

# REACT 350<sup>®</sup> Narrow (36")

## Product Description Manual

Part No. 116513B

Revision B August 2013



**TRINITY**  
HIGHWAY PRODUCTS  
ENERGY ABSORPTION SYSTEMS

# REACT 350<sup>®</sup> Narrow (36")

## Product Description Manual



**Important:** These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the specified REACT 350<sup>®</sup> Narrow system. These instructions are for standard assembly specified by the appropriate highway authority only. In the event the specified system assembly, maintenance, or repair would require a deviation from standard assembly parameters, contact the appropriate highway authority engineer. This system has been accepted by the Federal Highway Administration for use on the national highway system under strict criteria utilized by that agency. Energy Absorption Systems 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 Energy Absorption Systems at (888) 323-6374 or download from websites below.**

The instructions contained in this Manual supersede all previous information and Manuals. All information, illustrations, and specifications in this Manual are based on the latest REACT 350<sup>®</sup> Narrow system information available to Energy Absorption Systems at the time of printing. We reserve the right to make changes at any time. Please contact Energy Absorption Systems to confirm that you are referring to the most current instructions.

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## **Customer Service Contacts**

Energy Absorption Systems is committed to the highest level of customer service. Feedback regarding the REACT 350<sup>®</sup> Narrow system, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

### **Energy Absorption Systems:**

Telephone:	(888) 323-6374 (USA Only) (214) 589-8140 (USA or International)
E-mail:	customerservice@energyabsorption.com
Internet: Energy Absorption Systems Trinity Highway Products, LLC	<a href="http://www.energyabsorption.com">http://www.energyabsorption.com</a> <a href="http://www.highwayguardrail.com">http://www.highwayguardrail.com</a>

## **Important Introductory Notes**

Proper assembly of the REACT 350<sup>®</sup> Narrow system is essential to achieve performance of the system under appropriate federal and state criteria. These instructions should be read in their entirety and understood before assembling the REACT 350<sup>®</sup> Narrow system. These instructions are to be used only in conjunction with the assembly of the REACT 350<sup>®</sup> Narrow system and are for standard assemblies only as specified by the applicable highway authority. In the event your system assembly requires or involves deviation from standard parameters or, during the assembly process a question arises, please contact the appropriate highway authority that specified this system at this particular location for guidance. Energy Absorption Systems is available for consultation with that agency. These instructions are intended for an individual who is qualified to both read and accurately interpret them as written. They are intended for the individual who is experienced and skilled in the assembly of highway products which are specified and selected by the highway authority.

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



**Important:** Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing REACT 350<sup>®</sup> Narrow system. Failure to follow this warning can result in serious injury or death to workers and/or bystanders. It further compromises the acceptance of this system by the FHWA. Please keep these instructions for later use.



**Warning:** Ensure that all of the REACT 350<sup>®</sup> Narrow system Warnings, Cautions, and Important statements within the REACT 350<sup>®</sup> Narrow Manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

## **Recommended Safety Rules for Assembly**

### **\* Important Safety Instructions \***

This Manual must be kept in a location where it is readily available to persons who are skilled and experienced in the assembly, maintenance, or repair of the REACT 350<sup>®</sup> Narrow system. Additional copies of this Manual are immediately available from Energy Absorption Systems by calling (888) 323-6374 or by email at [customerservice@energyabsorption.com](mailto:customerservice@energyabsorption.com). This Manual may also be downloaded directly from the websites indicated below. Please contact Energy Absorption Systems if you have any questions concerning the information in this Manual or about the REACT 350<sup>®</sup> Narrow system.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the REACT 350<sup>®</sup> Narrow components. Gloves, safety goggles, safety toe shoes, and back protection should be used.

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

## Safety Symbols

This section describes the safety symbols that appear in this REACT 350<sup>®</sup> Narrow Manual. Read the Manual for complete safety, assembly, operating, maintenance, repair, and service information.

<u>Symbol</u>	<u>Meaning</u>
---------------	----------------



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

## Warnings and Cautions

Read all instructions before assembling, maintaining, or repairing the REACT 350<sup>®</sup> Narrow system.



**Warning:** Do not assemble, maintain, or repair the REACT 350<sup>®</sup> Narrow system until you have read this Manual thoroughly and completely understand it. Ensure that all Warnings, Cautions, and Important Statements within the Manual are completely followed. Please call Energy Absorption Systems at (888) 323-6374 if you do not understand these instructions. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Safety measures incorporating appropriate traffic control devices specified by the highway authority must be used to protect all personnel while at the assembly, maintenance, or repair site. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Use only Energy Absorption Systems parts that are specified herein for the REACT 350<sup>®</sup> Narrow for assembling, maintaining, or repairing the REACT 350<sup>®</sup> Narrow system. Do not utilize or otherwise commingle parts from other systems even if those systems are other Energy Absorption Systems or Trinity Highway Products systems. Such configurations have not been tested, nor have they been accepted for use. Assembly, maintenance, or repairs using unspecified parts or accessories is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with an UNACCEPTED system.



**Warning:** Do NOT modify the REACT 350<sup>®</sup> Narrow system in any way. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Ensure that the REACT 350<sup>®</sup> Narrow system and delineation used meet all federal, state, specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.



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

## **Limitations and Warnings**

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

The REACT 350<sup>®</sup> Narrow system has been approved by FHWA as meeting the requirements and guidelines of NCHRP Report 350 TL-2 (4 Bay system) and TL-3 (9 Bay system). These tests, typically evaluate product performance by utilizing established criteria impacts involving a typical range of vehicles on our roadways, from lightweight cars (approx. 820 kg [1800 lb.]) to full size pickup trucks (approx. 2000 kg [4400 lb.]) as specified by the FHWA. A product can be certified for multiple Test Levels. The REACT 350<sup>®</sup> Narrow is certified to the Test Level(s) as shown below:

Test Level 2: 70 km/h [43 mph]

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

**These FHWA directed tests are not intended to represent the performance of systems when impacted by every vehicle type or every impact condition existing on the roadway. This system is tested only to the test matrix criteria of NCHRP 350 as approved by FHWA.**

Energy Absorption Systems does not represent nor warrant that the results of these NCHRP tests show that vehicle impacts with the products in other conditions would necessarily avoid injury to person(s) or property. Impacts that exceed criteria capabilities of the product may not result in acceptable impact performance as outlined in NCHRP Report 350, relative to structural adequacy, occupant risk, and vehicle trajectory. Energy Absorption Systems expressly disclaims any warranty or liability for injury or damage to persons or property resulting from any impact, collision, or harmful contact with products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were assembled by or under the direction of Energy Absorption Systems or by third parties.

The REACT 350<sup>®</sup> Narrow system is intended to be assembled, delineated, and maintained in accordance with specific state and federal guidelines. It is important to select the most appropriate product configuration for a site. The appropriate highway authority approved engineer should be careful to properly select, assemble, and maintain the product. Careful evaluation of the site geometry, vehicle population type, speed, traffic direction, and visibility are some of the elements that require evaluation in the proper selection of a safety appurtenance. For example, assemblies on curbs have not been tested, nor evaluated and should not be permitted. Before assembly of this system at any location, these issues need to be fully discussed with the appropriate highway authority planning and specifying the installation.

After an impact occurs, the product should be restored to its original condition as soon as possible. When a potentially reusable highway product is impacted, it is still necessary to restore the product to its original length and inspect all the components as necessary. What constitutes a potentially reusable highway product should only be determined by a trained engineer, experienced in highway products, directed by the DOT, or other appropriate local highway authority.

## **System Overview**

The REACT 350<sup>®</sup> Narrow is a potentially reusable, redirective, non-gating crash cushion for hazards ranging in width from 203 mm to 914 mm (8" to 36"). It consists of high molecular weight, high density polyethylene (HMW/HDPE), energy-absorbing Cylinders. Again, the decision as to whether this product is reusable after impact rests within the sound discretion of the trained engineer, experienced in highway products, who is working at the direction of the local DOT, or appropriate highway authority which specified and now owns the product.

The REACT 350<sup>®</sup> Narrow system utilizes three types of cylinders in a "staged" configuration to address both lighter cars and heavier, high center-of-gravity vehicles. Its modular design allows the system length to be tailored to the design speed of a site. Refer to this REACT 350<sup>®</sup> Narrow Product Description Manual to determine the appropriate length system for a given speed.

### **Impact Performance**

The 4 Cylinder REACT 350<sup>®</sup> Narrow (TL-2) system has successfully passed the requirements stipulated in NCHRP Report 350, with both the light car and pickup at speeds of up to 70 km/h [43 mph] at angles up to 20 degrees

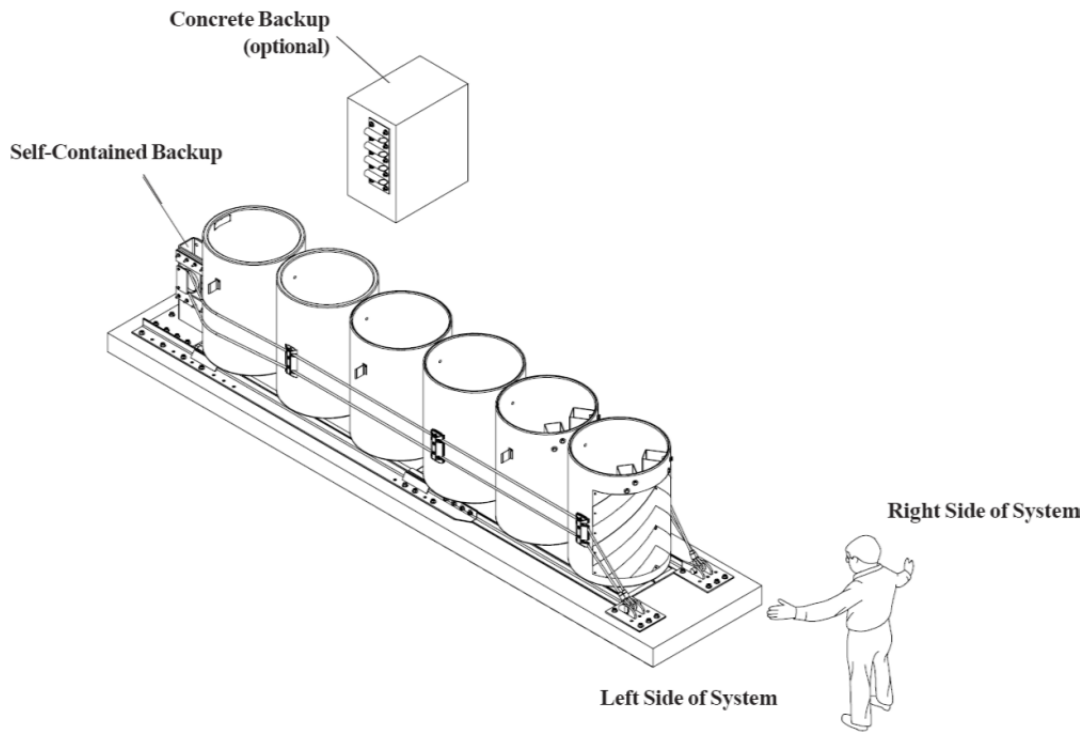
The 9 Cylinder REACT 350<sup>®</sup> Narrow (TL-3) system has successfully passed the requirements stipulated in NCHRP Report 350, with both the light car and pickup at speeds of up to 100 km/h [62 mph] at angles up to 20 degrees.

During head-on impacts, within the above-referenced NCHRP criteria, the REACT 350<sup>®</sup> Narrow Cylinders have been shown to compress rearward to absorb the energy of impact. When impacted from the side, within same criteria, it was shown to redirect the vehicle back toward its original travel path and away from the hazard.

### **System Overview**

Two Backup options are available to further meet specific requirements of each location. A Self-Contained Backup is available, or the system can be mounted to a new or existing Concrete Backup. In some locations, either Backup type may be appropriate (See Page 8).





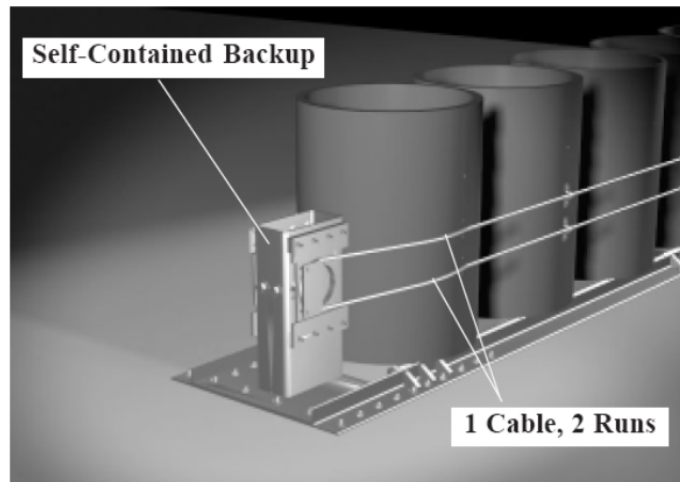
**Figure 1**  
**REACT 350 (36'') with Self-Contained Backup**

## **REACT 350<sup>®</sup> Narrow Criteria**

The REACT 350<sup>®</sup> Narrow is available with a Self-contained Backup or may be attached to a Concrete Backup (See Figures 2 and 3 along with the Backup Assembly drawings to determine which type of Backup is appropriate).

### **Self-Contained Backup**

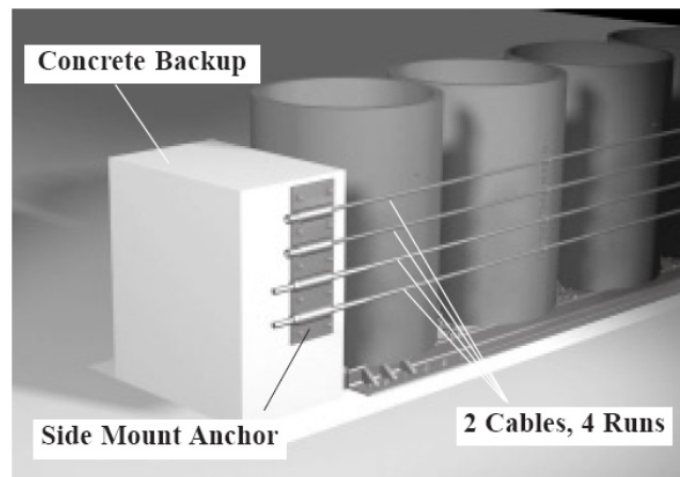
REACT 350<sup>®</sup> Narrow with a Self-Contained “Steel Tube” Backup requires two Cables, one Cable on each side of the Cylinders. These Cables begin at the front of the system, travel through the Cable Guides on the Cylinders, loop around the Backup structure, travel back through the Cable Guides, and terminate at the front of the system.



**Figure 2**  
**Self-Contained Backup**

### **Concrete Backup**

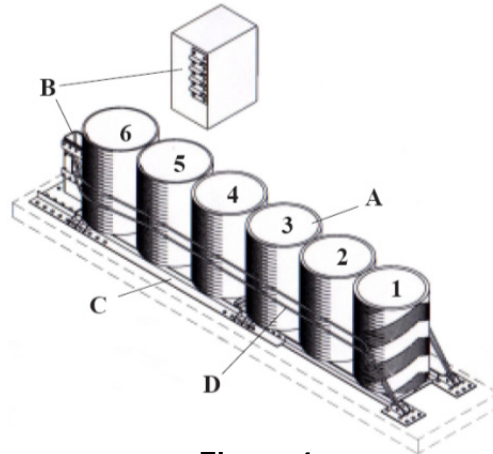
The REACT 350<sup>®</sup> Narrow system with Concrete Backup requires four Cables. Two Cables on each side of the Cylinders begin at the Side Anchor Plates, travel through the Cable Guides on the Cylinders, loop around the pin on the Front Anchor Plates, travel back through the Cable Guides, and terminate at the Side Anchor Plates. Existing concrete structures may serve as backups for the REACT 350<sup>®</sup> Narrow provided they meet specific size and strength requirements.



**Figure 3**  
**Concrete Backup**

## Number of Bays

A Bay consists of one Cylinder. The terms Bay and Cylinder may be used interchangeably. The Cylinder at the front of the system (traffic end) is always Bay 1, and each subsequent Bay is sequentially numbered to the rear of the system (hazard end). The standard REACT 350<sup>®</sup> Narrow is available in 4, 6, and 9 Bay configurations so the length of the system can be custom tailored for the design speed of the roadway.



**Figure 4**  
**Number of Bays**

### Key

- A. Cylinder/Bay
- B. Backup (Self-Contained or Concrete)
- C. Steel base track
- D. Cables (Quantity varies with Backup)

## Foundation Specifications

The REACT 350<sup>®</sup> Narrow shall be deployed on any of the following Foundations using the specified anchorage:

### **Permanent Installations**

For permanent installations, the REACT 350<sup>®</sup> Narrow should be installed only on an existing or freshly placed and cured concrete base (28 MPa [4000 psi] minimum). Orientation of the concrete base and the attenuator must comply with the project plans or as otherwise determined by the resident project engineer or appropriate highway authority.

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

### **Asphalt Installations**

For temporary installations in construction zones, REACT 350<sup>®</sup> Narrow may be installed on asphalt. Only systems with a Self-Contained Backup may be installed on asphalt. Provide a minimum of 76 mm [3"] layer of asphalt over a minimum of 76 mm [3"] layer of Portland Cement Concrete, 152 mm [6"] layer of asphalt over 152 mm [6"] layer of subbase, or 203 mm [8"] layer of asphalt with no subbase or 460 mm [18"] threaded rods, installed with the two-part MP-3<sup>®</sup> grout must be used for these foundations.



**Important:** Systems mounted on asphalt must be replaced and mounted on fresh, undisturbed asphalt if more than 10% of anchors are found to be loose, broken, or show signs of pull out. If 10% or fewer anchors are damaged, replace the damaged anchors in the existing asphalt. Anchor bolts used on systems mounted on asphalt must be inspected every 6 months. See Post Impact Instructions and Maintenance and Repair instructions in the REACT 350® Narrow Assembly Manual for details.

