U.S. Department
of Transportation
**Federal Highway
Administration**

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

February 9, 2017

In Reply Refer To:
HSST-1/SS-182

Greg Kirchgenser
Xcessories Squared and Allied Tube & Conduit
P.O. Box 135
Auburn, Illinois 62615

Dear Mr. Kirchgenser:

This letter is in response to your July 28 and 29, 2016, requests 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-182 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- MASSH-400 Breakaway Slip Base System for Square Steel Tube Sign Supports

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

FHWA previously issued an eligibility letter for the roadside safety system described in your request. Your request now identifies a modification to that roadside safety system.

The original roadside safety device information is provided here:

Name of system: MASSH-400
Type of system: Breakaway Slip Base System for Square Steel Tube Sign Supports
Date of original request: January 26, 2016
Original FHWA eligibility letter: April 16, 2016
FHWA Control number: SS-180

The modification(s) consists of the following changes:

1. Substitution of 5 ¾-inch long A325 bolt for the original 6-inch long bolt to eliminate the need for an additional washer.
2. Use of Redi-Torque bolt instead to standard bolt requiring specific torqueing during installation.
3. Holes in the side of the slip base are lowered by 7/8 inch in order that the same part may be used for the upper hinge mechanism.

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within 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

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

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 the 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 numbers SS-182 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.

- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely,

Scott T. Johnson

Scott T. Johnson
Acting Director, Office of Safety
Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter			
	Date of Request:	July 28, 2016	◉ New ○ Resubmission
	Name:	Greg Kirchgesner	
	Company:	Xcessories Squared and Allied Tube & Conduit	
	Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	
	Country:	USA	
	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

!-!-!

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	MASSH-400	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:	Greg Kirchgesner	Same as Submitter ☒
Company Name:	Xcessories Squared and Allied Tube & Conduit	Same as Submitter ☒
Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	Same as Submitter ☒
Country:	USA	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.		
No ongoing financial interests exist between the testing facility and the manufacturing companies. The only financial occurrence was the contract testing fee for the required MASH testing.		

PRODUCT DESCRIPTION

○ New Hardware or Significant Modification	◉ Modification to Existing Hardware	Non-Significant

The MASSH-400 Multi-directionally Activated Sign Support Hardware system, which was jointly developed by Xcessories Squared and Allied Tube & Conduit, has been reviewed by a few states. Some of them have identified products they currently use which they would like to be able to use with the MASSH-400 in place of product that was used when it was crash tested. Many of those products have also been tested. We developed a Redi-Torque bolt that is the same grade and size as the bolts used in the crash test. They are different only by containing an additional hex head which twists off during installation. This would establish the proper torque during installation resulting in the same clamping force between the two slip plates.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that the Modification to Existing Hardware is deemed Non-significant for the device listed above to meet the MASH criteria.

Engineer Name:	Roger P. Bligh	
Engineer Signature:	Bligh, Roger P — Digitally signed by Bligh, Roger P DN: postalCode=77843, o=TAMU-SIGN, street=Texas A&M University, st=TX, l=College Station, c=US, cn=Bligh, Roger P, email=rbligh@tamu.edu Date: 2016.07.29 16:32:19 -05'00'	
Address:	Texas A&M Transportation Institute 3135 TAMU	Same as Submitter ☐
Country:	USA College Station, TX 77843-3135	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-60 (1100C)	The RTB75-350-G Redi-Torque Bolts have an additional hex head that twists off during installation at the designed torque value (60 ft-lbs.) and are the same size, material, and coating as the G8FB75-350-G bolts that were used in the previously passed crash test. This change would have no affect on the results of Test Number 3-60, but would help insure proper installation.	Modification has no effect on crashworthiness
3-61 (1100C)	The RTB75-350-G Redi-Torque Bolts have an additional hex head that twists off during installation at the designed torque value (60 ft-lbs.) and are the same size, material, and coating as the G8FB75-350-G bolts that were used in the previously passed crash test. This change would have no affect on the results of Test Number 3-61, but would help insure proper installation.	Modification has no effect on crashworthiness

