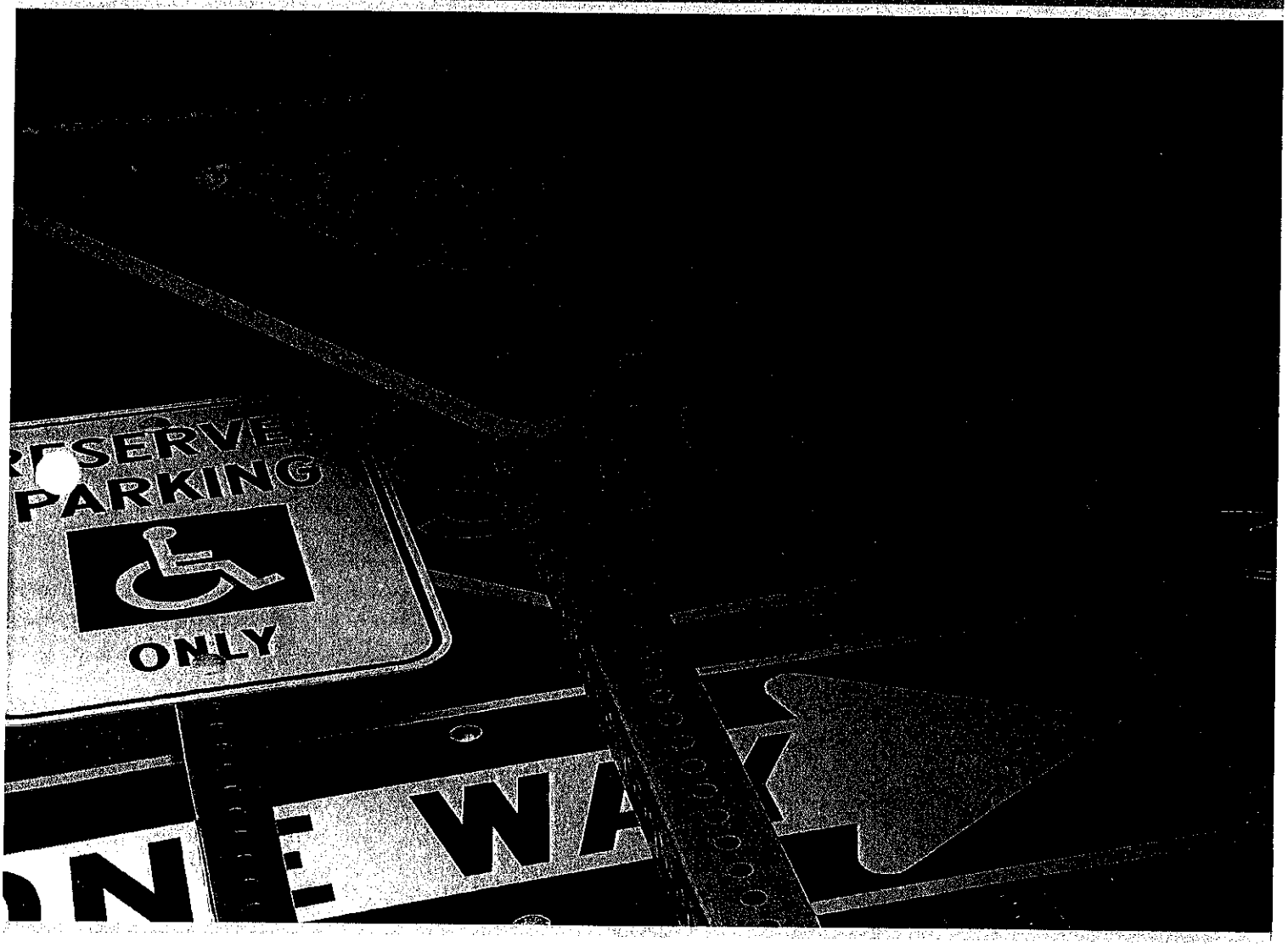
EXHIBIT 6

SIGN SUPPORT SYSTEMS MANUFACTURER'S SPECIFICATIONS

Sign Support Systems

Telespar®, Qwik-Punch®, Breakaway Systems, Anchoring and Accessories



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Telespar® Sign Support System

The Telespar® Sign Support System system is available with three types of posts: galvanized steel tubing with perforated holes on all four sides, Qwik-Punch® posts, which are made with 1⅞" knockouts, 1' on the center on all four sides, and the round sign system with socket and wedge. The tubing is produced through a unique manufacturing process that permits tubular sections of different sizes to telescope into the next larger size. It is complemented by a variety of compatible fittings accessories, nuts, bolts, and simple installation tools.

The engineered system of integrated parts enables you to mount signs back-to-back and on adjacent sides. It is designed to make adjustment, reinforcement, and splicing fast and easy. By utilizing a square tube, Telespar® exhibits superior wind load capabilities and torsional stability.

Telespar® is primarily designed for signpost usage but is adaptable for identification signage, parking meter posts, barricades, and numerous other applications.

The Original Telescoping Sign Support System

The Telespar® Advantage

Secure Signage

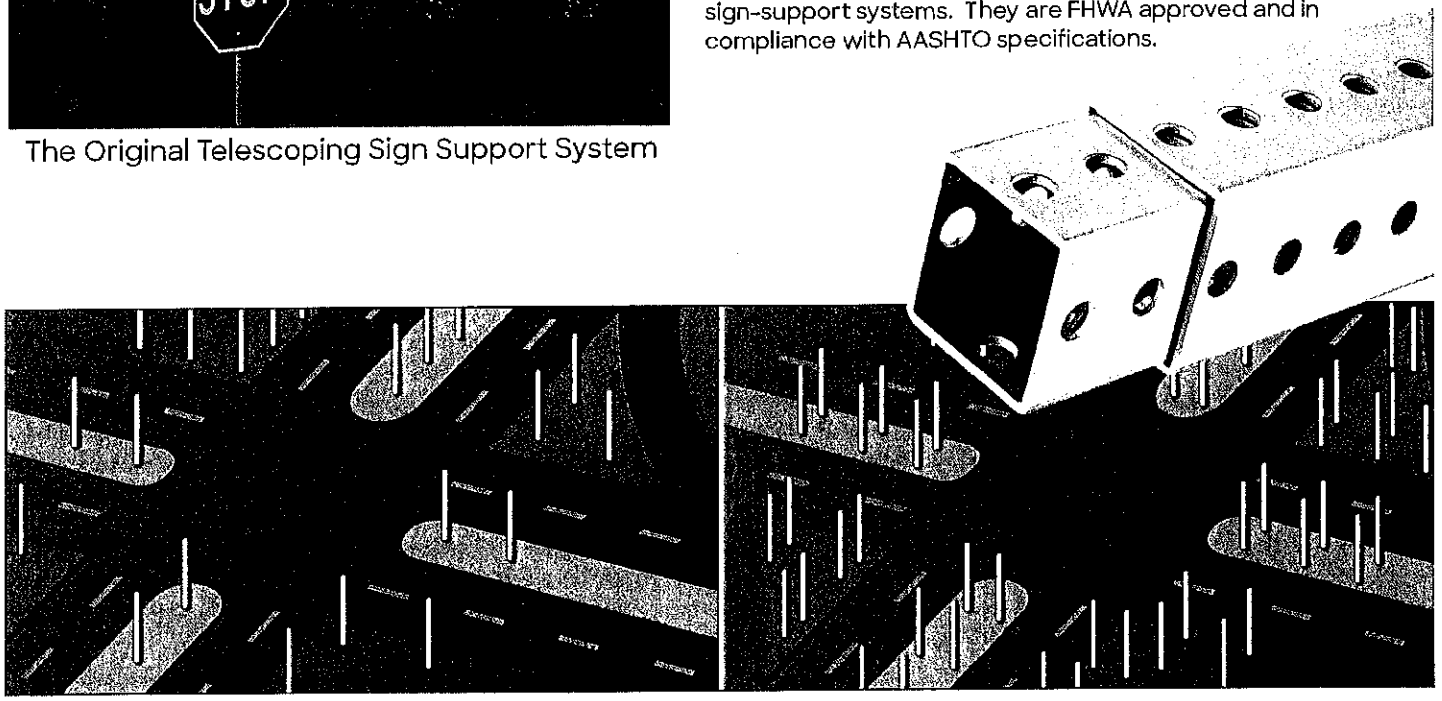
Using the Allied Tube & Conduit® recommended installation method, street signs are securely fastened to posts with rivets, providing greater torsional and wind load stability. Signs mounted via this method are more securely fastened and cannot easily be removed or loosened from their posts due to severe weather conditions. This differs from the bracket system commonly used with U-channel and standard post systems. These systems utilize small set screws that can be damaged or vandalized easily making replacement necessary.

Easy Installation, Rapid Replacement

Telespar® signposts are installed easily by using either a direct embedded method or breakaway anchor system. Installation can be performed by one-man at ground level, eliminating the need for bucket trucks and similar heavy equipment. Replacement is just as easy, having minimal tool requirements.

