

REACT 350[®] II

Product Description Assembly Manual



TRINITY
HIGHWAY

Ahead of the Curve[™]

REACT 350[®] II

The REACT 350[®] II system has been tested pursuant to National Cooperative Highway Research Program (“NCHRP”) Report 350 specifications. The REACT 350[®] II system has been deemed eligible for federal-aid reimbursement on the National Highway System (“NHS”) by the Federal Highway Administration (“FHWA”) as a TL-3 device.

Product Description Assembly Manual



2525 N. Stemmons Freeway
Dallas, Texas 75207



Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the REACT 350[®] II system. These instructions are for standard assemblies 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. Trinity Highway 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 directly at (888) 323-6374 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 REACT 350[®] II system information available to Trinity Highway at the time of printing. We reserve the right to make changes at any time. Please contact Trinity Highway to confirm that you are referring to the most current instructions.

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Customer Service Contacts

Trinity Highway is committed to the highest level of customer service. Feedback regarding the REACT 350[®] II system, its assembly procedures, supporting documentation, and performance is always welcome. Please contact Trinity Highway for additional information:

Trinity Highway

Telephone:	(888) 323-6374 (USA) (214) 589-8140 (International)
E-mail:	product.info@trin.net
Website:	www.trinityhighway.com

Important Introductory Notes

Proper assembly of REACT 350[®] II system is critical to achieve performance that has been evaluated and accepted by the FHWA per NCHRP Report 350. These instructions should be read in their entirety and understood before assembling the REACT 350[®] II system. These instructions are to be used only in conjunction with the assembly of the REACT 350[®] II system and are for standard assemblies only as specified by the applicable highway authority. If you need additional information, or have questions about the REACT 350[®] II system, please contact the highway authority that has planned and specified this assembly and, if needed, contact Trinity Highway's Customer Service Department. This product must be assembled in the location specified by the appropriate highway authority. If there are deviations, alterations, or departures from the assembly protocol specified in this manual, the device may not perform as tested.



Important: DO NOT use any component part that has not been specifically approved for this system during assembly or repair.

This product has been specified for use by the appropriate highway authority and has been provided to that user who has unique knowledge of how this system is to be assembled. No person should be permitted to assist in the assembly, maintenance, or repair of this system that does not possess the unique knowledge described above. These instructions are intended for an individual qualified to both read and accurately interpret them as written. These instructions are intended only for an individual experienced and skilled in the assembly of highway products that are specified and selected by the highway authority.

A manufacturer's drawing package will be supplied by Trinity Highway upon request. Each system will be supplied with a specific drawing package unique to that system. Such drawings take precedence over information in this manual and shall be studied thoroughly by a qualified individual who is skilled in interpreting them before the start of any product assembly.



Important: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the REACT 350[®] II system. Failure to follow this warning can result in serious injury or death to workers and/or bystanders. Such failure also compromises the acceptance of this system by the FHWA. Please keep up-to-date instructions for later use and reference by anyone involved in the assembly of the product.



Warning: Ensure that all of the REACT 350[®] II system Danger, Warning, Caution, and Important statements within the REACT 350[®] II system manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

Safety Rules for Assembly

*** Important Safety Instructions ***

This manual must be kept in a location where it is readily available to persons who are skilled and experienced in the assembly, maintenance, or repair of the REACT 350[®] II system. Additional copies of this manual are available from Trinity Highway by calling (888) 323-6374 or by email at product.info@trin.net. This manual may also be downloaded directly from the website indicated below. Please contact Trinity Highway if you have any questions concerning the information in this manual or about the REACT 350[®] II system.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the REACT 350[®] II system components. Gloves, safety goggles, safety-toe shoes, and back protection should be used.



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.

Safety Symbols

This section describes the safety symbols that appear in this REACT 350[®] II manual. Read the manual for complete safety and assembly information.

Symbol

Meaning



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



Warning: 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.



Warning: Do not assemble, maintain, or repair the REACT 350[®] II system 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 call Trinity Highway at (888) 323-6374 if you do not understand these instructions.



Warning: Use only Trinity Highway parts that are specified herein for the REACT 350[®] II for assembling, maintaining, or repairing the REACT 350[®] II system. **Do not utilize or otherwise comingle parts from other systems even if those systems are other Trinity Highway 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.



Warning: DO NOT modify the REACT 350[®] II system in any way.



Warning: Ensure that the REACT 350[®] II system and delineation used meet all federal, state, specifying agency, and local specifications.



Warning: Ensure that your assembly meets all appropriate Manual on Uniform Traffic Control Devices (“MUTCD”) and local standards.

Limitations and Warnings

Trinity Highway, in compliance with the 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 REACT 350[®] II system has been approved by FHWA as meeting the requirements and guidelines of NCHRP Report 350. These tests typically evaluate product performance defined by NCHRP Report 350 involving a range of vehicles on roadways, from lightweight cars (approx. 820 kg [1800 lb.]) to full size pickup trucks (approx. 2000 kg [4400 lb.]). A product can be certified for multiple Test Levels. The REACT 350[®] II is certified to the Test Level(s) as shown below:

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 Report 350 as approved by FHWA.

Trinity Highway neither represents nor warrants that the impact results of these federally established test criteria prevent or reduce the severity of any injury to person(s) or damage to property. These tests only demonstrate the occurrence of certain results following an impact within NCHRP Report 350 criteria. Every departure from the roadway is a unique event.

The REACT 350[®] II system is intended to be assembled, delineated, and maintained within specific state and federal guidelines. It is important for the highway authority specifying the use of a highway product to select the most appropriate product configuration for its site specifications. The customer should be careful to properly select, assemble, and maintain the product. Careful evaluation of the site lay out, vehicle population type; speed, traffic direction, and visibility are some of the elements that require evaluation in the selection of a highway product. For example, curbs could cause an untested effect on an impacting vehicle.

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

System Overview

The REACT 350[®] II system, through crash testing, has been shown to be a potentially reusable, re-directive, non-gating crash cushion for roadside obstacles up to 914 mm (3') wide. After those impacts observed within NCHRP Report 350 criteria, it has been observed that, potentially, the entire bulk of the system can be reused. What constitutes a potentially reusable highway product should only be determined by a trained engineer, experienced in highway products, directed by the appropriate highway authority.

When impacted under NCHRP Report 350 criteria, this system is capable of shielding specified roadside features up to 914 mm (3') wide. It consists of a series of "smart plastic" Cylinders attached to a steel Base Track. The term "smart plastic" refers to the memory characteristics of the Cylinders. After a head-on impact as described in NCHRP Report 350, the REACT 350[®] II system has the potential to recover a major portion of its shape, position, and energy absorbing capability.

The REACT 350[®] II system utilizes various Cylinder wall thicknesses to accommodate both light cars and heavier, high-center-of-gravity vehicles.

Two backup options are available to further meet specific requirements of each location. A Self-Contained Backup is available or the REACT 350[®] II system can be mounted to a new or existing Concrete Backup. In some locations, either Backup type may be applicable.

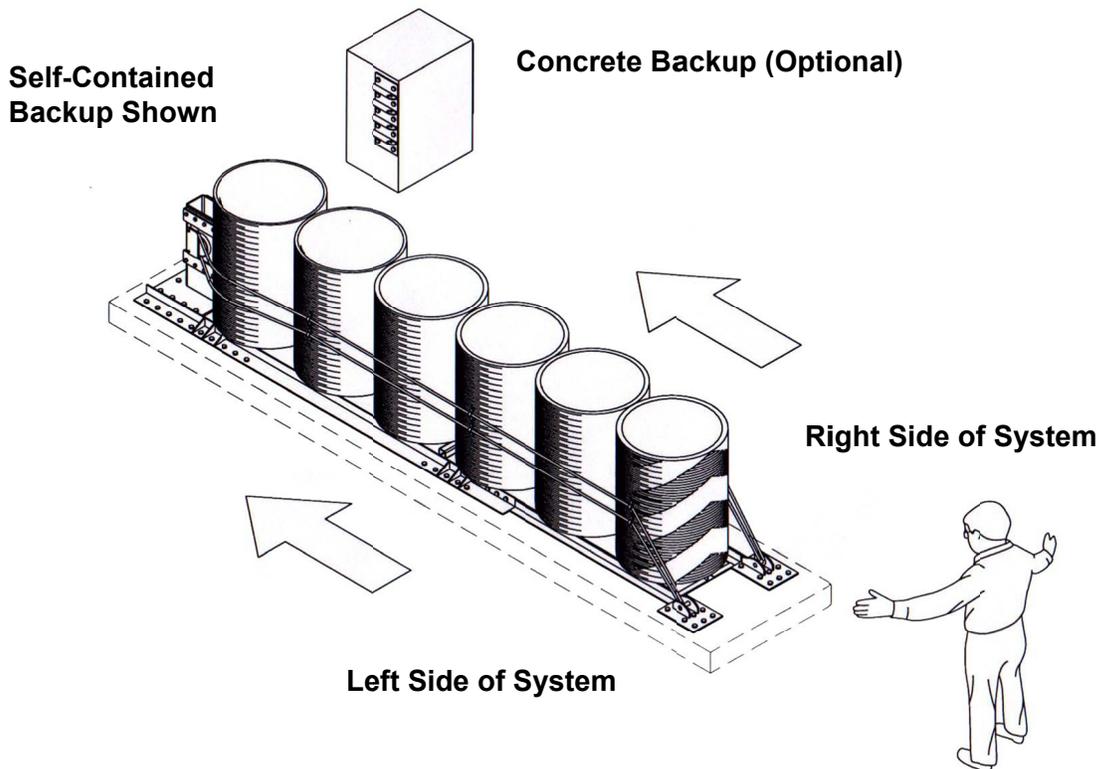


Figure 1 - REACT 350[®] II with Self-Contained Backup

REACT 350[®] II Foundation/Anchoring



Warning: Ensure that this assembly conforms with the guidance provided by the AASHTO Roadside Design Guide, including, but not limited to, those regarding placement on or adjacent to curbs.

Asphalt Installations

REACT 350[®] II systems with a Self-Contained Backup may be installed in construction zones on asphalt. Assemblies on **Asphalt Concrete (“A.C.”)** must provide a minimum 76 mm [3”] layer of asphalt over a minimum 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 Customer Service for a complete list of approved adhesives (see p. 3).



Important: REACT 350[®] II **Wide** systems should not be anchored to asphalt.

Concrete Installations

For concrete installations, the REACT 350[®] II 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 in your site specific drawing package or standard drawings in the back.

The REACT 350[®] II system may be installed on any of the following foundations using the specified anchorage:

Foundation A: Concrete Pad or Roadway

Foundation: 200 mm [8”] minimum depth P.C.C.

Anchorage: Approved adhesive with 180 mm [7”] studs 140 mm [5 1/2”] embedment

Foundation B: Asphalt over P.C.C.

Foundation: 76 mm [3”] minimum 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 Compacted Subbase (“C.S.”)

Foundation: 150 mm [6”] minimum A.C. over 150 mm [6”] minimum C.S.

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

Foundation D: Asphalt

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 six months. See Post Impact Instructions and Maintenance and Repair instructions on pages 34-37.

Foundation Specifications

For Foundations A, B, C and D mentioned above:

A.C. (Asphalt Concrete)

AR-4000 A.C. (per ASTM D3381) 3/4" Maximum, Medium (Type A or B) aggregate

Sieve Size	Operating Range (%) Passing
1"	100
3/4"	95-100
3/8"	65-80
No. 4	49-54
No. 8	36-40
No. 30	18-21
No. 200	3-8



Important: Walk-up inspections are recommended at least once every six months for installations on asphalt.

P.C.C. (Portland Cement Concrete)

Stone aggregate concrete mix

4000 psi minimum compressive strength

(Sampling per ASTM C31 or ASTM C42, testing per ASTM C39)

C.S. (Compacted Subbase)

150 mm [6"] minimum depth 95% compaction

Class 2 aggregate

Sieve Size	Moving Average % Passing
3"	100
2 1/2"	90-100
No. 4	40-90
No. 200	0-25

Trinity Highway Approved Adhesive Anchoring System

A Trinity Highway 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 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 REACT 350[®] II system Backup and/or Monorail sections to the concrete foundation must be those shipped in the kit or of high strength steel (Grade B7 or SAE-J429 Grade 5) tensile strength. 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: Consult OSHA silica respiratory standard 29 CFR 1910.134 for debris removal from borehole(s) and 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. See the approved adhesive instructions provided with your kit. Check to be sure all the boreholes are drilled to the proper depth and aligned with the part to be anchored (see Table A).

Table A
Anchoring Information

Stud Size:	Concrete Bit Size	Minimum Depth	Recommended Torque
3/4"x 7 1/2"	22 mm [7/8"]	150 mm [6"]	Consult Adhesive Kit Spec
3/4"x 18"	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 A. Due to the instability of asphalt, anchors may loosen over time. For this reason Trinity Highway recommends anchoring to asphalt only at temporary locations. It is recommended to re-torque anchors in asphalt every six months to the recommended torque specification.

3) Clean the Boreholes

Consult OSHA silica respiratory standard 29 CFR 1910.134 for debris removal from borehole(s). The anchor borehole must be free from oil, grease or other contaminants.

4) Apply Approved Adhesive

Fill the borehole with enough adhesive so when the anchor is inserted a small portion of anchoring adhesive squeezes 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 (see Figure 1).

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

Push the stud, nut, and washer assembly down through the part and into the borehole until the washer is seated against the part (see Figure 1).



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

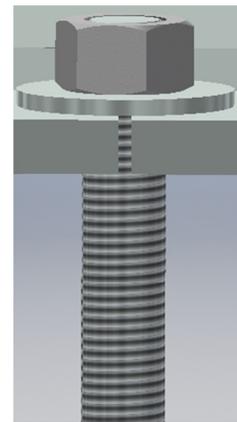


Figure 1
Anchor Application
(Before Applied Torque)

7) Torque the Nuts

Once the adhesive has fully cured, torque the nut to the manufacturer's recommended values (see Table A).

Encountering Foundation Rebar

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.

Recommended Tools

Documentation

- Manufacturer's Instructional Manual
- Manufacturer's Drawing Package

Personal protective equipment

- Eye Protection
- Gloves
- Safety-Toe Shoes

Cutting equipment

- Grinder/Hacksaw or Torch
- Rebar Cutting Bit
- Rotary Hammer Drill
- 22 mm (7/8") x 178 mm (7") Hollow Drill Bit for vacuum feature
- 19 mm (3/4") x 178 mm (7") Concrete Drill Bit (double-fluted)



Important: Trinity Highway recommends using **double-fluted** drill bits to achieve optimum tensile strength when applying an approved adhesive anchoring system (see p. 10).



Important: Because every impact is different, Trinity Highway 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 make certain that the instructions provided in this manual have been strictly followed.

Hammers

- Sledgehammer

Wrenches

- Heavy duty impact wrench
- 1/4", 5/16", 3/8", 3/4", 1 7/8" Sockets
- 3/4", 1 1/16", 1 1/8", 1 1/4" Deep Hex-head Sockets
- Ratchet and extensions for above sockets
- Standard adjustable wrench
- 1 1/16", 1 1/8", 1 1/4", 9/16", 5/8" combination wrenches
- Large Pipe Wrench

Screwdrivers

- Screw gun or standard drill with adapter chuck for small screws/bolts
- Flathead Screwdriver
- Phillips Screwdriver

Miscellaneous

- Traffic control equipment
- Lifting and moving equipment (A lifting device is preferred although a forklift can be used.) Minimum 2722 kg [6,000 lb.] capacity required. Do not lift overhead.
- Compressor (100 psi) and Generator (5 KW)
- Long pry bar
- Drift pin
- Tape measure 7.5 m (25')
- Chalk line
- Rags, water, and solvent for touch-up

Note: The above list of tools is a general recommendation and should not be considered an extensive 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 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 assembly site.

Know Your REACT 350[®] II System

For specific assembly, maintenance, or repair details refer to the state or specifying agency's standard drawing(s) and/or Trinity Highway standard layout drawings.

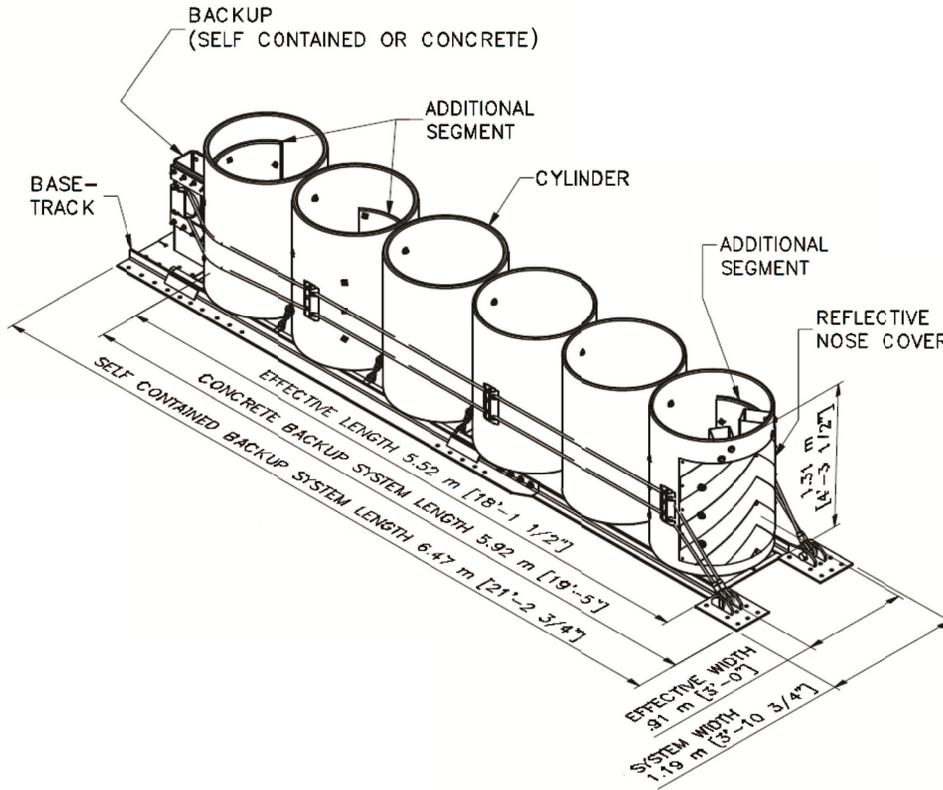


Figure 2

System Size

	Backup	
	Self-Contained	Concrete
Effective Length	5.52 m [18'-1 1/2"]	5.52 m [18'-1 1/2"]
System Length	6.47 m [21'-2 3/4"]	6.02 m [19'-9"]
Effective Width	.91 m [3'-0"]	
System Width	1.19 m [3'-10 3/4"]	
Height	1.31 m [4'-3 1/2"]	

Backup Type

It is important to fully understand the limitations of each backup type so the correct REACT 350® II system is chosen for each location.

The REACT 350® II system is available with a Self-Contained Backup or may be attached to a Concrete Backup. Refer to Figures 4a and 4b, along with the backup assembly drawings, to determine which type of backup is appropriate.

Self-Contained Backup

REACT 350® II System with a Self-Contained “steel tube” Backup require two cables, one cable on each side of the Cylinders. These cables begin at the front of the system, travel through the Cable Guides on the Cylinders, loop around the backup structure, travel back through the Cable Guides, and terminate at the front of the system.

Concrete Backup

REACT 350® II system with a Concrete Backup requires four cables. Two cables on each side of the Cylinders begin at the Side Anchor Plates, travel through the Cable Guides on the Cylinders, loop around the pin on the Front Anchor Plates, travel back through the Cable Guides, and terminate at the Side Anchor Plates.

Existing concrete structures may serve as backups for REACT 350® II system provided they meet specific size and strength requirements.

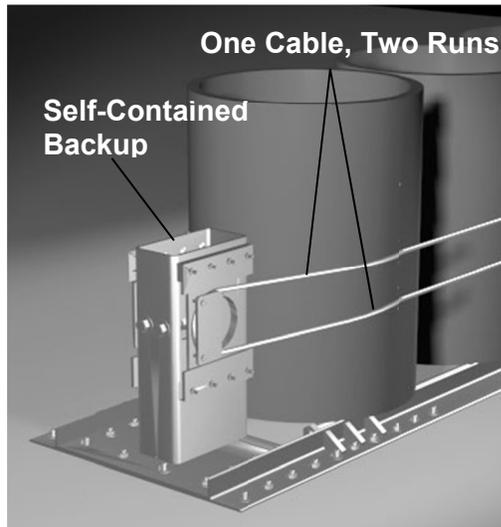


Figure 4a
Self-Contained Backup

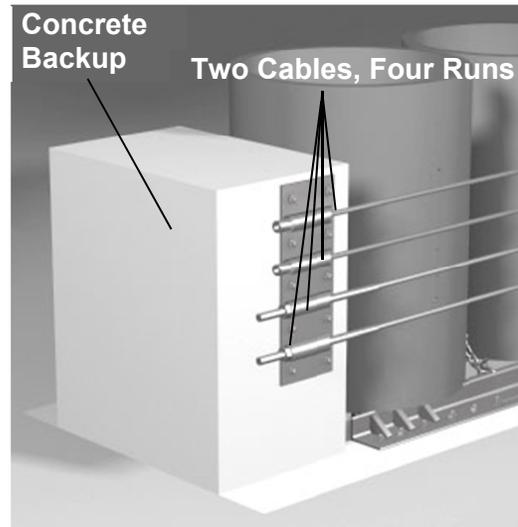


Figure 4b
Concrete Backup

System Design

Self-Contained Backup

The REACT 350[®] II system with a Self-Contained Backup is intended to minimize assembly time. This type of system arrives at the site fully assembled. The assembly crew needs only to lift and place the system in front of the barrier then drill and set the anchors. Refer to the “Assembly” section on page 23 for a complete list of instructions.

Roadside Feature Width

Generally, the REACT 350[®] II system, with a Self-Contained Backup, can shield objects up to 203 mm [8”] wide in a gore application. This type of system can also shield wider roadside features in non-gore and bidirectional traffic locations (see “Bidirectional Traffic” on p. 18 and “Offsetting the System” on p. 19). Please contact Trinity Highway for any additional information (see p. 3).

When shielding median barriers (813 mm [32”] tall safety shape), a Self-Contained Backup may be used if the base or “toe” of the barrier is tapered to a total width of 356 mm [14”] (see Figure 5).