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

**Foundation A: Concrete Pad or Roadway**

Foundation: 150 mm [6"] minimum depth Portland Cement Concrete (P.C.C.)

Anchorage: MP-3® with 180 mm [7"] studs 140 mm [5.5"] embedment

**Foundation B: Asphalt over P.C.C.**

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

Anchorage: Length of anchor required is 180 mm [18"] 420 mm [16.5"] embedment

**Foundation C: Asphalt over Subbase**

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

Anchorage: MP-3 with 460 mm [18"] studs 420 mm [16.5"] embedment

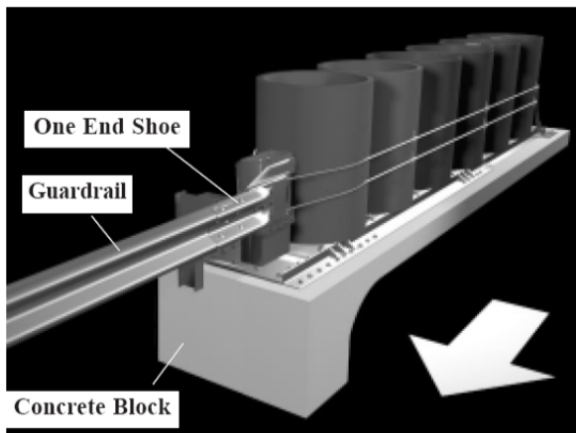
**Foundation D: Asphalt Only**

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

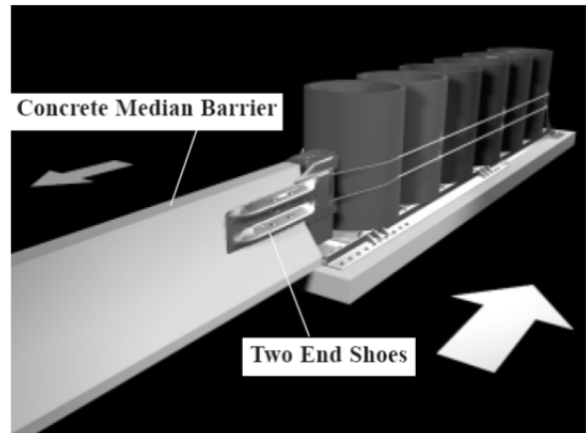
Anchorage: MP-3 with 460 mm [18"] studs - 420 mm [16.5"] embedment

**Foundation Specifications**

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



**Figure 5**  
**Below-Grade Anchor Block**



**Figure 6**  
**No Anchor Block Needed**

**A. C. (Asphalt Concrete)**

AR-4000 A. C. (per ASTM D3381 '83) .75" Maximum, Medium (Type A or B) aggregate

<b>Sieve Size</b>	<b>Operating Range (%) Passing</b>
1"	100
3/4"	95-100
3/8"	65-80
No. 4	49-54
No. 8 3	6-40
No. 30 1	8-21
No. 200	3-8



**Caution: 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 C31-84 or ASTM C42-84a, testing per ASTM C39-84)

**C.S. (Compacted Subbase)**

150 mm [6"] minimum depth 95% compaction

Class 2 aggregate

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

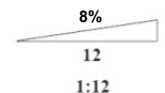
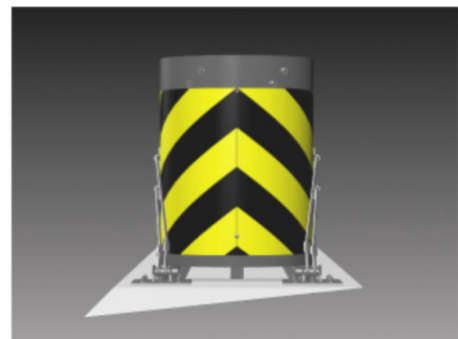
## **Special Site Conditions**

Contact Energy Absorption Systems Customer Service Department if you would like assistance with your application as proper model selection is essential to the performance of the REACT 350<sup>®</sup> Narrow 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<sup>®</sup> Narrow 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 the two appurtenances at the same time. Allow for 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 hazard, 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 hazard 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 hazard to the rear of the system may be necessary to prevent a vehicle from interacting on the rear of the system. See Bidirectional Traffic on Page 16.
7. Are there any other unique features at the site that may affect the positioning or performance of the REACT 350<sup>®</sup> Narrow system?

### **Other Factors That May Affect Your Assembly:**

1. The existence of drain inlets or buried culvert pipe.
2. Junction boxes or other appurtenances located near the hazard.
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 slope (See Figure 7). Often a system can be moved further forward to a more level site. Transitioning may be extended back to the existing hazard to accommodate the site.



**Figure 7**  
**Cross Slope**

## REACT 350<sup>®</sup> Narrow standard model numbers

Reference	Model No.	# of Bays	System Length		Max. Design Speed	
			Meters	Feet-Inches	km/h	mph
REACT 350.4	43B36	4	4.64	15' 3"	70	43
	43C036	4	4.19	13' 8 3/4"	70	43
REACT 350.6	55B036	6	6.47	21' 2 3/4"	89	55
	55C036	6	6.02	19' 8 3/4"	89	55
REACT 350.9	62B036	9	9.21	30' 2 3/4"	100	62
	62C036	9	8.76	28' 8 3/4"	100	62
REACT 350.9HS	70B036	9	9.21	30' 2 3/4"	113	70
	70C036	9	9.21	30' 2 3/4"	113	70

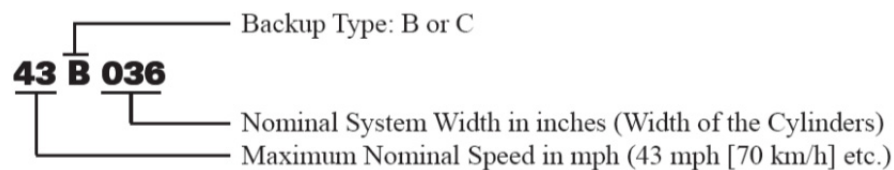


**Warning:** Shaded area denotes system not tested to NCHRP Report 350 standards. NCHRP Report 350 does not outline test criteria for speeds in excess of 100 km/h (62 mph). REACT 350.9HS is identical to the REACT 350.9 except it utilizes different cylinder thicknesses. REACT 350.9HS is expected to comply with NCHRP Report 350 TL-3 requirements and offer additional capacity for impacts up to 115 km/h [70 mph].

Impact conditions which differ from those described in the NCHRP Report 350 test matrix for non-gating redirective crash cushions may result in different crash results than those encountered in testing. Furthermore, impacts in excess of TL-3 impact severity or the existence of unusual impact conditions such as vehicle instability resulting from traversing curbs or excessive cross-slopes prior to impact may compromise crash performance and have not been crash tested. Performance criteria relative to structural adequacy, occupant risk, and vehicle trajectory may not meet NCHRP 350 evaluation criteria.

### Model Number Description

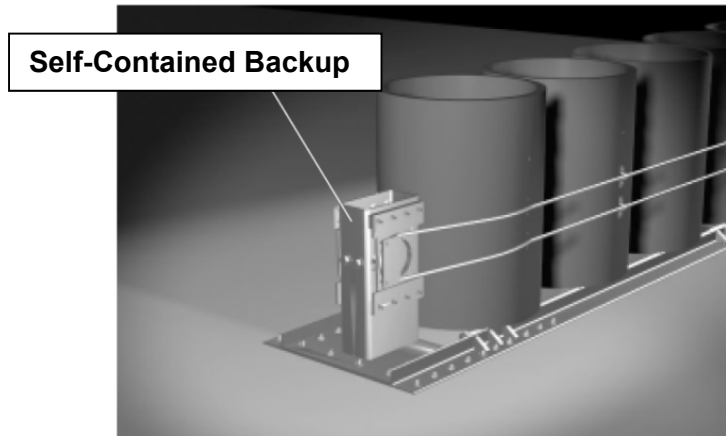
B	C
<b>Self-Contained Steel Backup</b>	<b>Concrete Backup with side mount anchors</b>
<b>Typical hazard width 203 mm [8"] (Safety Shape Barrier)</b>	<b>Max. hazard width 914 mm [36"]</b>



# **Self-Contained Backup**

## **Overview**

The REACT 350<sup>®</sup> Narrow system, with a Self-Contained Backup, is designed to minimize installation 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 Manual for a complete list of instructions.)

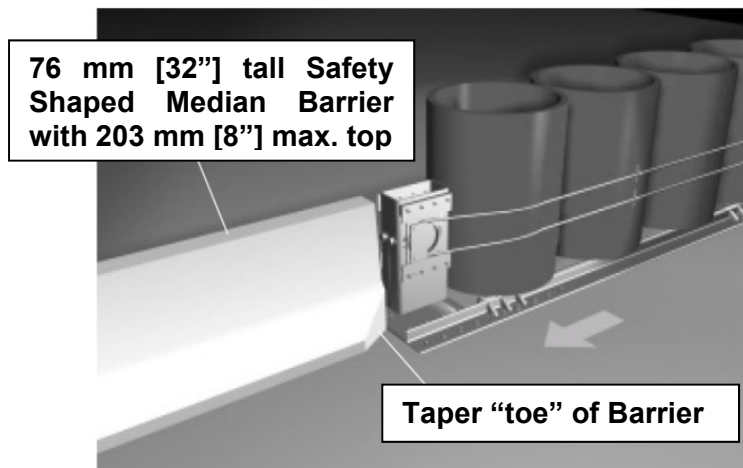


**Figure 8**  
**Self-Contained Backup**

## **Hazard Width**

The REACT 350<sup>®</sup> Narrow, with a Self-Contained Backup, can shield obstacles in gore, non-gore, and bidirectional applications (See Bidirectional Traffic and Offsetting the System on Pages 17 and 18).

When shielding median barriers, a Self-contained Backup system may be used if the base or “toe” of the barrier is tapered (See Figure 9). Contact Energy Absorption Systems for more information (See Page 3).

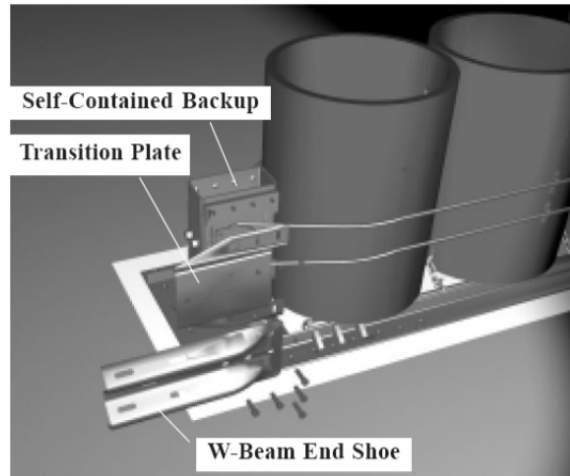


**Figure 9**  
**Taper**



## Guardrail Attachment

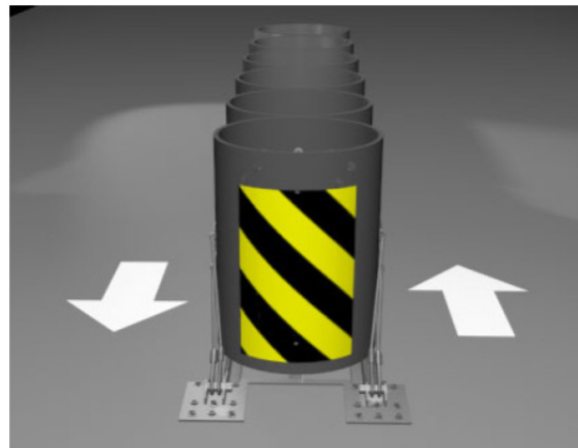
Hardware is available to mount W-Beam Guardrail or a safety shaped barrier to the Self-Contained Backup of the REACT 350<sup>®</sup> Narrow system. A Folded Transition Plate and W-Beam Connector can mount to either or both sides of the Backup assembly (See Figure 10). If bidirectional traffic is present, special post spacing, rail, and rubrail will be required for Guardrail.



**Figure 10**  
**Guardrail Attachment Hardware**

## Bidirectional Traffic

If bidirectional traffic (vehicles traveling opposite directions on either side of the system) is present, special considerations need to be taken when placing the system. It is important that the Self-Contained Backup does not become a hazard 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<sup>®</sup> Narrow may be offset such that the Backup structure is shielded by the hazard (See Offsetting the System). Guardrail transition hardware may also be used.



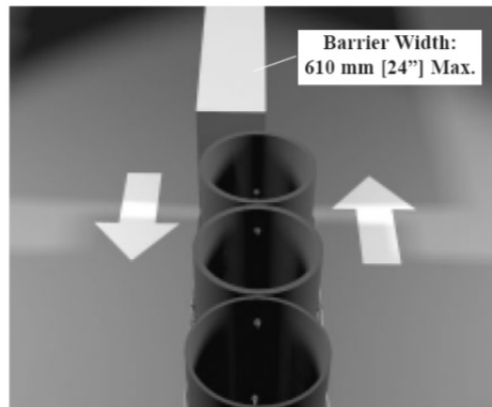
**Figure 11**  
**Bidirectional Traffic**

## Offsetting the System

The REACT 350<sup>®</sup> Narrow system, with a Self-Contained Backup, may be offset from the center of the hazard if space permits. Offsetting may be necessary for two reasons.

- 1) To shield a hazard 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 12). With this method, REACT 350<sup>®</sup> Narrow with Self-Contained Backup can shield hazards wider than 200 mm [8"]. If a wider hazard is present or if bidirectional traffic is present a Concrete Backup may be required. Contact Energy Absorption Systems Customer Service Department for offsetting input questions (See Page 3).

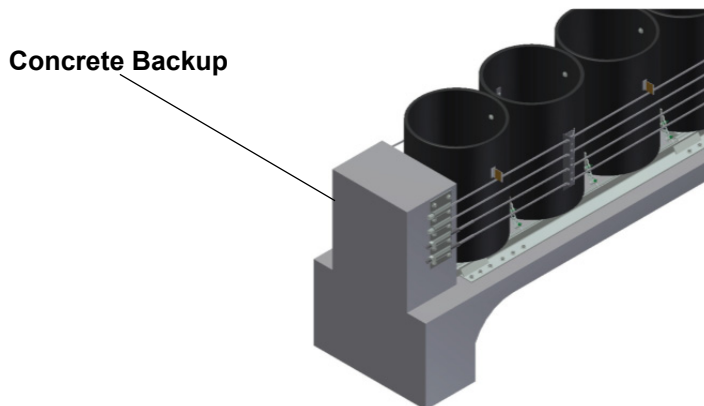


**Figure 12**  
**Offset**

## Concrete Backup

### Overview

The REACT 350<sup>®</sup> Narrow is also designed to mount directly to a new or existing Concrete Backup. This type of system requires slightly more deployment time, as the cables must be assembled on site. Refer to the Assembly Manual for a complete list of instructions. Existing Concrete Backups must be a minimum of 1 m [40"] high, 610 mm [24"] long, and 762 mm [30"] to 914 mm [36"] wide, with 28 day curing 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. You may Contact Energy Absorption Systems Customer Service Department with your site information if you would like input (See Page 3).



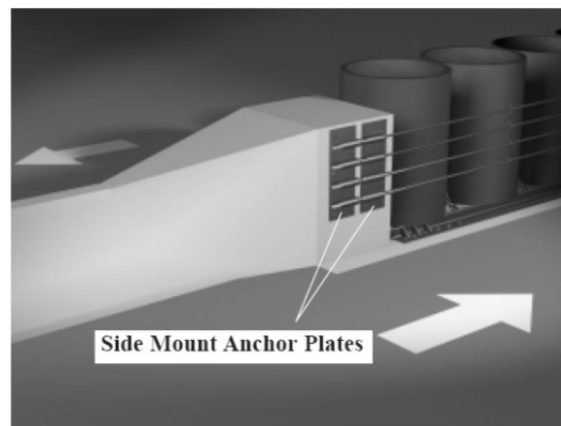
**Figure 13**  
**Concrete Backup**

## Hazard Width

The REACT 350<sup>®</sup> Narrow with a Concrete Backup is intended 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 that the Concrete Backup itself does not become a hazard to the reverse direction traffic. If a system is placed in a location where traffic will be approaching from the rear of the system, the Backup should not protrude beyond the hazard 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 14). In this case, the Backup must be 762 mm [30"] long.

