

FOR CONTRACT NO.: 06-0Q3504

INFORMATION HANDOUT

MATERIALS INFORMATION

SMART CRASH CUSHION (TYPE SCI-100GM)

COMPRESSOR ATTENUATOR CRASH CUSHION

ROUTE: 06-Fre, Ker, Tul-99, 180, 198-Var



SCI Products Inc.

**The World's Only
Speed-Dependent
Crash Attenuators.**



SMART CUSHION INNOVATIONS™

NCHRP 350 Approved



Marketed and Distributed by

Work Area Protection

SMART CUSHION INNOVATIONS™

The World's Only Speed-Dependent Crash Attenuators



The Smart Cushion Innovations (SCI) crash attenuator is a revolutionary, speed-dependent product that varies stopping resistance during an impact. The Smart Cushion Innovations (SCI) crash attenuator allows lighter and slower-moving vehicles to have longer ridedown distances and lower ridedown G forces.

Unlike fixed-resistance attenuators, the Smart Cushion Innovations (SCI) attenuator does not reach maximum stopping resistance unless a vehicle is traveling at the maximum design speed. This fully redirective, non-gating, bi-directional, impact attenuator was designed for maximum safety and reusability, as well as outstanding durability before, during and after an impact.

The SCI is the only attenuator with a reverse-tapered design to eliminate side panel stress during a collapse. It also has an extremely low angle of exit on side impacts ($<1^\circ$) to keep vehicles from rebounding back into traffic and causing secondary accidents. This is the lowest angle of exit for any redirective attenuator on the market.



How It Works

The hydraulic porting of the attenuator ensures that the proper resistance is used to stop the vehicle before it reaches the end of the cushion's usable length.

The SCI was specifically designed for durability and resetability to enable resets to be performed in less than one hour. After a frontal impact, an experienced crew can perform the two-stage reset in less than 45 minutes. Side impacts within NCHRP 350 specifications should not damage the attenuator.

After an impact, the cushion requires a dual-stage pull-out with the replacement of two 1/4" shear bolts. The crash attenuator requires a minimal inventory of spare parts because of the new side panels' durability and the normal requirement of only two shear bolts on the frontal impact reset. Minimal damage means quick resetting and reduced worker exposure to traffic, as well as lower costs for traffic control, replacement parts and labor.



Ready To Install

SCI attenuators come fully assembled for a pick-and-set install. A typical installation can be performed in less than 1-1/2 hours. The units require no backstops for permanent or temporary construction applications.

NCHRP 350 Test Results

All NCHRP 350 tests were performed on the same unit in four consecutive days. All tests showed outstanding results for ridedown G forces and low angle of exit. There were no replacement parts required prior to the next test except for shear bolts.

"It's a very easy installation. We set the SCI impact attenuator with a truck-mounted crane, drove into the concrete surfacing and then did some epoxy work. The installation went real well and took about an hour. It would normally take longer for a different type of system. SCI manufactures a quality product and I'm sure they save many lives."

— Tyler Chicoine, Garcia-Chicoine Enterprises Inc., Lincoln, Nebraska



Repair Costs

Based on NCHRP 350 Test results, the **SCI100GM** required the following parts and labor:

NCHRP 350 TEST LEVEL III REPAIR RESULTS	Part Names	Cost	Repair Hrs.	Cost	Total Cost
#3-31 2000 kg vehicle 0 degree frontal impact at 102 km/h	2 – Shear Bolts	\$1	2 man hours	\$80	\$81
#3-32 820 kg vehicle 15 degree frontal impact at 101 km/h	2 - Shear Bolts	\$1	2 man hours	\$80	\$81
#3-33 2000 kg vehicle 15 degree frontal impact at 101 km/h	2 - Shear Bolts	\$1	2 man hours	\$80	\$81
#3-37 2000 kg vehicle 20 degree side impact at 99 km/h	0	\$0	0	\$0	\$0
#3-39 2000 kg vehicle 20 degree rev. side impact at 99 km/h	0	\$0	0	\$0	\$0

Test Levels Available

The **SCI70GM** is our Test Level 2 (45 MPH) attenuator and the **SCI100GM** is our Test Level 3 (62 MPH) attenuator. Both attenuators can protect a wide range of hazards including bridges, median barriers and highway signs.

reusability.

The first speed-dependent, variable-resistance attenuator that can ramp resistance up or down to provide the smoothest ridedown of any system on the market.



