



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

June 21, 2024

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

In Reply Refer To:
HSST-1/B-379

Arthur Miles
EASI-SET Worldwide
5119 Catlett Road
PO Box 400
Midland, VA 22728

Dear Mr. Miles:

We received your initial correspondence on August 28, 2023, requesting issuance of a Federal-aid reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively “device”) described below. On May 1, 2024, we received a complete set of files needed to initiate our review. We write to inform you that the device J-J Hook Low Profile Concrete Barrier is eligible for Federal-aid reimbursement. This letter is assigned Federal Highway Administration (FHWA) control number B-379.

ELIGIBILITY LETTERS

The FHWA issues Federal-aid reimbursement eligibility letters for new roadside safety devices that are crash tested in accordance with the industry standard of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

FHWA, the Department of Transportation, and the United States (government) do not regulate roadside safety devices, crash test facilities, or the manufacturing industry. Issuance of eligibility letters is discretionary and provided only as a service to the states. FHWA may, at its discretion, decline to issue, revise, or rescind an eligibility letter. Eligibility letters are only issued by the FHWA headquarters Office of Safety.

Eligibility letters are issued only as notice to the states that a device is eligible for reimbursement under the Federal-aid highway program. They do not establish approval or certification for any other purpose. Issuance of an eligibility letter is not a prerequisite or requirement for state transportation agencies seeking to use Federal-aid funds for roadside safety devices. State agencies may use a device for which an eligibility letter has not been issued and seek Federal-aid reimbursement.

FEDERAL-AID REIMBURSEMENT

The request for issuance of this letter certified the device was crash tested in accordance with the industry standard of AASHTO’s MASH. This eligibility letter is based on that certification and

the material offered in support of its issuance. The device described below is eligible for reimbursement under the Federal-aid highway program.

Name of system: J-J Hook Low Profile Concrete Barrier
Type of system: Barrier
Test Level: Test Level 2
Testing conducted by: Texas A&M Transportation Institute
Date of request: August 28, 2023

Information about the device, including material such as the eligibility request, crash test reports, drawings, or images are included in one or more attachment(s) to this letter.

Eligibility letter B-379 is inapplicable to devices, optional equipment, alternate materials, or other features that were not crash tested in accordance with AASHTO's MASH.

This letter is issued only for the subject device as crash tested under AASHTO's MASH. Later modification(s) of the device are not eligible for Federal-aid reimbursement under this letter. Notice of later modification(s) should be given to transportation agencies, facility owners, and operators (collectively "agencies").

Agencies should be provided appropriate information about the device's design, installation, maintenance, materials, and mechanical properties.

Issuance of this letter is discretionary, and it may be revised or rescinded at FHWA's discretion. This letter is not a determination of compliance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) or ownership of any intellectual property rights.

This eligibility letter is not a determination by the government that a crash involving the subject device will result in any particular outcome. It is limited to only the device's eligibility for Federal-aid reimbursement.

INTELLECTUAL PROPERTY

Issuance of this eligibility letter does not convey property rights of any sort nor any exclusive privilege. This letter is not authorization or consent by the government for the use, manufacture, or sale of any patented or proprietary system, device, design, product, or hardware for which the requester is not the patent owner. Eligibility letters are not an expression of any view, position, or determination by the government as to the validity, scope, or ownership of any intellectual property rights to a specific device. These letters do not grant, impute, suggest, or otherwise establish any ownership, distribution, or licensing rights to the requester. The government expresses no opinion about the intellectual property rights relating to any device for which this or any other eligibility letter is issued.

PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this Federal-aid eligibility letter is assigned FHWA control number B-379. It should only be reproduced in full with its attachment(s). This Federal-aid eligibility letter and the material offered by the requester supporting its issuance is public information. All eligibility letters and supporting material are subject to public disclosure under the Freedom of Information Act (FOIA). Eligibility letters are available to the public at

https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

If you have any questions please contact Aimee Zhang at Aimee.Zhang@dot.gov.

Sincerely,

A handwritten signature in blue ink that reads "Amy S. Fox". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Amy S. Fox
Acting Director
Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	8/28/2023	☐ New	☐ Resubmission
	Name:	Arthur Miles		
	Company:	EASI-SET Worldwide		
	Address:	5119 Catlett Rd., PO Box 400, Midland, VA 22728		
	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
'B': Rigid/Semi-Rigid Barriers (Roadside, Median, Bridge Railings)	☒ Physical Crash Testing ☐ Engineering Analysis	Low Profile Barrier	AASHTO MASH	TL2

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:	Arthur Miles	Same as Submitter ☒
Company Name	EASI-SET Worldwide	Same As Submitter ☒
Address:	5119 Catlett Rd., PO Box 400, Midland, VA 22728	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.		
Texas A&M Transportation Institute (TTI) was contracted by the EASI-SET Worldwide to perform full-scale crash testing of the Low Profile Barrier. There are no shared financial interests in the Low Profile Barrier by TTI, or between EASI-SET Worldwide, other than costs involved in actual crash tests and reports for this submission to FHWA.		

PRODUCT DESCRIPTION

☒ New Hardware or
Significant Modification ☐ Modification to
Existing Hardware

The installation consisted of 10 free-standing, unanchored low-profile portable concrete barrier segments, connected end-to-end with interlocking J-J Hooks connections. The J-Hook connection consists of interlocking 3/8-inch thick x 12-inch tall steel plates with the exposed ends bent 180° to a 3/8-inch inside radius to form a "J" hook with a 1 ½-inch long return. The barrier segments were 20 inches high, 28 inches wide at the top, 26 inches wide at the bottom, and 20 feet long. The total installation length was approximately 200 feet on concrete surface.