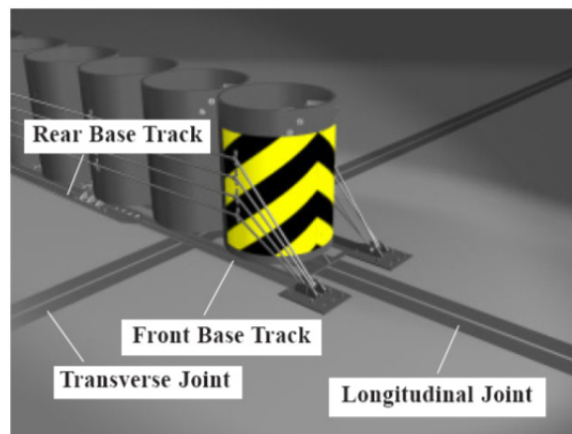


**Figure 14**  
**Asphalt/Concrete**

## Joints

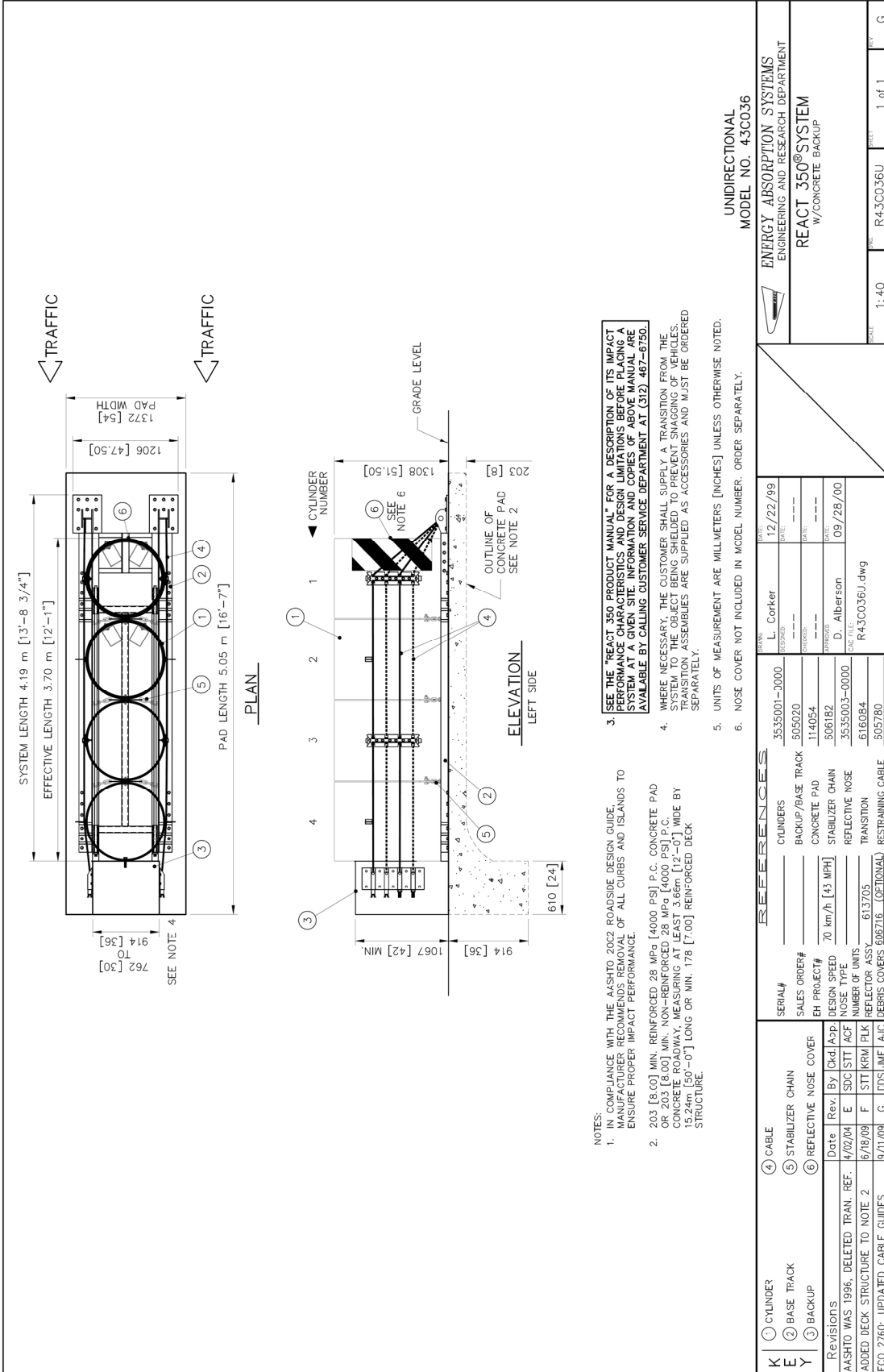
The REACT 350<sup>®</sup> Narrow system may span longitudinal joints; however, custom hardware will be required.

The REACT 350<sup>®</sup> Narrow system may also span a Transverse Joint if the joint falls under the front section of base track (See Figure 15). The front section of base track should be cut, after assembly, so as not to span the joint with structural steel. Never cut the rear section of base track. The joint movement must be limited to 38 mm [1.5"]. Four Cylinder systems do not have a front section of base track that can be cut.



**Figure 15**  
**Longitudinal or Transverse Joints**

DWG R43C036U



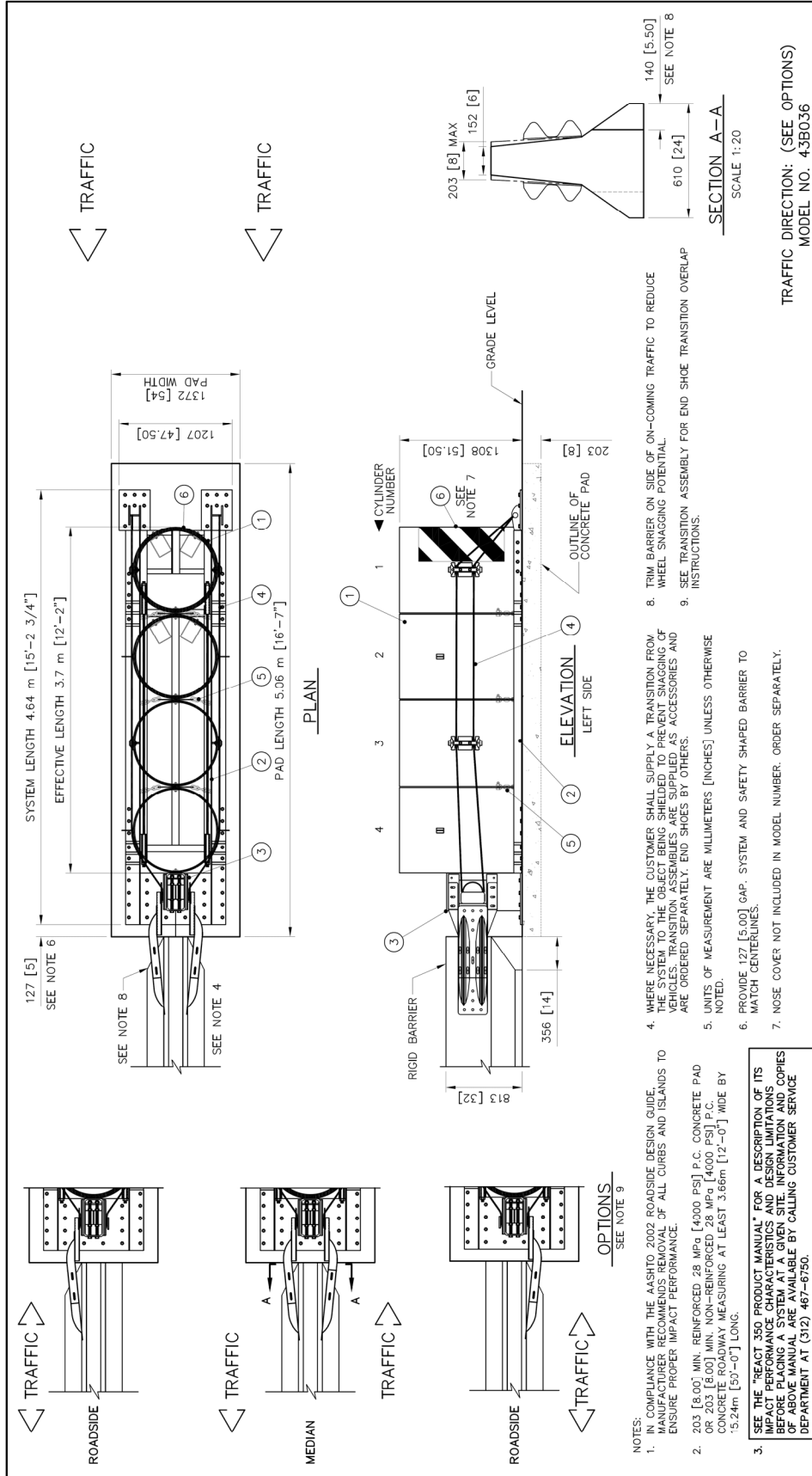
- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
  - 203 [8.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 203 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY, MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG OR MIN. 1.78 [7.00] REINFORCED DECK STRUCTURE.
  - SEE THE "REACT 350 PRODUCT 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) 487-8750.
  - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING 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.

UNIDIRECTIONAL  
MODEL NO. 43C036

REVISIONS K CYLINDER E BASE TRACK Y BACKUP	④ CABLE ⑤ STABILIZER CHAIN ⑥ REFLECTIVE NOSE COVER	SERIAL# 3535001-0000 SALES ORDER# 505020 EH PROJECT# 114054 DESIGN SPEED 70 km/h [43 MPH] NOSE TYPE STABILIZER CHAIN NUMBER OF UNITS 3535003-0000 REFLECTOR ASSY. 613705 TRANSITION 616084 DEBRIS COVERS 606216 (OPTIONAL) RESTRAINING CABLE 505780	DATE 12/22/99 DESIGNED BY L. Corter CHECKED BY L. Corter APPROVED BY D. Albersen DATE 09/28/00 DWT FILE R43C036U.dwg	ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT REACT 350® SYSTEM W/CONCRETE BACKUP	SCALE 1:40 SHEET R43C036U OF 1 OF 1
	Revisions AASHTO WAS 1996, DELETED TRAN. REF. 4/02/04 ADDED DECK STRUCTURE TO NOTE 2 6/18/09 ECO 2760; UPDATED CABLE GUIDES 9/11/09	Date: Rev. By: Ckd. App. E SDC STT JCF F STT KRM PLK G DDS JME A/C	REFERENCE CYLINDERS 3535001-0000 BACKUP/BASE TRACK 505020 CONCRETE PAD 114054 STABILIZER CHAIN 506182 REFLECTIVE NOSE 3535003-0000 TRANSITION 616084 RESTRAINING CABLE 505780	DATE 12/22/99 DESIGNED BY L. Corter CHECKED BY L. Corter APPROVED BY D. Albersen DATE 09/28/00 DWT FILE R43C036U.dwg	ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT REACT 350® SYSTEM W/CONCRETE BACKUP

REACT 350® , TL-2 w/Concrete Backup, Uni-Directional

DWG R43B036-TELR



KEY		REFERENCES		DATE	
1	CYLINDER	3535001-0000	CYLINDERS	L. Corker	05/08/01
2	BASE TRACK	605028	BACKUP/BASE TRACK		
3	BACKUP	114054	CONCRETE PAD	D. Ollom	05/14/01
4	CABLE	606182	STABILIZER CHAIN	B. Burgess	05/14/01
5	STABILIZER CHAIN	3535003-0000	REFLECTIVE NOSE		
6	REFLECTIVE NOSE COVER	613705	TRANSITION		
		606216 (OPTIONAL)	RESTRAINING CABLE		
		605780			

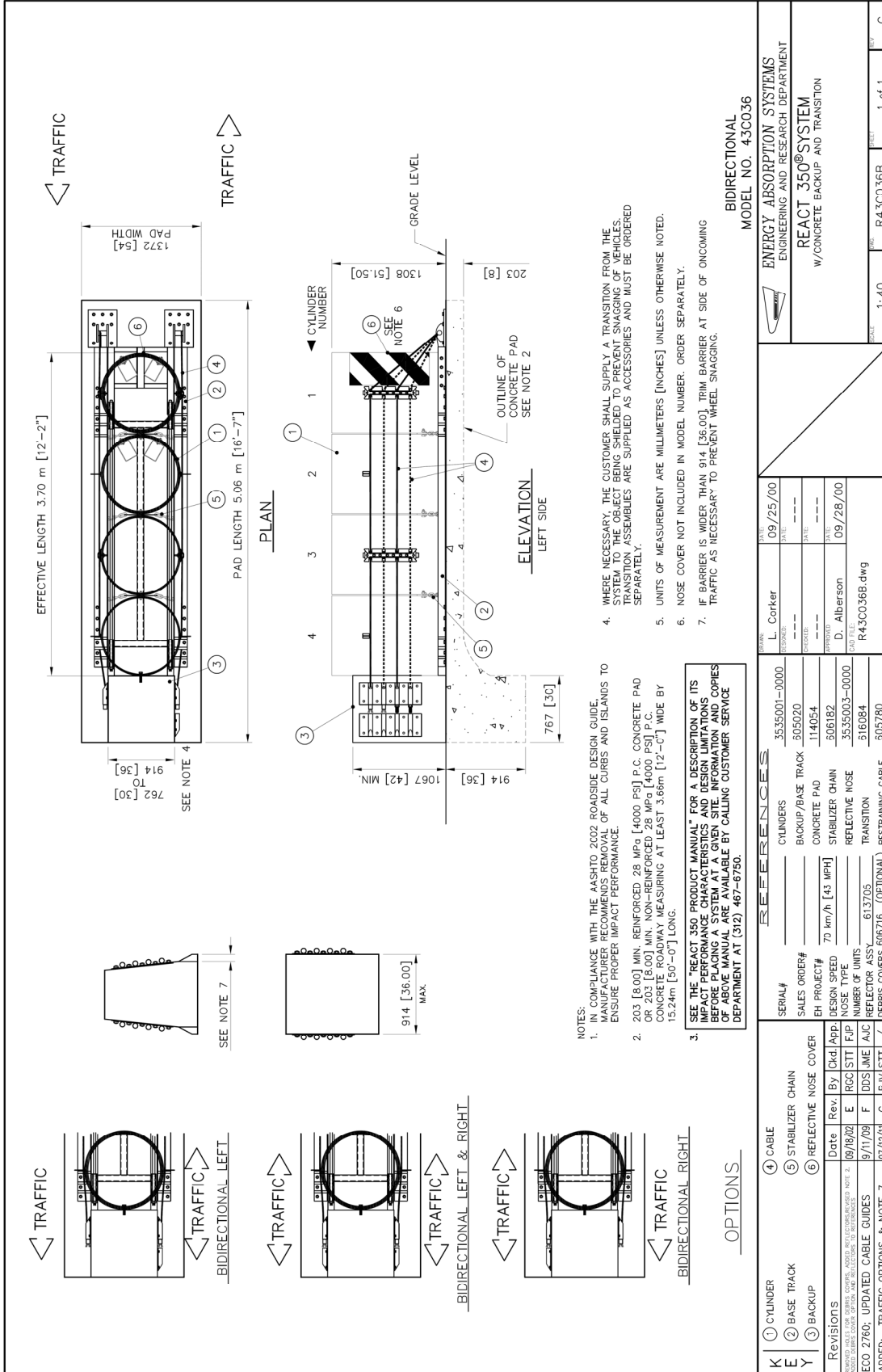
Revisions	Date	Rev.	By	Chk/ App.	DESCRIPTION
	09/18/02	D	RCC STI	FJP	DESIGN SPEED NOSE TYPE UNITS
	12/01/05	E	RCC DK	ACF	ADJUSTED TRAFFIC ARROWS
	09/11/09	F	EDS JME	AJC	DEBRIS COVERS

TRAFFIC DIRECTION: (SEE OPTIONS) MODEL NO. 43B036	ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT
	REACT 350@SYSTEM W/SELF CONTAINED BACKUP AND TRANSITIONS, BOTH SIDES
SCALE: 1:40	DATE: R43B036-TELR
	1 of 1

REACT 350®, TL-2 w/Self-Contained Backup and Transition, Multi-Directional

DWG R43C036B



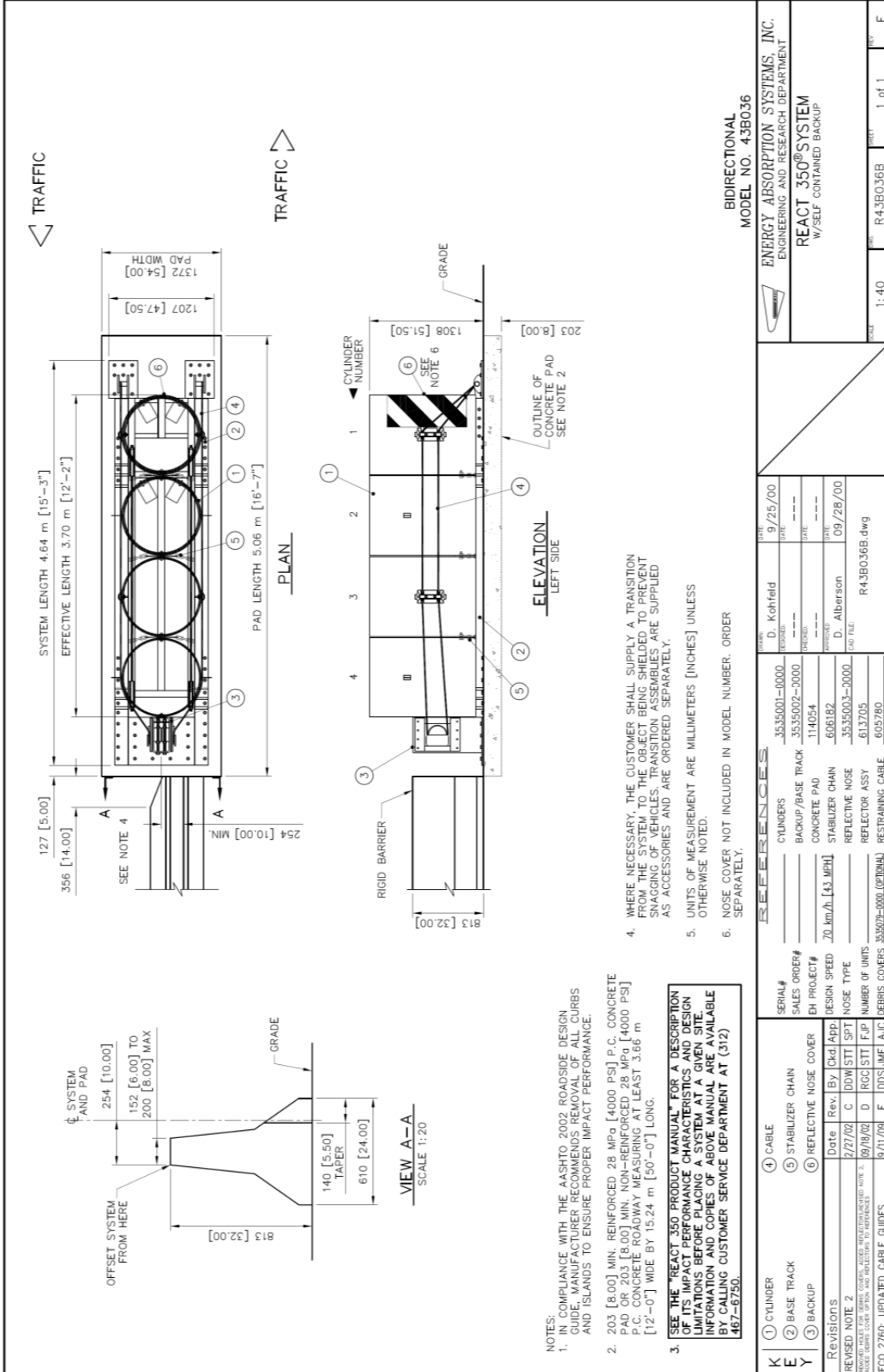
**REACT 350<sup>®</sup>, TL-2 w/Concrete Backup and Transition, Multi-Directional**

<b>KEY</b> ① CYLINDER ② BASE TRACK ③ BACKUP ④ CABLE ⑤ STABILIZER CHAIN ⑥ REFLECTIVE NOSE COVER	SERIAL# 3535001-0000 SALES ORDER# 505020 EH PROJECT# 114054 DESIGN SPEED 70 km/h [43 MPH] NOSE TYPE STABILIZER CHAIN NUMBER OF UNITS 36,35003-0000 REFLECTOR ASSY. 316084 TRANSITION 613705 DEBRIS COVERS 606716 (OPTIONAL) RESTRAINING CABLE 505760	DATE 09/25/00 BY L. Corker CHECKED APPROVED D. Albersen FILED R43C036B.dwg	MODEL NO. 43C036 BIDIRECTIONAL
	REVISIONS ECO 2760; UPDATED CABLE GUIDES 9/11/09 F ECO 2760; UPDATED CABLE GUIDES 9/11/09 F ADDED: TRAFFIC OPTIONS & NOTE 7 07/12/11 G ADDED: TRAFFIC OPTIONS & NOTE 7 07/12/11 G	ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT REACT 350 <sup>®</sup> SYSTEM W/CONCRETE BACKUP AND TRANSITION	SCALE 1:40 SHEET 1 of 1

- NOTES:**
- IN COMPLIANCE WITH THE AASHTO 2002 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 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 EXISTING ROADWAY TO THE REACT 350 SYSTEM. TRIM BARRIERS, TRAFFIC ASSEMBLIES, TRANSITION ASSEMBLIES AND ACCESSORIES MUST BE ORDERED SEPARATELY.
  - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
  - NOSE COVER NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  - IF BARRIER IS WIDER THAN 914 [36.00], TRIM BARRIER AT SIDE OF ONCOMING TRAFFIC AS NECESSARY TO PREVENT WHEEL SNAGGING.