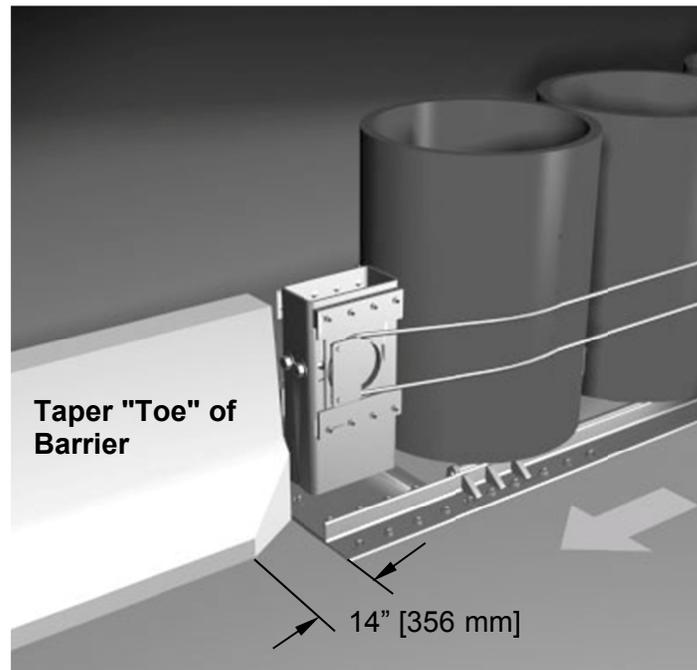


Figure 5
Tapered Barrier

Guardrail Attachment

Hardware is available to mount W-beam guardrail or a safety shaped barrier to the Self-Contained Backup of the REACT 350[®] II system. A folded Transition Plate and W-beam connector can mount to either or both sides of the backup assembly (see Figure 6). If bidirectional traffic is present, special post spacing, rail, and rub-rail will be required for the guardrail. Thrie Beam guardrail adapters are also available. Contact Trinity Highway for assistance (see p. 3).

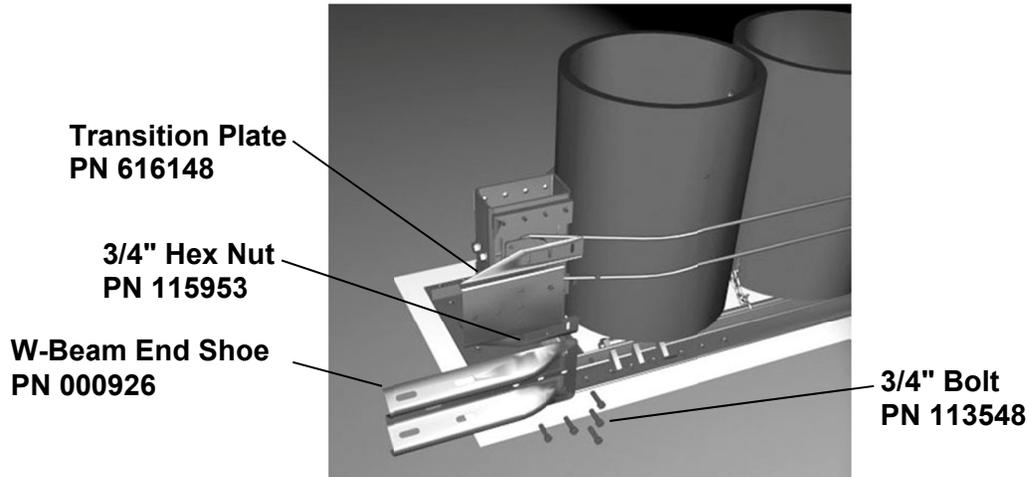


Figure 6
Guardrail Attachment Hardware

Bidirectional Traffic

If bidirectional traffic (vehicles traveling opposite directions on either side of the system) is present, special consideration needs to be taken when placing the system. It is important that the Self-Contained Backup does not become a roadside obstacle to the reverse direction traffic. If a system is placed in a location where traffic will be approaching from the rear of the system, transition hardware may be required.

Optionally, if space permits, the REACT 350[®] II system may be offset so that the backup structure is shielded by the roadside feature (see "Offsetting the System" on p. 19). Guardrail transition hardware may also be used.

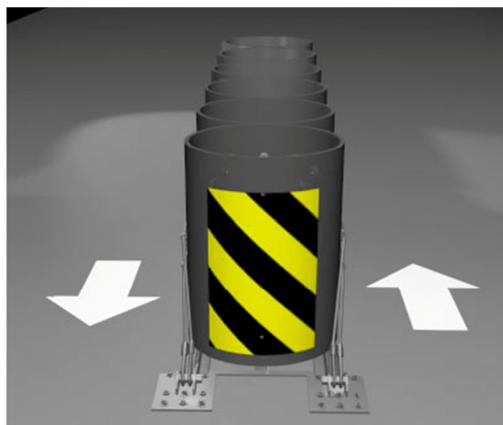


Figure 7
Bidirectional Traffic

Offsetting the System

If space permits, REACT 350[®] II system, with a Self-Contained Backup, may be offset from the center of the roadside obstacle. Offsetting may be necessary for two reasons:

- 1) To shield a fixed object wider than 200 mm [8"]
- 2) If bidirectional traffic is present

When offsetting the system, align the vertical face of the Backup structure with the face of the barrier (see Figure 8). With this method, REACT 350[®] II system with Self-Contained Backup may shield roadside features up to 610 mm [24"].

If a wider roadside obstacle is present or if bidirectional traffic is present, a Concrete Backup may be required. Please contact Trinity Highway Customer Service Department for further information (see p. 3).

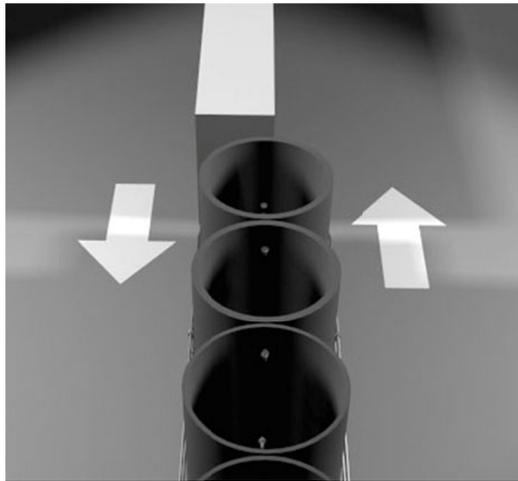


Figure 8

Offsetting the System

Concrete Backup

The REACT 350[®] II system is also intended to mount directly to a new or existing Concrete Backup. This type of system requires slightly more assembly time, as the cables must be assembled on site (see p. 27).

Existing Concrete Backups must be a minimum of 1000 mm [40"] high, 610 mm [24"] long, and 762 mm [30"] to 914 mm [36"] wide, with 28-day strength of 28 MPa [4000 psi] and fully reinforced.

If your existing structure does not meet these minimums, special hardware and designs may be available for them. Contact Trinity Highway Customer Service Department if you have questions concerning Concrete Backup requirements (see page 3).

Roadside Obstacle Width

The REACT 350[®] II system with a Concrete Backup may be specified to protect obstacles up to 914 mm [36"] wide. The backup must be 762 mm [30"] to 914 mm [36"] wide to use standard side anchor hardware.

Bidirectional Traffic

If bidirectional traffic (vehicles traveling opposite directions on either side of the system) is present, special consideration needs to be taken when placing the system.

It is important for the highway design engineer and the assembler to ensure that the Concrete Backup itself does not become a roadside obstacle to the reverse direction traffic. If the system is placed in a location where traffic will be approaching from the rear of the system, the Backup should not protrude beyond the obstacle being shielded. Concrete tapering may be required.

Also, an additional standard Side Anchor Plate should be rotated 180 degrees and placed behind the first anchor plate (see Figure 9). In this case, the backup must be at least 762 mm [30"] long.

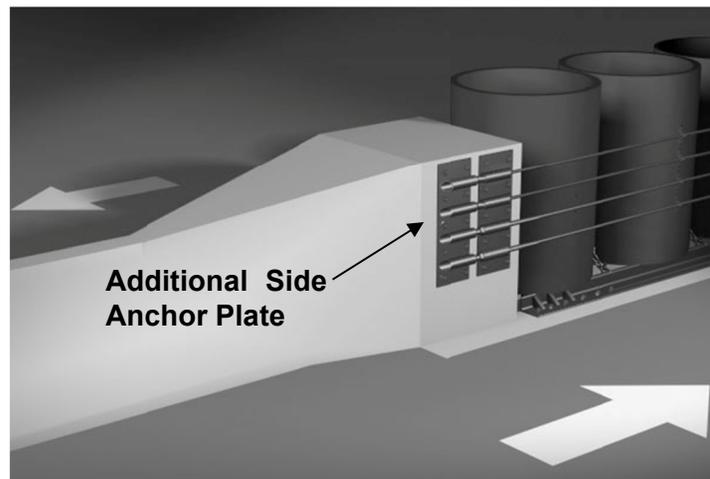


Figure 9

Standard Anchor Plate with Concrete Backup

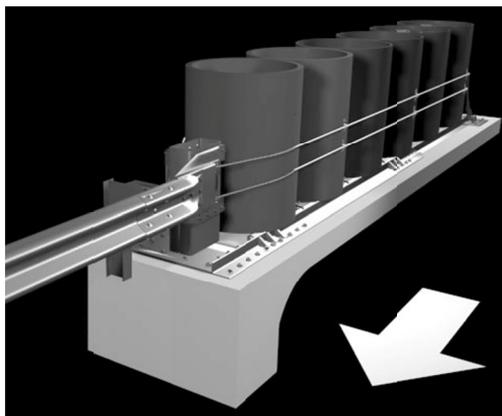


Figure 10a Below-Grade Anchor Block

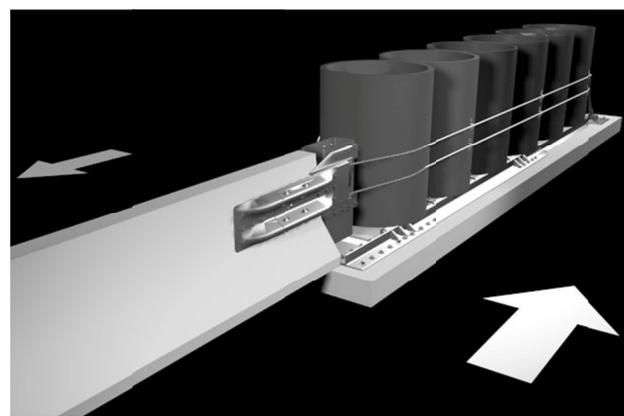


Figure 10b - Anchor Block Not Needed

Application Assistance

Contact Trinity Highway Customer Service Department if you would like input as to your specific application. Proper model selection is essential to the performance of the REACT 350[®] II system. You will need to answer the following questions:

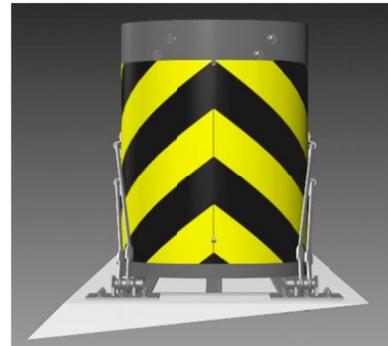
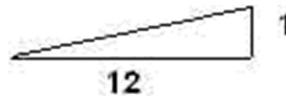
1. Are curbs, islands, or elevated objects (delineators or signs) present at the site? What height and width are they? All curbs and elevated objects should be removed. Curbs should be removed from behind the backup to approximately 15 m [50'] in front of the REACT 350[®] II system. Any curbs that must remain should be 102 mm [4"] maximum and be mountable. Signs should not interfere with the system's ability to collapse. Generally, a vehicle should not interact with two appurtenances at the same time. Allow adequate spacing.
2. If the deployment site is a gore area (place where two roads diverge), what is the angle of divergence?
3. What is the general geometry of the site? Include the roadway for 150 m [500'] in front of the roadside feature, so traffic patterns can be visualized.
4. Is there an existing guardrail or median barrier at the site?
5. What is the width of the roadside obstacle to be protected?
6. Will there be traffic approaching from the rear of the system? Is the system in a two-way traffic situation with traffic going in opposite directions on either side of the system? Or, is the system on the side of the road where cross over traffic is a concern? If so, a transition from the fixed object to the rear of the system may be necessary to prevent a vehicle from interacting with the rear of the system (see "Bidirectional Traffic" on pages 18 and 20).
7. Are there any other unique features at the site that may affect the positioning or performance of the REACT 350[®] II system? See "Other Factors That May Affect Your Specification" on page 22.

Other Factors That May Affect Your System

1. The existence of drain inlets or buried culvert pipe.
2. Junction boxes or other appurtenances located near the roadside object.
3. Insufficient space for the length of system preferred.
4. The location and movement of expansion joints.
5. Breaking cross-slopes under or near the proposed assembly or severe cross-slope under the system. Provide leveling to 8% maximum.



Warning: The existence of any cross-slopes in excess of 8% or curbs may create an untested effect on the impacting vehicle.



**Figure 11 – 1:12
Cross-Slope**

Joints

The REACT 350[®] II system with Concrete Backup and split Base Track may span longitudinal expansion or construction joints. Any system interactive joint movement must be limited to 38 mm [1-1/2"].



Important: The REACT 350[®] II system is not designed to span a transverse joint.

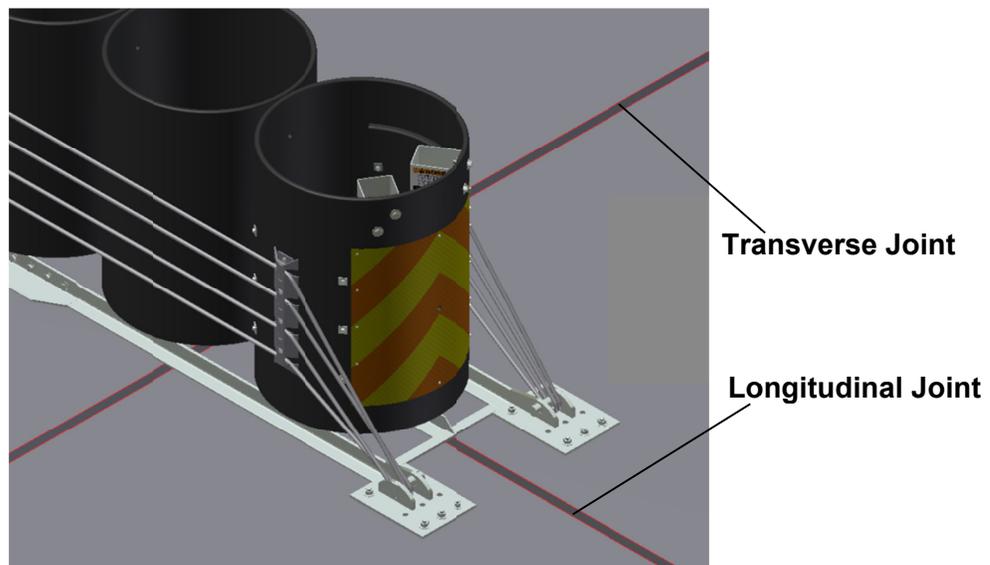


Figure 12 - Longitudinal or Transverse Joints

Inspect Shipment

Before assembling the REACT 350[®] II system at a specified location, check the received parts against the shipping list supplied with the system. Make sure all parts have been received. The system is shipped assembled. All assembly hardware can be found in the last Cylinder. The Pullout Assembly should be stored for post impact use.

Assembly

Note: The drawing assembly package provided with the REACT 350[®] II system must be used with these instructions for proper assembly and should take precedence over these general instructions.

1) Deploy Traffic Control

A traffic control plan appropriate to the complexity of the project should be prepared and understood by all parties before the REACT 350[®] II system is assembled. Follow the plan set forth by the highway authority specifying the use of this system.

Deploy the appropriate work zone safety devices prior to beginning the assembly and keep them present through all phases of deployment.



Warning: The correct safety equipment and traffic management system approved by the requisite highway authority must be used as required for any assembly using the REACT 350[®] II system.

2) Determining the Base Point & Centerline

Typically the base point of the REACT 350[®] II system will be the midpoint of the road obstacle at its front face. This may change if bidirectional traffic or expansion joints are present (see “Offsetting the System” on p. 19).

Extend a chalk line from the base point, perpendicular to the roadside obstacle face, or as determined by project engineer, to a distance greater than the maximum length of the REACT 350[®] II system (refer to the drawings provided). This chalk line will become the centerline for the REACT 350[®] II system (see Figure 13).

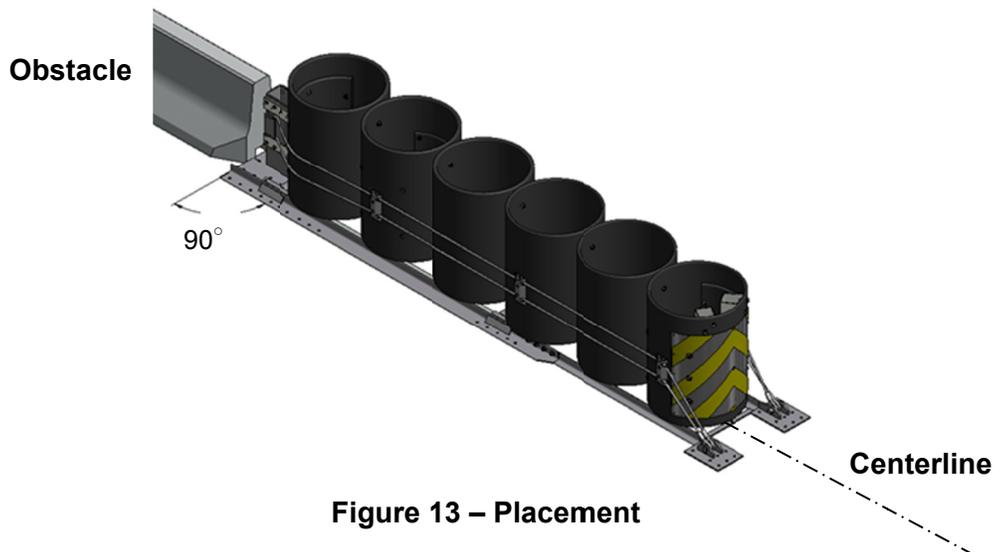


Figure 13 – Placement

3) Lifting/Placing the System

Mark the centerline on the front and rear of the Base Track. Use the Lifting Eyes located on the Middle Rail of the Rear Base Track (look down into the Cylinders) to lift the REACT 350[®] II system into place (see Figure 14).

Use fixed-length slings with a 2722 kg [6,000 lb.] minimum capacity. Fixed slings will prevent the REACT[®] 350 II from tipping. Do not lift overhead. Measure from the centerline to ensure that the REACT 350[®] II system is centered and positioned at the proper angle. The steel Base Track will rest flush against the roadside obstacle face for assemblies that do not require transitions.

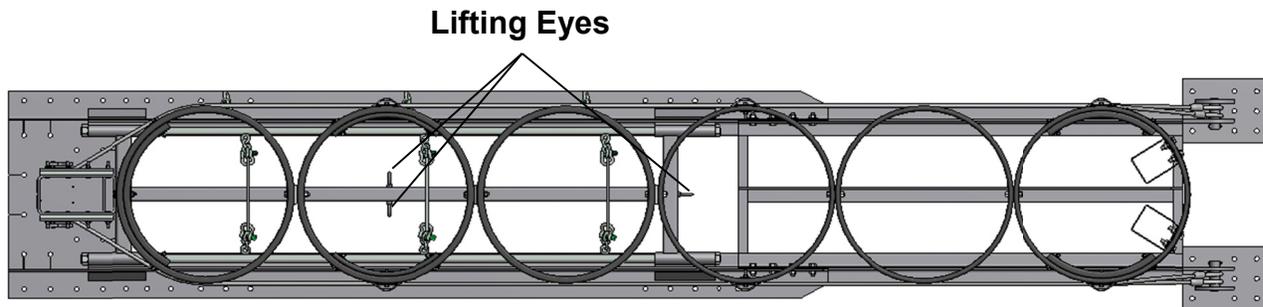


Figure 14 - Lifting Eye Location



Warning: Ensure the hoist device is properly rated to lift the REACT 350[®] II system.

For Self-Contained Backup assemblies requiring transition hardware to concrete wall or safety shape barrier (PN 616120), the steel Base Track should be 127 mm [5"] forward of the roadside obstacle face (see Figure 15).

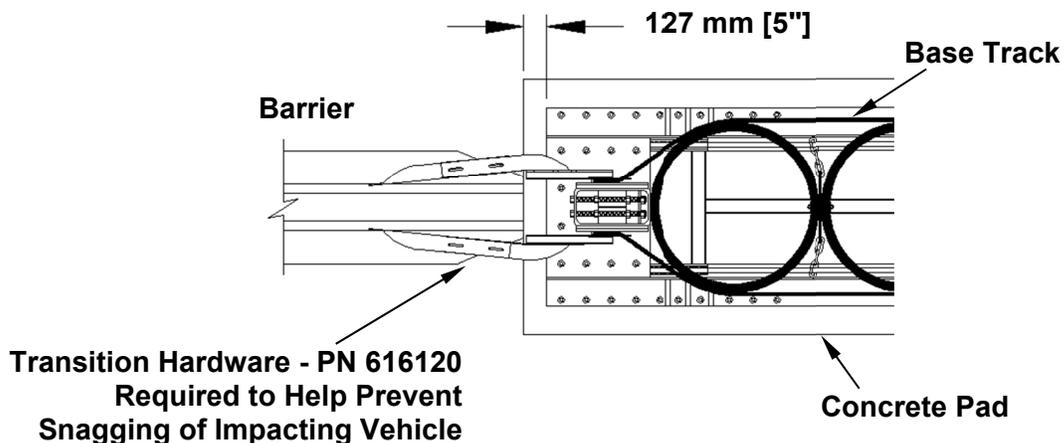


Figure 15 - Transition Hardware

Self-Contained Backups

4) Drill and Set Anchors

Use the holes in the Base Track as a template to locate and drill boreholes, 22 mm [7/8"] diameter x 150 mm [6"] deep into the concrete pad or roadway surface (see Figure 16). All boreholes in Base Plate must be used to anchor the REACT 350[®] II system to the foundation. Use an approved adhesive kit with instructions to secure the 3/4" diameter x 7 1/2" long studs (see p. 10).

After adhesive has cured, use 3/4" flat washers and nuts provided with kit to anchor Base Track to foundation.



Warning: Every anchor hole in the Base Plate must be used to secure the REACT 350[®] II system to the foundation.

