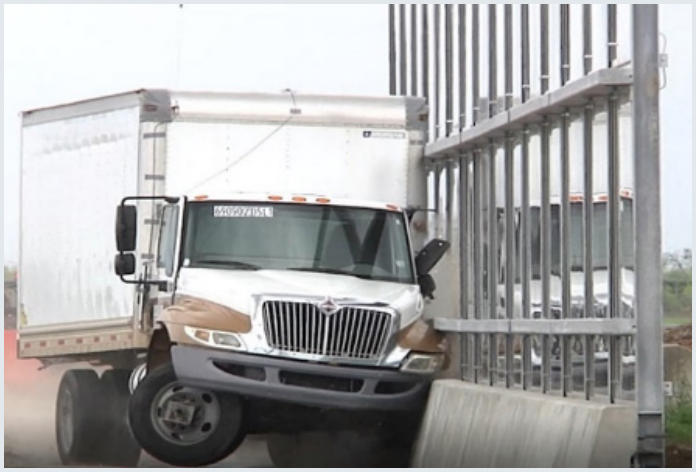
Memtech Acoustics

ACRYLITE® Soundstop
TL-4 System Installation Instruction Manual

MASH Compliant Crash Tested System



ACRYLITE® Soundstop TL-4 System example installation



ACRYLITE® Soundstop TL-4 System
MASH Test 4-12 uses a 22,180 lb box truck at 58 mph at a 15° angle which meets the minimum TL-4 criteria of 142 kip-ft.

PREFACE

This Manual for the Installation of the ACRYLITE® Soundstop TL-4 System has been prepared as a guide for installation of the system onto a capable concrete bridge railing. Its contents should be thoroughly reviewed by the Contractor, Superintendent, and Foreman responsible for construction prior to the delivery of ACRYLITE® Soundstop products and materials to the job site.

Memtech Acoustics representatives are available to assist the Contractor in the implementation of correct construction procedures. However, in the event of any conflict between this manual and the Plans, Specifications, or Contract Documents, the latter shall prevail. If there is any doubt with regard to any aspect of the ACRYLITE® Soundstop TL-4 System construction, contact Memtech Acoustics or its representatives directly.

It is the Contractor's obligation to devise and execute a project specific erection sequence, panel unloading, handling, and fall protection system. Compliance with the guidelines in this manual does not relieve the contractor of its responsibility to adhere to the project plans, specifications, and contract documents or compliance with all fall protection, safety laws, standards and procedures at the job site.

The ACRYLITE® Soundstop TL-4 Noise Barrier System consists of three primary components:

1. Steel posts which connect to the rear surface of the concrete bridge rail
2. Aluminum Framed Transparent panels which are installed inside post flanges
3. Tubular Steel Crash Rails which connect to the face of the posts

INTRODUCTION

Purpose
This document is intended to provide the Owner, Contractor, Engineer, and the inspection staff with the criteria necessary to monitor the installation of the ACRYLITE® Soundstop TL-4 System for compliance with the Plans, Specifications, and Contract Documents.

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Responsibilities
It is the Contractor's responsibility to complete construction in strict accordance with the Plans, Specifications, and Contract Documents. To assist the Contractor in this regard, this Document provides recommended installation procedures. Nothing in this document is intended to relieve the Contractor of the responsibility of complying with all safety standards and construction procedures, including fall protection, at the job site.

The Contractor and Owner should verify that the Contractor's on-site erection personnel are in possession of and are familiar with the recommendations of this Manual for the Installation and Quality Control Procedures for the ACRYLITE® Soundstop TL-4 System.

A Project Manager (PM) representing Memtech Acoustics may be available on-site during initial construction and thereafter on a request basis. The PM may assist the Contractor with material scheduling and provide advice on recommended installation procedures for the ACRYLITE® Soundstop TL-4 System as defined here.

A PM is not available on-site on a full-time basis and is not provided with the intent of replacing the Owner's and Contractor's designated quality control and/or inspection staff.

Plans, Specifications, Layout
Prior to commencing any site work, the contractor shall verify that the latest issue of the Plans, Specifications, and Contract Documents – approved for construction – are being used to install the ACRYLITE® Soundstop TL-4 System.