Safety

The Telespar® Sign Support System was the first to be used effectively in a yielding breakaway concept for small sign-support systems. They are FHWA approved and in compliance with AASHTO specifications.



Art from actual INDOT (Indiana Department of Transportation) installation.

Reduced materials needed per installation

Using Telespar® drastically cuts your material costs. Its greater strength and superior stability allow you to use single post installations instead of U-Channel's double post, cutting your material needs in half!

Telespar® Sign Support System

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Three Types of Posts to Meet Your Needs

One of the keys to the Telespar® Sign Support System's versatility and ease of installation is its three convenient methods for mounting signage.

Round Sign System

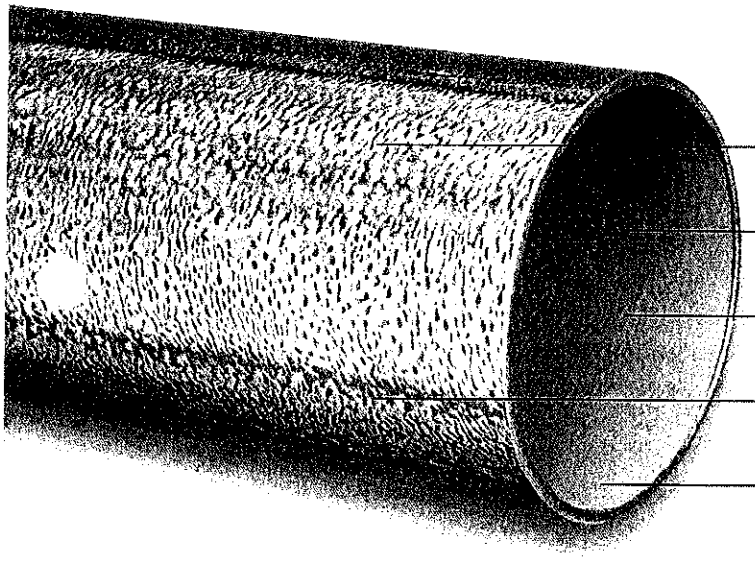
The Telespar® round sign system with socket and wedge provides superior corrosion resistance and strength benefits, demonstrating 50ksi yield strength resulting from the signature inline galvanizing process by Allied Tube & Conduit®. This highly durable product enables you to reduce replacement and repair costs caused by standard wear and tear.

Posts with Pre-Punched Holes

Telespar® square posts with 7/16" pre-punched hole on 1" centers are corner welded to allow smooth telescoping action.

Posts with Knockouts

Qwik-Punch® posts are made with 7/16" knockouts, 1" on the center, on all four sides. This feature allows workers in the field to quickly punch holes exactly where they are needed, leaving the balance of the post with a smooth unbroken appearance. These posts offer the same telescoping action and easy installation as standard Telespar® posts.



Round Sign System Specification

ELEMENTS OF SECTION

O.D./Gauge (in)	Wall Thickness (in)	Weight (lb / ft)
2.375 x 10	0.134	3.2101
2.375 x 12	0.109	2.6404
2.375 x 13	0.095	2.3155
2.375 x 14	0.083	2.0336
2.375 x 16	0.065	1.6051
2.875 x 12*	0.109	3.1444

* Used for Anchors Stocked in 10' and 12' lengths. Other lengths are available upon request.

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Telespar® Sign Support System

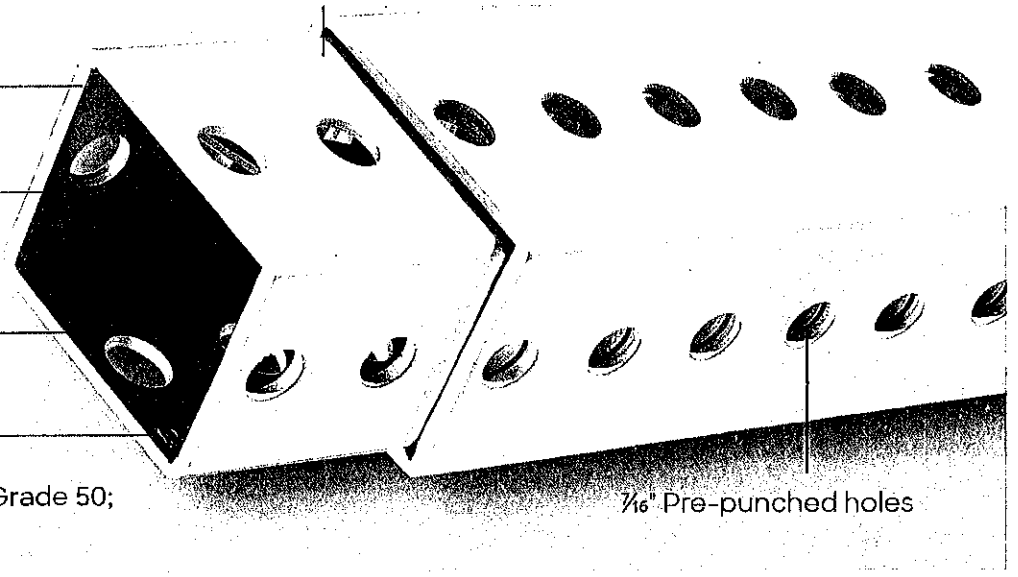
Corner welded for smooth telescoping action

Square shape allows signs to be mounted on all four sides

Square tubing for greater wind load capabilities and torsional stability

Galvanized steel tubing for superior corrosion resistance

Note: Steel conforms to ASTM A1011 Grade 50; Galvanizing meets ASTM A-653

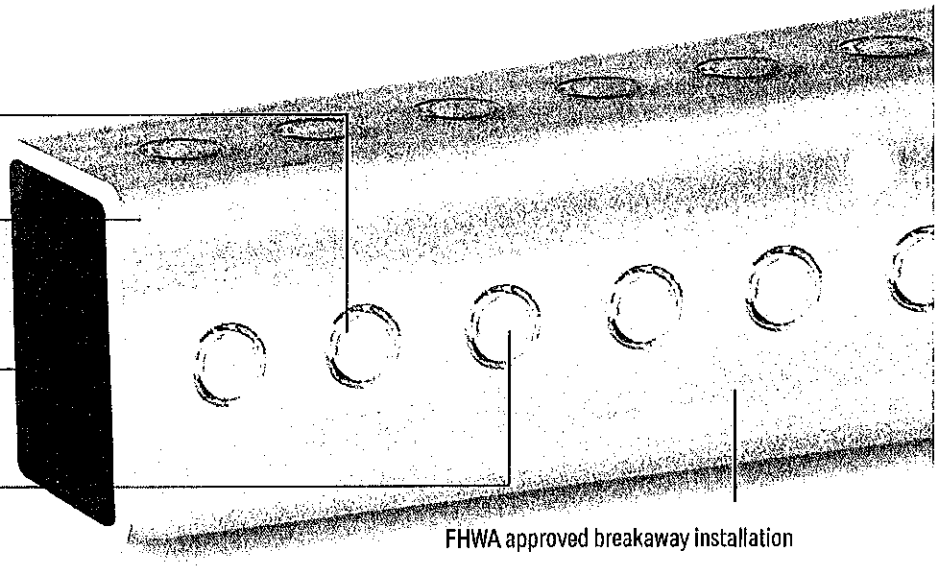


Signs mount with drive rivets for easy installation and tamper resistance

Smooth unbroken appearance

Inline zinc coating complies with AASHTO M-120

7/16" knockouts on all four sides



Tube Size (in)	Wall Thickness U.S. Std. Gauge & Inch	Area (sq in)	Wt./Ft. (lb)	I (in⁴)	s (in³)	r (in)
1¾ x 1¾	14 (0.083)	0.392	1.71	0.201	0.230	0.716
2 x 2	14 (0.083)	0.474	1.99	0.296	0.296	0.790
1½ x 1½	12 (0.105)	0.380	1.70	0.129	0.172	0.582
1¾ x 1¾	12 (0.105)	0.485	2.06	0.231	0.264	0.690
2 x 2	12 (0.105)	0.590	2.42	0.372	0.372	0.794
2¼ x 2¼	12 (0.105)	0.695	2.77	0.561	0.499	0.898
2½ x 2½	12 (0.105)	0.803	3.14	0.804	0.643	1.001
2 3/16 x 2 3/16	10 (0.135)	0.841	3.43	0.605	0.553	0.848
2½ x 2½	10 (0.135)	1.010	4.01	0.979	0.783	0.985
1¾ x 1¾ QP	14 (0.083)	0.392	1.88	0.201	0.230	0.716
2 x 2 QP	14 (0.083)	0.474	2.16	0.296	0.296	0.790

I = Moment of Inertia s = Section Modulus r = Radius of Gyration

Telespar® Type III Barricade

Safety and Convenience in One Simple Package

Requirement: High-strength yet safe temporary barricade

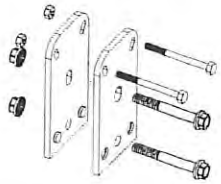
Fulfillment: Telespar® Type III Barricade

