U.S. Department
of Transportation
Federal Highway Administration

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

March 27, 2014

In Reply Refer To:
HSST/B-249

Mr. William Williams
Texas A&M Transportation Institute (TTI)
3135 TAMU
College Station, Texas 77843

Dear Mr. Williams:

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: Gravix Barrier/Retaining Wall System
Type of system: Longitudinal Barrier
Test Level: AASHTO MASH TL4
Testing conducted by: Texas A&M Transportation Institute (TTI)
Task Force 13 Designator: SGR50
Date of request: December 23, 2013
Date of completed package: March 18, 2014

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

- Gravix Barrier/Retaining Wall System

Based on a review of crash test results you submitted 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.

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-249 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 issues, if any, are to be resolved by the applicant.

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 20, 2013	◉ New ○ Resubmission
	Name:	William Williams	Signature:
	Company:	Texas A&M Transportation Institute	
	Address:	3135 TAMU, College Station, texas 77843-3135	
	Country:	United States	
	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.

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Barriers (Roadside, Median, Bridge Railings)	◉ Physical Crash Testing ○ FEA & V&V Analysis	Gravix Barrier/Retaining Wall System	AASHTO MASH	TL4

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:	Thomas Rainey	Same as Submitter ☐
Company Name:	Earth Wall Products	Same as Submitter ☐
Address:	1427 Walcutt's Way, Marietta, GA 30064	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐

PRODUCT DESCRIPTION

New Hardware
Gravix Traffic Barrier is the upper most section of the retaining wall system Gravix that can be used as a roadside barrier above a retaining wall or used alone to contain and redirect vehicles. The Gravix Traffic Barrier uses a moment cantilever that extends under the pavement and triangular in shape to capture resistance from the pavement subgrade materials. Made of precast reinforced concrete, the units are manufactured in a controlled facility to produce high quality materials without site forming and pouring issues. The Gravix Traffic Barrier interconnects using a tongue and groove with adjacent units to distribute loading and maintain alignment.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
4-10 (1100C)	Did not perform Test 4-10 based on prior testing	WAIVER REQUESTED
4-11 (2270P)	Did not perform Test 4-11 based on prior testing	WAIVER REQUESTED

Required Test Number	Narrative Description	Evaluation Results
4-12 (36000V)	MASH TEST 4-12 (SIngle Unit Truck) was performed on Gravix Barrier System	PASS
4-20 (1100C)		
4-21 (2270P)		
4-22 (10000S)		

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:	William Williams, P.E.	Same as Submitter ☐
Address:	Texas A&M Transportation Institute, 3135 TAMU, College Station, Texas 77843-3135	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐
Accreditation Certificate Number and Date:	A2LA Certificate Number: 2821.01, Valid to April 30, 2015	

