

2010 WASHTO

July 14, 2010

INNOVATIVE SAFETY DEVICES AND MATERIALS FOR ROADWAY SAFETY

*Arthur M. Dinitz, Chair/CEO
Transpo Industries, Inc.*

Saving Lives...



Omni-Directional Breakaway Systems



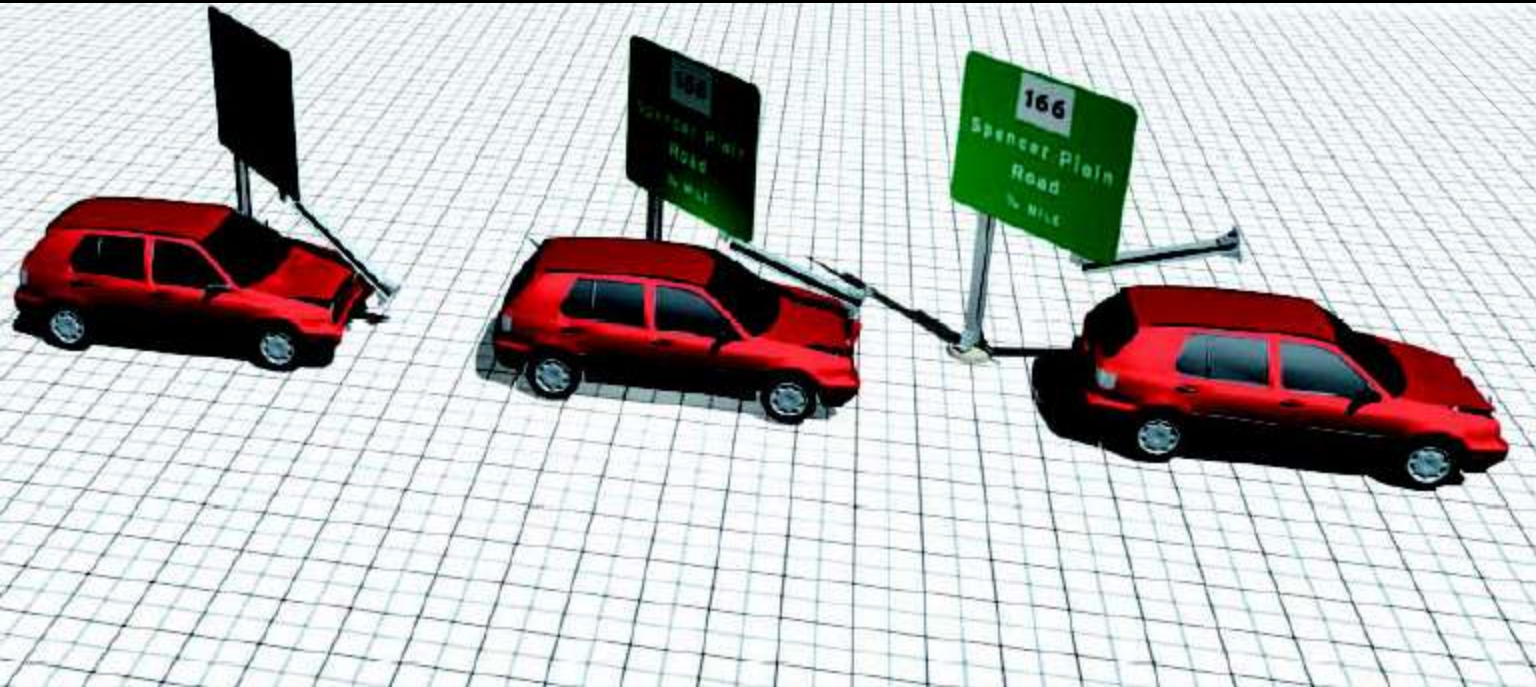
- Ground-Mounted Signs Located within Roadside Clear Zones
- Locations Vulnerable to Vehicular Impacts
- Single Post Signs
- Multiple Post Signs
- Use all over U.S.A.

Range of Post Sizes



- National Signing Standards Specify Increased Sizes for Visibility & Wind Loads
- These Changes Create an Increase in Structural Demands on Sign Supports
- Break-Safe Provides High Structural Load-Carrying Capacity
- Supports Wide range of Post Sizes, up to and Including the Largest Permitted by AASHTO
- Flexibility Allows for many Choices when Selecting Post Types and Sizes

Omni-Directional



- The angle of an errant vehicle leaving a highway impacting a roadside structure is impossible to predict. Most breakaway support systems are one directional in their design and crash performance.

