

Triton Barrier[®] CET Applications

WATER FILLED BARRIER

ASSEMBLY MANUAL



Triton Barrier® CET Applications

Assembly Manual



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Suite 525
Addison, Texas 75001



Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the Triton Barrier® 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 standard assembly parameters, contact the appropriate highway authority engineer. This system has been accepted for use by the Federal Highway Administration for use on the national highway system under strict criteria utilized by that agency. Valtir 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 Valtir at (888) 356-2363 or download from websites below.

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 Triton Barrier® system information available to Valtir at the time of printing. We reserve the right to make changes at any time. Please contact Valtir to confirm that you are referring to the most current instructions.

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Customer Service Contacts

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

Valtir:

Telephone:	(888) 356-2363 (USA Only) +1 (214) 589-8140 (USA or International)
Internet:	www.Valtir.com

Important Introductory Notes

Proper assembly of the Triton Barrier® CET is critical 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 Triton Barrier® CET. These instructions are to be used only in conjunction with the assembly of the Triton Barrier® CET 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.

A set of product and project shop drawings will be supplied by Valtir. The shop drawings will be for each section of the assembly. These drawings should be reviewed and studied thoroughly by a qualified individual who is skilled in interpreting them before the start of any assembly.



Important: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the Triton Barrier® CET system. 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: Ensure that all of the Triton Barrier® CET system Warnings, Cautions, and Important statements within the Triton Barrier® CET Manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

Recommended 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 Triton Barrier® CET system. Additional copies of this Manual are immediately available from Valtir by calling (888) 356-2363 or by email at Valtir.com/Contact. This Manual may also be downloaded directly from the websites indicated below. Please contact Valtir if you have any questions concerning the information in this Manual or about the Triton Barrier® CET system.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the Triton Barrier® CET components. Gloves, apron, safety goggles, steel toe boots, and back protection shall 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 Triton Barrier® CET 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, Safety, or Caution indicators could result in serious injury or death to the workers and/or bystanders.

Warnings and Cautions

Read all instructions before assembling, maintaining, or repairing the Triton Barrier® CET system.



Warning: Do not assemble, maintain, or repair the Triton Barrier® CET 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) 356-2363 if you do not understand these instructions. Failure to follow this warning could result in serious injury or death in the event of a collision.



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. Failure to follow this warning could result in serious injury or death in the event of a collision.



Warning: Use only Valtir parts that are specified herein for the Triton Barrier® CET for assembling, maintaining, or repairing the Triton Barrier® CET system. Do not utilize or otherwise comingle parts from other systems even if the 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.



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



Warning: Ensure that the Triton Barrier® CET 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.



Warning: Ensure that your 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.

Limitations and Warnings

Valtir, in compliance with the National Cooperative Research Highway Program 350 (NCHRP Report 350) “Recommended Procedures for the Safety Performance of Highway Safety Features”, contracts with FHWA approved testing facilities to perform crash tests, evaluation of tests, and submittal of results to the Federal Highway Administration for review.

The Triton Barrier® CET system was tested to meet the impact criteria, requirements and guidelines of NCHRP Report 350. These tests, specifically set forth by FHWA, evaluate product performance by simulating those impacts outlined by NCHRP Report 350 involving a typical range of vehicles on our roadways, from lightweight cars (approx. 820kg [1800 lb.]) to large trucks (approx. 2000 kg [4400 lb.]) as specified by the FHWA. The Triton Barrier® CET is certified to the Test Level as shown below:

Test Level 2: 70 km/h [45 mph]

Test Level 3: 100 km/h [62 mph]

These FHWA 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 NCHRP 350 as approved by FHWA.

Valtir does not represent nor warrant that the results of these controlled tests show that vehicle impacts with the products in other conditions would necessarily avoid injury to person(s) or property. Impacts that exceed the specifications of the system may not result in acceptable crash performance as outlined in NCHRP Report 350, relative to structural adequacy, occupant risk and vehicle trajectory. Valtir 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 by third parties.

The Triton Barrier® CET system is intended to be deployed, delineated, and maintained in accordance with specific state and federal guidelines. Valtir offers a reflective delineator panel and has reflective tabs for its Triton Barrier® line of products. However, the material is only intended to supplement delineation required by the Department of Transportation’s “Manual on Uniform Traffic Control Devices” (MUTCD). The appropriate highway authority approved engineer shall be careful to properly select, deploy, and maintain the product. Careful evaluation of the site geometry, vehicle population type, speed, traffic direction and visibility are some of the elements that require evaluation for the proper selection of a safety appurtenance by the appropriate specifying highway authority.

After an impact occurs, the product must be repaired to its original condition as soon as possible. When a safety product is impacted, it is mandatory that the highway authority inspect all the components for damage and replace/repair components as necessary. If the system is not repairable, a complete system replacement is required.

Important Introductory Notes

Proper deployment and maintenance of the Triton Barrier® CET is critical to achieve tested 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 any longitudinal Triton Barrier® CET without the proper plans and assembly Manual from the manufacturer.

If you require additional information, or have questions about the Triton Barrier® CET, please contact Valtir Customer Service Department. See Customer Service Contacts on Page 3 of this Manual.

Construction

Triton Barrier® sections are available in white and work zone safety orange colors. Each section is constructed of a lightweight polyethylene plastic shell intended to accept water ballast. This durable, recyclable material resists cracking, breakage and corrosion under harsh environmental conditions.

A steel cable, providing along a recess in the top of the section, resists the tensile forces generated during impacts.

The ends of each section are constructed with knuckles that interlock with those of other segments. The End Knuckles are vertically aligned to accept a steel connecting pin. The pin securely joins the sections and the Tension Cables for maximum impact performance. The sections can swivel 9.7 degrees at the pin for easy positioning around work areas. The sections can be positioned with an inside radius as small as 11.3 m [37’].

Triton Barrier® is constructed in a unique shape. The inwardly sloping ribbed sidewalls interact with an impacting vehicle in a way that resists penetration, underriding, or an untested effect on the impacting vehicle. Sections are also stackable to reduce shipping and storage space.

Each Triton Barrier® section is constructed with fork lift ports to allow for mechanical lifting if desired. Large fill openings and a rapid release gate valve are provided to allow quick filling or draining of the water ballast. A permanent fill level indicator in the top of each section allows quick verification that the section is adequately full.

Triton Barrier® CET Comparison

TL-2	TL-3
6 sections in length	6 sections in length
No pedestals	Pedestals under all sections
First section empty	First section empty
First section right-side-up	First section up-side-down
First section has no pedestal	First section has short pedestal

General Information

FEATURES:

- CONNECTABLE & INTERLOCKING**
- STACKABLE**
- LARGE FILL OPENINGS**
- SAFETY ACCESSORIES AVAILABLE**

CAPACITY:

550L [145 GAL.]

WEIGHT:

610KG [1350 LBS] FULL

65 KG [140 LBS] EMPTY

COLORS:

NATURAL [WHITE]

WORK ZONE SAFETY ORANGE

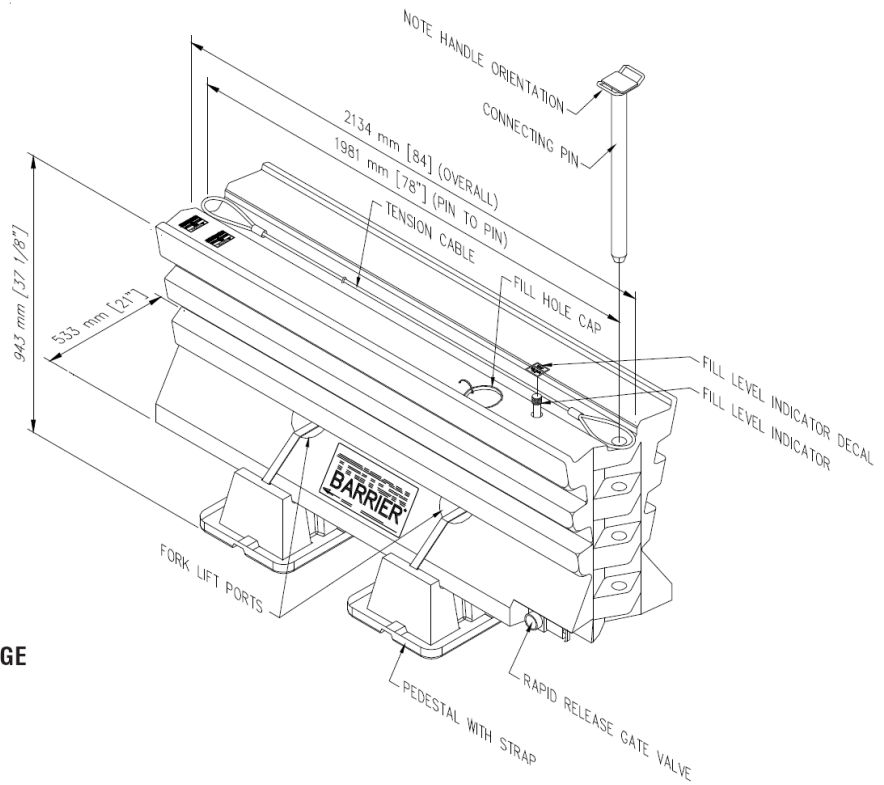


Figure 1
Triton Barrier® TL-3 Components

Special Site Considerations

A traffic control plan, in detail appropriate to the complexity of the work project, shall be prepared and understood by all parties before Triton Barrier® CET is deployed in a work zone. Some special site considerations are:

1. What is the intended speed at the site? The Triton Barrier® CET has shown in crash testing under NCHRP 350 criteria to handle impacts from vehicles up to 2000 kg [4400 lbs.] at speeds up to 100 km/h [62 mph] at angles up to 25 degrees.
2. What foundation will the barrier be deployed on and what is its slope? Triton Barrier® CET may be deployed on various surfaces. The existence of cross slopes greater than 5% or curbs may create an untested effect on the impacting vehicle.
3. Can the water ballast be drained at the site? If not, provisions must be made to either siphon out the water ballast or use a forklift to move full sections to a location where they can be drained.
4. Will the barrier be used in a climate where the water ballast may freeze? The Triton Barrier® CET will only perform properly if the water ballast is NOT allowed to freeze. Depending on anticipated climate conditions, an appropriate antifreeze agent may need to be selected and added in appropriate quantities to each water filled segment to prevent freezing.

Assembly

Preparation for Assembly

Using the drawings supplied with system, conduct a parts inventory check to make sure all the necessary components are available before proceeding to the site. Visually check the sections for damage to ensure that they will hold water. Additional sets of assembly drawings may be obtained by calling customer service using the appropriate phone numbers located on the back page of this Manual.

Recommended Tools

For a typical assembly the recommended tools and equipment are:

- Triton Barrier® CET Concrete End Treatment Manual
 - Application and/or traffic control plan (as required)
 - Traffic control equipment (as required)
 - Triton Barrier® CET Concrete End Treatment system components
 - Transport truck
 - Water truck with pump*
 - Sledge hammer
 - Pry bar
 - Forklift (optional)
- * A pump with 950-1135 liter/min. [250-300 GPM] output and a 75 mm [3"] dia. minimum x 15-30m [50-100'] long hose with a shutoff control has been shown to be efficient. Time to fill one barrier is approximately 30 seconds.

Note: The above list of tools is a general recommendation. Depending on specific site conditions and the complexity of the assembly specified by the appropriate highway authority, additional or fewer tools may be required. Decisions as to what tools are needed to perform the job are entirely within the discretion of the specifying highway authority and the authority's selected contractor performing the assembly of the system at the authority's specified site.

Deployment and Retrieval

1. A flatbed truck with a low bed is ideal for transporting the Triton Barrier® CET Concrete End Treatment system. Load the sections onto the transport truck to stack and position them for the greatest shipping density. Secure the load before transport.

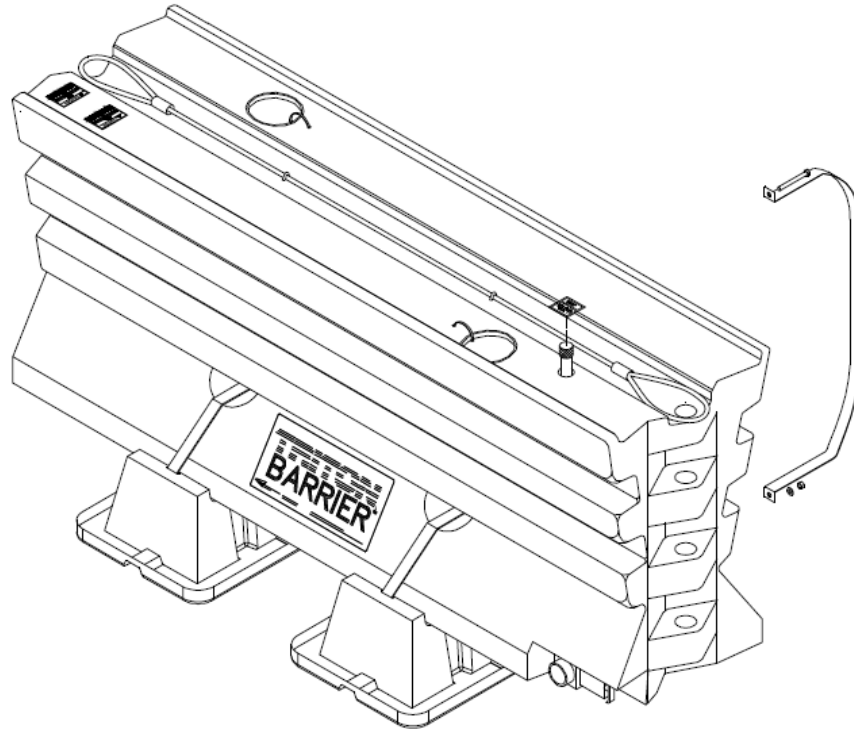


Figure 2
Triton Barrier® TL-3 Kit
(5 Segments Required)

2. Start by sliding or pinning the transition section onto the end of the CMB.
3. Begin deployment at the CMB to be shielded and work upstream. Work from the non-traffic side of the deployment whenever possible. Unload the sections taking care not to damage them. Unloading proceeds much faster if one person remains on the truck and two people work on the ground.
4. **For TL-3 applications, follow steps 5-6.**
5. Attach pedestals to the Triton segments using a strap as shown in Figure 2 above and assembly drawing. Five segments with pedestals are required.
6. Using the pedestal as a template, drill 1/2" holes – 4 places as shown (See Figure 3). Attach short pedestal to surface of first section using 3/8" nuts, lock washers, bolts and bar washers, as shown in Figure 3 & view A-A. Use fill port as access hole.

- Using the lower set of knuckles, attach the rear-most Triton section to the transition (See Detail "A" on Page 22). Insert the 36" long connecting pin through the top cable, through the top transition tab and into the overlapping end knuckles and transition tabs. Push the pin in until it is flush with the top of the section. Take care to orient the handle on the pin so that the handle is perpendicular to the length of the barrier. Slide the 1/4" x 3" x 4" Bar Washer over the end of the Pin and secure with the 1/2" x 3" hex bolt and 1/2" hex nut (See enlarged view on Page 28).

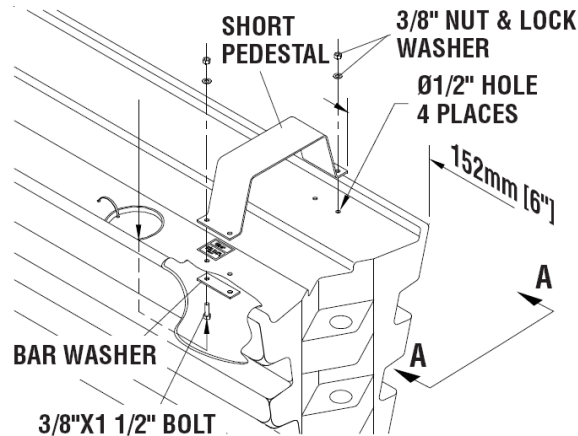


Figure 3
Cutaway View
 (Shown right side up for clarity)

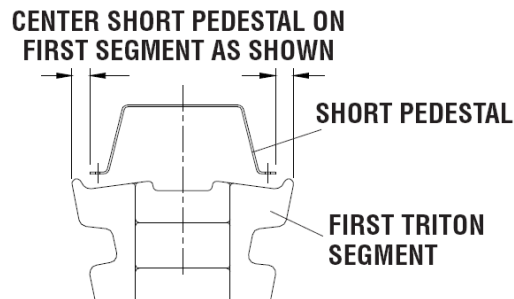
- Bring the remaining four upright Triton segments together and insert a connecting Pin through the Top Cables and into the overlapping end knuckles at each joint. Push the Pin in until it is flush with the top of the sections. Take care to orient the handle on the Pin so that the handle is perpendicular to the length of the barrier. (See Figure 1 on Page 9).