Required Test Number	Narrative Description	Evaluation Results
3-62 (2270P)	The RTB75-350-G Redi-Torque Bolts have an additional hex head that twists off during installation at the designed torque value (60 ft-lbs.) and are the same size, material, and coating as the G8FB75-350-G bolts that were used in the previously passed crash test. This change would have no affect on the results of Test Number 3-62, but would help insure proper installation.	Modification has no effect on crashworthiness

Testing Laboratory's signature concurs that these modifications are considered Non-Significant.		
Laboratory Name:	Texas AM Transportation Institute	
Laboratory Signature:	Darrell L. Kuhn — Digitally signed by Darrell L. Kuhn DN: cn=Darrell L. Kuhn, o=Texas A&M Transportation Insitute, ou=Proving Ground, email=d-kuhn@tti.tamu.edu, c=US Date: 2016.08.16 16:28:15 -05'00'	
Address:	Texas A&M Transportation Institute	Same as Submitter ☐
Country:	3135 TAMU; College Station, TX 77843-3135	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA ISO 17025 Laboratory Certificate #2821.01 Exp: 2017-4-30	

Submitter Signature*: Gregory Kirchgesner — Digitally signed by Gregory Kirchgesner DN: cn=Gregory Kirchgesner, o=Xcessories Squared, ou=Engineering, email=gkirchgesner@x-sqrd.com, c=US Date: 2016.08.23 12:11:31 -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

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	July 28, 2016	◉ New ○ Resubmission
	Name:	Greg Kirchgesner	
	Company:	Xcessories Squared and Allied Tube & Conduit	
	Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	
	Country:	USA	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

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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	○ Physical Crash Testing ◉ Engineering Analysis	MASSH-400	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:	Greg Kirchgesner	Same as Submitter ☒
Company Name:	Xcessories Squared and Allied Tube & Conduit	Same as Submitter ☒
Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	Same as Submitter ☒
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No ongoing financial interests exist between the testing facility and the manufacturing companies. The only financial occurrence was the contract testing fee for the required MASH testing.		

PRODUCT DESCRIPTION

○ New Hardware or Significant Modification	◉ Modification to Existing Hardware	Non-Significant

The MASSH-400 Multi-directionally Activated Sign Support Hardware system, which was jointly developed by Xcessories Squared and Allied Tube & Conduit, has been reviewed by a few states. We crash tested the product using the closest available A325 structural hex head bolt available. In order to make that work with some tolerance we added an additional washer to be used as a spacer for optimum thread fit. Following the successful crash test we worked with Nucor steel hardware division to have an A325 bolt made to the optimum length to eliminate the need for the additional washer. We would like to use that bolt for standard production. They are different only by being 5-3/4" long.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that the Modification to Existing Hardware is deemed Non-significant for the device listed above to meet the MASH criteria.

Engineer Name:	Roger P. Bligh	
Engineer Signature:	Bligh, Roger P — Digitally signed by Bligh, Roger P DN: postalCode=77843, o=TAMU-SIGN, street=Texas A&M University, st=TX, l=College Station, c=US, cn=Bligh, Roger P, email=rbligh@tamu.edu Date: 2016.07.29 16:33:59 -05'00'	
Address:	Texas A&M Transportation Institute 3135 TAMU College Station, TX 77843-3135	Same as Submitter ☐
Country:	USA	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-60 (1100C)	The 5/8"-11 x 6" A325 bolts were chosen for the original test because the next available size shorter one was too short. The 6" length used in the original crash test reached the proper torque at its last thread. A washer was added and used as a spacer to provide some tolerance and that is how the assembly was originally crash tested. We had an A325 bolt designed and produced by Nucor Steel that is 5-3/4" in length which provides the optimal thread position without requiring the additional washer. The effective change is essentially a slight change in thread position and would have no affect on the results of Test Number 3-60.	Modification has no effect on crashworthiness