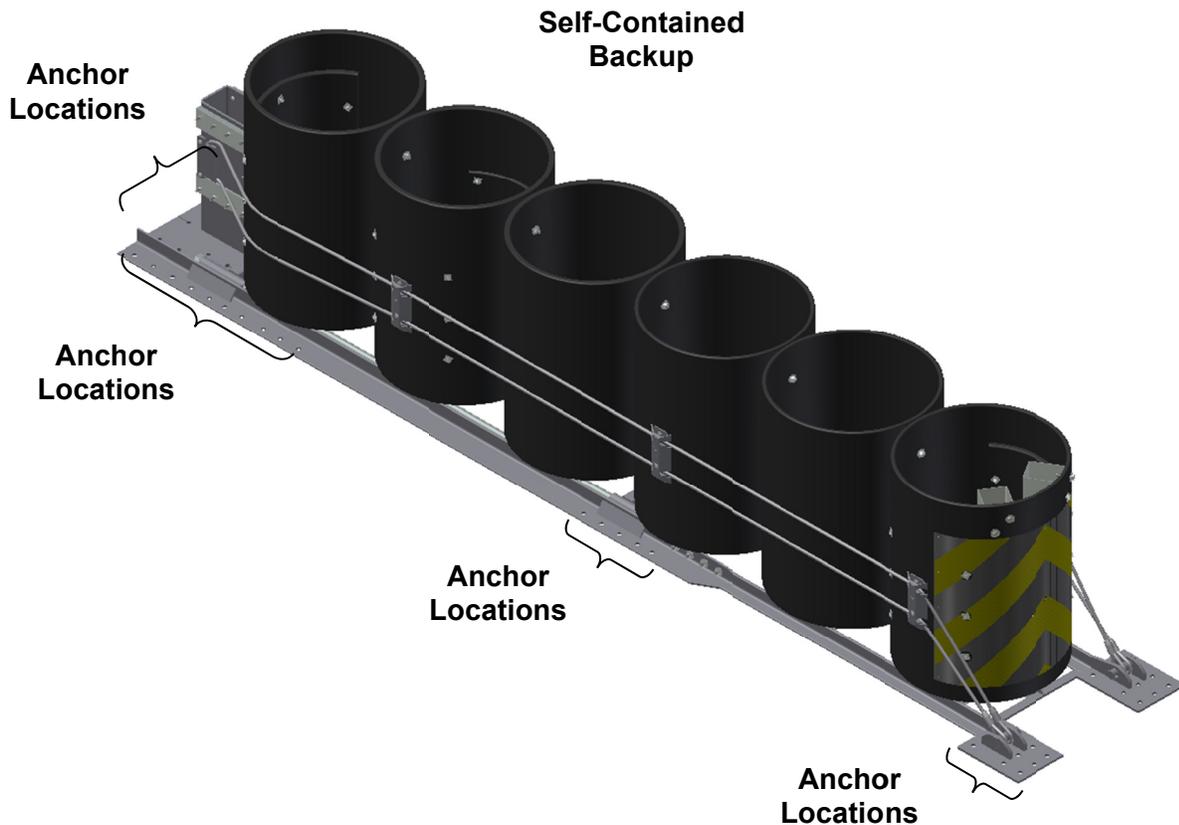


Figure 16 - Anchoring the System - Self-Contained Backup

5) Tension Restraining Cables

Use the two adjusting nuts at the rear of the Backup to tension the cables (see Figure 17). When properly tensioned, the cables should not deflect more than 75 mm [3"] with 45 kg [100 lb.] downward pressure.

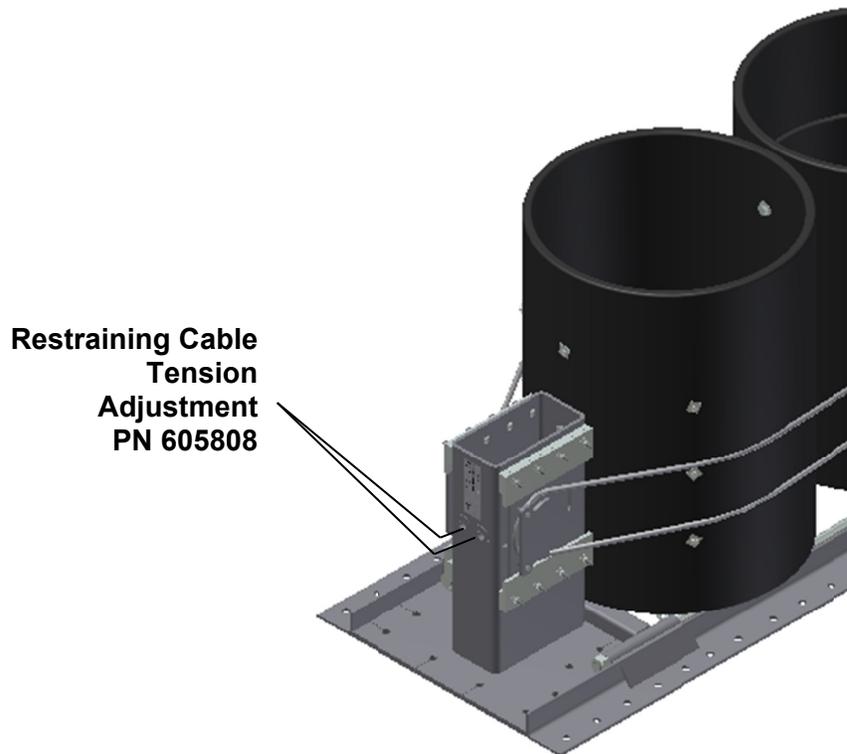


Figure 17 - Tension Adjustment (Self-Contained Backup)

Concrete Backups

1) Rear Cylinder Attachment

Use the top holes of each pair in the Rear Cylinder as a template to locate and drill two (2) holes, 22 mm [7/8"] diameter x 150 mm [6"] deep into the Concrete Backup (see Figure 18). Use an approved adhesive kit with instructions to secure the 3/4" diameter x 7 1/2" long studs using instructions included with kit (see p. 10). After adhesive has cured, use 3/4" nuts and flat washers included with the approved adhesive kit to attach the Cylinder Assembly to the Concrete Backup (see Figure 18).

2) Drill and Set Anchors

Use the holes in the Base Track as a template to locate and drill holes, 22 mm [7/8"] diameter x 150 mm [6"] deep into the concrete pad or roadway surface (see Figure 18). Use approved adhesive kits to attach 3/4" diameter x 7 1/2" long studs using instructions included with kit (see p. 10). After adhesive has cured, use 3/4" flat washers and nuts provided with kit to anchor Base Track to foundation.



Warning: All holes in Base Plate must be used to anchor the REACT 350[®] II system to the foundation.

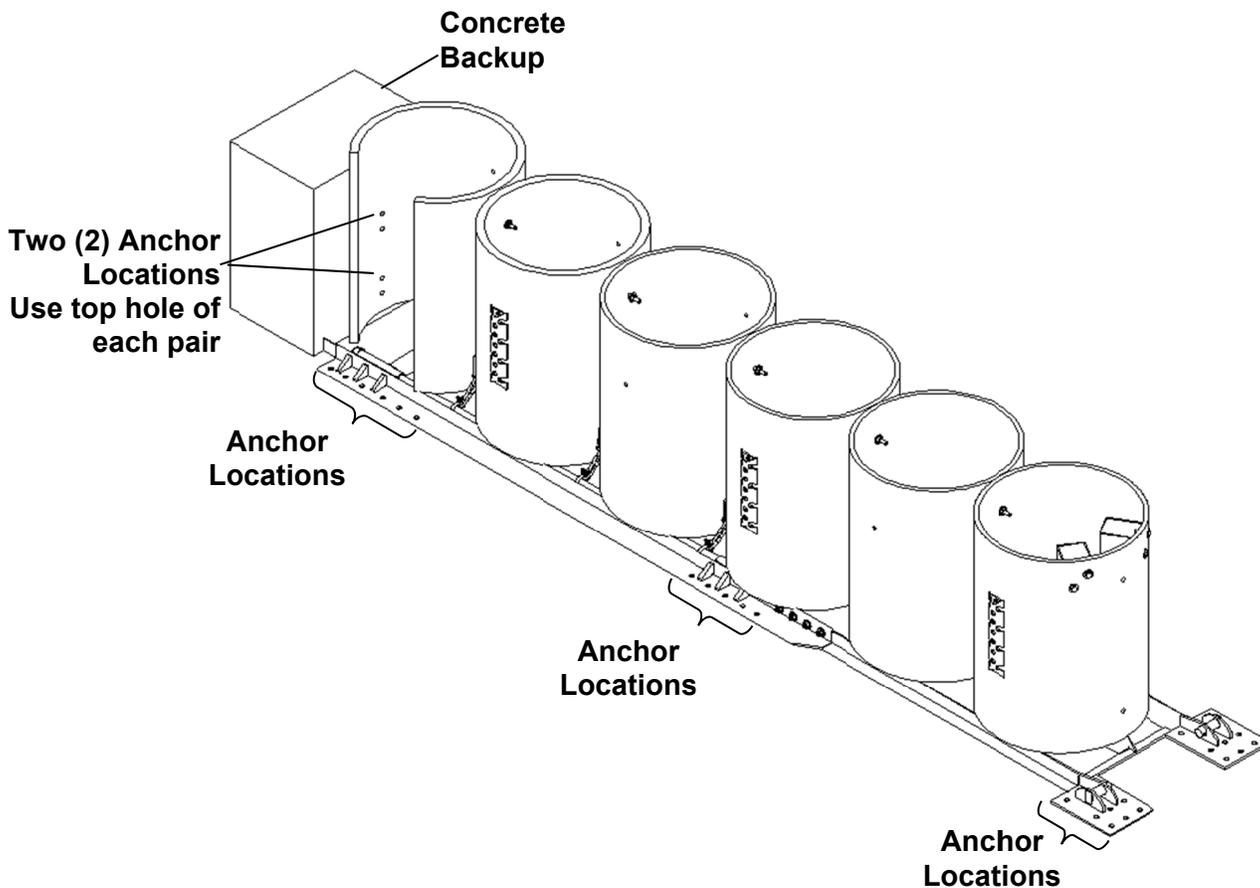


Figure 18 - Anchoring the System - Concrete Backup

3) Drill and Set Side Anchor Plate Anchors



Warning: For REACT 350® II system with a Concrete Backup, Side Cable Anchor Plates must be attached.



Warning: The vertical placement of the Side Anchor Plates is critical to the performance of the REACT 350® II system. If an existing backup is not tall enough to fulfill these requirements, special brackets are available. Consult Trinity Highway Customer Service for further information (see p. 3).

When correctly assembled, the top of the Side Cable Anchor Plates should be 991 mm (39") from the road surface. The front edge of the Side Cable Anchor Plates should be 51 mm - 102 mm [2" - 4"] from the front face of the backup to avoid reinforcing steel. The tapered tubes of the Side Cable Anchor Plates should face the front of the REACT 350® II (see Figure 19). Use the holes in the Side Cable Anchor Plates as templates to match drill ten (10) holes per side of backup, 22 mm [7/8"] diameter x 140 mm [5 1/2"] deep into the Concrete Backup. Use an approved adhesive kit to place twenty (20) 3/4" diameter x 6 1/2" long studs using instructions included with kit. After adhesive has cured, use 3/4" flat washers and nuts provided with kit to attach side cable anchor plates (one on each side) to Concrete Backup (see Figure 19).

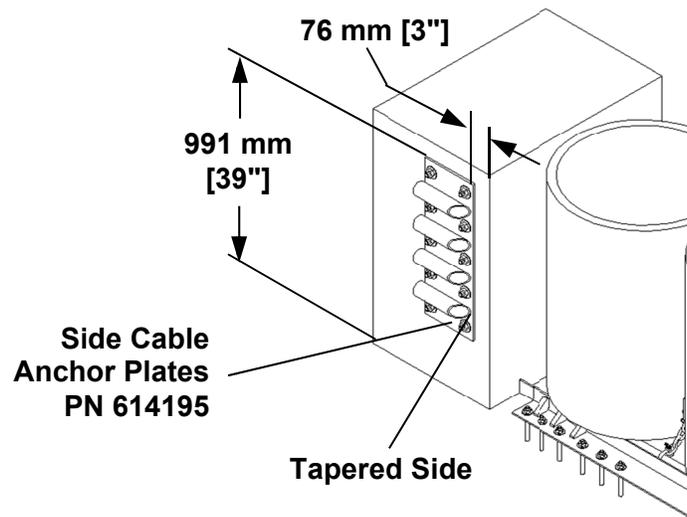


Figure 19 - Side Cable Anchor Plates

4) Attach Restraining Cables



Warning: Four (4) Restraining Cables must be attached; two (2) on each side of the Concrete Backup.

- A. Slide the threaded end of a Restraining Cable through the third guide down and attach flat washer and nut as shown in Figure 20. Tighten the nut so it is flush with the end of the threaded end of cable.

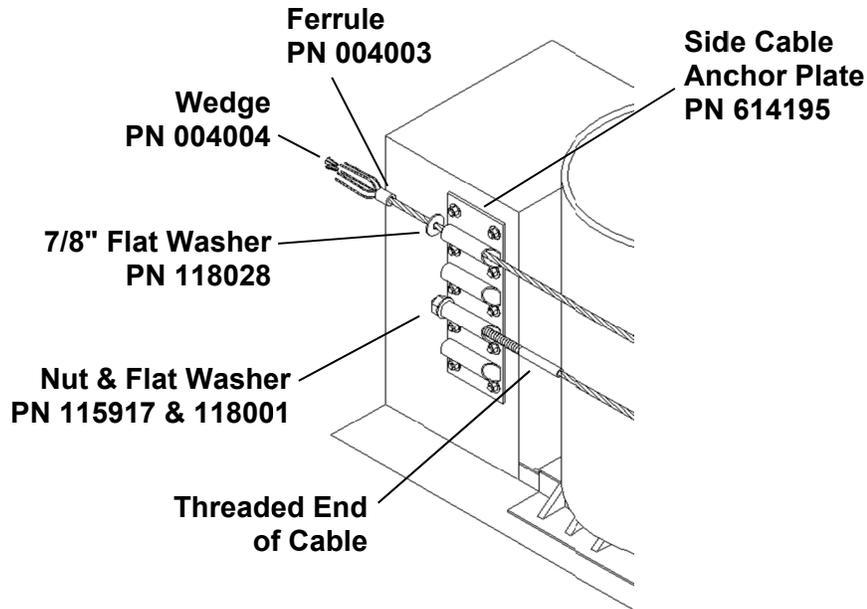


Figure 20 - Routing First Cable

- B. Route the Restraining Cable through the Cable Guides on the sides of the Cylinders, around the Restraining Cable Pin as shown in Figure 21, back through the Top Cable Guides on the Cylinders and through the Top Cable Guide of the Side Plate (see Figure 22).

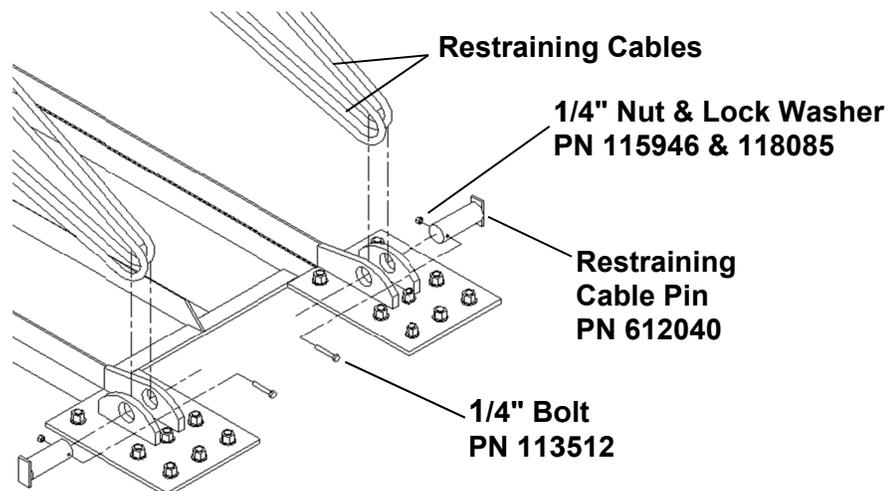
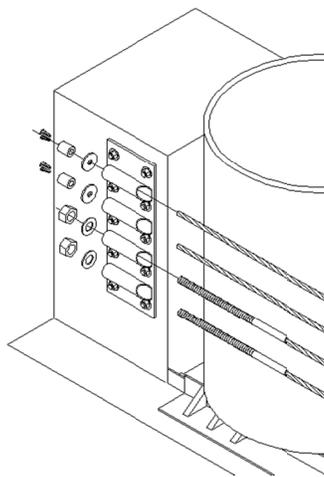


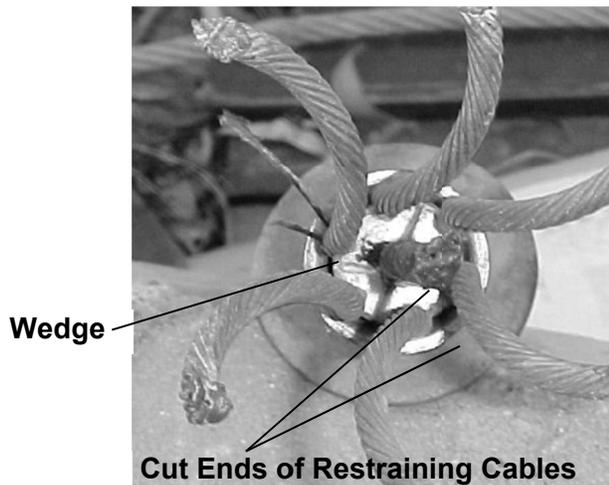
Figure 21 - Front of System Cable Attachment (Concrete Backup)

C. Pull on the cut end of the cable removing all possible slack. Slide the 7/8" x 3" flat washer and the ferrule (in that order) over the end of the non-threaded end of the Restraining Cable. Mark the cable 50 mm [2"] back from the ferrule. Leaving the ferrule and washer in place, cut the cable at the mark with a grinder or hack saw. Do not use a torch to cut the cable. Unbraid end of cable and insert middle strand between the two halves of the wedge. Carefully wrap the remaining six strands into the two halves of the wedge. Carefully wrap the remaining six strands into the slots around the wedge then push into ferrule to tighten (see Figure 22 and Detail A). Use a drift pin and sledge hammer to seat the ferrule into the cable receptacles.

Repeat these steps for remaining three Restraining Cables, ensuring that the threaded ends of the Restraining Cables are attached through the lower two guides as shown in Figure 22.



**Figure 22 – Rear Cable Attachment
Concrete Backup**



Detail A – Cable Ferrule

5) Tension Restraining Cables

Use the nuts on the threaded end of the cables to tension the cables (see Figure 20).

When properly tensioned, the cables should not deflect more than 75 mm [3"] with 45 kg [100 lb.] downward pressure.

Attach Nose Cover

1. Ensure appropriate Nose Cover is attached (see Figure 23). The Nose Cover Selection below will assist in your selection and you should refer to local standards and MUTCD for nose.

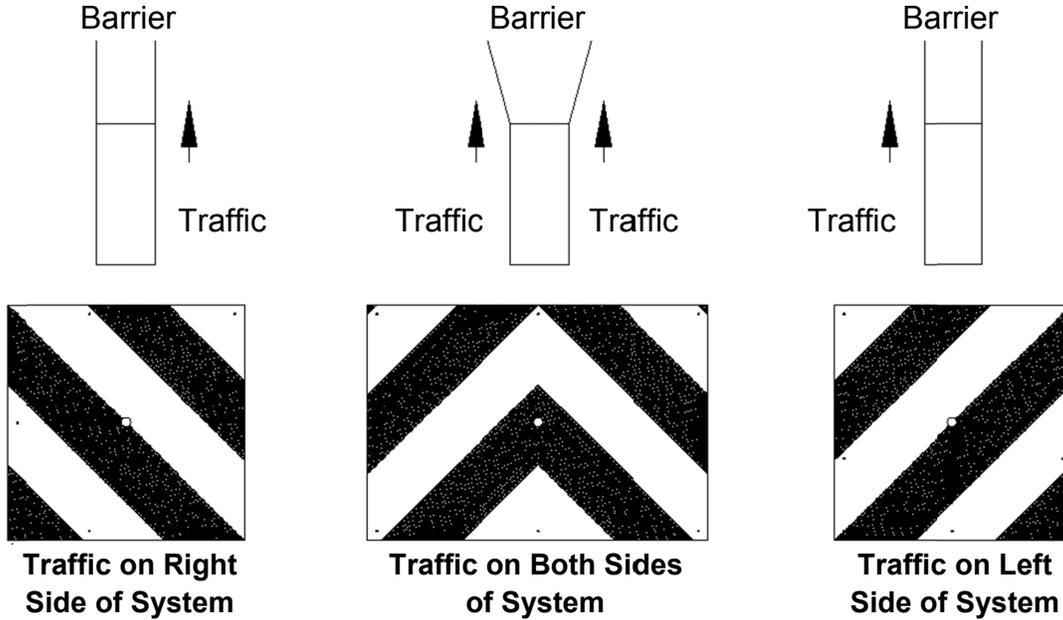


Figure 23 - Nose Cover Selection

2. Align 1" diameter hole in Nose Cover with 1" diameter hole in Cylinder (see Figure 24).
3. Screw 1/4" self-drilling screw into Cylinder to punch through reflective tape and into the existing holes in Nose Cover until head of fastener is flush (10 places) (see Detail B).

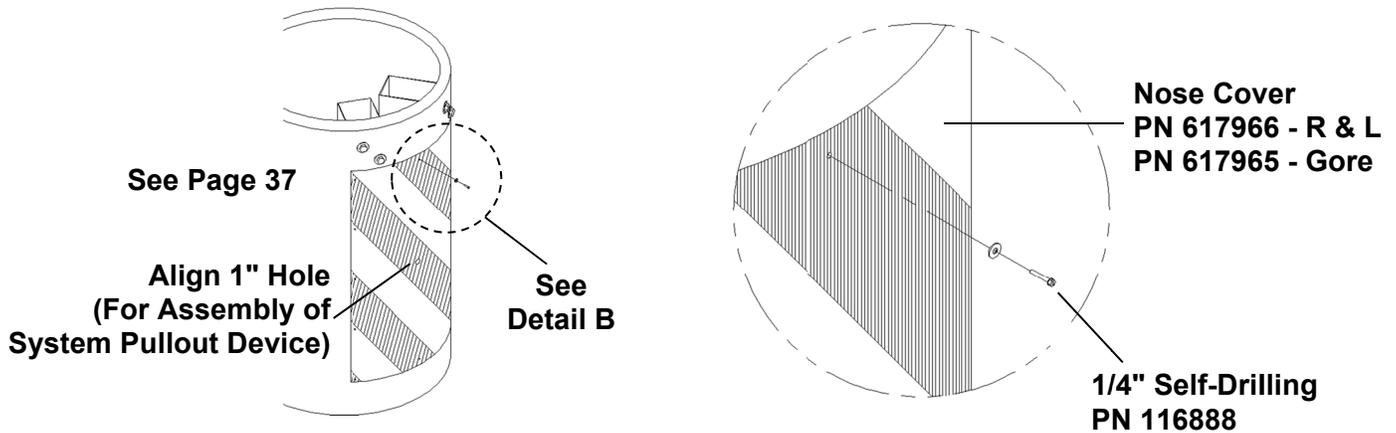


Figure 24 - Nose Cover Attachment

Detail B

Affix Side Mount Reflectors

Refer to local standards and MUTCD for reflectors.

Attach Side Mount Reflectors to traffic side(s) of the system, with the white side facing traffic, by screwing #8 self-tapping screws through the reflector and into the Cylinder until head is flush (see Figure 25).

Note: Reflector drawing available on page 58.

