U.S. Department of Transportation
Federal Highway Administration

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

December 20, 2012

In Reply Refer To:
HSST/ B-52C

Mr. Rick Groves
EASI-Set Industries
5119 Catlett Road
Midland, Virginia 22728

Dear Mr. Groves:

This letter is in response to your request for the Federal Highway Administration (FHWA) to review a roadside safety system for eligibility for reimbursement under the Federal-aid highway program.

Name of system: J-J Hooks Pin Down F-Shape Barrier
Type of system: Concrete Portable Barrier
Test Level: AASHTO MASH Test Level 3
Testing conducted by: Texas Transportation Institute (TTI)
Task Force 13 Designator: SWC02
Date of request: October 4, 2012
Date initially acknowledged: October 5, 2012
Date of completed package: December 13, 2012

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

- J-J Hooks Pin Down F-Shape Barrier for Asphalt Surface

Based on a review of crash test results and embedment computational analysis submitted by the manufacturer certifying the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH), the device is eligible for reimbursement under the Federal-aid highway program. Eligibility for reimbursement under the Federal-aid highway program does not establish approval or endorsement by the FHWA for any particular purpose or use.

The FHWA, the Department of Transportation, and the United States Government do not endorse products or services and the issuance of a reimbursement eligibility letter is not an endorsement of any product or service.

FHWA: HSST: WLongstreet: sf.x60087: WLongstreet: 12/14/12
File: h://directory folder/HSST/ B-52C_EASI JJ Hook Fshape MASH doc (2).docx
cc: HSST Will Longstreet

Requirements
To be found eligible for Federal-aid funding, roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH).

Description
The device and supporting documentation are described in the attached form.

Summary and Standard Provisions
Therefore, the system described and detailed in the attached form is eligible for reimbursement and may be installed under the range of conditions tested.

Please note the following standard provisions that apply to FHWA eligibility letters:

- This letter provides a AASHTO/ARTBA/AGC Task Force 13 designator that should be used for the purpose of the creation of a new and/or the update of existing Task Force 13 drawing for posting on the on-line 'Guide to Standardized Highway Barrier Hardware' currently referenced in AASHTO Roadside Design Guide.
- This finding of eligibility does not cover other structural features of the systems, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may influence system conformance with MASH will require a new reimbursement eligibility letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals safety problems, or that the system is significantly different from the version that was crash tested, we reserve the right to modify or revoke this letter.
- You are expected to supply potential users with sufficient information on design and installation 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.
- To prevent misunderstanding by others, this letter of eligibility is designated as number B-52C and 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 at our office 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. The FHWA does not become involved in issues concerning patent law. Patent and proprietary issues, if any, are to be resolved by the applicant.
- The J-J Hooks are considered 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 yours,

/SIGNED BY MICHAEL S. GRIFFITH/

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

Enclosures

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Sincerely yours,

Michael S. Griffith

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:	December 12, 2012	(•) New ( ) Resubmission
	Name:	Rick Groves	
	Company:	Easi-Set Industries	
	Address:	5119 Catlett Road, Midland, Virginia 22728	
	Country:	United States of America	
	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.

Help

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Barriers (Roadside, Media	(•) Physical Crash Testing ( ) FEA & V&V Analysis	J-J Hooks/MASH Pinned Down to Asphalt Barrier	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.

Identification of the individual or organization responsible for the product:

Contact Name:	Rick Groves	Same as Submitter ☒
Company Name:	Easi-Set Industries	Same as Submitter ☒
Address:	5119 Catlett Road, Midland, Virginia 22728	Same as Submitter ☒
Country:	United States of America	Same as Submitter ☒

PRODUCT DESCRIPTION

New Hardware
J-J Hooks/MASH pin down to asphalt barrier, 10-15 foot and 20 foot length to be included with as tested 12.5 foot section eligibility.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-11 (2270P)	MASH Test 311 on the Easi-Set Industries J-J Hooks MASH Barrier by TTI with acceptance of 10-15 foot and 20 foot lengths based on the TTI letter that states the testing results show that "the J-J Hooks /MASH restrained barrier systems will perform acceptably for segment lengths ranging from 10 to 15 feet with the 3-pin configuration that were successfully crash tested and a barrier segment length of 20 feet will perform acceptably if 3-pins are used." TTI Test number - TR-510602-JJH8	PASS
3-11 (1100C)	Considered not worst case by laboratory, therefore not conducted	Waiver Requested
3-20 (1100C)	Not a transition, therefore not conducted by laboratory	
3-21 (2270P)	Not a transition, therefore not conducted by laboratory	