**OPTIONS**

DWG R43B036B

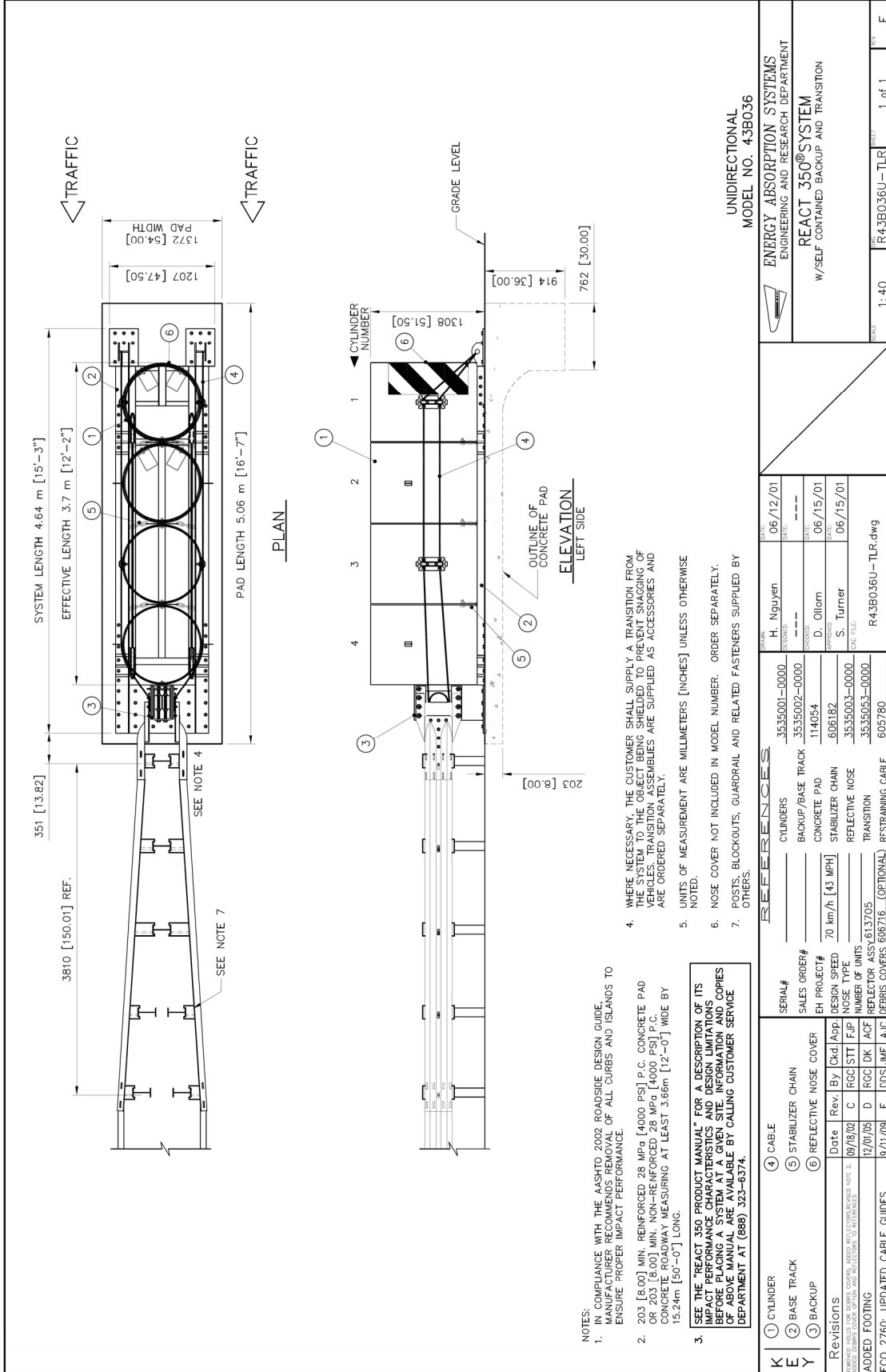


**REACT 350<sup>®</sup>, TL-2 w/ Self Contained Backup, Bi-Directional, Offset**

BIDIRECTIONAL  
MODEL NO. 43B036

		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
REACT 350 <sup>®</sup> SYSTEM w/SELF CONTAINED BACKUP		R43B036B.dwg	
DATE	9/25/00	DATE	9/25/00
DESIGNED BY	D. Kohfeld	DESIGNED BY	D. Kohfeld
CHECKED BY		CHECKED BY	
APPROVED BY		APPROVED BY	
DATE		DATE	09/28/00
DESIGNED BY	D. Albersen	DESIGNED BY	D. Albersen
CAD FILE		CAD FILE	
SCALE	1:40	SCALE	1:40
1 of 1		1 of 1	

DWG R43B036U-TLR



- NOTES:
1. IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
  2. 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.
  3. SEE THE "REACT 350 PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF THE PRODUCT MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (888) 523-6374.
  4. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE PAVEMENT SURFACE TO PREVENT DAMAGE TO VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.
  5. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
  6. NOSE COVER NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  7. POSTS, BLOCKOUTS, GUARDRAIL AND RELATED FASTENERS SUPPLIED BY OTHERS.

REFERENCES		DATE	BY	DATE	BY
① CYLINDER	④ CABLE	06/12/01	H. Nguyen	06/12/01	H. Nguyen
② BASE TRACK	⑤ STABILIZER CHAIN				
③ BACKUP	⑥ REFLECTIVE NOSE COVER				
Revisions	Date	Rev.	By	Chk'd	App'd
ADDED FOOTING	12/01/05	C	RCC STI	FJP	
ECO 2760; UPDATED CABLE GUIDES	9/11/09	E	EDS [JME, AUC]		

SALES ORDER#	3535001-0000	CYLINDERS	
EH PROJECT#	114054	BACKUP/BASE TRACK	3535002-0000
DESIGN SPEED	70 km/h [43 MPH]	CONCRETE PAD	
NOSE TYPE		STABILIZER CHAIN	606182
REFLECTIVE UNITS	MS-613705	REFLECTIVE NOSE	3535003-0000
REFLECTORS		TRANSITION	3535005-0000
DEBRIS COVERS	606716 (OPTIONAL)	RESTRAINING CABLE	6065780

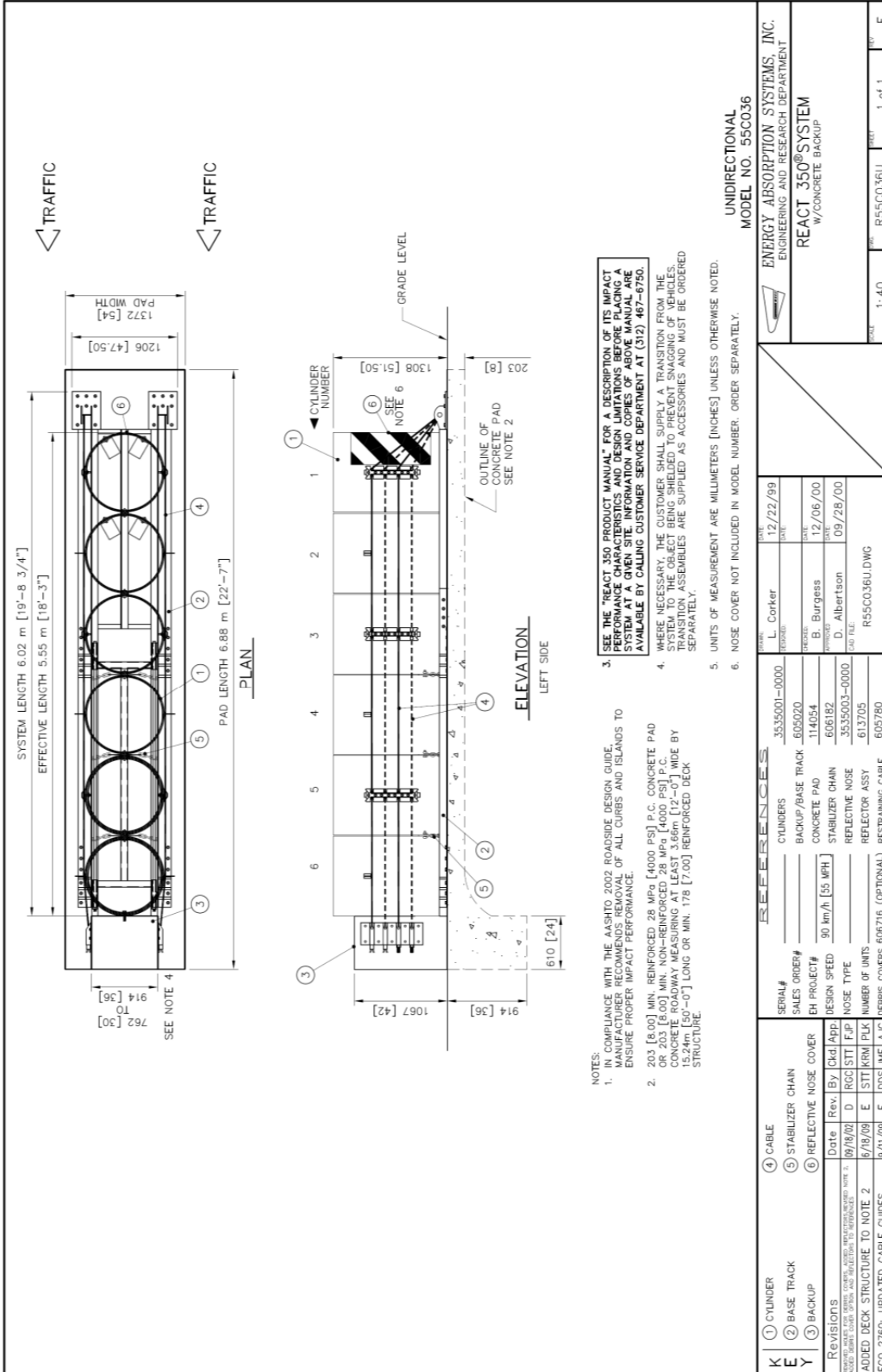
  

UNIDIRECTIONAL MODEL NO. 43B036	ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT
	REACT 350 SYSTEM
	W/SELF CONTAINED BACKUP AND TRANSITION
SCALE: 1:40	FILE: R43B036U-TLR.dwg
REV	1 of 1

REACT 350<sup>®</sup>, TL-2 w/Self Contained Backup and Guardrail Transition, Uni-Directional



DWG R55C036U



SEE THE "REACT 350 PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING OF VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND MUST BE ORDERED SEPARATELY.

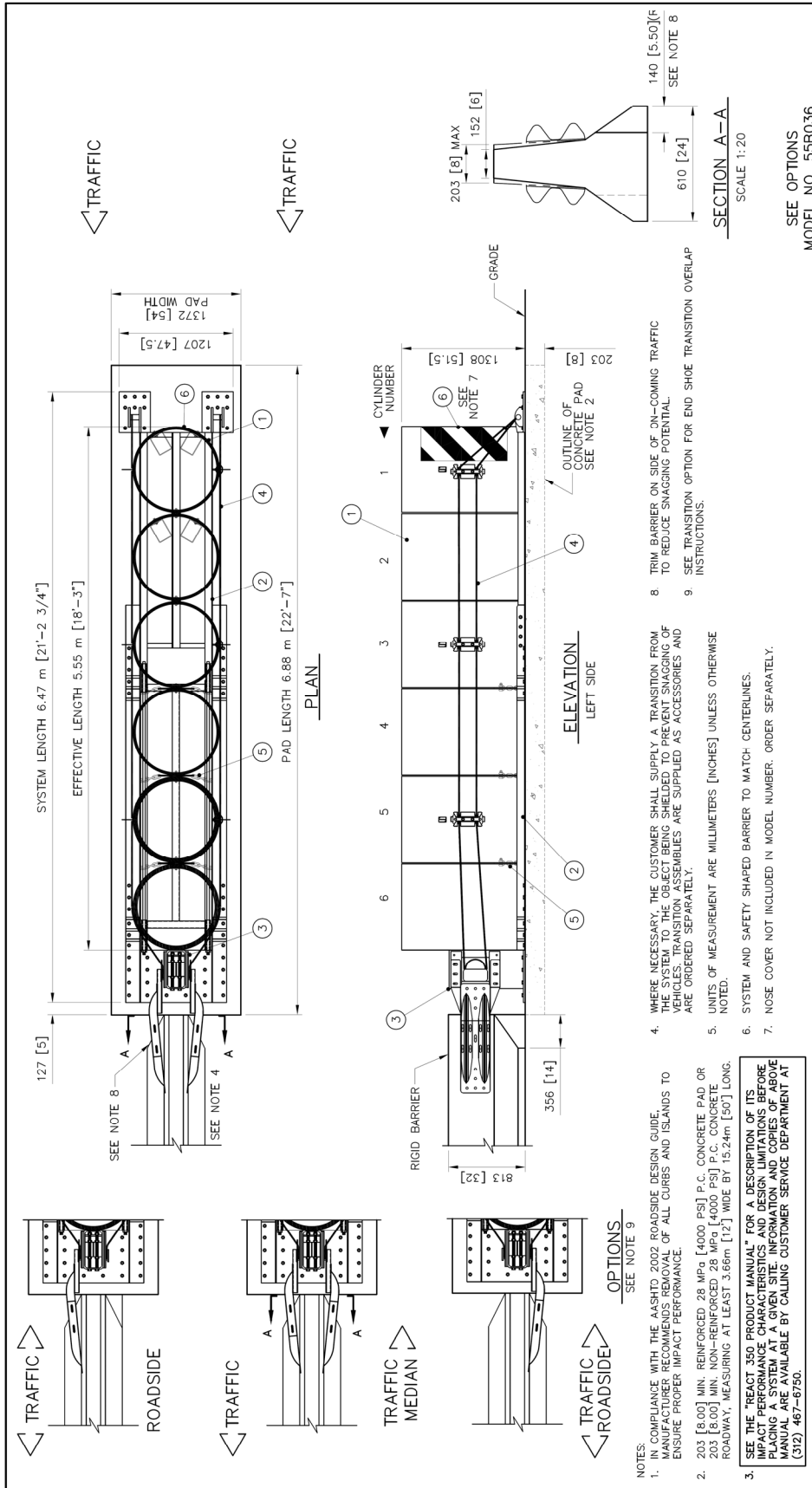
- IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
- 203 [8.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 203 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG OR MIN. 178 [7.00] REINFORCED DECK STRUCTURE.
- WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING 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.

