



ENERGITE® III

CRASH CUSHIONS

PRODUCT MANUAL



PN 627702

AUGUST 2022

Energite® III

The Energite® III has been tested pursuant to American Association of State Highway and Transportation Officials (“AASHTO”) Manual for Assessing Safety Hardware (“MASH”) specifications. The Energite® III has been deemed eligible for federal-aid reimbursement on the National Highway System by the Federal Highway Administration (“FHWA”).

Product Description Assembly Manual



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Addison, Texas 75001



Warning: The local highway authority, distributors, owners, contractors, lessors, and lessees are **RESPONSIBLE** for the assembly, maintenance, and repair of the Energite® III. Failure to fulfill these **RESPONSIBILITIES** with respect to the assembly, maintenance, and repair of the Energite® III could result in serious injury or death.



Important: These instructions are for standard assembly specified by the appropriate highway authority. In the event the specified system assembly, maintenance, or repair would require a deviation from standard assembly parameters, contact a Valtir representative. This system has been deemed eligible by the FHWA for use on the national highway system under strict criteria utilized by that agency.

This manual must be available to the worker overseeing and/or assembling the product at all times. For additional copies, contact Valtir at (888) 323-6374 or visit [Valtir.com/Products](https://www.valtir.com/Products).

The information contained in this manual supersedes all previous versions. The instructions, illustrations, and specifications are based on the latest Energite® III information available to Valtir at publication. We reserve the right to make changes at any time. Please visit [Valtir.com](https://www.valtir.com) to confirm the latest revision.

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Customer Service Contacts

Valtir is committed to the highest level of customer service. Feedback regarding the Energite® III, its assembly procedures, supporting documentation, and performance are always welcome. Additional information can be obtained from the contact information below:

Valtir:

Telephone	(888) 323-6374 (214) 589-8140 (International)
Contact link	Valtir.com/Contact

Important Introductory Notes

Proper assembly of the Energite® III is essential to achieve performance of the system under appropriate federal and state criteria. These instructions should be read in their entirety and understood before assembling the Energite® III. These instructions are to be used only in conjunction with the assembly of the Energite® III and are for standard assemblies only as specified by the applicable highway authority. In the event your system assembly requires or involves deviation from standard parameters or, during the assembly process a question arises, please contact the appropriate highway authority that specified this system at this particular location for guidance. Valtir is available for consultation with that agency. These instructions are intended for an individual who is qualified to both read and accurately interpret them as written. They are intended for the individual who is experienced and skilled in the assembly of highway products which are specified and selected by the highway authority.



Important: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the Energite® III. Failure to follow this warning can result in serious injury or death to workers and/or bystanders. It further compromises the acceptance of this system by the FHWA. Please keep these instructions for later use.



Warning: It is the responsibility of the installer to ensure that all of the Energite® III Danger, Warning, Caution, and Important statements are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

Safety Rules for Assembly

*** Important Safety Instructions ***

This manual must be kept in a location where it is readily available to persons who are skilled and experienced in the assembly, maintenance, or repair of the Energite® III. Additional copies of this manual are available from Valtir by calling (888) 323-6374 or by visiting Valtir.com/Product. Please contact Valtir if you have any questions concerning the information in this manual or about the Energite® III.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the Energite® III components. Gloves, safety goggles, safety-toe shoes, and back protection must be used.

Safety measures incorporating traffic control devices specified by the highway authority must be used to provide safety for personnel while at the assembly, maintenance, or repair site.

Safety Symbols

This section describes the safety symbols that appear in this Energite® III manual. Read entire manual for complete safety, assembly, operating, maintenance, repair, and service information.

<u>Symbol</u>	<u>Meaning</u>
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Safety Alert Symbol: Indicates Danger, Warning, or Caution. Failure to read and follow the Danger, Warning, Safety, or Caution indicators could result in serious injury or death to the workers and/or bystanders.



Warning: Do not assemble, maintain, or repair the inertial barrier system until you have read this manual thoroughly and completely understand it. Ensure that all Warnings, Cautions, and Important statements within the manual are completely followed. Please call Valtir at (888) 323-6374 if you do not understand these instructions. Failure to follow this warning could result in serious injury or death.



Warning: Do NOT modify the inertial barrier system in any way. Failure to follow this warning could result in serious injury or death in the event of a collision.