Features and Advantages








- Couplings Break with Consistent, Predictable Behavior Regardless of the Angle of Impact
- This Unique Capability exceeds FHWA and AASHTO Requirements for Impact Performance
- All Models are FHWA-Approved for use on the National Highway System
- Quick & Clean Breakaways Save Lives While Reducing Property Damage



Breakaway Supports

Model Selection:

Break-Safe Model A Series:

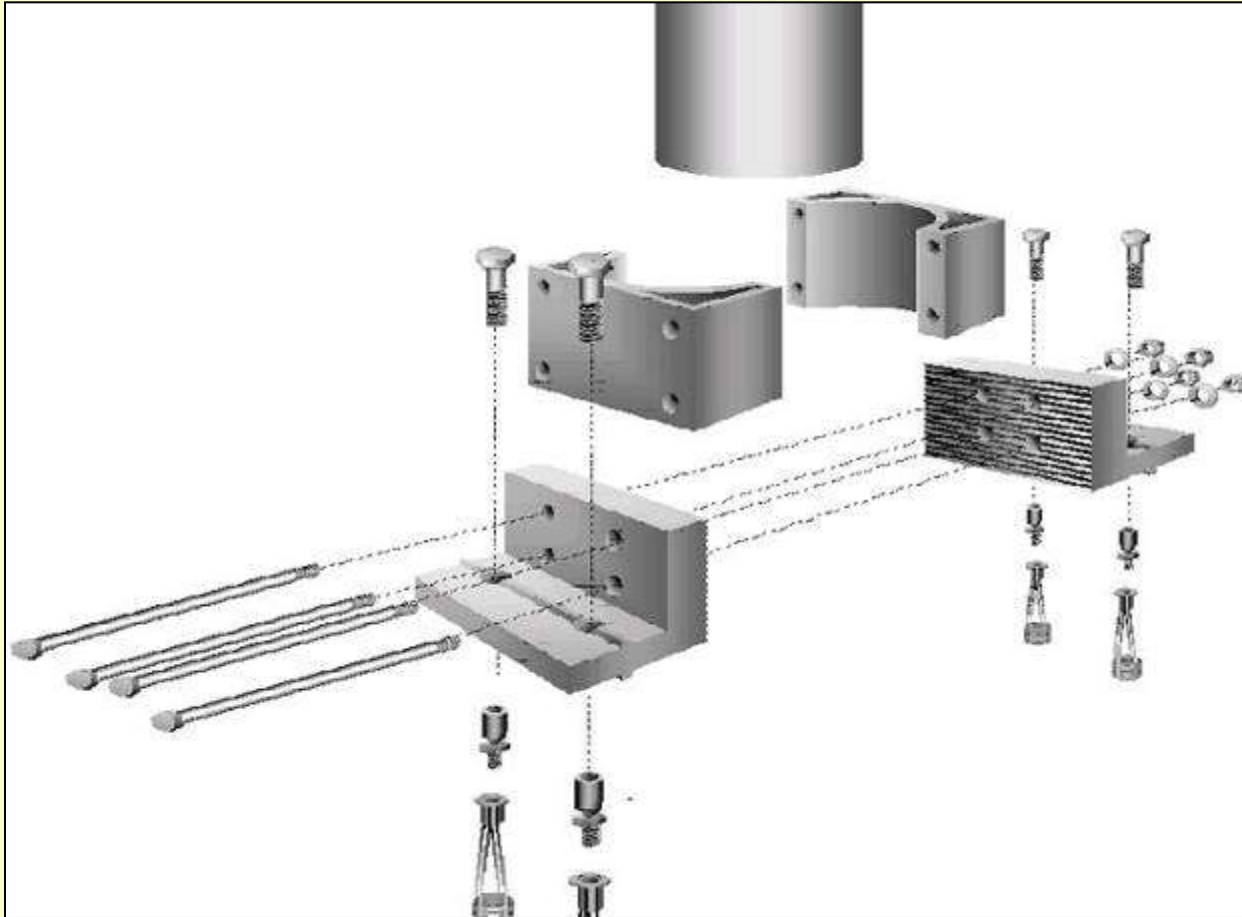
Break-Safe Model		Post Type and Size
AI4		4", 5" Standard I-Beams
AI6		W6x9 Wide Flange
AP		3", 3.5", 4", 4.5" O.D. Round Pipes
AS		2.5", 3", 4", 5" Square Tubes
AU		4, 6, 8 lb Back-to-Back U-Channels

Break-Safe Model B Series:

Break-Safe Model		Post Type and Size
B525		6", 8" Wide Flange
B650		10"-21" Wide Flange 6", 7", 8" Square Tubes



Type A: Small Posts



- Round Pipe (3", 3.5", 4", 4.5")
Steel or Aluminum
- Wide Flange (6x9w)
Steel I-Beam
- Standard "S" Shape
Steel Beam
- Square Tube (2.5", 3", 3.5", 4")
Steel or Aluminum

