

QuadGuard® Elite

Product Description Manual



TRINITY
HIGHWAY

Ahead of the Curve™

QuadGuard[®] Elite

Product Manual



2525 Stemmons Freeway
Dallas, Texas 75207



Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the QuadGuard[®] Elite 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. This system has been accepted by the Federal Highway Administration for use on the national highway system under strict criteria utilized by that agency. 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 at (888) 323-6374 or download copies from the website 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 QuadGuard[®] Elite 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 QuadGuard® Elite system, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

Energy Absorption Systems, Inc. dba Trinity Highway

Telephone:	(888) 323-6374 (USA) (312) 467-6750 (International)
E-mail:	product.info@trin.net
Website:	www.trinityhighway.com

Important Introductory Notes

Proper assembly of QuadGuard® Elite system is critical to achieve performance that has been evaluated and accepted by the Federal Highway Administration (FHWA) per NCHRP Report 350. These instructions should be read in their entirety and understood before assembling the QuadGuard® Elite system. These instructions are to be used only in conjunction with the assembly of the QuadGuard® Elite system and are for standard assemblies only as specified by the applicable highway authority. If you need additional information, or have questions about the QuadGuard® Elite 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 it was tested and accepted.

This system, like other Trinity Highway systems, has been crash tested pursuant to NCHRP Report 350 mandated criteria



Important: DO NOT use any component part that has not been specifically crash tested and/or approved for this system during the assembly or repair of this system.

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 QuadGuard® Elite 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 QuadGuard® Elite system Danger, Warning, Caution, and Important statements within the QuadGuard® Elite 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 QuadGuard® Elite system. Additional copies of this Manual are immediately available from Trinity Highway by calling (888) 323-6374 or by email at product.info@trin.net. Please contact Trinity Highway if you have any questions concerning the information in this Manual or about the QuadGuard® Elite system. This Manual may also be downloaded directly from the website listed below.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the QuadGuard® Elite system components. Work 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 QuadGuard® Elite 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.

Warnings and Cautions

Read all instructions before assembling, maintaining, or repairing the QuadGuard® Elite system.



Danger: 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 that has not been accepted by the Federal Highway Administration (FHWA).



Warning: Do not assemble, maintain, or repair the QuadGuard® Elite 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: 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.



Warning: Use only Trinity Highway parts that are specified herein for the QuadGuard® Elite for assembling, maintaining, or repairing the QuadGuard® Elite 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. 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 QuadGuard® Elite system in any way.



Warning: Ensure that the QuadGuard® Elite 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.



Warning: Ensure that there is proper site grading for the QuadGuard® Elite system placement as dictated by the state or specifying agency, pursuant to Federal Highway Administration (FHWA) acceptance.



Warning: Use only Trinity Highway parts on the QuadGuard® Elite system for assembly, maintenance, or repair. **The assembly or comingling of unauthorized parts is strictly PROHIBITED.** The QuadGuard® Elite and its component parts have been accepted for state use by the FHWA. However, a comingled system has not been accepted within the applicable criteria.



Important: 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 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.



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.

Limitations and Warnings

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

The QuadGuard® Elite system has been approved by FHWA as meeting the requirements and guidelines of NCHRP Report 350. These tests typically evaluate product performance defined by 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 QuadGuard® Elite is certified to the Test Level(s) as shown below:

Test Level 2: 70 km/h [44 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 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 QuadGuard® Elite 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 QuadGuard® Elite is a potentially reusable, redirective, non-gating impact cushion for roadside obstacles ranging in width from 610 mm to 2285 mm (24" to 90"). It consists of high molecular weight, high density polyethylene (HMW/HDPE), energy-absorbing cylinders surrounded by a framework of Quad-Beam™ panels.

The QuadGuard® Elite utilizes two (2) 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.

Measuring the Width

The nominal width of the Tension Strut Backup is the width between Side Panels behind the Backup (see Figure 1). The outside width of the system is approximately 150 mm [6"] to 230 mm [9"] wider than this measurement.

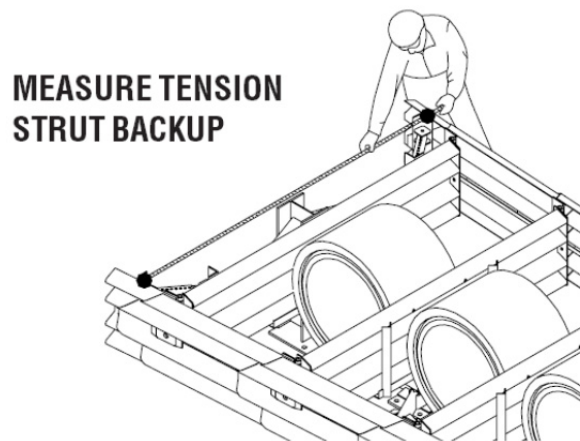


Figure 1
Tension Strut Backup Width

Counting the Number of Bays

One bay consists of one Diaphragm, two Fender Panels, etc. The Nose section is not considered a bay (see Figure 2)

How to Determine Left/Right

To determine left from right when ordering parts, stand in front of the system facing the roadside feature. Your left is the system's left and your right is the system's right (see Figure 3).

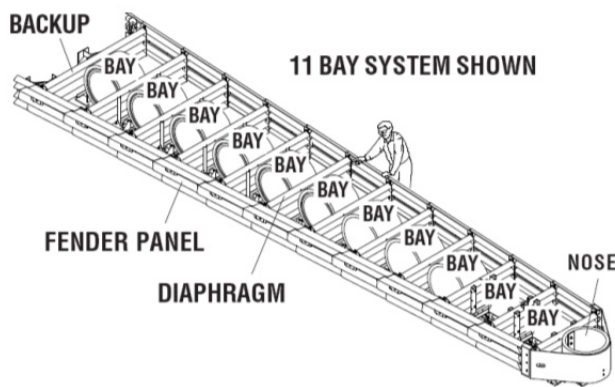


Figure 2
Number of Bays

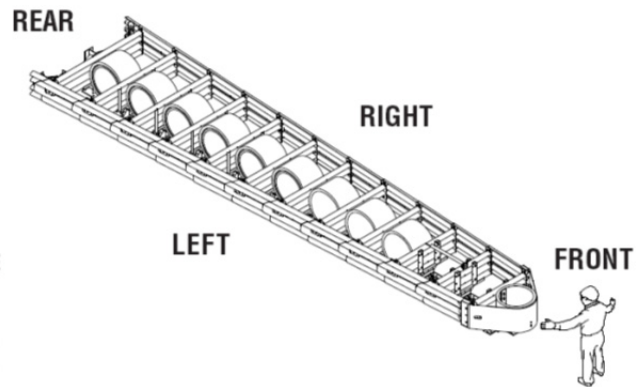


Figure 3
Left/Right

Impact Performance

The 5 bay and 7 bay EC QuadGuard® Elite systems have successfully passed the requirements stipulated in NCHRP Report 350, Test Level 2 tests with both the light car and pickup at speeds of up to 70 km/h [43 mph] at angles up to 15 degrees.

The 8 bay and 11 bay EC QuadGuard® Elite systems have successfully passed the requirements stipulated in NCHRP Report 350, Test Level 3 tests with both the light car and pickup at speeds of up to 100 km/h [62 mph] at angles up to 15 degrees.

The “EC” designation stands for “Extra Capacity”. This system has additional energy absorbing capacity.

The 14 bay 24”, 30” and 36” wide QuadGuard® Elite have successfully been tested with the pickup at speeds up to 115 km/h [70 mph].

During head-on impacts, within the applicable NCHRP Report 350 criteria, the QuadGuard® Elite has been shown to telescope rearward to absorb the energy of impact. During those same in-criteria impacts, when impacted from the side, the system has been shown to redirect the vehicle back toward its original travel path and away from the roadside feature.

Design Criteria

FHWA Criteria

The 5 bay and 7 bay QuadGuard® Elite systems have passed the requirements stipulated in NCHRP Report 350, Test Level 2 tests with both the light car and pickup at speeds of up to 70 km/h [43 mph] at angles up to 20°.

The 8 bay and 11 bay QuadGuard® Elite systems are capable of passing the requirements stipulated in NCHRP Report 350, Test Level 3 tests with both the light car and pickup at speeds of up to 100 km/h [62 mph] at angles up to 20°.

Establish Basic System Specifications

The specification of a QuadGuard® Elite system for a particular site must always include system width and system length.

1) Specification of System Width

The QuadGuard® Elite system is available in five nominal widths (see Figure 8 on p. 13).

610 mm [24"]

760 mm [30"]

915 mm [36"]

1755 mm [69"]

2285 mm [90"]

As a general rule, selection of the narrowest width that adequately shields the roadside obstacle is recommended.

2) Specification of System Length

System length is specified by the number of bays the system includes. The number of bays required is a function of the design speed of the roadway. The system nose is not considered to be a bay.

Backup Structure for the System

The Tension Strut backup drawings are available at the back of this Manual on pages 26 & 33 and are appropriate for use on grade or deck.

Establish Required System Footing

The system must be anchored. MP-3[®] polyester anchor bolts will be supplied for all required anchorages in concrete. Refer to QuadGuard[®] Elite system Installation Manual, or MP-3[®] kits for detailed assembly instructions.

- 1) **Existing concrete** – Concrete must be at least 150 mm [6"] thick, reinforced 28 MPa [4000 psi] Portland cement concrete (P.C.C.), or 200 mm [8"] thick non-reinforced measuring at least 3.66 m [12' – 0"] wide by 15.24 m [50' – 0"] long. The concrete should be in good condition and be free of major cracks.
- 2) **New concrete** – If existing concrete does not meet these criteria, a new concrete foundation must be placed to properly secure the system.
- 3) **Cross-slope**– if there is a cross-slope of more than 8% (5 deg.), or if the cross-slope varies (twists) more than 2% (1 deg.) over the length of the system, a concrete leveling foundation may be required (see Figure 4).
- 4) **No Cross-slope** – If the cross-slope is within the range described above, the leveling foundation is not required:
 - **Transversal slope $\leq 8\%$**
 - **Longitudinal slope $\leq 2\%$**

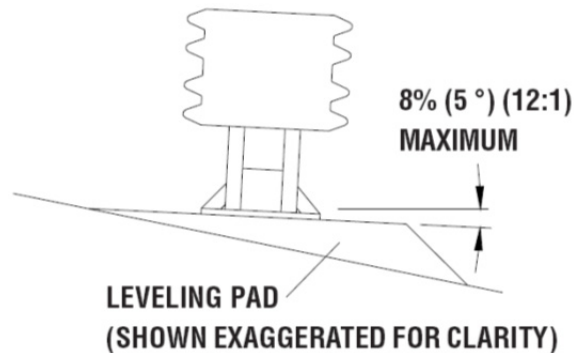


figure 4
Cross-Slope

Special Site Conditions

Contact the Trinity Highway Customer Service Department if you are a representative of the highway authority and would like input with your application. 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 100 mm [4"] high should be removed. If possible, curbs less than 100 mm [4"] high should be removed approximately 15 m [50'] in front of the QuadGuard® Elite system and as far back as the system's backup. Any curbs that must remain should be 100 mm [4"] maximum and be mountable.
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 highway feature so traffic patterns can be visualized.
4. When there is an existing guardrail or median barrier at the site, the backup of the QuadGuard® Elite system should tie into it when possible.
5. 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 in a location where crossover traffic is a concern? If so, a transition from the back of the system to the fixed object is necessary to prevent vehicle snagging (see "Transition Panel Types" on next page).
6. See next section if there are any other unique features at the site that may affect positioning or performance of the QuadGuard® Elite system?