Required Test Number	Narrative Description	Evaluation Results
3-61 (1100C)	The 5/8"-11 x 6" A325 bolts were chosen for the original test because the next available size shorter one was too short. The 6" length used in the original crash test reached the proper torque at its last thread. A washer was added and used as a spacer to provide some tolerance and that is how the assembly was originally crash tested. We had an A325 bolt designed and produced by Nucor Steel that is 5-3/4" in length which provides the optimal thread position without requiring the additional washer. The effective change is essentially a slight change in thread position and would have no affect on the results of Test Number 3-61.	Modification has no effect on crashworthiness
3-62 (2270P)	The 5/8"-11 x 6" A325 bolts were chosen for the original test because the next available size shorter one was too short. The 6" length used in the original crash test reached the proper torque at its last thread. A washer was added and used as a spacer to provide some tolerance and that is how the assembly was originally crash tested. We had an A325 bolt designed and produced by Nucor Steel that is 5-3/4" in length which provides the optimal thread position without requiring the additional washer. The effective change is essentially a slight change in thread position and would have no affect on the results of Test Number 3-62.	Modification has no effect on crashworthiness

Testing Laboratory's signature concurs that these modifications are considered Non-Significant.		
Laboratory Name:		
Laboratory Signature:	Darrell L. Kuhn — Digitally signed by Darrell L. Kuhn DN: cn=Darrell L. Kuhn, o=Texas A&M Transportation Insitute, ou=Proving Ground, email=d-kuhn@tti.tamu.edu, c=US Date: 2016.08.16 16:30:30 -05'00'	
Address:	Texas A&M Transportation Institute	Same as Submitter ☐
Country:	3135 TAMU; College Station, TX 77843-3135	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA ISO 17025 Laboratory Certificate #2821.01 Exp: 2017-4-30	

Submitter Signature*: Gregory Kirchgesner — Digitally signed by Gregory Kirchgesner DN: cn=Gregory Kirchgesner, o=Xcessories Squared, ou=Engineering, email=gkirchgesner@x-sqrd.com, c=US Date: 2016.08.23 12:12:36 -05'00'

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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.
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FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter			
	Date of Request:	July 29, 2016	◉ New ○ Resubmission
	Name:	Greg Kirchgesner	
	Company:	Xcessories Squared and Allied Tube & Conduit	
	Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	
	Country:	USA	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

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Device & Testing Criterion - Enter from right to left starting with Test Level

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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	MASSH-400	AASHTO MASH	TL3

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Individual or Organization responsible for the product:

Contact Name:	Greg Kirchgesner	Same as Submitter ☒
Company Name:	Xcessories Squared and Allied Tube & Conduit	Same as Submitter ☒
Address:	P.O. Box 135 Auburn, IL 62615 and 16100 South Lathrop Ave. Harvey, IL 60426	Same as Submitter ☒
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○ New Hardware or Significant Modification	◉ Modification to Existing Hardware	Non-Significant

The MASSH-400 Multi-directionally Activated Sign Support Hardware system, which was jointly developed by Xcessories Squared and Allied Tube & Conduit, has been reviewed by a few states. During some initial installations it was noted that the hole placement in the slip base is similar to but not exactly like the hole placement of the hinge, with respect to the square sign post. We would like to move the holes in the slip base 7/8" lower which would still have the same clamping holding strength and would have no effect on the crash test results. All material would be the same and all contacting surface area would be the same.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that the Modification to Existing Hardware is deemed Non-significant for the device listed above to meet the MASH criteria.

Engineer Name:	Roger P. Bligh	
Engineer Signature:	Bligh, Roger P Digitally signed by Bligh, Roger P DN: postalCode=77843, o=TAMU-SIGN, street=Texas A&M University, st=TX, l=College Station, c=US, cn=Bligh, Roger P, email=rbligh@tamu.edu Date: 2016.08.01 08:58:12 -05'00'	
Address:	Texas A&M Transportation Institute 3135 TAMU	Same as Submitter ☐
Country:	USA College Station, TX 77843-3135	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-60 (1100C)	The angled bracket sides which make up the slip base post receiver and the hinge post sockets were originally designed to be the same part. A few subtle changes were made during the last stages of design to the hinge post socket angle brackets to establish a better welds and a better product. During installation of some of the first systems by DOTs in the field it was noted that it would be more efficient and eliminate potential mistakes if the hole placement in the slip base socket were adjusted to allow for the holes in the posts to be the same, regardless of whether that end was used into a hinge post socket or into a slip base post receiver. The holes would be moved lower by 7/8" and there would be no other changes to the part or assembly. The same surface area of bracket would still be in contact and holding onto the same surface area of the sign post. There would be no affect on the results of Test Number 3-60.	Modification has no effect on crashworthiness