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:	Nauman Sheikh	
Engineer Signature:		Digitally signed by Sheikh, Nauman Date: 2024.04.30 14:24:35 -05'00'
Address:	1254 Avenue A, Bldg 7091, Bryan, Texas 77807	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
2-10 (1100C)	The results of the test conducted on October 21, 2022, are found in TTI Test Report No. 690900-JJH12. The test vehicle was traveling at a speed of 43.9 mi/h as it made contact with the Lowe profile Barrier at CIP at an impact angle of 25.3°. The Lowe Profile Barrier Transition contained and redirected the vehicle. The vehicle did not penetrate, underride, or override the installation. The vehicle did not cross the exit box. Maximum dynamic deflection of the rail during the test was 20.4 inches. Maximum permanent deformation was 20.0 inches. Working width was 48.4 inches. No detached elements, fragments, or other debris were present to penetrate, or to show potential for penetrating, the occupant compartment, or to present undue hazard for others in the area. The vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 11° and 5°, respectively. Longitudinal OIV was 17.3 ft/s and lateral OIV was 12.4 ft/s. Maximum longitudinal occupant ridedown acceleration was 4.8 g, and maximum lateral occupant ridedown acceleration was 5.3 g. Occupant risk factors were within the limits specified in MASH. There was no Occupant Compartment Deformation. The Low Profile Barrier performed acceptably for MASH test 2-11.	PASS
2-20 (1100C)	This device is not a transition, and this test is not relevant.	Non-Relevant Test, not conducted
2-21 (2270P)	This device is not a transition, and this test is not relevant.	Non-Relevant Test, not conducted

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 AM Transportation Institute	
Laboratory Signature:	Bill Griffith	 Digitally signed by Bill Griffith Date: 2024.04.30 11:35:04 -05'00'
Address:	1254 Avenue A, Bldg 7091, Bryan, Texas 77807	Same as Submitter ☐
Country:	USA	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, 2025	

Submitter Signature*: **Arthur X. Miles** Digitally signed by Arthur X. Miles
Date: 2024.05.01 11:08:35 -04'00'

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

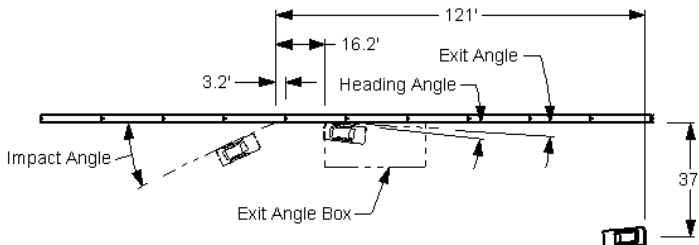
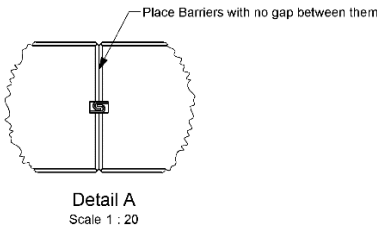
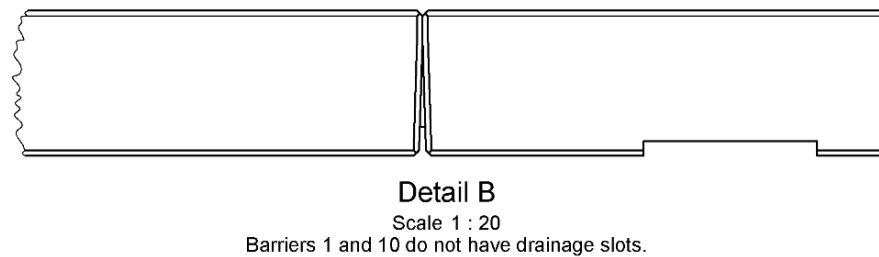
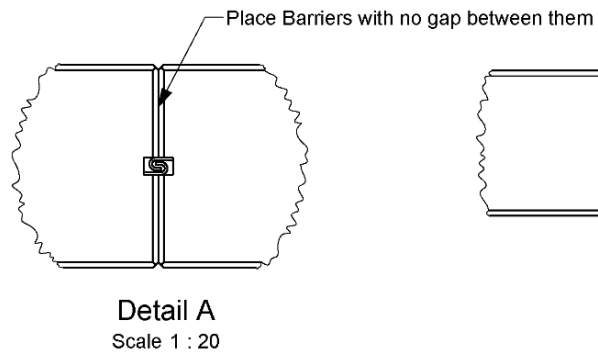
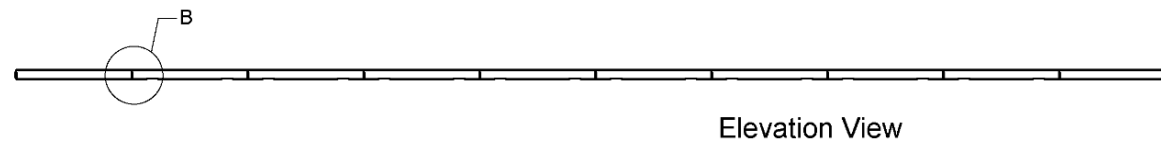
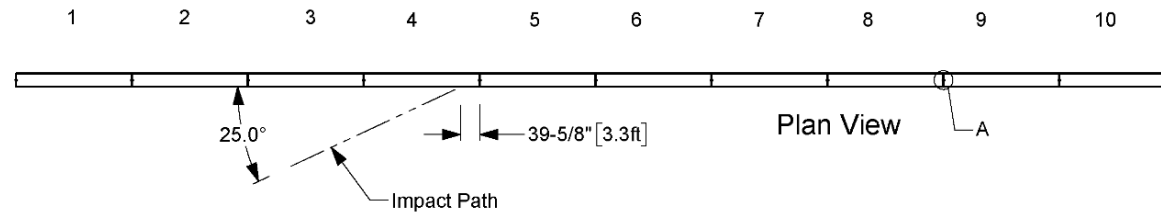
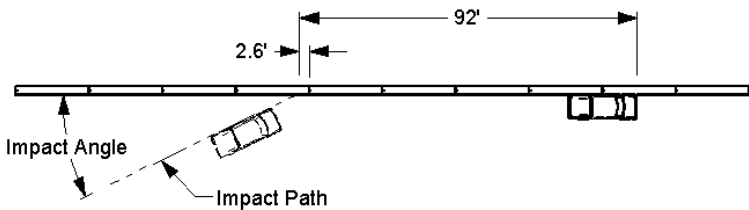
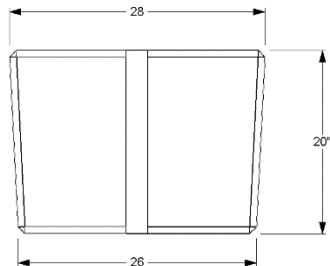
 0.000 s	Test Agency	Texas A&M Transportation Institute (TTI)					
	Test Standard/Test No.	MASH 2016, Test 2-10					
 0.200 s	TTI Project No.	690900-JJH14					
	Test Date	2023-07-06					
 0.400 s	TEST ARTICLE						
	Type	Longitudinal Barrier					
	Name	Low-Profile Barrier with J-J Hooks Connections					
	Length	200 feet					
	Key Materials	Low profile concrete barriers, JJ-Hook connections					
	Soil Type and Condition	Concrete, damp					
	TEST VEHICLE						
	Type/Designation	1100C					
	Year, Make and Model	2017 Nissan Versa					
	Inertial Weight (lb)	2432					
Dummy (lb)	165						
Gross Static (lb)	2597						
 0.600 s	IMPACT CONDITIONS						
	Impact Speed (mi/h)	44.4					
	Impact Angle (deg)	25.2					
	Impact Location	38.6 inches upstream from the center of the joint between barriers 4 and 5					
	Impact Severity (kip-ft)	29.1					
	EXIT CONDITIONS						
	Exit Speed (mi/h)	28.2					
	Trajectory/Heading Angle (deg)	5.9 / 3.5					
	Exit Box Criteria	Vehicle crossed the exit box a 71 ft downstream from loss of contact.					
	Stopping Distance	121 ft downstream 37 ft to the traffic side					
	TEST ARTICLE DEFLECTIONS						
	Dynamic (inches)	8.4					
	Permanent (inches)	8					
	Working Width / Height (inches)	36.4 / 20					
	VEHICLE DAMAGE						
	VDS	11LFQ4					
	CDC	11FLEN2					
	Max. Ext. Deformation (inches)	10					
	Max Occupant Compartment Deformation	No occupant compartment deformation					
OCCUPANT RISK VALUES							
Long. OIV (ft/s)	19.4	Long. Ridedown (g)	4	Max 50-ms Long. (g)	-10.7	Max Roll (deg)	4.2
Lat. OIV (ft/s)	-18.4	Lat. Ridedown (g)	6.7	Max 50-ms Lat. (g)	10.9	Max Pitch (deg)	5.5
THIV (m/s)	8.2	ASI	1.6	Max 50-ms Vert. (g)	-3	Max Yaw (deg)	99.3
							

