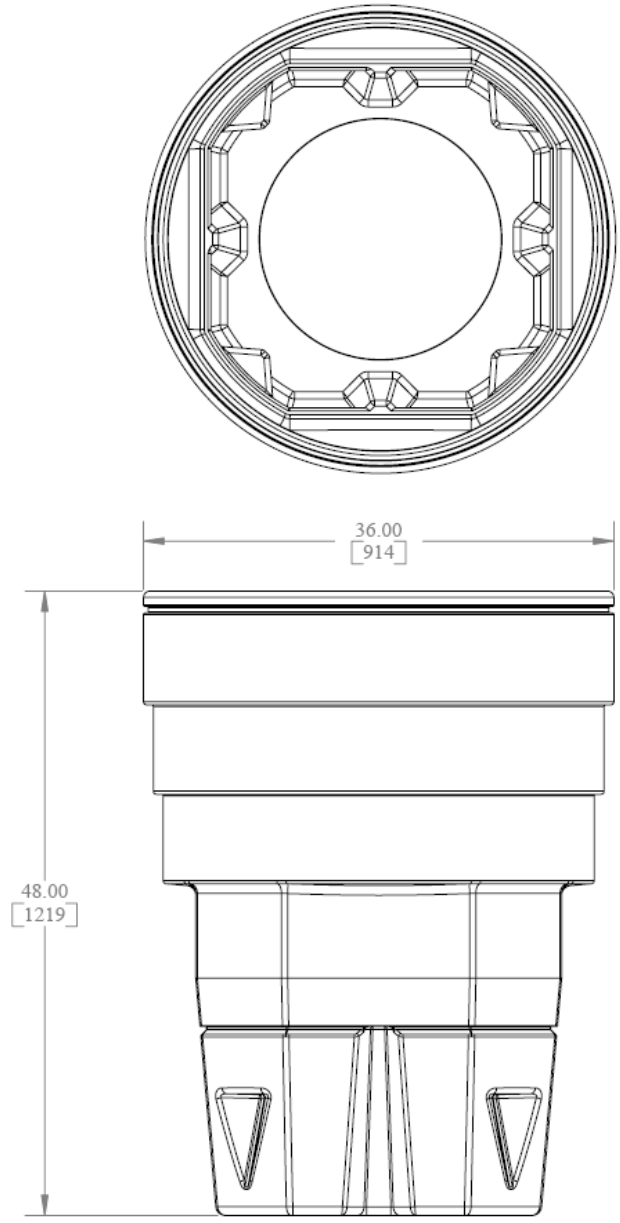
NCHRP-350 Test Array Design

CrashGard Sand Barrel

Plastic Safety Systems, Inc.

Designator
to be assigned

SHEET NO.	DATE:
3 of 6	1/19/07



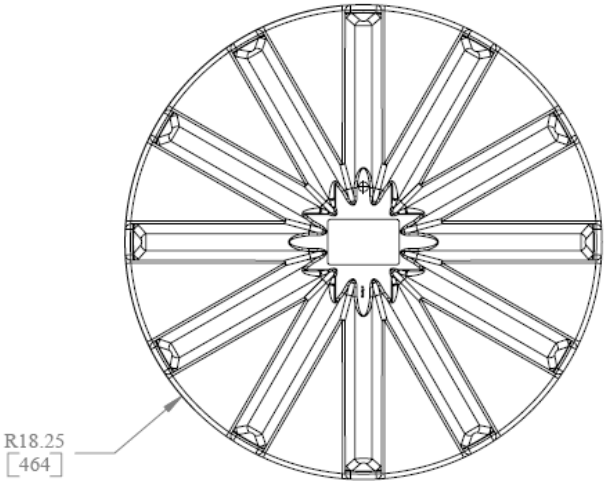
Sand Barrel P/N CC-48

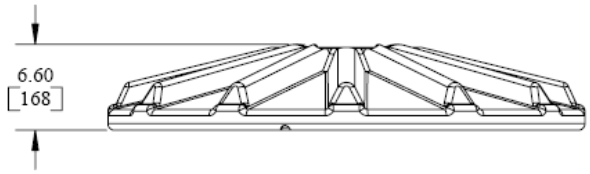
CrashGard Sand Barrel

Plastic Safety Systems, Inc.

