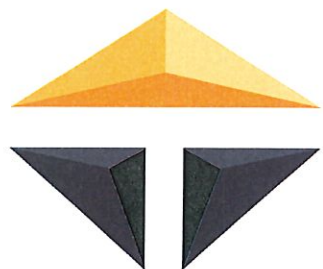


EuroTRACC[®]

Product Description Assembly Manual



TRINITY
HIGHWAY
INTERNATIONAL

EuroTRACC®

Product Description Assembly Manual

Trinity Highway Products, LLC dba



TRINITY
HIGHWAY
INTERNATIONAL
2525 Stemmons Freeway
Dallas, Texas 75207



Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the EuroTRACC® system. These instructions are for standard assembly specified by the appropriate highway authority only. In the event the specified system assembly, maintenance, or repair would require a deviation from these assembly instructions, contact a Trinity Highway representative. This system has been accepted for use by the European Standard EN1317-3 on the highway system under strict criteria utilized by that agency. **Trinity Highway Products, LLC dba Trinity Highway Products International (“Trinity Highway International”)** representatives are available for consultation if required.

This manual must be available to the worker overseeing and/or assembling the product at all times. For additional copies, contact Trinity Highway International at +1 214 589 8140 or visit www.trinityhighway.com.

The instructions contained in this manual supersede all previous information and manuals. All information, illustrations, and specifications in this manual are based on the latest EuroTRACC® system information available to Trinity Highway International at the time of printing. We reserve the right to make changes at any time. Please contact Trinity Highway International to confirm that you are referring to the most current instructions.

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Customer Service Contacts

Trinity Highway International is committed to the highest level of customer service. Feedback regarding the EuroTRACC® system, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

Trinity Highway International:

Telephone:	Singapore: +65 6276 3398 Sweden: +46 431 41 21 58 USA: +1 (214) 589 8140 U.K.: +44 1473 221105
E-mail:	product.info@trin.net
Website:	www.trinityhighway.com

Important Introductory Notes

Proper assembly of the EuroTRACC® system is essential to achieve performance of the system under appropriate highway authority criteria. These instructions should be read in their entirety and understood before assembling the EuroTRACC® system. These instructions are to be used only in conjunction with the assembly of the EuroTRACC® system 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. Trinity Highway International 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: **DO NOT** use any component part that has not been specifically approved for this system during the assembly or repair of this system.



Warning: Do NOT modify the EuroTRACC® in any way.



Warning: Ensure that the EuroTRACC® and delineation used meet all state, specifying agency, and local specifications.

Safety Symbols

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

Symbol

Meaning



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



Warning: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the EuroTRACC®. Failure to comply with these warnings could result in increased risk of serious injury or death in the event of a vehicle impact with a system.



Important: Please keep up-to-date instructions for later use and reference by anyone involved in the assembly of the product.

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 EuroTRACC®. Additional copies of this manual are available by contacting your local Trinity Highway International representative (p. 3). Please contact Trinity Highway International if you have any questions concerning the information in this manual or about the EuroTRACC®.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or EuroTRACC® components. Gloves, eye protection, safety toe shoes, and back protection shall be used.



Warning: 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.



Figure 1

Limitations and Warnings

The EuroTRACC® was tested to meet the requirements and guidelines of the 110km/h, 100km/h and 80km/h performance classes using criteria described in European Standard EN1317-3. The required tests are not intended to represent the performance of products when impacted by every vehicle type or every impact condition existing on the roadway.

The following full-scale crash tests have been conducted on the EuroTRACC®, and in each test all evaluation criteria specified in European Standard EN1317-3 were met.

Table 1 – SUMMARY OF EUROTRACC® EN1317-3 TESTS				
Performance Level	EN1317-3 Test No.	Vehicle Mass (kg)	Impact Speed (km/h)	Impact Angle & Impact Point
110	Model EuroTRACC® 110			
	TC 1.1.100	900	100	0 deg, head-on centre
	TC 1.3.110	1500	110	0 deg, head-on centre
	TC 2.1.100	900	100	0 deg, 1/4 vehicle offset
	TC 3.3.110	1500	110	15 deg, nose centre
	TC 4.3.110	1500	110	15 deg, redirect at L/3
	TC 5.3.110	1500	110	165 deg, redirect at L/2
110 Wide	Model EuroTRACC® 110 Wide			
	TC 1.1.100	900	100	0 deg, head-on centre
	TC 4.3.110	1500	110	15 deg, side impact
100	Model EuroTRACC® 100			
	TC 1.2.100	1300	100	0 deg, head-on centre
80	Model EuroTRACC® 80			
	TC 1.2.80	1300	80	0 deg, head-on centre
80 Wide	Model EuroTRACC® 80 Wide			
	TC 4.2.80	1300	80	15 deg, side impact
80-4	Model EuroTRACC® 80-4			
	TC 1.2.80	1300	80	NA*

*Article was provided a letter of conformity (SP Statement P902663).

Trinity Highway International expressly disclaims any warrant 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 Trinity Highway International or by third parties.

The EuroTRACC® was designed to be assembled at a specific deployment site, delineated, and maintained in accordance with local guidelines. Standard yellow reflective sheeting is provided with each EuroTRACC® and can be used to delineate left shoulder, right shoulder, and gore applications. The plastic nose is attached to the front of the EuroTRACC® using the side panel attachment hardware already located on the system.

Note: Consult local transportation authorities for delineation requirements.

The highway authority engineer, or other specifying authority, should be careful to properly select, assemble, and maintain the product. Careful evaluation of the site placement, vehicle population type, speed, traffic direction, and visibility are some of the elements that require evaluation in the proper selection of a safety appurtenance. For example, installations have not been tested, evaluated, or accepted on curbs and should not be permitted.

System Overview

The EuroTRACC® is a potentially reusable, re-directive crash cushion for hazards up to 1800 mm [70"] width. The Steel Backup Frame of the parallel EuroTRACC® is designed to be placed against and nest around the hazard. Determining if the system is reusable after an impact is at the sole discretion of the designated highway authority specifying the use of the system.

How to Determine Left/Right

To determine left from right when ordering transitions, stand in front of the system facing the hazard. Your left is the system's left and your right is the system's right.

Defining the Bays

Bay 1 consists of a steel framework and plastic Side Panels. Bay 2 and beyond consist of one Diaphragm and four Side Panels. Determine the number of Bays by counting the Side Panels on one side.