Warning: The special 36" long pin must be used to connect the Triton section to the transition to achieve proper test crash performance. This pin uses a 1/4" x 3" x 4" bar washer, 1/2" x 3" hex bolt and 1/2" hex nut as a retainer.



Warning: Each joint must be connected with a pin or improper impact performance will result. Barrier must not be used if steel cable is damaged or missing.



View A-A

- Bring the first Barrier segment into place. For TL-3, be sure it is empty, turned upside down, and has a short pedestal attached (See Figure 4). For TL-2, the first Triton Barrier segment is empty but oriented right-side-up (See Figure 4). Insert a connecting Pin through the second Triton segment Top Cable and into the overlapping end knuckles.



Important: The pin must be removed from the exposed end.

- Remove the fill level indicator decal (See Figure 1 on Page 9).

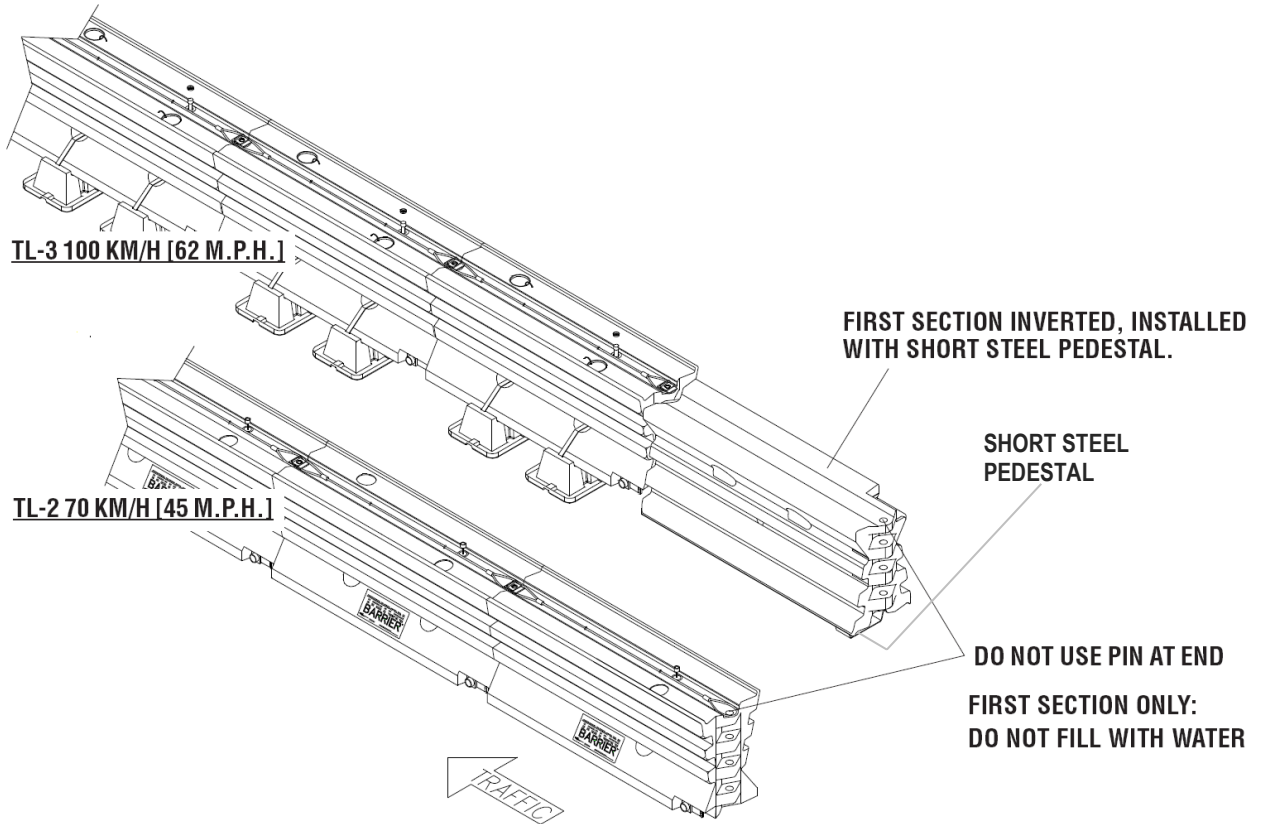


Figure 4
Triton Barrier end treatment

- Completely fill the last five segments with water. Approximately 2750 liters (725 gallons) will be required. The first segment remains empty.



Warning: Each joint must be connected with a Pin or improper impact performance will result. Barrier must not be used if steel cable is damaged or missing.

It is imperative in the colder climates that water not freeze. In consideration of local restrictions or regulations, add antifreeze as necessary.

Since filling the sections typically takes longer than deployment, it is convenient to have a water truck available as soon as deployment begins. The water truck can follow immediately behind the deployment crew to minimize time in the work zone. Filling proceeds more quickly if one worker drives the water truck and another worker moves the fill hose from section to section.

12. Place Caps in full holes to retard water evaporation and to prevent debris, bugs and birds from contaminating the water.
13. For TL-3 applications, the first barrier section must be turned upside down, empty and a Short Pedestal attached. For all applications, the pin must be removed from the exposed end.



Warning: Each joint must be connected with a Pin or improper impact performance will result. Barrier must not be used if steel cable is damaged or missing.

14. Deployment is not complete. Take the time to double check the assembly as noted above.

Checking the Deployment

Check the assembly to ensure that all sections are properly aligned, full of water ballast, and not leaking. All Fill Level Indicator Caps should be up. If any are not up, check to see if the decals used for shipment are still in place and remove them. Make sure that all cables are present and all Pins are inserted. If for some reason a section needs replacement, see the “Maintenance and Repair” section of this Manual on Page 17.

Retrieval

1. Begin retrieval at the downstream traffic end of the site and proceed upstream. Begin the retrieval procedure by removing the water ballast. If site conditions permit, the Quick Release Gate Valve may be opened to allow the water to drain. Insert the protective Fill Level Indicator Caps.

Note: The time it takes to drain a barrier section is approximately 4 1/2 minutes.



Caution: Water on the traveled roadway may create a slippery surface for vehicles. Proper traffic control shall be deployed.

If the water may not be drained at the site, then the water may either be siphoned out or the section can be unpinned and moved by forklift to another work area or site where it may be drained or stored.



Caution: Do not use tension cables to lift barrier(s).

2. Once the water is removed, the Pins may be removed and the sections separated.
3. Reattach Fill Indicator Caps.
4. Remove the empty sections onto the transport truck in the reverse order as they were deployed. Secure the load before transport storing.

Storing

When storing the Triton Barrier®, be sure to leave the Gate Valve open or store upside down.

Note: Empty sections may be stacked. Filled sections may not be stacked.

Maintenance and Repair

To Remove Pins

1. For the special 36" long Pin used to connect the Triton section to the Transition, remove the 1/4" x 3" x 4" Bar Washer, 1/2" x 3" hex bolt and 1/2" hex nut.
2. Pry Pin up while pushing cable loops down.
3. Once Pin is up approximately 100 to 125 mm [4" to 5"], the pin can be twisted to remove.

Proper maintenance of Triton Barrier® CET is essential to achieve performance of the system under appropriate federal and state guidelines. Take the time to review the product limitations, assembly cautions, and maintenance instructions before performing the necessary work. Do not attempt to deploy any longitudinal barrier without the proper plans for deployment.

The time interval between maintenance inspections depends a great deal upon particular site conditions. Frequent inspections are recommended until longer inspection intervals become justified.

Visual Drive by Inspection

A slow drive-by visual inspection of Triton Barrier® CET system is often all that is required. Some special inspection considerations are:

1. For TL-3 applications, the first barrier must be turned upside down and bolted to the Short Steel Pedestal. For all applications, the pin must be removed from the exposed end.
2. Are the five other sections full of water ballast? The sections must be adequately filled for proper impact performance. Look to see that the Fill Level Indicators are visible above the top of each section. A walk-up inspection of the assembly is required if the Fill Indicators are not visible (see Walk-Up Inspection section). Be sure Fill Indicator Decals used for shipping have been removed.
3. Are the sections properly aligned? The deployment must be aligned according to the plans for the site. Misaligned sections in the middle of an assembly may be an indication that the barrier has been hit and potentially damaged. If any sections are misaligned, carry out a walk-up inspection.

