



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,

A handwritten signature in blue ink that reads "Michael S. Griffith". The signature is written in a cursive style with a large, stylized "S" for the middle initial.

Michael S. Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures

## Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

|                  |  |   |   |
|------------------|--|---|---|
| <b>Submitter</b> | Date of Request:   | March 01, 2021                            | <input checked="" type="radio"/> New <input type="radio"/> 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<br>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

!-!-

| System Type   | Submission Type   | Device Name / Variant | Testing Criterion | Test Level |
|---|---|-----------------------|-------------------|------------|
| 'SS': Breakaway Sign Supports, Mailboxes, & other small sign supports | <input checked="" type="radio"/> Physical Crash Testing<br><input type="radio"/> 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 <input checked="" type="checkbox"/> |
| Company Name:   | Allied Tube & Conduit                     | Same as Submitter <input checked="" type="checkbox"/> |
| Address:  | 16100 S. Lathrop Avenue, Harvey, IL 60426 | Same as Submitter <input checked="" type="checkbox"/> |
| Country:  | U.S.A.                                    | Same as Submitter <input checked="" type="checkbox"/> |
| 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 3/8-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: | <b>Roger Bligh</b>                              | Digitally signed by Roger Bligh<br>Date: 2021.03.10 10:44:50 -06'00' |
| Address:            | TTI, 1254 Avenue A, Bldg. 7091, Bryan, TX 77807 | Same as Submitter <input type="checkbox"/>                           |
| Country:            | U.S.A.  | Same as Submitter <input type="checkbox"/>                           |

A brief description of each crash test and its result:

| Required Test Number | Narrative Description   | Evaluation Results |
|----------------------|---|--------------------|
| 3-60 (1100C)         | <p>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&amp;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.</p> | PASS               |

| Required Test Number | Narrative Description  | Evaluation Results |
|----------------------|--|--------------------|
| 3-61 (1100C)         | <p>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.</p> <p>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.</p>   | PASS               |
| 3-62 (2270P)         | <p>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.</p> <p>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.</p> | 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<br>'Date: 2021.03.01 14:01:06 -06'00                  |  |
| Address:   | 1254 Avenue A, Bldg. 7091, Bryan, TX 77807  | Same as Submitter <input type="checkbox"/>  |
| Country:   | U.S.A.  | Same as Submitter <input type="checkbox"/>  |
| Accreditation Certificate Number and Dates of current Accreditation period : | ISO 17025-2017 Laboratory<br>A2LA Certificate Number: 2821.01<br>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