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 Transportation Institute	
Laboratory Contact:	Roger Bligh	Same as Submitter ☐
Address:	Texas A&M University System, 3135 TAMU, College Station, Texas 77843-3132	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☒
Accreditation Certificate Number and Date:	TTI Proving Ground is an International Standards Organization (ISO) 17025 accredited laboratory with American Association for Laboratory Accreditation (A2LA) Mechanical Testing Certificate 2821.01. The full scale crash test was performed according to TTI Proving Ground quality procedures and according to the MASH guidelines and standards.	

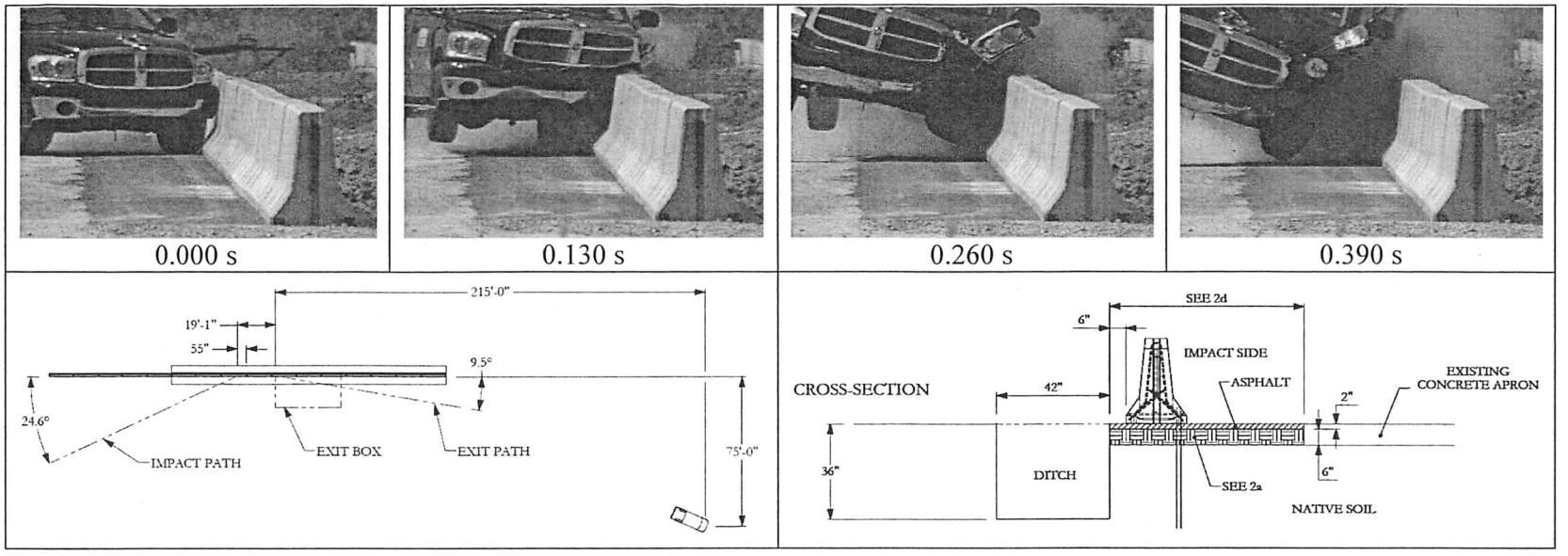
ATTACHMENTS

Attach to this form:

1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
2) 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 key to understanding the performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words
B-52C	December 14, 2012	SWC02	Longitudinal barriers, TL3 portable concrete barriers, PCB, concrete median barriers, CMB, pinned to asphalt surface



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-11
- TTI Test No. 510602-JJH8
- Date 2012-06-06