Figure 5.11. Summary of Results for MASH Test 2-10 on Low Profile Barrier with J-J Hooks Connections.

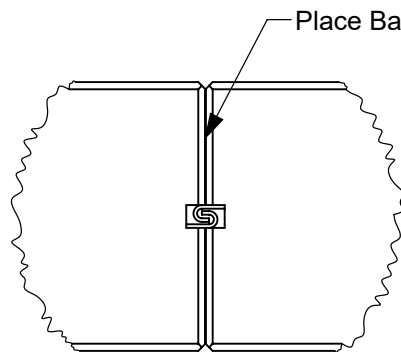
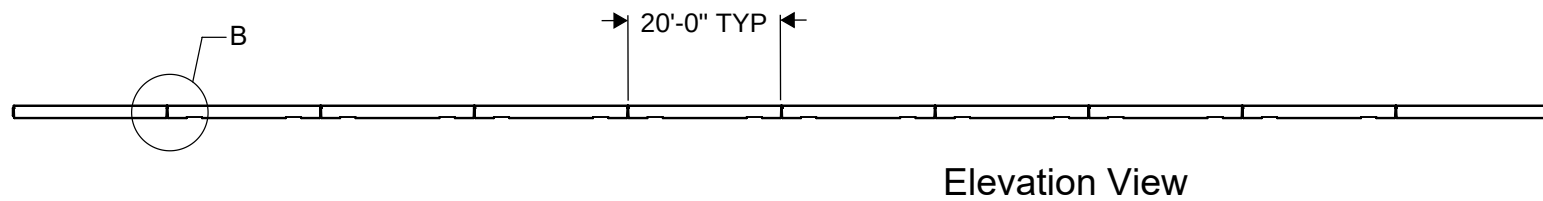
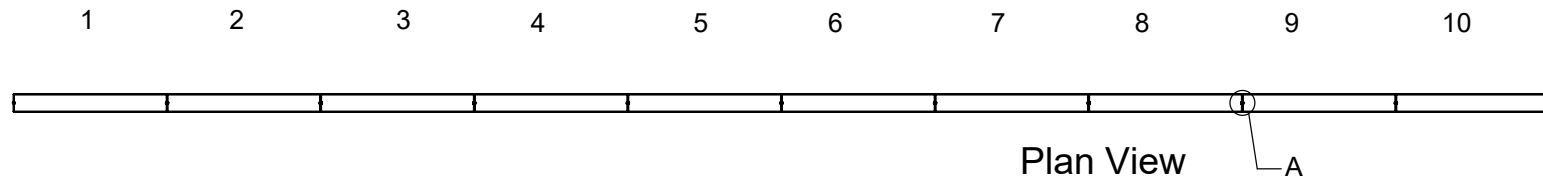
Test Installation