Limitations and Warnings

Pursuant to MASH “Manual for Assessing Safety Hardware” and the AASHTO Roadside Design Guide, Valtir contracts with FHWA approved testing facilities to perform and evaluate crash tests to prepare a crash test results report. Valtir is then able to submit a Request for Federal Aid Reimbursement of Safety Hardware Devices to the FHWA for review.

The Energite® III has been deemed eligible by FHWA as meeting the requirements and guidelines of MASH. These tests evaluate product performance defined by AASHTO involving lightweight cars (approx. 2420 lb. [1100 kg]), mid-weight cars (approx.. 3300 lb. [1500 kg]), and full size pickup trucks (approx. 5000 lb. [2270 kg]). A product can be certified for multiple Test Levels. The Energite® III is certified to the Test Level(s) as shown below:

Test Level 3: 62 mph [100 kph]



Important: Arrays for different design speeds may be specified by your state or local engineer.

These AASHTO directed tests are not intended to represent the performance of systems when impacted by every vehicle type or every impact condition existing on the roadway. This system is tested only to the test matrix criteria of MASH as approved by FHWA.

Valtir expressly disclaims any warranty or liability for injury or damage to persons or property resulting from any impact, collision or harmful contact with products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were assembled in consultation with Valtir or by third parties.

The Energite® III is intended to be assembled, delineated, and maintained within specific state and federal guidelines. It is important for the highway authority specifying the use of a highway product to select the most appropriate product configuration for site specifications. The customer should be careful to properly select, assemble, and maintain the product. Careful evaluation of site layout, traffic speed/type, direction, and visibility are some of the elements that require evaluation by the highway authority in the selection of a highway product. For example, curbs could cause an untested effect on an impacting vehicle.

After an impact occurs, the debris from the impact should be removed from the area immediately and the specified highway product should be evaluated and restored to its original specified condition or replaced as the highway authority determines as soon as possible.



Warning: It is the responsibility of the installer to ensure all safety measures incorporating appropriate traffic control devices specified by the highway authority are used to protect all personnel while at the assembly, maintenance, or repair site. Failure to follow this warning could result in serious injury or death.



Warning: Do not assemble, maintain, or repair the Energite® III until you have read this manual thoroughly and completely understand it. Ensure that all Danger, Warning, Caution, and Important statements within the manual are completely followed. Please contact Valtir if you do not understand these instructions (p. 3).

Important Introductory Notes

Proper deployment and maintenance of the Energite® III is critical to achieve performance under appropriate state and federal guidelines. Take the time to review this manual including the Limitations and Warnings section thoroughly before performing the necessary work. Do not attempt to assemble Energite® III without the proper plans and this manual. Contact the Valtir Customer Service Department if you require additional information (p. 3).

System Overview

The Energite® III is a non-redirective, easy-to-assemble crash cushion consisting of a number of sand-filled modules that are assembled in a specific geometric array in front of a roadside feature.

Each module of the Energite® III system consists of a one-piece barrel, a Lid, and in some cases a cone insert. The cone insert is used to adjust the sand height or center-of-mass and the overall weight of the barrel. The barrel's weight requirement is determined by its place within the array.

The Energite® III modules are available in 90, 180, 320, 640 and 960 kg (200, 400, 700, 1400 and 2,100 lb.) sizes (Figures 1 and 2).