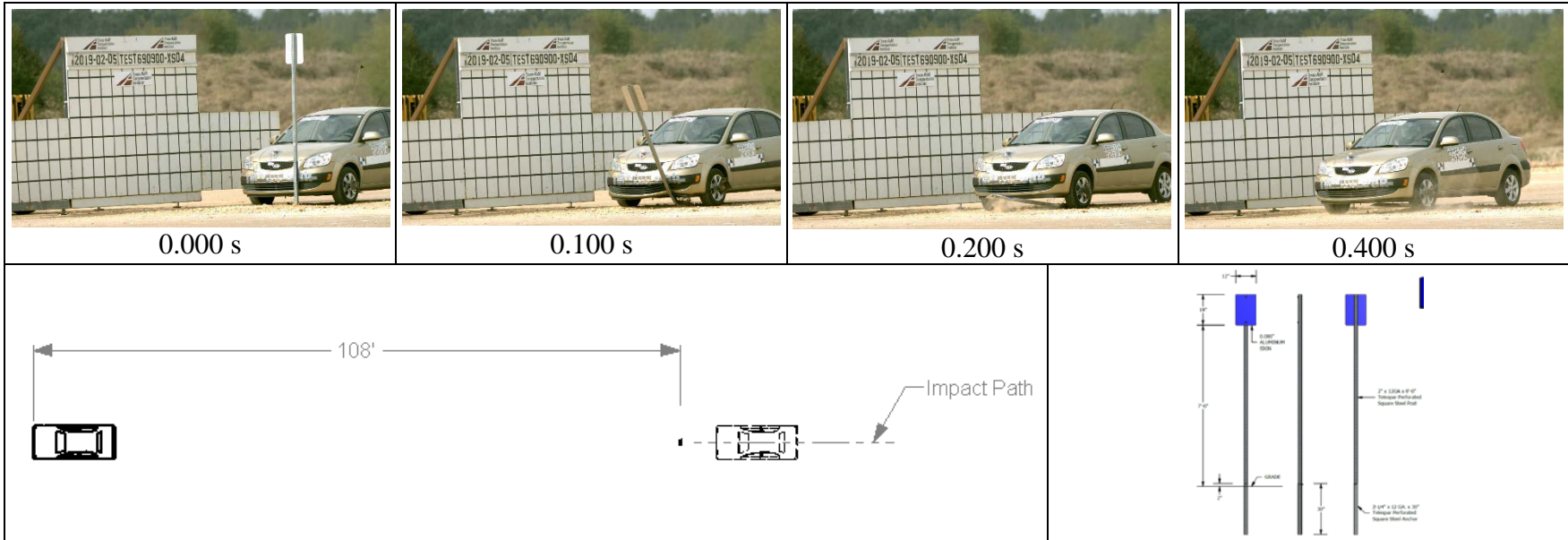
## ATTACHMENTS

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 |      | Key Words |
|--------------------|------|-----------|
| Number             | Date |           |
|                    |      |           |



**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 2 1/4-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**

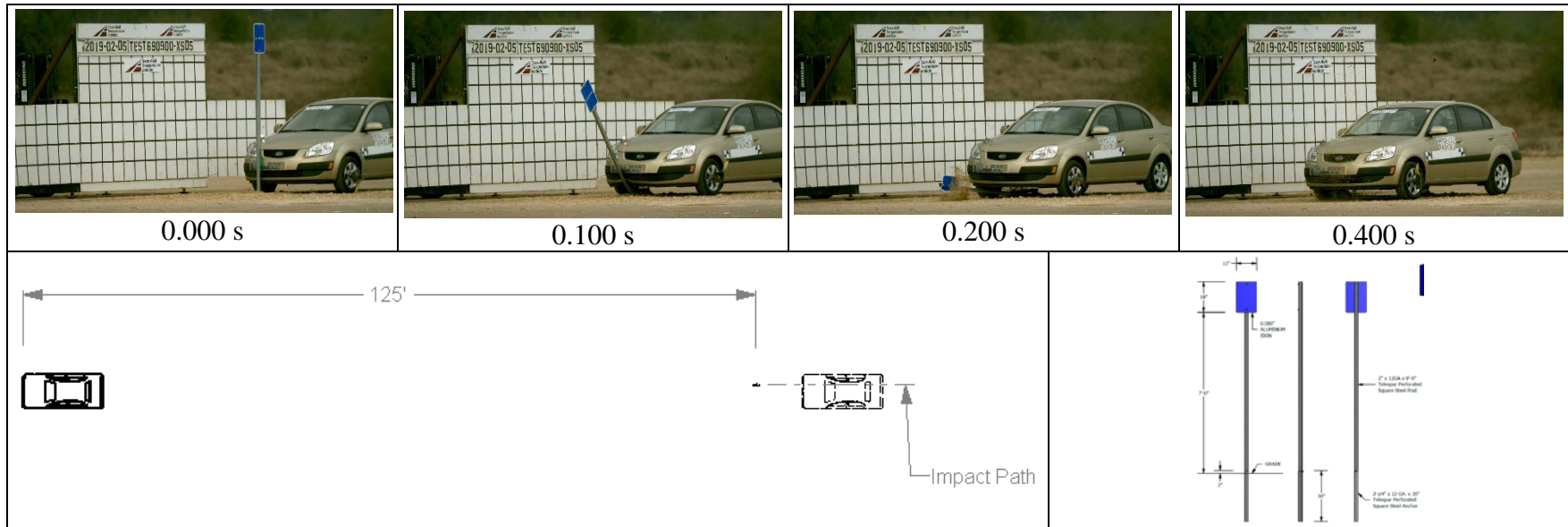
Longitudinal ..... Remained at  
 Lateral ..... impact site