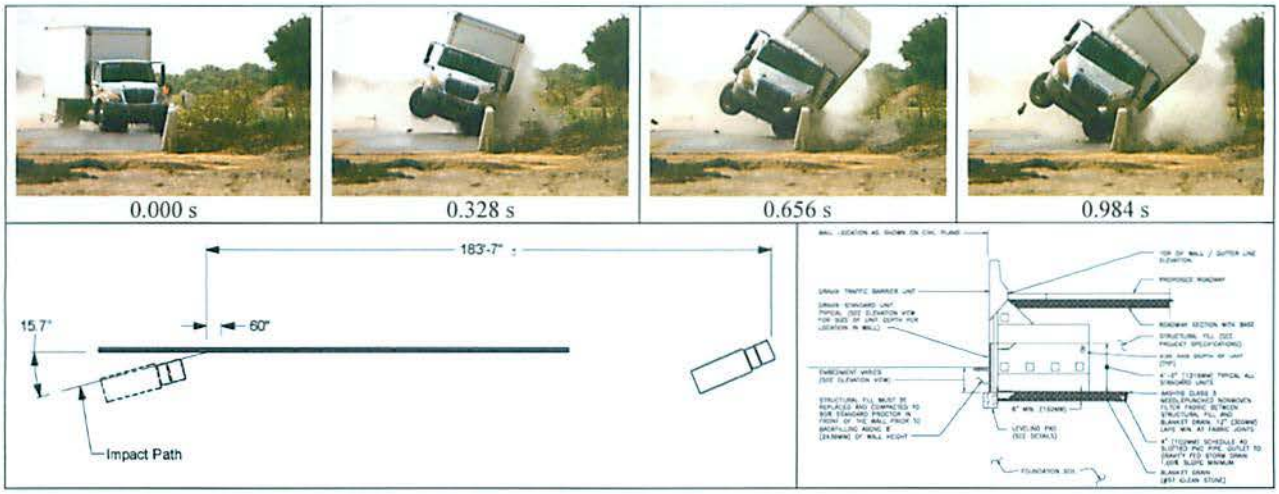
ATTACHMENTS

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-249	March 19, 2014	SGR50	retaining wall system. MASH TL4, precast reinforced concrete



General Information
- Test Agency: Texas A&M Transportation Institute (TTI)
- Test Standard Test No.: MASH Test 4-12
- TTI Test No.: 510602-EWP1
- Date: 2013-10-01

Test Article
- Type: Longitudinal Barrier
- Name: Gravix Impact Wall
- Installation Length: 152 ft 6¾ inches
- Material or Key Elements: Nineteen 8-ft wide (face width) × 7-ft tall × 8-ft deep stem Gravix single slope traffic barrier units

Soil Type and Condition: Mechanically Stabilized Earth, Dry

Test Vehicle
- Type/Designation: 10000S
- Make and Model: 2006 International 4200
- Curb: 13,740 lb
- Test Inertial: 22,000 lb
- Dummy: No dummy
- Gross Static: 22,000 lb

Impact Conditions
- Speed: 57.3 mi/h
- Angle: 15.7 degrees
- Location/Orientation: 6 ft dwnstrm 5-6

Impact Severity: 176.8 kip-ft

Exit Conditions
- Speed: Not obtainable
- Angle: Not obtainable

Occupant Risk Values
- Impact Velocity
  - Longitudinal: 7.9 ft/s
  - Lateral: 14.1 ft/s
- Ridedown Accelerations
  - Longitudinal: 3.6 G
  - Lateral: 5.2 G
- THIV: N/A
- PHD: N/A
- ASI: 0.61
- Max. 0.050-s Average
  - Longitudinal: -1.8 G
  - Lateral: 5.2 G