Test Article
- Type ..... Concrete Median Barrier
- Name ..... EASI-SET® Industries J-J Hooks/*MASH* Proprietary Barrier Pinned to Asphalt
- Installation Length ..... 200 ft
- Material or Key Elements .. F-shape 12.5 ft concrete barrier segments with J-J Hooks/MASH connections pinned to 2-inch deep asphalt pad

Soil Type and Condition ..... Asphalt 2 inches deep on road base

Test Vehicle
- Type/Designation 2270P
- Make and Model ..... 2007 Dodge Ram 1500 Pickup
- Curb ..... 4731 lb
- Test Inertial ..... 4980 lb
- Dummy ..... No dummy
- Gross Static ..... 4980 lb

Impact Conditions
- Speed ..... 63.0 mi/h
- Angle ..... 24.6 degrees
- Location/Orientation ..... 4.6 ft upstrm of joint 8 - 9

Impact Severity ..... 114.5 kip*ft

Exit Conditions
- Speed ..... 57.0 mi/h
- Angle ..... 9.5 degrees

Occupant Risk Values
- Impact Velocity
  - Longitudinal ..... 13.8 ft/s
  - Lateral ..... 23.0 ft/s
- Ridedown Accelerations
  - Longitudinal ..... 5.6 G
  - Lateral ..... 12.5 G
- THIV ..... 29.7 km/h
- PHD ..... 12.5 G
- ASI 1.43
- Max. 0.050-s Average
  - Longitudinal ..... -6.0 G
  - Lateral ..... 12.3 G
  - Vertical ..... -3.7 G

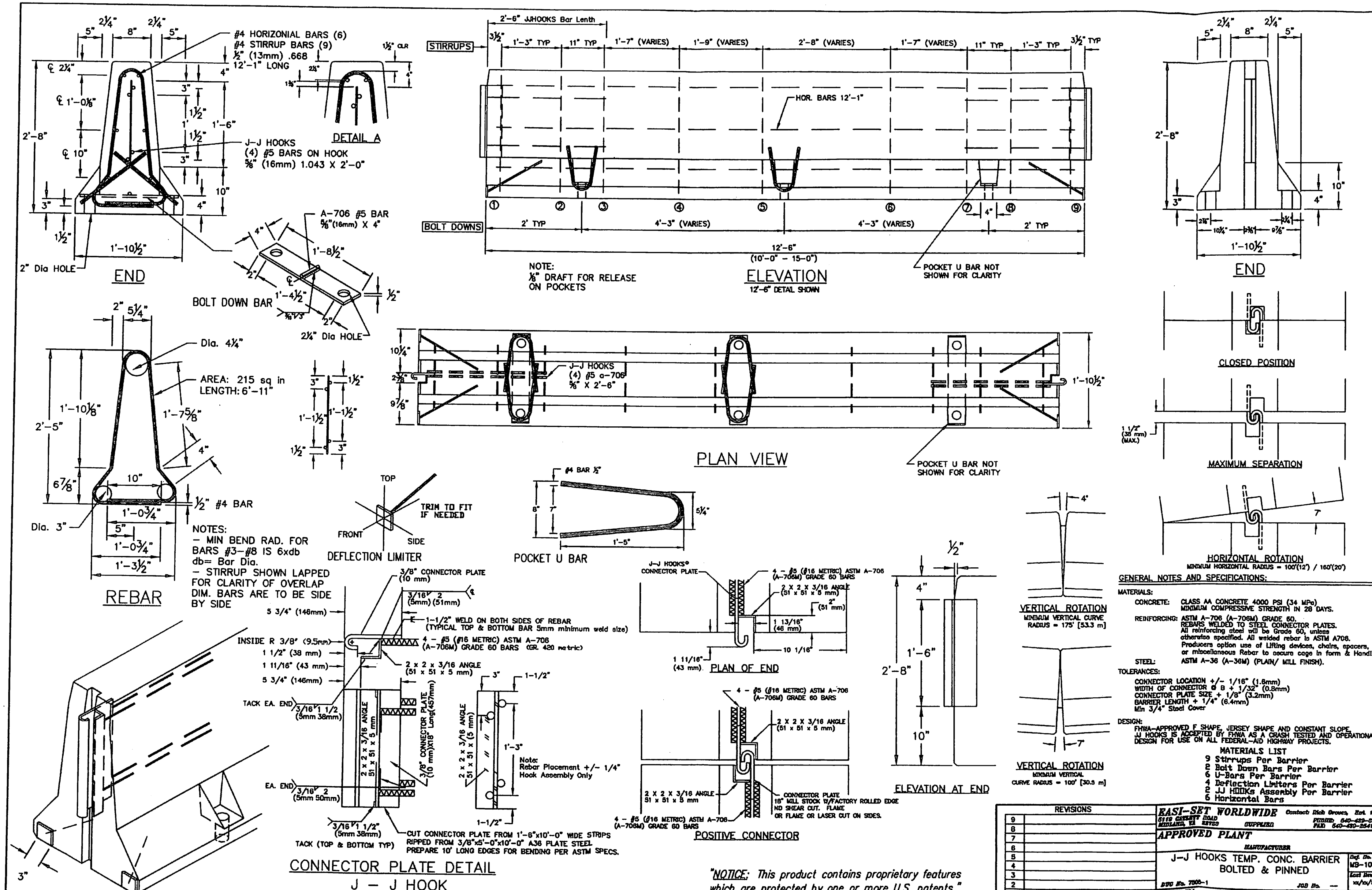
Post-Impact Trajectory
- Stopping Distance ..... 234 ft dwnstrm 75 ft twd traffic