Required Test Number	Narrative Description	Evaluation Results
3-61 (1100C)	The angled bracket sides which make up the slip base post receiver and the hinge post sockets were originally designed to be the same part. A few subtle changes were made during the last stages of design to the hinge post socket angle brackets to establish a better welds and a better product. During installation of some of the first systems by DOTs in the field it was noted that it would be more efficient and eliminate potential mistakes if the hole placement in the slip base socket were adjusted to allow for the holes in the posts to be the same, regardless of whether that end was used into a hinge post socket or into a slip base post receiver. The holes would be moved lower by 7/8" and there would be no other changes to the part or assembly. The same surface area of bracket would still be in contact and holding onto the same surface area of the sign post. There would be no affect on the results of Test Number 3-61.	Modification has no effect on crashworthiness
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Testing Laboratory's signature concurs that these modifications are considered Non-Significant.		
Laboratory Name:	Texas AM Transportation Institute	
Laboratory Signature:	Darrell L. Kuhn — Digitally signed by Darrell L. Kuhn DN: cn=Darrell L. Kuhn, o=Texas A&M Transportation Insitute, ou=Proving Ground, email=d-kuhn@tti.tamu.edu, c=US Date: 2016.08.16 16:32:48 -05'00'	
Address:	Texas A&M Transportation Institute	Same as Submitter ☐
Country:	3135 TAMU; College Station, TX 77843-3135	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA ISO 17025 Laboratory Certificate #2821.01 Exp: 2017-4-30	

Submitter Signature*: Gregory Kirchgesner — Digitally signed by Gregory Kirchgesner DN: cn=Gregory Kirchgesner, o=Xcessories Squared, ou=Engineering, email=gkirchgesner@x-sqrd.com, c=US Date: 2016.08.23 12:13:20 -05'00'

Submit Form

ATTACHMENTS

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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.
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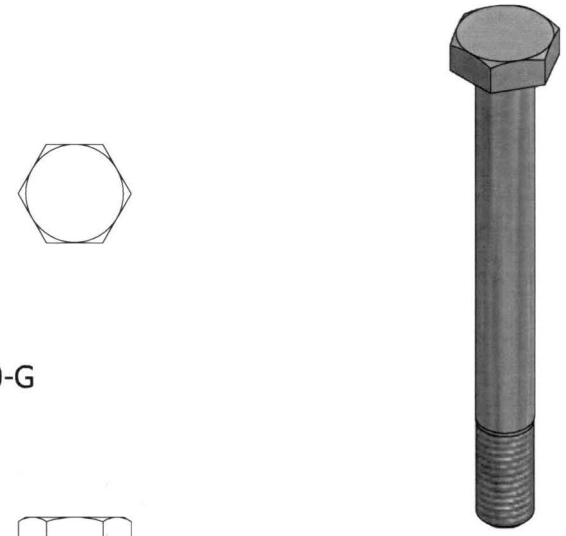
FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words