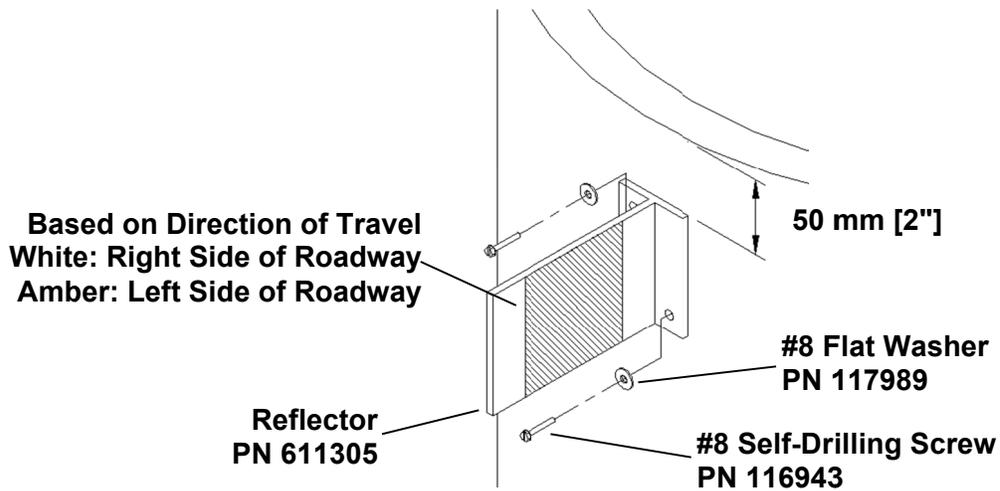


Figure 25 - Side Mounted Reflector

Attach Optional Debris Covers

To attach Optional Debris Covers, center a cover on Cylinder 1. Note the orientation of the grommets. The two grommets closest together should be located in the front or rear of the Cylinder (see Figure 26). Additional style covers are available by contacting Trinity Highway for more options (see p. 3)

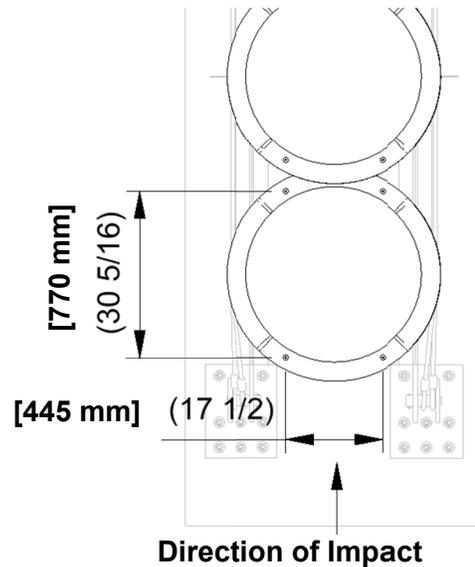


Figure 26

Next, attach Optional Debris Cover to Cylinder with four #10 flat head screws and fender washers ensuring each screw is positioned in the middle of the Cylinder wall (see Figure 27).

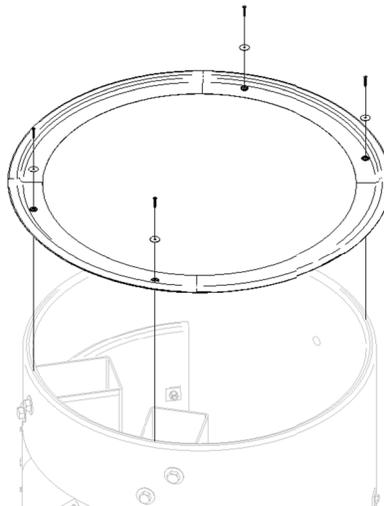


Figure 27

Continue to attach the remaining covers as described above.

Note: The covers may overlap; however, the overlap direction is not critical to system performance.

Maintenance and Repair

The REACT 350[®] II system, through crash testing, has been shown to be a potentially reusable crash cushion. After impacts within NCHRP Report 350 criteria, it has been observed that, potentially, the bulk of the system can be reused. However, whether or not a system is reusable is the sole discretion of the highway authority specifying their use.



Caution: After an impact, always follow the “Post-Impact Instructions” on p. 37.

Estimated Time for Maintenance

An experienced two-person crew with the proper tools and spare parts should be able to complete the work in one to three hours depending on the damage done to the system.

Life Expectancy

Impacts

Potential life expectancy of the system is mostly dependent on system impacts. This includes:

1. The number of impacts
2. The severity of the impacts
3. The temperature at the time of the impacts

The REACT 350[®] II system must be inspected after each impact. Depending on the impact, components may get damaged and need replacement. A cylinder requires replacement when the minor axis of the cylinder stays permanently at 460 mm [18"] or less (see figure 30) or the system does not reach 90% of the original length. It is critical that all cables and anchoring be checked and returned to original assembly conditions. Any parts used in the repair of the system must be original Trinity Highway parts (see p. 3).

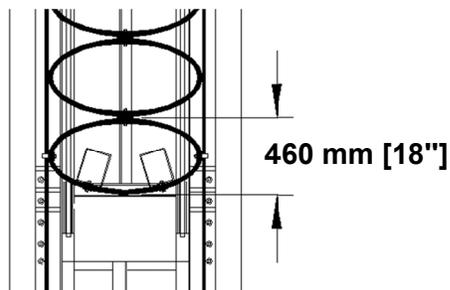


Figure 30 - Measure Minor Axis



Warning: Use only Trinity Highway parts that are specified herein for the REACT 350[®] II for assembling, maintaining, or repairing the REACT 350[®] II system. **Do not utilize or otherwise comingle parts from other systems even if those systems are other Trinity Highway 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.

Recycling Information

When parts need to be replaced, it is recommended that the old parts be recycled as follows:

Steel should be sold as scrap to a local metal recycler.

HDPE plastic cylinders should be sold to a plastic recycler if possible. If a recycler is unavailable, dispose of the material as plastic refuse.

Parts Ordering Procedure

1. Locate the Product Decal attached to the inside of the Rear Cylinder. Copy the sales order information from the decal.
2. Make a list of any damaged parts, using part numbers and descriptions found on the reference drawings included with the REACT 350[®] II system.
3. Only parts specified to be used in this system may be used during repair. The use of a part not specified in this system design renders this system as one that HAS NOT BEEN accepted by FHWA for use on the NHS and all observed crash testing to determine system performance is negated. The use of a part not contained herein during the repair renders the systems as something other than that which was tested.

Inspections

Inspections by the appropriate highway authority are recommended as determined by that authority based upon volume of traffic and impact history. Visual drive-by inspections are recommended at least once every three months. Walk-up inspections are recommended at least twice a year.



Important: After an impact, follow the “Post-Impact Instructions” on page 37.

Visual Drive-By Inspection

1. Check to see if there is evidence of an impact. Check to verify that the REACT 350[®] II system is fully extended from the backup. If it is not, a walk-up inspection will be necessary to determine the cause.
2. Note the location and condition of the REACT 350[®] II system and the date of visual drive-by inspection on a log sheet.



Warning: Debris, snow, or ice inside the cylinders may prevent the REACT 350[®] II system from absorbing the impact of a crash as observed in NCHRP Report 350 compliant crash testing. Perform a walk-up inspection as needed to check for and dispose of any debris inside the Cylinders. Failing to remove this debris or other material infringes upon the performance of the system as tested.

Walk-Up Inspection

1. Check for any foreign matter that may interfere with the smooth operation of the REACT 350[®] II system. Check for and remove any debris found inside the Cylinders. Check for and remove any debris found under and around the REACT 350[®] II system.
2. Check for evidence of bent or damaged parts. Replace as soon as possible following parts ordering procedure on page 35.
3. Verify that all nuts and bolts are tight and rust free.
4. Ensure all Anchor Bolts are securely anchored (see p. 10).
5. Verify that all Cylinders are in good condition and properly positioned on the Base Track. Any Cylinder that is cracked or otherwise damaged should be replaced. Measure the minor axis of the Cylinders. Cylinders require replacement when the minor axis of the cylinders measures 460 mm [18"] or less (see p. 34).
6. Ensure all cables are attached with parts specified for use in this system.
7. Note the location and condition of the REACT 350[®] II system and any work done for the date of this inspection. If further repair is necessary, note the repair requested. Refer to the standard drawing and assembly section of this manual for more information.



Warning: Locally approved personal safety equipment and traffic management must be used for walk-up inspections of the REACT 350[®] II system.

Post-Impact Instructions

1. Deploy the appropriate **traffic control** devices to protect your crew.



Warning: Locally approved personal safety equipment and traffic management must be used for walk-up inspections of the REACT 350® II system.

2. Check to see that all anchor bolts have remained firmly anchored in the roadway surface and in the Concrete Backup, if applicable. Replace any anchors that are loose, broken, or pulled out.

If the system is anchored to asphalt, up to 10% of the total anchors may be replaced if damaged. If more than 10% of the anchors are damaged, the system should be relocated to fresh, undisturbed asphalt and redeployed using the 460 mm [18"] threaded rods.

3. Clear and dispose of any debris inside the cylinders and on site.
4. Check the condition of the Cylinders. Any Cylinder that is cracked or otherwise damaged should be replaced. Measure the minor axis of the Cylinders. Cylinders require replacement when the minor axis of the Cylinders measures 460 mm [18"] or less (see p. 34).
5. The REACT 350® II system must be pulled out to its original length after each impact. The Pullout Assembly must be attached prior to this procedure and removed and stored when finished (see Figure 31).

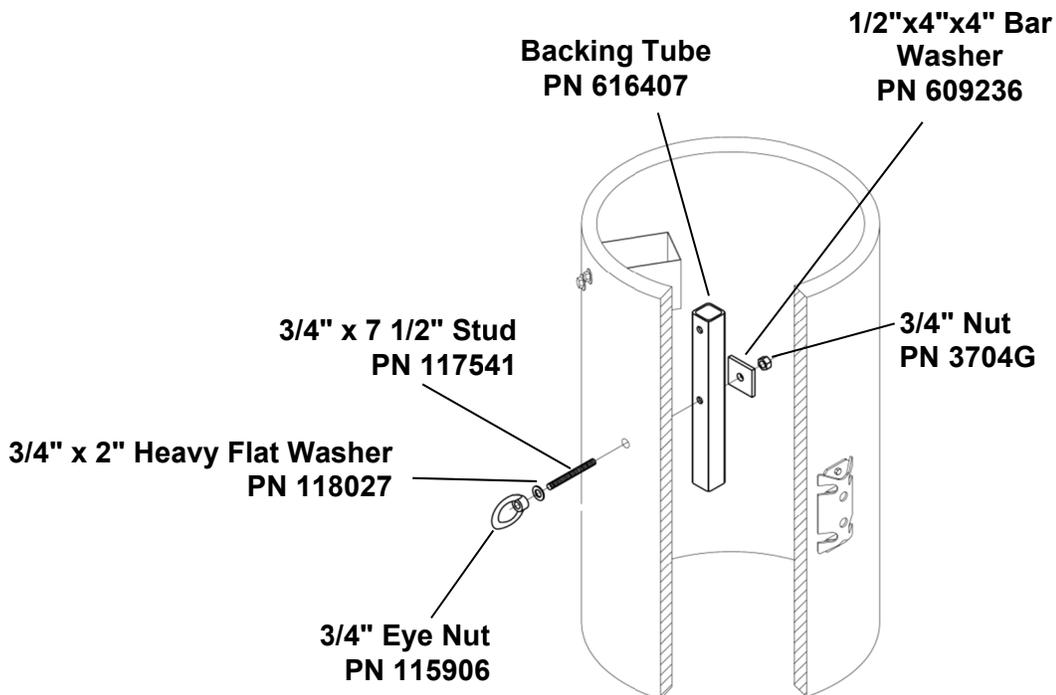
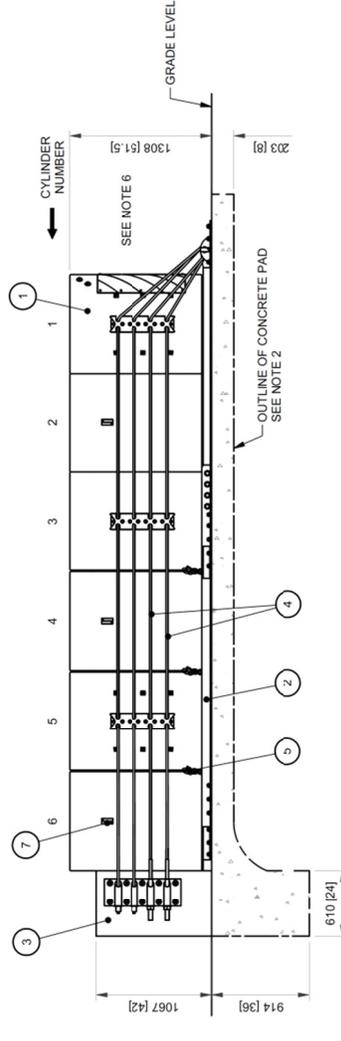
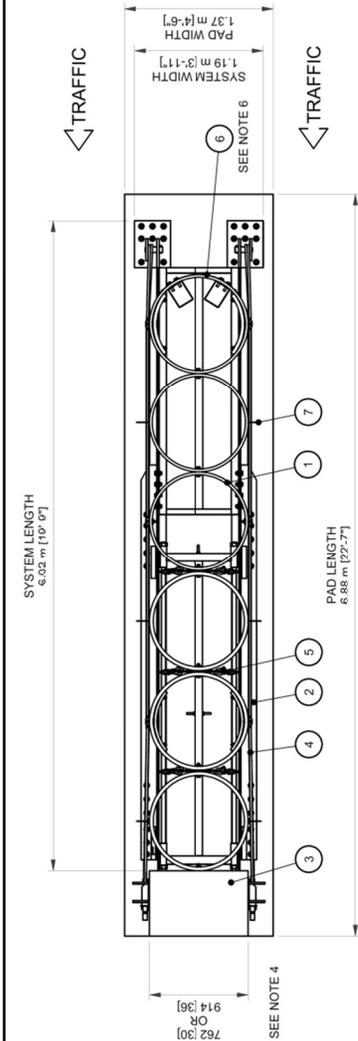


Figure 31 - Pullout Assembly

R626C036U

CYLINDER SCHEDULE	
CYL. NO.	STOCK NO. / CYLINDER ASSY NO.
1	613562B / 010003B
2	613562B
3	613562B
4	613564B
5	613564B / 618024B
6	613564B



- NOTES
- COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - 203 [8.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 203 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG.
 - SEE THE "REACT 350" PRODUCT DESCRIPTION INSTRUCTIONAL MANUAL* FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (312) 467-6750.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SWAGING OF VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND MUST BE ORDERED SEPARATELY.
 - UNITS OF MEASUREMENT ARE MILLIMETERS (INCHES) UNLESS OTHERWISE NOTED.
 - NOSE COVER NOT INCLUDED IN MODEL NUMBER, ORDER SEPARATELY.

KEY	1	2	3	4	5	6	7
	CYLINDER	BASE TRACK	BACKUP	RESTRAINING CABLE	STABILIZER CHAIN	NOSE COVER	REFLECTOR

R E F F E R E N C E S	
SERIAL NO.	69520
SALES ORDER	14465
EH PROJECT	606185
DESIGN SPEED	617987
NOSE TYPE	613705
NO. OF UNITS	602780
	618102

DESIGNER	DATE
D. Ileyes Jr.	2/16/2011
A. Cox	12/30/2011
K. Mortensen	2/21/2011
A. Cox	2/21/2011

UNDIRECTIONAL
MODEL NO. 626C036

EMERGENCY ASSOCIATION
ENGINEERING AND RESEARCH DEPARTMENT

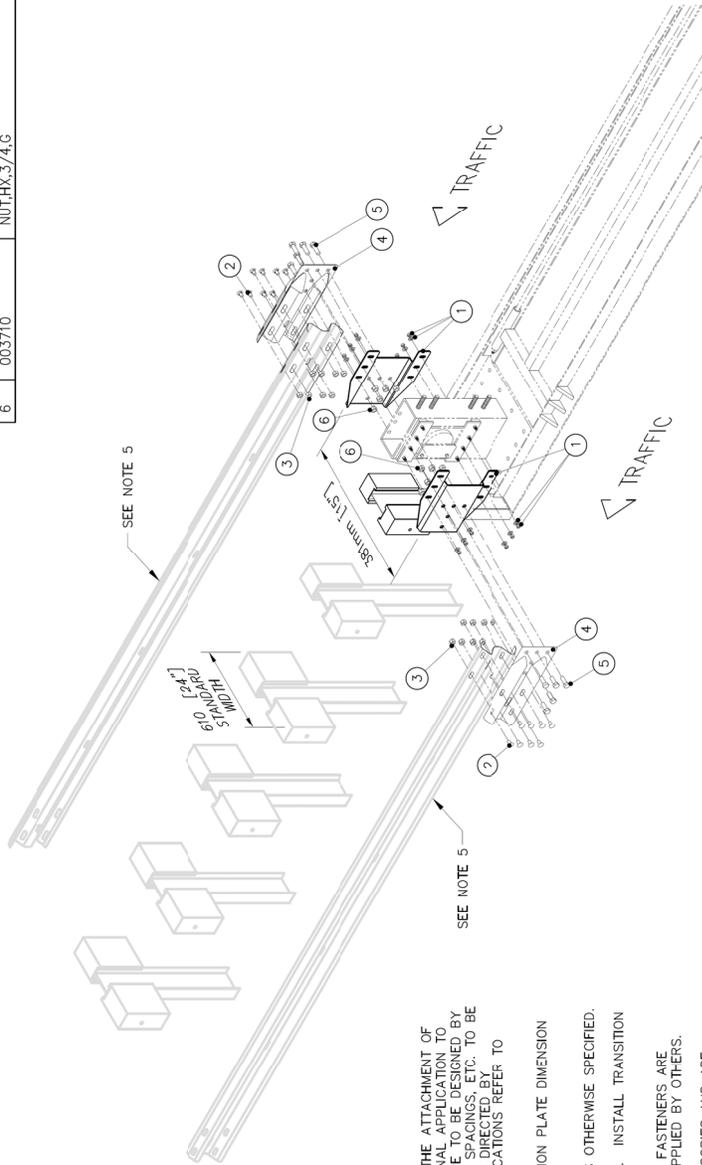
REACT 350® II SYSTEM
TL-3, W/ CONCRETE BACKUP

SCALE: NTS
SHEET: 1 of 1
REV: A

REACT 350® II TL-3 w/Concrete Backup

117815

PARTS LIST			
ITEM	STOCK NO	DESCRIPTION	QTY
1	616148	TRANSITION PLATE ASSEMBLY	2.00
2	003360	BOLT, RAIL, 5/8X1 1/4, G	16.0
3	003340	NUT, HX, 5/8, G, RAIL	16.0
4	000926	END SHOE, W-BEAM	2.00
5	113548	BOLT, HX, 3/4X1 1/4, G2, G	10.0
6	003710	NUT, HX, 3/4, G	10.0



NOTES:

- THE SCOPE OF THIS DRAWING IS RESTRICTED TO THE ATTACHMENT OF STANDARD W-BEAM GUARDRAIL IN A UNIDIRECTIONAL APPLICATION TO THE REACT SYSTEM. ALL DOWNSTREAM HARDWARE TO BE DESIGNED BY OTHERS. POST AND BLOCKOUT MATERIALS, POST SPACINGS, ETC. TO BE PER CONTRACT PLANS, STATE STANDARDS OR AS DIRECTED BY RESPONSIBLE AGENCY. FOR BIDIRECTIONAL APPLICATIONS REFER TO DRAWING #17827.
- FACE OF TRANSITION PLATE TO FACE OF TRANSITION PLATE DIMENSION IS APPROXIMATELY 381mm [15"].
- DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE SPECIFIED.
- EXISTING STUDS, WASHERS, AND NUTS TO REMAIN. INSTALL TRANSITION PLATE ON TOP OF EXISTING HARDWARE.
- W-BEAM PANELS, POSTS, BLOCKOUTS & RELATED FASTENERS ARE STANDARD HIGHWAY HARDWARE & ARE TO BE SUPPLIED BY OTHERS.
- TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.

ASSEMBLY NO. 117815

D. Kohfeld DATE: 1/8/01 REVIEWER: KRM DATE: 3/6/01 PREPARED: B. Burgess DATE: 3/6/01 FILE: 117815.dwg		TRINITY HIGHWAY REACT 350® SYSTEM TRANSITION ASSY, SC BU, UNI, REACT 350	
SCALE: 1:30		SHEET: 1 of 1	
		REV: A	

REACT 350® II Transition Assembly, SC BU, UNI

3535006-0000

ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	4720	TRANSITION PLATE ASSEMBLY	1.00
2	3525130-0000	ANCHOR,MP-3PT, KIT,3/4X5 1/2 HOR	1.00
3	2701811-0000	BOLT,RAIL,5/8X1 1/4,G	8.00
4	2704191-0000	NUT,HX,5/8,G,RAIL	8.00
5	2752171-0000	END SHOE,W-BEAM	2.00
6	2701641-0000	BOLT,HX,3/4X1 1/4,G5,G	5.00
7	2704091-0000	NUT,HX,3/4,G	5.00



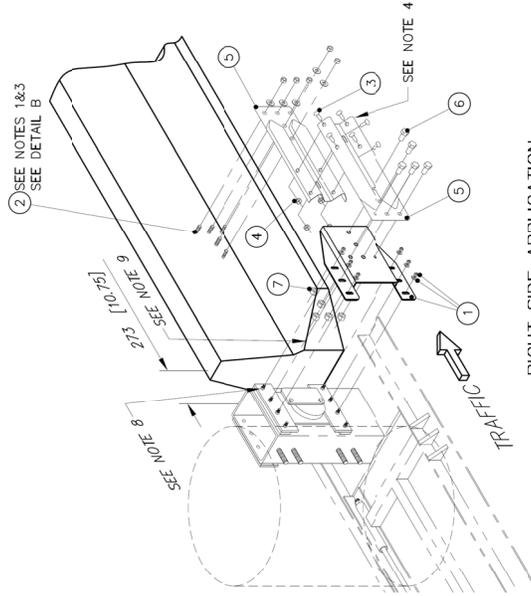
CORRECT



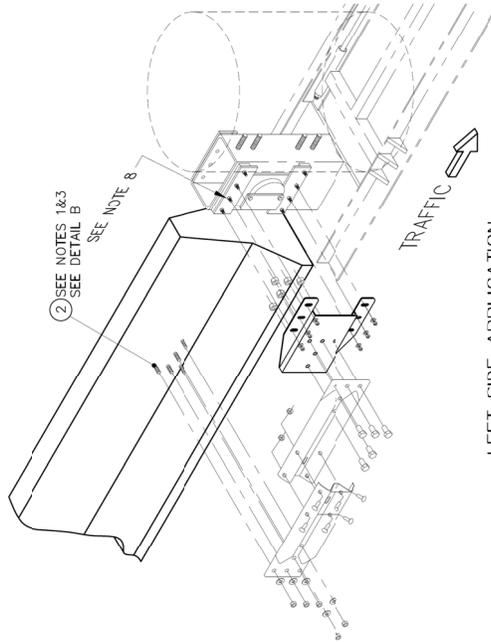
INCORRECT

DETAIL B
NOT TO SCALE

PARTS LIST



RIGHT SIDE APPLICATION



LEFT SIDE APPLICATION

NOTES:

- USE TRANSITION PANEL AS TEMPLATE FOR DRILLING.
- IMPACT FORCES COULD BE TRANSFERRED INTO TERMINAL END OF THE BARRIER. ADEQUATE REINFORCING AND ANCHORAGE ARE REQUIRED FOR PROPER IMPACT PERFORMANCE.
- ANCHOR STUD SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR NUT, SEE DETAIL B.
- TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.
- END SHOES MUST BE LAPPED FOR TRAFFIC DIRECTION.
- ITEMS 3 THROUGH 7 ARE STANDARD HIGHWAY HARDWARE & MAY BE SUPPLIED BY CUSTOMER. ORDER PART NUMBER 4720 TO RECEIVE ITEM 1 ONLY.
- THIS TRANSITION ASSEMBLY MAY BE USED FOR NEW JERSEY BARRIER, F-SHAPED OR VERTICAL CONCRETE WALL.
- EXISTING STUDS, WASHERS AND NUTS TO REMAIN. INSTALL TRANSITION PLATE ON TOP OF EXISTING HARDWARE.
- TRIM BARRIER 5 1/2" DEEP X 14" LONG, AS SHOWN.