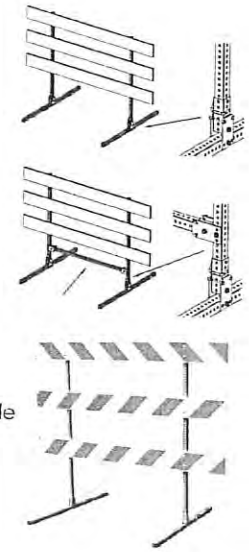
Easy to Use

- Easily stored, transported, and installed
- Legs are detachable
- No welding required

Barricade Assembly Guidelines
Required hardware for each connecting point

- TL132-Z Shear Pin Barricade Plate (2ea)
- ⅜-16 x 3 grade 8 flange bolt and serrated flange nut (2ea)
- ¼-20 x 3 grade 2 hex hd shear bolt and hex nut (2ea)





Safety Features

- FHWA/NCHRP 350 approved
- Temporary, yet crashworthy
- Yielding breakaway
- Minimal damage to impacting vehicle

Reusable after collision

Anchoring Options

Installation Guidelines

1. Drive a minimum 30" piece of 12 gauge Telespar® (anchor) into the soil until only 1-2 inches are left exposed. For a 2-piece anchor, use an 18" piece of tubing for a sleeve, one size larger than the anchor. It is advisable to drive the anchor and sleeve together making sure the holes are aligned.
2. Attach the sign to the post at the desired height using drive rivets or bolts.
3. Insert the signpost, which is one size smaller than the anchor, approximately 6-8 inches into the anchor base.
4. Bolt the signpost to the anchor assembly with a corner bolt.
5. When installing in concrete use a pneumatic hammer or concrete drill to break through the surface, the anchor assembly is driven to within 1" of the surface to allow attachment of the signpost. If a flush installation is desired clearance should be recessed on two sides to clear the bolt for signpost connection.
6. To install in asphalt, drive the anchor assembly through the blacktop into the subsoil from ground level. Once the anchor is through the blacktop, use the same instructions as for soil installations.

Anchor Type	Description	Unique Feature
Primary		
Single Breakaway Anchor	Can be used by one man working at ground level using manual or power equipment.	Minimum installation time
Two- Piece Breakaway Anchor Breakaway Anchor	Can be created by adding an outer sleeve to the original anchor base. This provides a double wall thickness to create a breakaway function.	Yielding breakaway system
Secondary		
Heavy Duty Anchor	For use with larger signposts. The heavy wall eliminates the need for a stiffener sleeve enabling the signpost to break on impact.	Works well in concrete and areas of high impact
Stabilization Anchor Sleeve	Attaches to a single anchor with corner bolt then bolted through the post at top of the anchor. Should always be attached to the corner farthest from traffic.	For use with soft or drop-off shoulders in loose or sandy soil
Omni-Directional Anchor	Designed specifically for ease of installation in loose soil conditions enabling the post to perform well when impacted.	Easily retrofitted to correct problem installations
Slip Base Breakaway System	For use with larger signs when the post is too strong to perform a normal breakaway function. Allows the unit to slip away without creating an unacceptable impact condition.	One of the most economical replacements in the industry

Note: The Telespar® Sign Support System can be directly embedded manually using a drive cap and sledge, with a pneumatic hammer or by means of self-contained power equipment.

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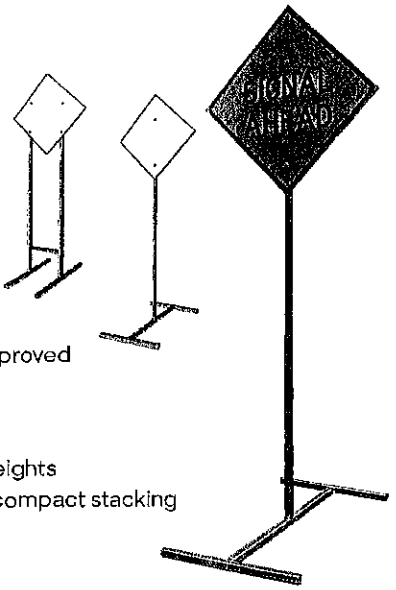
Telespar® Temporary Sign Skids



Put Your Construction Project on Easy Street

Nobody likes construction delays, the sooner the job is completed, the better it is for everyone. Telespar® temporary sign skids can help you get the job done quicker. This easy to assemble, simple to maneuver system, enables you to set up and reposition your signage quickly, allowing more time for performing the task at hand.

Requirement: High-strength yet safe temporary barricade

Fulfillment: Telespar® Type III Barricade

Easy to Use

- Pre-assembled kits
- Pre-manufactured components
- Eliminates the need to drive post into the ground

Safety

- Crashworthy
- FHWA & NCHRP 350 approved

Simple to Maneuver

- Adjustable base
- Telescopic for varied heights
- Detachable leg allows compact stacking
- Reusable

Fasteners

The Corner Bolt

Nobody likes construction delays. The sooner the job is completed, the better it is for everyone. Telespar® temporary sign skids can help you get the job done quicker. This easy to assemble, simple to maneuver system, enables you to set up and reposition your signage quickly, allowing more time for performing the task at hand.

Drive Rivits

Drive rivets provide the convenience of a one-piece fastener with effective tamper-resistant design and fast installation requiring only a hammer.

Flex Nuts and Bolts

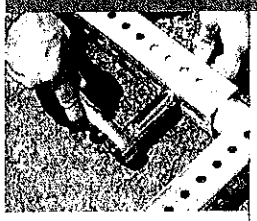
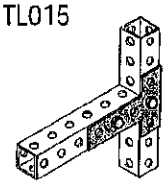
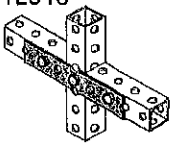
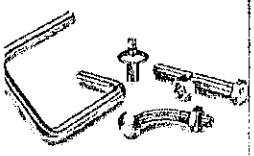
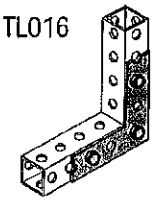
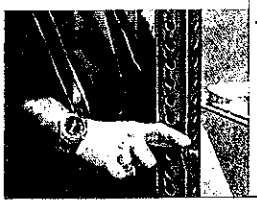
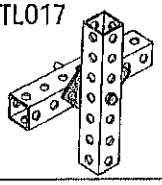
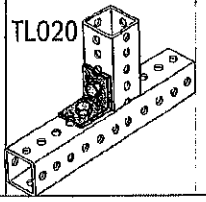
Standard hex nuts and bolts can also be used to connect components. A special jam nut is available to help form a permanent tamper resistant connection

Lock Pins

The lock pin allows for a quick temporary connection between telescoping tube sections. Simply align holes between sections insert the lock pin and allow it to drop into a locking position.

Fittings

In addition to the above-listed fasteners, the fittings in the chart below also can be used with the Telespar® system.

Fittings	Tube Size (in)	Cutting Dimensions* (in)	Fittings	Tube Size	Cutting Dimensions* (in)
 TL015 	1½ sq Both tubes must be the same size	1 3/16	TL018 	1½ sq	1 3/16
	1¾ sq	1 1/16		1¾ sq	1 1/16
	2 sq	1 5/16		2 sq	1 5/16
	2¼ sq	1 3/16		2¼ sq	1 3/16
	2½ sq	1 1/16		2½ sq	1 1/16
 TL016 	1½ sq Both tubes must be the same size	1 3/16	TL019 	1½ sq	
	1¾ sq	1 1/16		1¾ sq	
	2 sq	1 5/16		2 sq	
	2¼ sq	1 3/16		2¼ sq	
	2½ sq	1 1/16		2½ sq	
 TL017 	1½ sq		TL020 	1½ sq	1
	1¾ sq			1¾ sq	1
	2 sq			2 sq	1
	2¼ sq			2¼ sq	1
	2½ sq			2½ sq	1

* Distance from edge of tube to center of first hole.

Breakout™ Signpost Coupler

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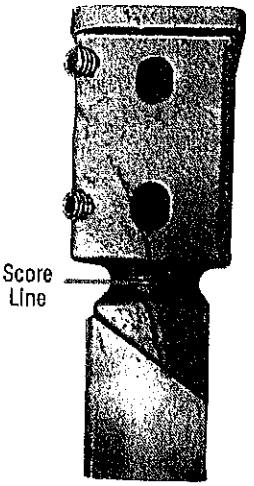
Telespar® is proud to introduce the Break-Out™ signpost coupler, designed to allow signposts to breakaway after impact, protecting passengers from potentially dangerous situations. The Break-Out coupler breaks away at grade, eliminating the risk of tripping hazards for pedestrians.

Designed to be impacted from any direction, the Break-Out coupler is strong enough to ensure maximum wind loads of 120 mph and not fail as a result of fatigue.

The Break-Out signpost couplers are compatible with all sizes of Telespar signpost, including 1.75", 2", 2.25", and 2.5" square posts. Telespar now offers a comprehensive product line for all signpost installation needs.