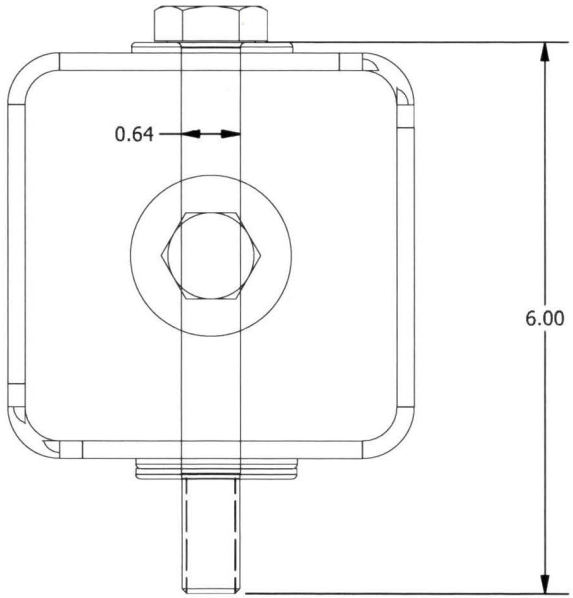
DWG#: 16153-B	SIGN POST CONNECTION HARDWARE BOLTS	DATE: 7-1-16

SPECIFICATION: 5/8" - 11 ASTM A325 hex head bolts - hot dip galvanized.