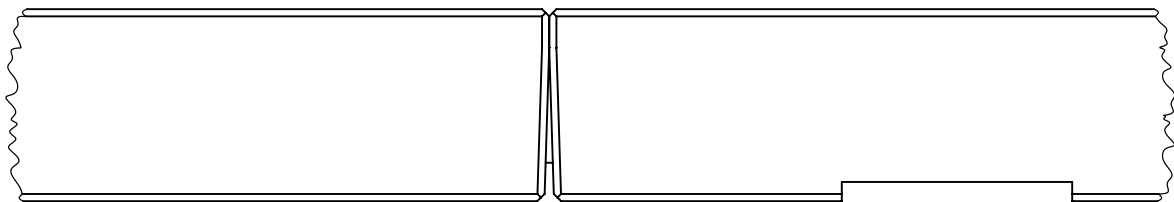
		Roadside Safety and Physical Security Division - Proving Ground
Project #690900-JJH-14 JJ Hooks Low Profile Barriers		2023-06-15
Drawn by GES	Scale 1:300	Sheet 1 of 1 Test Installation

 0.000 s	Test Agency	Texas A&M Transportation Institute (TTI)					
	Test Standard/Test No.	MASH 2016, Test 2-11					
	TTI Project No.	690900-JJH-12					
	Test Date	2022-10-21					
 0.200 s	TEST ARTICLE						
	Type	Longitudinal Barrier					
	Name	Low-Profile Portable Barrier with J-J Hooks Connections					
	Length	200 feet					
 0.400 s	Key Materials	20-foot Low-Profile Portable Barriers × 10					
	Soil Type and Condition	Concrete, wet (on the traffic side)					
	TEST VEHICLE						
	Type/Designation	2270P					
 0.600 s	Year, Make and Model	2017 RAM 1500					
	Inertial Weight (lb)	5025					
	Dummy (lb)	N/A					
	Gross Static (lb)	5025					
IMPACT CONDITIONS							
Impact Speed (mi/h)	43.9						
Impact Angle (deg)	25.3						
Impact Location	2.6 ft upstream of the center of the joint between barriers 4 and 5						
Impact Severity (kip-ft)	59.1						
EXIT CONDITIONS							
Exit Speed (mi/h)	Vehicle did not exit installation						
Trajectory/Heading Angle (deg)	Vehicle did not exit installation						
Exit Box Criteria	Did not cross						
Stopping Distance	92 ft downstream Left side of vehicle against barrier						
TEST ARTICLE DEFLECTIONS							
Dynamic (inches)	20.4						
Permanent (inches)	20						
Working Width / Height (inches)	48.4 / 20						
VEHICLE DAMAGE							
VDS	11FLQ2						
CDC	11FLEN2						
Max. Ext. Deformation (inches)	9						
Max Occupant Compartment Deformation	No occupant compartment deformation						
OCCUPANT RISK VALUES							
Long. OIV (ft/s)	17.3	Long. Ridedown (g)	4.8	Max 50-ms Long. (g)	-10.3	Max Roll (deg)	11
Lat. OIV (ft/s)	12.4	Lat. Ridedown (g)	5.3	Max 50-ms Lat. (g)	7.8	Max Pitch (deg)	5
THIV (m/s)	6.5	ASI	1.3	Max 50-ms Vert. (g)	-2.8	Max Yaw (deg)	31
							

Test Installation



Detail A
Scale 1 : 20



Detail B
Scale 1 : 20
Barriers 1 and 10 do not have drainage slots.