Designator
to be assigned

SHEET NO.	DATE:
4 of 6	1/19/07





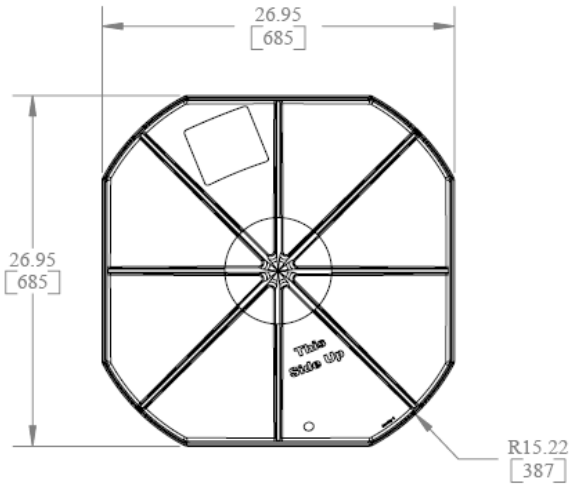
Lid P/N CC-L36

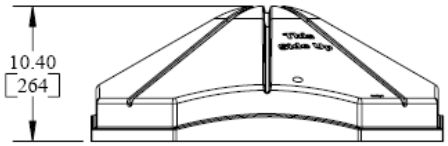
CrashGard Sand Barrel

Plastic Safety Systems, Inc.

Designator
to be assigned

SHEET NO.	DATE:
5 of 6	1/19/07





Insert P/N CC-I27

CrashGard Sand Barrel

Plastic Safety Systems, Inc.	Designator to be assigned	
	SHEET NO.	DATE:
	6 of 6	1/19/07

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0.400 s

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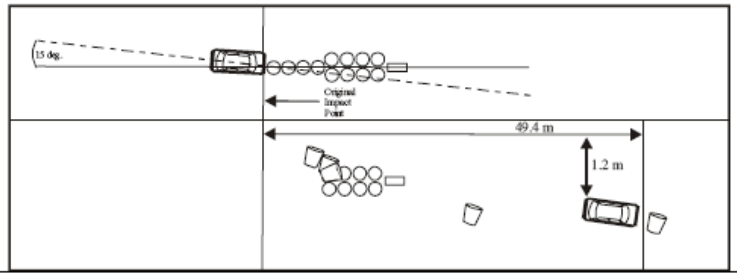

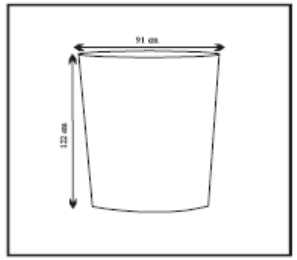

General Information	
Test Agency	Transportation Research Center Inc. (TRC Inc.)
Test No.	051227
Date	December 27, 2005
Test Article	
Type	Sand barrel array
Manufacturer	Plastic Safety Systems, Inc.
Size and/or dimension and material of key elements	12 individual portable sand filled barrels, each being 122 cm high with a 91 cm diameter
Soil Type and Condition	N/A
Test Vehicle	
Type	Production Model
Designation	820C
Model	2001Chevrolet Metro
Mass (kg)	
Curb	895.5
Test Inertial	843.6
Dummy(s)	73.0
Gross Static	919.6