Feature and Benefits

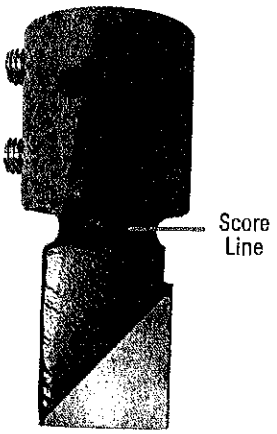
- Designed to breakaway at the score line in the coupler top, does not rely on the hardware or fasteners to breakaway upon impact
- Ratchet and pliers are the only tools required for installation or replacement
- Couplers compatible with square post, round post, and u-channel. Ground and Surface mount options are also available



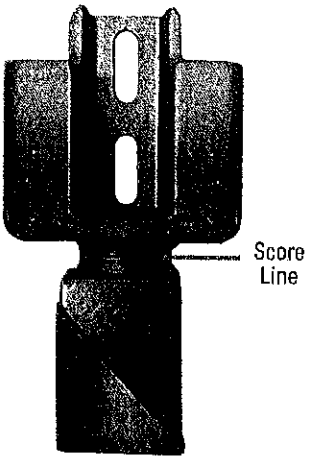
Square Post Coupler Assembled

Part Number	Size (O.D.)	GA
Square Post Couplers		
193013	1¾"	12
193014	1¾"	14
193015	2"	12
193017	2"	14
193020	2¼"	12
193019	2½"	12
Round Post Couplers		
193010	2⅜"	10-12
193012	2⅜"	13-16
U-Channel Couplers		
193025	2lb	-
193026	3lb	-

Note:
All kits come with associated hardware
Additional part numbers for surface mount applications and replacement parts are available on our website



Round Post Coupler Assembled



U-Channel Coupler Assembled

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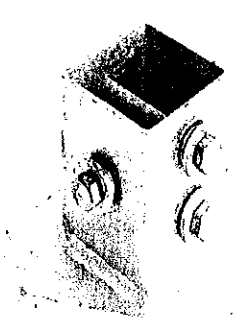
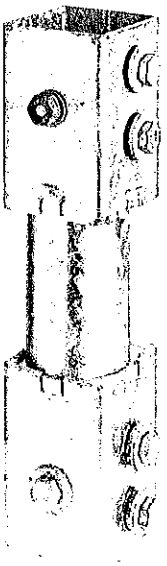
SafeSign™ Breakaway System

Telespar® is proud to introduce the SafeSign™ breakaway system, designed to allow sign posts to breakaway after impact, protecting passengers from potentially dangerous situations. Designed for use with 4" square x 8 gauge posts and finished with Gatorshield® to prevent corrosion. A two post system has the ability to support a 120 ft2 sign in a 90 mph wind zone.





The SafeSign™ breakaway system is designed to withstand the normal wear-and-tear from wind and weather. The hinge and slip base system will breakaway once impacted by a vehicle.

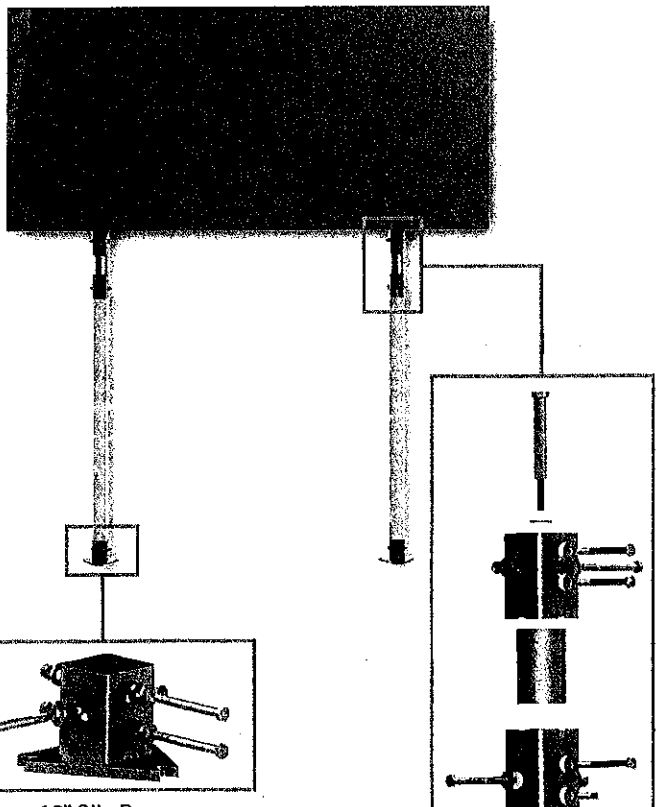
Tested and passed to MASH regulatory standards, the SafeSign™ allows sign installations to be FHWA compliant

Feature and Benefits

- **Compliant with MASH standard**
- 4" post can be cut to length in the field, allowing for easy installation, **reducing labor costs and worker roadside exposure to traffic**
- Can be impacted from any direction, breaking away to protect vehicles and passengers from harm
- Designed so that after impact only the hardware and cylinder component of the hinge need to be replaced
- Can hold signs commonly mounted on W6x9, W6x12, W6x15, and in some cases W8x18 beam posts
- **No torque wrench required for installation**

Part Number	Description
191582	Hinge Assembly Kit (Hardware Included)
191583	13" Slip Base Kit (Hardware Included)
191585	13" Slip Base Winged Anchor
191586	13" Slip Base Anchor
Replacement Parts	
191598	Hinge Cylinder
191558	Hinge Center Bolt
191600	Slip Base Replacement Hardware Kit

Assembled SafeSign™



13" Slip Base
Exploded View

SafeSign™ Hinge
Exploded View

Slip Base Breakaway System

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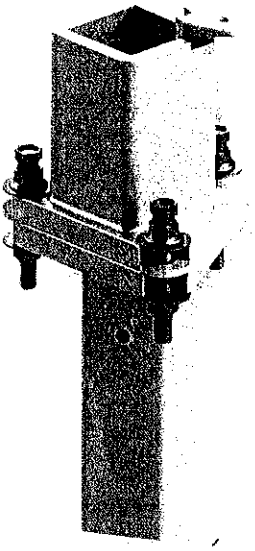
Introducing our Slip Base Breakaway System. Well known in the industry and tested to NCHRP Report 350 guidelines, the Slip Base Breakaway System has been an industry standard for decades.

Compatible with 2.5" Telespar square posts, the bolt head will breakaway when the proper installation torque is reached. Installation only requires a socket wrench, providing ease of mind for installation and maintenance crews.



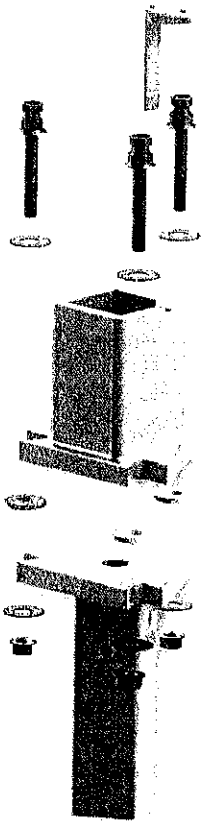
Feature and Benefits

Single Source for Sign Support Product
- The Slip Base is compatible with our standard 2.5" Telespar post, reducing the number of vendors needed to supply the complete sign support system

Crash Test Rated
- Tested to NCHRP 350 standards and designed to AASHTO guidelines

Low Replacement Cost in the Case of Impact
- Designed so only the hardware needs to be replaced
- Lower cost of replacement compared to other breakaway systems on the market

Designed for Easy Installation
- Bolt head shears off when correct torque is reached
- Wedge component reduces assembly time when putting the post in