Type B: Large Posts



- Wide Flange Steel Beam, 6" and 8"
- Wide Flange Steel Beam, 10" to 21"

Easy Installation



- No Special Tools or Equipment Required
- Components Secured using American Institute of Steel Construction (AISC) turning-of-nut tightening
- Eliminates Torque Requirement Typical of Slip-Base Systems

Pendulum Test



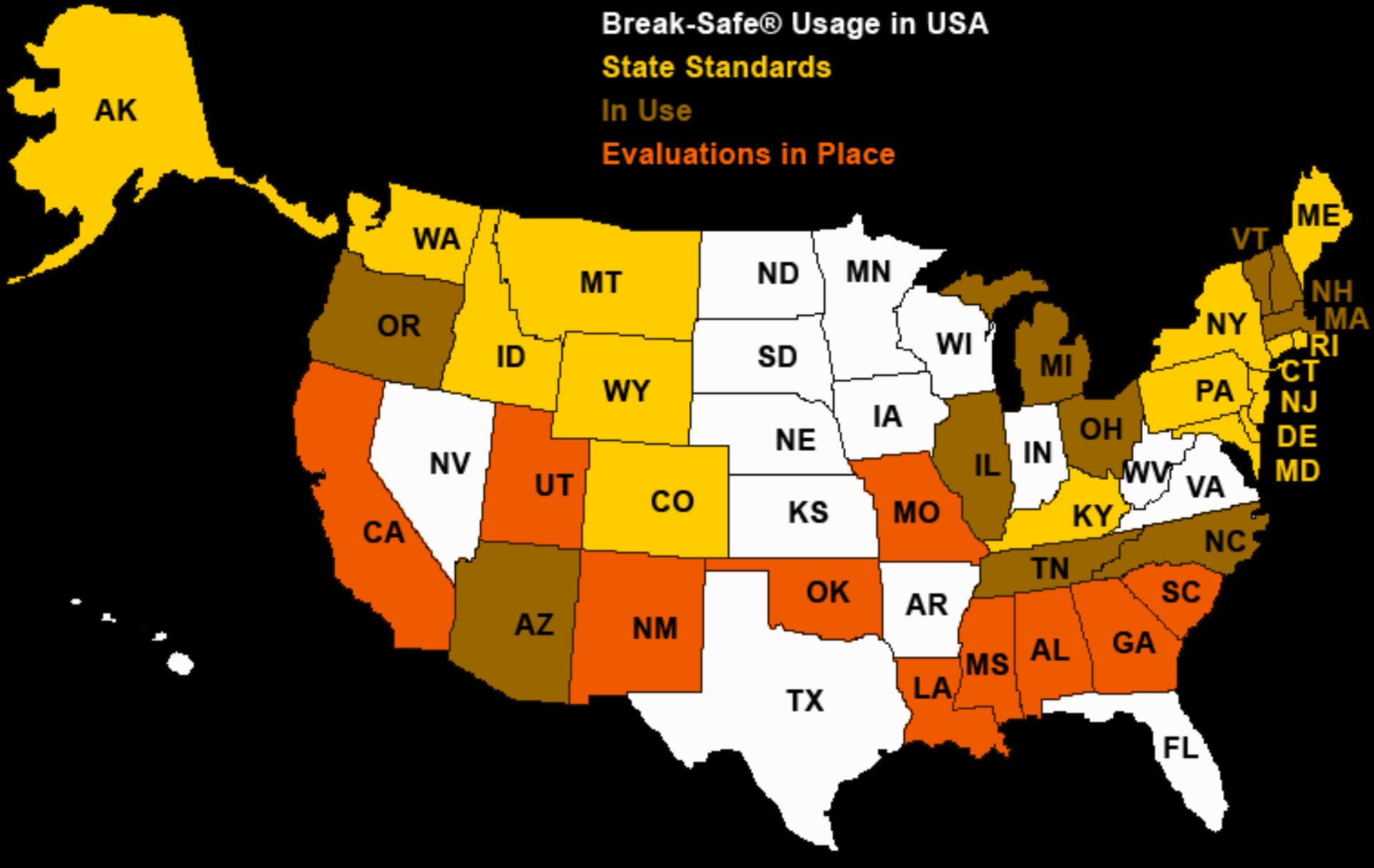
- Transpo Breakaways are Designed to Perform Equally, Regardless of the Angle of Impact
- Precisely Machined Couplings Cause System to Fracture Safely at Relatively Low Force and Energy Levels
- This Exceeds the AASHTO Requirements for Impact Velocity Change

Break-Safe® Usage in USA

State Standards

In Use

Evaluations in Place



Clear Zone



- What hardware items are mounted on approved breakaway supports?