UNIDIRECTIONAL  
MODEL NO. 55C036

<b>K</b> ① CYLINDER ② BASE TRACK ③ BACKUP ④ CABLE ⑤ STABILIZER CHAIN ⑥ REFLECTIVE NOSE COVER	SERIAL# 3535001-0000 SALES ORDER# 605020 EH PROJECT# 114054 DESIGN SPEED 90 km/h [55 MPH] DATE 08/18/09 BY RGG/STI CHECKED STI APPROVED J.P.P. DATE 09/26/00 DESIGNED BY D. Albertson DRAWN BY D. Albertson CADD FILE R55C036U.DWG	DATE 12/22/99 TIME DATE 12/06/00 DATE 09/26/00	ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT REACT 350 <sup>®</sup> SYSTEM W/CONCRETE BACKUP	SCALE 1:40 SHEET 1 of 1
	REVISIONS DATE 08/18/09 BY RGG/STI CHECKED STI APPROVED J.P.P. DATE 09/26/00 DESIGNED BY D. Albertson DRAWN BY D. Albertson CADD FILE R55C036U.DWG	REFERENCE CYLINDERS 3535001-0000 BACKUP/BASE TRACK 605020 CONCRETE PAD 114054 STABILIZER CHAIN 606182 REFLECTIVE NOSE 3535003-0000 REFLECTOR ASSY 613705 RESTRAINING CABLE 605780	UNIDIRECTIONAL MODEL NO. 55C036	ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT REACT 350 <sup>®</sup> SYSTEM W/CONCRETE BACKUP

REACT 350<sup>®</sup>, 90 km/h [56 mph] w/Concrete Backup, Uni-Directional

**DWG R55B036-TELR**



REVISIONS	DATE	BY	CHKD	APPD	DESCRIPTION
ADJUSTED TRAFFIC ARROWS	12/01/05	E	FGC	DK	ACF
MADE TRAFFIC ARROWS UNIDIRECTIONAL	06/12/07	F	FGC	STT	RCB
ECCO 2760; UPDATED CABLE GUIDES	9/11/09	G	DDS	JME	AJC

NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	CYLINDER	4/12/01	L. CORKER		
2	BASE TRACK				
3	SELF CONTAINED BACKUP				
4	CABLE				
5	STABILIZER CHAIN				
6	REFLECTIVE NOSE COVER				

NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	CYLINDERS				
2	BACKUP/BASE TRACK				
3	CONCRETE PAD				
4	STABILIZER CHAIN				
5	REFLECTIVE NOSE				
6	TRANSITION				
7	RESTRAINING CABLE				
8	REFLECTOR ASSY.				

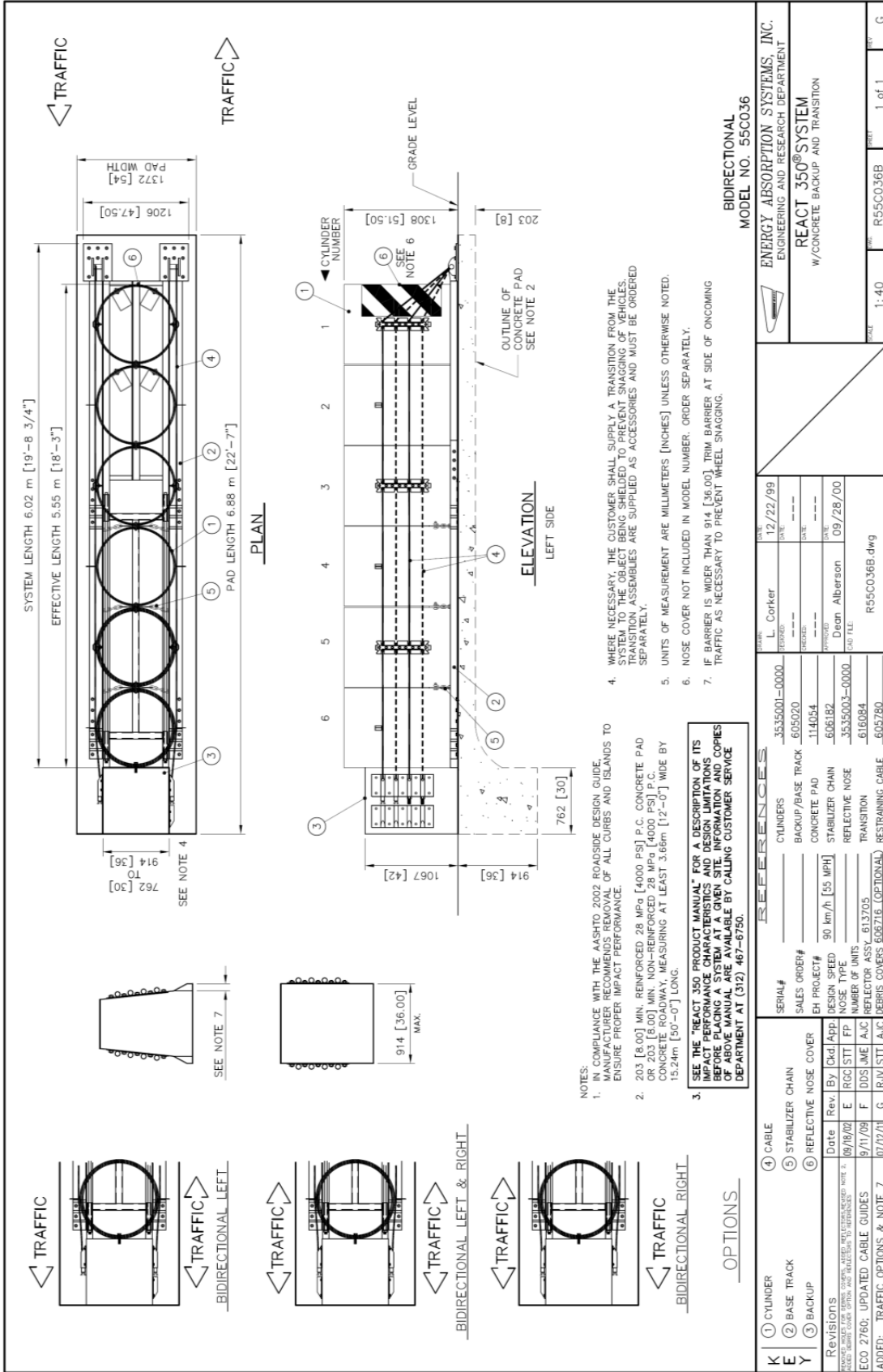
NO.	DESCRIPTION
1	CYLINDERS
2	BACKUP/BASE TRACK
3	CONCRETE PAD
4	STABILIZER CHAIN
5	REFLECTIVE NOSE
6	TRANSITION
7	RESTRAINING CABLE
8	REFLECTOR ASSY.

NO.	DESCRIPTION
1	CYLINDERS
2	BACKUP/BASE TRACK
3	CONCRETE PAD
4	STABILIZER CHAIN
5	REFLECTIVE NOSE
6	TRANSITION
7	RESTRAINING CABLE
8	REFLECTOR ASSY.

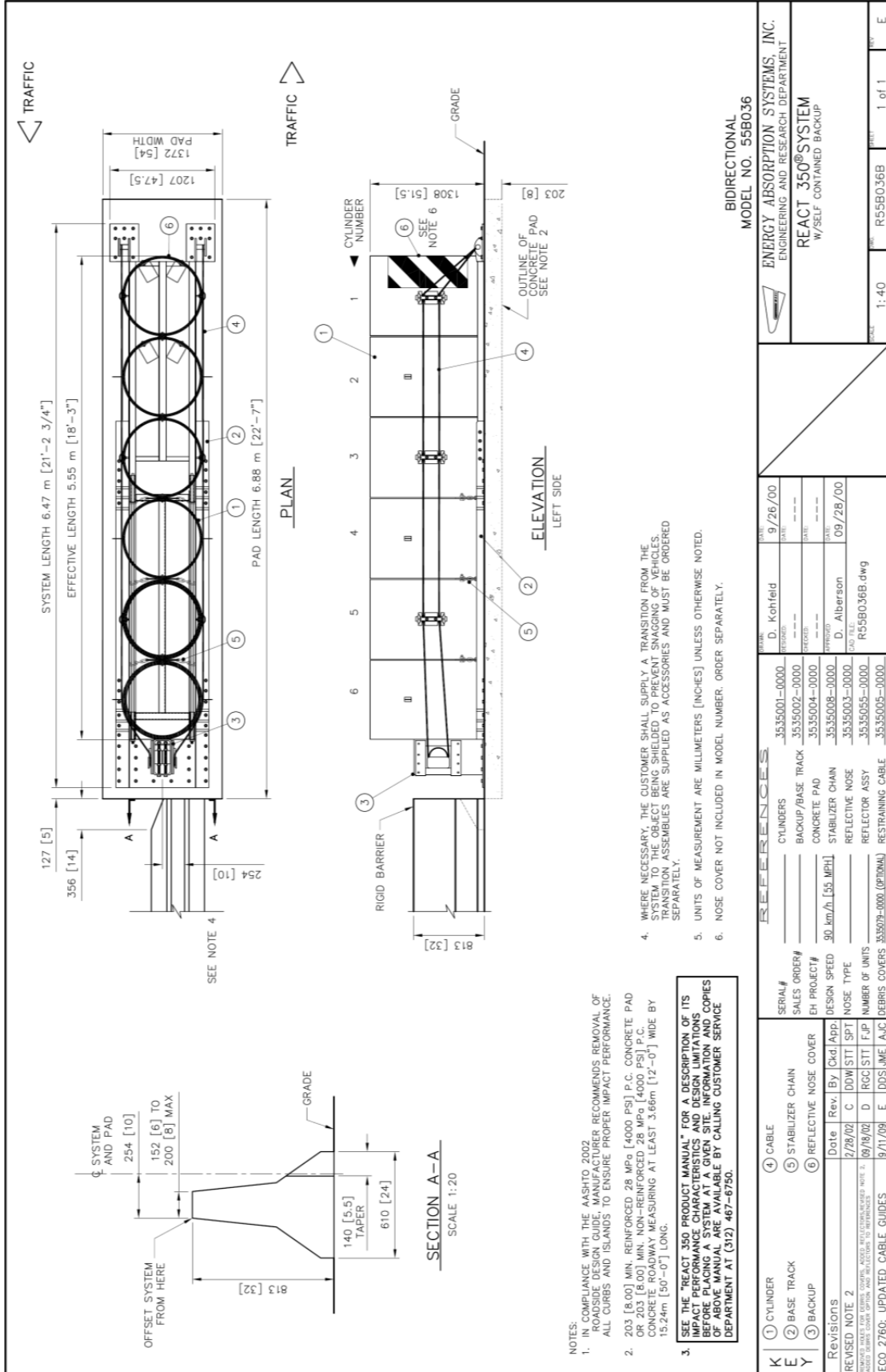
**REACT 350® , 90 km/h [56 mph] w/Self-Contained Backup and Transition, Multi-Directional**

**DWG R55C036B**



**REACT 350®, 90 km/h [56 mph] w/Concrete Backup and Transition, Multi-Direction**

DWG R55C036B

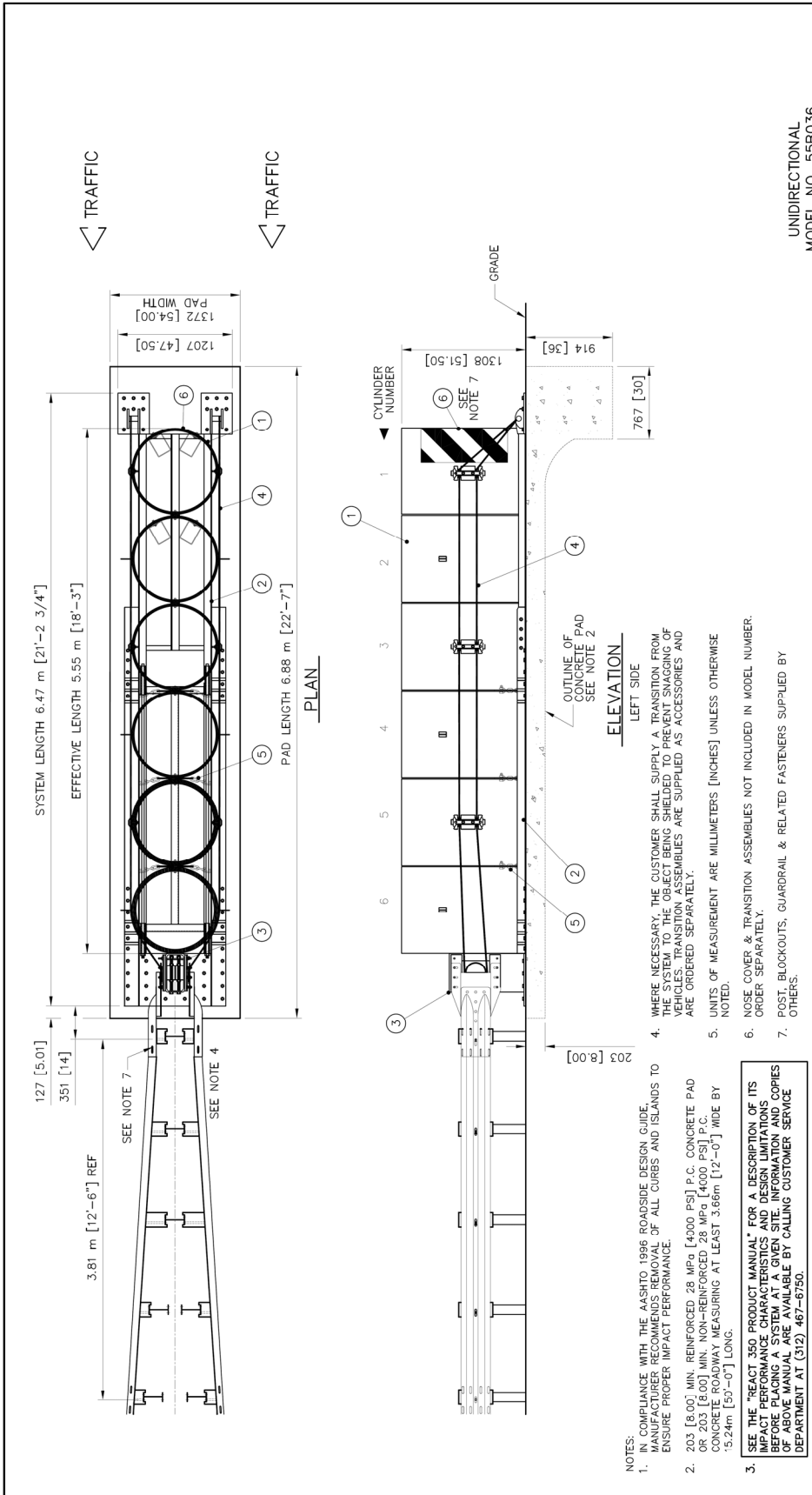


REACT 350<sup>®</sup>, 90 km/h [56 mph] w/Self Contained Backup, Bi-Directional, Offset

BIDIRECTIONAL  
MODEL NO. 55B036

		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
REACT 350 <sup>®</sup> SYSTEM w/SELF CONTAINED BACKUP		DATE: 9/26/00 DATE: 09/28/00	
SERIAL# K ① CYLINDER Y ② BASE TRACK ③ BACKUP	SALES ORDER# EH PROJECT# DESIGN SPEED NOSE TYPE NUMBER OF UNITS DEBRIS COVERS	35350001-0000 35350002-0000 35350004-0000 35350008-0000 35350003-0000 35350055-0000	D. Kohfeld D. Albersen R55B036B.dwg
Revisions REVISED NOTE 2 DATE: 7/28/02 BY: DDW/STI DATE: 09/19/02 BY: D RGC/STI DATE: 9/11/09 BY: E DDS/IME	CABLE ④ CABLE ⑤ STABILIZER CHAIN ⑥ REFLECTIVE NOSE COVER	90 km/h [56 MPH] NOSE TYPE REFLECTOR ASSEMBLY RESTRAINING CABLE	DATE: 9/26/00 DATE: 09/28/00 DATE: 09/28/00 DATE: 09/28/00 DATE: 09/28/00
ECO 2760; UPDATED CABLE GUIDES		SCALE: 1:40 SHEET: R55B036B 1 of 1	

# DWG R55B036-TLR



KEY		REFERENCES	
1	CYLINDER	CYLINDERS	3535001-0000
2	BASE TRACK	BACKUP/BASE TRACK	3535002-0000
3	SELF CONTAINED BACKUP	CONCRETE PAD	114054
4	CABLE	STABILIZER CHAIN	606182
5	STABILIZER CHAIN	REFLECTIVE NOSE	3535003-0000
6	REFLECTIVE NOSE COVER	TRANSITION	3535005-0000
		RESTRAINING CABLE	6065780

Revisions	Date	Rev.	By	Chk	App	DESCRIPTION
	09/19/02	A	RCC	JMT	FJP	NOSE TYPE UNITS
	12/01/05	B	RCC	DK	ACF	REFLECTOR
	09/11/09	C	EDS	JME	AJC	DERIS COVERS

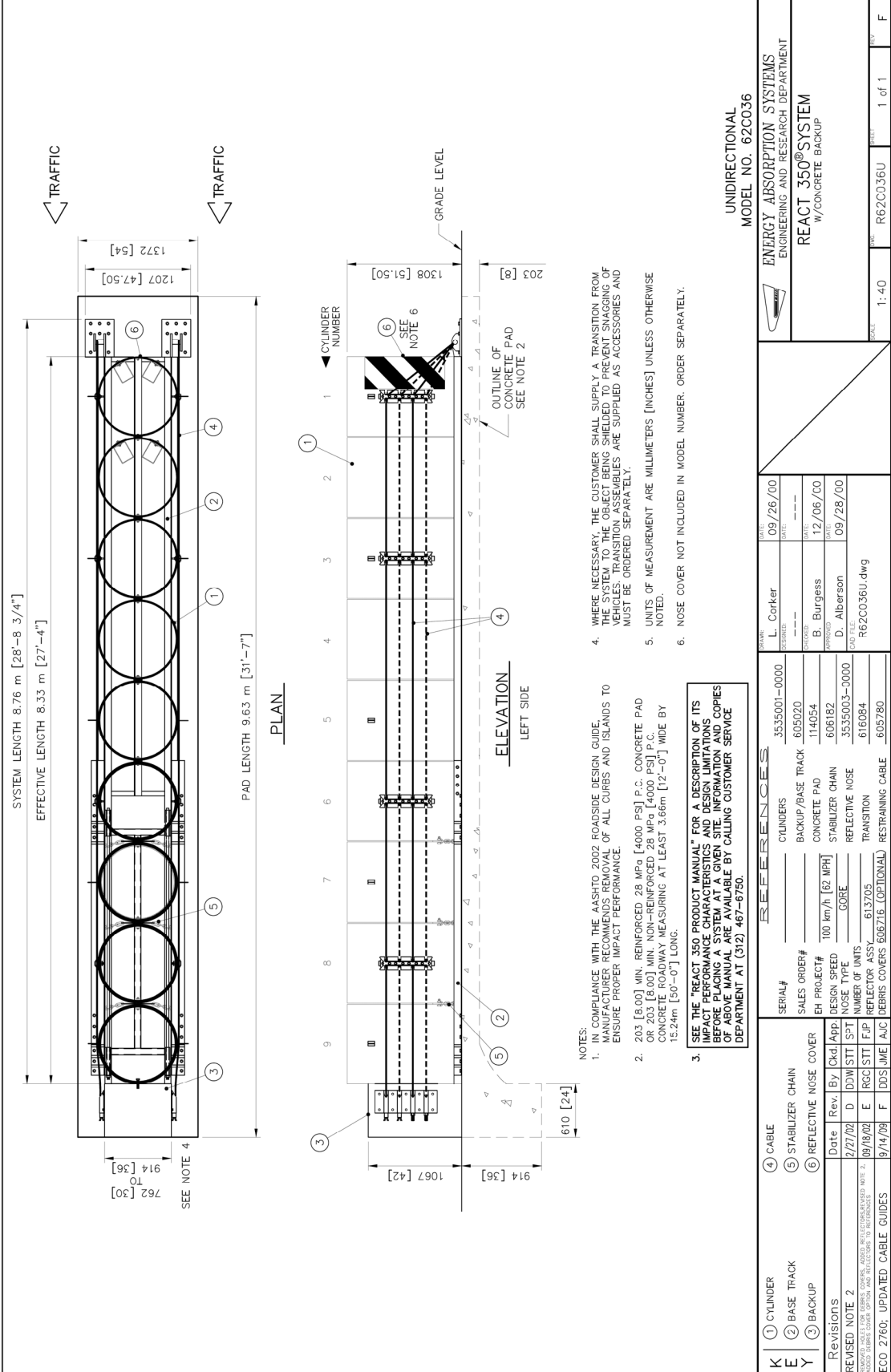
DATE	BY	DATE	BY
06/12/01	R. Cummins	11/15/02	D. Wolff
		11/15/02	S. Turner

SCALE	SHEET	TITLE	REV
1:40	R55B036-TLR		1 of 1

## REACT 350®, 90 km/h [56 mph] w/Self Contained Backup and Transition, Uni-Directional

# DWG R62C036U



- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2002 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 MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT ANY GIVEN SITE. INFORMATION AND COPIES OF THIS MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (312) 467-8750.
  - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING 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.