Caution: The potentially restorable nature of the cylinders could provide for possible rebounding of an impacting vehicle into pathways beyond the reserve area under certain impact conditions. Consideration of a system for a particular site should include an assessment of this factor.

Other Factors That May Affect Your Design:

1. The existence of drain inlets.
2. Junction boxes or other appurtenances located near the roadside feature.
3. Insufficient space for the length preferred.
4. The location and movement of expansion joints. Contact Trinity Highway Customer Service Department before proceeding with your design (see p. 3).

Transition Panel Types

If a system is placed in a location where traffic will be approaching from the rear, a Transition Panel is necessary. Figures 5, 6 & 7 show the standard panel types. There are variations for each panel type. The specific Panel needed will depend on system and site conditions. Therefore, it is important to send site specific data to the customer service department for a recommendation for exact Panel needed for your application.

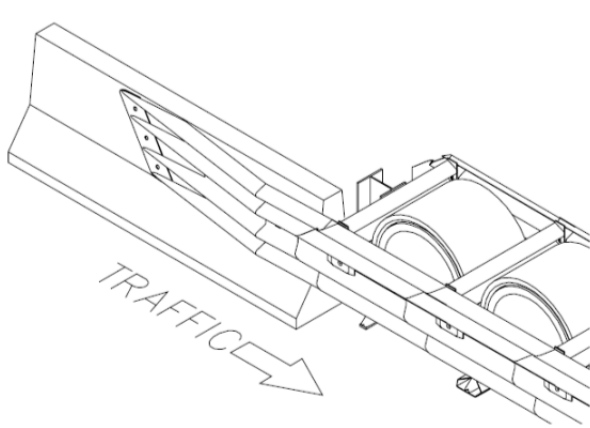


Figure 5
Quad-Beam™ to Safety Shape Barrier
Transition Panel

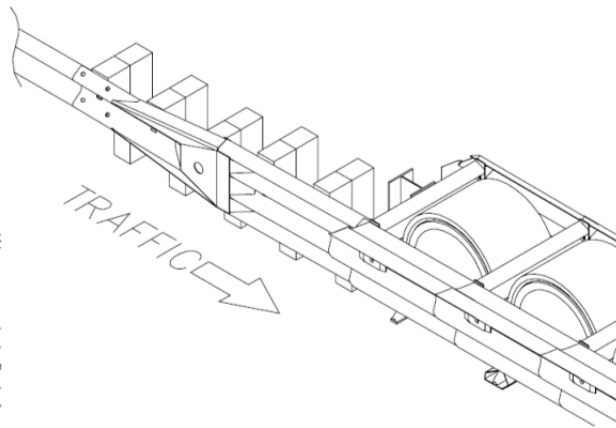


Figure 6
Quad-Beam™ to W-Beam Transition Panel

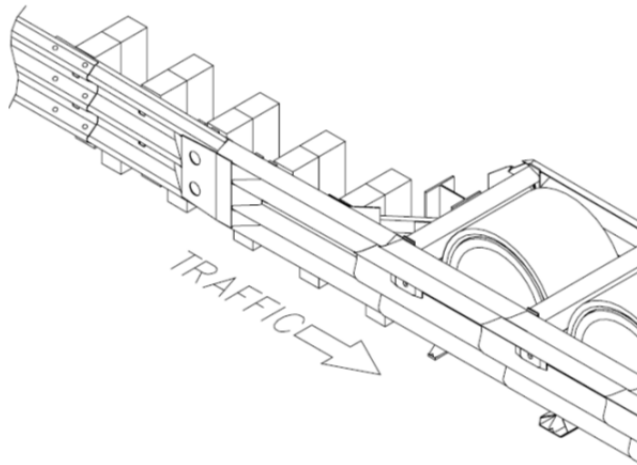


Figure 7
Quad-Beam™ to Thrie-Beam Transition Panel

System Width	5 Bay TL2 70 km/h [43 mph]	7 Bay EC TL2 85 km/h [53 mph]	8 Bay TL3 100 km/h [62 mph]	11 Bay EC TL3 105 km/h [65 mph]	14 Bay TL3 115 km/h [72 mph]
610 mm [24"]	QS2405E	QS2407E	QS2408E	QS2411E	QS2414E
760 mm [30"]	QS3005E	QS3007E	QS3008E	QS3011E	QS3014E
915 mm [36"]	QS3605E	QS3607E	QS3608E	QS3611E	QS3614E
1755 mm [69"]	QS6905E	QS6907E	QS6908E	QS6911E	Not Available
2285 mm [90"]	QS9005E	QS9007E	QS9008E	QS9011E	Not Available

Figure 8
QuadGuard® Elite System Model Numbers

Model Number Description

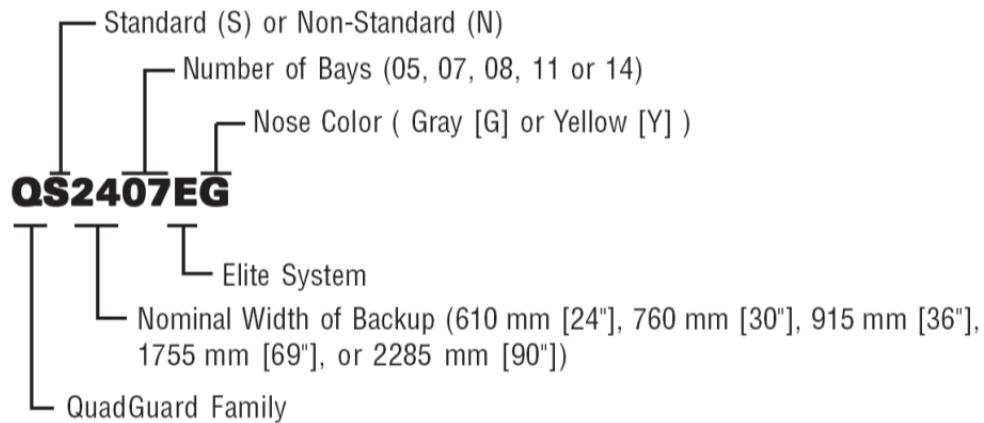
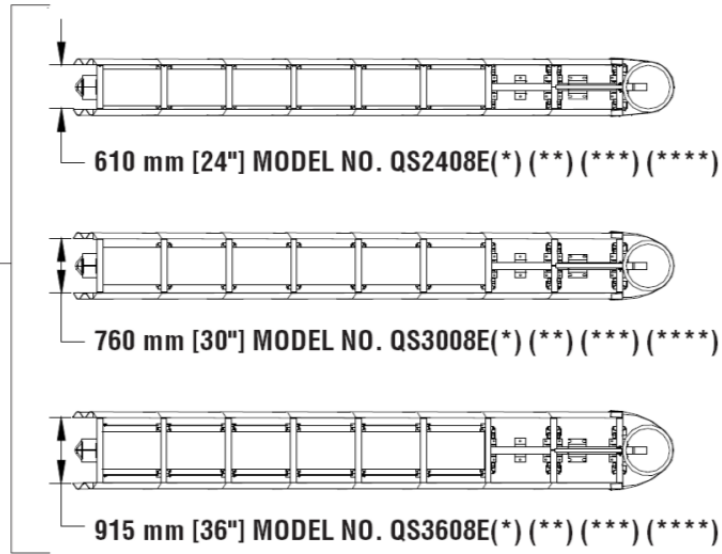
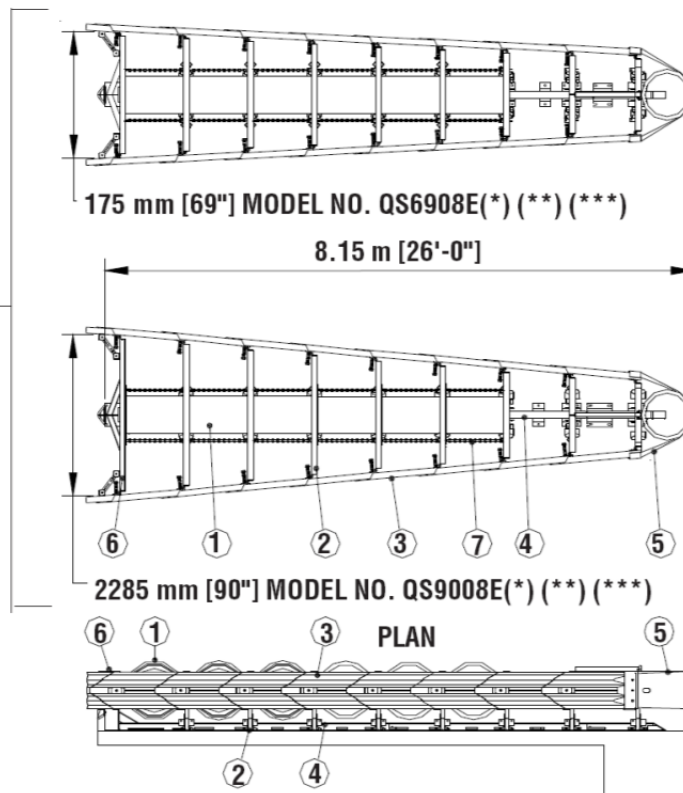


Figure 9
Model Number Key

QUADGUARD ELITE
FOR NARROW HAZARDS



QUADGUARD ELITE
FOR WIDE HAZARDS



Key

- 1) Energy-Absorbing Cylinder
- 2) Diaphragm
- 3) Quad-Beam™ Fender Panel
- 4) Monorail
- 5) Nose Cover
- 6) Backup
- 7) Chain Assembly

- * Also Available in 5 Bay Lengths
- ** Also Available in 7 Bay Lengths (EC Model)
- *** Also Available in 11 Bay Lengths (EC Model)
- **** Also Available in 14 Bay Lengths

Figure 10
Plan & Elevation

Recommended Tools

Documentation

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

Personal Protective equipment

- Safety Glasses
- Gloves
- Apron for MP-3[®] application
- Safety-toe shoes

Cutting equipment

- Rotary hammer drill
- Rebar cutting bit
- Concrete drill bits – 22 mm [7/8"] (*Double-Fluted)
- Grinder, Hacksaw, or Torch (optional)
- Drill motor
- Drill bits 1/16" through 7/8"

* Trinity Highway recommends using double-fluted drills to achieve optimum tensile strength when installing the MP-3[®] anchoring system.