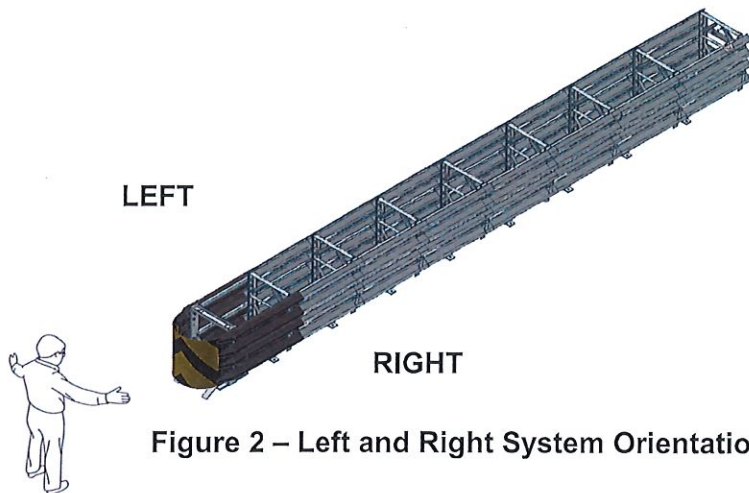


Figure 2 – Left and Right System Orientation

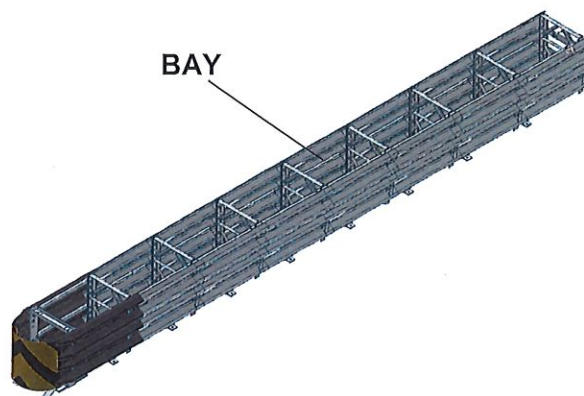


Figure 3 – 8 Bay System Shown

Recommended Tools

Documentation

- Manufacturer's Assembly Manual
- Manufacturer's Drawing Package

Drilling Equipment

- Rebar cutting bit 19 mm [3/4"]
- Concrete drill bits – 19 x 400 mm [3/4" x 16"] with 750 mm [30"] extender (Double Fluted)
- Air Drill
- Hammer Drill

Note: Trinity Highway International recommends using double fluted drill bits to achieve optimum tensile strength when assembling the anchoring system. That decision must be confirmed with the highway authority authorizing the assembly and confirming that it is assembled to their specification.

Wrenches

- Heavy duty impact wrench 13 mm [1/2"] drive
- Standard adjustable wrench 305 mm [12"]
- Socket and Ratchet Set or Flat Wrenches – 10 mm to 32 mm [3/8" to 1 1/4"]
- Ratchet and attachments for the above sockets
- 13 mm [1/2"] drive Breaker bar – 610 mm [24"] long
- 2 ea. Open/Box End Wrench – 19 mm [3/4"]
- 2 ea. Open/Box End Wrench – 27 mm [1 1/16"]
- 2 ea. Open/Box End Wrench – 32 mm [1 1/4"]

Personal Protective Equipment

- Eye Protection
- Gloves
- Back Protection for Lifting
- Safety-Toe Shoes



Important: Trinity Highway International makes no recommendation whether use or reuse of any part of the system is appropriate or acceptable following an impact. It is the sole responsibility of the project engineer and/or the local highway authority and its engineers to make that determination. It is critical that you inspect this product after assembly is complete to ensure that the instructions provided in this manual have been strictly followed.

Miscellaneous

- Traffic control equipment
- Lifting and moving equipment (A lifting device is preferred although a forklift can be used.) A Minimum of 2,000 kg [4,000 lb] capacity is required.
- Lifting slings or chains
- Air Compressor 690 kPa (100 psi minimum) and generator (5 kW)
- Long pry bar
- Drift pin 305 mm [12"]
- Center punch
- Tape measure 7.6 m [25']
- Chalk line
- Concrete marking pencil
- Steel bristle tube brush for cleaning 19 mm [3/4"] drilled holes
- Rags, water, and solvent for touch-up
- Dispensing Gun and Mixing Tubes for HILTI HY-200 Adhesive

Note: HILTI anchors supplied with EuroTRACC® require 19 mm [3/4"] diameter holes for assembly. Dispensing gun and mixing tubes for HY-200 adhesive are available from Trinity Highway International or directly from HILTI, Inc.

Note: The above list of tools is a general recommendation and should not be considered an exhaustive list. Depending on specific site conditions and the complexity of the assembly specified by the appropriate highway authority the required tools may vary. Decisions as to what tools are needed to perform the assembly properly are the sole discretion of the specifying highway authority and the authority's selected contractor performing the assembly of the system at the authority's specified assembly site.



Warning: Do not assemble, maintain, or repair the EuroTRACC® 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 your Trinity Highway International representative if you do not understand these instructions (p. 3).



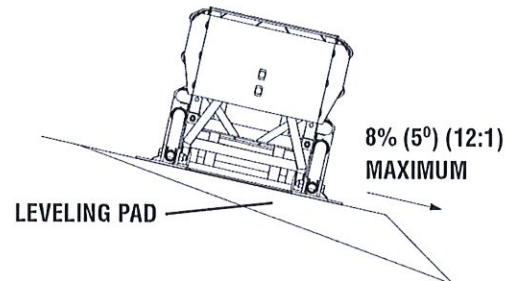
Warning: Safety measures incorporating appropriate traffic control devices specified by the highway authority must be used to protect all personnel while at the assembly, maintenance, or repair site.

Design Criteria

The EuroTRACC® has been successfully crash tested to the European Standard EN1317-3. For the full test matrix, see the Limitations and Warnings section of the manual on page 6. Impact conditions which differ from those described in the European Standard EN1317-3 may result in different crash results than those encountered in testing. Furthermore, impacts that exceed design impact severity, or cross-slopes in excess of 8%, may yield results which do not meet the evaluation criteria of European Standard EN1317-3.



Important: Ensure this assembly conforms to EN1317-3 guidelines.