The Contractor should also confirm that the ACRYLITE® Soundstop structure is being installed at the proper location by verifying elevations, lines, grades, offsets, and all other location criteria.

Materials and Services Provided by Memtech Acoustics
- Engineering and design of the ACRYLITE® Soundstop TL-4 System. Note that this system was approved for use on the basis of a 2020 crash test conducted at the Texas Transportation Institute. Project specific designs and analysis of foundations are not within Memtech Acoustics' scope of supply.
- The ACRYLITE® Soundstop TL-4 System itself.
- Delivery of materials to the site (per shipping terms of the contract between Memtech Acoustics and buyer), with 1.5 hours of time allowed for unloading unless otherwise stipulated.
- On-site technical assistance at start of wall construction.
- Anchor bolts if supplied per the supply contract.
- Epoxy and related equipment, if supplied per supply contract.

Typical Bill of Materials for a Single Section

QTY	Description
1	Post (up to ten foot space between posts)
1 – 2	Aluminum Framed ACRYLITE® Soundstop panel – quantity depends on overall wall height
1	Front top rail
1	Front lower rail
6	1 ¼" x 12" HDG ASTM A193 B7 Threaded Anchor Rod
8	5/16" thick plate washers
6	1 ¼" HDG ASTM F563DH Heavy Hex Nuts
2	Jam nuts
4	¾" x 5 ¾" HDG ASTM F3125 A325 Hex Head Bolts
2 – 4	3/16" dia x 36" long HDG or SS cable with ½" threaded ends – average of 2 per panel
8 – 16	2" OD fender washers and nuts for each cable above

Equipment, Materials, Tools, and Work supplied by the Contractor
- Suitable equipment for foundation / barrier construction
- All reinforcing cages as specified in drawings
- All concrete and reinforcing for construction of foundation / barrier
- A hydraulic crane, boom truck, or similar equipment is required for post and panel erection
- Survey equipment including levels, lasers, and measuring devices to ensure proper horizontal and vertical alignment of wall.
- Any other site specific tools and equipment needed as dictated by site conditions for the safe and proper handling and storage of ACRYLITE® Soundstop materials.

- Lifting cables, spreader beams, shackles, vacuum hoist, lifting eyes, and guide cables for hoisting and installing ACRYLITE® Soundstop materials.
- All equipment for off loading ACRYLITE® Soundstop materials from delivery trucks.

Summary of Work Performed by the Contractor

- Site preparation including excavation, compaction of fill, and installation of sound barrier foundations.
- Construction of the base structure to which the ACRYLITE® Soundstop TL-4 System shall be attached.
- Erection and positioning of all components including but not limited to posts, rails, fastening hardware, ACRYLITE® Soundstop panels, and if necessary placement and compaction of backfill.
- Final grading and restoration as needed, with touchup to any wall panels damaged during installation.
- Identification of all underground and above ground utilities for clearance certificates.

HANDLING ACRYLITE® MATERIALS & PANELS

System Delivery

Prior to the start of construction the Contractor should establish a delivery schedule that will allow Memtech Acoustics to match its panel production and delivery to the Contractor's construction schedule.

The ACRYLITE® Soundstop TL-4 System typically consists of the following deliveries:

1. Aluminum Framed ACRYLITE® Soundstop Panels delivered on pallets on a flatbed trailer. Each pallet may weigh up to 3000 lbs and consist of four to ten framed panels. It requires a forklift or other suitable picking device to offload.
2. Posts and related structural components delivered via flatbed with cribbing requiring a forklift for offloading.
3. Anchors, steel retention cables, and other fasteners may be delivered on pallets or in boxes.

Shipping details will be discussed with the designated Memtech Acoustics representative.

Care must be taken to protect ACRYLITE® Soundstop panels from damage during handling and storage. If pallets will be stored onsite longer than 10 days prior to installation they should be covered with heavy duty tarps to prevent sunlight from negatively affecting the protective masking on the panels.

Offloading

1.5 hours maximum are allowed for unloading each delivery. Demurrage costs will apply for additional waiting time on site. See Memtech Acoustics proposal/quotation for additional costs. Shipping is also predicated on day time deliveries, between the hours of 6:30am and 4:30pm., Monday to Friday. Deliveries requested outside these times will be subject to additional cost.