Walk-up Inspection

If the drive-by visual inspection indicates maintenance is required, then a walk-up inspection is necessary. Some of the most common maintenance concerns and corresponding repair techniques are:

Empty Sections

Sections with water levels below 100 mm [4"] from the top must be refilled for proper Triton Barrier® CET performance. Sections with very low water levels, or those that consistently need filling should be filled and thoroughly inspected for leaks. If leaks are found, the section should be replaced (see Damaged Sections). A certain amount of water loss may occur due to evaporation depending on the environment.

Damaged Sections

Generally, sections are usable if they remain full of water and properly connected to other sections. Occasionally, sections may become damaged from impact or puncture and must be replaced. Sections with minor damage or leaks may often be repaired using sealants or plastic welding methods. (See Triton Barrier® Patching on Page 19.) Empty the water from the sections immediately surrounding the damaged section(s). Remove the Pins holding the damaged section(s) and slide the section(s) sideways until enough gap opens up in the assembly for removal. New sections are replaced by reversing this process. Take care to work in a direction away from traffic and to properly line up the deployment when replacement is complete (See Misaligned Sections below).

Misaligned Sections

Sections may occasionally become misaligned due to impact or nuisance hits. Generally 600-900 mm [2' to 3'] of lateral misalignment is easily corrected by simply pushing the sections back into alignment. If the sections are emptied, they can usually be pushed manually; if they are full, they can be nudged into position with a vehicle, pry bar, or forklift, being sure to use the forklift ports. Care must be taken to avoid damaging the sections.

Triton Barrier® Patching

Preparation:

The area to be patched must be completely dry and free of dirt and grease. Additionally, a film coats the barrier and should be removed by either lightly sanding the pieces or burning it off with a small butane torch. Do not damage the plastic by overheating. A few quick passes are sufficient.

Options:

Plastic Welding

The most reliable means of patching can be accomplished with plastic welding and can range from "stick" welding to automatic preparation and feed. The temperature, as measured 6 mm [1/4"] away from the welding torch should be at 290 deg. C [550 deg. F.] for the Triton Barrier® material. Welding speed for ideal, straight line welds can range from 100 mm - 150 mm [4" to 6"] per minute with stick welding to 600 mm [24"] per minute with an automatic gun. A plastic welding equipment supplier can offer additional information.

Spin Weld Plugs

Spin Weld plugs give excellent results for patching small holes and leaks in Triton Barriers®. Individuals who will be performing the repairs should read the instructions and practice a few times before trying to repair Triton Barrier®. Practicing the Spin Weld process is important as this gives the individual a feel for the techniques required to perform a proper weld.

Items necessary for repair:

- Drill Motor w/7 mm drill bit
- 25,000 rpm Router
- Spin Weld tool
- Spin Weld plugs
- Rasp

Repair Procedure

1. Drill 7 mm hole at point of leak.
2. Secure the Spin Weld tool onto Router.
3. Place a Spin Weld plug onto the Spin Weld tool.
4. Place plug and router squarely over the hole to be plugged.
5. Turn on router, holding it firmly with light downward pressure. Watch for indications of melting plastic flowing around the plug. Turn off the router, holding it steady until the plastic solidifies.
6. Inspect plug to insure that it has bonded to the barrier.
7. Rasp plugged area smooth to finish repair.

Hot Glue Gun

Relatively good success in patching the Triton Barrier® can be accomplished with a standard hot glue gun using general purpose adhesive. This type of patching will deteriorate over an extended period of exposure to the sun, etc. The best results will be obtained by using patience and large amounts of glue.

Field Patching

Initial preparation as outlined above should be accomplished whenever feasible. No materials are available that adhere properly when applied to a wet barrier. Duct tape (silver, fiber reinforced tape) sticks to the barrier well, and Butyl caulking (gray, sticky pads or rolls) works fairly well to fill gaps for temporary patching.

The black and white Triton Barrier® decals stick well to the barriers. Spare decals can be kept on hand and cut to size with scissors for effective temporary patch. The decal will need to be placed smoothly without air pockets or creases to obtain the best results. Smaller holes on smooth faces will seal while larger gashes can be reduced to minor trickles. Should the decal begin to leak, it will deteriorate rapidly.

Either fiberglass resin or epoxy can be used to fill and plug leaks. Epoxy's liquid consistency makes it more difficult to keep in any hole during its cure, but is effective if this shortfall can be overcome. Fiberglass resin and sheeting/cloth can be used on larger areas. The exterior of the matte must be completely covered with resin. Otherwise, any exposed fibers will quickly act like wicks and the patch will fail. The resin or epoxy will require a curing time before the barrier may be refilled with water.

Any repaired barriers should be marked for easy identification. It is recommended to periodically check the repairs for leaks.

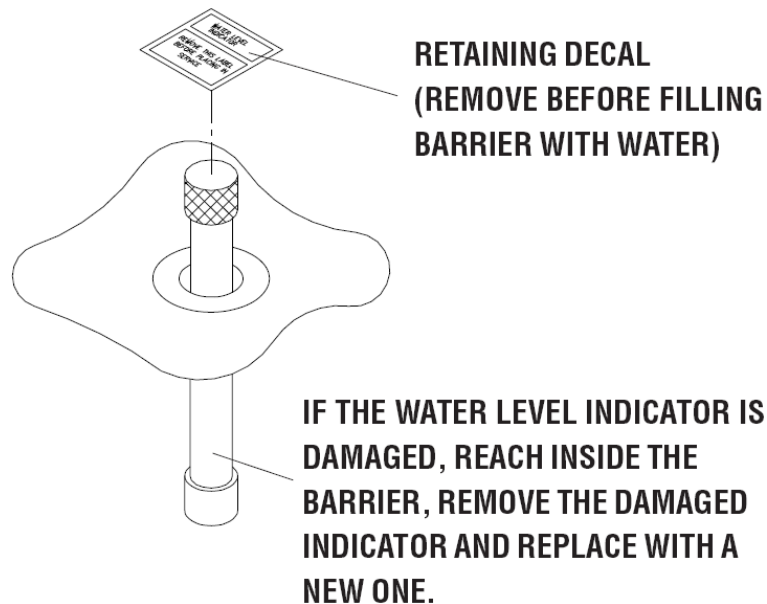


Figure 5
Water level indicator

Gate Valves and Plugs

Gate valves must be unbolted before they can be unscrewed. Six or seven wraps of Teflon® tape will keep the treads from leaking.