Hammers

- Sledgehammer
- Standard hammer

Wrenches

- Heavy duty impact wrench
- Standard adjustable wrench
- 1/2" drive sockets: 9/16", 11/16", 3/4", 15/16", 1 1/8", 1 1/4"
- 1/2" drive Deep sockets: 15/16", 1 1/4"
- 1/2" drive Ratchet and attachments
- 1/2" drive Breaker bar - 24" long
- 1/2" drive Torque wrench: 200 ft-lb
- Crescent wrench: 300 mm [12"]
- Allen wrench: 3/8
- Impact wrench: 1/2" drive

Miscellaneous

- Traffic control equipment
- Lifting and moving equipment (A lifting device is preferred although a forklift can be used.) Minimum 5,000 lb. capacity required.
- Compressor (100 psi) and Generator 95 kW)
- Long pry bar
- Drift pin 300 mm [12"]
- Center punch
- Tape measure 7.5 m [25']
- Chalk line
- Concrete marking pencil
- Nylon bottle brush for cleaning 7/8" drilled holes
- Rags, water, and solvent for touch-up

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



Caution: The assembly/maintenance information provided here is for planning and system selection purposes only. Do not attempt to deploy or maintain the QuadGuard® Elite system without the proper plans and Assembly/Maintenance Manual from the manufacturer. If you need additional information, or have questions, please contact the highway authority who has planned and specified this product and, if needed, call the Trinity Highway Customer Service Department at (888) 323-6374.

Site Preparation/Foundation

The QuadGuard® Elite system should be deployed only on an existing or freshly placed and cured concrete foundation (28 MPa [4000 psi] minimum). Location and orientation of the concrete foundation and attenuator must comply with project plans or as otherwise determined by the resident project engineer.

Recommended dimension and reinforcement specifications for new concrete foundation are provided in Trinity Highway concrete foundation drawings, supplied with the system. System may be deployed on concrete roadway (see p. 10). Deployment cross-slope shall not exceed 8% and should not vary more than 2% over the length of the system. The foundation surface shall have a light broom finish.



Caution: Accurate placement of all steel rebar is critical to avoid interference with the concrete Anchor Bolts.



Warning: Location of the backup in relation to nearby objects will affect the operation of the attenuator. Upon impact, the fender panels telescope toward and extend beyond the rigid backup as much as 635 mm [25"] from their pre-impact location. Position the backup so that the rear ends of the last fender panels are a minimum of 635 mm [25"] forward of objects that would otherwise interfere with movement of the panels. Failure to comply with this requirement will result in impaired system performance offering motorists less protection and cause component damage.

Estimated Time for Assembly

With the use of proper tools and trained crew of three workers, the estimated time for deployment on a fully cured foundation is six to eight hours depending on site conditions, traffic, size and experience of work crew, and quality of tools.

General Maintenance and Repair

The QuadGuard® Elite System is considered to be a potentially reusable system. The system must be inspected after each impact and must be manually pulled out to its original length if necessary. Depending on the impact, components may get damaged and need replacement.

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

Environment

Except due to damage, it is anticipated that the cylinders may survive in a highway environment for a period ranging from five to fifteen years from the date of deployment.

Impact

Life expectancy is also affected by:

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

Systems must be inspected after each impact. Any cylinder that is cracked or otherwise damaged should be replaced and the system should be pulled out to its original length.



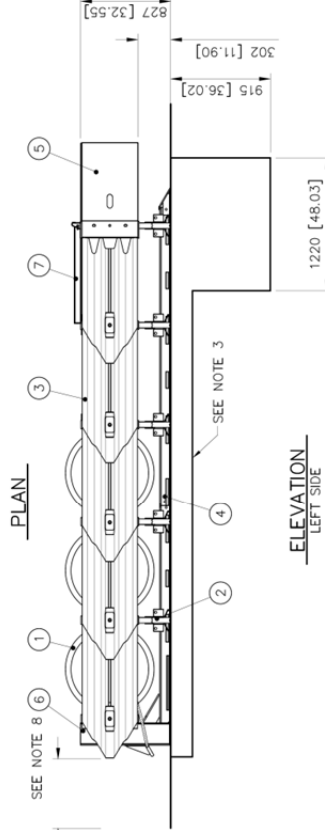
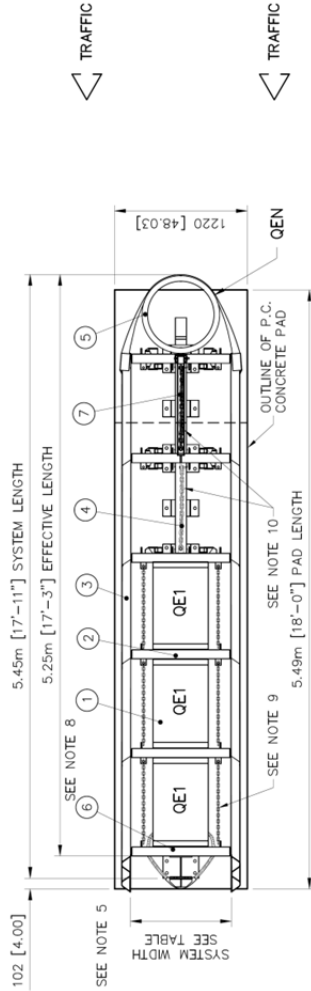
Caution: After an impact, always follow "Post-Impact Instructions" in the maintenance and repair section of the Assembly Manual.

Recycle Information

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

1. Steel should be sold as scrap to a local metal recycler.
2. Cylinders should be sold to a plastic recycler if available. If a recycler is unavailable, dispose of the material as plastic refuse.

DWG QL2SCVR5-U



MODEL#	SYSTEM WIDTH
QS2405E*	610 [24.00]
QS3005E*	762 [30.00]
QS3605E*	914 [36.00]

* Y=YELLOW NOSE
G=GRAY NOSE

UNIDIRECTIONAL
MODEL NO. QS-05E (SEE CHART)

ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD® ELITE™ SYSTEM W/ TENSION STRUT BACKUP
SCALE: 1=40
FILE: QL2TSCVR5-U
REV: 1 OF 1
B

- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 6.35 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM 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 1-888-32-ENER-6.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.
 - CHAINS SHOWN INCLUDED ONLY ON 914 [36.00] AND WIDER SYSTEMS.
 - CHAINS SHOWN INCLUDED IN BAYS 1 & 2 ONLY ON 24,30,36 SYSTEMS.

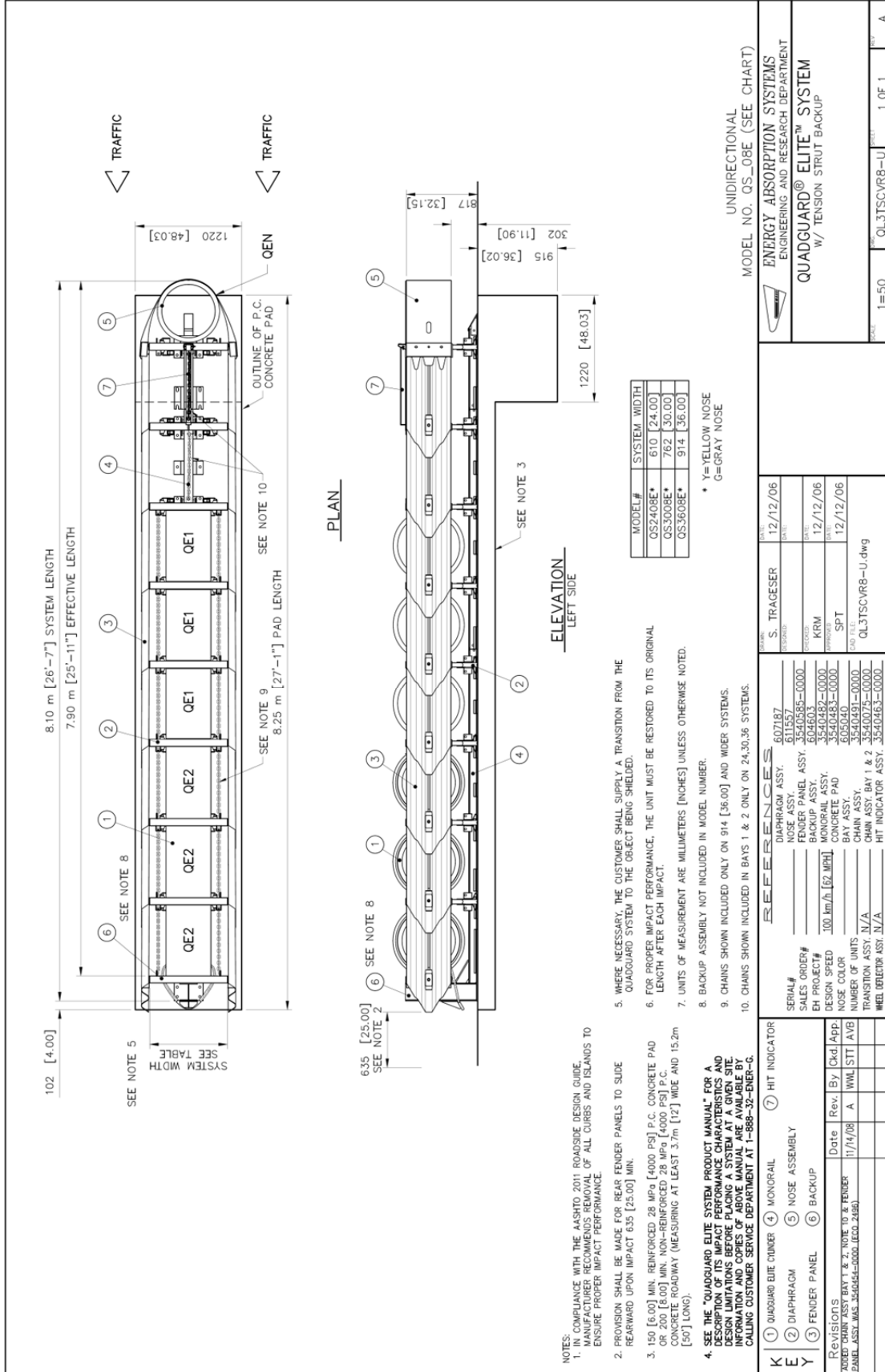
REVISIONS	Date	Rev.	By	Chk'd	App'd
INITIAL CHAIN ASSY BAY 1 & 2, NOTE 10 & FENDER PANEL ASSY BAYS 3-6	11/17/08	A	WML	STT	AVB
UPDATE NOTE 3	7/1/09	B	FJP	JME	KWL