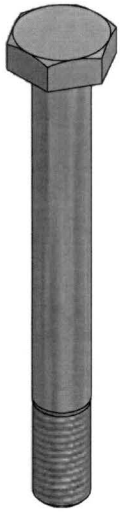
AS TESTED



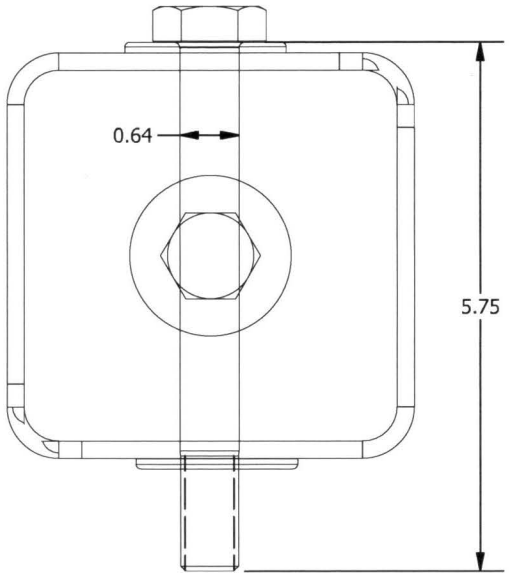
HB58-11-600-G



REQUESTING



HB58-11-575-G

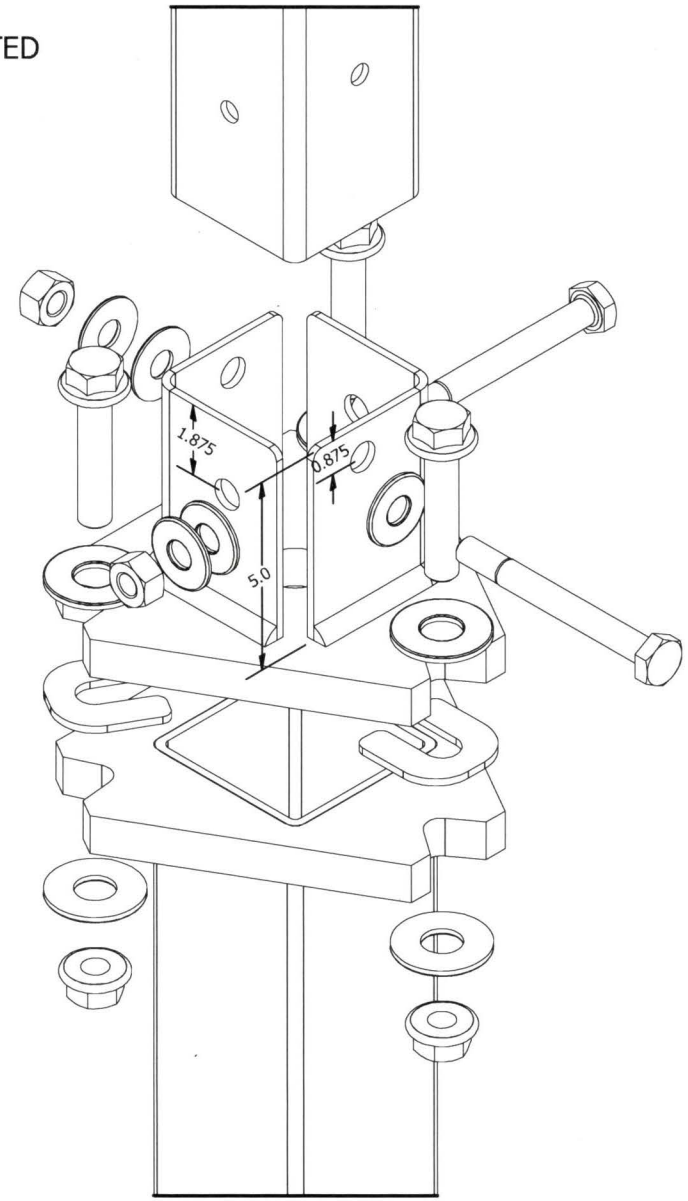


XCESSORIES SQUARED DEVELOPMENT & MFG., INC. AUBURN, IL 62615 TEL#: (217) 438-3535 FAX#: (217) 438-3917

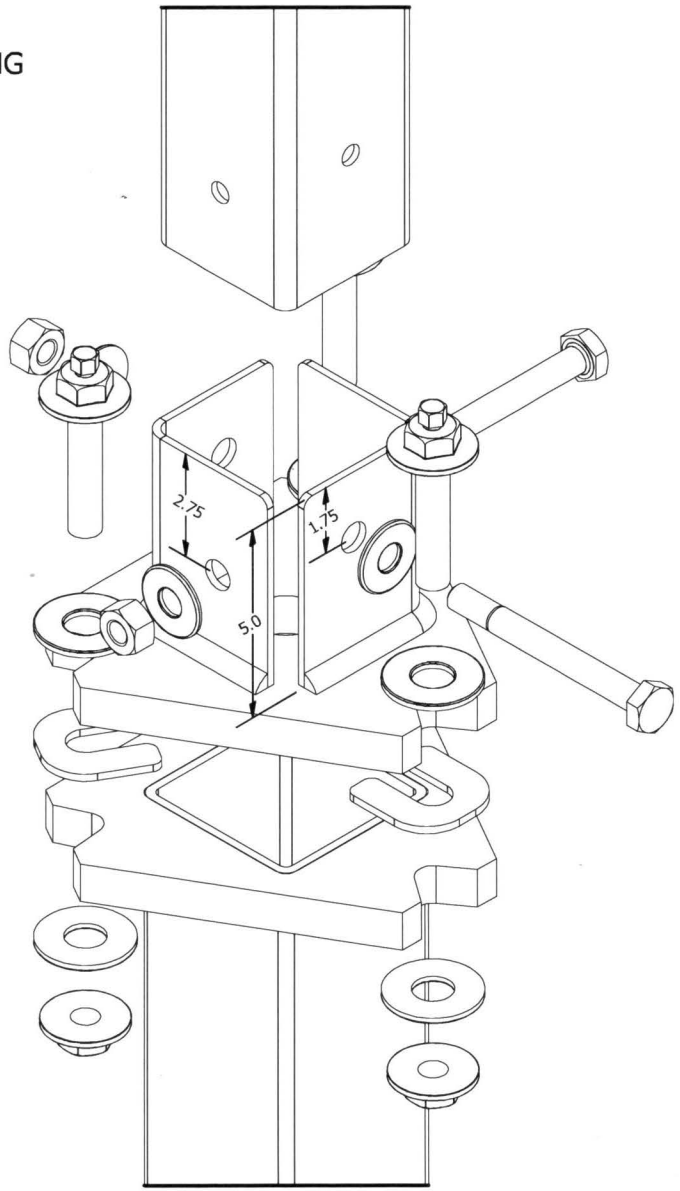
DWG#: 16153-E	RELOCATE SLIP BASE TO POST HARDWARE HOLE LOCATION	DATE: 7-1-16

SPECIFICATION: No material change.