DESIGNED BY D. K. H. Field	DATE 9/25/00
CHECKED BY B. BURGESS	DATE 10/17/00
DRAWN BY 3535006-0000.dwg	
ASSEMBLY NO. 3535006-0000	
FIMIRACY, ARSORPTION, SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
REACT 350® SYSTEM	
TRANSITION ASSY, SC BU, N, REACT 350	
SCALE 1:30	REV 3535006-0000
1 of 1	C

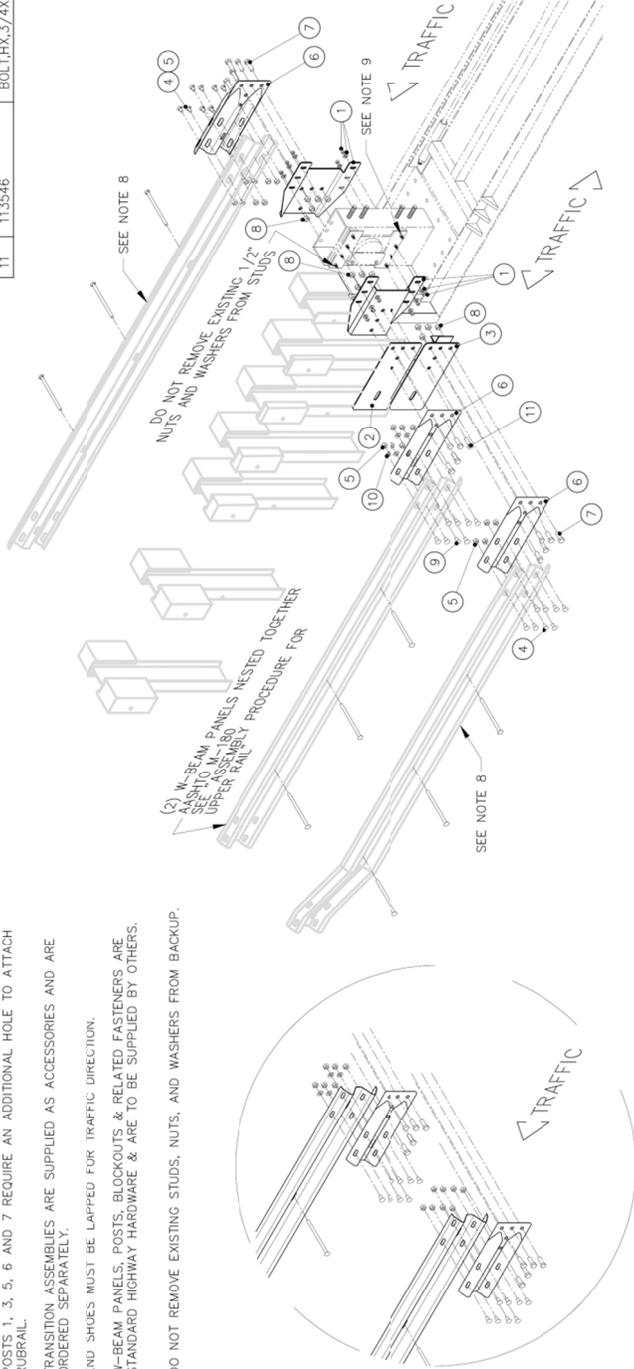
REACT 350® II Transition Assembly, SC BU, N

117827 - Sheet 1 of 3

NOTES:

- STANDARD BARRIER HARDWARE HAS BEEN USED TO DEVELOP THIS GUARDRAIL TRANSITION. SEE "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE," 2014, AASHTO TASK FORCE 13 JOINT COMMITTEE.
- DO NOT BOLT NESTED W-BEAM OR RUBRAIL W-BEAM TO POSTS AND BLOCKS ON POSTS #2 AND #4. BOLT BLOCKS DIRECTLY TO POSTS.
- USE OF PLATE WASHERS (FWR01) IS OPTIONAL.
- THE RUBRAIL MAY BE SHOP BENT IN THE LAST 915mm [36"] TO FACILITATE INSTALLATION.
- POSTS, 1, 3, 5, 6 AND 7 REQUIRE AN ADDITIONAL HOLE TO ATTACH RUBRAIL.
- TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.
- END SHOES MUST BE LAPPED FOR TRAFFIC DIRECTION.
- W-BEAM PANELS, POSTS, BLOCKOUTS, & RELATED FASTENERS ARE STANDARD HIGHWAY HARDWARE & ARE TO BE SUPPLIED BY OTHERS.
- DO NOT REMOVE EXISTING STUDS, NUTS, AND WASHERS FROM BACKUP.

PARTS LIST		
ITEM	STOCK NO.	DESCRIPTION
1	616148	TRANSITION PLATE ASSEMBLY
2	608107	END SHOE CONNECTOR PLATE
3	613886	RUBRAIL BRACE
4	003360	BOLTRAIL,5/8X1 1/4,G
5	003340	NUT,HX,5/8,G,RAIL
6	000926	END SHOE,W-BEAM
7	113548	BOLTHX,3/4X1 1/4,G2,G
8	003710	NUT,HX,3/4,G
9	003400	BOLTRAIL,5/8X2,G
10	003300	WASHER,FLAT,5/8 X 1 3/4,G
11	113546	BOLTHX,3/4X1 1/2,G2,G



ASSEMBLY NO. 117827

TRINITY HIGHWAY

REACT 350[®] SYSTEM
TRANSITION ASSY, SCBU, N,
REACT 350 W/RUB RAIL

TOL FRANCES PER
QMS-SF-001, UNLESS
OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING

DATE	1/23/01
BY	D. Kohfeld
DATE	3/2/01
BY	B. Euldruss

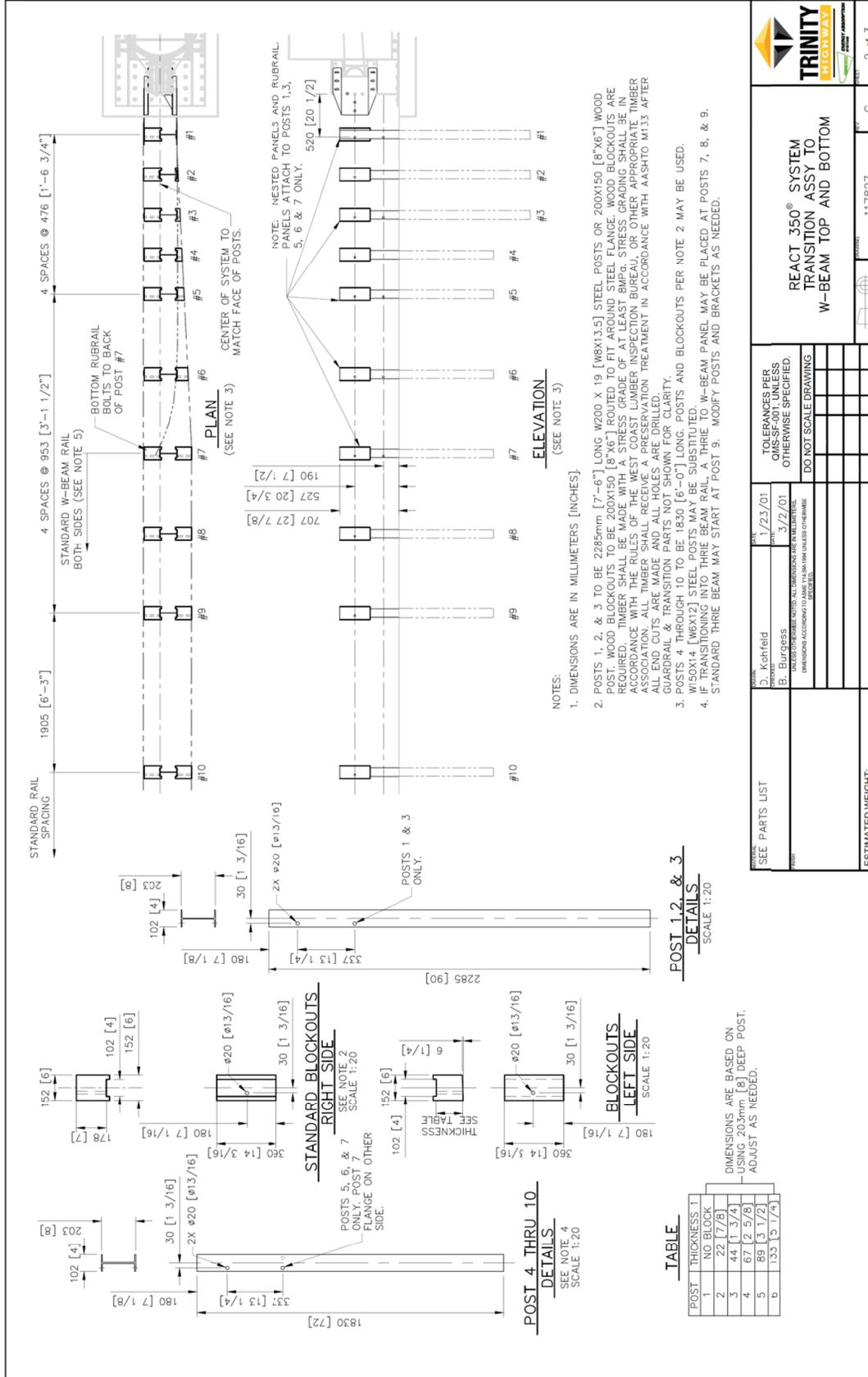
ESTIMATED WEIGHT: 193.39 lbs/mss

REV C

1 of 3

REACT 350[®] II Transition Assembly, SC BU, N, w/Rub Rail

117827 - Sheet 2 of 3



TRINITY HIGHWAY

REACT 350® SYSTEM
TRANSITION ASST TO
W-BEAM TOP AND BOTTOM

DATE: 1/23/01
BY: D. Kohfeld
CHECKED: J. J. [unclear]
DESIGNED: J. J. [unclear]
DIMENSIONS ACCORDING TO AASHTO M133 UNLESS OTHERWISE SPECIFIED.

TOLERANCES PER
QMS-SF-001, UNLESS
OTHERWISE SPECIFIED.

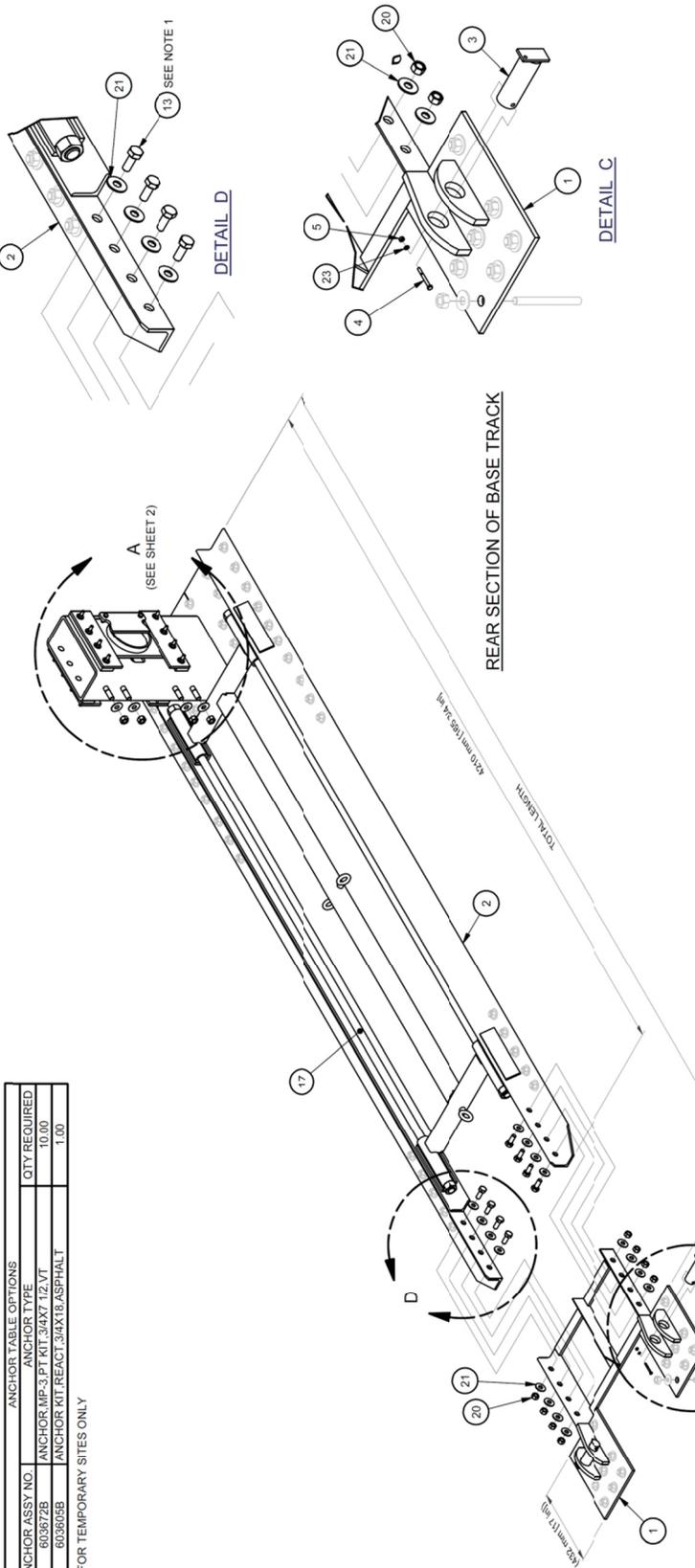
DO NOT SCALE DRAWING

ESTIMATED WEIGHT: 117827

2 of 3

ANCHOR TABLE OPTIONS		
ANCHOR ASSY NO.	ANCHOR TYPE	QTY REQUIRED
603672B	ANCHOR MP-3 PT KIT 3/4X7 1/2 VT	10.00
603695B	ANCHOR KIT REACT 3/4X16 ASPHALT	1.00

* FOR TEMPORARY SITES ONLY



ASSEMBLY NO.	STOCK NO. ITEM NO. 1	NUMBER OF CYLINDERS	FRONT BASETRACK LENGTH (ITEM 1)	TOTAL LENGTH	STOCK NO. ITEM NO. 24
605028B	609107G	4	4.84 m [15'-2 3/4"]	4.84 m [15'-2 3/4"]	113674G
605028B	609110G	6	2.28 m [7'-5"]	6.47 m [21'-2 3/4"]	113674G
605031B	609114G	9	5.00 m [16'-5"]	9.21 m [30'-2 3/4"]	113674G
605027B	609104G	11	6.83 m [22'-5"]	11.04 m [36'-2 3/4"]	113674G
617350B*	609110G	6	2.28 m [7'-5"]	6.47 m [21'-2 3/4"]	118362G

*FOR REACT II

ASSEMBLY NO. SEE TABLE	
DESIGNED BY	ENERGY ABSORPTION SYSTEMS
CHECKED BY	ENGINEERING AND RESEARCH DEPARTMENT
APPROVED BY	REACT 350® SYSTEM
FILE	SELF CONTAINED BACKUP
BASETRACK ASSEMBLY FOR 36" WIDE UNITS	
SCALE	NTS
REV	1 of 2
DATE	605028
ISSUED BY	605028.kdw

DESIGNED BY	D. Kraft
CHECKED BY	
APPROVED BY	DEAN ALBERSON
FILE	605028.kdw

DATE	07/25/2000
DATE	
DATE	
DATE	9/28/2000
DATE	

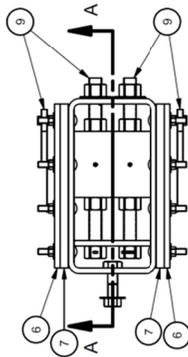
DATE	

NOTES:
1. THE POSITION OF BOLTS MAY BE POSITIONED FROM OUTSIDE OF TRACK OR FROM INSIDE AS SHOWN.

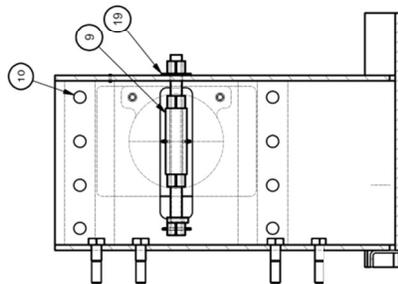
REACT 350® II Base Track Assembly 36" Wide Units

605028 - Sheet 2 of 2

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	SEE TABLE	FRONT BASETRACK, G	1
2	613621B	REAR BASETRACK (SCBU)(REACT), G, W/DECAL	1
3	612040G	PIN, RESTRAINING CABLE, G	2
4	113512G	BOLT, HX, 1/4X2 1/2, G2, G	2
5	115946G	NUT, HX, 1/4, G	2
6	613734G	RETAINER, TENSIONER, G, (REACT)	4
7	614628G	STANDOFF, RETAINER, TENSIONER, G, (REACT)	4
8	605806B	CABLE TENSIONER ASSY, L&R	2
9	115408G	BOLT, CR, 1/2X3 1/4, WRIBBED NECK, G	16
10	115939G	NUT, HX, 1/2, G	20
11	113457G	BOLT, HX, 1/2X1 1/2, G2, G	4
12	113552G	BOLT, HX, 3/4X2, G2, G	8
13	115900G	NUT, HX, 7/8, G	4
14	115900G	WASHER, FLAT, 7/8 X 2 1/4, G	4
15	118059G	RRD ST 1 1/2X130, THREADED, G	2
16	617946G	NUT, HX, 1 1/2, G	4
17	115917G	WASHER, FLAT, 1 1/4 ID X 2 3/4 OD, G	2
18	118002G	3/4" HEX NUT, A563	8
19	003710G	WASHER, FLAT, 3/4X2, HVY, G	16
20	118009G	WASHER, FLAT, 1/2X1 3/8, G	16
21	118095G	WASHER, LOCK, 1/4, G	2
22	118095G	BOLT, HX, 7/8X, G2, G	4
23	SEE TABLE		
24	SEE TABLE		

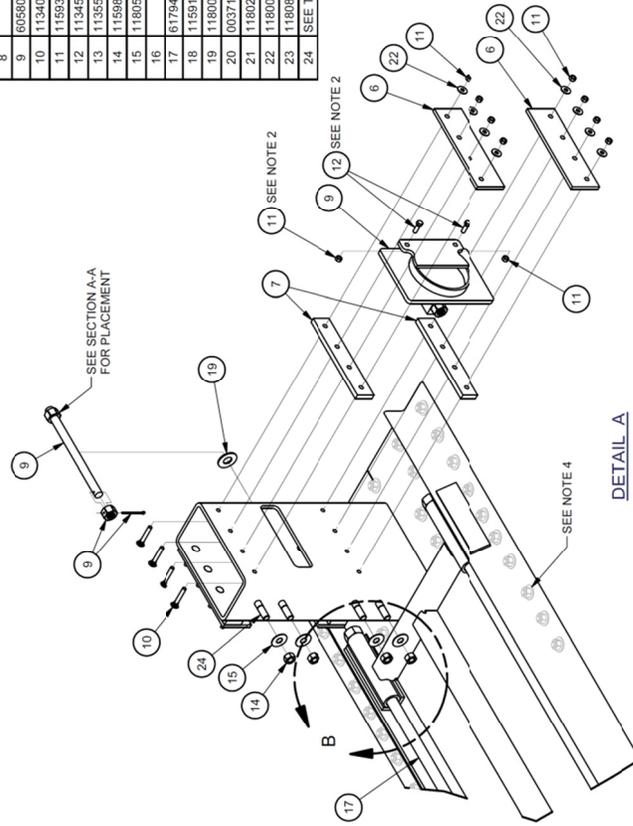


TOP VIEW

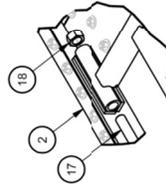


SECTION A-A

(SOME HIDDEN LINES NOT SHOWN FOR CLARITY)



DETAIL A



DETAIL B

(SOME ITEMS NOT SHOWN FOR CLARITY)

- NOTES:
- BEFORE INSTALLING CABLE TENSION ROD, W/ NUT, INTO CABLE TENSIONER ASSEMBLY, FILL WITH HEAVY GREASE USING GREASE FITTING, LUBRICATE THREADS ON TENSION ROD.
 - ITEM 9 WILL NEED TO BE REMOVED TO INSTALL CABLE (DWG 605780 [8535005-0000]).
 - ITEMS 11 & 12 NEED TO BE REMOVED TO INSTALL REAR CYLINDER.
 - ANCHORS MUST BE ORDERED SEPARATELY. SEE ANCHOR TABLE OPTIONS SHEET 1.