**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 2 1/4-inch x 12 gauge x 30 inches long square perforated steel anchor post protruding 2 inches above grade; 12x18x0.080 inch aluminum sign panel  
 Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp

**Soil Type and Condition** ....

**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°

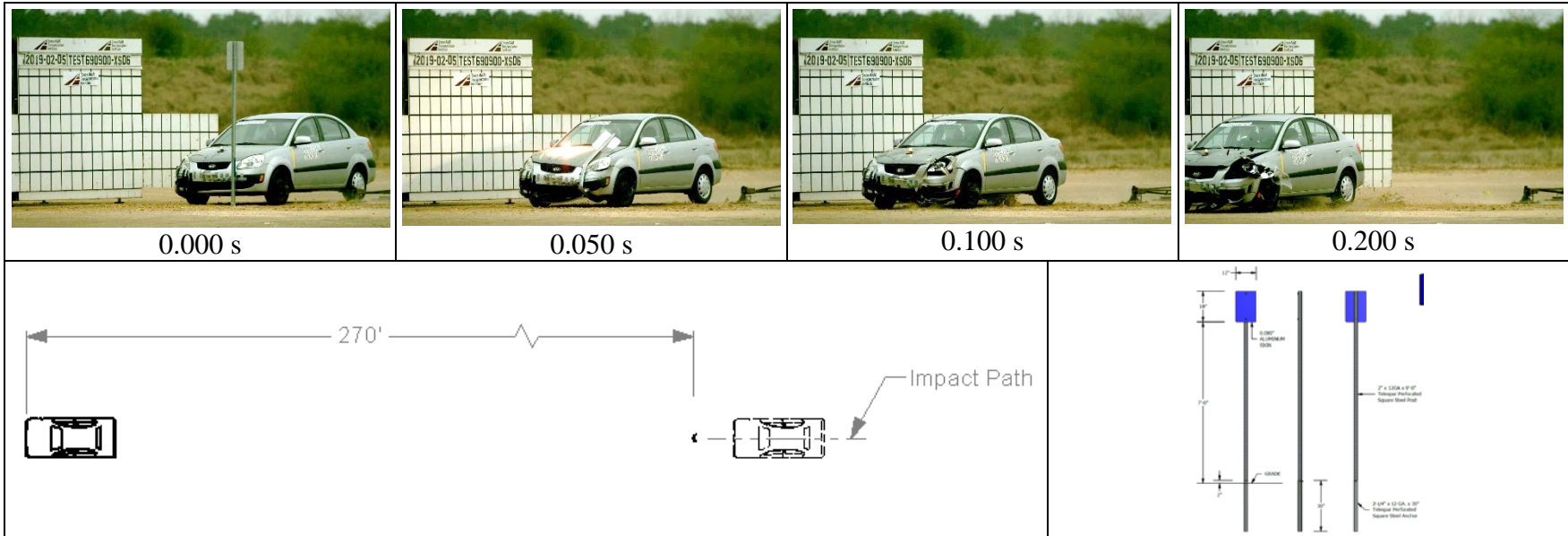