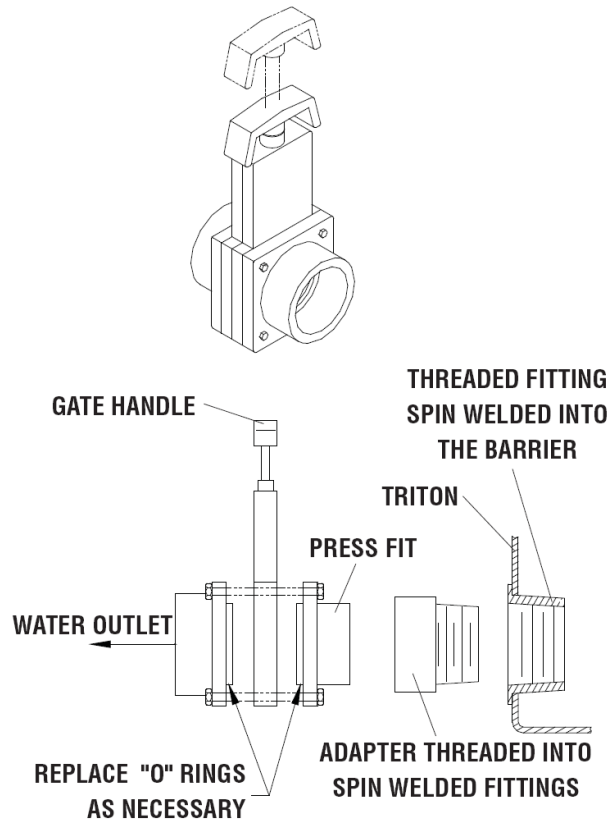
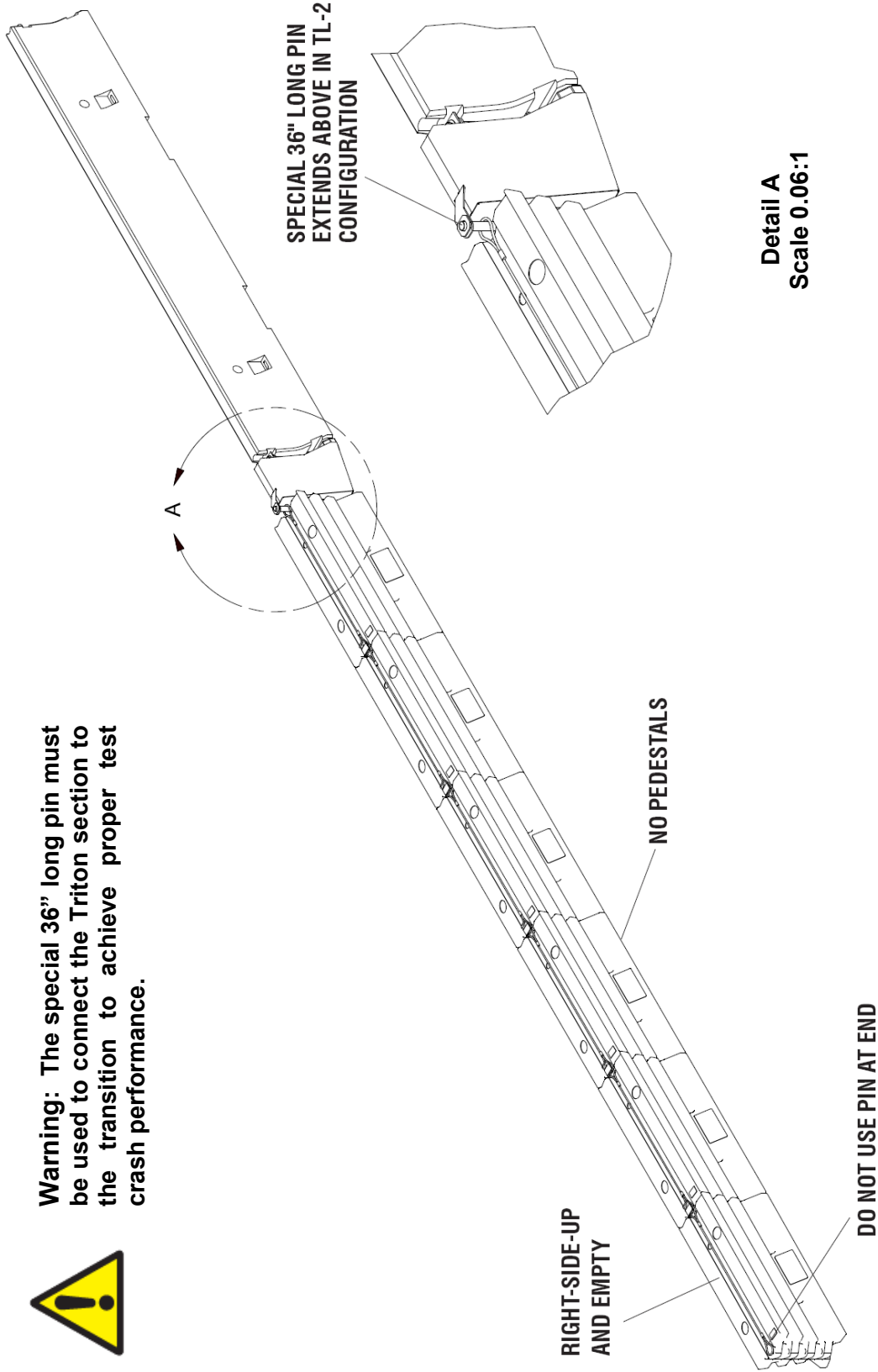


Figure 6
Repair of the gate valve



Warning: The special 36" long pin must be used to connect the Triton section to the transition to achieve proper test crash performance.



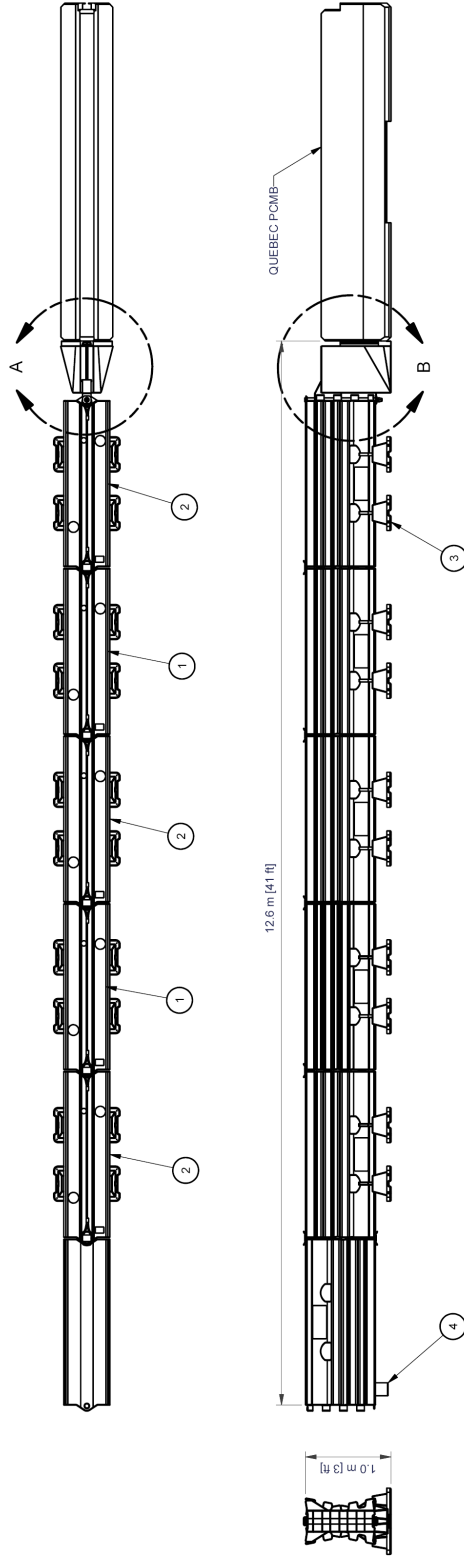
Detail A
Scale 0.06:1

Figure 7
Triton Barrier® CET TL-2 Configuration

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	3595020-0100	BARRIER SECTION ASSY, TRI, ORANGE	3
2	3595020-0000	BARRIER SECTION ASSY, TRI, WHITE	3
3	3595351-0000	TRITON TL-3 KIT	5
4	3595361-0000	END TREATMENT, TRITON, TL-3	1
5	2785400-0000	TRANSITION, TRITON, QUEBEC PCMB	1
6	2708313-0000	PIN, TRITON TRANSITION, G	1
7	2708313-0000	WASHER BAR, 14X3, 1/2X4, G	1
8	2701361-0000	BOLT, HX, 1/2X3, G2, G	1
9	2704011-0000	NUT, HX, 1/2, G	1

BARRIER SECTIONS & TL-3 KITS NOT INCLUDED IN ASSEMBLY. ORDER SEPARATELY.

THE DEPICTED TRITON CONCRETE END TERMINAL PLUS TRANSITION IS A NARROW, NON-REDIRECTIVE, GATING CRASH CUSHION. IT HAS BEEN CRASH TESTED FOLLOWING THE GUIDELINES IN NCHRP 350 TL-3 (100 km/h). ITS IMPACT PERFORMANCE IS SIMILAR TO A SAND-FILLED INERTIAL BARREL ARRAY. AS A CONSEQUENCE, CARE MUST BE USED IN ITS APPLICATION IN THE FIELD. IT IS RECOMMENDED THE TRITON CONCRETE END TERMINAL PLUS TRANSITION BE USED IN A SAND-FILLED INERTIAL CRASH CUSHION. HIGH SPEED IMPACTS, SUCH AS HIGH SPEED IMPACTS, SHOULD BE INSTALLED INSTEAD.