Roadside Safety and
Physical Security Division -
Proving Ground

Project #690900-JJH-14 JJ Hooks Low Profile Barriers

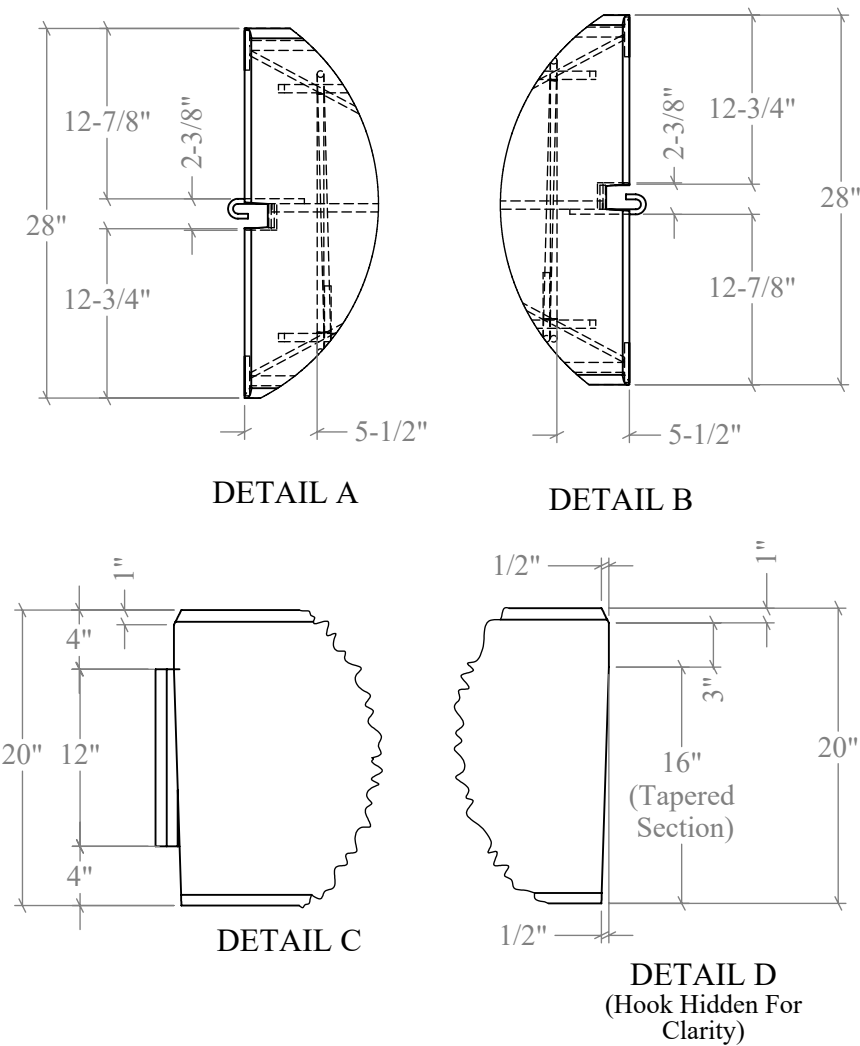
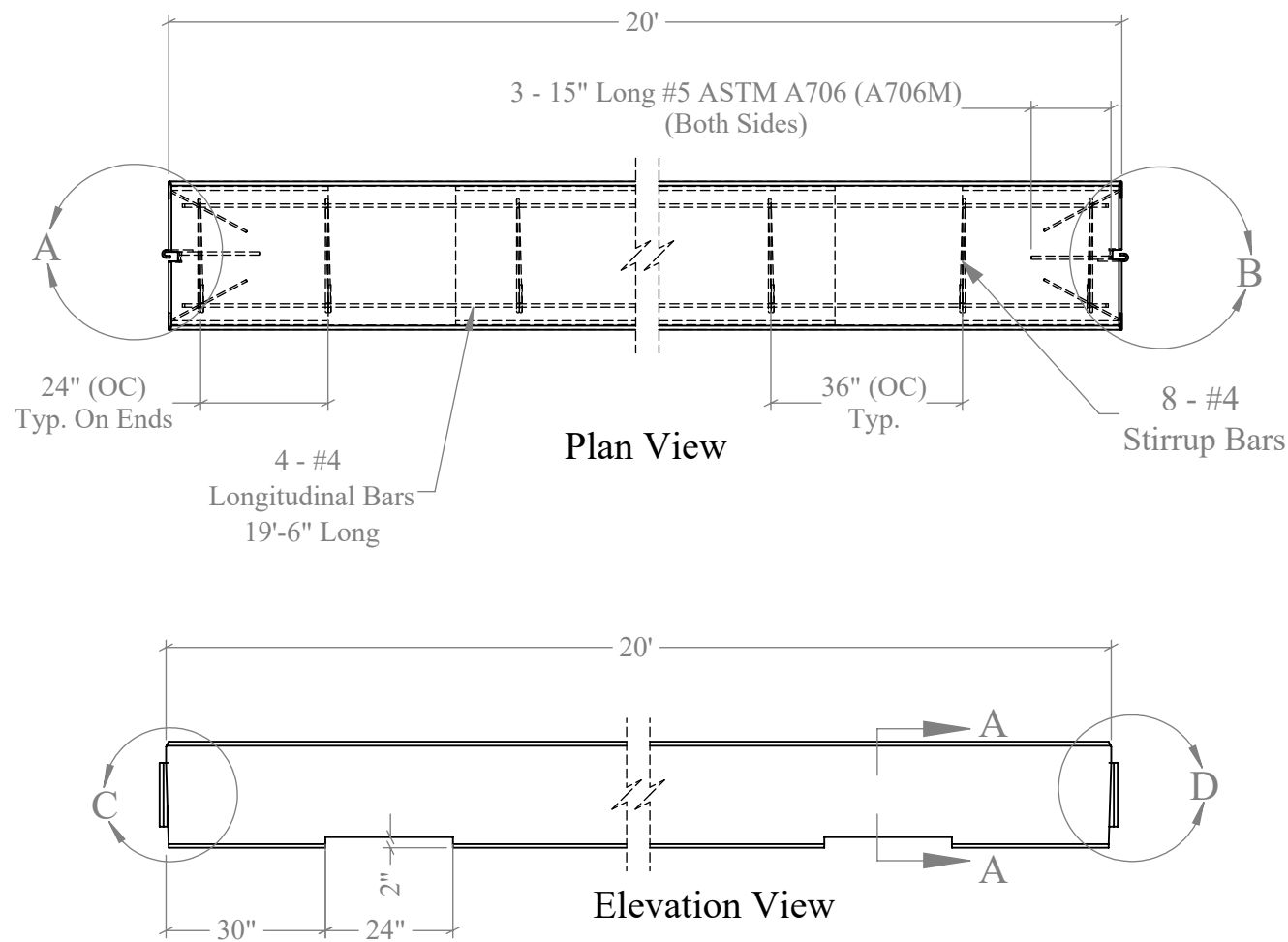
2023-06-15

Drawn by GES

Scale 1:300

Sheet 1 of 1 Test Installation

J-J Hook Low Profile Concrete Barrier (LPCB)



General Notes And Specifications

Specifications:
AASHTO: American Association of Highway and Transportation Officials
AISC: American Institute of Steel Construction
ASNT: American Society for Nondestructive Testing
ASTM E165 Standard Test Method For Liquid Penetrant Examination

Materials:

Concrete: Class AA concrete 4000 PSI (34 MPa) minimum compressive strength in 28 days.

Reinforcing:

Rebar: ASTM A706 (A706M) grade 60 OR dual certified meeting ASTM A615 GR. 60 rebar (rebar welded to steel).
ASTM A615 GR. 60.
Producers option to use lifting devices, chairs, spacers, or miscellaneous rebar to secure cage in form & handling as needed.

Steel: ASTM A-36 (A-36M) minimum (plain/mill finish).
Optional - galvanize J-J Hooks as required

Welding: AWS D1.1 Structural Welding Code-Steel
AWS D1.4 Structural Welding Code-Reinforcing Steel

Tolerances:
Connector Location +/- 1/16" (1.6mm)
Connector Plate Size + 1/8" (3.2mm)
Barrier Length + 1/4" (6.4mm) or per agency product specification
Min 1-1/4" steel cover

Design: MASH TL-2

Rebar lengths shown will vary depending on overall barrier length

Drainage slots may vary in size and location depending on state DOT standards

Installation: Barrier segment ends must be installed in closed position as shown on sheet 2.