Vehicle Stability
- Maximum Yaw Angle ..... 43 degrees
- Maximum Pitch Angle ..... 20 degrees
- Maximum Roll Angle ..... 36 degrees
- Vehicle Snagging ..... No
- Vehicle Pocketing ..... No

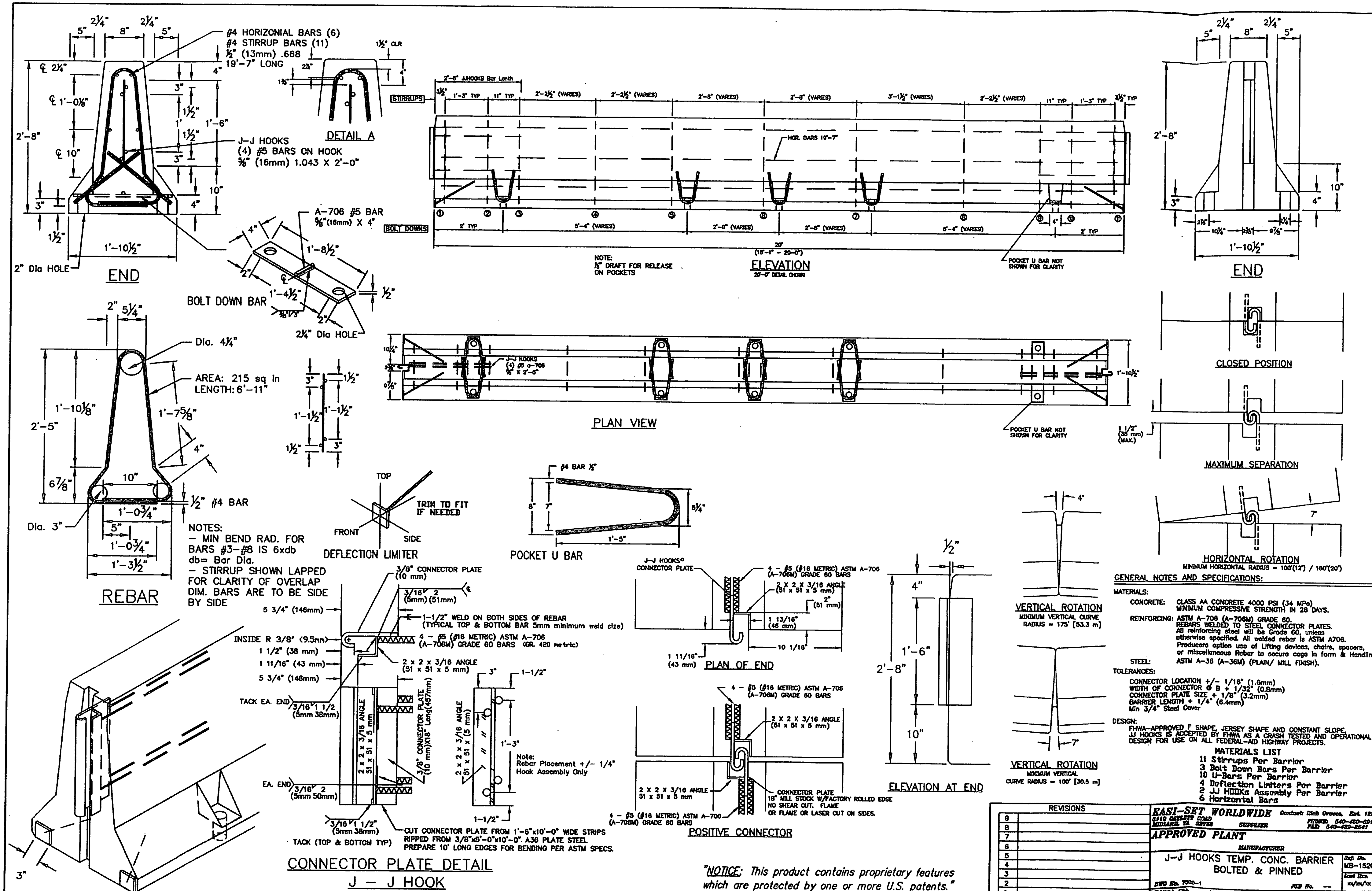
Test Article Deflections
- Dynamic ..... 8.76 inches
- Permanent ..... 5.50 inches
- Working Width ..... 32.03 inches