REFERENCE	DATE
DIAPHRAGM ASSY. 607187	4/30/08
NOSE ASSY. 611557	
FENDER PANEL ASSY. 3540565-0000	
BACKUP ASSY. 504603	4/30/08
MONORAIL ASSY. 3540583-0000	
CONCRETE PAD 605040	4/30/08
CHAIN ASSY. 3540491-0000	
TRANSITION ASSY. N/A	
HIT INDICATOR ASSY. 3540456-0000	

DESIGNED BY	CHECKED BY	DATE
S. Trogeser		4/30/08
DESIGNED BY	CHECKED BY	DATE
KRM		4/30/08
DESIGNED BY	CHECKED BY	DATE
J. M. Thompson		4/30/08
CAD FILE:		
QL2TSCVR5-U.dwg		

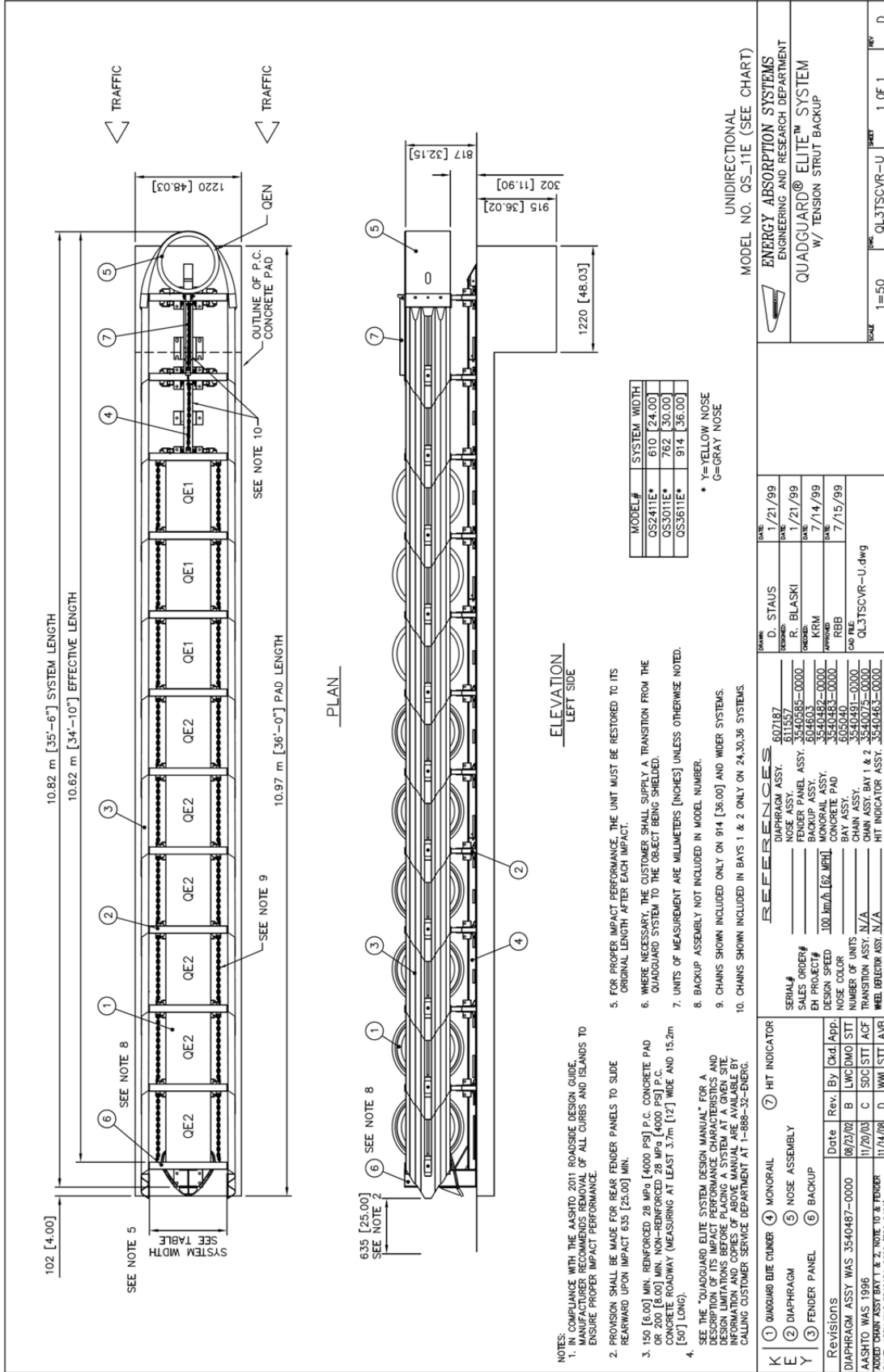
QuadGuard® Elite System w/ Tension Strut Backup TL-2

DWG QL3TSCVR8-U



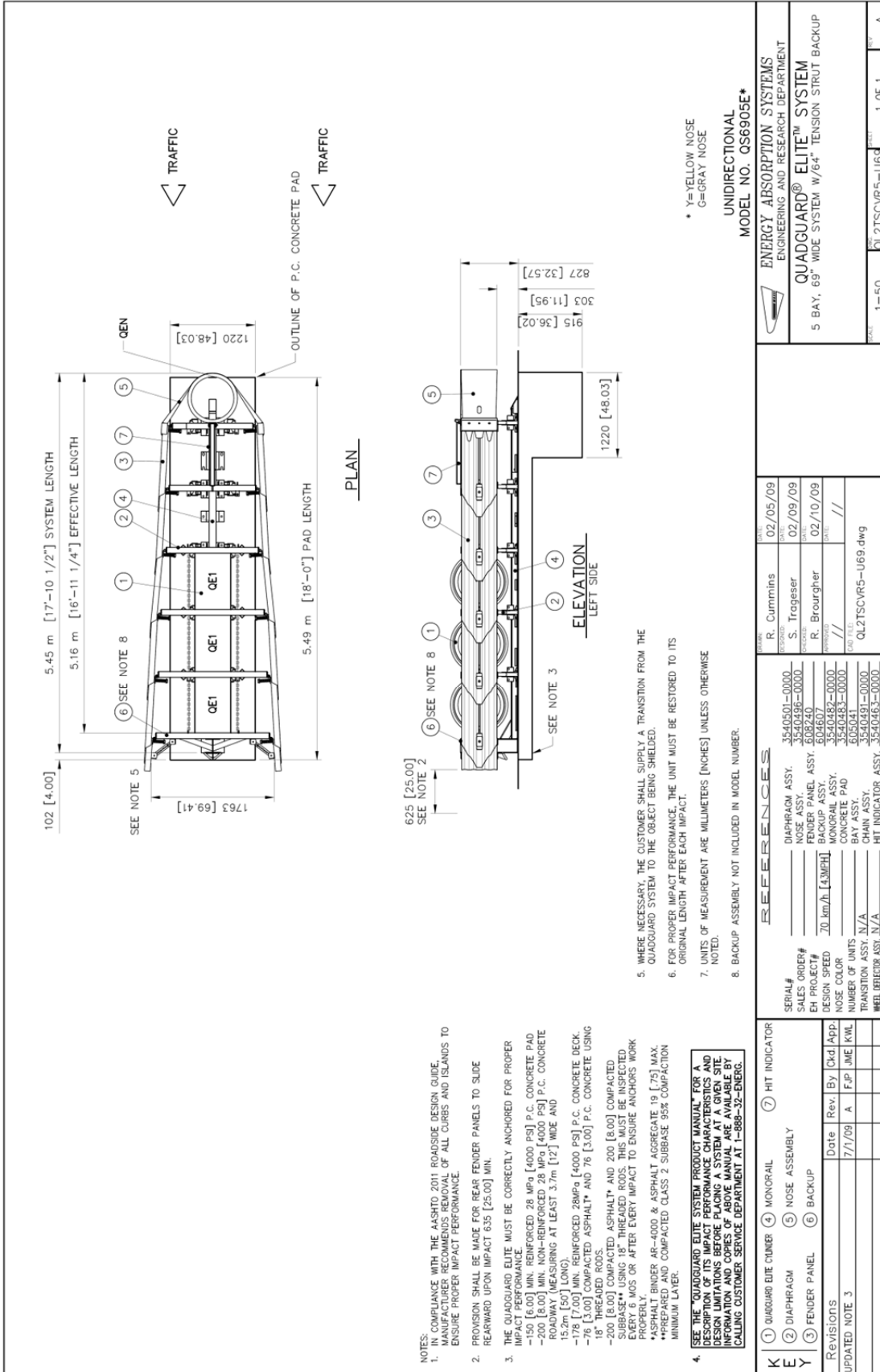
QuadGuard® Elite System w/ Tension Strut Backup TL-3

DWG QL3TSCVR-U



QuadGuard® Elite System w/ Tension Strut Backup TL-3 (EC Model)

DWG QL3TSCVR-U69



NOTES:
 1. COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 2. PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 6.35 [25.00] MIN.
 3. THE QUADGUARD ELITE MUST BE CORRECTLY ANCHORED FOR PROPER IMPACT PERFORMANCE.
 -150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD
 -200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 5.2m [17'] LONG)
 -176 [3.00] MIN. REINFORCED 28MPa [4000 PSI] P.C. CONCRETE DECK
 -176 [3.00] MIN. REINFORCED ASPHALT* AND 76 [3.00] P.C. CONCRETE USING 18" THREADED RODS.
 -200 [8.00] COMPACTED ASPHALT* AND 200 [8.00] COMPACTED SUBBASE** USING 18" THREADED RODS. THIS MUST BE INSPECTED EVERY 6 MOS OR AFTER EVERY IMPACT TO ENSURE ANCHORS WORK PROPERLY UNDER MS-6000 & ASPHALT ACCRETEGATE 19 [76] MAX. **PREPARED AND COMPACTED CLASS 2 SUBBASE 95% COMPACTION MINIMUM LAYER.

4. SEE THE "QUADGUARD ELITE SYSTEM PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND INFORMATION ON THE SYSTEM. THE SYSTEM'S PERFORMANCE INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT 1-888-32-ENERG.

5. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.

6. FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.

7. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

8. BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

* Y=YELLOW NOSE
 G=GRAY NOSE

UNIDIRECTIONAL
 MODEL NO. QS6905E*

ENERGY ABSORPTION SYSTEMS
 ENGINEERING AND RESEARCH DEPARTMENT
 QUADGUARD® ELITE™ SYSTEM
 5 BAY, 69" WIDE SYSTEM W/64" TENSION STRUT BACKUP

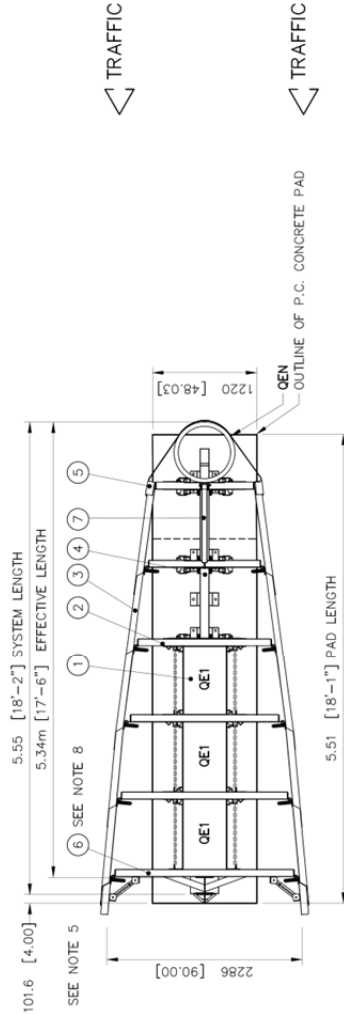
SCALE: 1=50
 QLT2TSCVR5-U69
 1 OF 1

REVISIONS	Date	Rev. By	Checked By
UPDATED NOTE 3	7/7/09	A	FJP JME KWL

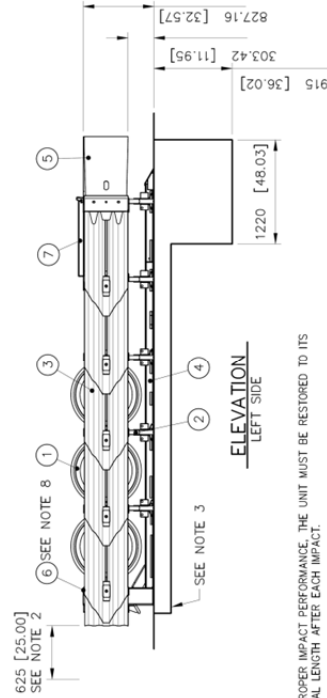
KEY	DESCRIPTION	DATE
1	QUADGUARD ELITE NUMBER	02/05/09
2	DIAPHRAGM	02/09/09
3	FENDER PANEL	02/10/09
4	MONORAIL	
5	NOSE ASSEMBLY	
6	BACKUP	
7	HIT INDICATOR	

REFERENCES	DESCRIPTION
SERIAL#	3540501-0000
SALES ORDER#	3540501-0000
EH PROJECT#	602657
DESIGN SPEED	70 km/h [43MPH]
NOSE COLOR	3540482-0000
NUMBER OF UNITS	3540483-0000
TRANSITION ASSY. N/A	605041
HIT INDICATOR ASSY. N/A	3540491-0000
	3540496-0000

DWG QL2TSCVR5-U90



PLAN



ELEVATION LEFT SIDE

- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR BEAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 635 [25.00] MIN.
 - THE QUADGUARD ELITE MUST BE CORRECTLY ANCHORED FOR PROPER IMPACT PERFORMANCE.
 -50 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD
 -20 [2.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 -178 [7.00] MIN. REINFORCED 28MPa [4000 PSI] P.C. CONCRETE DECK.
 -76 [3.00] COMPACTED ASPHALT* AND 76 [3.00] P.C. CONCRETE USING 18" THREADED RODS.
 -200 [8.00] COMPACTED ASPHALT* AND 200 [8.00] COMPACTED SUBBASE USING 18" THREADED RODS. THIS MUST BE INSPECTED PROPERLY 60S OR AFTER EVERY IMPACT TO ENSURE ADEQUATE WORK PROPERLY.
 *ASPHALT BINDER AR-4000 & ASPHALT AGGREGATE 19 [.75] MAX.
 **PREPARED AND COMPACTED CLASS 2 SUBBASE 95% COMPACTION MINIMUM LATER.
 - SEE THE "QUADGUARD ELITE SYSTEM 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 1-888-32-DRENG.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.

KEY	(1) QUADGUARD ELITE CURBER	(4) MONORAIL	(7) HIT INDICATOR
	(2) DIAPHRAGM	(5) NOSE ASSEMBLY	
	(3) FENDER PANEL	(6) BACKUP	
Revisions	Date	Rev. By	Chd.App.
REMOVED PLATE BY THE NOSE AREA	06/11/08	A	RIVSITT PAS
UPDATE NOTE 3	7/1/08	B	F.P.J.M.E.K.W.L

REFERENCES	
SERIAL#	3540501-0000
SALES ORDER#	3540498-0000
EH PROJECT#	603240
DESIGN SPEED	70 km/h [44 mph]
NOSE COLOR	N/A
TRANSITION ASSY	N/A
WHEEL INDICATOR ASSY	N/A
DIAPHRAGM ASSY.	3540501-0000
FENDER PANEL ASSY.	604607
BACKUP ASSY.	3540482-0000
MONORAIL ASSY.	3540483-0000
CONCRETE PAD	3540481-0000
BAY ASSY.	3540481-0000
CHAIN ASSY.	3540481-0000
HIT INDICATOR ASSY.	3540481-0000

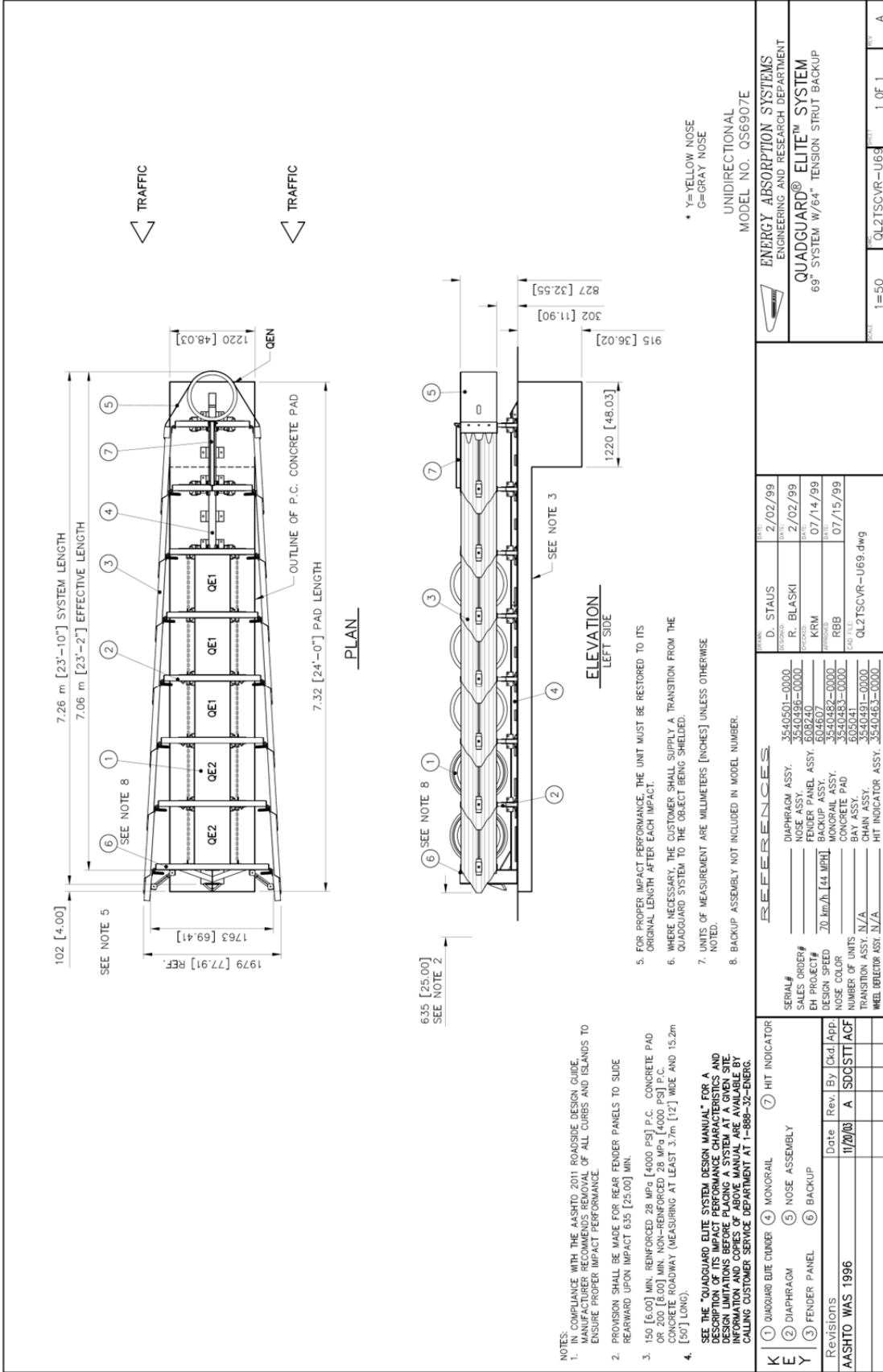
DESIGNED BY	R. Cummins	DATE	02/09/09
CHECKED BY		DATE	
DESIGNED BY	S. Trogeser	DATE	02/01/09
CHECKED BY	R. Broughter	DATE	02/11/09
DATE P.L.C.			
FILE NAME	QL2TSCVR5-U90.dwg		

ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT	
QUADGUARD® ELITE™ SYSTEM	
5 BAY, 90" SYSTEM W/83" TENSION STRUT BACKUP	
SCALE	1=50
NO.	QL2TSCVR5-U90
1 OF 1	

* Y=YELLOW NOSE
G=GRAY NOSE
UNIDIRECTIONAL
MODEL NO. QS9005E*

90" 5 Bay QuadGuard® Elite System w/83" Tension Strut Backup TL-2

DWG QL2TSCVR-U69



- NOTES:
- COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 6.35 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM DESIGN 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 1-888-32-ENERG.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHELLED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

• Y=YELLOW NOSE
G=GRAY NOSE
UNIDIRECTIONAL
MODEL NO. QSG6907E

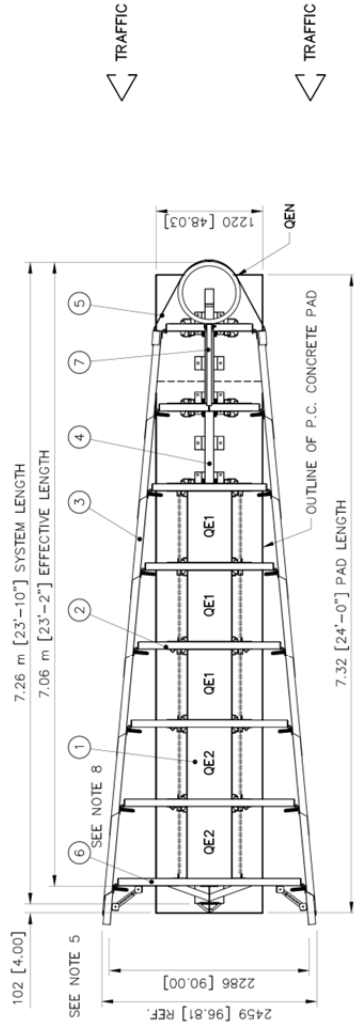
REFERENCES		DATE	
SERIAL#	3540501-0000	DATE	2/02/99
SALES ORDER#	DIAPHRAGM ASSY.	DATE	2/02/99
EH PROJECT#	NOSE ASSY.	DATE	07/14/99
DESIGN SPEED	FENDER PANEL ASSY.	DATE	07/15/99
NOSE COLOR	BACKUP ASSY.	DATE	
NUMBER OF UNITS	CONCRETE PAD	DATE	
TRANSITION ASSY.	CONCRETE PAD	DATE	
WHEEL INDICATOR ASSY.	CHAIN ASSY.	DATE	
	HIT INDICATOR ASSY.	DATE	