*"The **SCI100GM** unit has experienced three hits in a very short period. The first was well above the NCHRP 350 criteria. The crash used every bit of the capacity the unit has and I believe the driver survived because of the performance of the unit in extreme circumstances. The next two hits were within the NCHRP 350 criteria and the unit functioned as designed with very little repair cost. As we gain experience in resetting units, the job can be accomplished in less than 30 minutes for a majority of hits. Damage to the unit for the last two hits was limited to the shear pins and the chevron plate."*

— Ron Jones, Trafficade Services Inc., Phoenix, Arizona

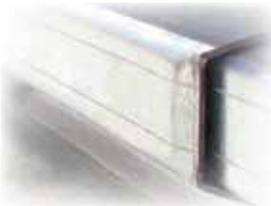


Features



Support Gussets.

Gussets located behind the panels reduce gap formation and deformation to prevent snagging on reverse side impacts.



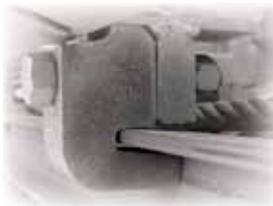
Stronger Side Panel.

Our panels are over 90% stronger than curved profiles. The profile allows the edges to be beveled, reducing the potential for snagging and damage on reverse-direction impacts. The panel also smoothly redirects vehicles on side impacts. The side panel is fabricated from 10-gauge, 60-ksi, minimum-yield steel with a G90 galvanized coating.



Cable & Cylinder System.

This system allows longer ridedown distances for smaller vehicles, as well as smoother ridedown with lower G forces for all vehicles. The cylinder's hydraulic porting assures a controlled ridedown by applying the necessary resistance required based on the speed of the vehicle.



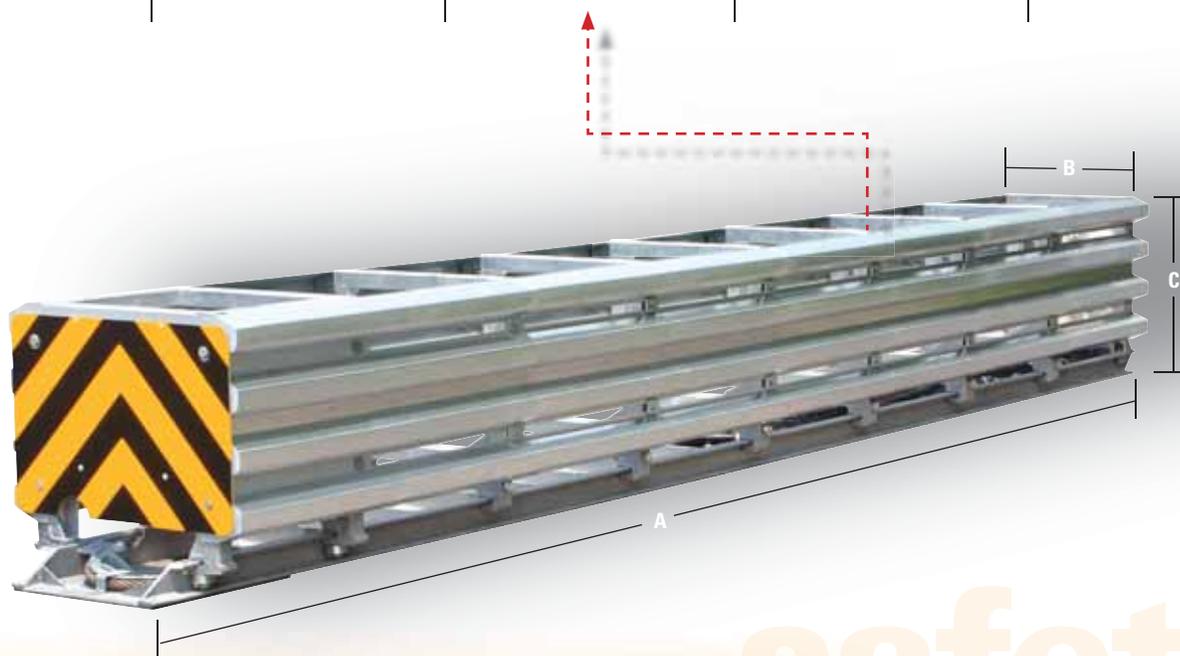
Side Guide Design.

This new design withstands side impacts with no damage. It also allows individual replacement of the support frames.



Front Rollers.

The roller guide design on the front sled produces a smooth, aligned collapse by reducing friction and binding.



SCI Dimensions	Test Level 2	Test Level 3
A	13' 6"	21' 6"
B	24"	24"
C	34"	34"
Weight	2470 lbs.	3450 lbs.

Weights are for attenuators only

safety.



SMART CUSHION INNOVATIONS™

Highlights

Safety Benefits

- ▶ Variable force (speed-dependent), not fixed force, provides consistent deceleration during ridedown.
- ▶ Longer ridedown distances and lower sustained G forces for lighter or slower-moving vehicles.
- ▶ Low angle of exit on side impacts ($<1^\circ$) to keep vehicle from deflecting back into traffic.
- ▶ Quick and easy resetting for reduced worker exposure to traffic.
- ▶ Reduced out-of-service time to maximize highway safety.