- Light Poles
- Traffic Monitoring Poles
- Weather Station Poles
- Call Box Poles
- Residential Poles
- Any Other Roadside Pole Requiring Breakaway Support

Decorative Way Finding Signs



Vehicle Impact



Superior Safety



- Pole-Safe designed with heaviest pole mass allowed for use on any breakaway system as specified by AASHTO.
- High-strength offers exceptional resistance to wind and dead load forces.
- Unique physical properties gives the greatest flexibility in designing specific lighting requirements.

Typical Light Pole Installation



Light Bar Landing Aid



Communication Pole



Fractured Stub of Coupling

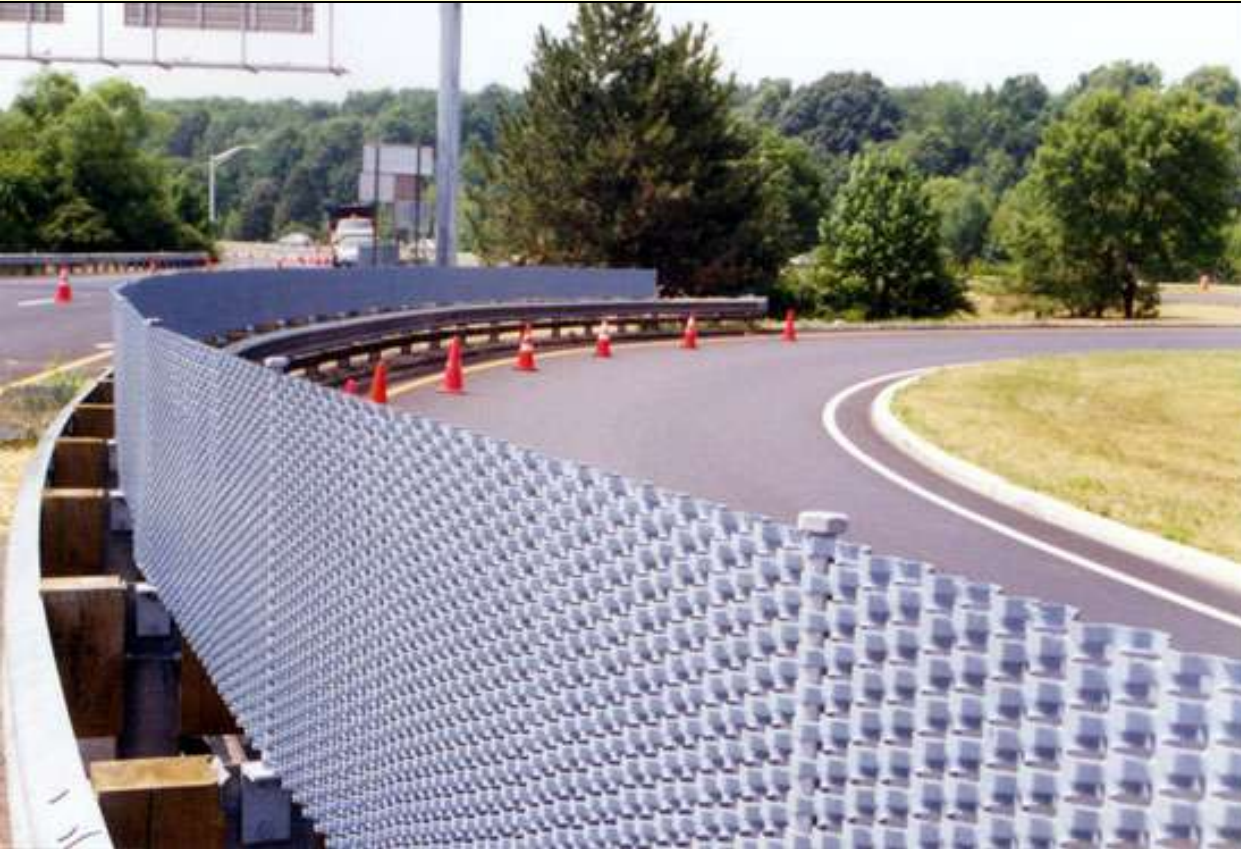


Work Zone & Permanent Glare Screen



- Driver distractions in work zones slows traffic and may cause accidents
- Headlight glare from approaching traffic contributes to driver “blindness” which causes accidents

Applications



- Median Barriers
- Guardrails
- Curved Roadways
- Access Ramps
- Raised Highways
- Work Zones
- Temporary Locations

Barrier Mount



- Pre-Engineered System Components Minimize Assembly Time
- Mount uses $\frac{3}{4}$ " Anchor Inserts
- "Unique" Double-Reverse Corrugated Steel Fabric (DRC)
- Hot-Dip Galvanized to ASTM A-653, Coating Designation G90
- Powder Coat Finish with Zinc Provides Additional Deterrent to Salt, Snow and Slush.