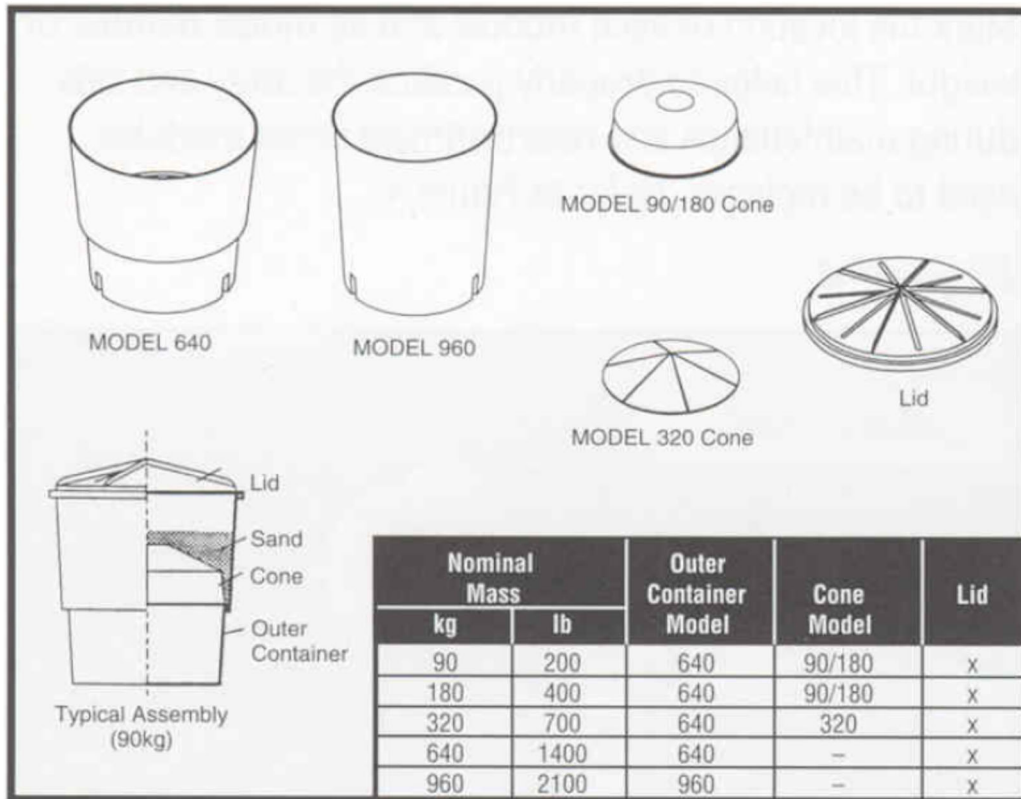


Figure 1



Warning: It is the responsibility of the installer to ensure the inertial barrier system and delineation used meet all federal, state, specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.

Energite® III Barrel Dimensions

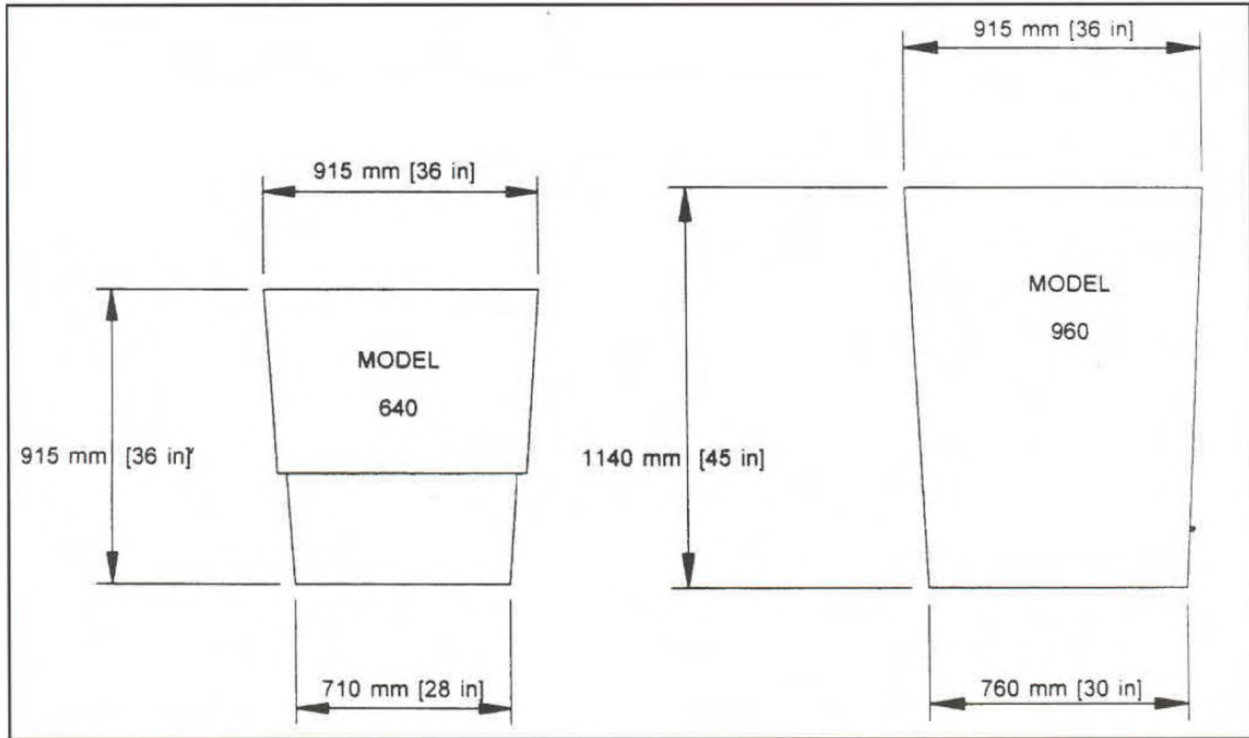


Figure 2



Warning: It is the responsibility of the installer to ensure the assembly meets all appropriate Manual on Uniform Traffic Control Devices (MUTCD) and local standards. Failure to follow this warning could result in serious injury or death in the event of a collision.