ASSEMBLY NO. SEE TABLE



REACT 350® SYSTEM
 SELF CONTAINED BACKUP
 BASETRACK ASSEMBLY
 FOR 36" WIDE UNITS

DESIGNED BY	D. Kraftfeld	DATE	9/25/2000
CHECKED BY		DATE	
APPROVED BY	DEAN ALBERSON	DATE	9/26/2000
FILE			

605028.klw

SCALE	NTS	REV	2
DATE	605028	SHEET	2 of 2
REV			J

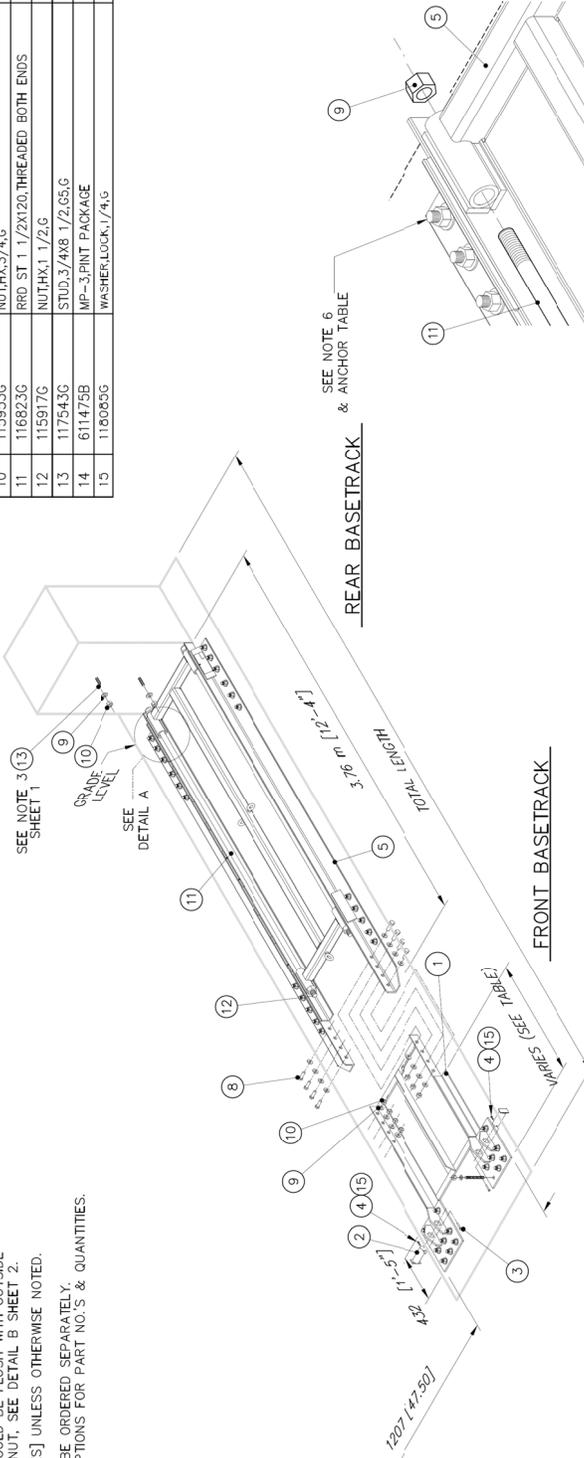
605020 - Sheet 1 of 3

- NOTES:
- BACKUP MUST BE ABLE TO WITHSTAND A MAXIMUM OVERTURNING MOMENT OF 226 kNm [2000 KIP-IN.] AT DECK LINE FOR DURATIONS 40+ ms.
 - IMPACT FORCES COULD BE TRANSFERRED INTO STRUCTURE THROUGH SYSTEM. ADEQUATE ANCHORAGE IS REQUIRED FOR PROPER IMPACT PERFORMANCE.
 - USE ITEMS 1, 5, AND 6 AS TEMPLATES FOR DRILLING CONCRETE. INSTALL ITEM 13 USING MP-3 EPOXY ITEM 14 TO SECURE. USE NUTS AND WASHERS ITEMS 9 & 10.
 - ANCHOR STUD END SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR NUT. SEE DETAIL B SHEET 2.
 - UNITS ARE mm [INCHES] UNLESS OTHERWISE NOTED.
 - ANCHOR BOLTS MUST BE ORDERED SEPARATELY. SEE ANCHOR TABLE OPTIONS FOR PART NO.'S & QUANTITIES.

ANCHOR TABLE OPTIONS

ANCHOR ASSEMBLY NO.	ANCHOR TYPE	ANCHOR TYPE	QUANTITY REQUIRED
603672B	ANCHOR,MP-3,PT KIT,3/4X7 1/2,VT		7.00
603670B	ANCHOR,MP-3,PT KIT,3/4X6 1/2,HOR		4.00

ITEM	STOCK NO	DESCRIPTION	RFQ'D
1	SEE TABLE	BASETRACK,FRONT	1.00
2	612040G	PAIR,RESTRAINING CABLE	2.00
3	113512G	BOLTHX,1/4X2 1/2,G2,G	2.00
4	115946G	NUT,HX,1/4,G	2.00
5	613615B	WELDMENT,REAR BASETRACK,CONC,(REACT)	1.00
6	614195G	WELDMENT,CABLE ANCHOR,CONC,(REACT)	2.00
8	113552G	BOLTHX,3/4X2,G2,G	8.00
9	118027G	WASHER,FLAT,3/4X2,HVY,G	18.00
10	115953G	NUT,HX,3/4,G	10.00
11	116823G	RRD ST 1 1/2X120,THREADED BOTH ENDS	2.00
12	115917G	NUT,HX,1 1/2,G	4.00
13	117543G	STUD,3/4X8 1/2,G5,G	2.00
14	611475B	MP-3,PINT PACKAGE	1.00
15	118095G	WASHER,LOCK,1/4,G	2.00



TABLE

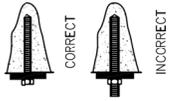
BASETRACK ASSEMBLY NO.	STOCK NO. ITEM NO.1	NUMBER OF CYLINDERS	FRONT BASETRACK LENGTH (ITEM 1)	TOTAL LENGTH
605020B	609107G	4	0.43 m [1'-5"]	5.06 m [16'-7"]
605025B	609110G	6	2.26 m [7'-5"]	6.88 m [22'-7"]
605025B	609114G	9	5.00 m [16'-5"]	9.63 m [31'-7"]
605019B	609104G	11	6.83 m [22'-5"]	10.59 m [34'-9"]

DATE	BY	DESCRIPTION
12/22/00	L. CORNER	REVISED
09/28/00	DEAN ALBERSON	ISSUED

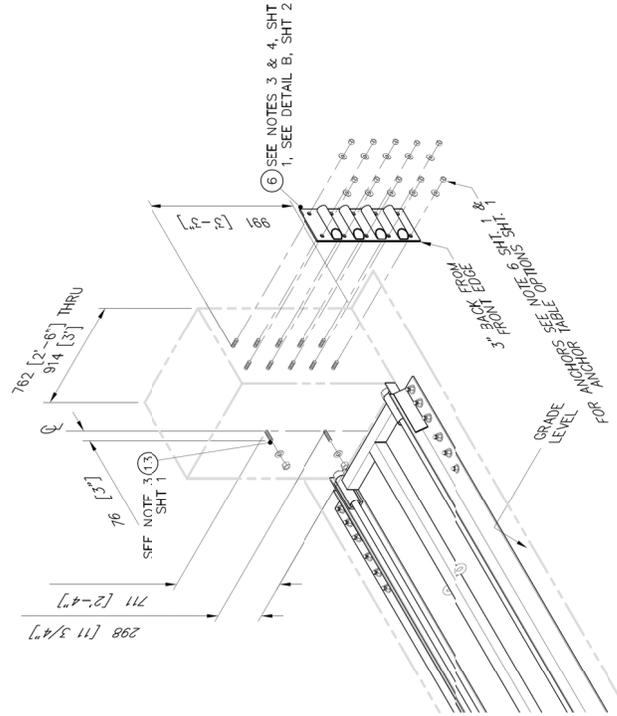
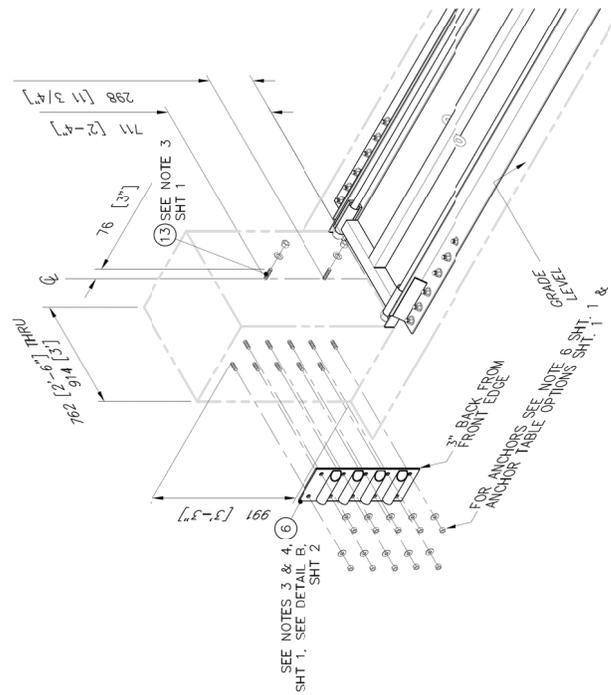
ASSEMBLY NO. SEE TABLE	ENGINEERING AND RESEARCH DEPARTMENT
REACT 350® SYSTEM	CONCRETE BACKUP
BASETRACK ASSEMBLY	36" WIDE SYSTEMS
SCALE: 1:40	605020
SHEET: 1 of 3	F

REACT 350® II Concrete B-up Base Track Assembly 36" Wide Units

605020 - Sheet 2 of 3



DETAIL B
NOT TO SCALE
SEE NOTE 6 SHEET 1



ASSEMBLY NO. SEE SHEET 1

FINFRY, ARSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

REACT 350® SYSTEM
CONCRETE BACKUP,
BASETRACK ASSEMBLY
36" WIDE SYSTEMS

SCALE 1:30

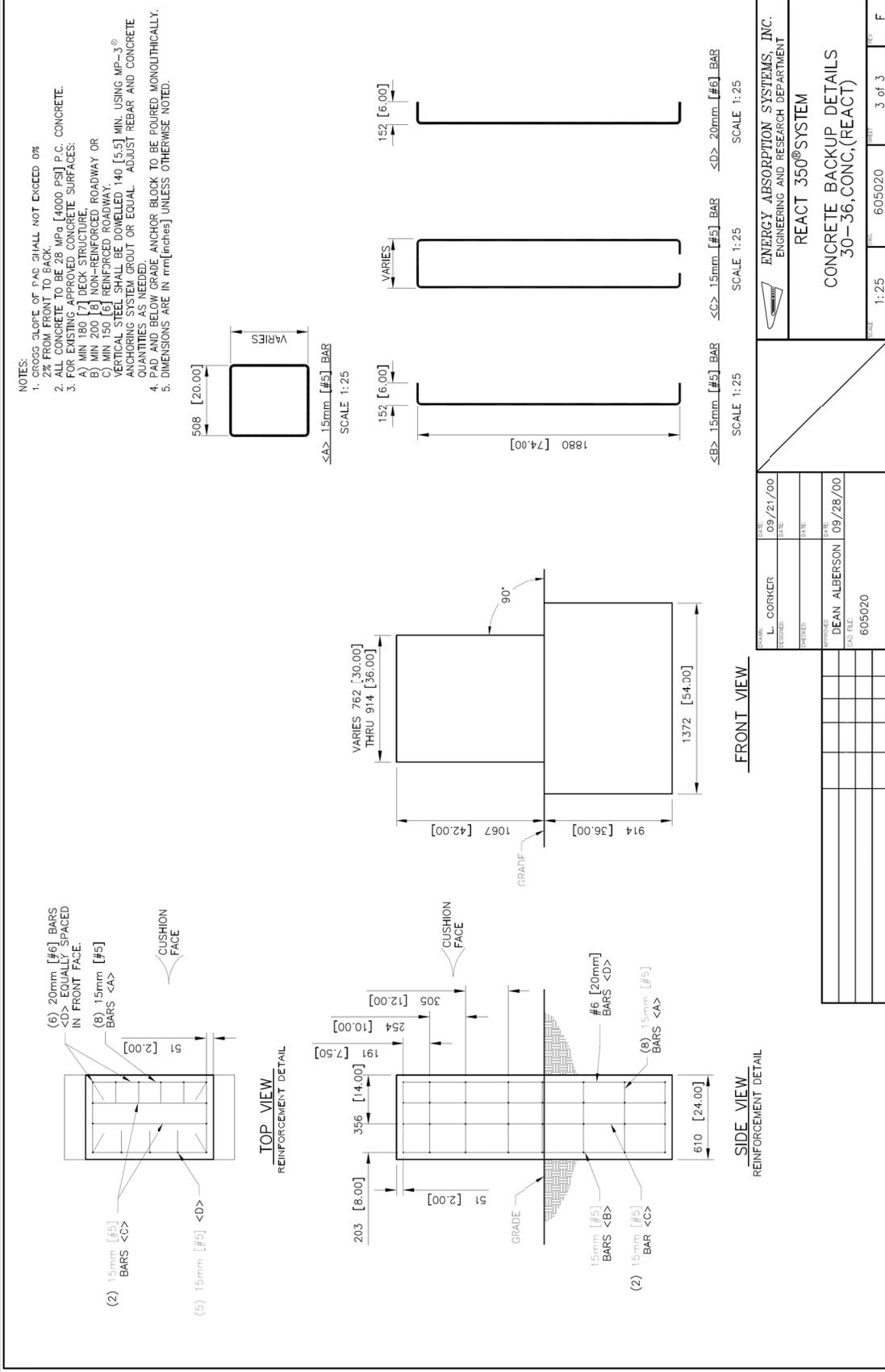
PROJECT 605020

SHEET 2 of 3

REV F

DATE	12/22/09
BY	L. CORNER
CHECKED	
DATE	
BY	DEAN ALBERSON
DATE	09/28/00
PROJECT	605020

605020 - Sheet 3 of 3



616084

ITEM	STOCK NO.	DESCRIPTION	RECD
1	614195G	WELDMENT CABLE ANCHOR, CONG. (REACT)	1.00
2	603670B	ANCHOR, MP-3, PT KIT, 3/4X6 1/2 HOR	* 2.00

* EXPANSION ANCHORS OPTIONAL (SUPPLIED BY OTHERS).

TOL ANGULAR:	TOL LINEAR:	CONFORMANCE:	NOTES:

NEXT ASSEMBLY:	MATERIAL:

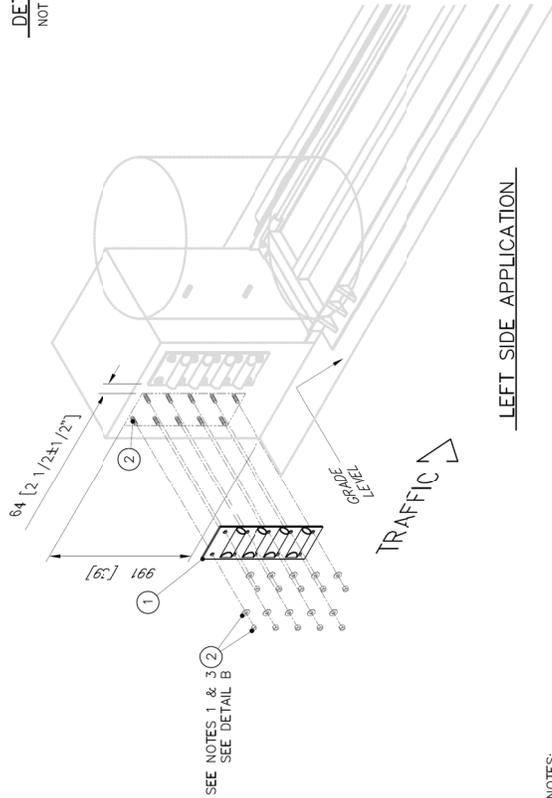


CORRECT

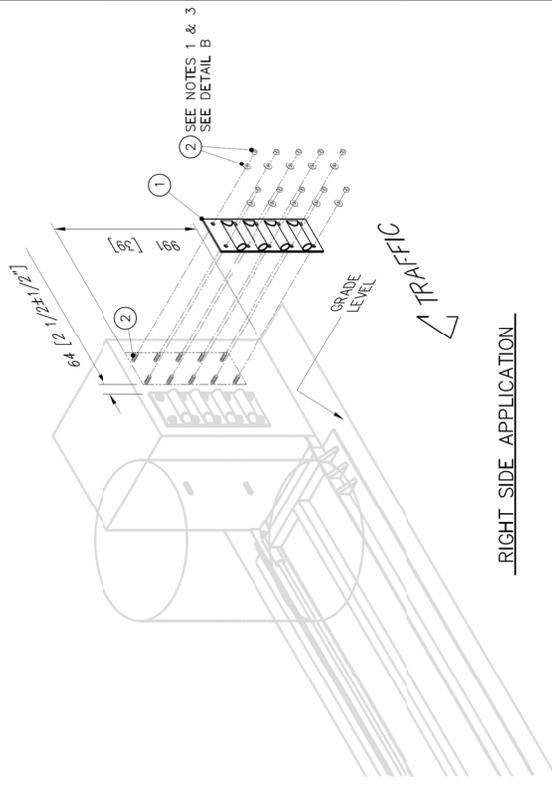


INCORRECT

DETAIL B
NOT TO SCALE



LEFT SIDE APPLICATION



RIGHT SIDE APPLICATION

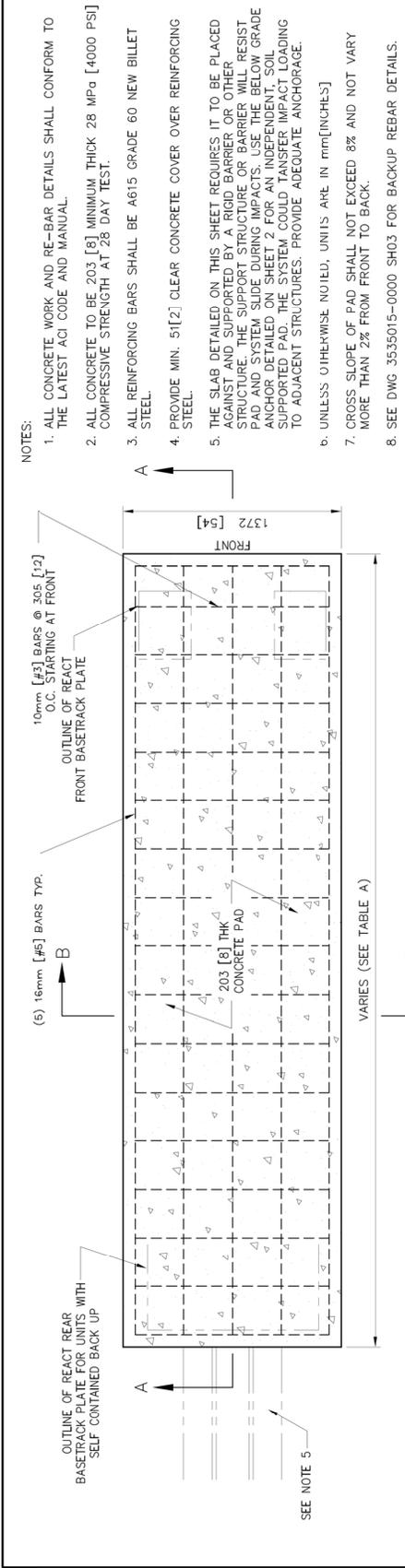
- NOTES:
1. USE CABLE ANCHOR (ITEM 1) AS TEMPLATE FOR DRILLING. RECOMMENDED HOLE DEPTH 140 [5 1/2\"/>
 2. ANCHOR STUD END SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR NUT, SEE DETAIL B.
 3. UNITS ARE mm [INCHES] UNLESS OTHERWISE NOTED.

DATE: 01/25/00	DATE:	ASSEMBLY NO. 616084B
DESIGNED: L. CORKER	DATE:	ENERGY ABSORPTION SYSTEMS, INC.
CHECKED:	DATE:	ENGINEERING AND RESEARCH DEPARTMENT
APPROVED: DEAN ALBERSON	DATE: 09/28/00	REACT 350 [®] SYSTEM
DWG FILE: 616084		TRANSITION ASSEMBLY
		FOR USE W/CONCRETE B.U.

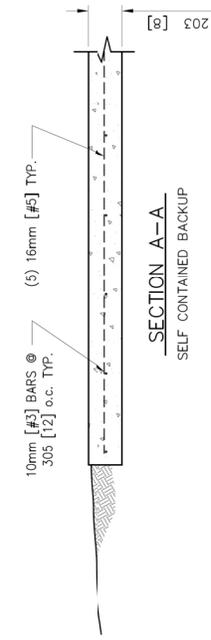
SCALE: 1:30	NO. 616084	REV. 1 of 1	APP. A
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REACT 350[®] II Transition Assembly for use w/Concrete Backup

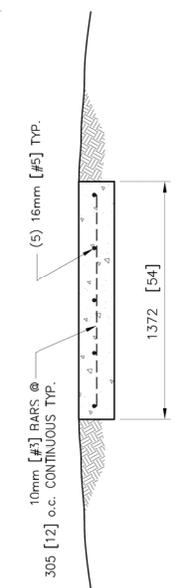
114054 - Sheet 1 of 2



PLAN VIEW



SECTION A-A
SELF CONTAINED BACKUP



SECTION B-B

NOTES:

1. ALL CONCRETE WORK AND RE-BAR DETAILS SHALL CONFORM TO THE LATEST ACI CODE AND MANUAL.
2. ALL CONCRETE TO BE 203 [8] MINIMUM THICK 28 MPa [4000 PSI] COMPRESSIVE STRENGTH AT 28 DAY TEST.
3. ALL REINFORCING BARS SHALL BE A615 GRADE 60 NEW BILLET STEEL.
4. PROVIDE MIN. 51[2] CLEAR CONCRETE COVER OVER REINFORCING STEEL.
5. THE SLAB DETAILED ON THIS SHEET REQUIRES IT TO BE PLACED AGAINST AND SUPPORTED BY A RIGID BARRIER OR OTHER STRUCTURE. THE SUPPORT STRUCTURE OR BARRIER WILL RESIST PAD AND SYSTEM SLIDE DURING IMPACTS. USE THE BELOW GRADE ANCHOR DETAILED ON SHEET 2 FOR AN INDEPENDENT, SOIL SUPPORTED PAD. THE SYSTEM COULD TRANSFER IMPACT LOADING TO ADJACENT STRUCTURES. PROVIDE ADEQUATE ANCHORAGE.
6. UNLESS OTHERWISE NOTED, UNITS ARE IN mm[INCHES]
7. CROSS SLOPE OF PAD SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
8. SEE DWG. 3535015-0000 SH03 FOR BACKUP REBAR DETAILS.