**Test Article Scatter**

Longitudinal ..... Remained at  
 Lateral ..... impact site

**Vehicle Damage**

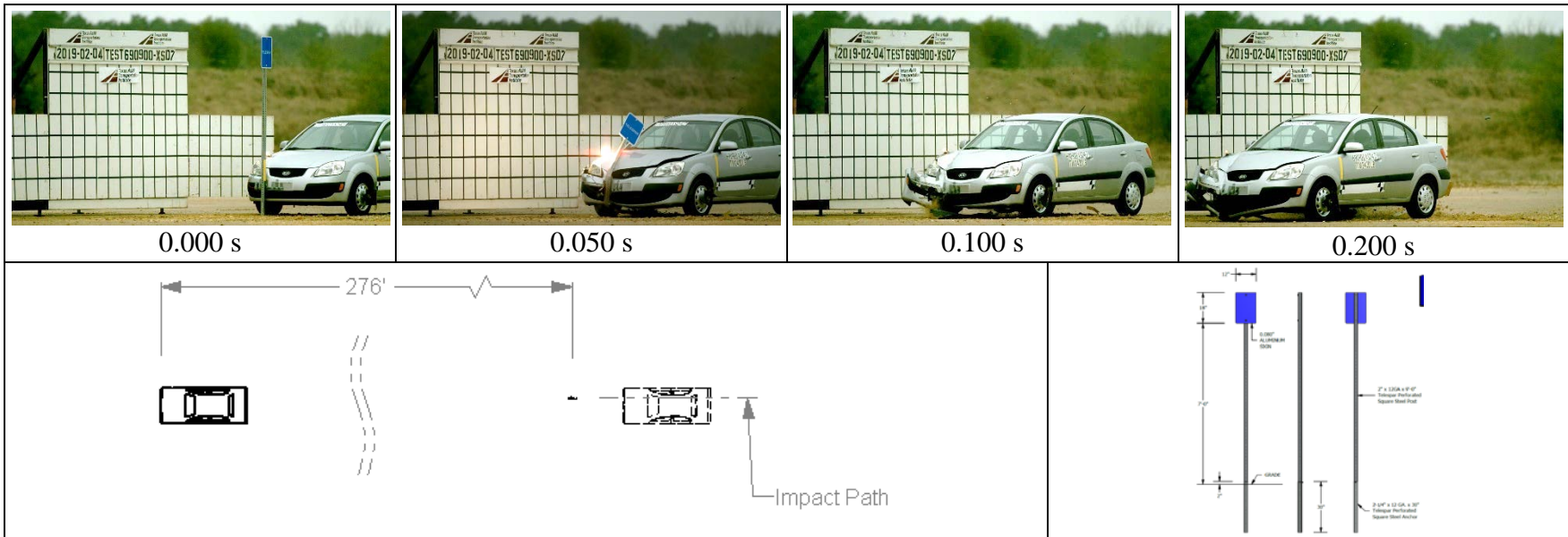
VDS ..... 12FR1  
 CDC ..... 12FREN1  
 Max. Exterior Deformation ..... Not measurable  
 OCDI ..... FS000000  
 Max. Occupant Compartment Deformation ..... None