Impact Conditions	
Speed (km/h)	101.3
Angle (deg)	15
Exit Conditions	
Speed (km/h)	N/A
Angle (deg)	N/A
Occupant Risk Values	
Impact Velocity (m/s)	
x-direction	8.2
y-direction	1.4
THIV (optional)	N/A
Ridedown Acceleration (g's)	
x-direction	4.7
y-direction	2.8
PHD (optional)	N/A
ASI (optional)	N/A
Max. 0.050 –s Average (g's)	
x-direction	N/A
y-direction	N/A
z-direction	N/A

Test Article Deflections (m)	
Dynamic	50.0[1]
Permanent	50.0[1]
Vehicle Damage	
Exterior	
VDS	N/A
CDC	12FZEW2
Interior	
OCDI	FS0000000
Maximum Exterior Vehicle Crush (mm)	111
Max. Occ. Compart. Deformation (mm)	12
Post-Impact Vehicular Behavior	
Maximum Roll Angle (deg)	7.6
Maximum Pitch Angle (deg)	-6.1
Maximum Yaw Angle (deg)	-7.4

Vehicle Trajectory Post Test

The impacting vehicle's final most outer left trajectory stayed within twelve feet of the barrier. Assuming that the barrier was at the edge of the lane, the vehicle would have stayed within a 12-foot lane width.

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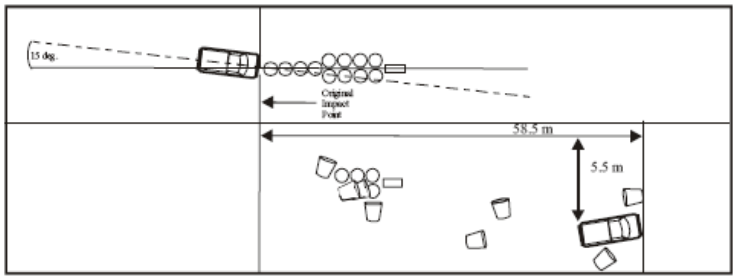
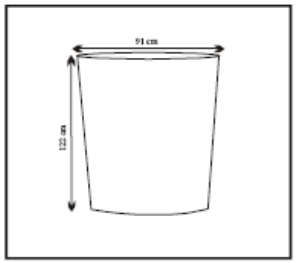
0.600 s





General Information		Impact Conditions		Test Article Deflections (m)		Vehicle Trajectory Post Test	The impacting vehicle's final most outer left trajectory did not stay within twelve feet of the barrier. Assuming that the barrier was at the edge of the lane, the vehicle would not have stayed within a 12-foot lane width.
Test Agency	Transportation Research Center Inc. (TRC Inc.)	Speed (km/h)	101.9	Dynamic	58.5		
Test No.	051228	Angle (deg)	15	Permanent	58.5		
Date	December 28, 2005	Exit Conditions					
Test Article		Speed (km/h)	N/A	Vehicle Damage			
Type	Sand barrel array	Angle (deg)	N/A	Exterior			
Manufacturer	Plastic Safety Systems, Inc.	Occupant Risk Values		VDS	N/A		
Size and/or dimension and material of key elements	12 individual portable sand filled barrels, each being 122 cm high with a 91 cm diameter	Impact Velocity (m/s)		CDC	12FZEW2		
		x-direction	8.0	Interior			
		y-direction	0.9	OCDI	FS0000000		
Soil Type and Condition	N/A	THIV (optional)	N/A	Maximum Exterior			
Test Vehicle		Ridedown Acceleration (g's)		Vehicle Crush (mm)	201		
Type	Production Model	x-direction	3.6	Max. Occ. Compart.			
Designation	2000P	y-direction	2.2	Deformation (mm)	7		
Model	2000 Chevrolet Silverado	PHD (optional)	N/A				
Mass (kg)		ASI (optional)	N/A	Post-Impact Vehicular Behavior			
Curb	2238.0	Max. 0.050 –s Average (g's)		Maximum Roll Angle (deg)	45.6		
Test Inertial	2027.0	x-direction	N/A	Maximum Pitch Angle (deg)	7.6		
Dummy(s)	0.0	y-direction	N/A	Maximum Yaw Angle (deg)	12.2		
Gross Static	2027.0	z-direction	N/A				