Design Site Preparation/Foundation

Before selecting inertial barriers as the attenuator for any given site, certain conditions of the site must be taken into consideration. See below for various condition recommendations.

Conditions	Valtir Recommendations	Example
1. Angle of array in relation to center line of obstacle	Not recommended for more than 10°	
2. Bidirectional traffic	Offset array to avoid impact to the rear module from wrong-way vehicles	
3. Module spacing: module to module and module to hazard	Width: 6" [150 mm] max. Length: 6" [150 mm] min. To Hazard: 12" [305mm] min.	
4. "Coffin" corner	Shield 30" [760 mm] outside of hazard	
5. Sloping sites (lateral and longitudinal)	5% grade maximum	
6. Curbs and raised islands or pallets for temporary sites	No more than 4" [100 mm] high	
7. Foundation pads	Flat surface; concrete or asphalt	
8. Maintenance	Keep site clear of debris and snow	
9. Sand densities	100 lbs/ft ³ [1600 kg/m ³]	
10. Vandalism	Check Periodically for damage	



Important: Placing Energite® III barrels on pallets is an untested condition that is not covered under FHWA eligibility but is allowable in Roadside Design Guide applications for systems placed on curbs.

Special Site Considerations

Other special considerations warrant consideration in the configuration and assembly of inertial barrier systems. The following conditions and recommendations for treatment are based on performance.

1) Freezing Temperatures

In cold climates, sand (having a moisture content of 3% or more) should be mixed with 5% rock salt (by weight) to prevent the sand from freezing.

2) Modules on Structures

Two options are available when vibrations from moving traffic could cause modules to shift on structures.

- Steel or formed-in-place asphaltic concrete half-rings placed on the downhill side of the modules will prevent movement.
- Nails or bolts driven through the bottom of the outer module container into the roadway will also prevent movement.

3) Other Unique Conditions

You may find that there are other conditions unique to a particular site that must be considered to ensure a properly designed and functional inertial barrier system.

Standard Array

The following is the MASH tested 12 barrel TL-3 array for Energite® III (Figure 3). Arrays for different design speeds may be specified by your state or local engineer.