**Figure 4
(Cross Slope)**

Special Site Conditions

Contact Trinity Highway International Customer Service Department if you would like assistance with your application (p. 3). You will need to be able to answer the following EuroTRACC® questions:

1. **If there is a cross-slope of more than 8% (5 degrees),** then a leveling pad must be used (Figure 4).
2. **What is the angle of divergence** if the assembly site is a gore area?
3. **What is the general geometry of the site?** Please ask for a current version of our Site Data Sheet from your Trinity Highway International representative. Use the form to disclose site information that includes 150 m [500'] in front of proposed area.
4. **When there is an existing guardrail or median barrier at the site,** the Backup of the EuroTRACC® should tie into the existing guardrail or median barrier.
5. **Is the system in a bidirectional traffic situation with traffic going in opposite directions on either side of the system? Will the system be on the side of the road in a location where crossover traffic is a concern?** An appropriate transition at the back of the system to the hazard will be necessary to prevent vehicle snagging (p. 12).
6. **Do the foundation requirements meet or exceed the system footing specification in this manual?** See page 13 for Foundation information.
7. **Are there any other unique features at the site that may affect positioning or performance of the EuroTRACC®?** See page 12 for Location Requirements.

Other Factors that may Affect Your Design

1. The existence of drain inlets.
2. Junction boxes or other items located near the hazard.
3. Insufficient space for the system length.
4. The location and movement of expansion joints.

Table 2 - EuroTRACC® EN1317-3 Conformance

Product Name	Model No. Unidirectional	Model No. Bidirectional	Performance Level (km/h)	Performance Class
EuroTRACC® 110	25926A	25927A	110	A
EuroTRACC® 110 Wide	25841A	25845A	110	B
EuroTRACC® 100	54413A	NA	100	B
EuroTRACC® 80	25894A	2589A5	80	A
EuroTRACC® 80-4	25613A	25634A	80	A*
EuroTRACC® 80 Wide	25842A	25844A	80	B

*Article was provided a letter of conformity (SP Statement P902663).



Important: All systems are rated re-directional zone Z1 and lateral displacement D1.



Important: All EuroTRACC® narrow systems (with the exception of the EuroTRACC® 100) will have impact severity A.



Important: The EuroTRACC® 100 and all EuroTRACC® Wide systems will have impact severity B.

Design Information

The EuroTRACC® meets testing criteria described in the European Standard EN1317-3. All EuroTRACC® crash cushions are re-directive energy absorbing systems designed to help protect motorists from impacting the end of concrete barriers, bridge parapet rail, bridge piers, and other road features in both permanent and temporary work zone locations if such impact is within the European Standard EN1317-3.

Maintenance Overview

The EuroTRACC® is designed to be a low maintenance roadside safety feature. Except for repairs due to impact, there may be no maintenance required for the system. That decision is left to the highway authority specifying this system. It is recommended that a bi-annual drive-by inspection be performed to ensure that no minor impacts went undetected and that debris has not accumulated in or around the system.

Crash Performance

EuroTRACC® meets testing criteria described in the European Standard EN1317-3. The EuroTRACC® has been shown to redirect vehicles that impact along its side at angles up to 15° with the axis of the system as specified in EN1317-3. The EuroTRACC® has also been shown to stop vehicles that impact the ends of the systems at angles up to 15° as specified in EN1317-3. See Table 2 for specific system type and design speed information.

Application

Unidirectional

Assembly of a EuroTRACC® system and its backup connections or transitions depends on the traffic pattern and the backup structure at each location. Unidirectional traffic (one side or both) requires no transition (Figures 5 and 6) and only requires connection to a backup structure. The Backup Frame can be attached to any solid structure including a square cast-in-place concrete pillar, a vertical concrete wall, or the end of a New Jersey-style barrier. The Backup Frame provides a pattern for anchor studs that may require adaptation to the Backup structure. “Free-standing” assemblies need two (2) driven standard guardrail posts or two (2) foot-plate posts anchored to the system foundation and attached to the Backup Frame. Call Customer Service at +1-214-589-8140 or your local Trinity Highway International representative with questions (p. 3).

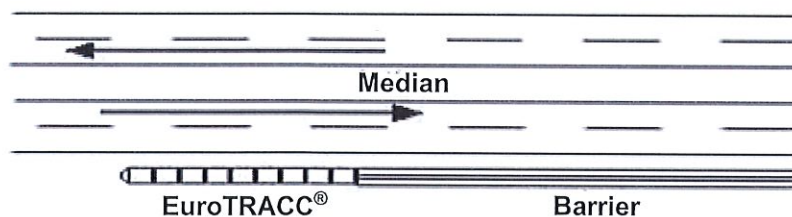


Figure 5 - Unidirectional Traffic Flow – One Side – Requires No Transition.

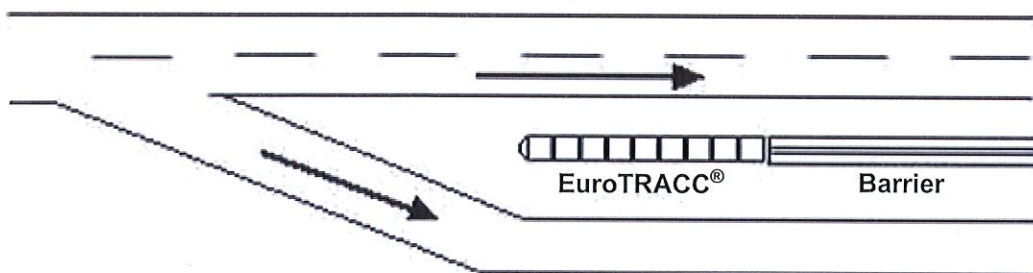


Figure 6 - Unidirectional Traffic Flow – Both Sides – Requires No Transition.

Bidirectional

For assemblies that face oncoming traffic from the reverse direction (Figure 7). Consult Trinity Highway International for an appropriate transition to concrete barrier, w-beam or thrie beam guardrail profiles (p. 3).

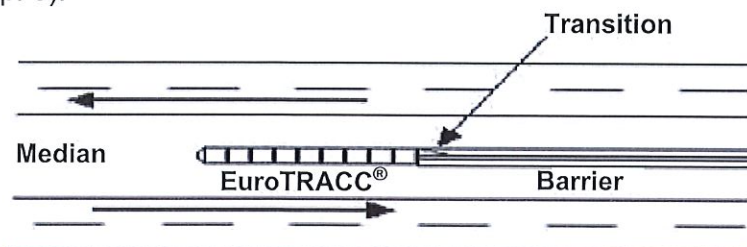


Figure 7 - Bidirectional Traffic Flow – Requires Transition on One Side.

Approach Zone and Clear Zone

The EuroTRACC® system should not be placed directly behind a raised curb. The approach area in front of the system in the direction of traffic flow should slope at a rate of no more than 10% (6 degrees or 10:1) from the surrounding area. The cross-slope should differ from the surrounding area by no more than 8% (5 degrees or 12:1). The clear zone behind the EuroTRACC® system should be consistent with the area behind the downstream length-of-need of the barrier.