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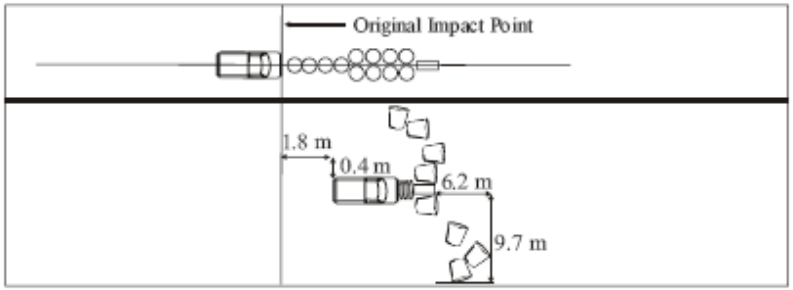
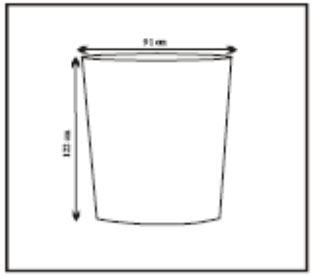
0.600 s





General Information		Impact Conditions		Test Article Deflections (m)		Vehicle Trajectory Post Test	The impacting vehicle's final most outer left trajectory stayed within twelve feet of the barrier. Assuming that the barrier was at the edge of the lane, the vehicle would have stayed within a 12-foot lane width.
Test Agency	Transportation Research Center Inc. (TRC Inc.)	Speed (km/h)	101.2	Dynamic	9.69		
Test No.	061111	Angle (deg)	0	Permanent	9.69		
Date	November 11, 2006	Exit Conditions					
Test Article		Speed (km/h)	N/A	Vehicle Damage			
Type	Sand barrel array	Angle (deg)	N/A	Exterior			
Manufacturer	Plastic Safety Systems, Inc.	Occupant Risk Values		VDS	N/A		
Size and/or dimension and material of key elements	12 individual portable sand filled barrels, each being 122 cm high with a 91 cm diameter	Impact Velocity (m/s)		CDC	12FZEW2		
		x-direction	8.9	Interior			
		y-direction	0.4	OCDI	LF0000000		
Soil Type and Condition	N/A	THIV (optional)	32.24 km/h	Maximum Exterior			
Test Vehicle		Ridedown Acceleration (g's)		Vehicle Crush (mm)	167		
Type	Production Model	x-direction	11.46	Max. Occ. Compart.			
Designation	2000P	y-direction	1.6	Deformation (mm)	6		
Model	2002 GMC Sierra 2500	PHD (optional)	11.54 g				
Mass (kg)		ASI (optional)	0.68	Post-Impact Vehicular Behavior			
Curb	2285.0	Max. 0.050 –s Average (g's)		Maximum Roll Angle (deg)	-7.73		
Test Inertial	2031.7	x-direction	-7.7	Maximum Pitch Angle (deg)	-6.04		
Dummy(s)	0.0	y-direction	-0.9	Maximum Yaw Angle (deg)	-9.79		
Gross Static	2031.7	z-direction	-2.8				