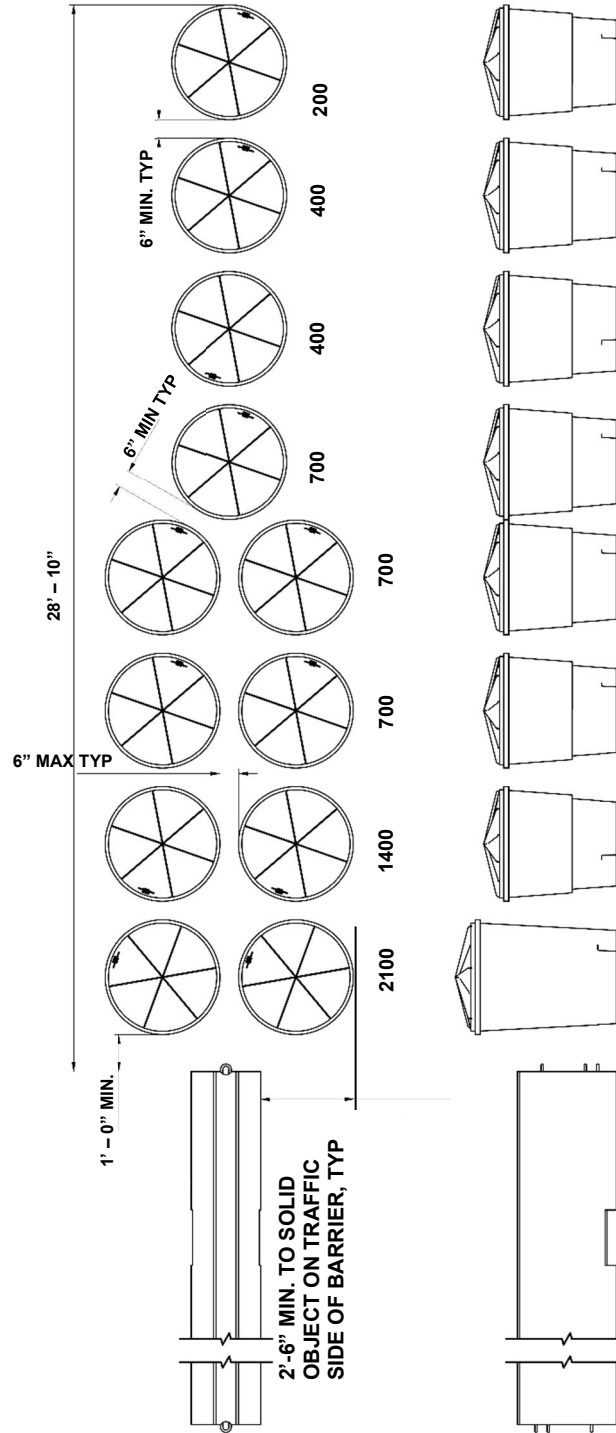


Figure 3 – Standard 12 Barrel TL-3 Array

Inspect Shipment

It is the responsibility of the installer to check inventory of delivered parts against the shipping list supplied with the unit to ensure all parts have been received. In addition, verify that you have the array specifications provided by the manufacturer and responsible agency.

Assembly



Caution: At the time of assembly, a number indicating the location for each model type should have been painted on the roadway surface. Assemble the array following the markings at the site.

1) Review array configuration/specifications

Qualified engineer to direct array painted configuration and specification.

2) Deploy traffic control

Place traffic control to protect your crew and motorists.

3) Take measurements

Take measurements to properly position the first row of barrels (closest to the roadside feature) according to specifications. These barrels must be laterally offset from the hazard by at least 30" (762 mm) and be positioned a minimum of 12" (305 mm) in front of the hazard (Figure 4).

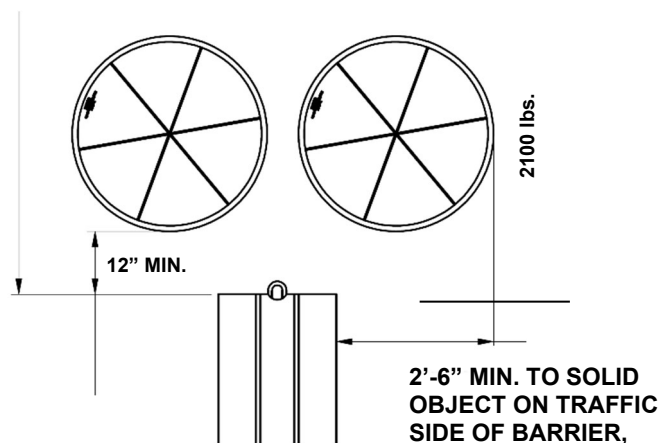


Figure 4

4) Position the barrels

For barrels placed side by side, position them with 6" (152 mm) maximum of space between them (measured at the top of the barrel lid to lid). Position the barrels with 6" (152 mm) minimum between each barrel from back to front (measured lid to lid at the top of the barrel) according to the array (Figure 5).

When Energite® III modules are placed on slopes or vibrating surfaces, the modules may be held in place on concrete or asphalt:

- **Concrete** - two expansion bolts through holes, 180 degrees apart in the bottom.
- **Asphalt** - four galvanized nails driven through the bottom, 90 degrees apart, 3" (75 mm) from the outside wall of the barrel with full penetration.