Cost Benefits

- ▶ Minimal replacement parts requirement reduces spare parts inventory and parts costs.
- ▶ Quick, easy resetting reduces labor and traffic control costs.
- ▶ The new, reverse-tapered design eliminates side panel stress on frontal impacts to reduce damage and system fatigue from multiple impacts.
- ▶ Low life cycle cost benefits increase dramatically as impacts occur.



About Work Area Protection Corporation

Work Area Protection Corporation is the international leader in traffic control devices and work zone safety products. Since 1969, we have been meeting customer needs and exceeding quality standards with a wide range of highway and construction safety products. We back those products with knowledgeable, personalized customer service and strong distributor support.

Part No.	Description	Weight
Attenuators		
9400	SCI100GM Attenuator 24" wide w/Concrete Anchors Test Level 3	3500 lbs.
9450	SCI100GM Attenuator 24" wide w/Asphalt Anchors Test Level 3	3575 lbs.
9451	SCI70GM Attenuator 24" wide w/Concrete Anchors Test Level 2	2500 lbs.
9452	SCI70GM Attenuator 24" wide w/Asphalt Anchors Test Level 2	2550 lbs.
Anchor Kits		
9401	Concrete Anchor Kit for SCI100GM	
9402	Asphalt Anchor Kit for SCI100GM	
9453	Concrete Anchor Kit for SCI70GM	
9454	Asphalt Anchor Kit for SCI70GM	
Accessories		
9406	Shear Bolt	
9424	Delineator Panel Yellow Test Level 3	
9456	Delineator Panel Yellow Test Level 2	
9439	Epoxy 22 oz. Cartridge Required for Attenuator Part No. 9400=4/9450=12/9451=3/9452=9	
9440	Nozzle Epoxy Mixing – 1 nozzle required per cartridge	
9444	Spare Parts Kit Test Level 3	
9458	Spare Parts Kit Test Level 2	
Transitions		
9431	Transition 24" Jersey Barrier - Right (viewed from front)	 Transition 24" Jersey Barrier
9432	Transition 24" Jersey Barrier - Left (viewed from front)	
9433	Transition 24" Concrete - Left & Right	
		 Transition 24" Concrete

Call for other transition design availability

Disclaimer

This product is only intended for use as a redirective impact attenuator. Installations must be performed according to manufacturer's specification. Improper installations, modifications or unintended use creates a hazardous condition that can cause personal injury, property damage or death. Any modification or unintended use of this product shall immediately void all manufacturers' warranties. SCI Products Inc. disclaims all liability for injuries to persons or property resulting from any modifications to, unintended use of or unspecified installation of this product.

Designs are subject to change without notice.

SMART CUSHION INNOVATIONS is a trademark of SCI Products Inc.

PATENT PENDING.



SCI Products Inc.

Permanent Message Boards • Attenuators • Speed Awareness Products • LED Signals • Advanced Warners