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



|  |   |   |
|--|---|---|
| <p><b>General Information</b><br/>                 Test Agency..... Texas A&amp;M Transportation Institute (TTI)<br/>                 Test Standard Test No. .... MASH Test 3-61<br/>                 TTI Test No. .... 690900-XSD6<br/>                 Test Date ..... 2019-02-05</p> <p><b>Test Article</b><br/>                 Type ..... Support Structure (Sign Support)<br/>                 Name..... Telespar Sign Support<br/>                 Installation Height ..... 7 ft above grade<br/>                 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</p> <p><b>Soil Type and Condition</b> .... Installed in AASHTO M147-65(2004), grading B Soil (crushed limestone), Damp</p> <p><b>Test Vehicle</b><br/>                 Type/Designation ..... 1100C<br/>                 Make and Model ..... 2009 Kia Rio<br/>                 Curb..... 2480 lb<br/>                 Test Inertial..... 2440 lb<br/>                 Dummy ..... 165 lb<br/>                 Gross Static ..... 2605 lb</p> | <p><b>Impact Conditions</b><br/>                 Speed ..... 63.5 mi/h<br/>                 Angle ..... 0°<br/>                 Location/Orientation ..... Left quarter point</p> <p><b>Impact Severity</b>..... 329 kip-ft</p> <p><b>Exit Conditions</b><br/>                 Speed ..... 60.2 mi/h<br/>                 Angle ..... 0°</p> <p><b>Occupant Risk Values</b><br/>                 Longitudinal OIV ..... 3.6 ft/s<br/>                 Lateral OIV..... 2.0 ft/s<br/>                 Longitudinal Ridedown ..... 0.2 g<br/>                 Lateral Ridedown ..... 0.6 g<br/>                 THIV ..... 4.5 km/h<br/>                 PHD ..... 0.6 g<br/>                 ASI..... 0.15<br/>                 Max. 0.050-s Average<br/>                 Longitudinal ..... -1.7 g<br/>                 Lateral..... 0.6 g<br/>                 Vertical..... 1.3 g</p> | <p><b>Post-Impact Trajectory</b><br/>                 Stopping Distance..... 270 ft downstream</p> <p><b>Vehicle Stability</b><br/>                 Maximum Yaw Angle ..... 5°<br/>                 Maximum Pitch Angle ..... 1°<br/>                 Maximum Roll Angle ..... 6°</p> <p><b>Test Article Scatter</b><br/>                 Longitudinal ..... Remained at<br/>                 Lateral ..... impact site</p> <p><b>Vehicle Damage</b><br/>                 VDS ..... 12FL1<br/>                 CDC..... 12FLEN1<br/>                 Max. Exterior Deformation..... 1.5 inches<br/>                 OCDI..... FS0000000<br/>                 Max. Occupant Compartment Deformation ..... None</p> |
|--|---|---|