<b>UNDIRECTIONAL</b> <b>MODEL NO. 62C036</b>	<b>ENERGY ABSORPTION SYSTEMS</b> ENGINEERING AND RESEARCH DEPARTMENT	
	<b>REACT 350® SYSTEM</b> W/CONCRETE BACKUP	
	SCALE: 1:40	REV: 1 of 1

DATE: 09/26/00	DESIGNED BY: L. Corker
DATE: 12/06/00	APPROVED BY: B. Burgess
DATE: 09/28/00	DATE: 09/28/00
FILE: R62C036U.dwg	DATE: 09/28/00

NO.	DESCRIPTION	DATE
1	CYLINDER	
2	BASE TRACK	
3	BACKUP	
4	CABLE	
5	STABILIZER CHAIN	
6	REFLECTIVE NOSE COVER	

SERIAL#	3535001-0000
SALES ORDER#	605020
EH PROJECT#	114054
DESIGN SPEED	100 km/h [62 MPH]
NOSE TYPE	GORE
NUMBER OF UNITS	606182
REFLECTOR NOS	3535003-0000
TRANSITION	616084
RESTRAINING CABLE	605780

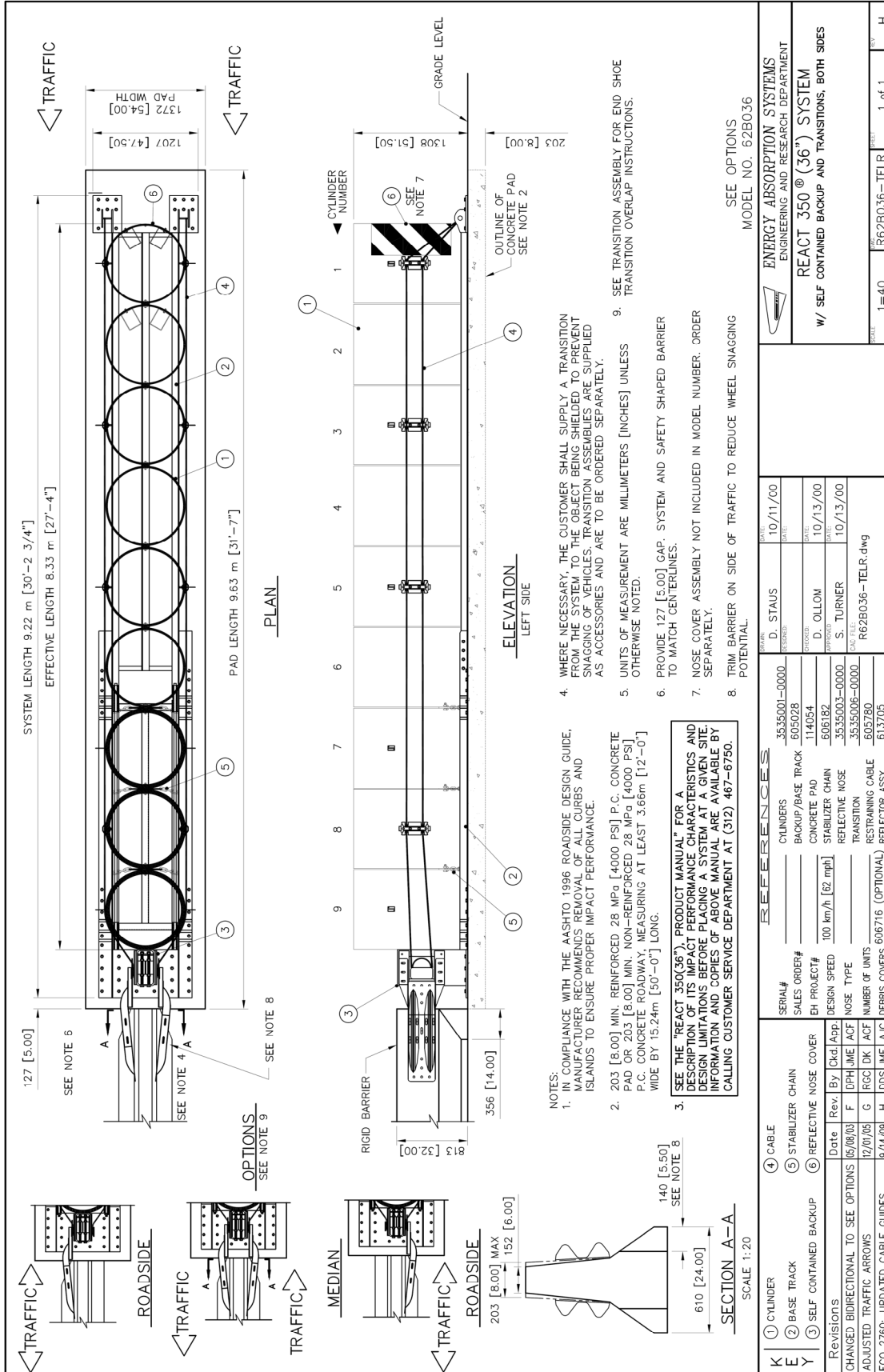
REVISED	DATE	BY	APP.	REVISION
2	2/27/02	D	DDW	SITI SPT
3	09/18/02	E	RCC	SITI FJP
4	9/14/09	F	DDS	JME AUC

ECO 2760: UPDATED CABLE GUIDES

## REACT 350® , TL-3 w/Concrete Backup, Uni-Directional

DWG R62B036-TELR



NOTES:  
 1. IN COMPLIANCE WITH THE AASHTO 1996 ROADSIDE DESIGN GUIDE, MANUFACTURE RECOMMENDS REINFORCING ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.  
 2. 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.  
 3. SEE THE "REACT 350(36) PRODUCT 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.

4. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING OF VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE TO BE ORDERED SEPARATELY.  
 5. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.  
 6. PROVIDE 127 [5.00] GAP, SYSTEM AND SAFETY SHAPED BARRIER TO MATCH CENTERLINES.  
 7. NOSE COVER ASSEMBLY NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.  
 8. TRIM BARRIER ON SIDE OF TRAFFIC TO REDUCE WHEEL SNAGGING POTENTIAL.  
 9. SEE TRANSITION ASSEMBLY FOR END SHOE TRANSITION OVERLAP INSTRUCTIONS.

REVISECTIONS		DATE	BY	CHKD	APP'D	DATE	DESCRIPTION
K	① CYLINDER						
E	② BASE TRACK						
Y	③ SELF CONTAINED BACKUP						
	④ CABLE						
	⑤ STABILIZER CHAIN						
	⑥ REFLECTIVE NOSE COVER						

REVISIONS	DATE	BY	CHKD	APP'D
CHANGED BIDIRECTIONAL TO SEE OPTIONS	05/08/03	F	DPH	JME
ADJUSTED TRAFFIC ARROWS	12/01/05	G	FGC	DK
ECO 2760; UPDATED CABLE GUIDES	9/14/09	H	DDS	JME

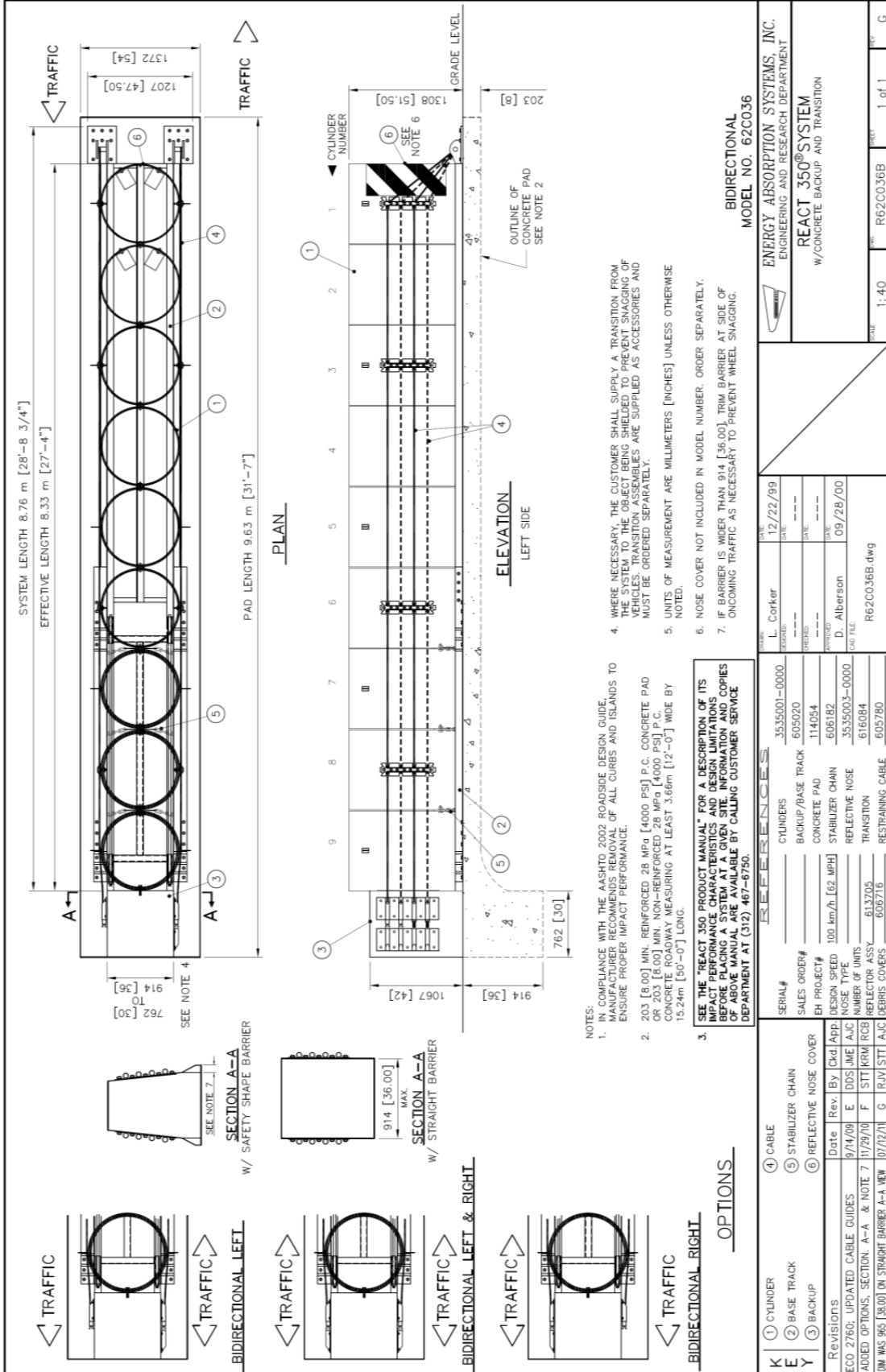
NO.	DESCRIPTION	DATE	BY	CHKD	APP'D
3535001-0000	CYLINDERS	10/11/00	D. STAUS		
605028	BACKUP/BASE TRACK				
114054	CONCRETE PAD	10/13/00	D. OLLOM		
606182	STABILIZER CHAIN				
3535003-0000	REFLECTIVE NOSE	10/13/00	S. TURNER		
3535006-0000	TRANSITION				
605780	RESTRAINING CABLE				
613705	REFLECTOR ASSY				

ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT	
W/ SELF CONTAINED BACKUP AND TRANSITIONS, BOTH SIDES	
REACT 350® (36") SYSTEM	
SCALE: 1=40	1 OF 1

REACT 350® , TL-3 w/Self-Contained Backup Transition, Multi-Directional

**DWG R62C036B**



- NOTES:**
- IN COMPLIANCE WITH THE AASHTO 2002 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 PAD MAX. MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG.
  - SEE THE "REACT 350 PRODUCT 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) 467-8750.
  - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SNAGGING 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.
  - IF BARRIER IS WIDER THAN 914 [36.00], TRIM BARRIER AT SIDE OF ONCOMING TRAFFIC AS NECESSARY TO PREVENT WHEEL SNAGGING.

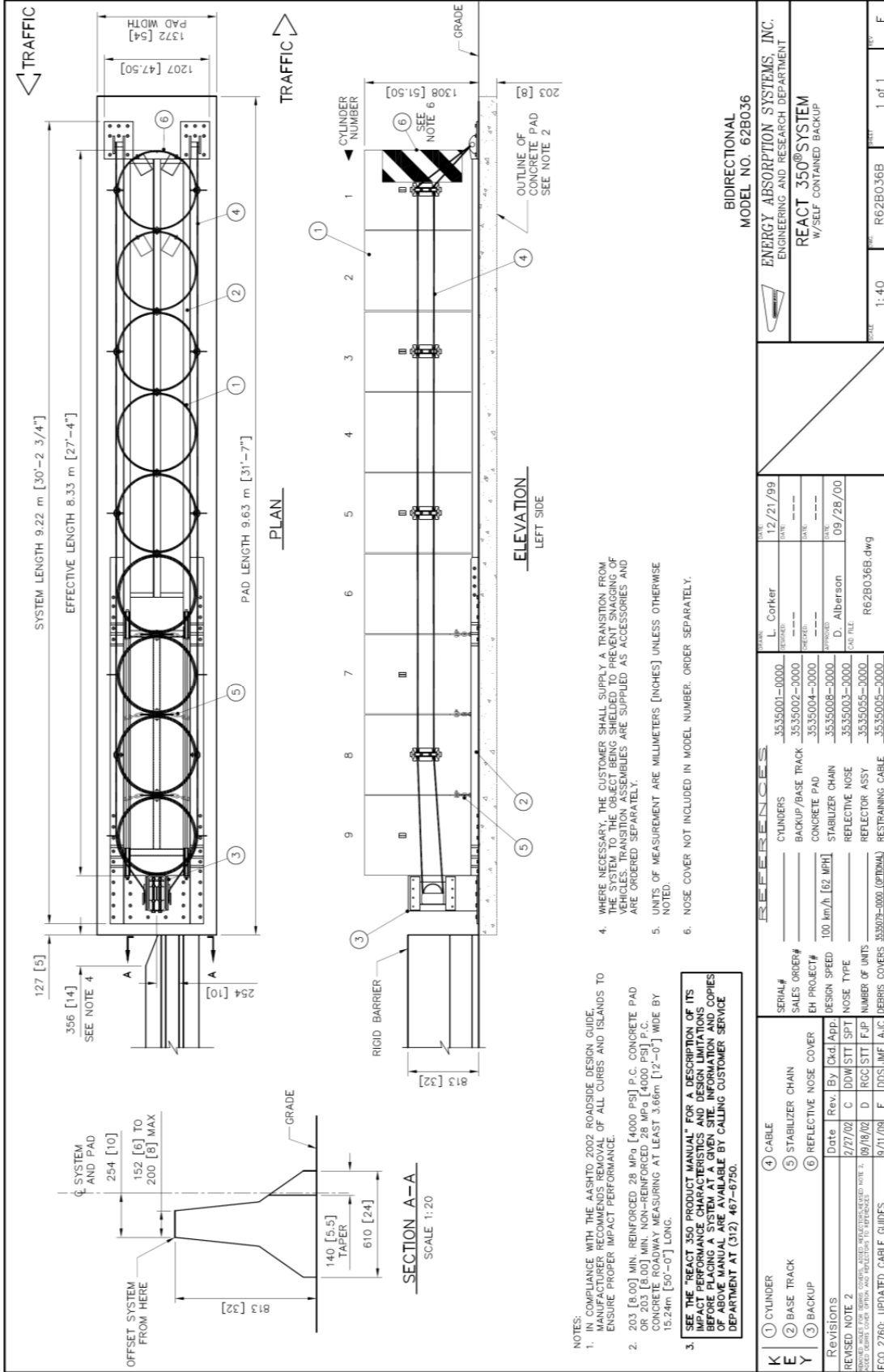
**BIDIRECTIONAL**  
MODEL NO. 62C036

<b>REFERENCES</b> SERIAL# 3535001-0000 SALES ORDER# 605020 EH PROJECT# 114054 DESIGN SPEED 100 km/h [62 MPH] NOSE TYPE STABILIZER CHAIN NUMBER OF UNITS 3535003-0000 REFLECTOR ASSY. 616084 TRANSITION 613205 RESTRAINING CABLE 605780	DATE 12/22/99 DESIGNED BY L. Corker APPROVED BY D. Alberson DATE 09/28/00 FILE NO. R62C036B.dwg	ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT REACT 350® SYSTEM W/CONCRETE BACKUP AND TRANSITION	SCALE 1:40 SHEET 1 of 1
	Revisions: (1) CYLINDER (2) BASE TRACK (3) BACKUP (4) CABLE (5) STABILIZER CHAIN (6) REFLECTIVE NOSE COVER ECO 2760: UPDATED CABLE GUIDES 8/14/09 E [DLS] JME A/C ADDED OPTIONS, SECTION, A-A & NOTE 7 11/29/10 F [STT] RRM RCB DW WAS 962 [38.00] ON STRAIGHT BARRIER A-A VIEW 07/12/11 G [RJV] STT A/C		