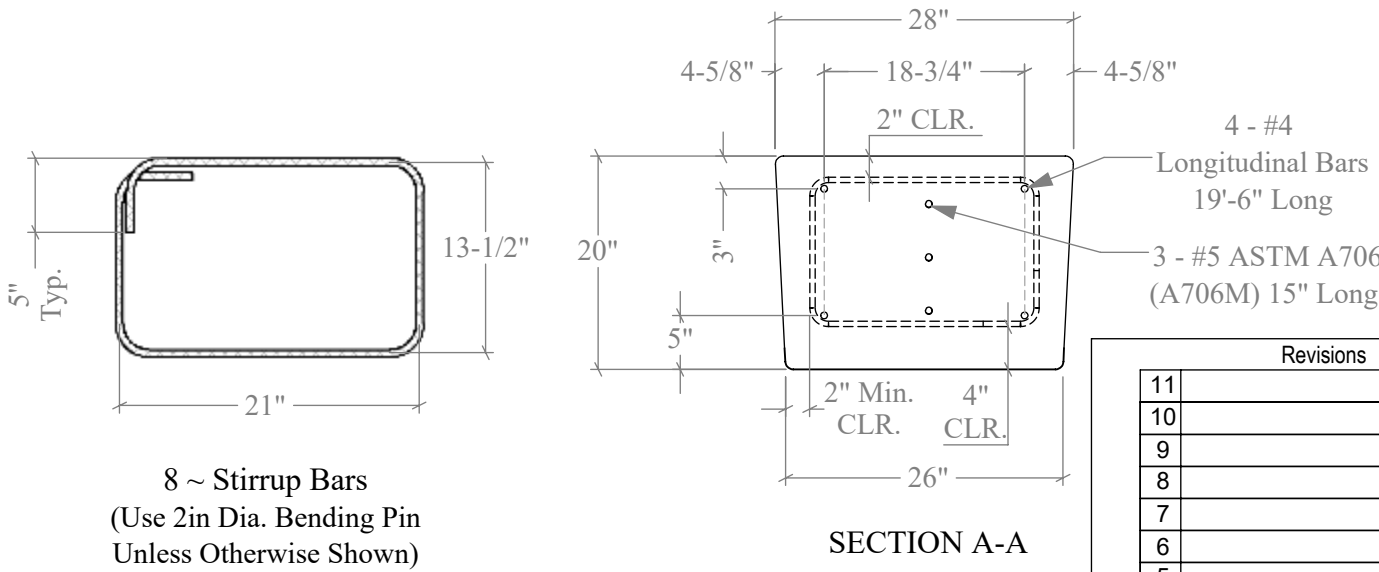
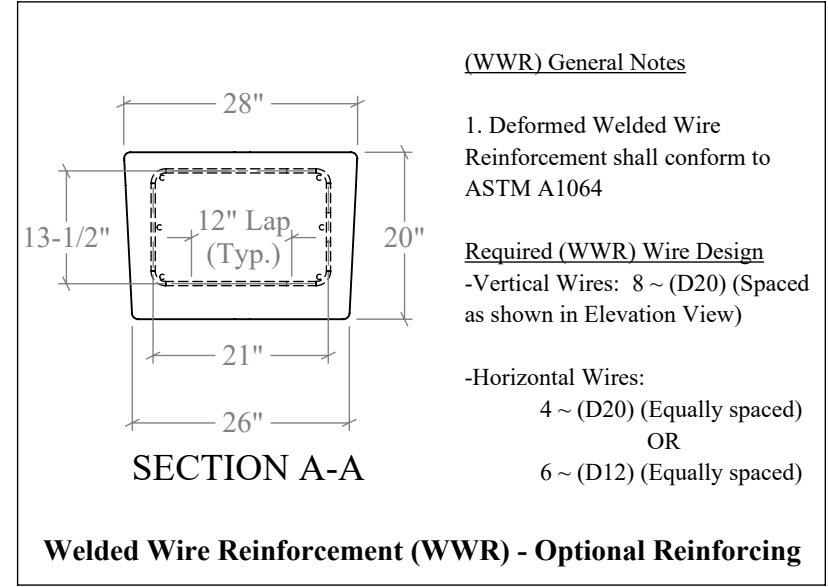
A transition piece between a J-J Hook Barrier and another successfully tested connection is acceptable

Notice: This product contains proprietary features which are protected by intellectual property rights under the laws of any jurisdiction

Provide barrier edges with a chamfer or a tooled radius as required.

Welded Wire Reinforcement (WWR) may be used in lieu of conventional reinforcement, and shall meet the requirements shown or equivalent.