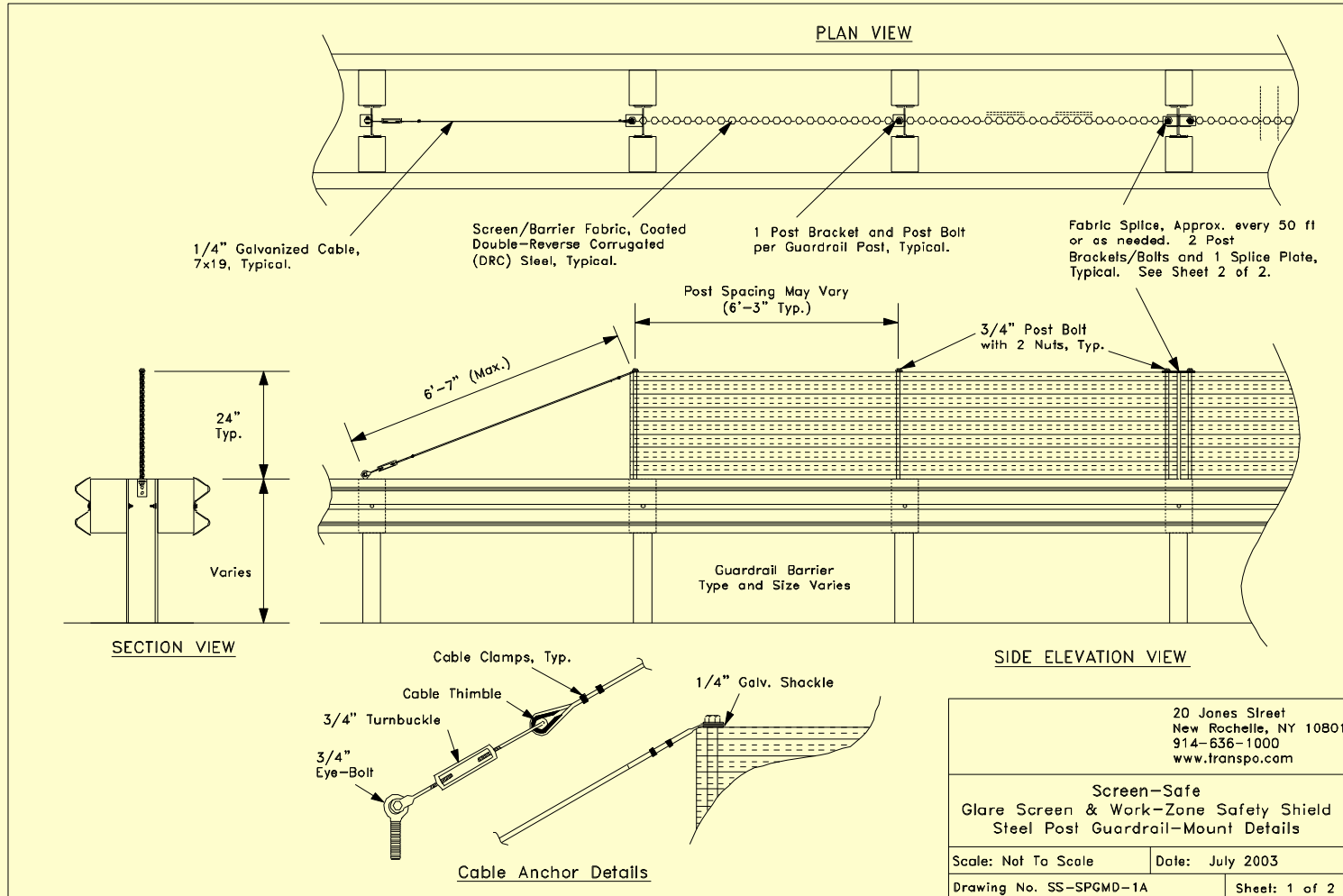
Features & Advantages



Guardrail Mounting:

- Eliminates “Hot Spots” from Headlights
- Ability to Follow Tight Radius of On/Off Ramps
- Adapts to Different Post Configurations Using Standard Parts

Guardrail Barrier



Precast Polymer Concrete Barrier Panel



Imagine New Barriers
without Demolition of
Old

Precast Polymer Concrete Barrier Panel



Applications:

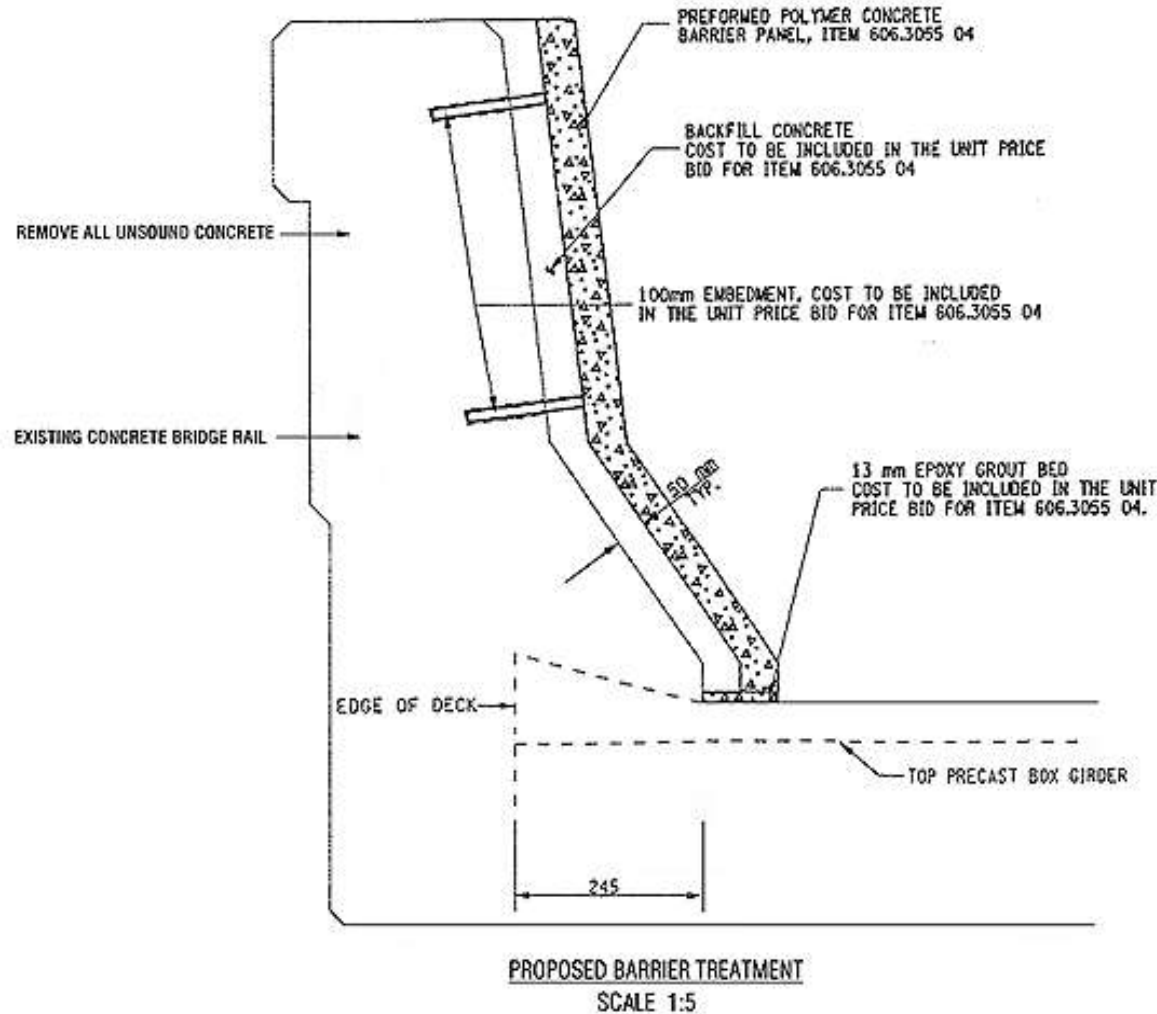
- Median Barriers
- Tunnel Panels
- Bridge Parapets and Rails

Precast Polymer Concrete Barrier Panel



- Precast polymer concrete for median barriers, bridge rails, toll plazas, tunnel bench walls, and tunnel wall panels
- Can be used as a stay-in-place form
- Retro-reflective safety stripe increases visibility during night-time
- Conforms to Highest Safety Standards

Precast Polymer Concrete Barrier Panel



Existing Bridge Rail Improvement

No Need to Demolish and Remove Old Rail or Barriers

NYS DOT I-390 INTERCHANGE - CITY OF ROCHESTER (NYS DOT D260179)

Precast Polymer Concrete Barrier Panel

Physical Properties*

Property	Value	Test Method
Average Compressive Strength	14000 psi (96 MPa)	ASTM C109
Average Flexural Strength	3200 psi (22 MPa)	ASTM C384
Average Impact Strength	100 ft.lbs. min (0.23 kg.m.sec.)	ASTM D-2444
Fire Resistance	Class "A"	
Flame Spread	<25	ASTM E-84
Smoke Development	<75	ASTM E-84

* To be used as general guidelines only.

Low Cost Safety Concept: Color-Safe Surface

“Noting that wet-weather crashes are claiming more lives, the National Transportation Safety Board has urged the federal government to adopt a ‘comprehensive’ program to reduce crashes caused by skidding.”