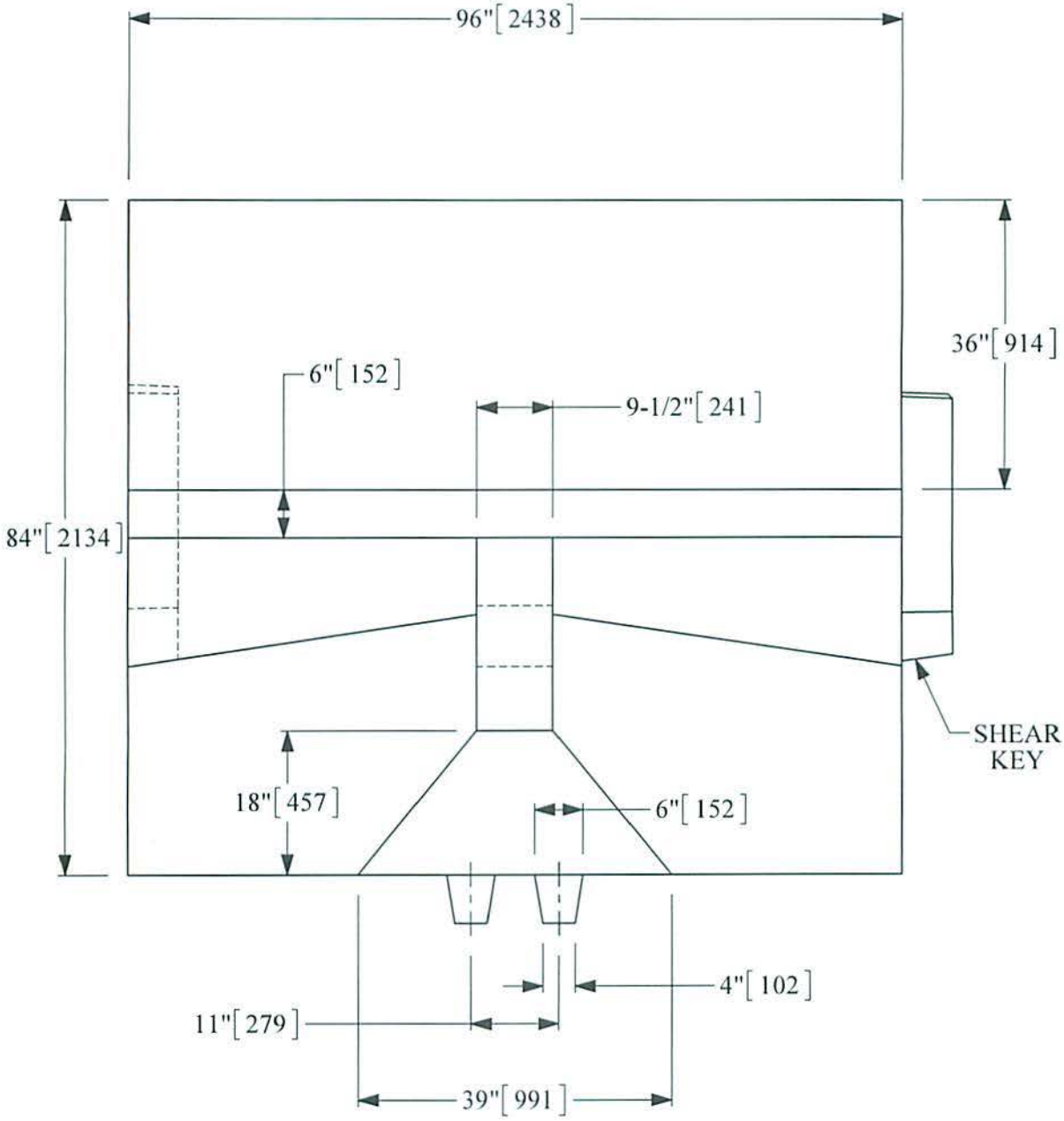
Post-Impact Trajectory
- Stopping Distance: 183.6 ft dwnstrm

Vehicle Stability
- Maximum Yaw Angle: Malfunction
- Maximum Pitch Angle: Malfunction
- Maximum Roll Angle: 42 degrees (film)
- Vehicle Snagging: No
- Vehicle Pocketing: No

Test Article Deflections
- Dynamic: Not obtainable
- Permanent: 1.25 inches
- Working Width: Not obtainable
- Vehicle Intrusion: 101.1 inches

Vehicle Damage
- VDS: NA
- CDC: 11FLEW3
- Max. Exterior Deformation: 16 inches
- OCDI: LF0300000
- Max. Occupant Compartment Deformation: 11.2 inches

Figure 5.7. Summary of Results for *MASH* Test 4-12 on Gravix Impact Wall.