Downstream Zone

The EuroTRACC® system must be assembled so a 1.00 m [40"] clear space will exist on both sides of the backup structure for the Side Panels to retract during an end-on impact (Figure 8).

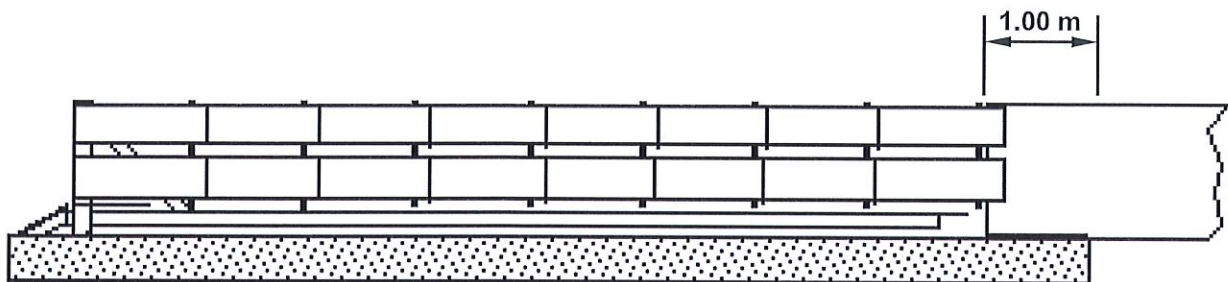


Figure 8 - Clear Space for Panel Retraction

Foundation/Anchoring



Important: During an impact within the European Standard EN1317-3 criteria, the stopping force provided by a EuroTRACC® system is **NOT** transferred to the backup structure beyond the cushion. All stopping loads pass to the anchors and foundation **BELOW** the system through the anchor bolts that attach the system to the foundation.

Concrete Installations

For concrete installations, the EuroTRACC® should be installed only on an existing or freshly placed and cured concrete base (28 MPa [4000 psi] minimum). Orientation of the concrete base and the attenuator must comply with the project plans or as otherwise determined by the resident project engineer or appropriate highway authority.

Recommended dimension and reinforcement specifications for new concrete pads can be found on the standard drawings.

Asphalt Installations

Assemblies on **Asphalt Concrete ("A.C.")** must provide a minimum of 76 mm [3"] layer of asphalt over a minimum of 76 mm [3"] layer of **Portland Cement Concrete ("P.C.C.")**, 152 mm [6"] layer of asphalt over 152 mm [6"] layer of subbase, or 203 mm [8"] layer of asphalt with no subbase.



Important: Only 460 mm [18"] threaded rods, utilizing Trinity Highway approved adhesive, can be used with asphalt foundations. Contact the Customer Service Department for a complete list of approved adhesives (see p. 3).

Foundation Options

The EuroTRACC® may be installed on any of the following foundations using the specified anchorage:

Foundation A: Reinforced Concrete Pad or Roadway

Foundation: 150 mm [6"] minimum depth P.C.C.

Anchorage: Approved adhesive with 191 mm [7 1/2"] studs 140 mm [5 1/2"] embedment

Foundation B: Asphalt over P.C.C.

Foundation: 76 mm [3"] minimum asphalt concrete (A.C.) over 76 mm [3"] minimum P.C.C.

Anchorage: Length of anchor required is 460 mm [18"] 420 mm [16 1/2"] embedment

Foundation C: Asphalt over Subbase

Foundation: 150 mm [6"] minimum A.C. over 150 mm [6"] minimum Compacted Subbase (C.S.)

Anchorage: Approved adhesive with 460 mm [18"] studs 420 mm [16 1/2"] embedment

Foundation D: Asphalt Only

Foundation: 200 mm [8"] minimum A.C.

Anchorage: Approved adhesive with 460 mm [18"] studs - 420 mm [16 1/2"] embedment



Important: Systems mounted on asphalt must be replaced and mounted on fresh, undisturbed asphalt if more than 10% of anchors are found to be loose, broken, or show signs of pull out. If 10% or fewer anchors are damaged, replace the damaged anchors in the existing asphalt. Anchor bolts used on systems mounted on asphalt must be inspected every 6 months. See Post Impact Instructions and Maintenance and Repair instructions on pages.

Anchor Block

For an independent, soil-supported concrete foundation, include a below-grade anchor block as part of the foundation. The large block will keep the foundation from sliding during an impact. Additional details can be found on the standard drawings and project plans.

Note: Recommended dimension and reinforcement specifications for new concrete foundations are provided in Trinity Highway International concrete foundation drawings, supplied with the system.

Backup Support and Transition Options

The EuroTRACC® system with its sliding Side Panels can be attached or transitioned to an appropriate backup structure capable of supporting the Backup Frame. “Free-standing” assemblies need two (2) driven standard guardrail posts or two (2) foot-plate posts anchored to the system foundation and attached to the Backup Frame. Trinity Highway International can provide backup connections or transitions for a variety of concrete barrier, w-beam or thrie beam guardrail profiles.

Nose Delineation Options

The EuroTRACC® system is intended for use on either shoulder or in the median in both unidirectional and bidirectional traffic situations. Delineation of the plastic Nose section can be customized for any particular location. Standard yellow reflective sheeting is provided with the EuroTRACC® system and can be used to delineate left shoulder, right shoulder, and gore applications.

Assembly

To facilitate accurate communication regarding the parts of the EuroTRACC®, Figure 9 shows the system with Side Panels removed and major parts labelled.

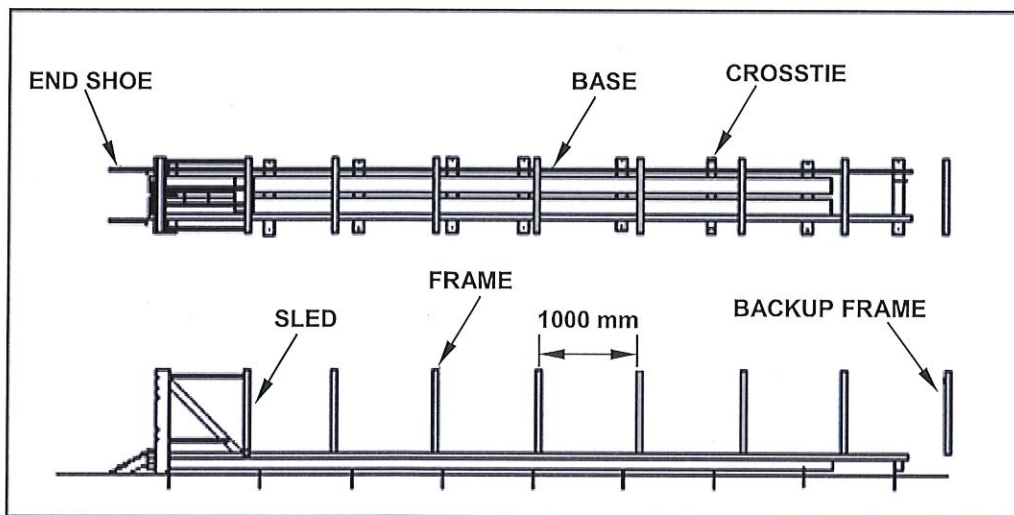


Figure 9 - Major Components of the EuroTRACC®

Note: Side Panels have been removed from the outside of the system for clarity.