Safety Restraints

Contractor shall supply and use safety restraints, when offloading of panels direct from truck to the barrier. Memtech Acoustics can suggest methods and designs of safety restraints but these restraint designs shall be used strictly at the contractors risk and liability. The manufacturer assumes no liability for the use of these restraints.

Inspection

Materials should be thoroughly inspected upon delivery to the job site. Any damaged items should be set aside and Memtech Acoustics shall be notified immediately. Damage must be noted on the delivery waybill before signing release from site to be eligible for claim. Materials should be handled and stored to prevent damage or theft.

Memtech Acoustics, upon request, furnishes certificates of compliance with project specifications for delivered wall materials. However, it is the Contractor's responsibility to verify that all materials received at the job site are in accordance with shipping documents and project requirements. Any discrepancies should be reported to Memtech Acoustics immediately.

To prevent construction delays, the Contractor should continuously monitor the quantity of materials on hand to ensure an adequate supply consistent with the Plans, Specifications, and Contract Documents.

CONSTRUCTION PROCEDURES

The basic installation sequence for the ACRYLITE® Soundstop TL-4 System can be summarized in the following steps. These steps should be reviewed prior to the start of installation. This procedure is defined for when using adhesive set anchor rods.

1. **Plan post anchor hole locations.**Consult approved shop drawings and site markings or survey data as appropriate to properly locate the start of wall location and each successive post location. Use a template (if provided) or other means to accurately position holes prior to drilling. NOTE – Post anchoring details may vary with the height of the post. Take care to verify fastener locations, depths, and type at each location.

2. **Drill holes for the post anchor rods.** Follow the manufacturer's instructions for hole size and hole cleaning. For example, for a Hilit HIT-RE 500 Epoxy Anchoring System for 1¼" diameter anchor rods, it recommends a 1 ½" drill diameter. Blow out the holes according to the epoxy manufacturer's instructions to remove dust and debris prior to proceeding. NOTE – Hole location should be such that when installed the posts will not vary more than ±1/8" from plan. Failure to follow these recommendations may result in improper panel engagement or inability to fit the wall components during assembly.

3. **Set the anchor rods.**Using the epoxy specified in the approved plans, follow the manufacturer's installation procedure to set and test the anchors. NOTE – There is limited fit tolerance in the anchor plates. If anchors have any lean/tilt when installed in the drilled holes it will be difficult to place the post over the anchors. Therefore the contractor may elect to set the top two anchors only, then set the post, then set the other four anchor rods. If electing this method it is the contractor's responsibility to ensure epoxy manufacturer's recommendations are followed prior to installing the nuts.



4. **Install vertical posts.** Ensure the specified time has been allowed for the epoxy to cure (based upon manufacturer's specifications) prior to installing posts. Using adequate lifting equipment pick and guide the post anchor plates over the anchors being careful not to damage them. Install nuts and washers for each anchor rod as shown on project detail drawings and tighten nuts to snug tight per the AISC Steel Construction Manual. Utilize provided shim plates between barrier and bottom anchor plate to plumb posts. Take care not to surpass the maximum tightening torque per the epoxy manufacturers recommendation.

5. **Prepare the Aluminum Framed ACRYLITE® Soundstop Panel for installation.** Peel the protective film off what will be the rear (residential) surface of the panel and peel the film away from the corners on the highway side far enough to connect the 3/16" diameter steel retention cables to the drilled holes on the left of each framed panel as it will be installed. Tighten to snug but do not overtighten against the acrylic panels. Connection for loose ends of cables will be made in a later step.

6. **Lifting the Aluminum Framed ACRYLITE® Soundstop Panel for installation.** Using a vacuum lift with tilting capability (example PC1104DC3S Woods Power Grip Rotator / Tilter), lift the Aluminum Framed ACRYLITE® Soundstop panel from the pallet and swing the sheet from horizontal to vertical. Lift the panel up over the top of post and lower into place. Memtech Acoustics can supply information for companies who rent vacuum lifting equipment and/or other lifting options.