**REACT 350® , TL-3 w/Concrete Backup and Transition, Multi-Directional**



DWG R62B036B

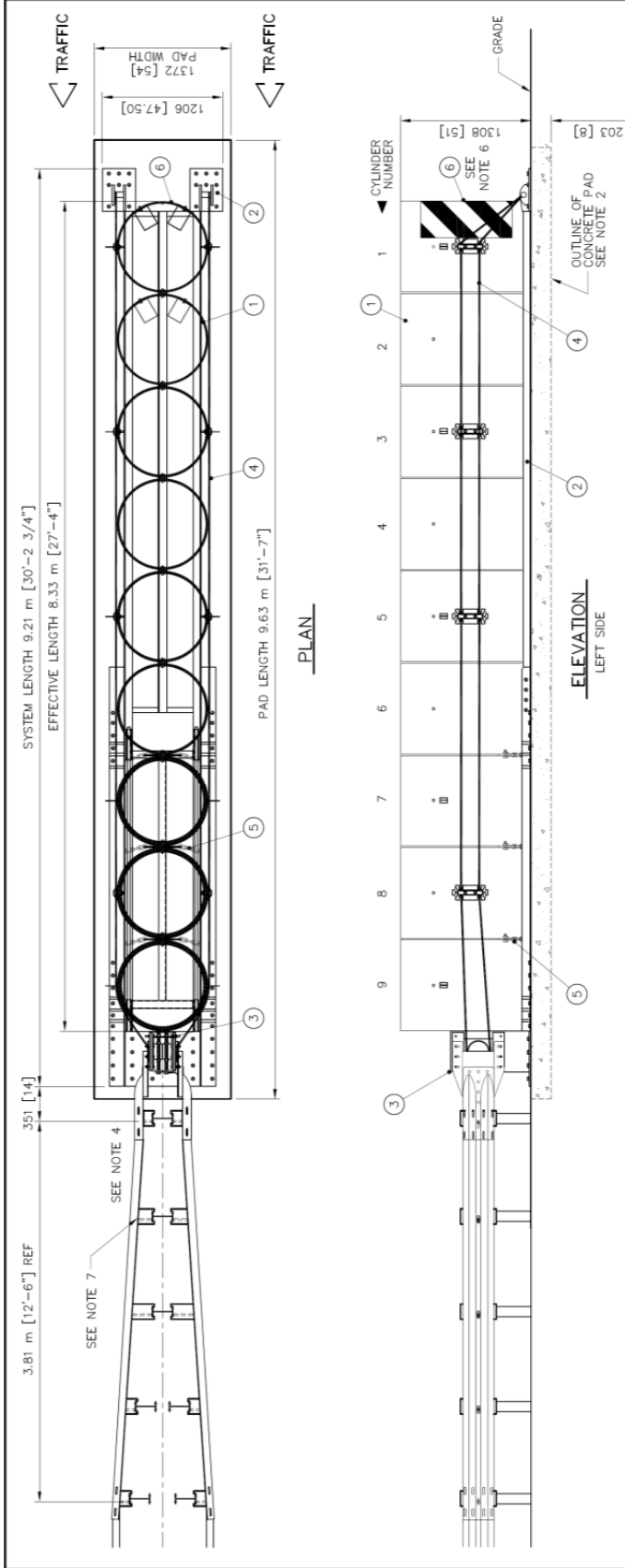


**REACT 350<sup>®</sup>, TL-3 w/Self Contained Backup and Transition, Bi-Directional, Offset**

<p><b>KEY</b></p> <p>① CYLINDER    ④ CABLE</p> <p>② BASE TRACK    ⑤ STABILIZER CHAIN</p> <p>③ BACKUP    ⑥ REFLECTIVE NOSE COVER</p>		<p>DATE: 12/21/99</p> <p>DESIGNED BY: L. Corker</p> <p>CHECKED BY: ---</p> <p>DATE: ---</p> <p>DESIGNED BY: D. Albersen</p> <p>CHECKED BY: ---</p> <p>DATE: 09/28/00</p> <p>DWG FILE: R62B036B.dwg</p>	<p>SCALE: 1:40</p> <p>NO: R62B036B</p> <p>SHEET: 1 of 1</p> <p>REV: E</p>
<p><b>REVISITONS</b></p> <p>REVISIONS: Date By [Gck] App</p> <p>DESIGN SPEED: 100 km/h [62 MPH]</p> <p>NOSE TYPE: C DDW/STT SPT</p> <p>NOSE TYPE: D</p> <p>NOSE TYPE: E</p> <p>NOSE TYPE: F</p> <p>NOSE TYPE: G</p> <p>NOSE TYPE: H</p> <p>NOSE TYPE: I</p> <p>NOSE TYPE: J</p> <p>NOSE TYPE: K</p> <p>NOSE TYPE: L</p> <p>NOSE TYPE: M</p> <p>NOSE TYPE: N</p> <p>NOSE TYPE: O</p> <p>NOSE TYPE: P</p> <p>NOSE TYPE: Q</p> <p>NOSE TYPE: R</p> <p>NOSE TYPE: S</p> <p>NOSE TYPE: T</p> <p>NOSE TYPE: U</p> <p>NOSE TYPE: V</p> <p>NOSE TYPE: W</p> <p>NOSE TYPE: X</p> <p>NOSE TYPE: Y</p> <p>NOSE TYPE: Z</p>		<p><b>REFERENCES</b></p> <p>CYLINDERS: 3535001-0000</p> <p>BACKUP/BASE TRACK: 3535002-0000</p> <p>CONCRETE PAD: 3535004-0000</p> <p>STABILIZER CHAIN: 3535008-0000</p> <p>REFLECTIVE NOSE: 3535003-0000</p> <p>REFLECTOR ASST: 3535055-0000</p> <p>RESTRAINING CABLE: 3535005-0000</p>	<p><b>MODEL NO. 62B036</b></p> <p><b>BIDIRECTIONAL</b></p> <p><b>ENERGY ABSORPTION SYSTEMS, INC.</b></p> <p>ENGINEERING AND RESEARCH DEPARTMENT</p> <p><b>REACT 350<sup>®</sup> SYSTEM</b></p> <p>W/SELF CONTAINED BACKUP</p>

- NOTES:
- IN COMPLIANCE WITH THE AASHTO, 2002 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 PAD WITH REINFORCING BARS MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG.
  - SEE THE "REACT 350 PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF THE PRODUCT 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 SNAGGING OF VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.
  - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
  - NOSE COVER NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.

# DWG R62B036U-TLR

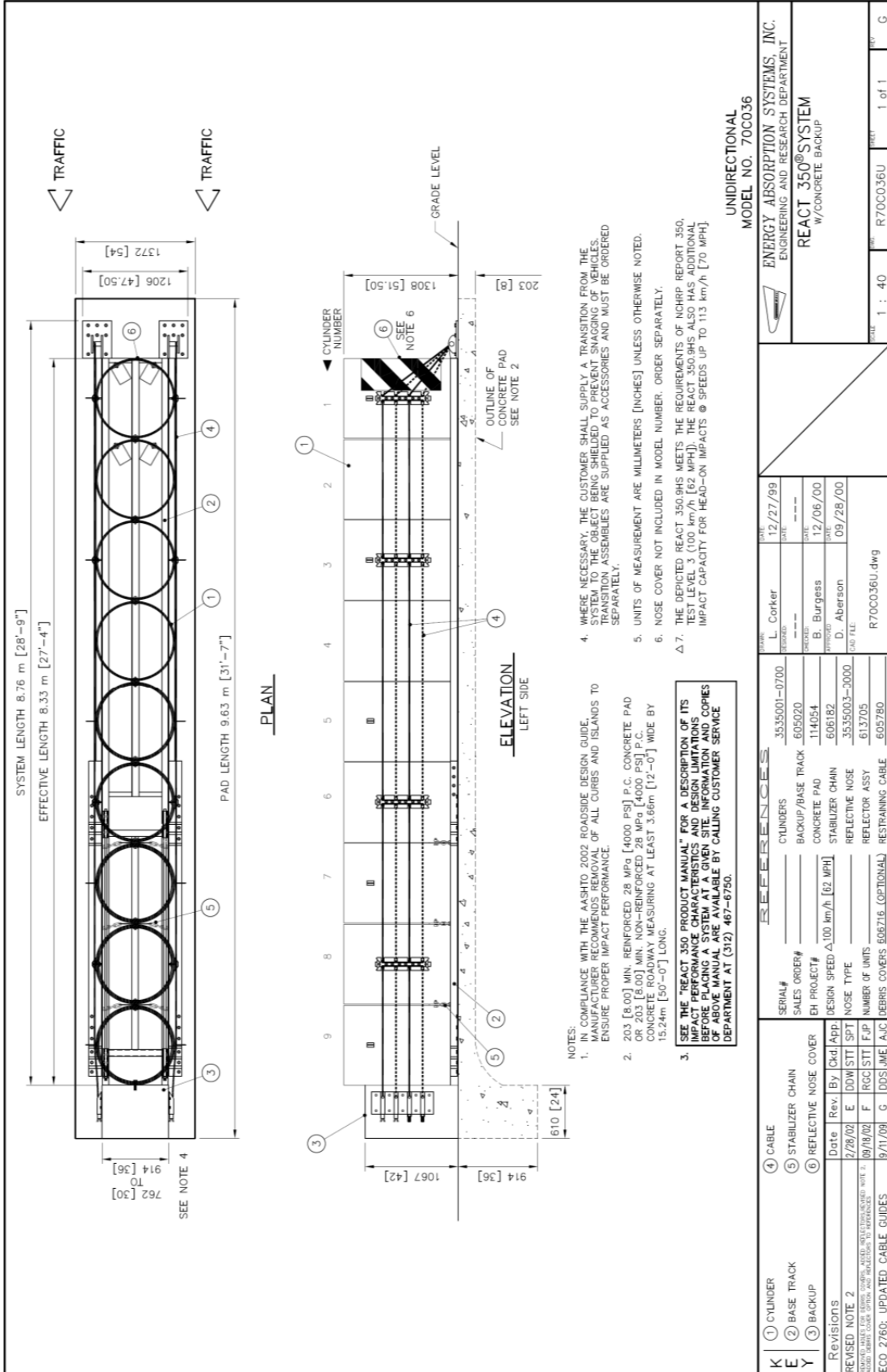


- NOTES:**
1. COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
  2. 203 [8.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 203 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY, MEASURING AT LEAST 3.66m [12'-0"] WIDE BY 15.24m [50'-0"] LONG, OR 178 [7'00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE DECK STRUCTURE.
  3. SEE THE "REACT 350 PRODUCT 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.
  4. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE SYSTEM TO THE OBJECT BEING SHIELDED TO PREVENT SHAKING OF VEHICLES. TRANSITION ASSEMBLIES ARE SUPPLIED AS ACCESSORIES AND ARE ORDERED SEPARATELY.
  5. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
  6. NOSE COVER NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  7. POSTS, BLOCKOUTS, GUARDRAIL AND RELATED FASTENERS SUPPLIED BY OTHERS.

<b>UNIDIRECTIONAL</b> MODEL NO. 62B036		<b>ENERGY ABSORPTION SYSTEMS, INC.</b> ENGINEERING AND RESEARCH DEPARTMENT <b>REACT 350<sup>®</sup> SYSTEM</b> W/ SELF CONTAINED BACKUP AND TRANSITIONS, BOTH SIDES	
<b>REVISES</b> SERIAL# _____ SALES ORDER# _____ EN PROJECT# _____ DESIGN SPEED _____ NOSE COLOR _____ NUMBER OF UNITS _____ REFLECTOR ASSY. _____	<b>REFERENCES</b> CYLINDERS 3535001-2000 BACKUP/BASE TRACK 3535002-2000 CONCRETE PAD 114054 STABILIZER CHAIN 606182 REFLECTIVE NOSE 3535003-2000 TRANSITION 3535053-2000 RESTRAINING CABLE 605780	DATE 12/20/00 BY D. KOHFIELD CHECKED _____ DATE 01/11/01 BY DO APPROVED B. BURGESS DATE 01/22/01 FILED R62B036U-TLR.DWG	SCALE 1:40 SHEET 1 OF F

## REACT 350<sup>®</sup>, TL-3 w/Self Contained Backup and Guardrail Transitions, Uni-Directional

**DWG R70C036U**



- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
  - 203 [8.00] MIN. NON-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 3.96m [12'-0"] WIDE BY 15.24m [50'-0"] LONG.
  - SEE THE "REACT 350 PRODUCT MANUAL" FOR A DESCRIPTION OF ITS APPLICATIONS AND REQUIREMENTS. THE REACT 350 SYSTEM MUST BE INSTALLED 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 SNAGGING 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.
  - THE DEPICTED REACT 350 SHS MEETS THE REQUIREMENTS OF NCHRP REPORT 350, TEST LEVEL 3 (100 km/h [62 MPH]). THE REACT 350 SHS ALSO HAS ADDITIONAL IMPACT CAPACITY FOR HEAD-ON IMPACTS @ SPEEDS UP TO 113 km/h [70 MPH].

UNIDIRECTIONAL  
MODEL NO. 70C036

ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
REACT 350 <sup>®</sup> SYSTEM w/CONCRETE BACKUP	
SCALE: 1 : 40	FIG. NO. R70C036U
1 of 1	

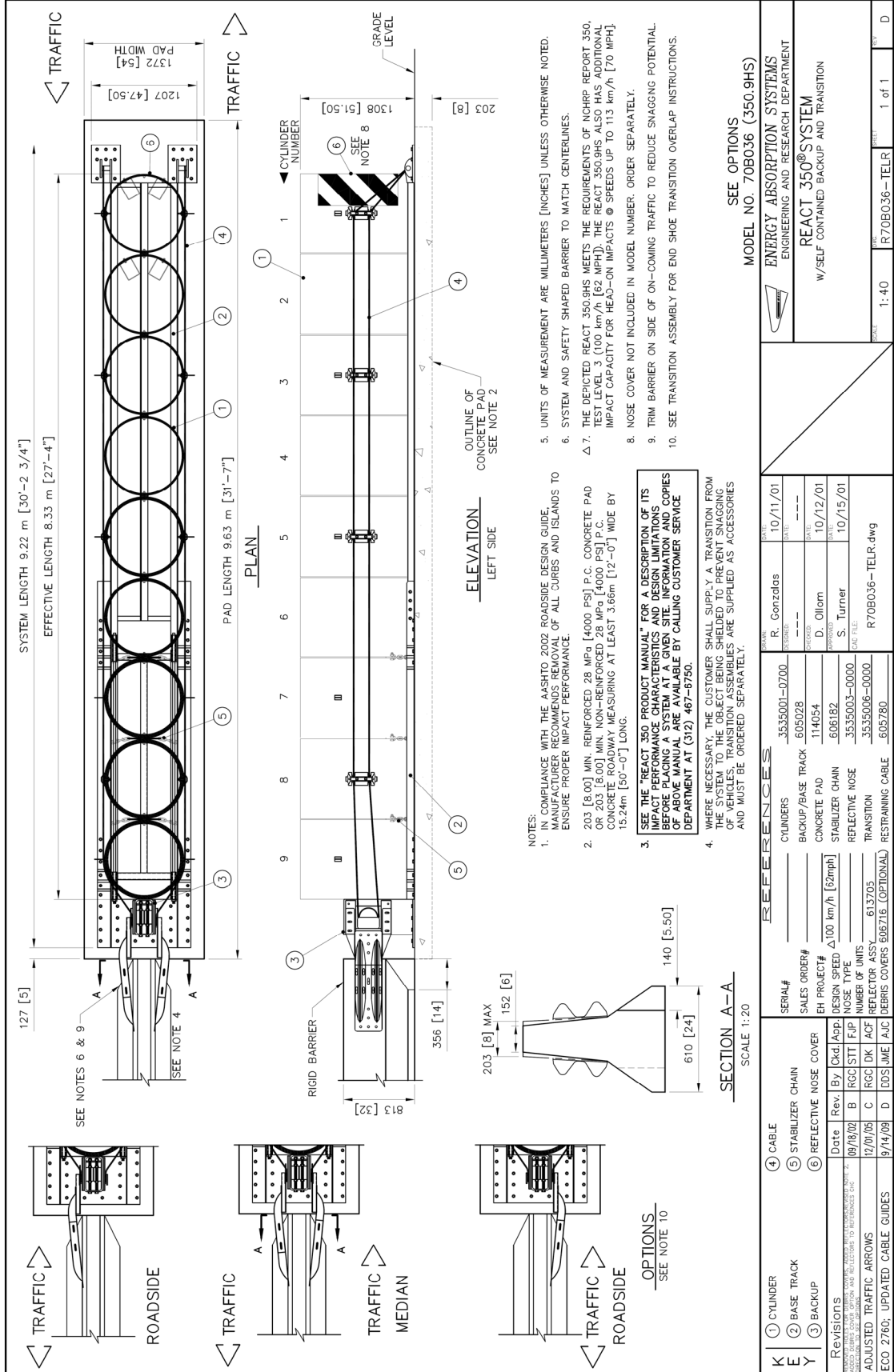
DATE: 12/27/99	BY: L. Corker
DESIGNED: 12/06/00	BY: B. Burgess
APPROVED: 09/28/00	BY: D. Abernethy
FILE NO: R70C036U.dwg	

REFERENCES	
CYLINDERS	3535001-0700
BACKUP/BASE TRACK	605020
CONCRETE PAD	114054
STABILIZER CHAIN	606182
REFLECTIVE NOSE	3535003-3000
REFLECTOR ASSY	615705
RESTRAINING CABLE	605780

① CYLINDER	④ CABLE
② BASE TRACK	⑤ STABILIZER CHAIN
③ BACKUP	⑥ REFLECTIVE NOSE COVER
Revisions	Date   Rev   By   Ckd   App.
REVISED NOTE 2	2/28/02   E   DOM/STT   SPT
ECO 2760: UPDATED CABLE GUIDES	9/11/09   G   DDS   JME   A.C.