Lifting the System

EuroTRACC® systems can be lifted as complete units by threading lifting chains or slings directly through the tops of the frames. Maintain control of the unit by hand guiding the end as it is lifted and moved. Ensure the system can be lifted and handled safely prior to moving.

Trinity Highway International Approved Adhesive System

A Trinity Highway International approved adhesive anchoring system is required to securely anchor crash cushions. Each approved adhesive kit contains adhesive, studs, nuts, washers and instructions. Both vertical and horizontal assemblies are possible using an approved adhesive anchoring system.



Important: Follow adhesive manufacturer's temperature storage requirements.

Anchor Assemblies

Note: Read all Trinity Highway International approved adhesive instructions before starting.

1) Prepare the Concrete Foundation



Warning: Do not allow anchoring adhesive to contact skin or eyes. See material safety data sheet supplied with adhesive kit for first-aid procedures. Use only in well-ventilated area. Do not use near open flame.



Warning: Wear gloves and protective eyewear during application.

The anchor bolts (studs) that anchor the EuroTRACC® system to an approved foundation must be those shipped in the kit or of high strength steel (830 MPa [120,000 psi] minimum tensile strength or equal). These studs must be set in minimum 28 MPa [4000 psi] concrete. Allow the concrete to cure a minimum of seven days before applying anchoring adhesive.

2) Drill Boreholes



Caution: Use Trinity Highway approved adhesive to achieve optimum tensile strength. Do not use diamond drill bits for anchors as the surface will be too smooth for adhesive.

Use the part that is to be anchored as a drilling template. Use a rotary hammer drill to drill the boreholes 3 mm [1/8"] larger than the stud diameter to the recommended depth. Refer to the approved adhesive instructions provided with your kit. Ensure all boreholes are drilled to the proper depth and aligned with the part to be anchored (Table 3).

Stud Size:	Orientation	Concrete Bit Size	Minimum Depth	Recommended Torque
5/8"x 7 1/2"	Vertical	22 mm [7/8"]	140 mm [5 3/4"]	Manufacturer Spec
5/8"x 18"	Vertical	22 mm [7/8"]	420 mm [16 1/2"]	15 N-m [10 ft-lb] ⚠



Important: When mounting on asphalt, initial torque shall be as shown in Table 3. Due to the properties of asphalt, anchors may loosen over time. It is recommended to re-torque anchors in asphalt every six (6) months to the initial torque specified.

3) Clean the Boreholes

Blow the concrete dust from the borehole using (90 psi) oil-free compressed air. Thoroughly brush the borehole with a 7/8" diameter steel bristle tube brush and then blow it out again to ensure it is completely dry and debris free.

4) Apply Approved Adhesive

Fill the borehole with enough adhesive so when the anchor is inserted a small portion of anchoring adhesive is squeezed out.



Caution: Fill the borehole from bottom up to prevent air pockets. Do not overfill or under-fill the borehole. If the borehole is overfilled, there will not be enough adhesive to anchor all of the studs provided in the kit. If borehole is underfilled, the adhesive may not develop the required pull out strength.

5) Add Nuts to Anchor Studs

Thread the nut on until flush with the end of the stud (Figure 10).

6) Insert Studs in Boreholes and Wait for Adhesive to Cure

Preassemble and push the stud, washer, lock washer, and nut assembly down through the part and into the borehole until the bottom washer is seated against the part (Figure 10).



Warning: Do not disturb or load the stud until the approved adhesive material has fully cured (reference instructions supplied with the approved adhesive kit).

7) Torque the Nuts

Once the adhesive has fully cured, torque the nut to the adhesive manufacturer's recommended values.

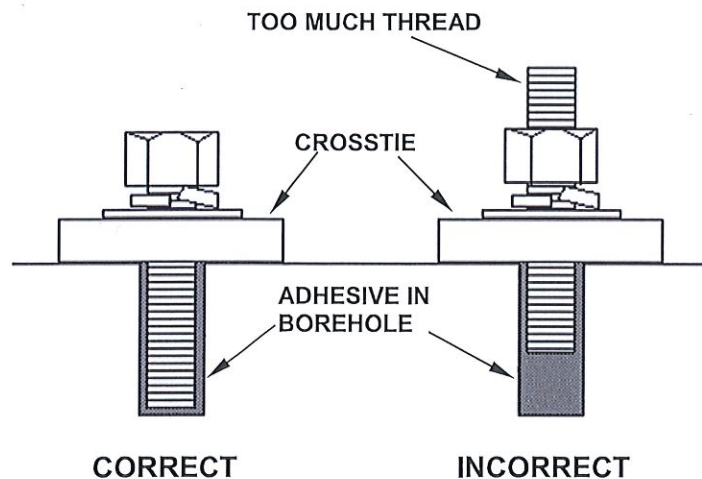


Figure 10
Anchor Application
(Before Applied Torque)

Assembly Cautions

1) Steel rebar

If steel rebar is encountered while drilling an anchor bolt borehole, apply one of the following solutions:

- A) Using a diamond core drill bit or rebar drilling tool, drill through the rebar only, then switch back to the concrete bit and drill into the underlying concrete until the proper borehole depth is reached.



Caution: Do not drill through rebar without first obtaining permission to do so from the project engineer.

- B) Drill a new borehole down at an angle past the rebar to the proper depth. Anchor the stud by completely filling both boreholes with an approved adhesive.

- 2) Cross-slope of assembled location shall not exceed 8% (5 degrees) and not vary (twist) more than 2% (1 degree) from front to back (p. 10). A leveling pad may be required to meet these conditions. The anchors, when attached, must have a pull out strength of 82.3 kN [18,500 lb] and a shear strength of 109 kN [24,500 lb].
- 3) The system should be aligned within 1° of the downstream barrier according to the approach and downstream zone requirements set forth in the Location Requirements section (p. 12). Boreholes for the anchor studs can be drilled into the foundation using the appropriate system part(s) as a template. Because of the open design of the EuroTRACC® systems, it is not necessary to disassemble any portion of the system in order to drill the anchoring boreholes.