7. **Repeat Steps 5 & 6** with a second panel if a bay requires two framed panels.

8. **Rail Installation.** Rails are bolted to the face of the posts on rail support angles welded to the posts. Position the rails on the angles and use ¾" diameter bolts to make

the connections as shown on the drawings and tighten the nuts to snug tight per the AISC Steel Construction Manual. Where shown on drawings connect two rails with inner rail splices.

9. **Terminate Steel Retention Cables.** Using a lift from the residential side or an articulating lift from the road side to access the rear of the wall, thread the 3/16" Steel Retention Cables through the post holes as shown in the drawings and terminate the free end to the drilled holes of the adjacent framed panel. Tighten to snug but do not overtighten against acrylic panels. Note if this is an end point, then the steel cable terminates into the post.

Construction Notes
The protective film on the ACRYLITE panel must be removed during install or no later than 2 weeks after install. This protective film will become more difficult to remove over time. If panels are to be stored outside for a period of more than 2 weeks prior to installation, they should be covered with a heavy tarps to prevent UV damage to the protective film.

Evaluation and approval of foundation suitability is the responsibility of the Owner's or Contractor's Engineer. Any foundation soils found to be unsuitable shall be removed and replaced with material approved by the Engineer. The material shall then be compacted, as directed by the Engineer, to a density suitable for the application.



GLOSSARY OF TERMS

Agency
The person(s), firm, or corporation acting as Agent for the Owner.

Contract Documents
The Owner-Contract agreement, including the conditions of the Contract (general, supplementary, and other conditions), the drawings, Specifications and the provisions of the agreement between the Contractor and Memtech Acoustics; and also including all addenda issued prior to execution of the Contract, all modifications thereto and any other items specifically stipulated as being included in the Contract Documents.

Contractor
The individual, firm, or corporation undertaking the execution of the Work under the terms on the Contract, and acting directly through its Agents or employees.

Engineer
The person(s) designated by the Owner, as having authoritative charge over certain specific engineering operations and duties.

Inspector
The authorized representative assigned to make a detailed inspection of any or all portions of the Work or materials on the Owner's behalf.

Owner
The Owner of a project. The agency, person, firm, or corporation with a Contract that has been made for the payment of the Work performed under the Contract.

Plans
The official approved plans, profiles, typical cross sections, working drawings, and supplemental drawings, or exact reproductions thereof, which show the locations, character, dimensions and detail of the work to be performed.

Specifications
A description, for contract purposes, of the materials and workmanship required in a structure(s), as also shown on the related working drawings. The written material containing the standard provisions and special provisions, as may be necessary, pertaining to the quantities and qualities of materials to be furnished under the Contract.

Technical Advisor
Representative of Memtech Acoustics who may be available to assist the Contractor with material scheduling and coordination, and give advice on the recommended construction procedures applicable to Memtech Acoustics structures as set out in this manual.

Work
The entire scope of the Work to be performed at the site of the construction project including labor, materials, equipment, transportation and such other facilities as are necessary to fulfil all obligations under the Contract.

NON-DISCLOSURE NOTICE & DISCLAIMER

1. This Document is the property of the manufacturer. This Document is being made available solely for use in connection with the client/contractor's interest or participation in the proposed ACRYLITE® wall project, and for no other purpose.

2. Except as specified in the paragraph above, the client/contractor must not, without the prior express written consent of the Document owners, use any of the information contained in this Document, whether to construct, design, manufacture, fabricate, assemble, produce or install, or otherwise utilize – or cause the same or any of them to be done – any elements of ACRYLITE® Soundstop (whether or not patented) or special forms of equipment unique to the production, manufacture, fabrication, assembly, installation, or utilization of ACRYLITE® Soundstop, or for any other purpose.

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4. Receipt of Documents gives no entitlement to any property right in the Document or in the information contained therein by virtue of the temporary supply of the Document in accordance herewith.

5. The ACRYLITE® Soundstop TL-4 System, designed specifically for each application, comprises or is based solely upon:
   a. The layout and geometry of the structure based upon survey details, plans and drawings supplied by or on behalf of the Owner, and
   b. The Job Specifications.

6. Upon demand, the Document and all copies thereof must be immediately surrendered and returned.

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