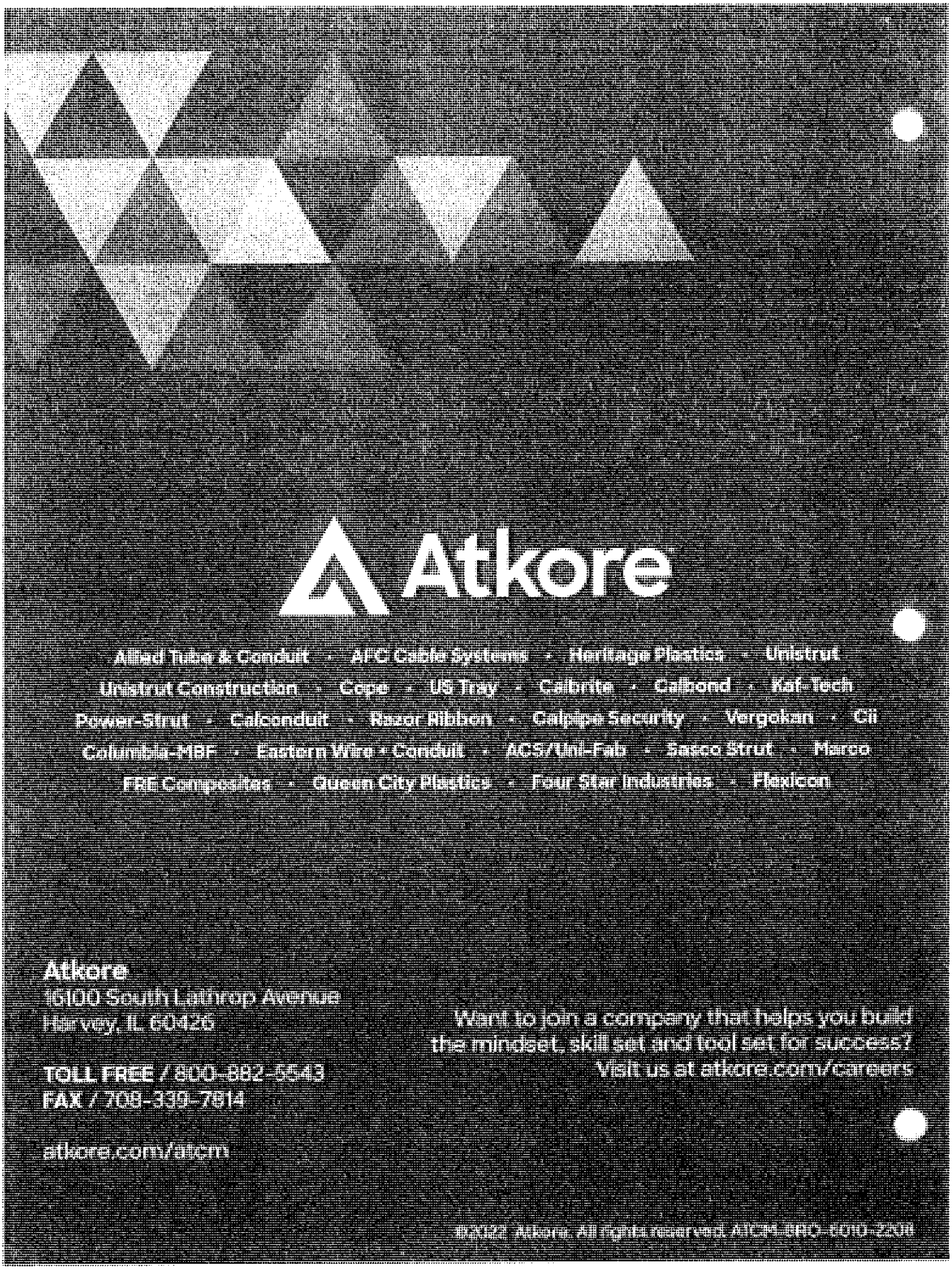


Part Number	Description
191004	8" Slip Base Kit (Hardware Included)
Replacement Parts	
191005	Slip Base Replacement Hardware Kit

*Slip Base Anchors available, call Telespar Customer Service for more information

Notes

Notes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Allied Tube & Conduit · AFC Cable Systems · Heritage Plastics · Unistrut
Unistrut Construction · Cope · US Tray · Calbrite · Calbond · Kaf-Tech
Power-Strut · Calconduit · Razor Ribbon · Calpipe Security · Vergokan · Cii
Columbia-MBF · Eastern Wire + Conduit · ACS/Uni-Fab · Sasco Strut · Marco
FRE Composites · Queen City Plastics · Four Star Industries · Flexicon
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Harvey, IL 60426
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U.S. Department
of Transportation
Federal Highway Administration

July 21, 2021

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

In Reply Refer To:
HSST-1/SS-185

Mr. Nate Kolmodin
Allied Tube and Conduit
16100 S. Lathrop Ave.
Harvey, IL 60426

Dear Mr. Kolmodin:

This letter is in response to your March 1, 2021 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 SS-185 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- Telespar Sign Support

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'(AASHTO) 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 AASHTO's 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: Telespar Sign Support
Type of system: Sign Support
Test Level: TL 3
Testing conducted by: Texas A&M Transportation Institute
Date of request: March 1, 2021

FHWA concurs with the recommendation of the accredited crash testing laboratory on 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

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

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 AASHTO's 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 SS-185 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.

- This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.

Sincerely,

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 01, 2021	◉ New ○ Resubmission
	Name:	Nate Kolmodin	
	Company:	Allied Tube & Conduit	
	Address:	16100 S. Lathrop Avenue, Harvey, IL 60426	
	Country:	U.S.A.	
	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 1-1-1

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'SS': Breakaway Sign Supports, Mailboxes, & other small sign supports	◉ Physical Crash Testing ○ Engineering Analysis	Telespar Sign Support	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:	Nate Kolmodin	Same as Submitter ☒
Company Name:	Allied Tube & Conduit	Same as Submitter ☒
Address:	16100 S. Lathrop Avenue, Harvey, IL 60426	Same as Submitter ☒
Country:	U.S.A.	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.		
Texas A&M Transportation Institute (TTI) was contracted by Allied Tube & Conduit to perform full-scale crash testing of the Telespar Sign Support. There are no shared financial interests in the Telespar Sign Support, or between Allied Tube & Conduit and TTI, other than the costs involved in the actual crash tests and reports for this submission to FHWA. 690900-XSD 4-9		

PRODUCT DESCRIPTION

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

The Telespar sign support system consists of a 2-inch × 14 gauge perforated square steel tube (PSST) support post inserted 8 inches into a 2¼-inch × 12 gauge PSST anchor. Both the PSST support and anchor had 7/16-inch diameter pre-punched holes spaced on one inch centers along the length of all four sides. The PSST support is secured to the PSST anchor using a 5/16-inch diameter corner bolt and nut. The PSST anchor tube was 30 inches long and embedded in soil such that it protruded 2 inches above grade. Two ⅜-inch diameter aluminum drive rivets secured a 12-inch × 18-inch × 0.080-inch thick aluminum sign panel to the PSST support post at a mounting height of 7 ft above grade to the bottom of the sign panel. The top of the PSST support post was flush with the top of the sign panel. The PSST support and anchor are fabricated from ASTM A1011 steel and are galvanized in accordance with ASTM A653.

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 criteria.

Engineer Name:	Roger Bligh	
Engineer Signature:	Roger Bligh — Digitally signed by Roger Bligh Date: 2021.03.10 10:44:50 -06'00'	
Address:	TTI, 1254 Avenue A, Bldg. 7091, Bryan, TX 77807	Same as Submitter ☐
Country:	U.S.A.	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-60 (1100C)	MASH Test 3-60 was successfully performed on the Telespar sign support system at both 0 and 90 degrees. In both tests (690900-XSD 4&5), the support yielded and was overridden by the vehicle. The vehicle remained stable and upright. The support post was partially fractured, but the components of the sign support system remained intact. The vehicle sustained a small indentation at the at the location of impact, but it was so minimal as to be not measurable. Occupant risk indices (occupant impact velocity and ridedown acceleration) were within MASH thresholds. No occupant compartment deformation or intrusion was observed.	PASS

Required Test Number	Narrative Description	Evaluation Results
3-61 (1100C)	MASH Test 3-61 was successfully performed on the Telespar sign support system at both 0 and 90 degrees. In both tests, the support yielded and was overridden by the vehicle. The vehicle remained stable and upright. In the 0-degree test (690900-XSD 6), the support post was partially fractured at several locations, but the components of the sign support system remained intact. The vehicle sustained minor damage, including a 1.5-inch deep indentation in the hood. Occupant risk indices were within MASH thresholds. No occupant compartment deformation or intrusion was observed. In the 90-degree test (690900-XSD 7), the support post fractured and separated into two pieces. The lower 4 ft of the support remained with the anchor post. The sign detached from the upper section of the post. The vehicle sustained minor damage, including a 2-inch deep indentation in the hood. Occupant risk indices were within MASH thresholds. No occupant compartment deformation or intrusion was observed.	PASS
3-62 (2270P)	MASH Test 3-62 was successfully performed on the Telespar sign support system at both 0 and 90 degrees. In both tests, the support yielded and was overridden by the vehicle. The vehicle remained stable and upright. In the 0-degree test (690900-XSD 8), the support post was partially fractured at several locations, but the components of the sign support system remained intact. The vehicle sustained minor damage, including a 1.5-inch deep indentation in the hood. Occupant risk indices were within MASH thresholds. No occupant compartment deformation or intrusion was observed. In the 90-degree test (690900-XSD 9), the support post fractured and separated into two pieces. The lower 4.5 ft of the support remained with the anchor post. The sign detached from the upper section of the post. The vehicle sustained minor damage, including a 2-inch deep indentation in the hood. Occupant risk indices were within MASH thresholds. No occupant compartment deformation or intrusion was observed.	PASS

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:	Texas A&M Transportation Institute	
Laboratory Signature:	Digitally signed by Darrell L. Kuhn Date: 2021.03.01 14:01:06 -06'00	
Address:	1254 Avenue A, Bldg. 7091, Bryan, TX 77807	Same as Submitter ☐
Country:	U.S.A.	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	ISO 17025-2017 Laboratory A2LA Certificate Number: 2821.01 Valid To: April 30, 2021	