Note: Reference adhesive manufacturer's instructions for cure times under different environmental conditions.

Note: If asphalt is located over a minimum of 152 mm [6"] of concrete, the 457 mm [18"] long anchor stud(s) can be cut off to a total length equal to the asphalt thickness plus 191 mm [7.5"].

Attaching Backups and Transitions

The Backup Frame on a EuroTRACC® system must be attached to an appropriate backup structure in order to support the Side Panels and any required transition panels. While no direct stopping forces are transmitted into the backup support structure, if hit within the European Standard EN1317-3 criteria, its presence is important for possible redirecting impacts. **"Free-standing"** assemblies need two (2) driven standard guardrail posts or two (2) foot-plate posts anchored to the system foundation and attached to the Backup Frame. For more information about specific assembly options, including reference drawings, contact your local Trinity Highway International representative (p. 3).

Attaching Plastic Nose and Delineator

The EuroTRACC® system is intended for use on either shoulder or in the median in both unidirectional and bidirectional traffic situations. Delineation of the plastic nose section can be customized for any location. Standard yellow reflective sheeting is provided with each EuroTRACC® system and can be used to delineate left shoulder, right shoulder, and gore applications. The plastic nose should be attached to the front of the EuroTRACC® system using the side panel attachment hardware already located on the system.



Important: Consult local transportation authorities for delineation requirements.

Repair

EuroTRACC® is designed for field repair or rapid replacement of the entire unit. The energy absorbing segments of the EuroTRACC® can be replaced in stages depending on the extent of the impact. Because EuroTRACC® is delivered fully assembled, it is practical to replace the entire damaged system on the roadside and then perform the necessary repairs safely and accurately in the maintenance shop away from traffic.

Types of Damage

EuroTRACC® systems are designed to withstand end-on impacts and redirecting side impacts within the European Standard EN1317-3 criteria. Side impacts, depending on the severity, may only cause cosmetic damage to the system. Any system that has been impacted along its side should be examined to ensure that the damage is only cosmetic and that any damage that might hinder subsequent functions of the system is repaired. During some severe high-speed redirecting impacts with heavy vehicles, a EuroTRACC® system may become permanently twisted. If the deformation of the Base Assembly causes a portion of one side of the system to be raised more than 25 mm [1"] when compared to the other side of the system, then the damaged portion of the Base Assembly must be replaced.

Field Repair

The EuroTRACC® system is specifically designed for rapid field repair. Removal and replacement of the system remains a valid option for those who prefer to work on the system away from the roadside.

EuroTRACC® systems can be repaired in the field by replacing the parts that have been damaged. The first step for repair will be to disconnect the Sled and its attached Side Panels from the remainder of the system and pull them back to their original upstream location (p. 15). To facilitate this, it may be necessary to release the Shredder Assemblies from the Sled and to partially remove the Straps that brace the lower part of the Sled. Ensure the Shredder Assemblies and Straps are properly reattached once the Sled is relocated to its original position.

After the Sled is relocated, the damaged Rip Plates can be replaced by removing the bolts that hold down each Rip Plate and Doubler Plate. Please refer to the assembly drawings to ensure that the new rip plates are properly located (p. 21).

The Side Panels and Frames can now be redistributed along the length of the system. It may be necessary to loosen some of the Side Panel attachment hardware in order to facilitate re-spacing. The reassembled Sled and its Side Panels can be reattached to the remainder of the system and all the hardware tightened to complete the repair job.

Removal / Replacement of System

The EuroTRACC® system can be removed from its foundation by releasing the Anchor Nuts that hold down the Crossties. Flat wrenches may be required to access the Anchor Studs under the displaced Frames and Sled. Once released, the system can be lifted as a unit (p. 15) and transported back to a maintenance facility for repair. A new or reconditioned EuroTRACC® system can be positioned on the existing Anchor Studs and firmly attached using the appropriate fastener assembly (p. 17).

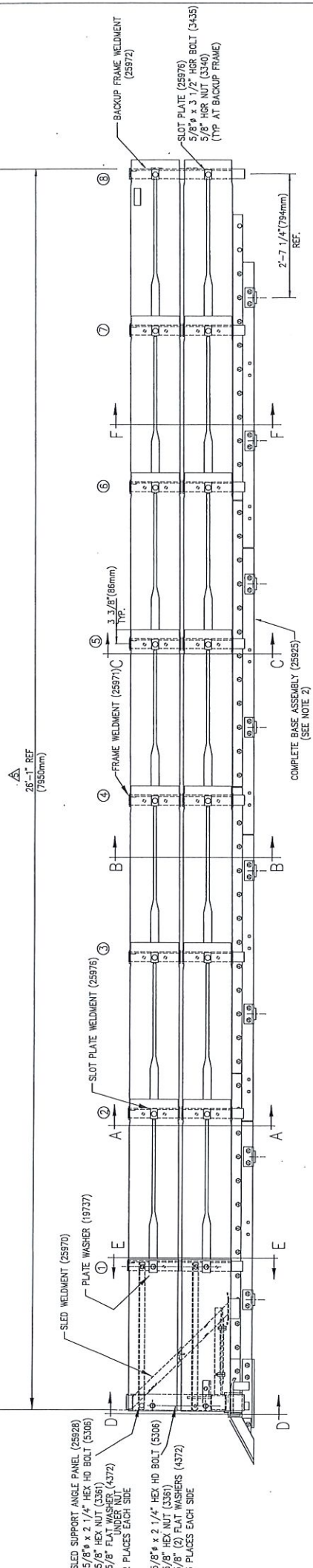
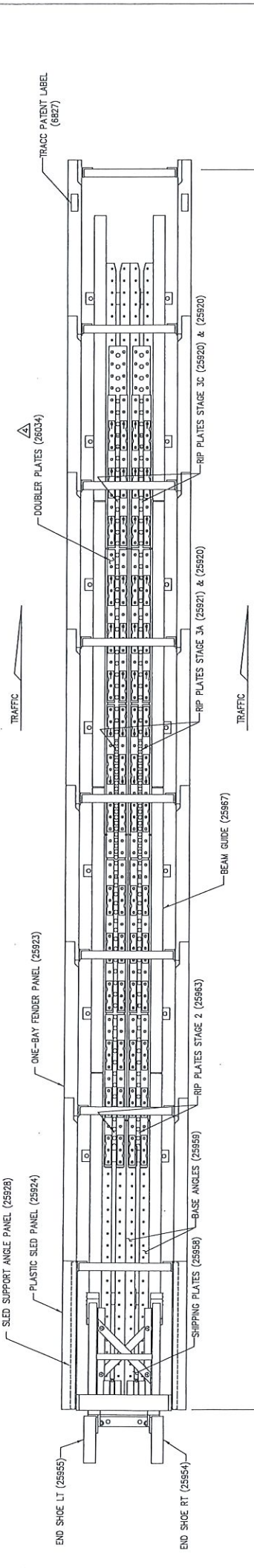
Repair at Maintenance Facility

In general, the procedure for repairing a EuroTRACC® system at a maintenance facility will be the same as a field repair. Should you encounter technical difficulty, advice in assembly is available by calling your local Trinity Highway International representative (p. 3).