ASSEMBLY NO. 3595400-0000

REVISED	DATE	BY	CHK	APP
1	3/27/2003	D. Kohfeld		
2	3/4/2003	J. Welch		
3	4/4/2003	JME		
4	4/4/2003	JBW		

REVISED	DATE	BY	CHK	APP
1	3595020-0000			
2	3595351-0000			
3	3595361-0000			

REVISED	DATE	BY	CHK	APP
1	3595020-0000			
2	3595351-0000			
3	3595361-0000			

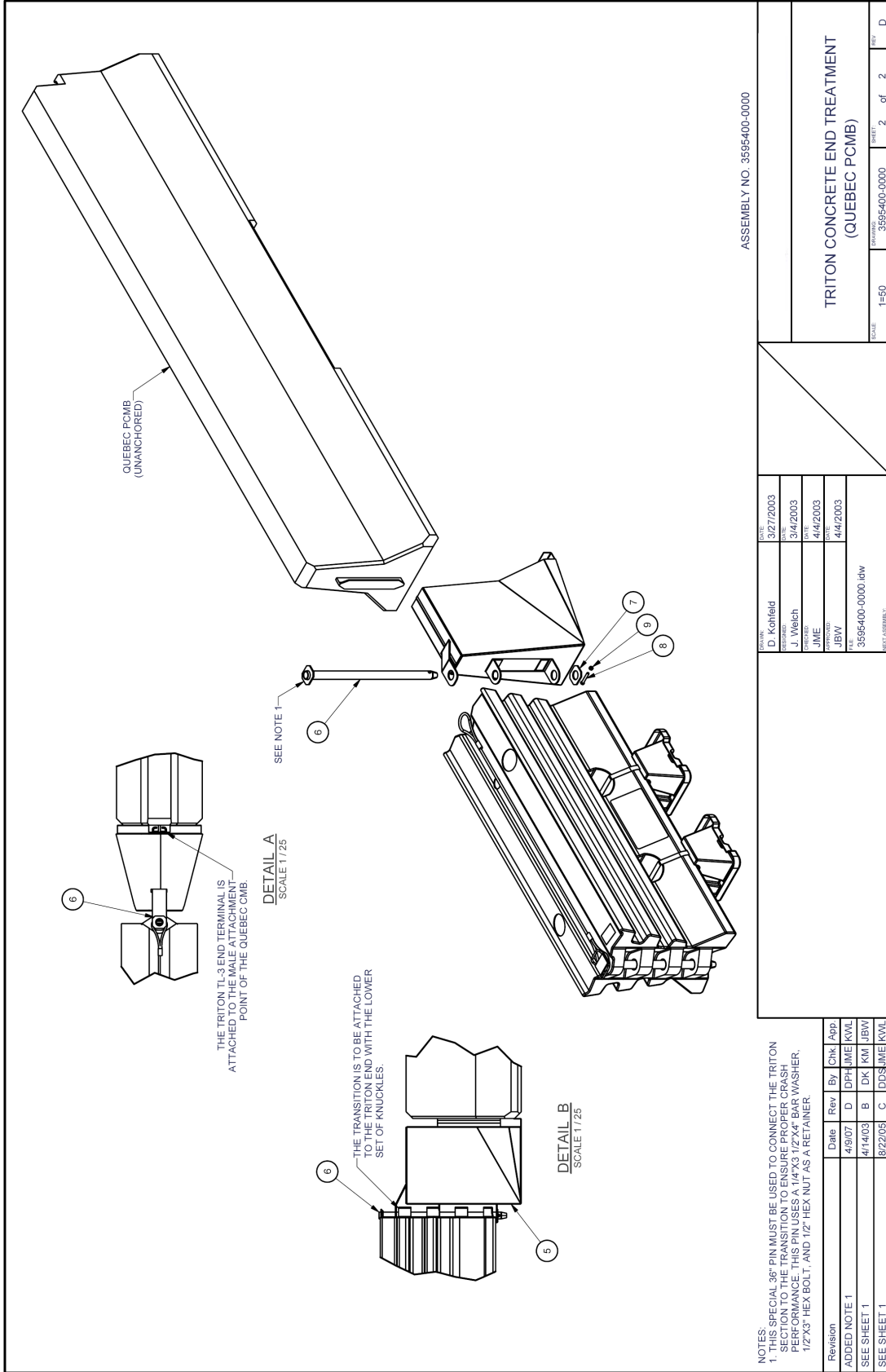
REVISED	DATE	BY	CHK	APP
1	3595020-0000			
2	3595351-0000			
3	3595361-0000			

TRITON CONCRETE END TREATMENT (QUEBEC PCMB)

SCALE 1=50 SHEET 1 of 2 REV D

Triton Barrier® CET (Quebec PCMB)

DWG 3595400-0000 Sheet 1 of 2



ASSEMBLY NO. 3595400-0000

TRITON CONCRETE END TREATMENT (QUEBEC PCMB)

DESIGNED BY	D. Kohfeld	DATE	3/27/2003
DESIGNED BY	J. Welch	DATE	3/4/2003
DESIGNED BY	JME	DATE	4/4/2003
DESIGNED BY	JBV	DATE	4/4/2003
PROJECT NO.	3595400-0000 idw		

Revision	Date	Rev	By	Chk	App
ADDED NOTE 1	4/9/07	D	DPH	JME	KVL
SEE SHEET 1	4/14/03	B	DK	KM	JBV
SEE SHEET 1	8/22/05	C	DD	JME	KVL

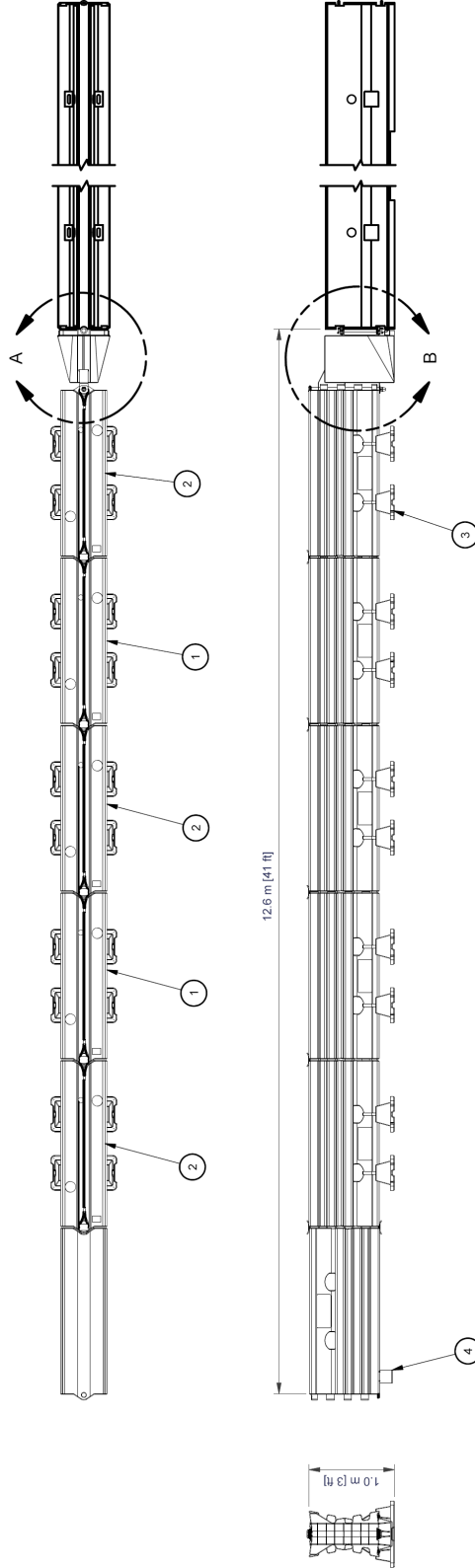
SCALE	1=50	DRAWING NO.	3595400-0000	SHEET	2	OF	2	REV	D
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DWG 3595400-0000 Sheet 2 of 2

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	3595020-0100	BARRIER SECTION ASSY, TRI, ORANGE	3
2	3595020-0000	BARRIER SECTION ASSY, TRI, WHITE	3
3	3595351-0000	TRITON TL-3 KIT	5
4	3595361-0000	END TREATMENT, TRITON, TL-3	1
5	2795403-0000	TRANSITION, TRITON, PCMB	1
6	2795401-0000	PIN, TRITON, TRANSITION, G	1
7	2708313-0000	WASHER BAR, 1/4X3, 1/2X4, G	1
8	2701361-0000	BOLT, HK, 1/2X3, G/2, G	1
9	2704011-0000	NUT, HK, 1/2, G	1
10	2701044-0000	BOLT, HK, 1, 1/4X22, G, ALL, THREAD	1
11	2715055-0000	WASHER BAR, 3/8X3, 3/4X5, G	2
12	2708732-0000	WASHER, FLAT, 1, 1/2, SAE, G	2
13	2704571-0000	NUT, HK, 1, 1/4, G	1

BARRIER SECTIONS & TL-3 KITS NOT INCLUDED IN ASSEMBLY. ORDER SEPARATELY.