**REACT 350<sup>®</sup>, TL-3 113 km/h [70 mph] w/Concrete Backup, Multi-Directional**

# DWG R70B036U-TELR



# REACT 350® , TL-3 113 km/h [70 mph] w/Self-Contained Backup and Transition, Multi-Directional

SEE OPTIONS  
MODEL NO. 70B036 (350.9HS)

REFERENCES		DATE
DESIGNED BY	R. Gonzales	10/11/01
CHECKED BY		
DESIGNED BY	D. Ollom	10/12/01
CHECKED BY	S. Turner	10/15/01
DATE FILED	R70B036-TELR.dwg	

DATE	DESCRIPTION
09/19/02	DESIGN SPEED Δ 100 km/h [62mph]
12/01/05	ADJUSTED TRAFFIC ARROWS
09/14/09	ECO 2760; UPDATED CABLE GUIDES

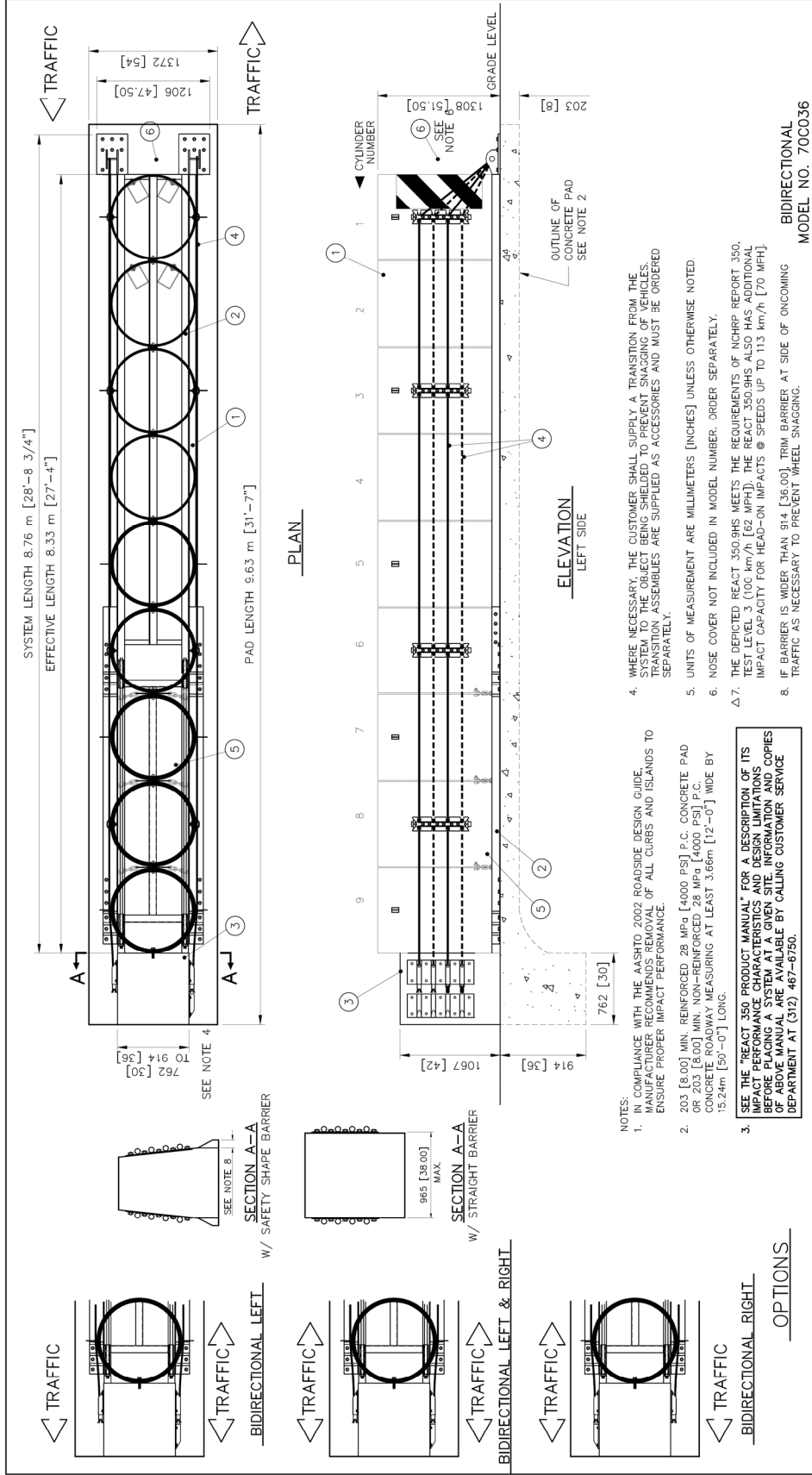
  

NO.	DESCRIPTION	DATE
1	CYLINDER	
2	BASE TRACK	
3	BACKUP	
4	CABLE	
5	STABILIZER CHAIN	
6	REFLECTIVE NOSE COVER	

DATE	BY	CHKD	APP'D	NOSE	NOSE	REFLECTIVE	REFLECTIVE	REFLECTIVE	REFLECTIVE	REFLECTIVE	REFLECTIVE
09/19/02	B	RCC	STI	F.P.	NUMBER OF	NOSE	NOSE	NOSE	NOSE	NOSE	NOSE
12/01/05	C	RCC	DK	ACF	REFLECTOR ASSY	61.3705					
09/14/09	D	DDS	JME	AJC	DEBRIS COVERS	60B2716 (OPTIONAL)					

DWG R70C036B



NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	CYLINDER	09/26/00	L. Corker		
2	BASE TRACK				
3	BACKUP				
4	CABLE				
5	STABILIZER CHAIN				
6	REFLECTIVE NOISE COVER				

REV.	DATE	DESCRIPTION
06/29/07	E	R/V/J LME
09/17/09	F	DD/S LME A/C
11/29/10	G	STI [KRM] PCB

REVISIONS	DATE	BY	CHKD	APPD
CYLINDER REF DWG WAS 3535001-0000	06/29/07	E	R/V/J LME	
ECO 2760; UPDATED CABLE GUIDES	09/17/09	F	DD/S LME A/C	

ADDED OPTIONS, SECTION A-A & NOTE 8	DATE	BY	CHKD	APPD
REFLECTIVE NOISE COVER	06/26/16 (OPTIONAL)			
RESTRANING CABLE	6065780			

REFERENCES	SERIAL#	DESCRIPTION
CYLINDERS	3535001-0700	
BACKUP/BASE TRACK	3535015-0000	
CONCRETE PAD	114054	
STABILIZER CHAIN	606182	
REFLECTIVE NOISE	3535003-0000	
TRANSITION	3535034-0000	
RESTRANING CABLE	6065780	

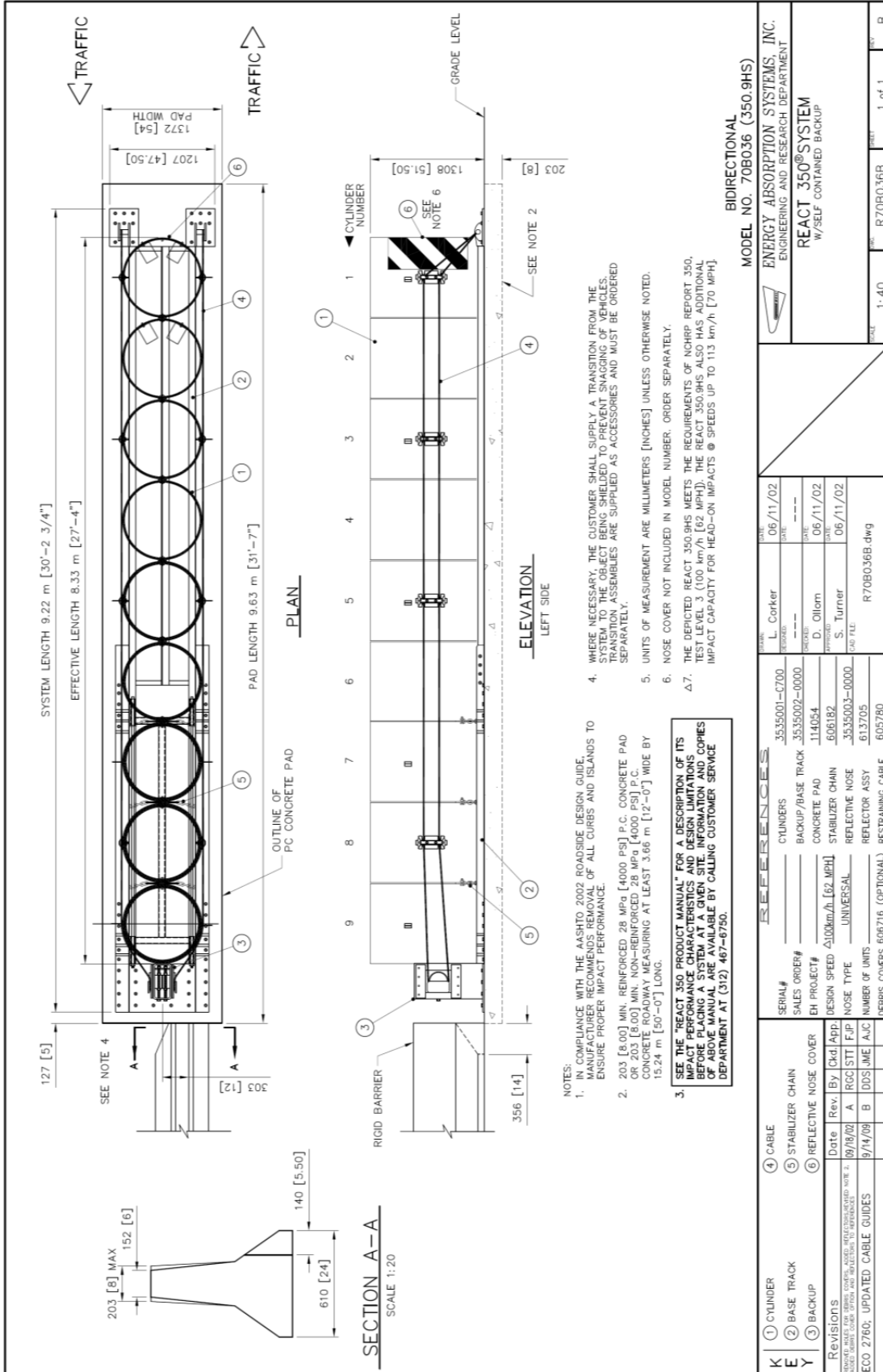
DATE	BY	CHKD	APPD
09/26/00	L. Corker		

ENGINEERING AND RESEARCH DEPARTMENT	MODEL NO.	SCALE	SHEET	TOTAL
ENERGY ABSORPTION SYSTEMS	R70C036B	1:40	1	1

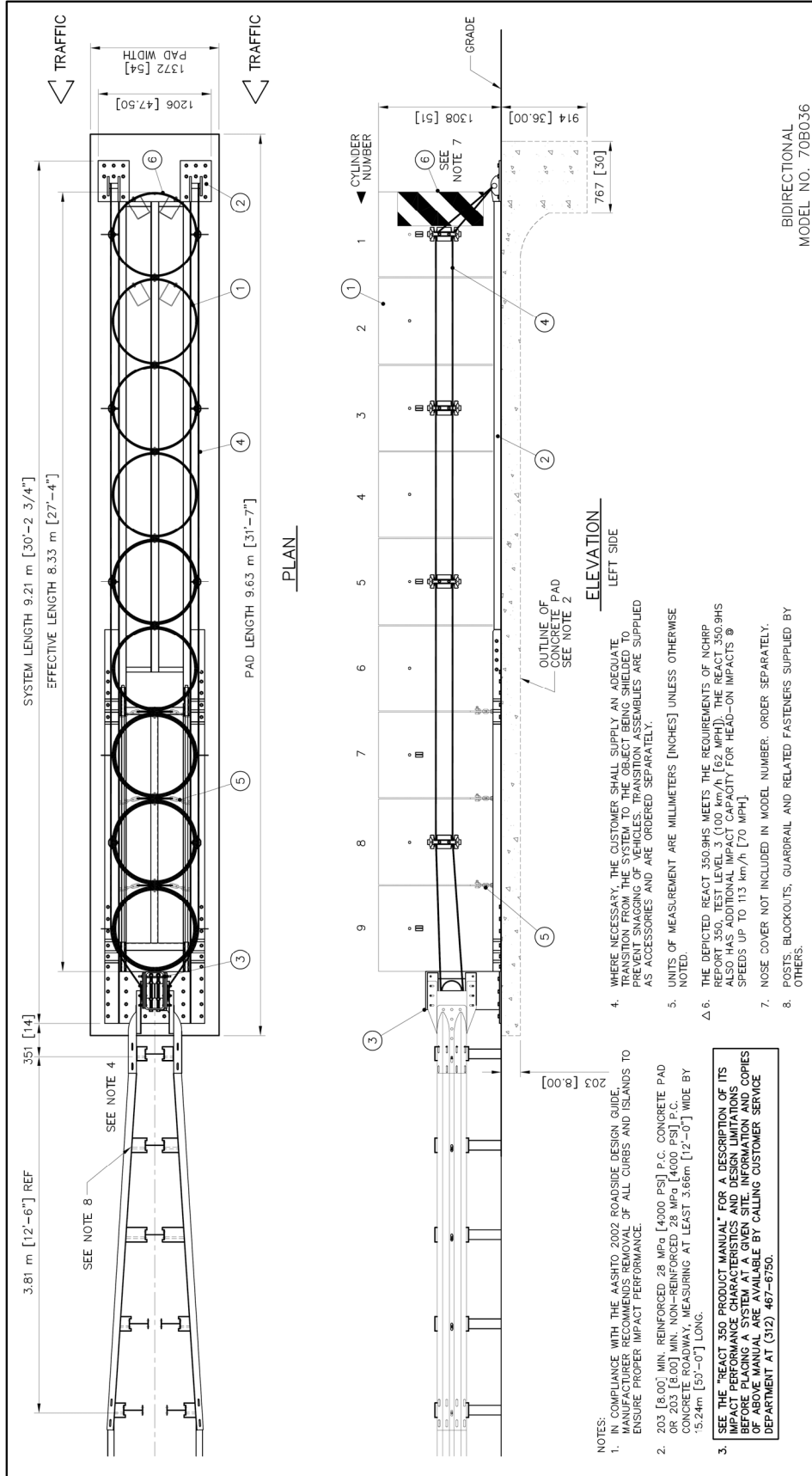
REACT 350®, TL-3 113 km/h [70 mph] w/Concrete Backup and Transition, Multi-Directional

DWG R70B036B



REACT 350®, TL-3 113 km/h [70 mph] w/Self Contained Backup, Bi-Directional, Offset

DWG R70B036U-TLR



<b>ENERGY ABSORPTION SYSTEMS</b> ENGINEERING AND RESEARCH DEPARTMENT <b>REACT 350® SYSTEM</b> W/ SELF CONTAINED BACKUP AND TRANSITIONS, BOTH SIDES		MODEL NO. 70B036 BIDIRECTIONAL	
<b>REFERENCES</b> SERIAL# SALES ORDER# EH PROJECT# DESIGN SPEED NOSE COLOR NUMBER OF UNITS REFLECTOR ASSY. DEBRIS COVER	3535001-0700 605028 114054 606182 3535003-0000 613705 606780	W. LEDDINGTON A. FRANKLIN F.J. POWELL R70B036U-TLR.DWG	DATE: 06/30/05 DATE: 6/30/05 DATE: 6/30/05
① CYLINDER ② BASE TRACK ③ SELF CONTAINED BACKUP ④ CABLE ⑤ STABILIZER CHAIN ⑥ REFLECTIVE NOSE COVER	① 203 [8.00] ② 203 [8.00] ③ 203 [8.00] ④ 351 [14] ⑤ 1206 [47.50] ⑥ 1372 [54]	① 1308 [51] ② 914 [36.00] ③ 767 [30]	SCALE: 1:40 SHEET: 1 REV: C

NOTES:  
 1. IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.  
 2. 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 1.524m [5'-0"] LONG.  
 3. SEE THE "REACT 350 PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS. COPIES OF THIS MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (312) 467-6750.

**REACT 350®, TL-3 113 km/h [70 mph] w/Self Contained Backup and Transition, Uni-Directional**



2525 Stemmons Freeway

Dallas, Texas 75207

888-323-6374 (USA only)

214-589-8140 (International)

[www.energyabsorption.com](http://www.energyabsorption.com)

[www.highwayguardrail.com](http://www.highwayguardrail.com)