Deflection:
Static Deflection = NA
Dynamic Deflection = NA

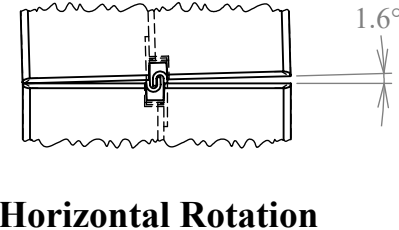
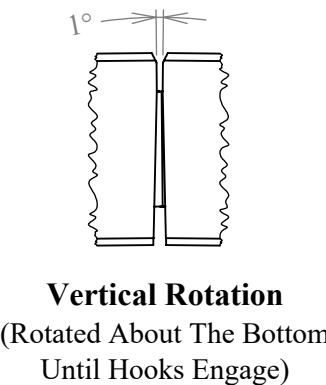
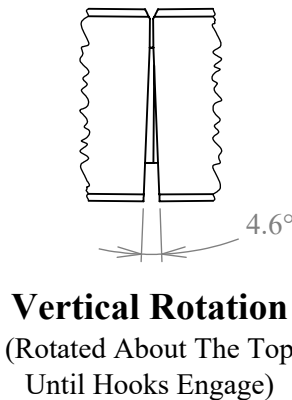
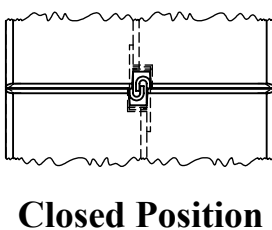
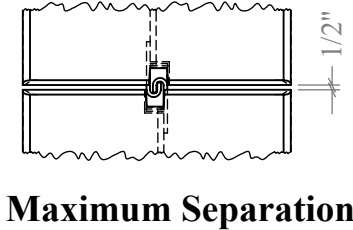
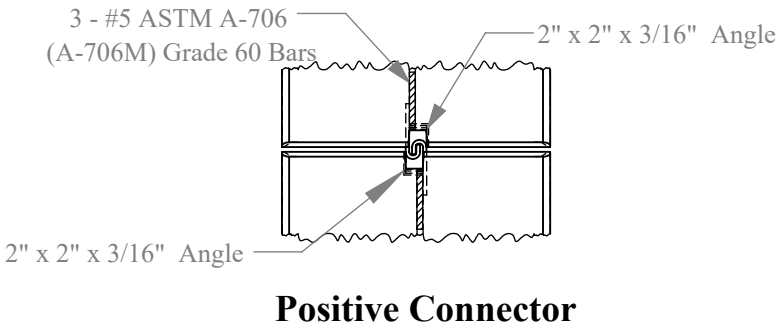
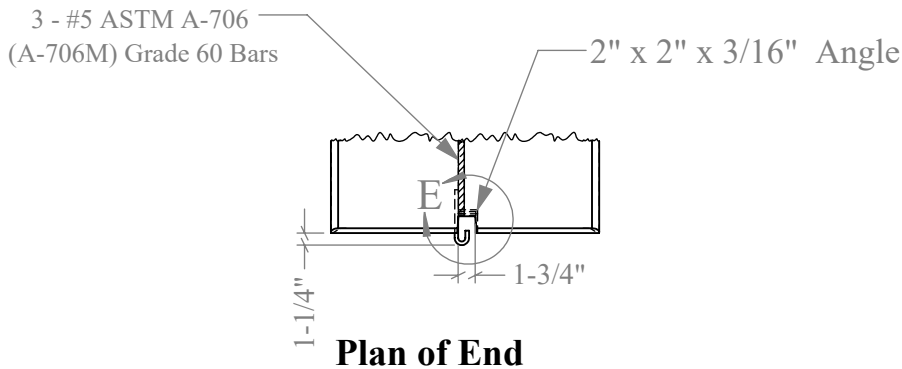
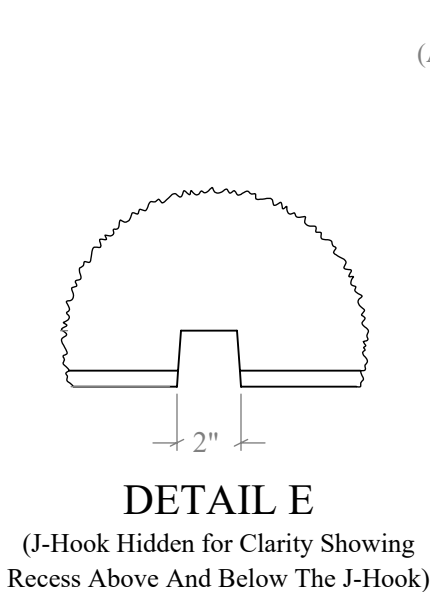
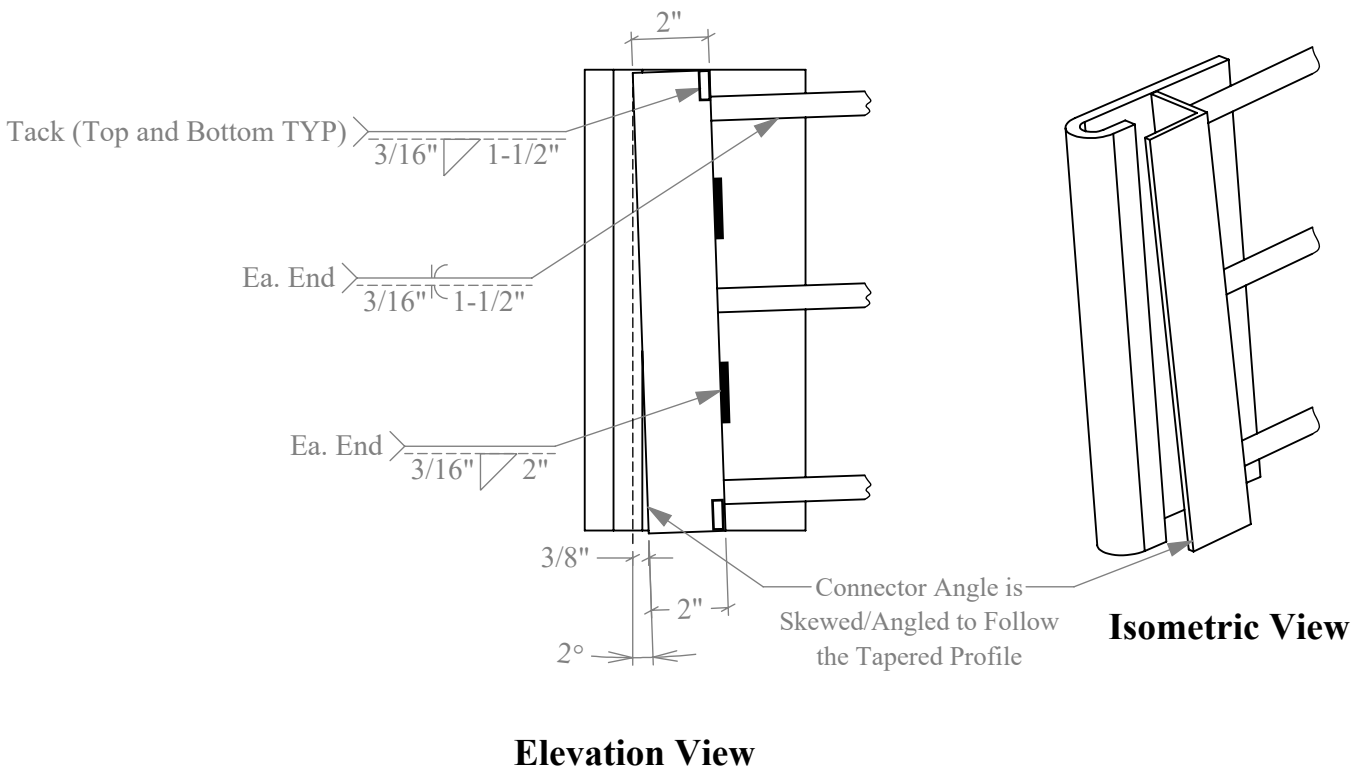
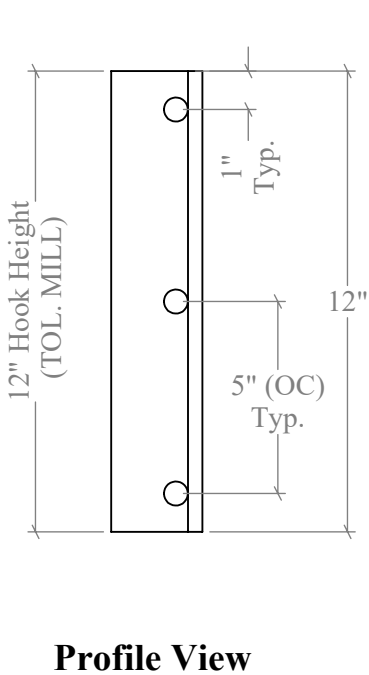
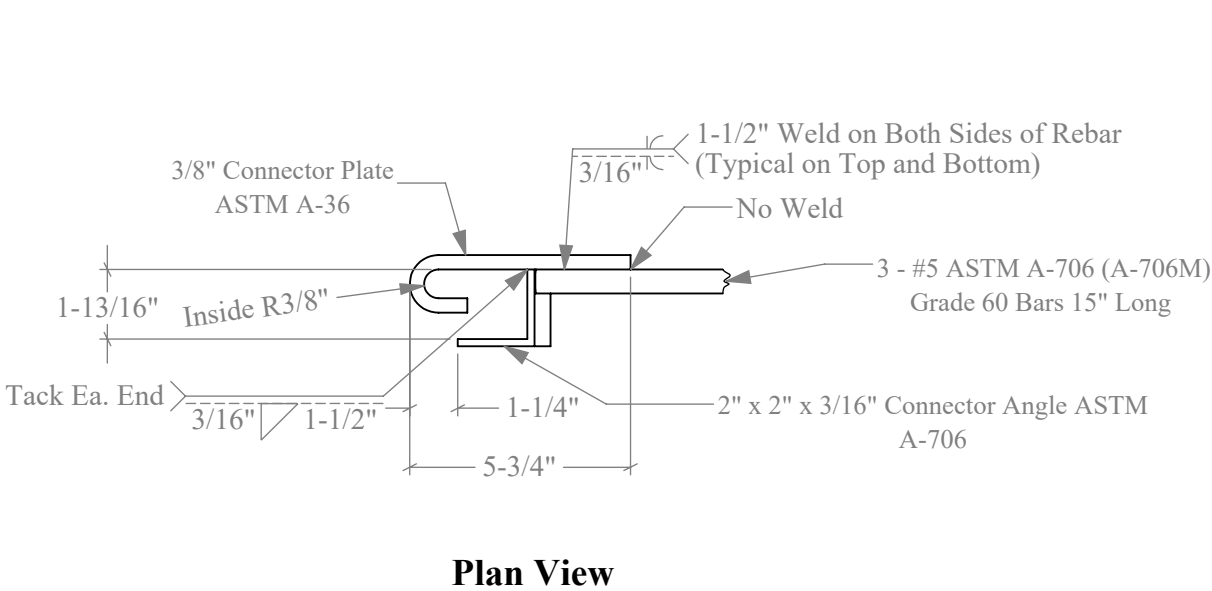