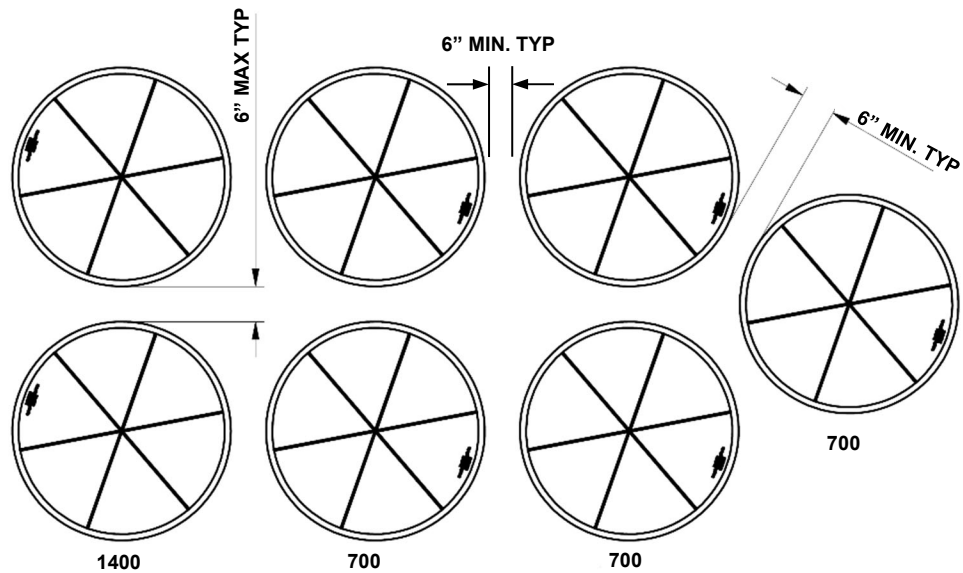


Figure 5

5) Placement of Inner Cones

Place the appropriate inner cones on the ledge inside the Barrel for the 200, 400 and 700 lb. (90, 180 and 320 kg) modules. (The 1400 – 2100 lb (640 - 960 kg) modules do not require a Cone insert.) Refer to page 6 (Figure 1) of this manual for a drawing and description of the module components.

Note: The same Cone is used for the 200 and 400 lb. (90 and 180 kg) modules. Ensure all cones are in the proper position (Figure 6).

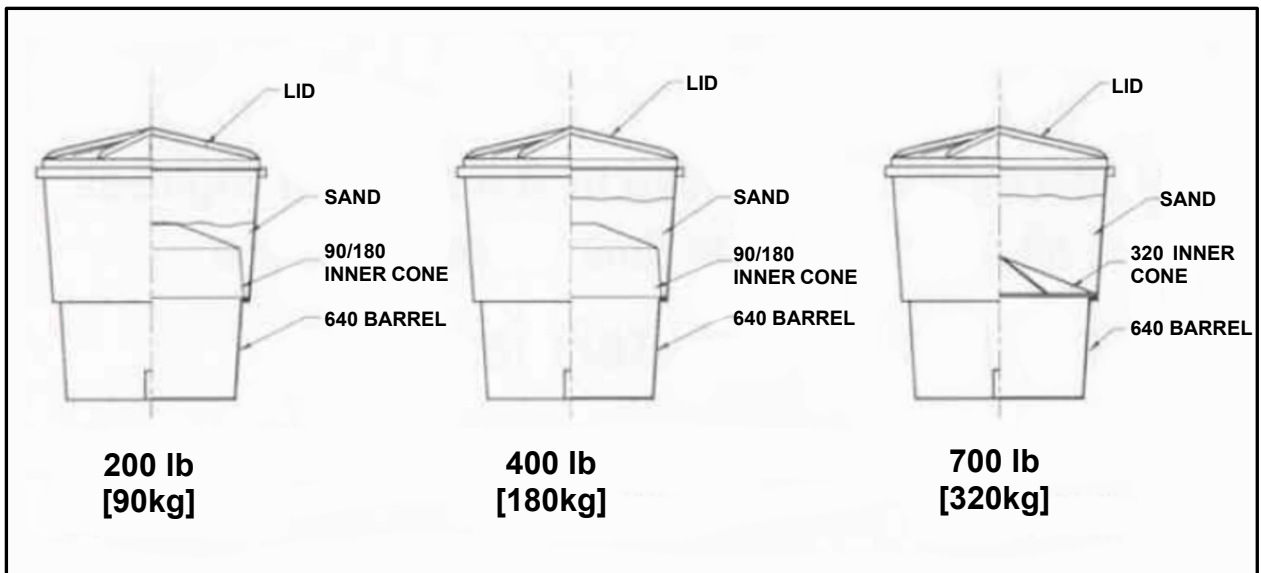


Figure 6

6) Filling the barrels

Once the first row of modules (last row in array) is in place, they can be filled with the proper level of sand (Figure 8) using a sand-filled cement truck, skid steer, or front load tractor (Figure 5).



Figure 7

The sand must conform to ASTM C-33 (washed concrete sand or equal). The level is indicated on the decal located on the inside of the module. Fill heights marked on the decal are based on a sand density of 100 lbs/ft³ (1600 kg/m³).



Caution: During the filling process, it is very important that the modules are filled with the proper level of sand (Figure 8).



Caution: If the modules are located where freezing temperatures might occur, mix the sand with 5% rock salt by weight to prevent the sand from freezing. Be sure the salt is evenly dispersed in the sand.

7) Lid Placement

Snap Lids firmly into place to prevent water and debris from affecting system performance.