DESIGNED BY	D. STAUS	DATE	2/02/99
CHECKED BY	R. BLASKI	DATE	2/02/99
APPROVED BY	KRM	DATE	07/14/99
DATE PLOTTED	RBB	DATE	07/15/99
PLT FILE	QL2TSCVR-U69.dwg		

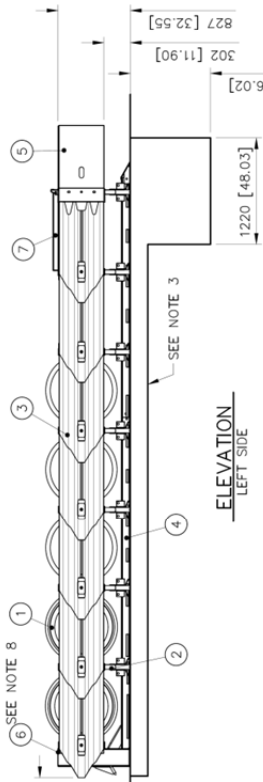
SCALE	1=50	DATE	01/23/00	SCALE	1 OF 1
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69" 7 Bay QuadGuard® Elite System w/ Tension Strut Backup TL-2

DWG QL2TSCVR-U90



PLAN



ELEVATION LEFT SIDE

- NOTES:
- COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 635 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM DESIGN MANUAL" FOR A COMPLETE LIST OF DESIGN LIMITATIONS 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 1-888-32-ENERS.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS (INCHES) UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

Revisions	Date	Rev.	By	Chd.App.
AASHTO WAS 1996	11/20/96	A	ISDCIST	ACF

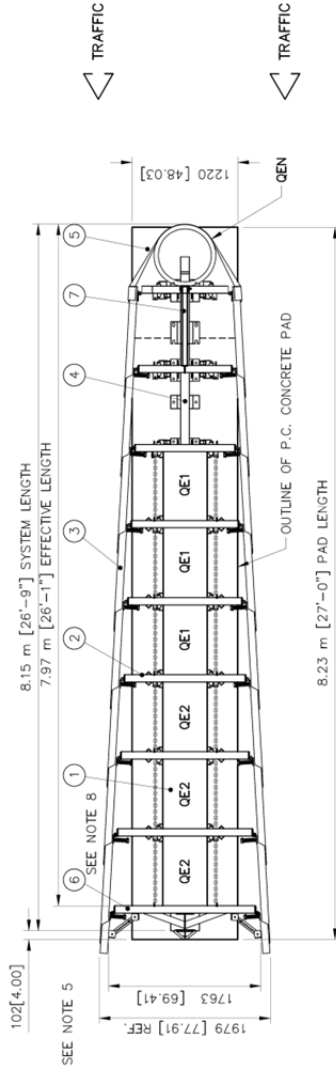
NO.	DESCRIPTION	DATE
1	QUADGUARD ELITE CUMBER	7/15/99
2	DIAPHRAGM	7/14/99
3	FENDER PANEL	7/14/99
4	MONORAIL	7/15/99
5	NOSE ASSEMBLY	7/15/99
6	BACKUP	7/15/99
7	HIT INDICATOR	7/15/99

DATE	BY	DESCRIPTION
2/02/99	D. STAUS	DESIGNED
2/02/99	R. BLASKI	DRAWN
7/14/99	KRM	CHECKED
7/15/99	RBB	APPROVED

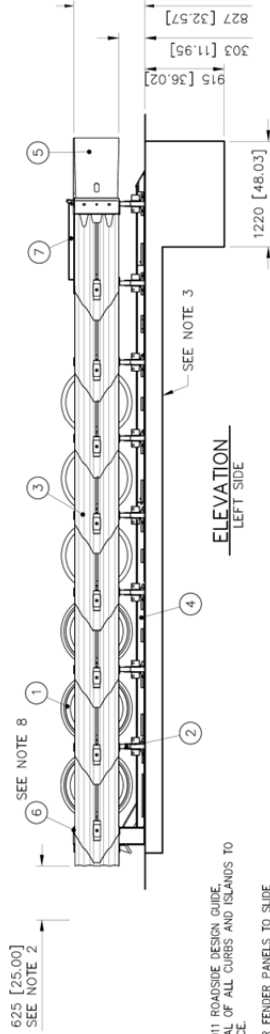
ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT	MODEL NO. OS9007E*
QUADGUARD® ELITE™ SYSTEM 90° SYSTEM W/83° TENSION STRUT BACKUP	
SCALE: 1=50	REV: 1 OF 1
FILE: QL2TSCVR-U90	REV: A

90" 7 Bay QuadGuard® Elite System w/83" Tension Strut Backup TL-2

DWG QL3TSCVR8-U69



PLAN



- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 635 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM 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 1-888-32-ENERG.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

• Y=YELLOW NOSE
G=GRAY NOSE
UNIDIRECTIONAL
MODEL NO. OS6908E*

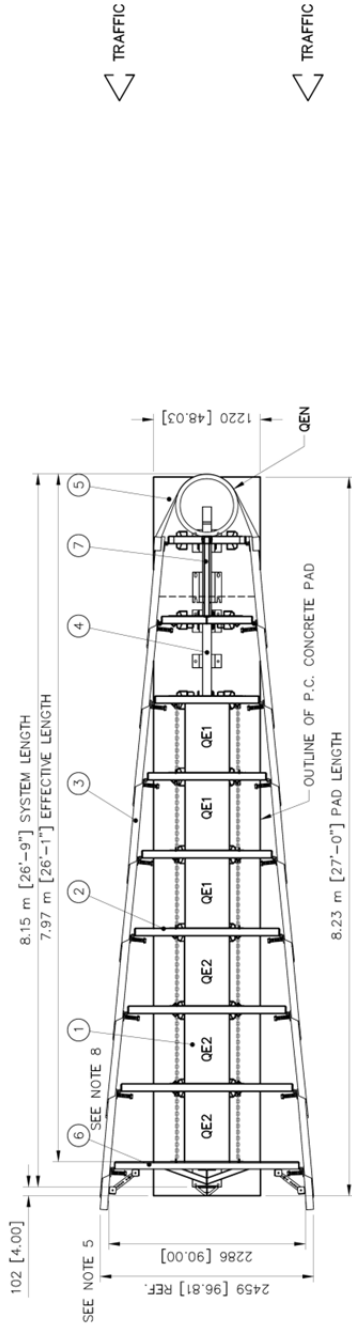
Revisions	Date	By	Chk	App

REFERENCES		DATE
SERIAL#	DIAPHRAGM ASSY.	01/04/07
SALES ORDER#	NOSE ASSY.	
EH PROJECT#	FENDER PANEL ASSY.	
DESIGN SPEED	MONORAIL ASSY.	10/11/07
NOSE COLOR	CONCRETE PAD	
NUMBER OF UNITS	BAY ASSY.	
TRANSITION ASSY.	CHAIN ASSY.	
WHEEL INDICATOR ASSY.	HIT INDICATOR ASSY.	

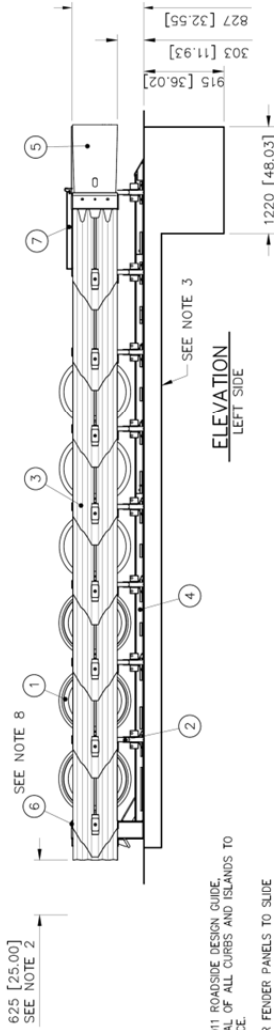
		ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD® ELITE™ SYSTEM 8 BAY, 69" WIDE SYSTEM W/64" TENSION STRUT BACKUP		MODEL NO. OS6908E*
SCALE	1=50	QUADGUARD-069 1 OF 1

69" 8 Bay QuadGuard® Elite System w/64" Tension Strut Backup TL-3

DWG QL3TSCVR8-U90



PLAN



ELEVATION
LEFT SIDE

- NOTES:
- CONFORMANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE. MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 635 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM PRODUCT MANUAL" FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT 1-888-32-ENERG.

- FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
- WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
- UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
- BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

* Y= YELLOW NOSE
G= GRAY NOSE

UNIDIRECTIONAL
MODEL NO.: QS9008E*

REVISIONS	DATE	REV.	BY	CHKD	APP.