*-ATSSA Policy Proposal,
Robert N. Dingess
Mercer Strategic Alliance, Inc.*

Safety Applications

- Skid Resistance for High-Risk Roadway Safety Locations
 - » Horizontal Curves
 - » Pedestrian and School Crossings
 - » Intersections
 - » Bridge Decks

Single Application Process



- 3 Component System
- Resin, Catalyst, Aggregate
- Mix, Place, Finish

Application Conditions

- Dry
- Clean
- Surface temperature between +32°F (+5°C) and +113°F (+45°C)
- Application on cement concrete or asphalt pavements
 - New concrete: remove surface laitance
 - New asphalt: allow 14 days after placement, no surface prep required

Applications



- Bike Paths
- Pedestrian Walkways
- Bus Lanes and Stops
- Hazardous Turns
- Toll Lanes
- Managed Lanes

Application Features



- Enhance Skid-Resistance
- Increase Visibility
- Cure in Wide Temperature Range
- Acrylic Based Resin
- No External Heat Sources Needed
- No CO2 Emissions

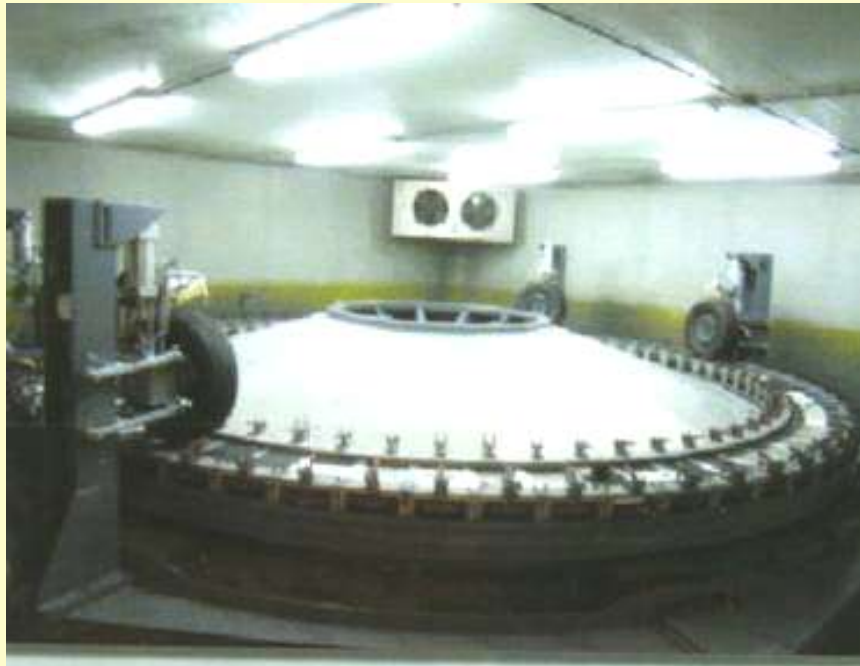
Application Benefits



- Single Application System
- High Skid-Resistance
- Color Variety
- Color Retention
- Long-Term Durability
- Low Life Cycle Cost
- Strong Adhesion

Performance Simulation

- Approval tests implemented by AETEC – Madrid, Spain



Turntable test according to EN 13197 (*Wear Simulation, Road Marking*)