Alternate Assembly Option

- 1) The Energite® III barrels feature a convenient one-piece design with a solid bottom. This allows the modules to be fully assembled and filled at a remote site and then transported to the deployment site. The fully-assembled modules can be lifted on and off the truck using a crane and lifting device.
- 2) Barrels can be placed on 4" (100 mm) maximum height pallets for temporary assembly.



Warning: Placing Energite® III barrels on pallets is an untested condition that is not covered under FHWA eligibility but is allowable in Roadside Design Guide applications for systems placed on curbs.

960 kg FILL TO TOP
(MODEL 960 ONLY)

2100 lbs. FILL TO TOP
(MODEL 960 ONLY)

FILL HEIGHTS

FILL HEIGHTS

NOTICE

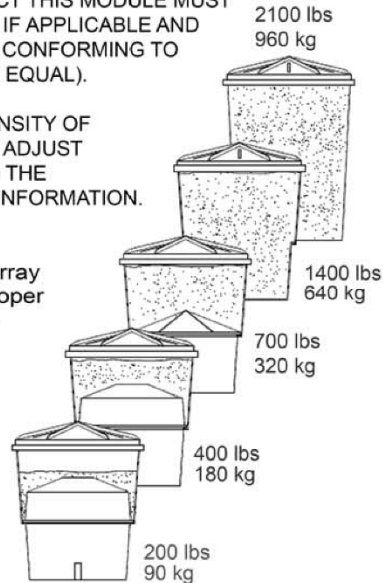
TO FUNCTION PROPERLY DURING AN IMPACT THIS MODULE MUST BE USED WITH THE PROPER CONE INSERT IF APPLICABLE AND FILLED TO THE PROPER LEVEL WITH SAND CONFORMING TO ASTM C-33. (WASHED CONCRETE SAND OR EQUAL).

FILL HEIGHTS SHOWN ARE BASED ON A DENSITY OF 1600 kg/m³ [100 pcf]. FOR OTHER DENSITIES ADJUST THE FILL HEIGHT ACCORDINGLY. REFER TO THE ENERGITE III SYSTEM MANUAL FOR MORE INFORMATION.
CAUTION

- 640 kg. -

- 1400 lbs. -

1. Sand module should be placed in an array designed by a qualified engineer. Improper placement could result in excessive G levels for errant vehicles and possible injuries to occupants.



2. In cold climates add 5% (by weight) rock salt, evenly dispersed, to prevent the sand from freezing.

- 320 kg. -

- 700 lbs. -

3. Lids should be snapped in place around entire circumference.

- 180 kg. -

- 400 lbs. -

4. When placed on slopes or vibrating surfaces the module may be held in place on:
 - Concrete by two bolts through holes, 180° apart, in the bottom.
 - Asphalt by four galvanized nails driven through the bottom, 90° apart, 75mm [3"] from the outside wall, full penetration.

5. Sand arrays DO NOT have redirecting capability for side angle impacts. Sites where cars could penetrate to the rigid hazard should be protected with an alternate type of crash cushion with side re-direct capability.

Energite® III

Made in U.S.A.

Decal No. 114908

_ 90 kg. _

_ 200 lbs. _

Figure 8

Check Assembly

After assembling an array, it is important to check the system before leaving the site:

1) Verify assembly according to array specifications

Verify that the system has been assembled according to the array specifications provided by the qualified engineer. Be sure all modules are in their proper locations.

2) Verify Lids

All Lids are securely fastened and not missing or ajar.

3) Clean up

Remove any debris around the system that could cause ramping.

System Maintenance

It is important to inspect the systems often and according to traffic patterns as an impact can occur at any time.

Inspection types:

- Drive-by Inspection
- Walk-up Inspection

Drive-By Inspection

Drive-by inspections are recommended as needed based upon volume of traffic and frequency of impact data. If any of the following conditions are noticed, a walk-up inspection is required. Repair compromised systems as soon as possible.

1) Check Modules

Modules show visible damage.

2) Check Lids

Lids are missing or ajar.

3) Check for debris

Clear debris around the modules.

4) Check for objects

Clear any objects that are on top of the modules.

5) Note the location

Record the location, condition, and date of the visual drive-by inspection in your maintenance log.

Walk-Up Inspection

Physical inspections are recommended as needed based upon volume of traffic and impact history. Refer to Refurbishment section if system repairs are needed (p. 18).

Complete the following steps during the walk-up inspection:

1) Lids in place

All lids are snapped firmly in place.

2) Lids not inverted

Lids are not inverted or collapsed inwards.