FRONT VIEW

2012

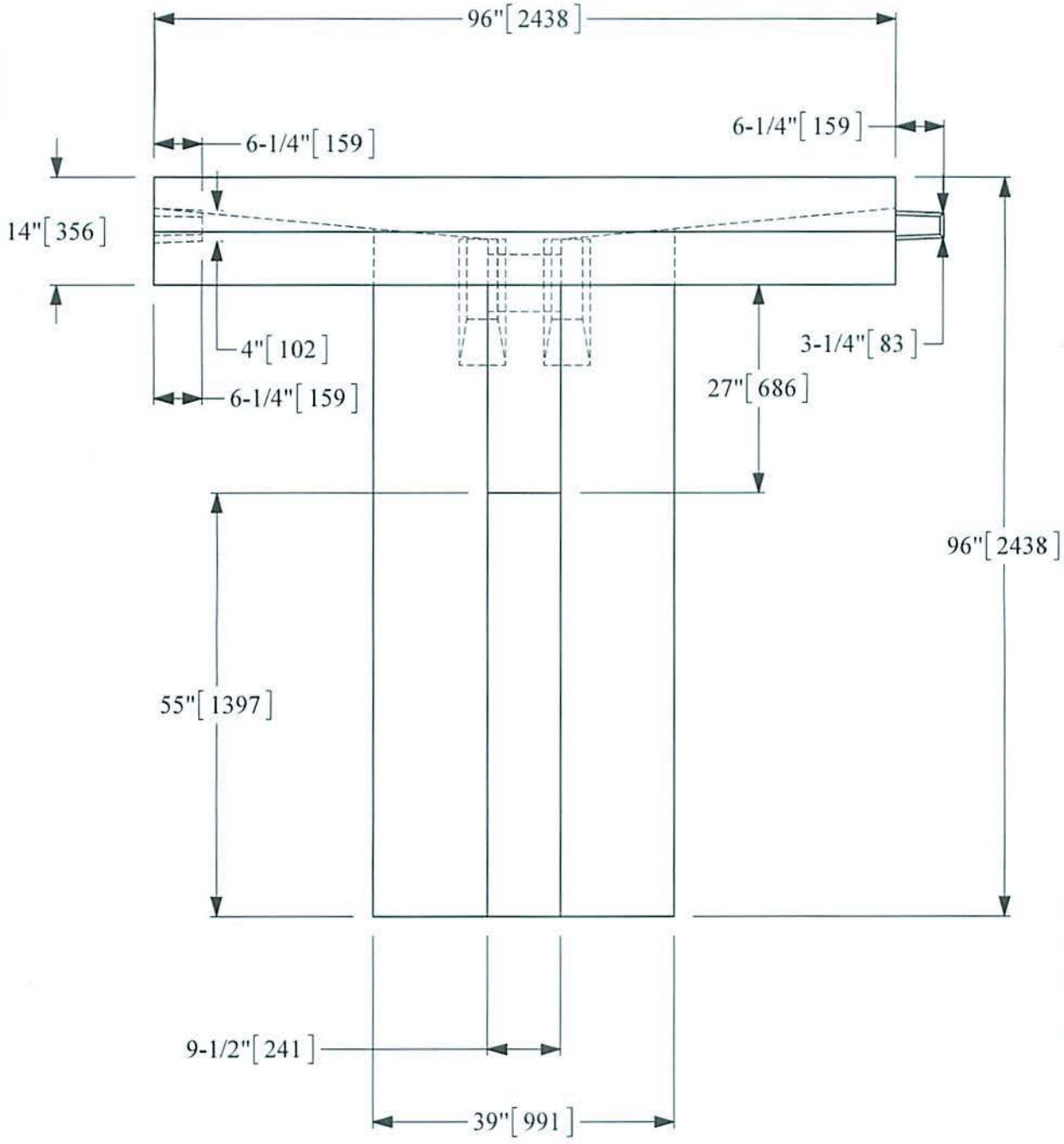
GRAVIX TL-4 BARRIER UNIT

GRAVIX
DOT Precast Wall System

EARTH WALL PRODUCTS

XXX00

SHEET NO.	DATE
1 of 4	2013-12-16



TOP VIEW

2012

GRAVIX TL-4 BARRIER UNIT

GRAVIX