**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 2 1/4-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°

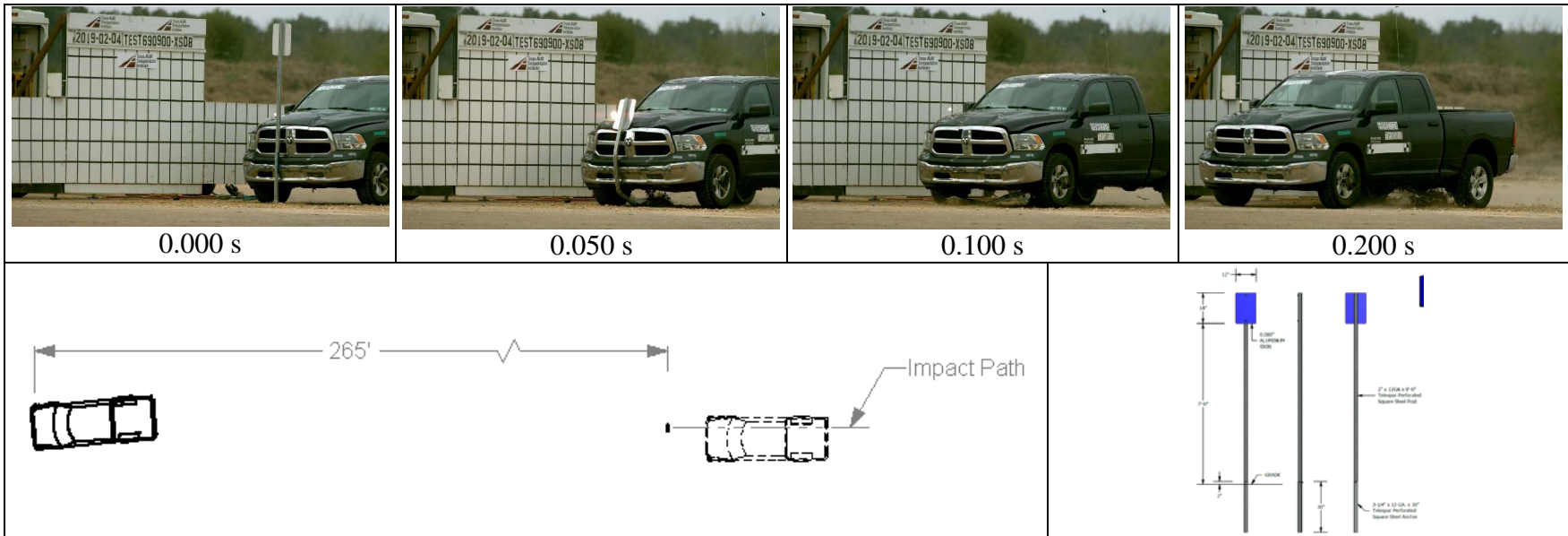
**Test Article Scatter**

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 2 1/4-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**

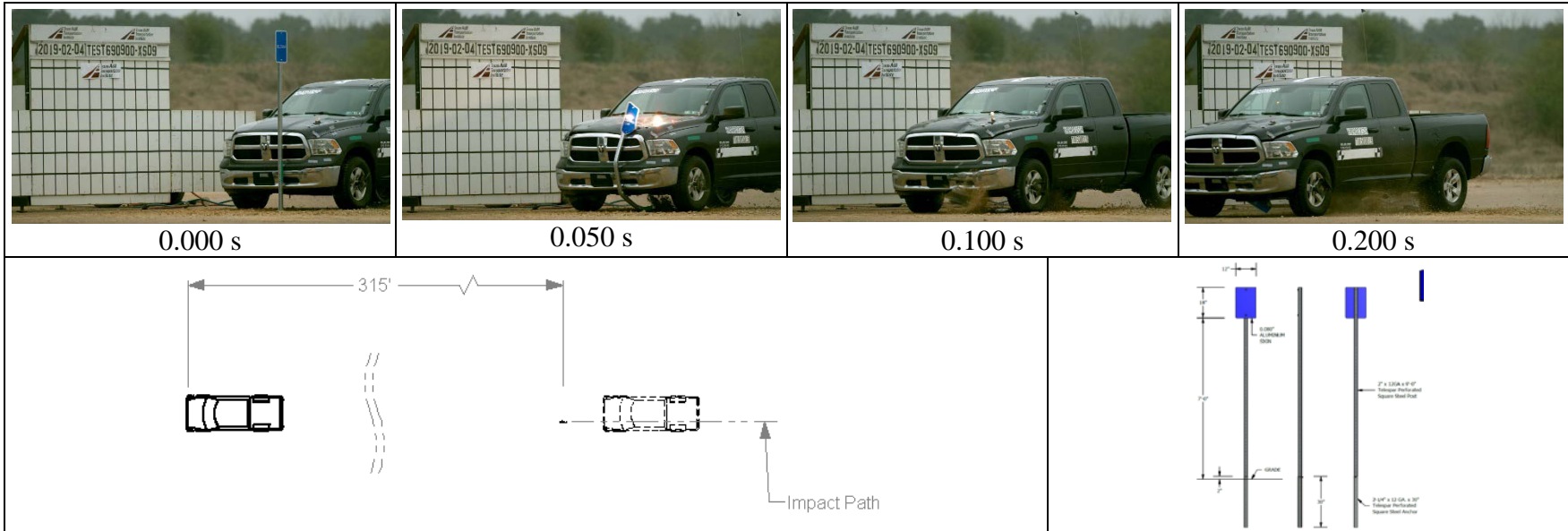
Longitudinal ..... Remained at  
 Lateral ..... impact site