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Compressor[®] Attenuator



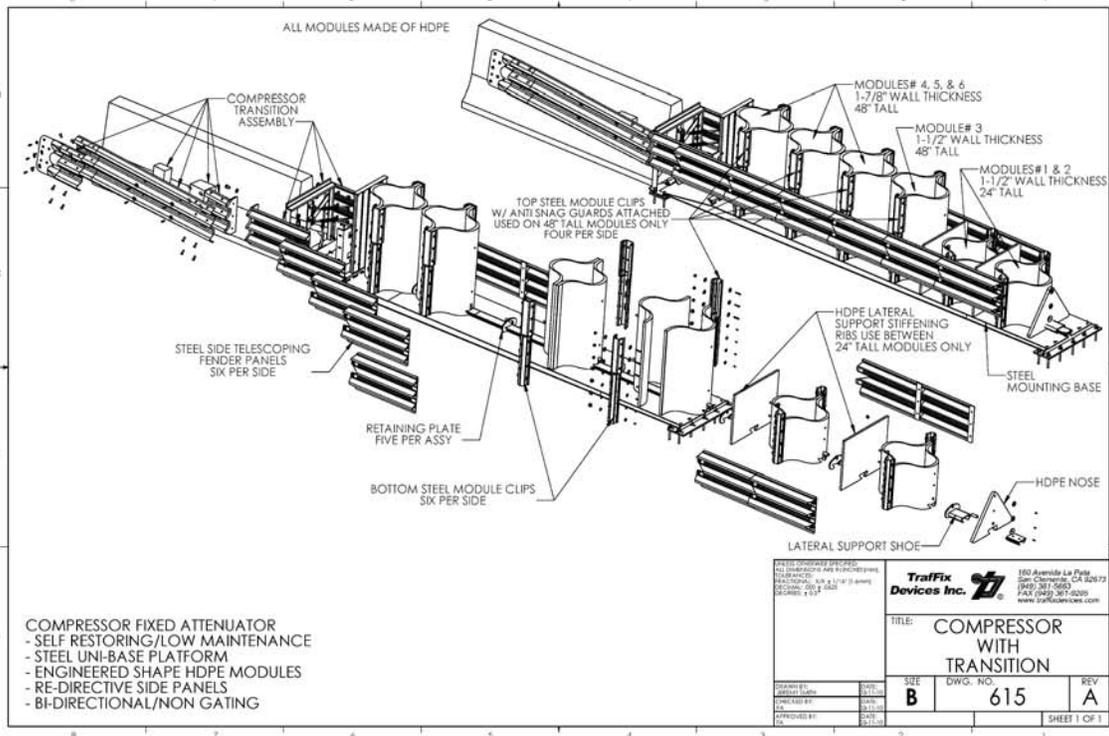
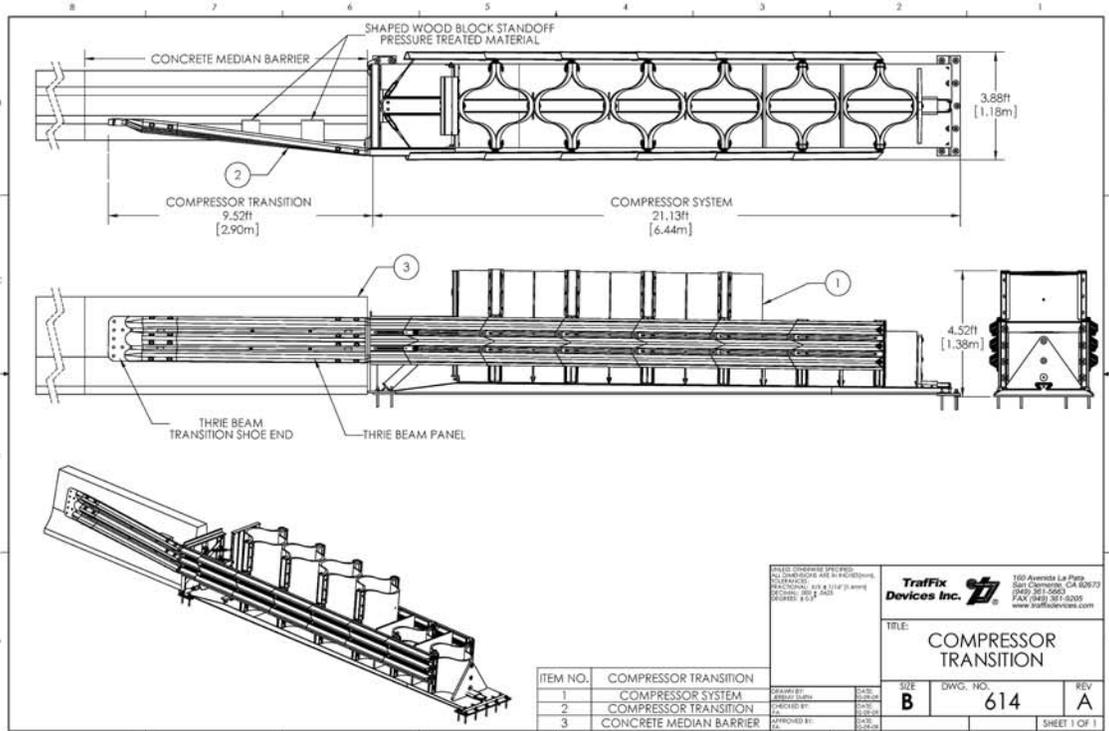
Features

- Passed all required NCHRP 350 TL-3 Tests — FHWA Acceptance Letters CC95 and CC95A
- Compressor is categorized by the FHWA as a "Low Maintenance / Self Restoring" Attenuator
- Overall length 21' 3" — Attenuator Module/Effective length 16' 6"
- Delivered assembled and ready to install — eliminates on-site assembly
- Compressor is up to 30% shorter than other Low Maintenance / Self Restoring Attenuators on the market today
- Galvanized steel Uni-Base™ platform requires only 14 bolts to secure Compressor to concrete pad or roadway
- Compressor's assembled design combined with the Uni-Base™ construction makes job site installation fast, easy and safe — one crew can safely install several units in one day
- Compressor's specially formulated attenuator modules are injection molded from HDPE plastic and are designed to more efficiently absorb energy in a shorter distance
- Attenuator modules are pre-flattened to provide more consistent results after repeated impacts
- Compressor's telescoping ultra high strength steel side panels re-direct side impacts with minimal damage to the attenuator's modules or panels

**TraFix
Devices Inc.**



Compressor[®] Specifications



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