Submitter Signature*: Kolmodin, Nate Digitally signed by Kolmodin, Nate Date: 2021.04.14 15:48:12 -05'00'

Submit Form

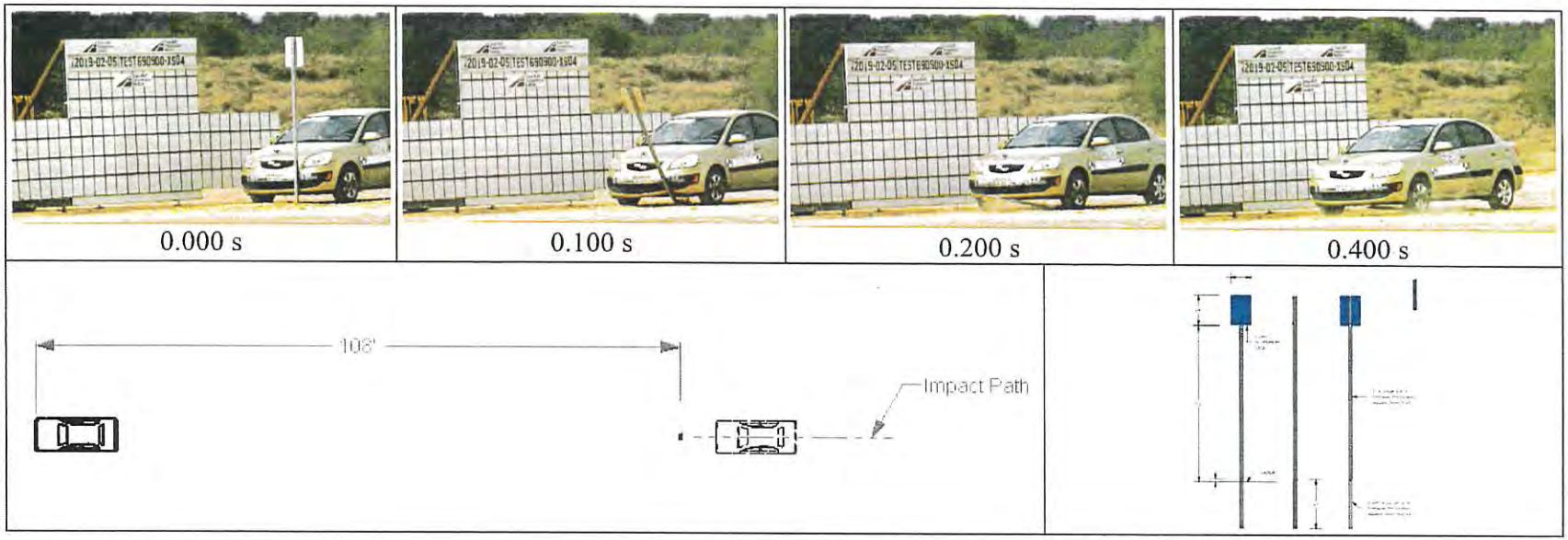
ATTACHMENTS

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



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-60
- TTI Test No. 690900-XSD4
- Test Date 2019-02-05

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 inch aluminum sign panel

Soil Type and Condition ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2009 Kia Rio
- Curb ..... 2407 lb
- Test Inertial ..... 2434 lb
- Dummy ..... 165 lb
- Gross Static ..... 2599 lb

Impact Conditions
- Speed ..... 18.8 mi/h
- Angle ..... 0°
- Location/Orientation ..... Left quarter point

Impact Severity ..... 29 kip-ft

Exit Conditions
- Speed ..... 16.1 mi/h
- Angle ..... 0°

Occupant Risk Values
- Longitudinal OIV ..... 3.6 ft/s
- Lateral OIV ..... 0.0 ft/s
- Longitudinal Ridedown ..... 0.5 g
- Lateral Ridedown ..... 1.3 g
- THIV ..... 4.1 km/h
- PHD ..... 1.3 g
- ASI 0.10

Max. 0.050-s Average
- Longitudinal ..... -1.2 g
- Lateral ..... 0.3 g
- Vertical ..... -0.4 g

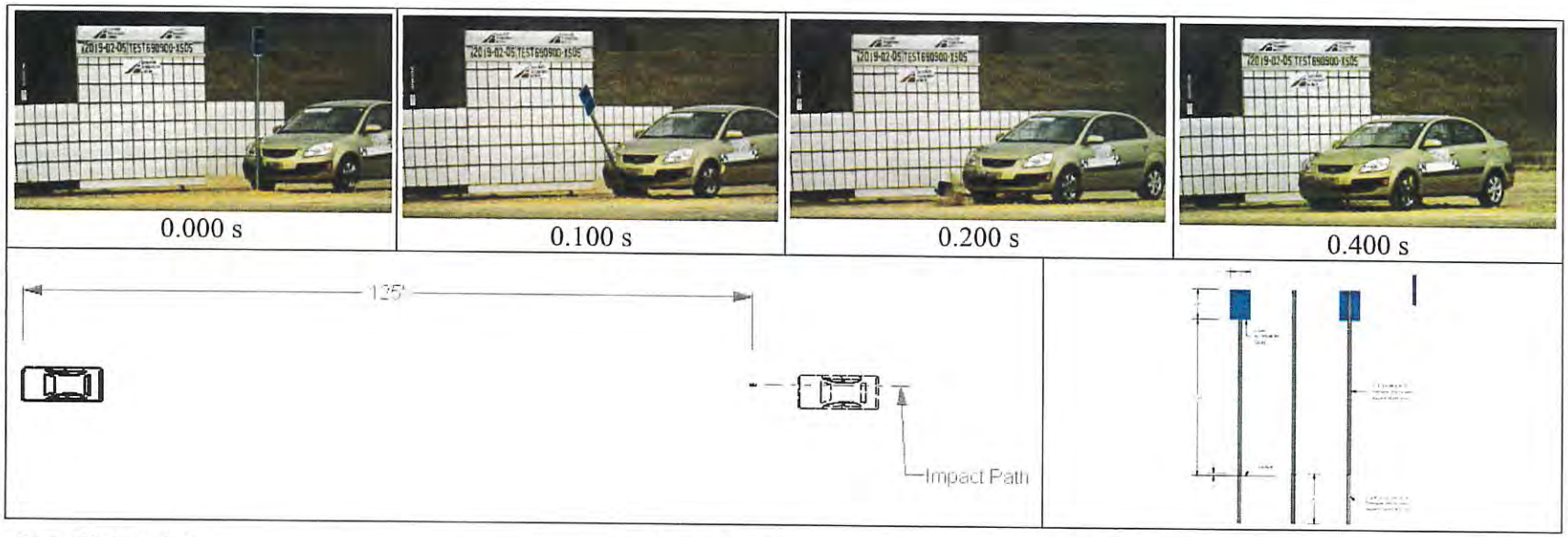
Post-Impact Trajectory
- Stopping Distance ..... 108 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 1°
- Maximum Pitch Angle ..... 3°
- Maximum Roll Angle ..... 1°

Test Article Scatter
- Longitudinal ..... Remained at
- Lateral ..... impact site

Vehicle Damage
- VDS 12FL1
- CDC 12FLEN1
- Max. Exterior Deformation ..... Not measurable
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 5.6. Summary of Results for *MASH* Test 3-60 at 0° on Telespar Sign Support.



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-60
- TTI Test No. 690900-XSD5
- Test Date 2019-02-05

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 inch aluminum sign panel

Soil Type and Condition ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2009 Kia Rio
- Curb ..... 2407 lb
- Test Inertial ..... 2434 lb
- Dummy ..... 165 lb
- Gross Static ..... 2599 lb

Impact Conditions
- Speed ..... 19.5 mi/h
- Angle ..... 90°
- Location/Orientation ..... Right quarter point

Impact Severity ..... 31 kip-ft

Exit Conditions
- Speed ..... 16.8 mi/h
- Angle ..... 90°

Occupant Risk Values
- Longitudinal OIV ..... 3.3 ft/s
- Lateral OIV ..... 0.7 ft/s
- Longitudinal Ridedown ..... 0.2 g
- Lateral Ridedown ..... 0.1 g
- THIV ..... 3.7 km/h
- PHD ..... 0.2 g
- ASI 0.11

Max. 0.050-s Average
- Longitudinal ..... -1.3 g
- Lateral ..... 0.2 g
- Vertical ..... -0.3 g