DOT Precast Wall System

EARTH WALL PRODUCTS

XXX00

SHEET NO.	DATE
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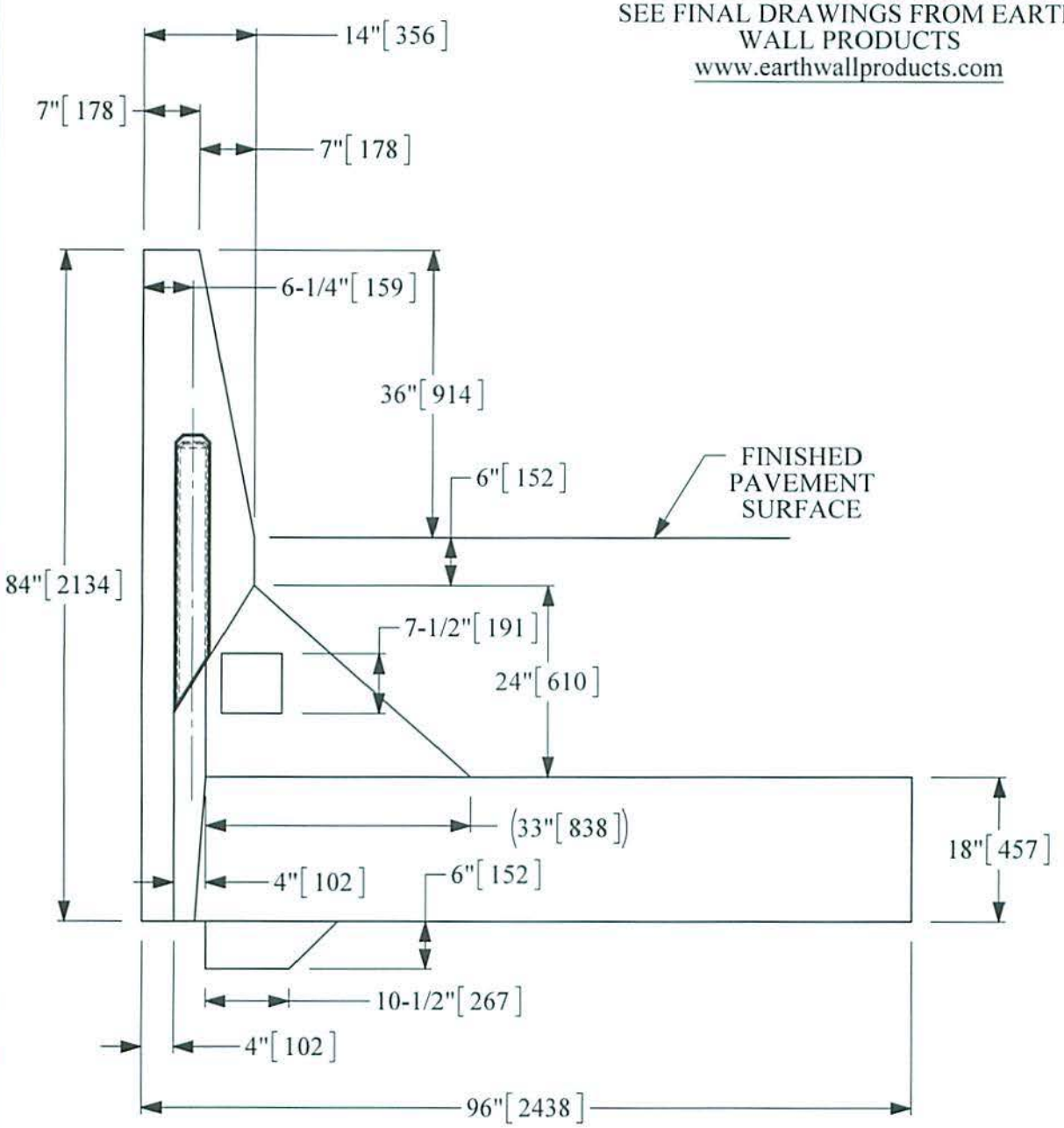
CONCRETE STRENGTH: 5000 psi

UNIT WEIGHT: 10,200 LBS. APPROX.