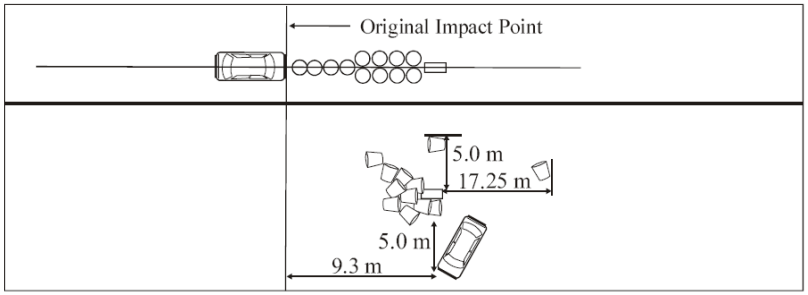
0.000 s

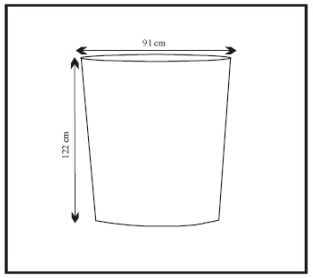
0.300 s

0.600 s

1.200 s

2.000 s





General Information	
Test Agency	Transportation Research Center Inc. (TRC Inc.)
Test No.	061120
Date	November 20, 2006
Test Article	
Type	Sand barrel array
Manufacturer	Plastic Safety Systems, Inc.
Size and/or dimension and material of key elements	12 individual portable sand filled barrels, each being 122 cm high with a 91 cm diameter
Soil Type and Condition	N/A
Test Vehicle	
Type	Production Model
Designation	Passenger car
Model	2000 Chevrolet Metro LSi
Mass (kg)	
Curb	845.5
Test Inertial	843.8
Dummy(s)	76.0
Gross Static	919.8

Impact Conditions	
Speed (km/h)	101.8
Angle (deg)	0
Exit Conditions	
Speed (km/h)	N/A
Angle (deg)	N/A
Occupant Risk Values	
Impact Velocity (m/s)	
x-direction	9.6
y-direction	0.7
THIV (optional)	34.79 km/h
Ridedown Acceleration (g's)	
x-direction	9.5
y-direction	2.1
PHD (optional)	9.65 g
ASI (optional)	0.79
Max. 0.050 –s Average (g's)	
x-direction	-8.7
y-direction	1.5
z-direction	2.7

Test Article Deflections (m)	
Dynamic	17.25
Permanent	17.25
Vehicle Damage	
Exterior	
VDS	N/A
CDC	12FZEW2
Interior	
OCDI	RS0000000
Maximum Exterior	
Vehicle Crush (mm)	---[1]
Max. Occ. Compart.	
Deformation (mm)	40
Post-Impact Vehicular Behavior	
Maximum Roll Angle (deg)	-31.6
Maximum Pitch Angle (deg)	-23.9
Maximum Yaw Angle (deg)	-228.2

Vehicle Trajectory Post Test

The impacting vehicle's final most outer right trajectory did not stay within twelve feet of the barrier. Assuming that the barrier was at the right edge of the lane, the vehicle would not have stayed within a 12-foot lane width to the right.

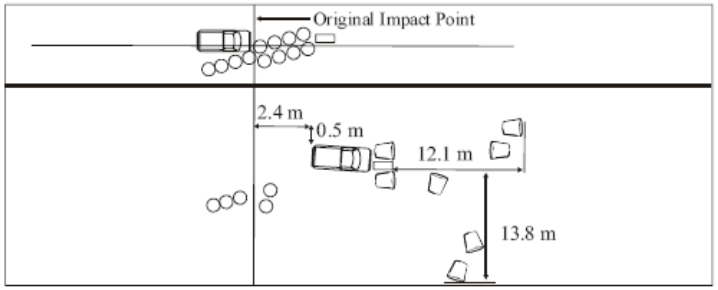
0.000 s

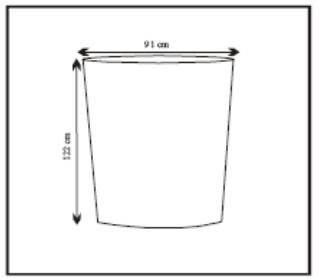
0.300 s

0.600 s

1.200 s

2.000 s





General Information	
Test Agency	Transportation Research Center Inc. (TRC Inc.)
Test No.	061205
Date	December 5, 2006
Test Article	
Type	Sand barrel array
Manufacturer	Plastic Safety Systems, Inc.
Size and/or dimension and material of key elements	12 individual portable sand filled barrels, each being 122 cm high with a 91 cm diameter
Soil Type and Condition	N/A
Test Vehicle	
Type	Production Model
Designation	2000P
Model	2002 GMC Sierra 2500
Mass (kg)	
Curb	2285.0
Test Inertial	2028.8
Dummy(s)	0.0
Gross Static	2028.8