QTY	Material List
4	Deflection Limiters Per Barrier
2	J-Hook Connector Plates (with 1'-3" rebar welded to each)
8	#4 Stirrups Per Barrier
4	#4 Longitudinal Bars 19'-6" Long
1	WWF (see Section View A-A)

Concrete CY: 2.69
Weight: 10,900 lbs

Revisions		EASI SET WORLDWIDE	
11		5119 Catlett Rd., - Midland, VA 22728 - info@EasiSet.com	
10		www.EasiSet.com - 800-547-4045 - Fax 540-4392541	
9		APPROVED PLANT	
8		MANUFACTURER	
7		J-J HOOKS LOW-PROFILE CONCRETE BARRIER (MASH)	Ref. No.
6			Last Rev.
5			
4		DWG No. -	JOB No. --
3		DRAWN BY: TDS	DATE: 7/25/2022
2		CHECKED BY: SMM	DATE: 7/25/2022
1		APPROVED BY:	DATE:

J-J Hook LPCB - Component Details



Revisions		EASI SET WORLDWIDE 5119 Catlett Rd.,- Midland, VA 22728 - info@EasiSet.com www.EasiSet.com - 800-547-4045 - Fax 540-4392541		EASI-SET® WORLDWIDE		
11		APPROVED PLANT MANUFACTURER				
10						
9						
8						
7		J-J HOOKS LOW-PROFILE CONCRETE BARRIER (MASH)		Ref. No.		
6				Last Rev.		
5						
4						
3		DWG No. -		JOB No. --		
2		DRAWN BY: TDS		DATE: 7/25/2022		SHEET
1		CHECKED BY: SMM		DATE: 7/25/2022		
		APPROVED BY:		DATE:		2 / 2