**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 2 1/4-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**

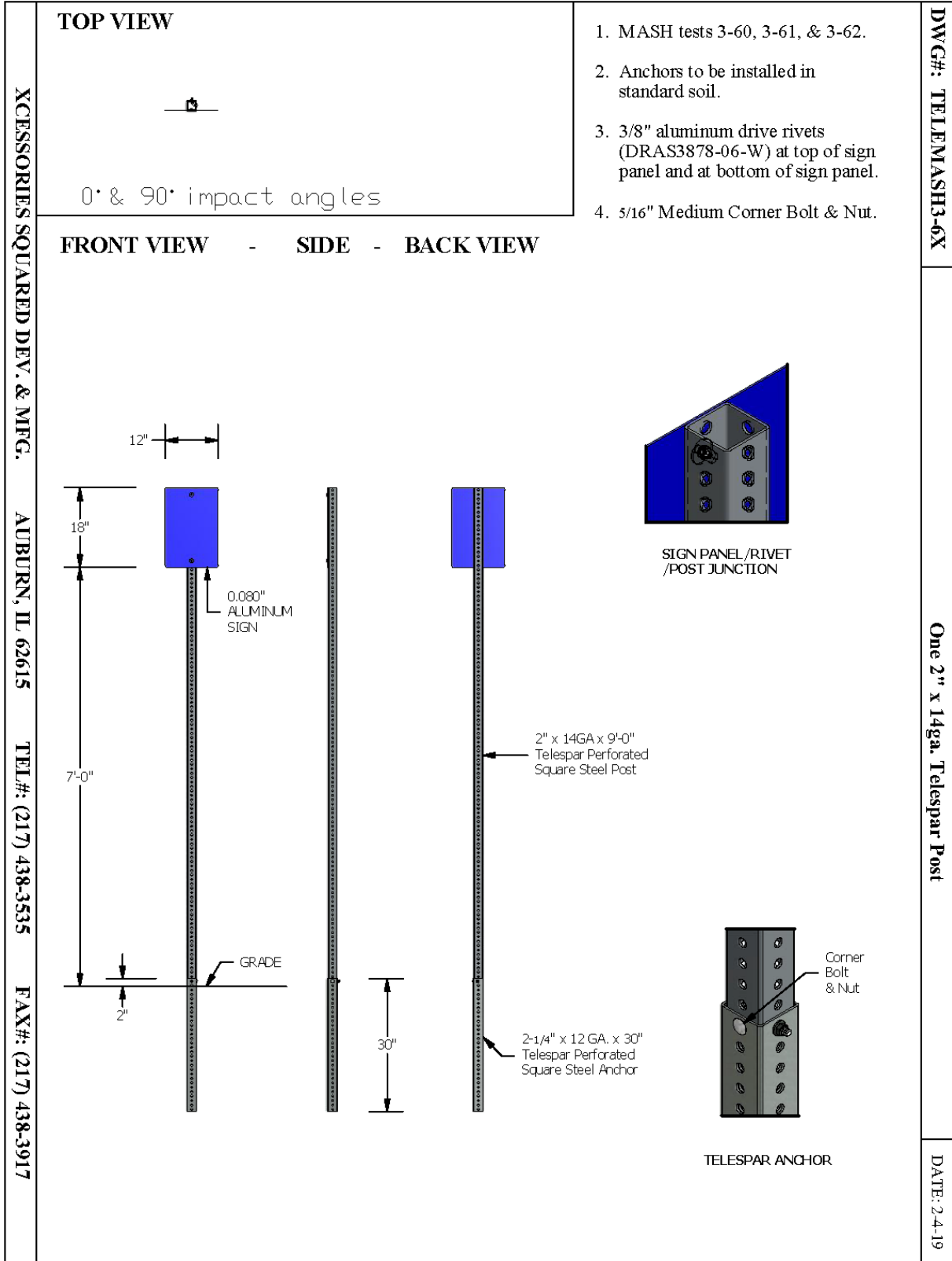
Longitudinal ..... 159 ft downstream  
 Lateral ..... Centerline

**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 TELES PAR SIGN SUPPORT



DWG#: TELEMASH3-6X

One 2" x 14ga. Telespar Post

DATE: 2-4-19