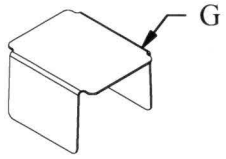
AS TESTED



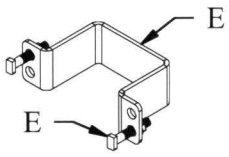
REQUESTING



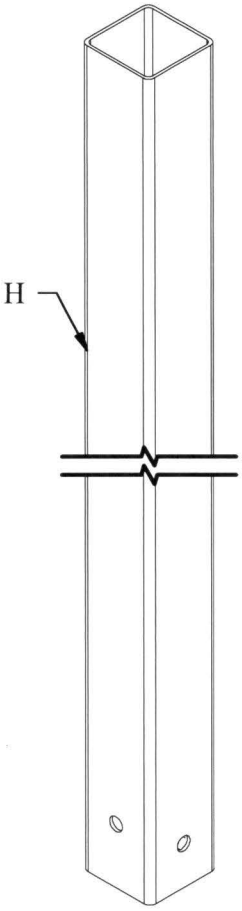
XCESSORIES SQUARED DEVELOPMENT & MFG., INC. AUBURN, IL 62615 TEL#: (217) 438-3535 FAX#: (217) 438-3917



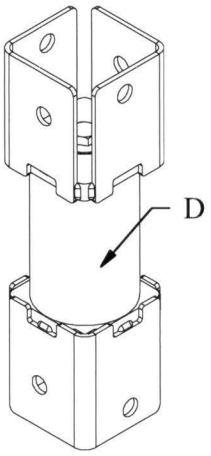
Sign Post Cap



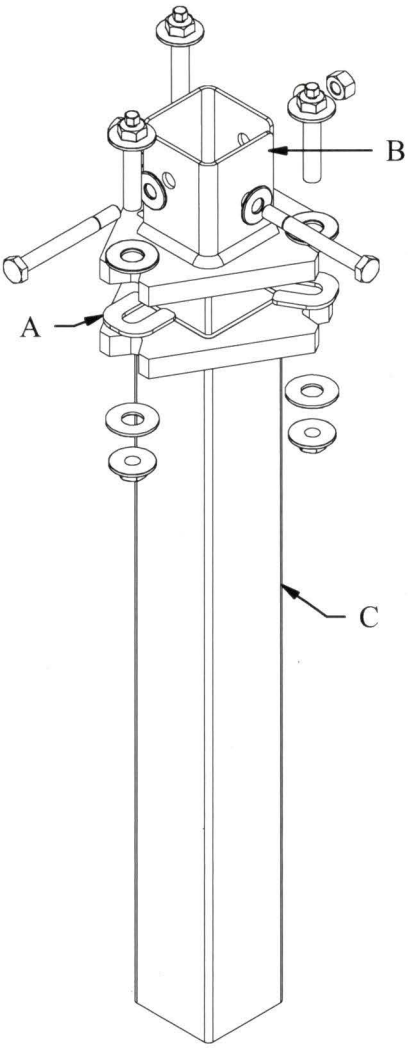
Sign Panel
Clamp Set



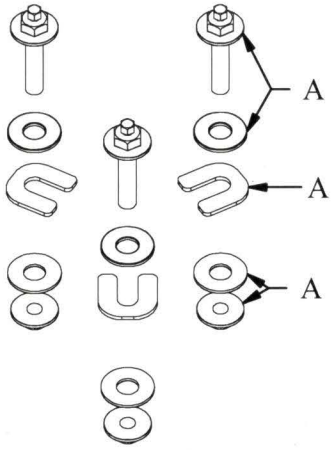
Square Sign Post



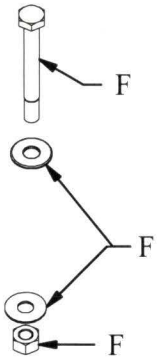
Multi-directionally
Activated
Sign
Support
Hinge



Complete Slip Base
Assembly for
Concrete Installation



Slip Base Match
Plate Hardware Set



Sign Post
Hardware Set

Multi-directionally Activated Sign Support Hardware System

Xcessories Squared Development & Manufacturing Inc.

allied TUBE & CONDUIT
A PART OF atkore INTERNATIONAL

SSS21a-b

SHEET NO.	DATE
3 of 3	7/29/16