THE DEPICTED TRITON CONCRETE END TERMINAL PLUS TRANSITION IS A NARROW, NON-REDIRECTIVE, GATING, CRASH CUSHION. IT HAS BEEN CRASH TESTED FOLLOWING THE GUIDELINES IN NCHRP 350 TL-3 (100 km/h). ITS IMPACT PERFORMANCE IS SIMILAR TO A SAND-FILLED INERTIAL BARREL ARRAY. AS A CONSEQUENCE, CARE MUST BE USED IN ITS APPLICATION IN THE FIELD. IT IS RECOMMENDED THE TRITON CONCRETE END TERMINAL ONLY BE USED TO PROTECT PORTABLE (UNANCHORED) CONCRETE BARRIER AT SITES WHERE THE CHANCE OF HIGH ANGLE, HIGH SPEED IMPACTS IS LOW. WHEN THESE TYPES OF ANGLED IMPACTS MAY OCCUR, A REDIRECTIVE CRASH CUSHION, SUCH AS THE QUADGUARD SYSTEM, SHOULD BE INSTALLED INSTEAD.



ASSEMBLY NO. 3595500-0000

DATE	BY	CHK	APP
4/11/2003	D. Kohfeld		
4/10/2003	J. Welch		
4/17/2003	KM		
4/17/2003	JBW		

3595020-0000
3595351-0000
3595361-0000

REFERENCES
BARRIER SECTION ASSY, TRI
BARRIER SECTION ASSY, TRI
END TREATMENT, TRITON, TL3

TRITON CONCRETE END TREATMENT (PIN & LOOP PCMB)

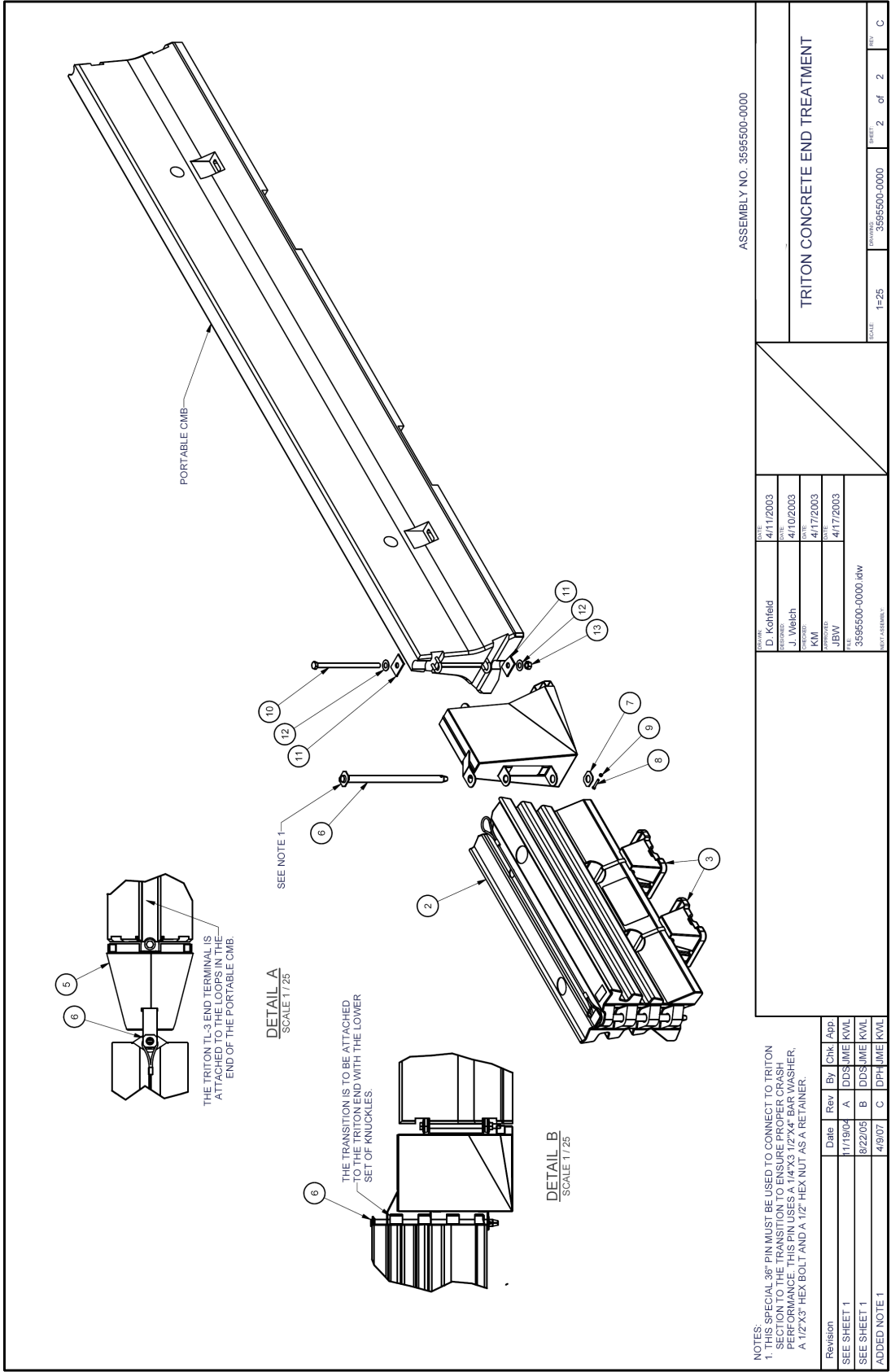
SCALE	1=50	DRAWING NO.	3595500-0000	SHEET	1	OF	2	REV	C
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Triton Barrier® CET (Pin & Loop PCMB)

Revision	Date	Rev	By	Chk	App
1	1/19/04	A	DDJ	JME	KVL
2	8/22/05	B	DDJ	JME	KVL
3	4/9/07	C	DPH		

ITEM WAS QTY 2. 3 WAS QTY 10. ADDED NOTE @ 1/19/04
ADDED ITEM 3 TO LIST OF ITEMS NOT INCLUDED IN BILL OF MATERIALS
SEE SHEET 2

DWG 3595500-0000 Sheet 1 of 2



ASSEMBLY NO. 3595500-0000

DESIGNER	D. Kohfeld	DATE	4/11/2003
REVISOR	J. Welch	DATE	4/10/2003
PROJECT	KM	DATE	4/17/2003
SCALE	1=25	DRAWING	3595500-0000
SHEET		2	of 2
REV			C

NOTES:	1. THIS SPECIAL 3/8" PIN MUST BE USED TO CONNECT TO TRITON SECTION TO THE TRANSITION TO ENSURE PROPER CRASH PERFORMANCE. THIS PIN USES A 1/4"x3 1/2"x4" BAR WASHER, A 1/2"x3" HEX BOLT AND A 1/2" HEX NUT AS A RETAINER.				
Revision	Date	Rev	By	Chk	App
SEE SHEET 1	1/19/04	A	DD	JME	KVIL
SEE SHEET 1	8/22/05	B	DD	JME	KVIL
ADDED NOTE 1	4/9/07	C	DP	JME	KVIL