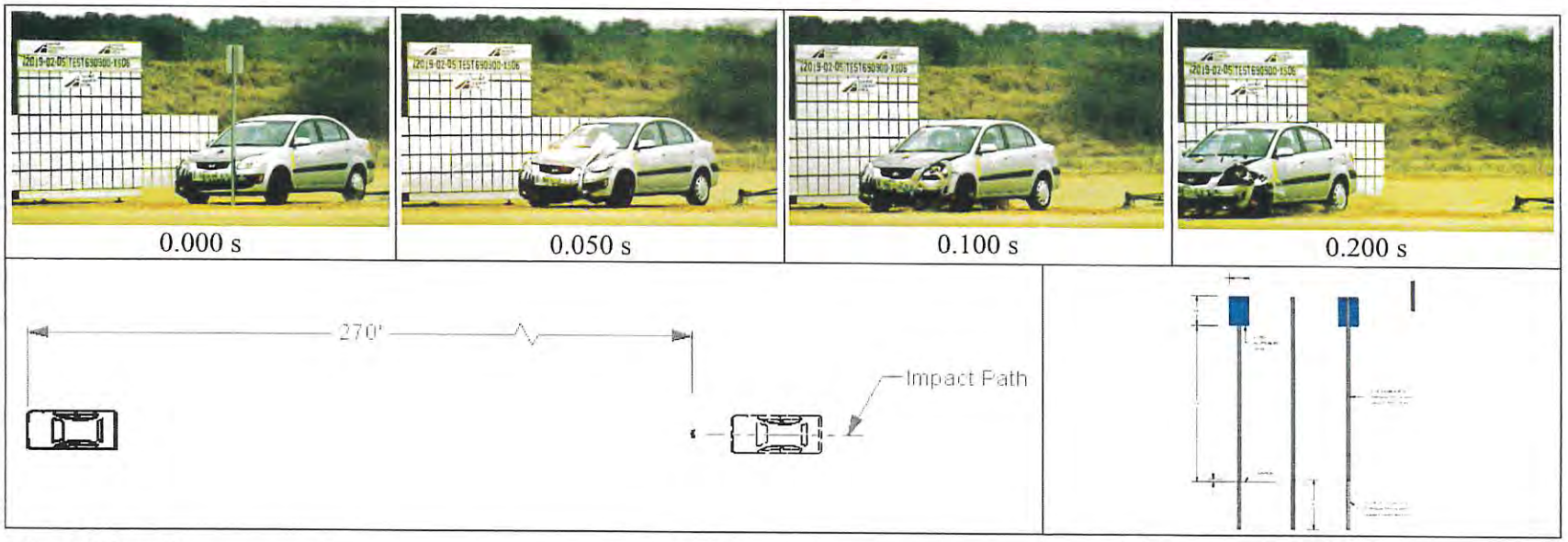
Post-Impact Trajectory
- Stopping Distance ..... 125 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 1°
- Maximum Pitch Angle ..... 3°
- Maximum Roll Angle ..... 2°

Test Article Scatter
- Longitudinal ..... Remained at
- Lateral ..... impact site

Vehicle Damage
- VDS 12FR1
- CDC 12FREN1
- Max. Exterior Deformation ..... Not measurable
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 6.6. Summary of Results for *MASH* Test 3-60 at 90° on Telespar Sign Support.



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-61
- TTI Test No. 690900-XSD6
- Test Date 2019-02-05

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 aluminum sign panel
- **Soil Type and Condition** ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2009 Kia Rio
- Curb ..... 2480 lb
- Test Inertial ..... 2440 lb
- Dummy ..... 165 lb
- Gross Static ..... 2605 lb

Impact Conditions
- Speed ..... 63.5 mi/h
- Angle ..... 0°
- Location/Orientation ..... Left quarter point

Impact Severity ..... 329 kip-ft

Exit Conditions
- Speed ..... 60.2 mi/h
- Angle ..... 0°

Occupant Risk Values
- Longitudinal OIV ..... 3.6 ft/s
- Lateral OIV ..... 2.0 ft/s
- Longitudinal Ridedown ..... 0.2 g
- Lateral Ridedown ..... 0.6 g
- THIV ..... 4.5 km/h
- PHD ..... 0.6 g
- ASI 0.15

Max. 0.050-s Average
- Longitudinal ..... -1.7 g
- Lateral ..... 0.6 g
- Vertical ..... 1.3 g

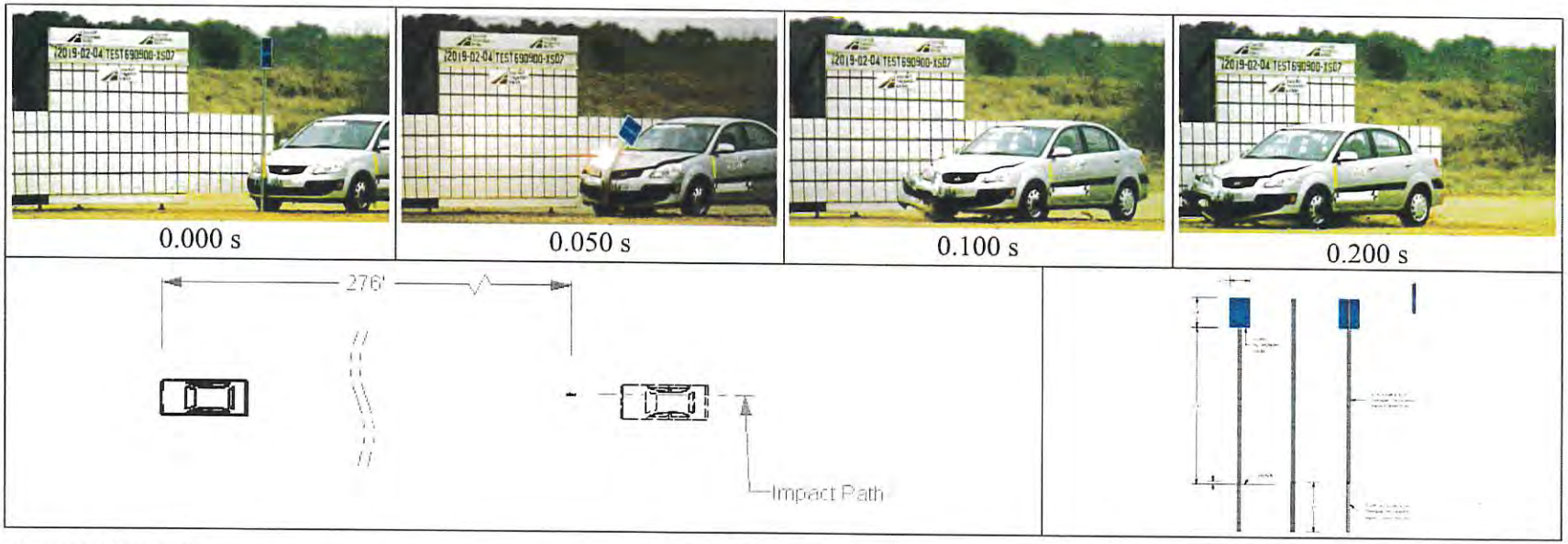
Post-Impact Trajectory
- Stopping Distance ..... 270 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 5°
- Maximum Pitch Angle ..... 1°
- Maximum Roll Angle ..... 6°

Test Article Scatter
- Longitudinal ..... Remained at
- Lateral ..... impact site

Vehicle Damage
- VDS 12FL1
- CDC 12FLEN1
- Max. Exterior Deformation ..... 1.5 inches
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 7.6. Summary of Results for *MASH* Test 3-61 at 0° on Telespar Sign Support.



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-61
- TTI Test No. 690900-XSD7
- Test Date 2019-02-04

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 aluminum sign panel
- **Soil Type and Condition** ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2009 Kia Rio
- Curb ..... 2480 lb
- Test Inertial ..... 2440 lb
- Dummy ..... 165 lb
- Gross Static ..... 2605 lb

Impact Conditions
- Speed ..... 63.4 mi/h
- Angle ..... 90°
- Location/Orientation ..... Right quarter point

Impact Severity ..... 328 kip-ft

Exit Conditions
- Speed ..... 62.5 mi/h
- Angle ..... 90°

Occupant Risk Values
- Longitudinal OIV ..... 3.9 ft/s
- Lateral OIV ..... 1.6 ft/s
- Longitudinal Ridedown ..... 1.0 g
- Lateral Ridedown ..... 0.5 g
- THIV ..... 4.8 km/h
- PHD ..... 1.0 g
- ASI 0.15

Max. 0.050-s Average
- Longitudinal ..... -1.7 g
- Lateral ..... -0.6 g
- Vertical ..... 1.1 g