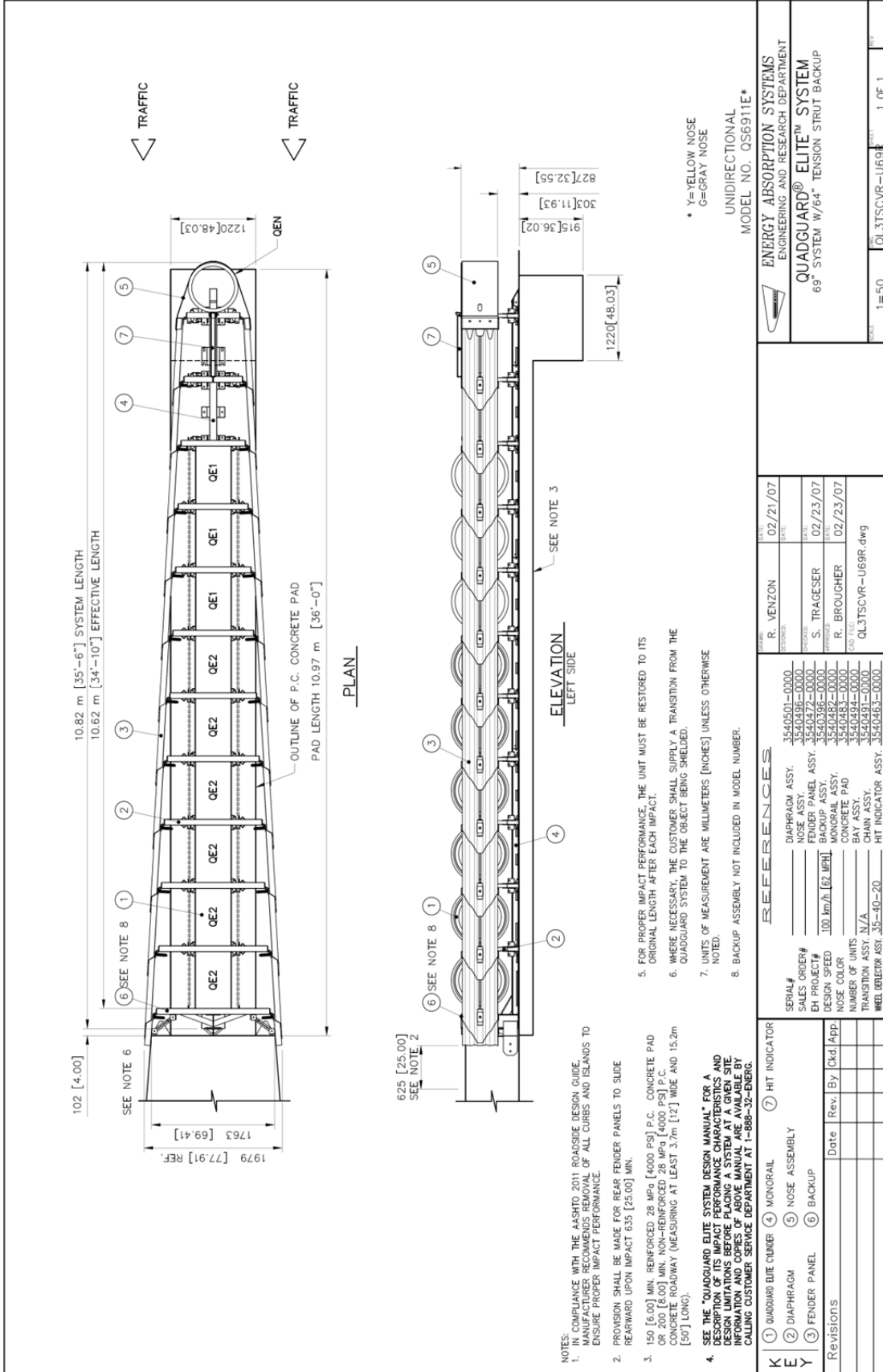
KEY	DESCRIPTION	DATE	BY
1	QUADGUARD ELITE CURBER	01/04/07	S. Trageser
2	DIAPHRAGM	10/11/07	KRM
3	FENDER PANEL	10/11/07	R. Brougher
4	MONORAIL	10/11/07	R. Brougher
5	NOSE ASSEMBLY	10/11/07	R. Brougher
6	BACKUP	10/11/07	R. Brougher
7	HIT INDICATOR	10/11/07	R. Brougher

REFERENCES	DESCRIPTION	DATE
3540501-0000	DIAPHRAGM ASSY.	01/04/07
3540496-0000	NOSE ASSY.	01/04/07
608240	FENDER PANEL ASSY.	10/11/07
604607	BACKUP ASSY.	10/11/07
3540482-0000	MONORAIL ASSY.	10/11/07
605046-0000	CONCRETE PAD	10/11/07
3540491-0000	CHAIN ASSY.	10/11/07
610237	HIT INDICATOR ASSY.	10/11/07

ENERGY ABSORPTION SYSTEMS	ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD® ELITE™ SYSTEM	8 BAY, 90" WIDE SYSTEM W/83" TENSION STRUT BACKUP
SCALE: 1=50	MODEL NO.: QS9008E*
DATE: 10/11/07	FILE: QL3TSCVR8-U90.dwg
DRAWN BY: S. Trageser	DATE: 01/04/07
CHECKED BY: KRM	DATE: 10/11/07
APPROVED BY: R. Brougher	DATE: 10/11/07
SCALE: 1=50	FILE: QL3TSCVR8-U90.dwg
SHEET: 1 OF 1	SCALE: 1 OF 1

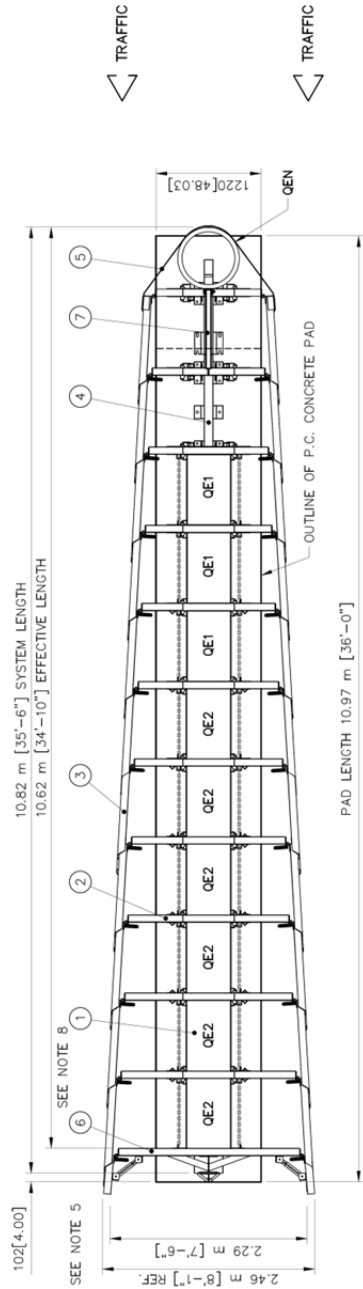
90" 8 Bay QuadGuard® Elite System w/83" Tension Strut Backup TL-3

DWG QL3TSCVR-U69R

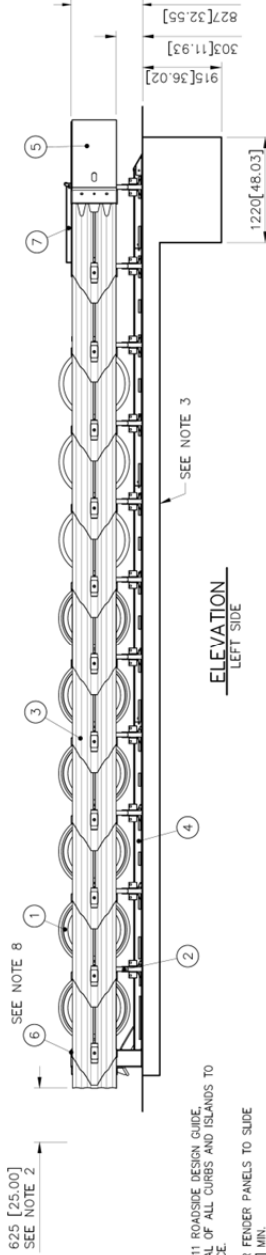


69" 11 Bay QuadGuard® Elite System w/64" Tension Strut Backup TL-3

DWG QL3TSCVR-U90



PLAN



ELEVATION
LEFT SIDE

- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2011 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 635 [25.00] MIN.
 - 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY (MEASURING AT LEAST 3.7m [12'] WIDE AND 15.2m [50'] LONG).
 - SEE THE "QUADGUARD ELITE SYSTEM DESIGN 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 1-888-32-ENRG.
 - FOR PROPER IMPACT PERFORMANCE, THE UNIT MUST BE RESTORED TO ITS ORIGINAL LENGTH AFTER EACH IMPACT.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - BACKUP ASSEMBLY NOT INCLUDED IN MODEL NUMBER.

* Y= YELLOW NOSE
G= GRAY NOSE

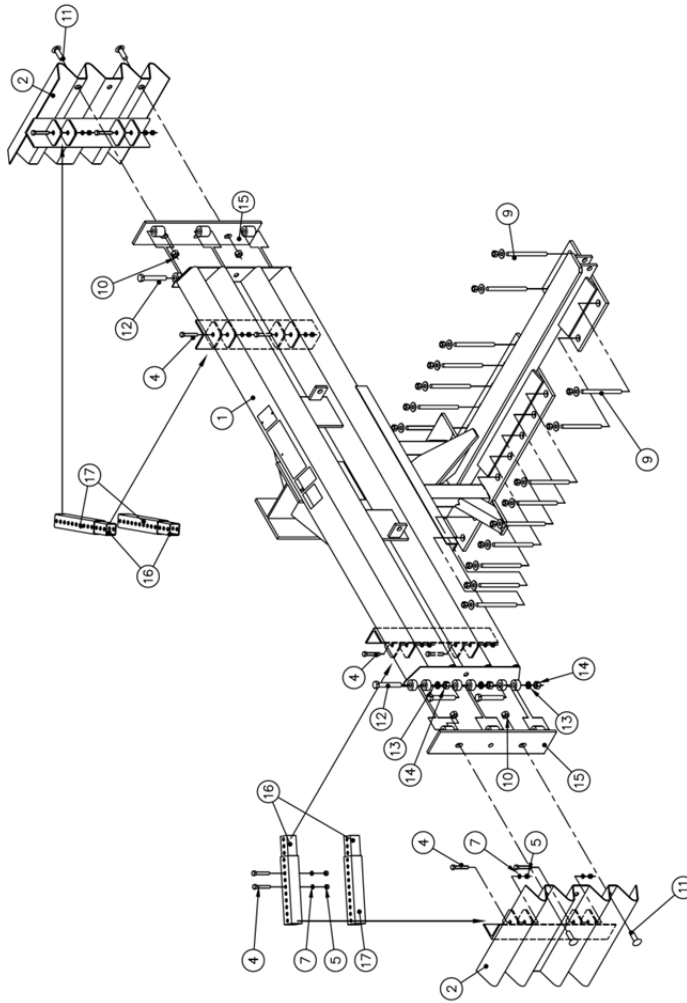
UNIDIRECTIONAL
MODEL NO. QS9011E*

<p>ENERGY ABSORPTION SYSTEMS ENGINEERING AND RESEARCH DEPARTMENT</p>		<p>QUADGUARD® ELITE™ SYSTEM 90" SYSTEM W/83" TENSION STRUT BACKUP</p>	
<p>SCALE: 1=50</p>		<p>DATE: 01.31.2011</p>	
<p>DESIGNER: S. VAN OGLE</p>		<p>DATE: 11/13/98</p>	
<p>CHECKER: R. BLASKI</p>		<p>DATE: 2/03/99</p>	
<p>APPROVER: KRM</p>		<p>DATE: 07/14/99</p>	
<p>DATE: 07/15/99</p>		<p>DATE: 07/15/99</p>	
<p>FILE: QL3TSCVR-U90.dwg</p>		<p>FILE: QL3TSCVR-U90.dwg</p>	
<p>DIAPHRAGM ASSY. 3540501-0000</p>		<p>SALES ORDER# 3540499-0000</p>	
<p>FENDER PANEL ASSY. 604607-0000</p>		<p>EH PROJECT# 604607-0000</p>	
<p>DESIGN SPEED 100 km/h [62 mph]</p>		<p>MONORAIL ASSY. 3540482-0000</p>	
<p>NOSE COLOR 605041</p>		<p>CONCRETE PAD 3540483-0000</p>	
<p>NUMBER OF UNITS N/A</p>		<p>BAY ASSY. 605041</p>	
<p>TRANSITION ASSY. N/A</p>		<p>CHAIN ASSY. 3540491-0000</p>	
<p>WHEEL DEFLECTOR ASSY. N/A</p>		<p>HIT INDICATOR ASSY. 3540463-0000</p>	
<p>REVISIONS</p>		<p>REFERENCES</p>	
K	(1) QUADGUARD ELITE CINDER	(4) MONORAIL	(7) HIT INDICATOR
E	(2) DIAPHRAGM	(5) NOSE ASSEMBLY	
Y	(3) FENDER PANEL	(6) BACKUP	
<p>Revisions</p>		<p>Date [Rev] By [Ckd App]</p>	
<p>AASHTO WAS 1996</p>		<p>11/20/01 A [SDC/STI] ACF</p>	