New Application



After 4 Million Cycles

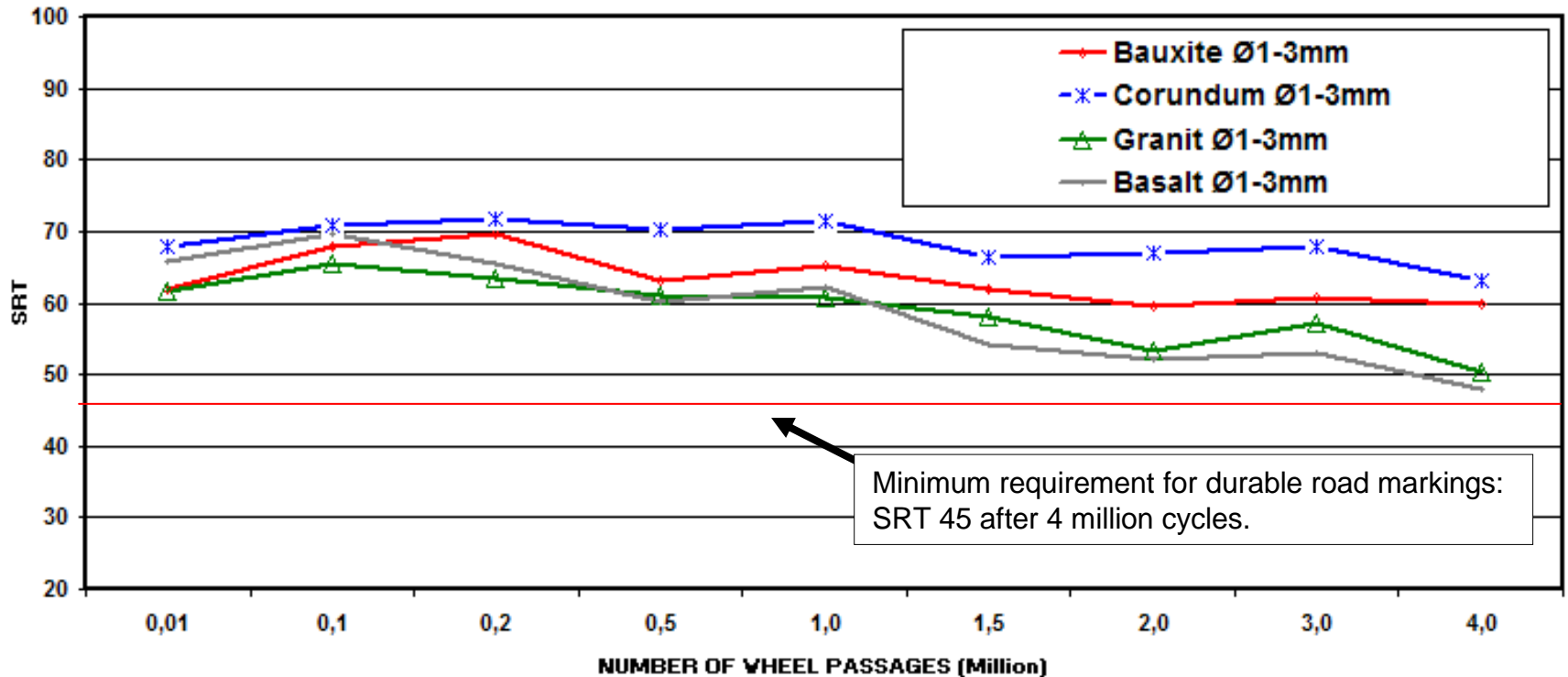


4 Million Cycles
Equates to 40,000
VPD for 4 Years

Anti-Skid Material:
Basalt Ø 1-3mm

Performance Test

Different Anti-Skid Aggregates used with T-28 Area Marking System



Properties	Unit of Measure	Test
Neat Resin		
Tensile Strength	2000 psi (14 MPa) min	ASTM D638
Elongation	70%	ASTM D638
Tensile Modulus of Elasticity	1370 psi (9.5 MPa) min	ASTM D638
Hardness	15-20 Shore D	ASTM D638
Water Absorption	< 0.25%	
Pot Life @72°F (22°C)	15 minutes	AASHTO T237
Flash Point	50°F (10°C)	ASTM D1310
Solids Content	100%	ASTM D1644
Hardness	7.0	Mohs Scale

* To be used as general guidelines only

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Work Zone Intrusion Alarm



- Impact-Activated Alarm
- Alert Both Drivers & Workers
- Blasts at 125dB
- Help Prevent Crashes and Injuries
- NCHRP 350 Accepted
- Mounts Easily

Features and Advantages



- Requires No Electrical Power
- Mounts as Easily as a Flasher
- Affordable, Light-Weight Units
- Work Zone Friendly
- Mounts to Cones or Barricades
- Each Unit Operates Independently
- Pinpoints the Source of Danger

New Technology



- Powered by Safe, Reliable CO₂ Cartridges
- Critical Alignment Not Needed
- No Receiver Units Required
- Tilt Activation: Deploys when Tilted 70-90 degrees
- Stable: Resistant to Normal Roadway Vibration
- Shock-Activated: Deploys Upon Impact

Work Zone Use



- Unit is Cocked Using a Simple Key Chain Tool
- Unit Placed on Road in “Safe” Mode
- Control Knob Rotated to “Ready”
- Unit is then “Armed”

Applications



- Construction Zones
- Maintenance Areas
- Survey Crews
- Patching/Pothole Repairs
- Tree Trimming/Mowing
- Pedestrian Crossings
- Hazmat Scenes
- Railroad Grade Crossings
- Loading Docks
- Airport Runway Operations

Easily Attaches



- Traffic Cones
- Barrels and Drums
- Delineators
- A-Frames
- Type III Barricades
- Security Fences

Specifications



- Alarm: Duration is 15 Seconds
- Level: 125 dB @ 6 Feet
- Rugged: High-Impact Visible Yellow
- Activation Angle: 70-90 Degrees
- Integral: Pressure Relief Valve
- Universal: Barricade Light-Type Mount

Advanced Technology Products for Transportation



Thank you!