FOR ADDITIONAL INFOR. PLEASE SEE FINAL DRAWINGS FROM EARTH WALL PRODUCTS
www.earthwallproducts.com



SIDE VIEW

2012

GRAVIX TL-4 BARRIER UNIT

GRAVIX
DOT Precast Wall System

EARTH WALL PRODUCTS

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SHEET NO.	DATE
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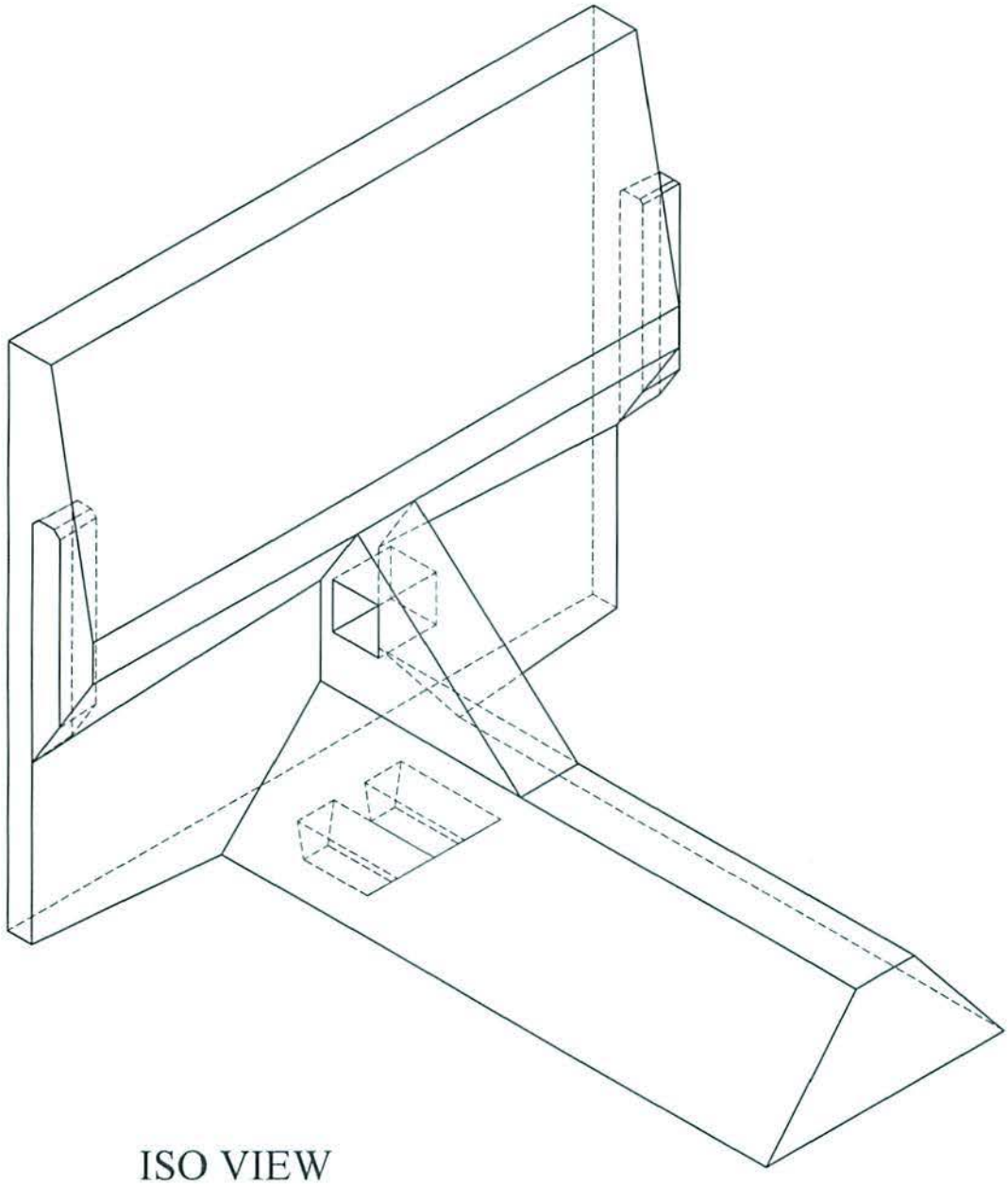

ISO VIEW

2012

GRAVIX TL-4 BARRIER UNIT

GRAVIX
DOT Precast Wall System

EARTH WALL PRODUCTS

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SHEET NO.	DATE
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