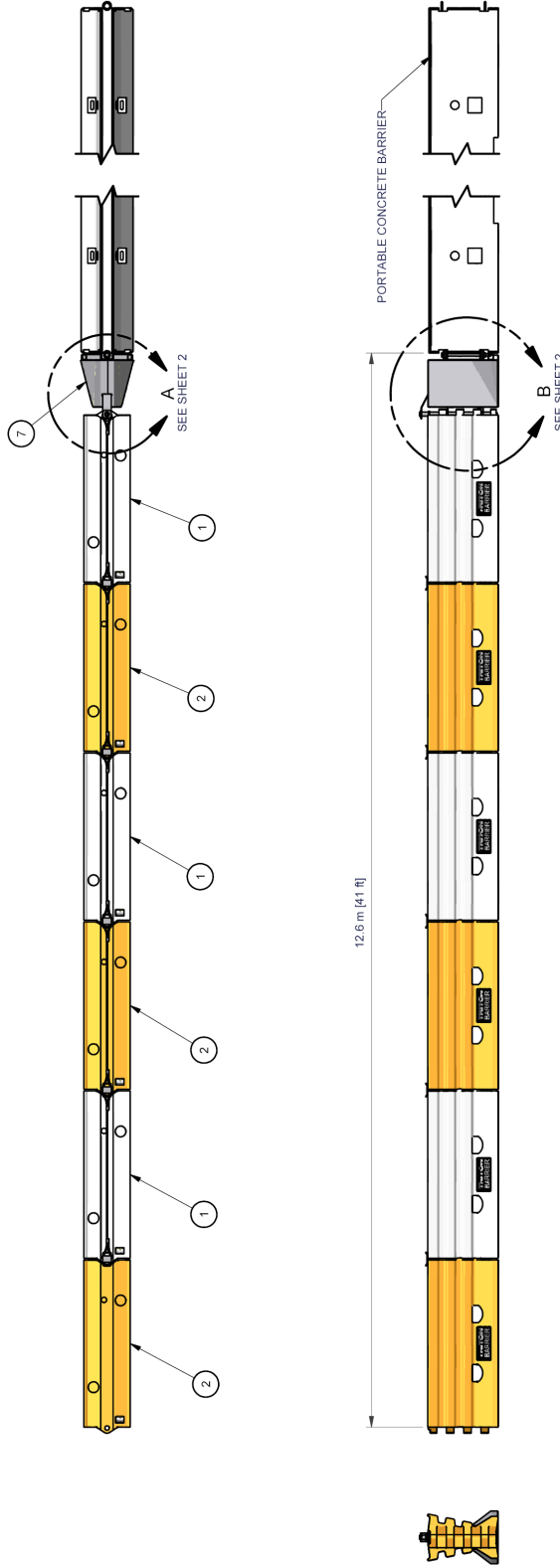
ASSEMBLY NO.	3595500-0000
TITLE	TRITON CONCRETE END TREATMENT

Triton Barrier® Concrete End Treatment

DWG 3595500-0000 Sheet 2 of 2

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	3595020-0100	BARRIER SECTION ASSY,TRI,WHITE	3
2	3595020-0000	BARRIER SECTION ASSY,TRI,ORANGE	3
3	2795401-0000	PIN,TRITON, TRANSITION,G	1
4	2701044-0000	BOLT,HX,1.14X22,G	1
5	2715055-0000	WASHER,BAR,3/8X3.3/4X5,G	2
6	2708732-0000	WASHER,FLAT,1.12 SAE,G	2
7	2795403-0000	TRANSITION,TRITON,PCMB	1
8	2704571-0000	NUT,HX,1.14,G	1

THE DEPICTED TRITON CONCRETE END TERMINAL PLUS TRANSITION IS A NARROW, NON-REDIRECTIVE, GATING CRASH CUSHION. IT HAS BEEN CRASH TESTED FOLLOWING THE GUIDELINES IN NCHRP . ITS IMPACT PERFORMANCE IS SIMILAR TO A SAND-FILLED INERTIAL BARREL ARRAY. THIS TYPE OF CRASH CUSHION IS NOT TO BE USED TO PROTECT PORTABLE (UNANCHORED) CONCRETE BARRIERS AT SITES WHERE THE CHANCE OF HIGH ANGLE, HIGH SPEED IMPACTS IS LOW. WHEN THESE TYPES OF ANGLED IMPACTS MAY OCCUR, A REDIRECTIVE CRASH CUSHION, SUCH AS THE QUADGUARD SYSTEM, SHOULD BE INSTALLED INSTEAD.



ASSEMBLY NO. 3595501-0000

DATE	BY
2/23/2004	R. Cummins
	DESIGNED
3/10/2004	S. Trageser
3/5/2004	K. Looney
	FILE
	3595501-0000.dwg

DATE	BY
2/23/2004	R. Cummins
	DESIGNED
3/10/2004	S. Trageser
3/5/2004	K. Looney
	FILE
	3595501-0000.dwg

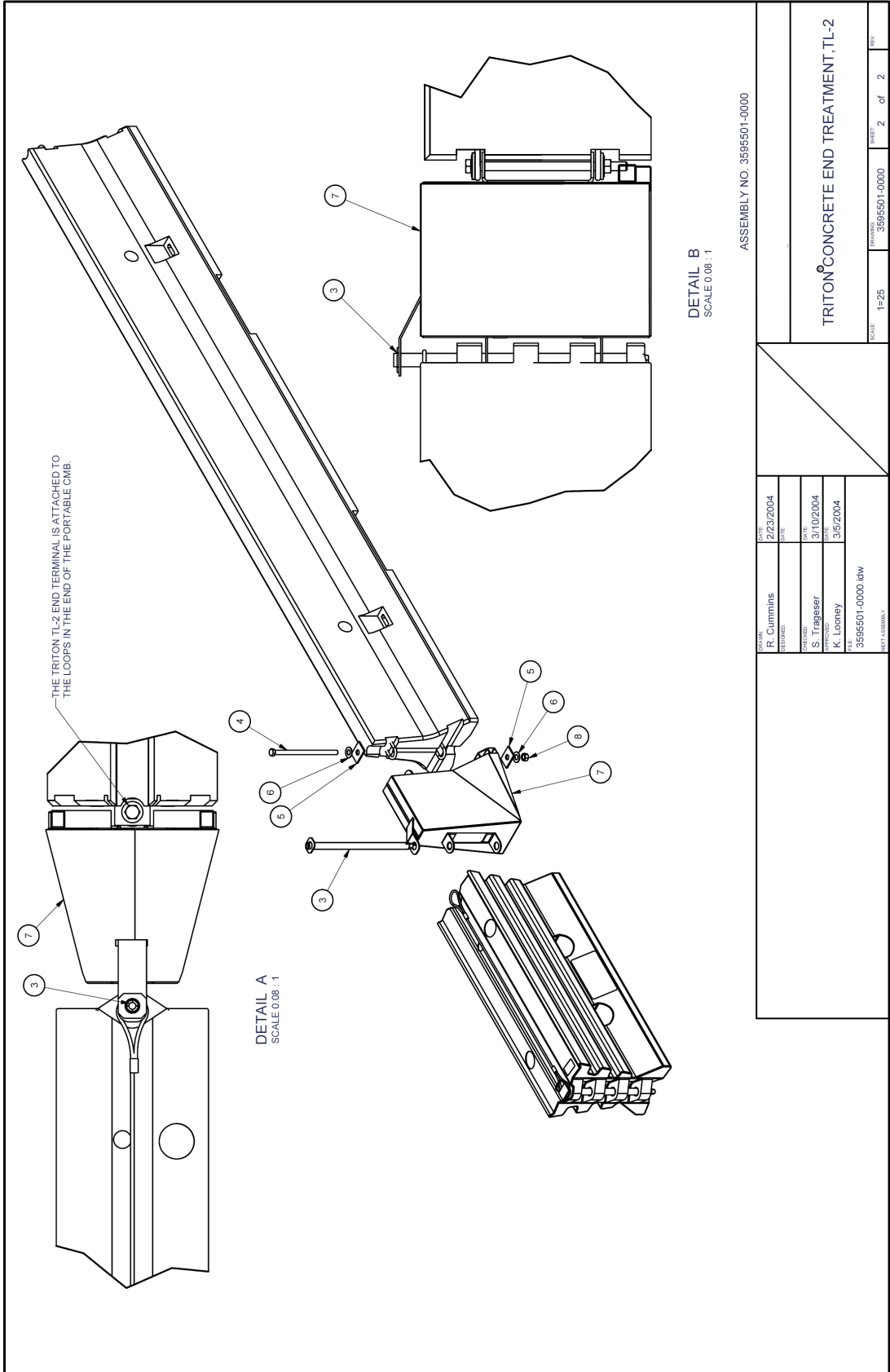
DATE	BY
2/23/2004	R. Cummins
	DESIGNED
3/10/2004	S. Trageser
3/5/2004	K. Looney
	FILE
	3595501-0000.dwg

DATE	BY
2/23/2004	R. Cummins
	DESIGNED
3/10/2004	S. Trageser
3/5/2004	K. Looney
	FILE
	3595501-0000.dwg

TRITON CONCRETE END TREATMENT, TL-2 (PIN & LOOP PCMB)

SCALE	DRAWING NO.	SHEET	OF
1:50	3595501-0000	1	2

Triton Barrier® CET, TL-2 (Pin & Loop PCMB)



Triton Barrier® CET, TL-2



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