Vehicle Damage
- VDS 11LFQ3
- CDC 11LFEW3
- Max. Exterior Deformation ..... 15.0 inches
- OCDI LF0000100
- Max. Occupant Compartment Deformation ..... 0.25 inch

Figure 5.7. Summary of results for *MASH* test 3-11 on the EASI-SET® Industries J-J Hooks/*MASH* proprietary barrier pinned to asphalt.



END
REBAR
DETAIL A
BOLT DOWN BAR
ELEVATION
12'-6" DETAIL SHOWN
NOTE: ⅛" DRAFT FOR RELEASE ON POCKETS
POCKET U BAR NOT SHOWN FOR CLARITY
PLAN VIEW
DEFLECTION LIMITER
POCKET U BAR
CONNECTOR PLATE DETAIL
J - J HOOK
PLAN OF END
POSITIVE CONNECTOR
ELEVATION AT END
VERTICAL ROTATION
CLOSED POSITION
MAXIMUM SEPARATION
HORIZONTAL ROTATION
MINIMUM HORIZONTAL RADIUS = 100'(12') / 160'(20')
NOTES:
- MIN BEND RAD. FOR BARS #3-#8 IS 6xdb db= Bar Dia.
- STIRRUP SHOWN LAPPED FOR CLARITY OF OVERLAP DIM. BARS ARE TO BE SIDE BY SIDE
GENERAL NOTES AND SPECIFICATIONS:
MATERIALS:
CONCRETE: CLASS AA CONCRETE 4000 PSI (34 MPa) MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS.
REINFORCING: ASTM A-706 (A-706M) GRADE 60. REBARS WELDED TO STEEL CONNECTOR PLATES. All reinforcing steel will be Grade 60, unless otherwise specified. All welded rebar is ASTM A706. Producers option use of Lifting devices, chairs, spacers, or miscellaneous Rebar to secure cage in form & Handling
STEEL: ASTM A-36 (A-36M) (PLAIN/ MILL FINISH).
TOLERANCES:
CONNECTOR LOCATION +/- 1/16" (1.6mm)
WIDTH OF CONNECTOR @ B + 1/32" (0.8mm)
CONNECTOR PLATE SIZE + 1/8" (3.2mm)
BARRIER LENGTH + 1/4" (6.4mm)
Min 3/4" Steel Cover
DESIGN:
FHWA-APPROVED F SHAPE, JERSEY SHAPE AND CONSTANT SLOPE. JJ HOOKS IS ACCEPTED BY FHWA AS A CRASH TESTED AND OPERATIONAL DESIGN FOR USE ON ALL FEDERAL-AID HIGHWAY PROJECTS.
MATERIALS LIST
9 Stirrups Per Barrier
2 Bolt Down Bars Per Barrier
6 U-Bars Per Barrier
4 Deflection Limiters Per Barrier
2 JJ HOOKs Assembly Per Barrier
6 Horizontal Bars
"NOTICE: This product contains proprietary features which are protected by one or more U.S. patents."
REVISIONS
EASI-SET WORLDWIDE
APPROVED PLANT
J-J HOOKS TEMP. CONC. BARRIER BOLTED & PINNED
MB-1015
DRAWN BY: MCG DATE: 12-10-12
CHECKED BY: RHG DATE: 12-10-12
APPROVED BY: R.SMITH DATE: 12-10-12
SHEET 1/1