1. This is a two person job.
2. Remove Plastic Nose.
3. Remove first set of side Fender Panels (4) (upper and lower) closest to the front of the collapsed system (five (5) bolts at upper Panel & four (4) bolts at lower Panel).
4. Remove both pins holding Shredder Bolts in place at Sled.
5. Loosen and remove one rear bolt at each of the diagonally crossed flat bars located under the Sled.
6. Swing each flat bar parallel to the side of the Sled.
7. Front bolts can be loosened slightly to allow bars to swing.
8. Slide the Sled all the way forward.
9. Loosen and remove Doubler Plate bolts (3 bolts at each Doubler Plate).
10. Remove all Doubler Plates at damaged Rip Plate locations.
11. Remove exposed and damaged Rip Plates.
12. Remove Shredder Bolts that may be wedged tight within damaged Rip Plates.
13. The Shredder Bolts may need to be tapped loose with a hammer.
14. Ensure correct placement and sequence of Rip Plates by checking all part numbers and referring to appropriate Trinity Highway International drawings.
15. Insert new Rip Plates starting from the back.
16. Re-attach the Doubler Plates on top of the Rip Plates.
17. Tighten the whole assembly down with bolts (3 bolts at each Doubler Plate).
18. Attach Rip Plate Shredder Bolts and crossed flat bars to the Sled.
19. Slide all Frames forward to equidistant positions behind the Sled.
20. Ensure Fender Panels are not wedged or caught on any portion of the system when sliding Frames forward with or without Fender Panels attached.
21. Once Frames are in place, re-attach remaining Fender Panels.
22. Reattach / replace the Plastic Nose.
23. Verify all bolts are in place and tight.



Warning: Use only Trinity Highway International parts that are specified herein for the EuroTRACC® for assembling, maintaining, or repairing the EuroTRACC®. **Do not utilize or otherwise comingle parts from other systems even if those systems are other Trinity Highway International 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.



- SLED SUPPORT ANGLE PANEL (25928)
- 5/8" x 2 1/4" HEX HD BOLT (5306)
- 5/8" HEX NUT (2361)
- 5/8" FLAT WASHER (4372)
- 2 PLACES EACH SIDE
- 5/8" x 2 1/4" HEX HD BOLT (5306)
- 5/8" HEX NUT (2361)
- 5/8" FLAT WASHER (4372)
- 3 PLACES EACH SIDE

EUROTRACC BILL OF MATERIAL (PN 25928)				
PART NUMBER	QTY	DESCRIPTION	LSB/EA	Kg/EA
19737G	4	1/4"x3"x2 1/4" TRACC WSHR	0.5#	2
25970A	1	SLED WELDMENT	185#	83.7
25971A	7	FRAME WELDMENT	60#	27.2
25923A	28	EUROTRACC 44" PANEL	74#	33.5
25924B	4	PLASTIC SLED PANEL	27#	12.2
25975A	2	SHREDDER ASSEMBLY	4#	1.8
25976A	28	SLOT PLATE	0.4#	2.7
25978A	1	ASSEMBLED BASE (NOTE 2)	16#	7.48
25982A	4	SLED SUPPORT ANGLE	8#	3.6
TOTAL WEIGHT (EXCLUDES SHOP-HRDWR)			315#	143.1 Kg

SHOP HARDWARE (GALV A165)			
PART NUMBER	QTY	DESCRIPTION	MAT. SPEC.
32530	2	HITCH PIN CLIP	A563 GR A
33400	28	5/8" HGR NUT	A563 GR DH
33910	70	5/8" x 1 3/4" HEX HD BOLT	A325
34360	28	5/8" x 3 1/2" HGR BOLT	A307 GR A
43720	124	5/8" FLAT WASHER	F436
44260	2	1/4" x 2" CLEVIS PIN	
53060	14	5/8" x 2 1/4" HEX HD BOLT	A325
68270	2	TRACC PATENT LABEL	

REV.	BY	DATE	DESCRIPTION
5	BT	5/04/15	ADDED 'REF' TO DIMENSION
4	BT	5/19/13	PART #25924 WAS 25960
3	BT	09/07/11	REVISED BILL OF MATERIALS (5/8" NUT & BOLT QTY)
2	BT	10/07/06	ADDED SLED SUPPORT ANGLES & NECESSARY HARDWARE
1	CC	10/07/06	ADDED SLED SUPPORT ANGLES & NECESSARY HARDWARE

REV.	BY	DATE	DESCRIPTION
5	BT	5/04/15	ADDED 'REF' TO DIMENSION
4	BT	5/19/13	PART #25924 WAS 25960
3	BT	09/07/11	REVISED BILL OF MATERIALS (5/8" NUT & BOLT QTY)
2	BT	10/07/06	ADDED SLED SUPPORT ANGLES & NECESSARY HARDWARE
1	CC	10/07/06	ADDED SLED SUPPORT ANGLES & NECESSARY HARDWARE

TRACC

EUROTRACC 110
 CRASH-CUSHION ATTENUATING TERMINAL
 PLAN, ELEVATION, & SECTION
 SHOP ASSEMBLY DETAILS
 PN 25926 UNIDIRECTIONAL