3) Modules

Each module is not tilted or leaning.

4) Damaged modules

Modules are not cracked and outer shells are undamaged.

5) System location

All modules are in their proper locations.

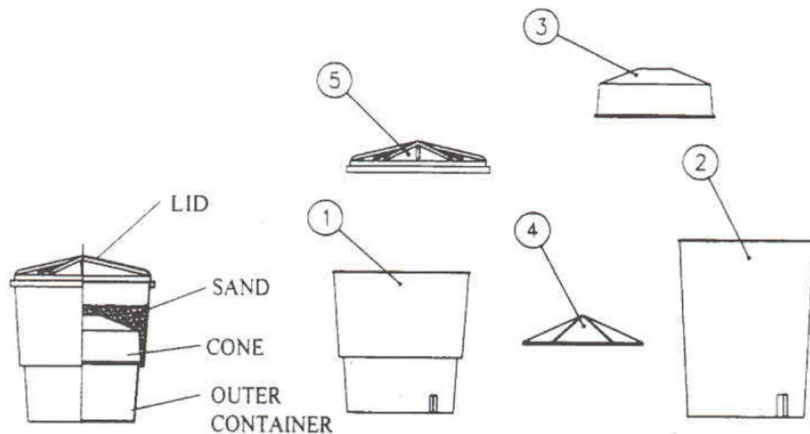


Figure 9

ITEM	PART NO	DESCRIPTION
1	114904	1400 lbs. (640 kg) Outer Container
2	114906	2100 lbs. (960 kg) Outer Container
3	114905	200/400 lbs. (90/180 kg) Inner Cone
4	114903	700 lbs. (320 kg) Inner Cone
5	114907	Lid, Black



Warning: Use only Valtir parts that are specified for assembling, maintaining, or repairing the Energite® III. Do not utilize or otherwise comingle parts from other systems even if those systems are other Valtir systems. Such configurations have not been tested, nor have they been accepted for use. Assembly, maintenance, or repairs using unspecified parts or accessories is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with an UNACCEPTED system.

Refurbishment



Important: The Energite® III may be a total loss on impact.

1) Setup traffic control

Set up traffic control to protect your crew as designated by the local authority.

2) Remove debris

Remove sand and debris from the site. This sand may be used later for filling the replacement barrels, but it must first be cleared of all debris.

3) Position barrels

Place the first row (closest to the roadside feature) of new barrels on the existing roadway surface markings that indicate original barrel location.



Caution: At the time of assembly, a number indicating the location for each model type should have been painted on the roadway surface. Assemble the array following the markings at the site.

4) Barrel placement on concrete / asphalt slopes or vibrating surfaces:

Concrete – Use two (2) bolts through holes, 180 degrees apart in the bottom.

Asphalt – Use four (4) galvanized nails driven through the bottom 90 degrees apart, 3” (75 mm) from the outside wall of the barrel with full penetration.

5) Placement of inner cones

Place the appropriate inner cones on the ledge inside the replacement barrels for the 200, 400 and 700 lb. (90, 180 and 320 kg) modules. (The 640 and 960 kg modules do not require a cone insert.) The same Cone is used for the 200 and 400 lb. (90 and 180 kg) modules.

6) Filling of sand

Once the first row of modules is in place, they can be filled with the proper level of sand. (An efficient method of quickly filling the modules is to use a sand filled cement mixer.)

The sand must conform to ASTM C-33 (washed concrete sand or equal). The level is indicated on the decal located on the inside of the module. Fill heights marked on the decal are based on a sand density of 100 lbs/ft³ [1600 kg/m³].



Caution: If the modules are located where freezing temperatures might occur, mix the sand with 5% rock salt by weight to prevent the sand from freezing. The rock salt should be evenly dispersed throughout the sand.

7) Snap Lids closed

Snap all Lids firmly into place until each module is secure.

8) Clean up

Remove any debris from site.

Alternate Refurbishment Option

The Energite® III barrels feature a convenient, one–piece design with a solid bottom. This allows replacement modules to be fully assembled and filled before transport and placement. Pre-assembled modules can be lifted on and off the truck using a crane or lifting device.

Maintenance Log

Date	System Location	Type of Inspection		Comments
		Drive-By	Walk-Up	



For more complete information on Valtir products and services, visit us on the web at www.valtir.com. Materials and specifications are subject to change without notice. Please contact Valtir to confirm that you are referring to the most current instructions.

WWW.VALTIR.COM
1.888.323.6374