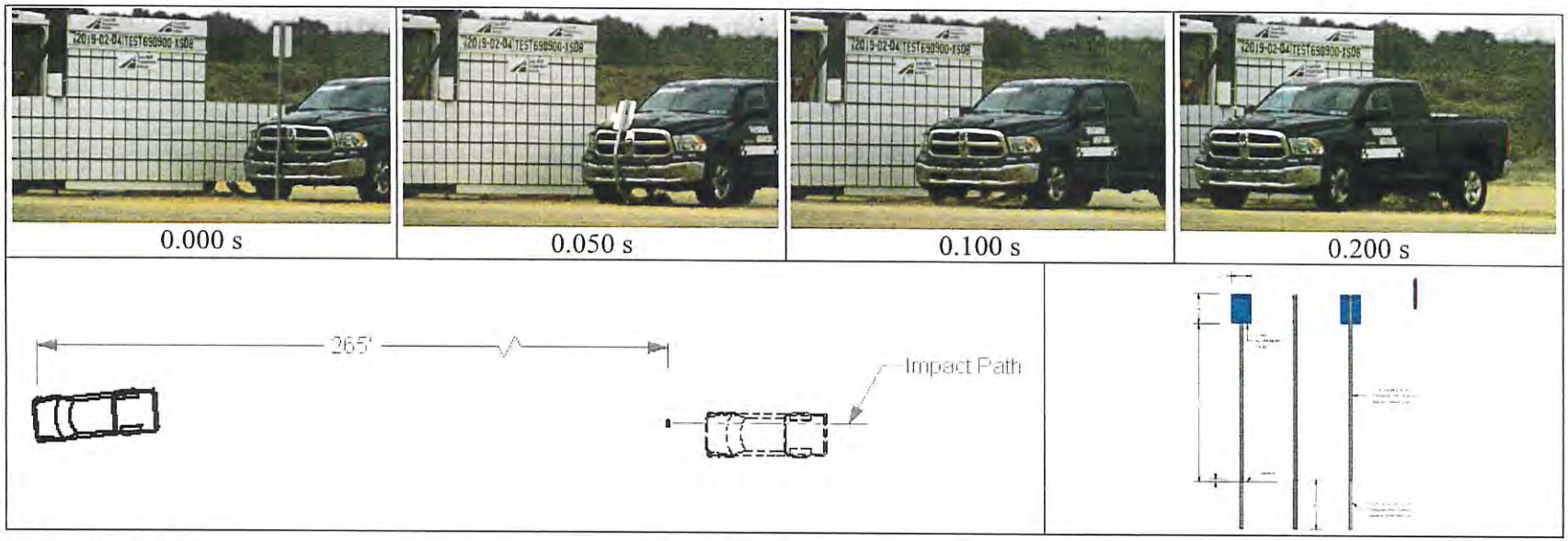
Post-Impact Trajectory
- Stopping Distance ..... 276 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 3°
- Maximum Pitch Angle ..... 1°
- Maximum Roll Angle ..... 3°

Test Article Scatter
- Longitudinal ..... 47 ft downstream
- Lateral ..... 4 ft left

Vehicle Damage
- VDS 12FR1
- CDC 12FREN1
- Max. Exterior Deformation ..... 2.0 inches
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 8.6. Summary of Results for *MASH* Test 3-61 at 90° on Telespar Sign Support.



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-62
- TTI Test No. 690900-XSD8
- Test Date 2019-02-04

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 aluminum sign panel
- **Soil Type and Condition** ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 2270P
- Make and Model ..... 2013 RAM 1500 Pickup
- Curb ..... 4985 lb
- Test Inertial ..... 5019 lb
- Dummy ..... No dummy
- Gross Static ..... 5019 lb

Impact Conditions
- Speed ..... 63.0 mi/h
- Angle ..... 0°
- Location/Orientation ..... 12 inches right of centerline of vehicle

Impact Severity ..... 666 kip-ft

Exit Conditions
- Speed ..... 62.0 mi/h
- Angle ..... 0°

Occupant Risk Values
- Longitudinal OIV ..... 1.0 ft/s
- Lateral OIV ..... 2.0 ft/s
- Longitudinal Ridedown ..... 0.1 g
- Lateral Ridedown ..... 0.5 g
- THIV ..... 2.6 km/h
- PHD ..... 0.5 g
- ASI 0.09

Max. 0.050-s Average
- Longitudinal ..... -0.8 g
- Lateral ..... 0.4 g
- Vertical ..... 0.6 g

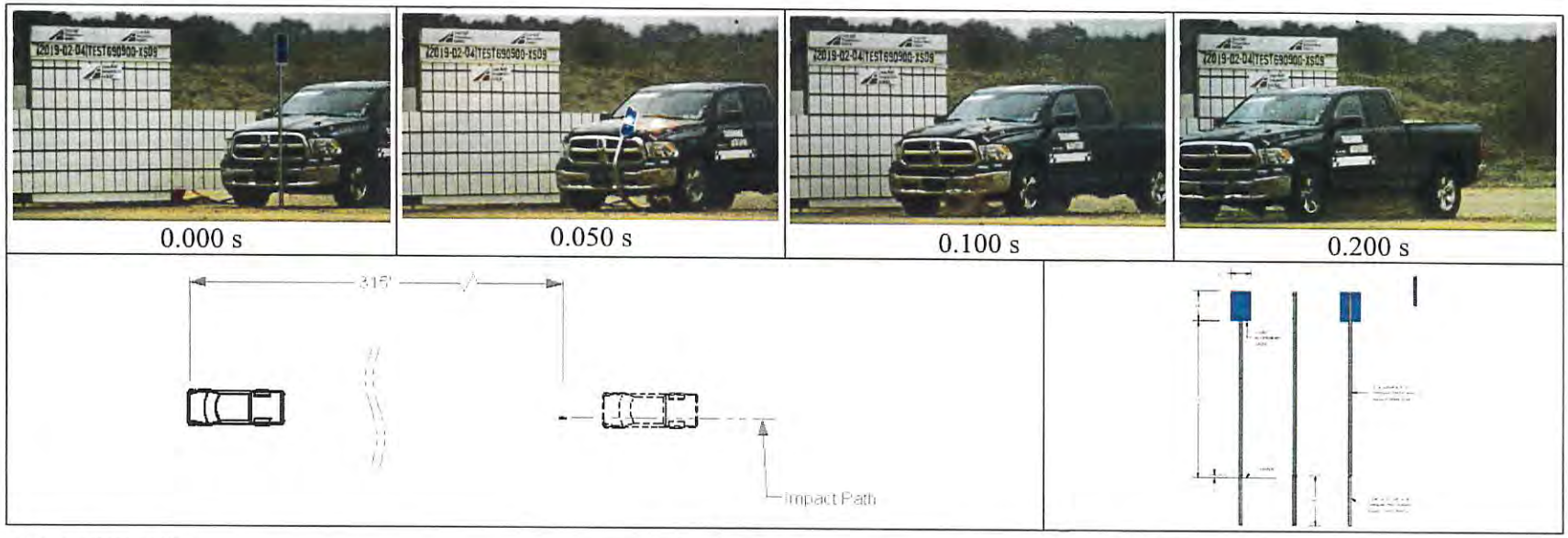
Post-Impact Trajectory
- Stopping Distance ..... 265 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 2°
- Maximum Pitch Angle ..... 1°
- Maximum Roll Angle ..... 4°

Test Article Scatter
- Longitudinal ..... Remained at
- Lateral ..... impact site

Vehicle Damage
- VDS 12FL1
- CDC 12FLEN1
- Max. Exterior Deformation ..... 1.5 inches
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 9.6. Summary of Results for *MASH* Test 3-62 at 0° on Telespar Sign Support.



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-62
- TTI Test No. 690900-XSD9
- Test Date 2019-02-04

Test Article
- Type ..... Support Structure (Sign Support)
- Name ..... Telespar Sign Support
- Installation Height ..... 7 ft above grade
- Material or Key Elements ... 2-inch x 14 gauge square perforated steel support post inserted 8 inches into 2¼-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 aluminum sign panel

Soil Type and Condition ..... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

Test Vehicle
- Type/Designation 2270P
- Make and Model ..... 2013 RAM 1500 Pickup
- Curb ..... 4985 lb
- Test Inertial ..... 5019 lb
- Dummy ..... No dummy
- Gross Static ..... 5019 lb

Impact Conditions
- Speed ..... 62.7 mi/h
- Angle ..... 90°
- Location/Orientation ..... 12 inches left of centerline of vehicle

Impact Severity ..... 660 kip-ft

Exit Conditions
- Speed ..... 60.8 mi/h
- Angle ..... 90°

Occupant Risk Values
- Longitudinal OIV ..... 0.0 ft/s
- Lateral OIV ..... 4.3 ft/s
- Longitudinal Ridedown ..... 0.2 g
- Lateral Ridedown ..... 0.7 g
- THIV ..... 4.9 km/h
- PHD ..... 0.7 g
- ASI 0.10

Max. 0.050-s Average
- Longitudinal ..... -0.8 g
- Lateral ..... -0.6 g
- Vertical ..... 0.8 g

Post-Impact Trajectory
- Stopping Distance ..... 315 ft downstream

Vehicle Stability
- Maximum Yaw Angle ..... 3°
- Maximum Pitch Angle ..... 2°
- Maximum Roll Angle ..... 2°

Test Article Scatter
- Longitudinal ..... 159 ft downstream
- Lateral ..... Centerline

Vehicle Damage
- VDS 12FR1
- CDC 12FREN1
- Max. Exterior Deformation ..... 1.5 inches
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 10.6. Summary of Results for *MASH* Test 3-62 at 90° on Telespar Sign Support.

APPENDIX A. DETAILS OF TELESPAR SIGN SUPPORT