TABLE A

NO. CYLINDERS	SYSTEM	LENGTH
4	REACT-43B036	5.06 m [16'-7"]
6	REACT-55B036	6.88 m [22'-7"]
9	REACT-62B036	9.63 m [31'-7"]
11	REACT-75B036	11.46 m [37'-7"]

		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT
DATE:	9/25/00	REACT 350® SYSTEM CAST-IN-PLACE CONCRETE SLAB FOR 36" SYSTEMS W/STEEL BACKUP & AGAINST RIGID BARRIER
DESIGNED BY:	D. Kuhfeld	
DATE:		SCALE: 1:25 SHEET: 114054 REV: 1 of 2 C
APPROVED:	DEAN ALBERSON	
DATE:	09/28/00	
CAD FILE:	114054	

REACT 350® II Cast-in-Place Concrete Slab w/Steel Backup 36"

114054 - Sheet 2 of 2

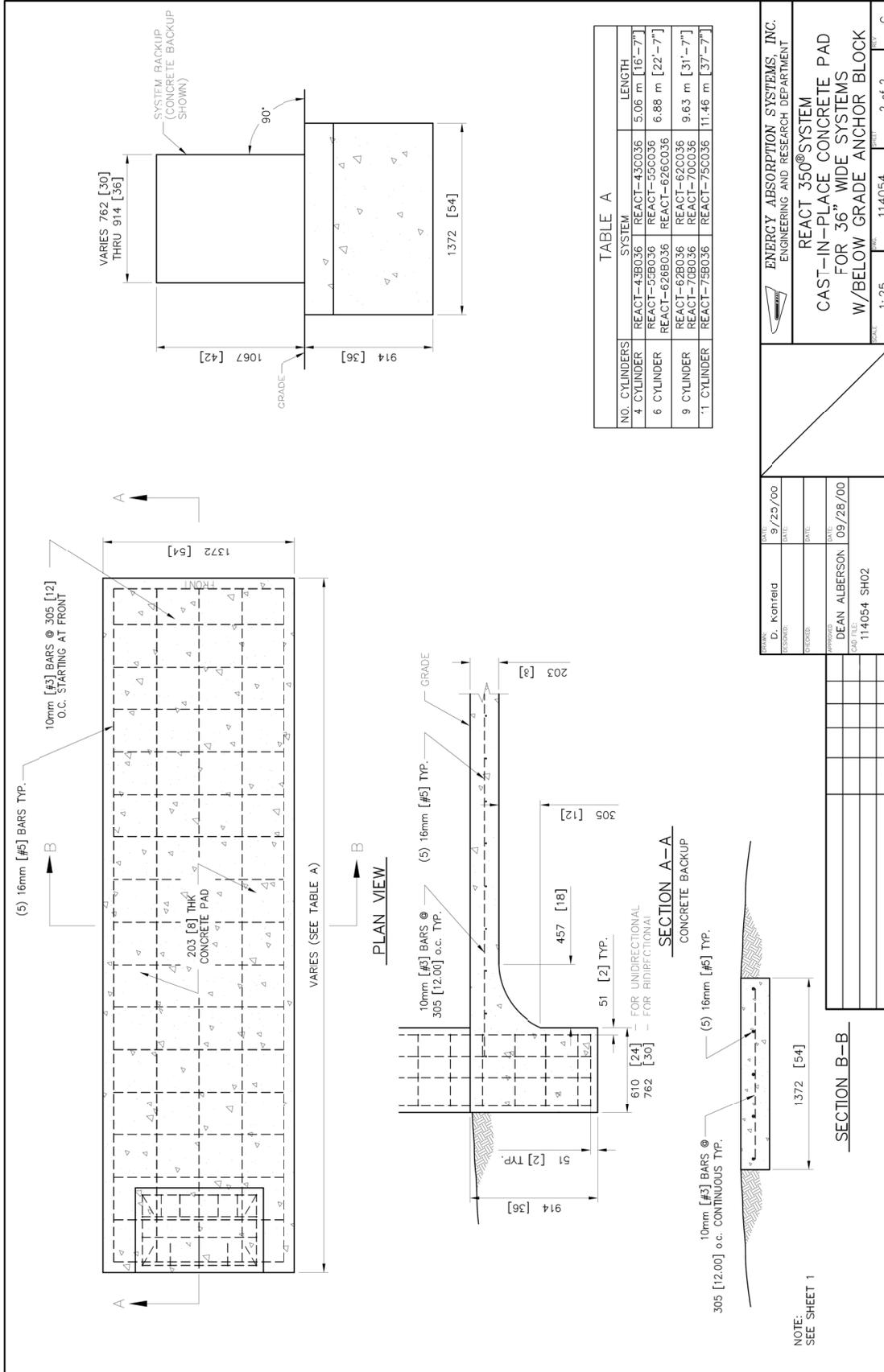


TABLE A

NO. CYLINDERS	SYSTEM	LENGTH
4 CYLINDER	REACT-43B036	5.06 m [16'-7"]
4 CYLINDER	REACT-55B036	6.88 m [22'-7"]
6 CYLINDER	REACT-62B036	9.63 m [31'-7"]
9 CYLINDER	REACT-70C036	11.46 m [37'-7"]
1 CYLINDER	REACT-75B036	11.46 m [37'-7"]

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

REACT 350® SYSTEM
CAST-IN-PLACE CONCRETE PAD
FOR 36" WIDE SYSTEMS
W/BELOW GRADE ANCHOR BLOCK

DATE: 9/25/00
DESIGNED: D. Kohfeld
CHECKED:
APPROVED: DEAN ALBERSON
DATE: 09/28/00
PAD FILE: 114054 SH02

SCALE: 1:25

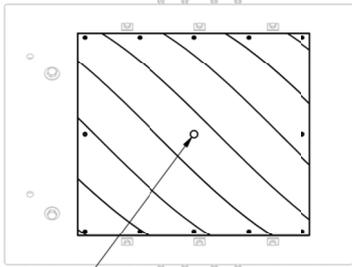
REV: 2 of 2

617967

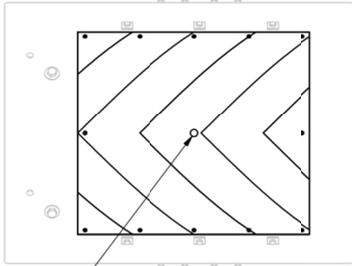
PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	SEE TABLE	NOSE COVER, .32X32, TL-3, REACT **	1
2	116688G	SCREW, HW, 1/4X1 1/4, SELF-DRILL/TAP, P	12

* GORE / UNIV / APPLICATION TYPE
** TAPE COLOR

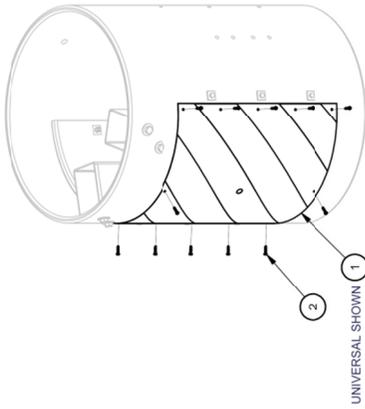
ASSEMBLY NO.	DESCRIPTION	ITEM 1
617967B	NOSE COVER ASSY, GORE, TL-3, REACT Y	617965B
617968B	NOSE COVER ASSY, UNIV, TL-3, REACT Y	617966B
618068B	NOSE COVER ASSY, GORE, TL-3, REACT O	618066B
618069B	NOSE COVER ASSY, UNIV, TL-3, REACT O	618067B



UNIVERSAL
ASSEMBLY NO. 617968B
(SEE NOTE 4)

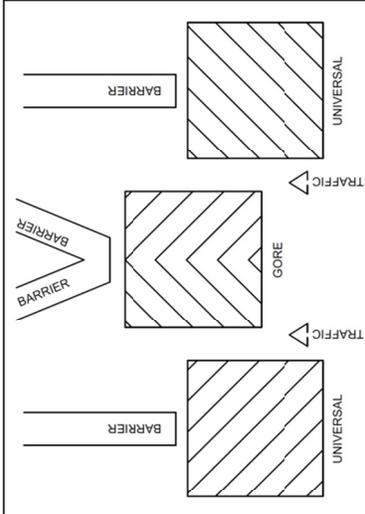


GORE
ASSEMBLY NO. 617967B



UNIVERSAL SHOWN (1)

APPLICATION DETAIL



ASSEMBLY NO. SEE TABLE

ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	REACT 350® SYSTEM	NOSE COVER ASSEMBLY, TL-3, REACT
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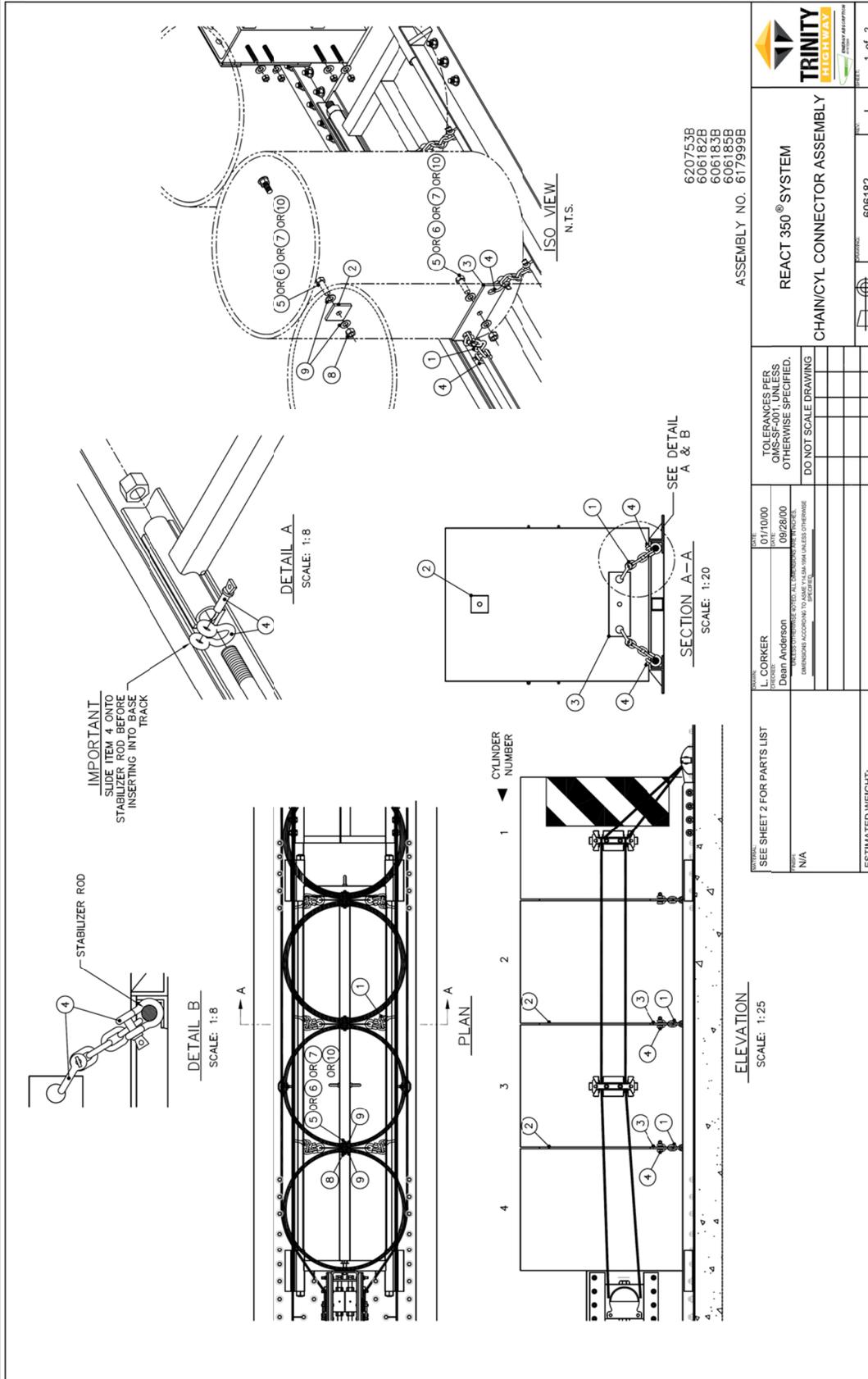
DATE	12/21/2010	DRAWN	617967.dwg	
DESIGNED BY	D. Hayes, Jr.	DATE	11/12/2010	
CHECKED BY	A. Cox	DATE	2/22/2011	
APPROVED BY	J. Espinoza	DATE		
FILE	A. Cox			

SCALE	NTS	DRAWING	617967	SHEET	1	OF	1	REV	A
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REACT 350® Nose Cover Assembly TL-3

- NOTES:**
- LOCATE $\phi 1"$ HOLE IN NOSE COVER OVER $\phi 1"$ HOLE IN CYLINDER, THEN SECURE WITH SCREWS (ITEM 2).
 - APPLY TAPE TO CYLINDER SURFACE, INCLUDING THRU REFLECTIVE TAPE AND INTO EXISTING HOLES IN NOSE COVER UNTIL HEAD OF FASTENER (ITEM 2) IS FLUSH. DO NOT CONTINUE TO SPIN FASTENER.
 - NOSE COVER NOT INCLUDED IN MODEL AND MUST BE ORDERED SEPARATELY. DESIRED NOSE MUST BE SPECIFIED WHEN ORDERING. REVIEW APPLICATION DETAIL TO VERIFY TYPE.
 - NOSE HAZARD/OBJECT IS ON RIGHT SIDE OF TRAVELWAY. FOR APPROACH TRAFFIC ON RIGHT OF SYSTEM NOSE & HAZARD/OBJECT ON THE LEFT OF TRAVELWAY, ROTATE 90°.

606182 - Sheet 1 of 2



REACT 350® Chain/CYL Connector Assembly

ASSEMBLY NO. 617999B

REACT 350® SYSTEM

CHAIN/CYL CONNECTOR ASSEMBLY

1 of 2

606182 - Sheet 2 of 2

ASSEMBLY NO. 617998B

ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113564G	BOLT, HK, 3/4X4 1/2, G5, G	2
6	113567G	BOLT, HK, 3/4X4, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	4
8	003710G	3/4" HEX NUT A563	10
9	118027G	WASHER, FLAT, 3/4, HVY, G	20

* ITEM 5 USED TO CONNECT CYLINDERS 4, 5 AND 5 & 6.
 * ITEM 6 USED TO CONNECT CYLINDERS 3 & 4.
 * ITEM 7 USED TO CONNECT CYLINDERS 1 & 2 AND 2 & 3.

ASSEMBLY 606182B

ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113564G	BOLT, HK, 3/4X4 1/2, G5, G	2
6	113571G	BOLT, HK, 3/4X5 1/2, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	4
8	003710G	3/4" HEX NUT A563	6
9	118027G	WASHER, FLAT, 3/4, HVY, G	12

* ITEM 5 USED TO CONNECT CYLINDERS 2 & 3.
 * ITEM 6 USED TO CONNECT CYLINDERS 1 & 2.
 * ITEM 7 USED TO CONNECT CYLINDERS 3 & 4.

ASSEMBLY 606183B

ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113564G	BOLT, HK, 3/4X4 1/2, G5, G	2
6	113571G	BOLT, HK, 3/4X5 1/2, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	4
8	003710G	3/4" HEX NUT A563	10
9	118027G	WASHER, FLAT, 3/4, HVY, G	20
10	113567G	BOLT, HK, 3/4X4, G5, G	2

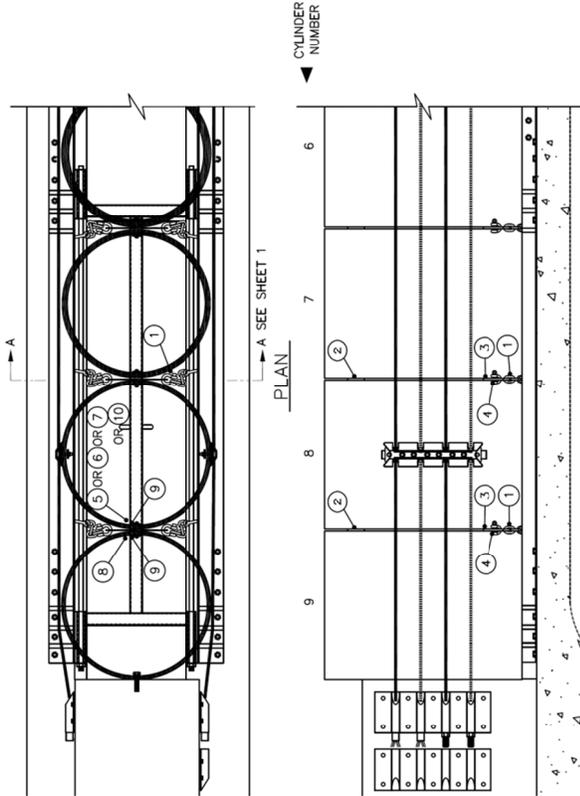
* ITEM 5 USED TO CONNECT CYLINDERS 4 & 5.
 * ITEM 6 USED TO CONNECT CYLINDERS 5 & 6.
 * ITEM 7 USED TO CONNECT CYLINDERS 1 & 2 AND 2 & 3.
 * ITEM 10 USED TO CONNECT CYLINDERS 3 & 4.

ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113564G	BOLT, HK, 3/4X4 1/2, G5, G	6
6	113567G	BOLT, HK, 3/4X4, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	2
8	003710G	3/4" HEX NUT A563	16
9	118027G	WASHER, FLAT, 3/4, HVY, G	24
10	113562G	BOLT, HK, 3/4X3, G5, G	6

* ITEM 5 USED TO CONNECT CYLINDERS 6 & 7, 7 & 8, 8 & 9.
 * ITEM 6 USED TO CONNECT CYLINDERS 9 & 5.
 * ITEM 7 USED TO CONNECT CYLINDERS 4 & 5.
 * ITEM 10 USED TO CONNECT CYLINDERS 1 & 2, 2 & 3, 3 & 4.

ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113571G	BOLT, HK, 3/4X5 1/2, G5, G	2
6	113564G	BOLT, HK, 3/4X4, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	2
8	003710G	3/4" HEX NUT A563	16
9	118027G	WASHER, FLAT, 3/4, HVY, G	24
10	113562G	BOLT, HK, 3/4X3, G5, G	6

* ITEM 5 USED TO CONNECT CYLINDERS 6 & 7, 7 & 8, 8 & 9.
 * ITEM 6 USED TO CONNECT CYLINDERS 5 & 6.
 * ITEM 7 USED TO CONNECT CYLINDERS 4 & 5.
 * ITEM 10 USED TO CONNECT CYLINDERS 1 & 2, 2 & 3, 3 & 4.



ITEM	STOCK NO.	DESCRIPTION	RECD
1	606177B	CHAIN, PROOF COIL, 1/2.4 LINKS, REACT	6
2	609236G	FTB ST 1/2X4X4, W/HOLE, G.(REACT)	3
3	609236G	FTB ST 1/2X3X15, G.(REACT)	3
4	117071G	SHACKLE, ANCHOR, 5/8, W/SCREW PIN	12
5	113571G	BOLT, HK, 3/4X5 1/2, G5, G	2
6	113564G	BOLT, HK, 3/4X4, G5, G	2
7	113558G	BOLT, HK, 3/4X3 1/2, G5, G	2
8	003710G	3/4" HEX NUT A563	16
9	118027G	WASHER, FLAT, 3/4, HVY, G	24
10	113562G	BOLT, HK, 3/4X3, G5, G	6

* ITEM 5 USED TO CONNECT CYLINDERS 6 & 7, 7 & 8, 8 & 9.
 * ITEM 6 USED TO CONNECT CYLINDERS 5 & 6.
 * ITEM 7 USED TO CONNECT CYLINDERS 4 & 5.
 * ITEM 10 USED TO CONNECT CYLINDERS 1 & 2, 2 & 3, 3 & 4.

DATE:	01/10/00
DESIGNED BY:	L. CORKER
DRAWN BY:	ANNE P. BROWN
CHECKED BY:	ANNE P. BROWN
DATE:	09/28/00
DESIGNED BY:	ANNE P. BROWN
DRAWN BY:	ANNE P. BROWN
CHECKED BY:	ANNE P. BROWN
DATE:	09/28/00
DESIGNED BY:	ANNE P. BROWN
DRAWN BY:	ANNE P. BROWN
CHECKED BY:	ANNE P. BROWN

DIMENSIONS ACCORDING TO ASME Y14.5M UNLESS OTHERWISE SPECIFIED.

SEE PARTS LIST	ESTIMATED WEIGHT:
TOLERANCES PER QMS-SF-001, UNLESS OTHERWISE SPECIFIED.	
DO NOT SCALE DRAWING	
REACT 350® SYSTEM	
CHAIN/CYL CONNECTOR ASSEMBLY	
606182	
2 of 2	

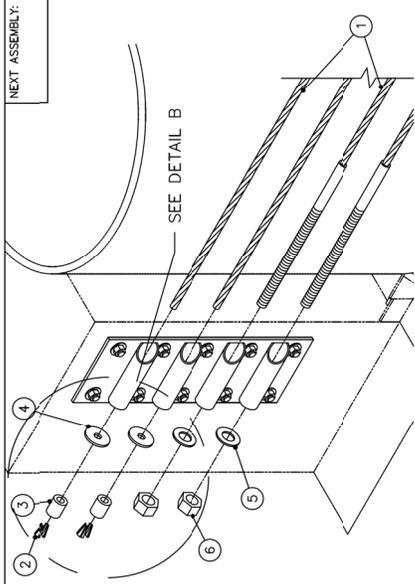


605780 - Sheet 2 of 2

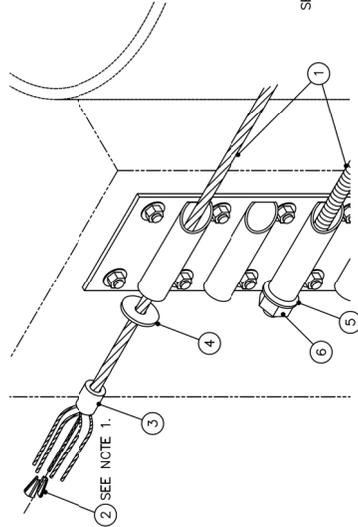
ITEM	STOCK NO.	DESCRIPTION	REQD.
1	SEE TABLE	RESTRAINING CABLES	4.00
2	004004B	CBL, 3/4, WEDGE, #6	4.00
3	004003G	CBL, 3/4 FERRULE, L6, LIGHT	4.00
4	118028G	WASHER, FLAT, 7/8X3 OD, G	4.00
5	118001G	WASHER, FLAT, 1 1/2X3 OD, G	4.00
6	115917G	NUT, HEX, 1 1/2, G	4.00

NEXT ASSEMBLY: _____
 MATERIAL: _____
 TOL. ANGULAR: _____
 TOL. LINEAR: _____
 UNLESS OTHERWISE NOTED.

NO. CYLINDERS	ASSEMBLY NO.	CABLE LENGTH	ITEM 1
4	605780B	12.20 m [40']	113925G
6	605781B	15.24 m [50']	113928G
9	605782B	21.34 m [70']	113930G
11	605779B	27.43 m [90']	113923G

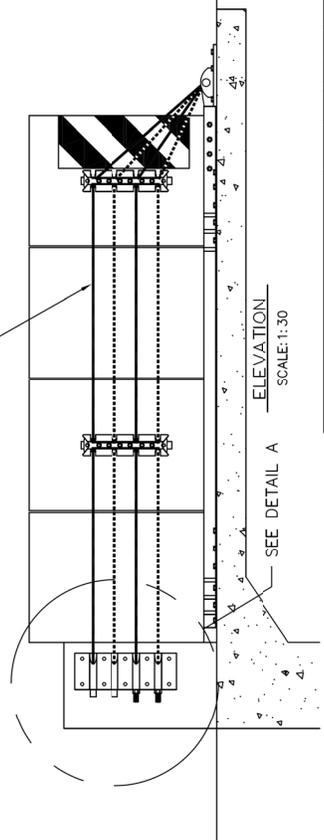


DETAIL A
SCALE: 1:15

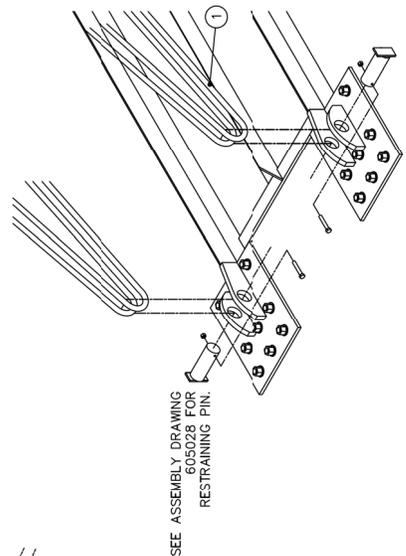


DETAIL B
SCALE: 1:10

AFTER TENSIONING CABLE SHOULD NOT DEFLECT MORE THAN 75mm [3"] WITH HEAVY FOOT PRESSURE



ELEVATION
SCALE: 1:30



FRONT CABLE ATTACHMENT DETAIL
FOR CONCRETE BACKUP
SCALE: 1:15

NOTES:
 1. SLIDE ITEM 4 ONTO END OF CABLE FIRST, THEN ITEM 3. UN-BRAID CABLE (ITEM 1), INSERT MIDDLE STRAND BETWEEN ITEM 2, PLACE REMAINING 6 STRANDS INTO SLOTS AROUND ITEM 2 THEN PUSH INTO ITEM 3 TO TIGHTEN.