Impact Conditions	
Speed (km/h)	102.3
Angle (deg)	20
Exit Conditions	
Speed (km/h)	N/A
Angle (deg)	N/A
Occupant Risk Values	
Impact Velocity (m/s)	
x-direction	8.9
y-direction	0.4
THIV (optional)	45.0 g
Ridedown Acceleration (g's)	
x-direction	10.9
y-direction	1.6
PHD (optional)	14.6 g
ASI (optional)	1.29
Max. 0.050–s Average (g's)	
x-direction	-15.1
y-direction	-1.5
z-direction	-5.2

Test Article Deflections (m)	
Dynamic	13.84
Permanent	13.84
Vehicle Damage	
Exterior	
VDS	N/A
CDC	12FDEW2
Interior	
OCDI	RF0000000
Maximum Exterior	
Vehicle Crush (mm)	465
Max. Occ. Compart.	
Deformation (mm)	0
Post-Impact Vehicular Behavior	
Maximum Roll Angle (deg)	-10.25
Maximum Pitch Angle (deg)	-5.27
Maximum Yaw Angle (deg)	18.19

Vehicle Trajectory Post Test	The impacting vehicle's final most outer right trajectory stayed within twelve feet of the barrier. Assuming that the barrier was at the right edge of the lane, the vehicle would have stayed within a 12-foot lane width to the right.

Test Summary Report

Finite Element Analysis of Test 3-43

General Information

Test Agency:	Battelle COE
Test Number:	2006-10-06
Test Date:	10 / 06/ 2006
Test Article:	Crash Guard (bottom of sand is 17.5 inches above grade)

Test Vehicle

Description:	200 kg Mass
Test Inertial Mass:	2000 kg
Gross Static Mass:	2000 kg

Impact Conditions

Speed: 100.0 km/hr
Angle: 0.0 degrees

Occupant Risk Factors

Impact Velocity (m/s)		at 0.1583 seconds on front of interior
x-direction	7.2	
y-direction	-0.4	
THIV (km/hr):	26.0	at 0.1581 seconds on front of interior
THIV (m/s):		7.2
Ridedown Accelerations (g's)		
x-direction	-8.9	(0.2088 - 0.2188 seconds)
y-direction	4.0	(0.1725 - 0.1825 seconds)
PHD (g's):		9.1 (0.2088 - 0.2188 seconds)
ASI:		0.53 (0.0297 - 0.0797 seconds)

Max. 50msec Moving Avg. Accelerations (g's)

x-direction	-6.3	(0.0585 - 0.1085 seconds)
y-direction	2.1	(0.1528 - 0.2028 seconds)
z-direction	1.2	(0.2336 - 0.2836 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)

Roll	3.1	(0.3732 seconds)
Pitch	-2.3	(0.2998 seconds)
Yaw	-3.6	(0.3452 seconds)

Title 23, Code of Federal Regulations
§ 635.411 Material or product selection.

(a) 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, unless:

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

(2) The State transportation department 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 an 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 specifications for each such material or product that is considered acceptable for incorporation in the work. If the State transportation department 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 an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State transportation department 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 participation 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 number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

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

(f) In the case of a design-build project, the following requirements apply: 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 Request for Proposals document unless the conditions of paragraph (a) of this section are applicable.

[41 FR 36204, Aug. 27, 1976, as amended at 67 FR 75926, Dec. 10, 2002]