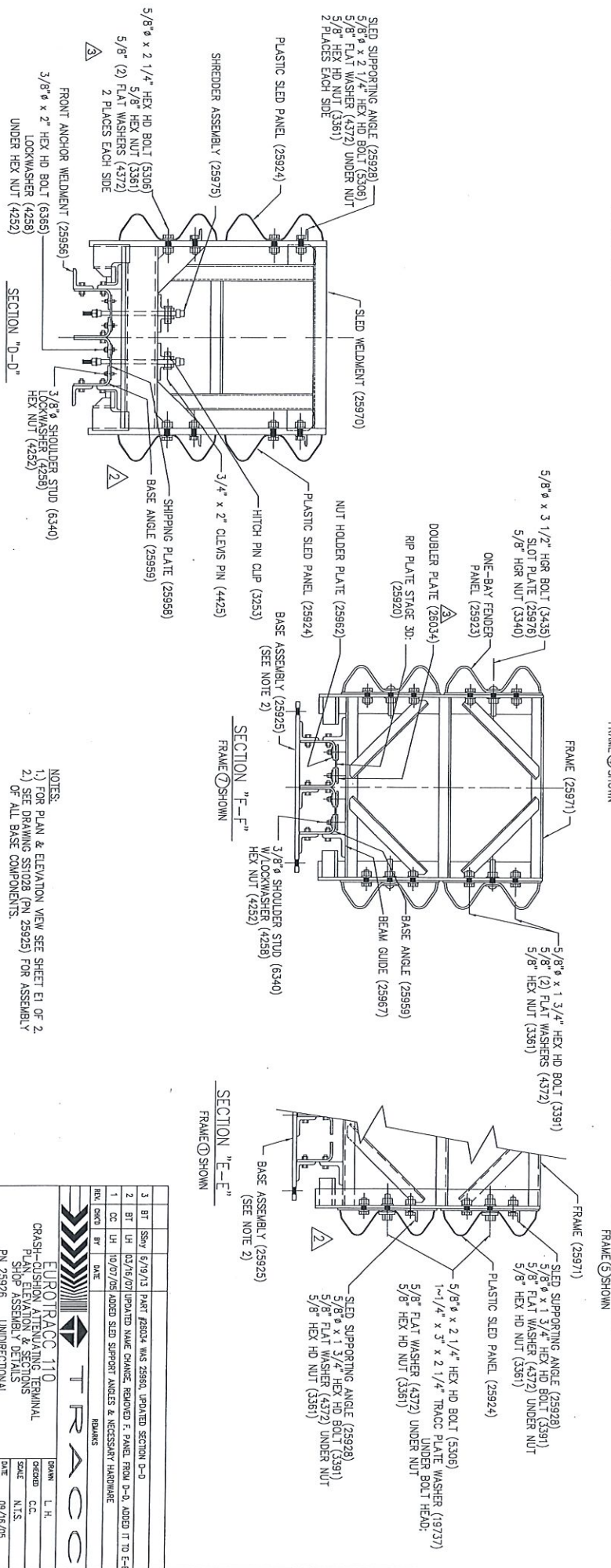
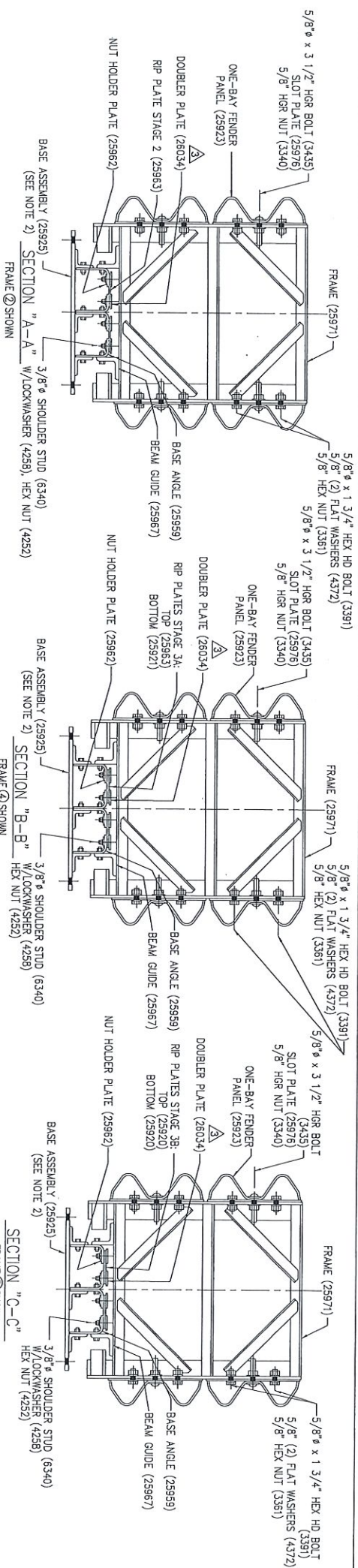
TRINITY HIGHWAY PRODUCTS, LLC.
 2525 STEAMONS FREEWAY,
 DALLAS, TX 75207

DATE: 09/19/05
 SCALE: N.T.S.
 CHECKED: CC
 DRAWN: LH

PKG. REF: SS1029-01E
 SHEET: E1 OF 2
 DRAWING NO.: SS 1029/PN 25926
 REV: 5

- NOTES:
- FOR SECTIONAL VIEWS SEE SHEET E2 OF 2.
 - SEE DRAWING SS1028 (PN 25925) FOR ASSEMBLY OF ALL BASE COMPONENTS.
 - UNIDIRECTIONAL UNIT IS SHOWN. UNIDIRECTIONAL UNIT IS AVAILABLE; WITH REINFORCED LOWER PANELS. SEE SS 1030 (PN 25927)
 - BIDIRECTIONAL UNIT IS AVAILABLE.

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- NOTES:
- 1.) FOR PLAN & ELEVATION VIEW SEE SHEET E1 OF 2
 - 2.) SEE DRAWING S1029 (REV 25925) FOR ASSEMBLY OF ALL BASE COMPONENTS.

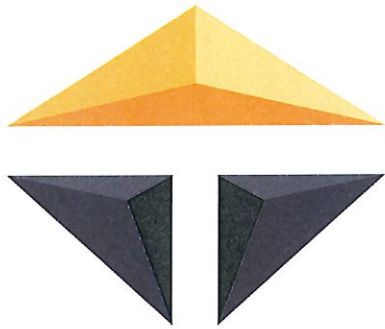
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REV	DATE	BY	CHKD	DESCRIPTION
3	6/19/13	ISSBY		PART 25924 WAS 25960. UPDATED SECTION D-D
2	6/19/13	LH		UPDATED NAME CHANGE. REMOVED F. PANEL FROM D-D. ADDED IT TO E-E
1	10/07/08	LH		ADDED SLED SUPPORT ANGLES & NECESSARY HARDWARE

DRWING NO.	SS 1029
REV	3
DATE	09/16/08
SCALE	N.T.S.
PROJECT	EUROTRACC 110
CLIENT	CRASH CUSHION AND RAMP SYSTEMS
DESIGNER	TRINITY HIGHWAY SAFETY PRODUCTS
LOCATION	2525 STEWARTS FREEMAY, DALLAS, TX 75207

Notes:

Notes:



TRINITY

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