	DATE: 02/25/00 DESIGNED: _____ CHECKED: _____ APPROVED: Dean Albersen CAD FILE: 605780 SH02	ASSEMBLY NO. SEE TABLE ENRGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT REACT 350® SYSTEM CABLE ASSEMBLIES	SCALE: AS NOTED SHEET: 605780 2 of 2 E
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613705

PARTS LIST		REFLECTOR KIT ASSEMBLY			
ITEM	STOCK NO.	DESCRIPTION	4 REF	8 REF	16 REF
1	611305	MARKER TAB FLEX.WHT/AMBER.WHOLES	4	8	16
2	116643	SCREW/PN#BX1.TAPPING.A6.S	8	16	24
3	117989	WASHER.FLAT.#6.S	8	16	24

REFLECTOR KIT ASSEMBLY	
ITEM	DESCRIPTION
4	613706
5	613707
6	613708
7	613709
8	613710
9	613711
10	613712
11	613713
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96	613798
97	613799
98	613800
99	613801
100	613802

DATE	10/09/2001	PROJECT NO.	N/A
DESIGNED BY	R. GONZALES	DATE	10/18/2001
CHECKED BY	F. POWELL	PROJECT	613705.R/W
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS.			
DIMENSIONS ACCORDING TO AASHTO M 198-01M AND CMC-TRP-02-001.			
MATERIALS TO BE USED AS SHOWN.			
DO NOT SCALE DRAWING			
ASSEMBLY NO. - SEE TABLE			
REACT 350 SYSTEM		REFLECTOR ASSEMBLY, WHITE/AMBER, SIDE, REACT 350	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
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R. GONZALES		F. POWELL	
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R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	
DATE		PROJECT	
10/18/2001		613705	
DRAWN BY		CHECKED BY	
R. GONZALES		F. POWELL	

3535043-0000

NEXT ASSEMBLY:		MATERIAL:		TOL. ANGULAR:		TOL. LINEAR:		PARTS LIST			
SEE MATERIAL SPECIFICATIONS		SEE MATERIAL SPECIFICATIONS		UNLESS OTHERWISE NOTED		UNLESS OTHERWISE NOTED		ITEM	STOCK NO.	DESCRIPTION	REQ'D
						ASSEMBLY 3535032-0000		1	2765053-0000	STT ST 3X3X1/4X36.W/HOLES	1.00
								2	2700911-0000	STUD.3/4X7 1/2.G5.G	1.00
								3	2704175-0000	NUT.EYE.3/4.G	1.00
								4	2765015-0000	FTB ST 1/2X4X4.W/HOLE.G	1.00
								5	2704341-0000	NUT.HX.3/4.G.GR DH	1.00
								6	2708081-0000	WASHER.FLAT.3/4X2.HVY.G	1.00
								7	2750978-0000	INSTALLATION INSTRUCTIONS REACT 350	1.00
								8	2735831-3500	MATERIAL SAFETY INFORMATION NOTICE	1.00

ASSEMBLY
3535044-0000
SCALE 1:10

ASSEMBLY
2765001-0000
SCALE 1:10

ASSEMBLY
2765032-0000
SCALE 1:10

ASSEMBLY
3535045-0000
SCALE 1:10

ASSEMBLY
2765105-0000
SCALE 1:10

NOTE:
1. INSTALLER TO DELIVER PULLOUT BRACKET & ASSOCIATED HARDWARE, DRAWINGS & MAINTENANCE. ENERGY RESPONSIBLE FOR MAINTENANCE.

ASSEMBLY NO. 3535043-0000
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT
REACT 350® SYSTEM
MISCELLANEOUS HARDWARE

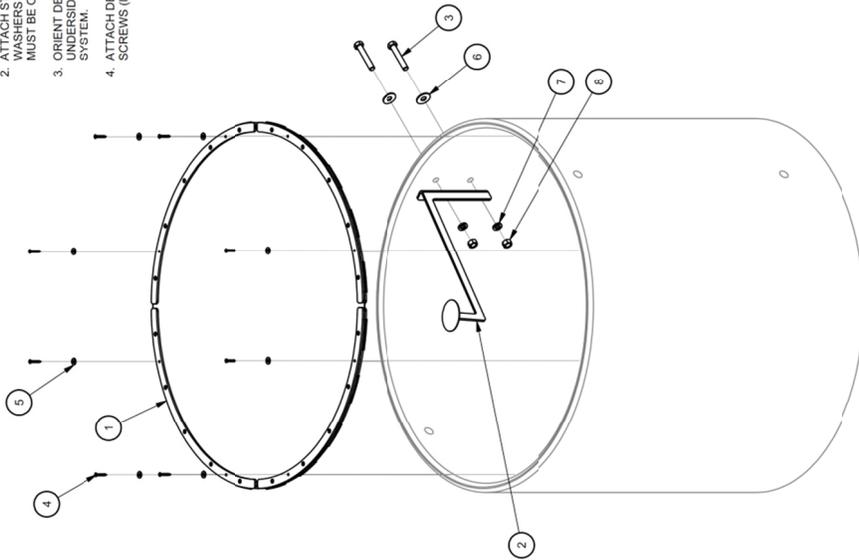
DATE: 2/27/01	DATE: 2/27/01	DATE: 2/27/01	DATE: 2/27/01
BY: B. Burgess	BY: D. June	BY: S. Trageser	BY: S. Trageser
SCALE: AS NOTED	SCALE: AS NOTED	SCALE: AS NOTED	SCALE: AS NOTED
1 of 1	1 of 1	1 of 1	1 of 1

REACT 350® Misc. Hardware

606715

ASSEMBLY INSTRUCTIONS:

1. DRILL 2/32" HOLES AT THE LOCATION SHOWN. HOLES MUST BE ON A SIDE PERPENDICULAR TO LINE OF HEAD ON IMPACT.
2. ATTACH STANDOFF ASSEMBLY (ITEM 2) WITH SCREWS (ITEM 3), WASHERS (ITEM 6 & 7) AND NUTS (ITEM 8) AS SHOWN. THE STANDOFF MUST BE ORIENTED SO THAT IT IS PERPENDICULAR TO THE SYSTEM.
3. ORIENT DEBRIS COVER SO THAT THE ARROW STENCILED ON THE UNDERSIDE OF THE COVER POINTS TOWARD THE FRONT OF THE SYSTEM.
4. ATTACH DEBRIS COVER TO CYLINDER WITH FLAP SIDE UP USING 8 SCREWS (ITEM 4) AND 8 WASHERS (ITEM 5) AS SHOWN.



TRAFFIC
SEE ASSEMBLY
NOTE 1

SECTION A-A

ITEM	STOCK NO.	DESCRIPTION	QTY
1	615992B	TOP PRE-ASSEMBLY DEBRIS COVER, 36	1
2	614624W	STANDOFF ASSEMBLY, 36, REACT P/T	1
3	113477G	BOLT, HX, 1/2X3, G2, G, ALL THREAD	2
4	116861G	SCREW, FL, #10X1 1/4, S	8
5	118019B	WASHER, FLAT, 1/4X5/8, S	8
6	118009G	WASHER, FLAT, 1/2X1 3/8, G	2
7	118892G	WASHER, LOCK, 1/2, G	2
8	115939G	NUT, HX, 1/2, G	2
9	115397B	INSTRUCTIONS, DEBRIS COVER, II ASSY, REACT, 36	1

TOL ANGLAR: ± 1/16
TOL FRACTIONAL: ± .005
TOL DECIMAL: .XXX ±
TOL DIMENSION: ± .005
DO NOT SCALE DRAWING

PARTS LIST

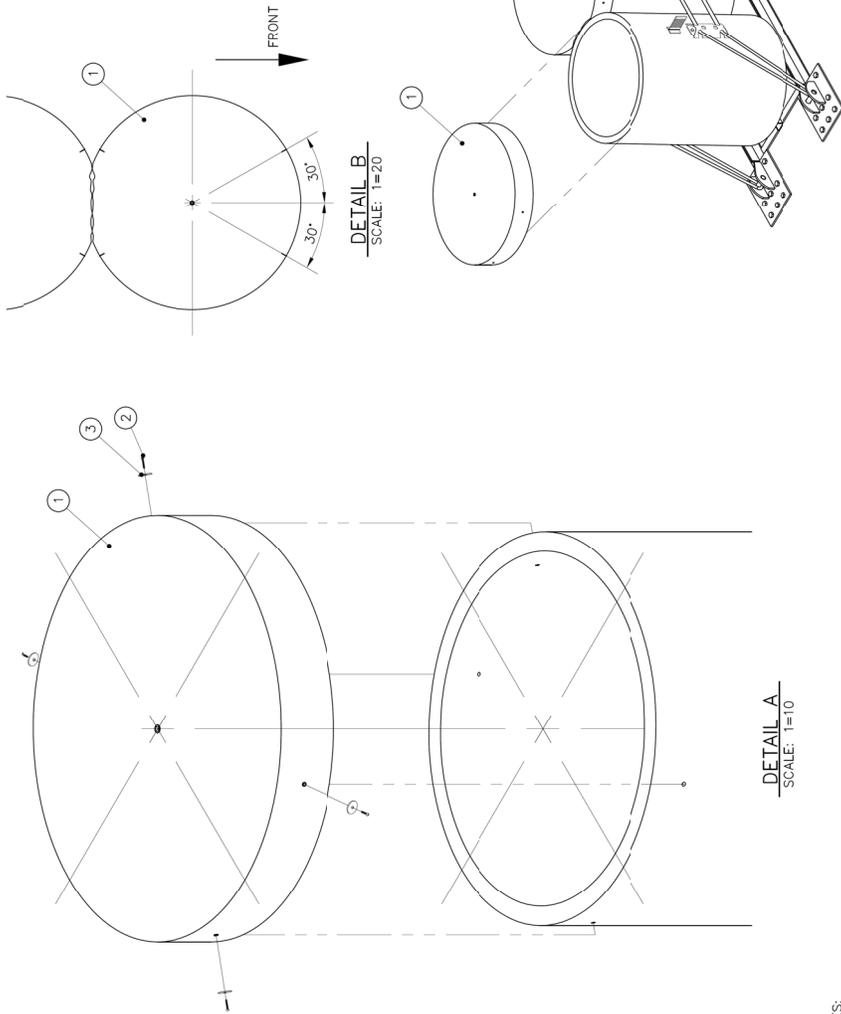
DESIGNED BY	D. Shanoridge	DATE	7/19/2007	ASSEMBLY NO.	605715B	WEIGHT	6.40 lbs/mass
CHECKED BY	S. Thompson	DATE	7/19/2007	ENGINEERING AND RESEARCH DEPARTMENT			
DESIGNED BY	JME	DATE	8/3/2007	DEBRIS COVER ASSY II, REACT 350, 36			
CHECKED BY	S. Thompson	DATE	9/3/2007	INSTRUCTION NO. 115397B			

REACT 350® 36" Debris Cover Assembly

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN INCHES DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS	606715	1	of	1	D
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606716

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	RECD.
1	114426B	DEBRIS COVER,36",REACT 350	1.00
2	116943G	SCREW,P.N.#BX1,TAPPING,AB'S	4.00
3	117994G	WASHER,FLAT,.219 ID X 1.25 OD,G	4.00



DETAIL A
SCALE: 1=10

DETAIL B
SCALE: 1=20

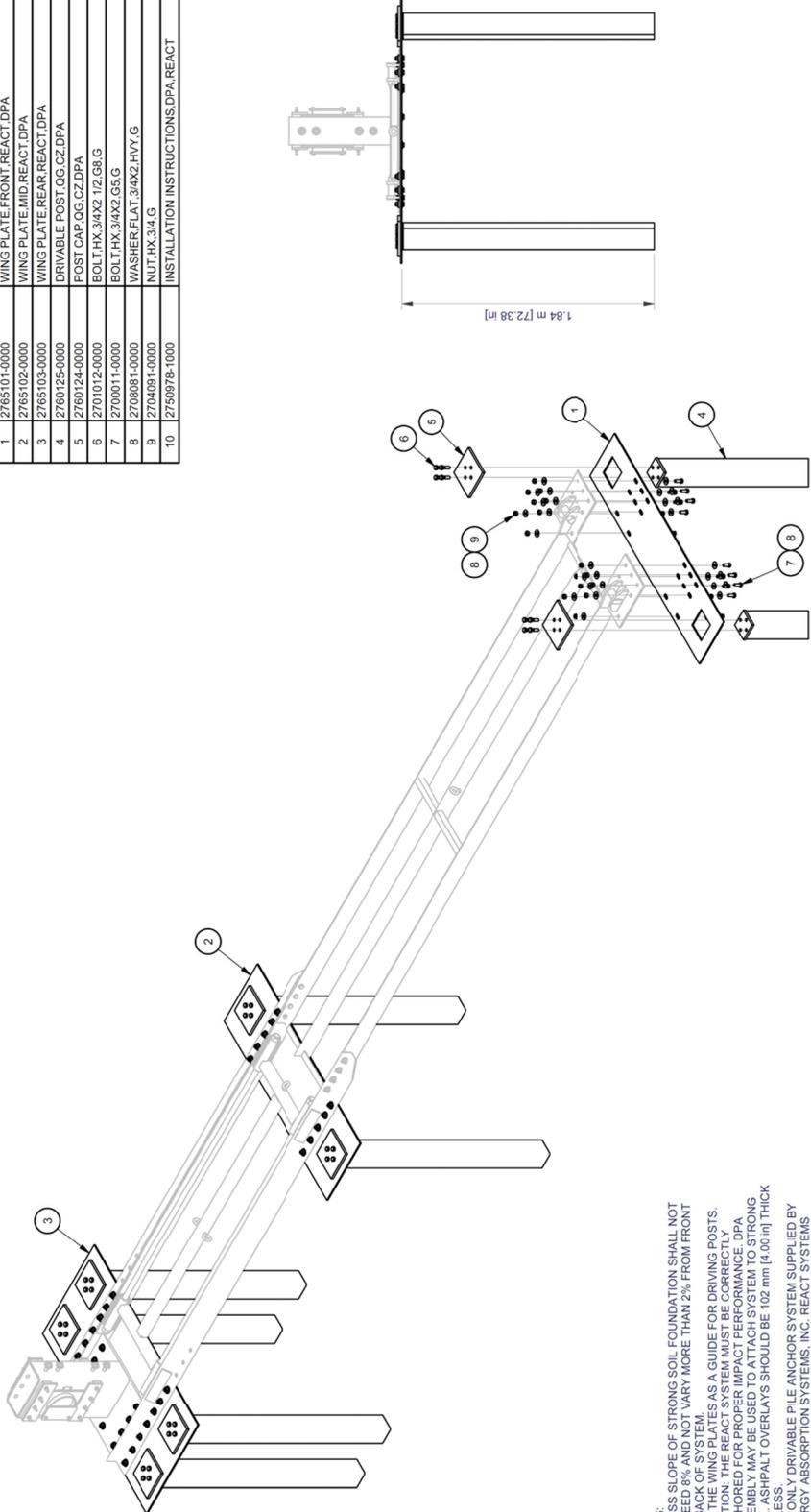
- NOTES:
- STARTING AT THE FRONT, PLACE COVERS ON EVERY CYLINDER IN SYSTEM. ORIENT FASTENERS IN LINE WITH LENGTH OF SYSTEM AS SHOWN IN DETAIL B.
 - USE COVER AS A TEMPLATE FOR SCREW LOCATION. KFFP COVERS TIGHT ON SIDE OF SYSTEM.
 - COVERS WILL BUNCH UP BETWEEN CYLINDERS. FIT COVERS BETWEEN CYLINDERS AS BEST AS POSSIBLE.

ASSEMBLY NO. 606716B	
ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
REACT 350@SYSTEM	
DEBRIS COVER ASSEMBLY,36",REACT 350	
SCALE: 1=30	REV: 1 of 1

DATE: 10/24/01	DATE: 11/1/01
DESIGNED BY: R. CONZALES	DESIGNED BY: JME
APPROVED BY: F. POWELL	APPROVED BY: F. POWELL
CAD FILE: 606716	

3535113-0000

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2765101-0000	WING PLATE,FRONT,REACT,DPA	1
2	2765102-0000	WING PLATE,MID,REACT,DPA	1
3	2765103-0000	WING PLATE,REAR,REACT,DPA	1
4	2760125-0000	DRIVABLE POST,OG,CZ,DPA	8
5	2760124-0000	POST CAP,OG,CZ,DPA	8
6	2701012-0000	BOLT,HX,3/4X2 1/2,G8.G	32
7	2700011-0000	BOLT,HX,3/4X2,G5.G	50
8	2708081-0000	WASHER,FLAT,3/4X2,HVY.G	100
9	2704091-0000	NUT,HX,3/4.G	50
10	2750978-1000	INSTALLATION INSTRUCTIONS,DPA,REACT	1



- NOTES:
- CROSS SLOPE OF STRONG SOIL FOUNDATION SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO REAR.
 - USE THE CORRESPONDING LEVELS AS A GUIDE FOR DRIVING POSTS.
 - CAUTION: THE REACT SYSTEM MUST BE CORRECTLY ANCHORED FOR PROPER IMPACT PERFORMANCE. DPA ASSEMBLY MAY BE USED TO ATTACH SYSTEM TO STRONG SOIL. ASPHALT OVERLAYS SHOULD BE 102 mm [4.00 in] THICK OR LESS.
 - USE ONLY DRIVABLE PILE ANCHOR SYSTEM SUPPLIED BY ENERGY ABSORPTION SYSTEMS, INC. TO ENSURE THE ANCHORS ARE STILL PROPERLY SET FOLLOWING EACH IMPACT. RE-ANCHOR AS NECESSARY.
 - EVERY SQUARE HOLE IN THE WING PLATES MUST HAVE A DRIVABLE POST ANCHORING IT.
 - REFER TO REACT SYSTEM DRIVABLE PILE ANCHOR INSTALLATION ADDENDUM INSTRUCTIONS FOR FURTHER INFORMATION.

ASSEMBLY NO. 3535113-0000



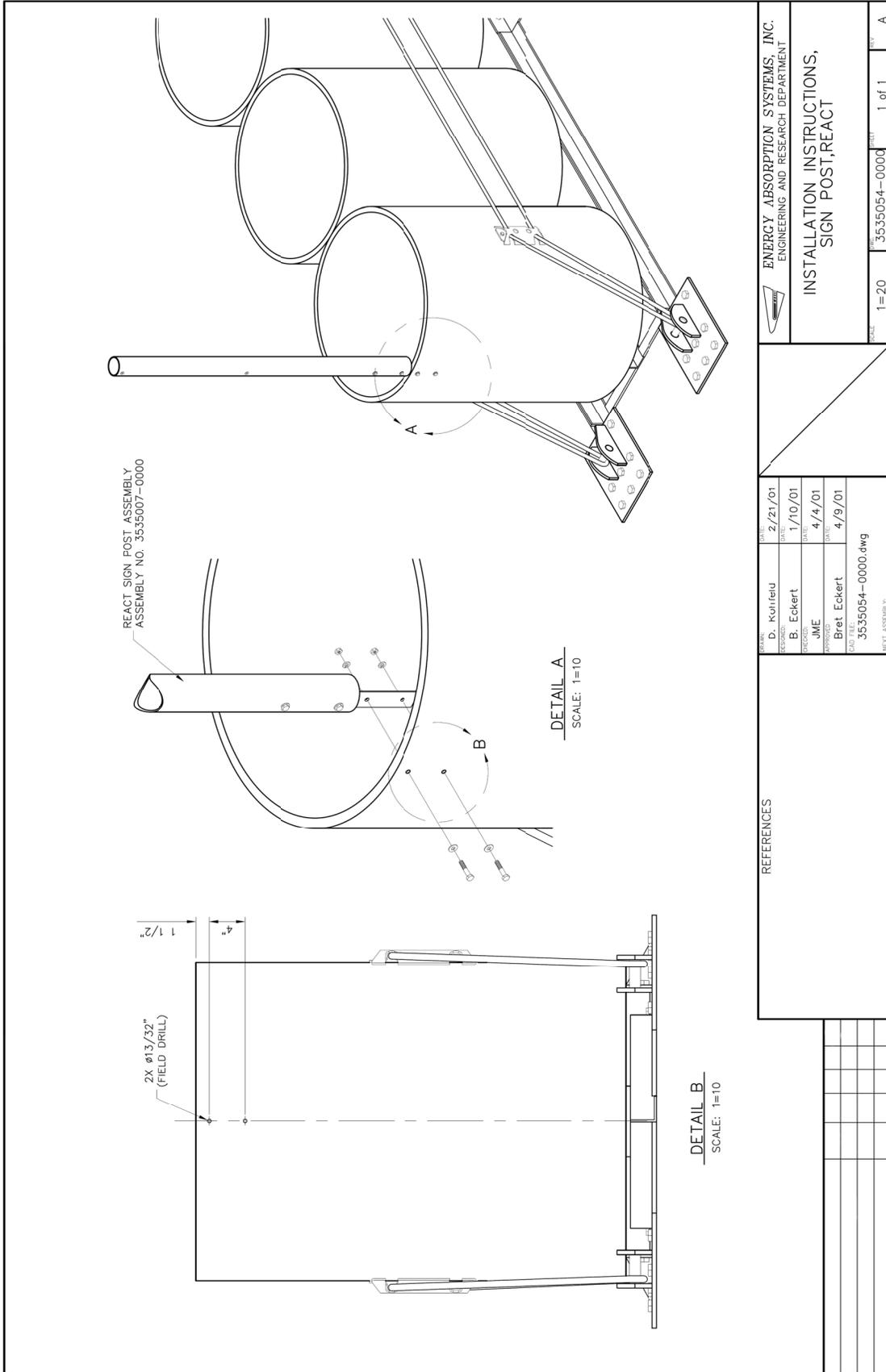
DRIVABLE PILE ANCHOR ASSY, REACT

SCALE: 1:30 DRAWING: 3535113-0000 SHEET: 1 of 1 REV: -

DESIGN	D. Hayes Jr.	DATE	1/12/2006
DESIGNED BY	A. Franklin	DATE	9/22/2005
APPROVED	A. Franklin	DATE	3/15/2006
APPROVED BY	R. Broughton	DATE	3/16/2006
PROJECT NO.	3535113-0000.LDW		
PROJECT NAME	DRIVABLE PILE ANCHOR ASSY		

REACT 350® Drivable Pile Anchor Assembly

3535054-0000



REFERENCES		DATE: 2/21/01		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
DESIGNED BY:	D. Kufield	DATE:	1/10/01	INSTALLATION INSTRUCTIONS, SIGN POST, REACT	
DESIGNED BY:	B. Eckert	DATE:	4/4/01		
APPROVED BY:	JME	DATE:	4/9/01		
APPROVED BY:	Bret Eckert	DATE:	4/9/01		
DRAWN BY:		3535054-0000.dwg		SCALE:	1=20
PROJECT NO.:		3535054-0000		REV.:	1 of 1
REV.:		A			

REACT 350® Sign Post Assembly Instructions

Notes:

Notes:



TRINITY

HIGHWAY

Ahead of the Curve™

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888.323.6374 (USA)

+1 214.589.8140 (International)