END
#4 HORIZONIAL BARS (6)
#4 STIRRUP BARS (11)
½" (13mm) .668
19'-7" LONG
J-J HOOKS
(4) #5 BARS ON HOOK
⅝" (16mm) 1.043 X 2'-0"
2" Dia HOLE
DETAIL A
1½" CLR
STIRRUPS
BOLT DOWNS
HOR. BARS 19'-7"
NOTE:
½" DRAFT FOR RELEASE ON POCKETS
ELEVATION
20'-0" DETAIL SHOWN
POCKET U BAR NOT SHOWN FOR CLARITY
A-706 #5 BAR
⅝"(16mm) X 4"
BOLT DOWN BAR
2¼" Dia HOLE
PLAN VIEW
CLOSED POSITION
MAXIMUM SEPARATION
HORIZONTAL ROTATION
MINIMUM HORIZONTAL RADIUS = 100'(12') / 160'(20')
Dia. 4¼"
AREA: 215 sq in
LENGTH: 6'-11"
½" #4 BAR
Dia. 3"
REBAR
NOTES:
- MIN BEND RAD. FOR BARS #3-#8 IS 6xdb
db= Bar Dia.
- STIRRUP SHOWN LAPPED FOR CLARITY OF OVERLAP DIM. BARS ARE TO BE SIDE BY SIDE
TOP
FRONT
SIDE
TRIM TO FIT IF NEEDED
DEFLECTION LIMITER
#4 BAR ½"
POCKET U BAR
3/8" CONNECTOR PLATE (10 mm)
1-1/2" WELD ON BOTH SIDES OF REBAR (TYPICAL TOP & BOTTOM BAR 5mm minimum weld size)
INSIDE R 3/8" (9.5mm)
4 - #5 (#16 METRIC) ASTM A-706 (A-706M) GRADE 60 BARS (GR. 420 metric)
2 x 2 x 3/16 ANGLE (51 x 51 x 5 mm)
TACK EA. END
EA. END
3/8" CONNECTOR PLATE (10 mm)X18" Long(457mm)
Note: Rebar Placement +/- 1/4" Hook Assembly Only
CUT CONNECTOR PLATE FROM 1'-6"x10'-0" WIDE STRIPS RIPPED FROM 3/8"x5'-0"x10'-0". A36 PLATE STEEL
PREPARE 10' LONG EDGES FOR BENDING PER ASTM SPECS.
TACK (TOP & BOTTOM TYP)
CONNECTOR PLATE DETAIL
J - J HOOK
J-J HOOKS© CONNECTOR PLATE
PLAN OF END
POSITIVE CONNECTOR
CONNECTOR PLATE 18" MILL STOCK W/FACTORY ROLLED EDGE NO SHEAR CUT. FLAME OR FLAME OR LASER CUT ON SIDES.
ELEVATION AT END
VERTICAL ROTATION
MINIMUM VERTICAL CURVE RADIUS = 175' [53.3 m]
VERTICAL ROTATION
MINIMUM VERTICAL CURVE RADIUS = 100' [30.5 m]
GENERAL NOTES AND SPECIFICATIONS:
MATERIALS:
CONCRETE: CLASS AA CONCRETE 4000 PSI (34 MPa) MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS.
REINFORCING: ASTM A-706 (A-706M) GRADE 60. REBARS WELDED TO STEEL CONNECTOR PLATES. All reinforcing steel will be Grade 60, unless otherwise specified. All welded rebar is ASTM A706. Producers option use of Lifting devices, chairs, spacers, or miscellaneous Rebar to secure cage in form & Handling
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