90" 11 Bay QuadGuard® Elite System w/83" Tension Strut Backup TL-3

DWG 604607

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	RECD
1	SEE TABLE	BACKUP, TS, _____ OG LMC/QGE W/DECALS	1.00
2	611900G	PANEL, SIDE, OG WIDE, G	2.00
4	113612G	BOLT, HX, 3/8X3 1/2, G2, G, ALL THREAD	16.0
5	115960G	NUT, HX, 3/8, G	16.0
7	118092G	WASHER, LOCK, 3/8, G	16.0
9	603673B	ANCHOR, MP-3, PT-KIT, 3/4X7, VT	3.00
10	603340G	NUT, HX, 5/8, G, RAIL	4.00
11	003400G	BOLT, TRAIL, 5/8X2, G	4.00
12	113666G	BOLT, HX, 5/8X4, G5, G	6.00
13	118100G	WASHER, LOCK, 5/8, G	6.00
14	115970G	NUT, HX, 5/8, G	6.00
15	61072G	HINGE PLATE, FENDER PANEL, OG LMC 69/90	2.00
16	615756B	TEL ST 1 3/4X1 3/4X12GA, H4S, G, 10" LG	4.00
17	615765B	TEL ST 2X2X12GA, H2S, G, 10" LONG	4.00



TABLE

ASSY. NO.	STOCK NO.	DESCRIPTION	WIDTH
604607B	604783B	BACKUP, TS, 64, OG LMC/QGE W/DECALS	1620 [64"]
604608B	604791B	BACKUP, TS, 83, OG LMC/QGE W/DECALS	2100 [83"]

- NOTES:
- WHEN TRANSITIONING QUADGUARD SYSTEM TO EXISTING BARRIER REFER TO THE EXISTING BARRIER ASSEMBLY DRAWINGS FOR PROPER USE OF SIDE PANEL PART NO. 611898G.
 - DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

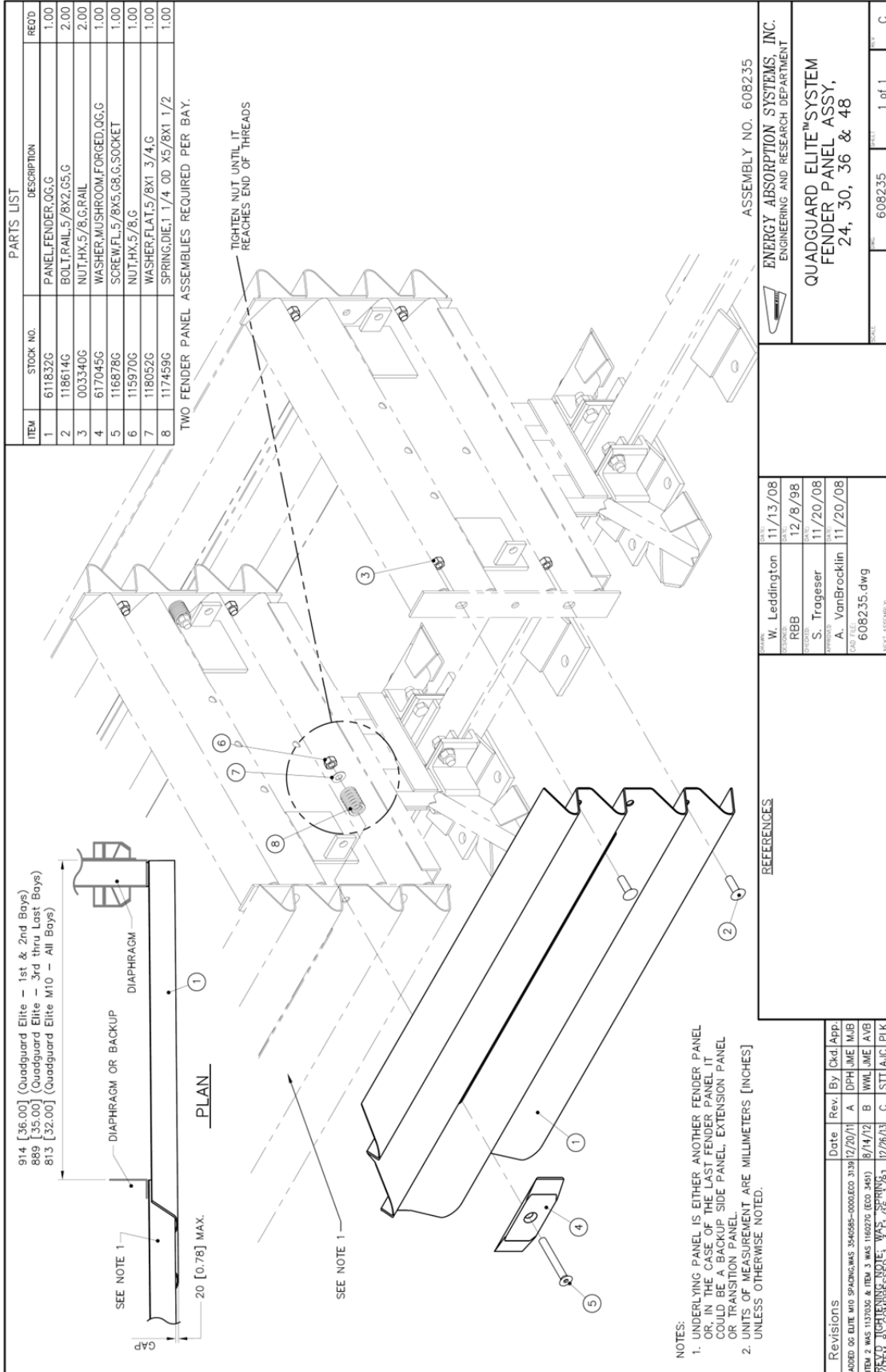
ASSEMBLY NO. SEE TABLE

		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
QUADGUARD® ELITE™ SYSTEM BACKUP ASSY, TS, QGE WIDE		SCALE: 1:20 PART: 604607 1 of 1	
DRAWN: S. Cholda DESIGNED: R. Blaski CHECKED: KRM APPROVED: RBB CAD FILE: 604607.dwg NEXT ASSEMBLY:	DATE: 12/01/98 DATE: 12/1/98 DATE: 3/19/99 DATE: 3/23/99	REFERENCE:	

Revisions	Date	Rev.	By	Chd.	App.
NEW TABLE ADDED ANCHOR TO SECOND HOLE FROM REAR BOTH SIDES. INSURED NOTE & UPDATED TO ROMACS (ECO 3180)	11/22/11	A	WWL	JME	ST
REMOVED ITEMS 18, 19 & 20 (ECO 3737)	11/11/13	B	WWL	JME	ARY

QuadGuard® Elite System Backup Assembly, Tension Strut, QGE Wide

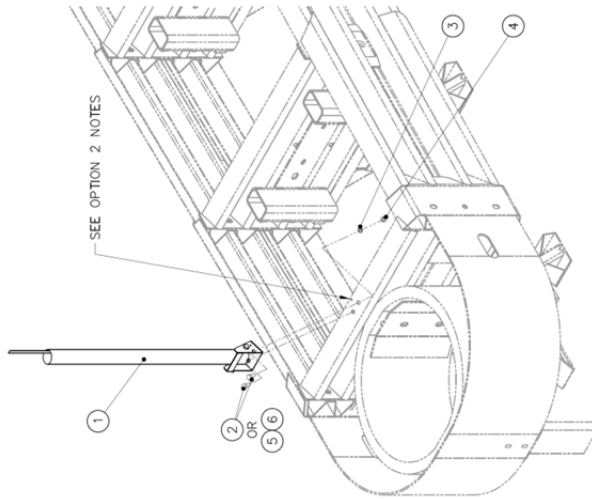
DWG 608235



QuadGuard® Elite System Fender Panel Assembly, 24, 30, 36 & 48

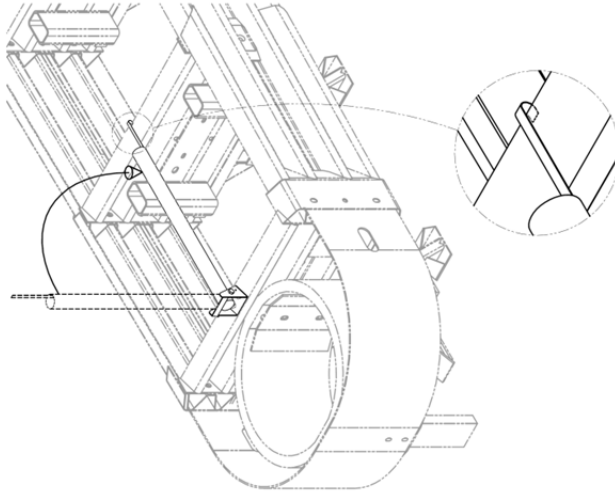
DWG 610237 Sheet 1 of 2

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	610238B	HIT INDICATOR,LMC/ELITE	1.00
2	113467G	BOLT,HX,1/2X1,G	2.00
3	118082G	WASHER,LOCK,1/2,G	2.00
4	115939G	NUT,HX,1/2,G	2.00
5	116891G	SCREW,HH,1/4X1,SELF DRILL/TAPPING,G	2.00
6	118013G	WASHER,FLAT,1/4 X 1,G	2.00



STEP 1: POSITION HIT INDICATOR ON 1ST DIAPHRAGM. DRILL ONE $\phi 1/4"$ HOLE AS NEEDED TO SET BRACKET TAB IN DIAPHRAGM. BRACKET SHOULD BE CENTERED ON TOP SURFACE OF DIAPHRAGM.

STEP 2: ATTACH HIT INDICATOR TO 1ST DIAPHRAGM. OPTION 1: MATCH DRILL TWO $\phi 9/16"$ HOLES AS NEEDED IN DIAPHRAGM. USE ITEMS 2, 3 & 4 TO ATTACH BRACKET. OPTION 2: USE SELF DRILLING + TAP SCREWS (ITEM 5) ALONG WITH FLAT WASHER (ITEM 6) TO ATTACH BRACKET.



STEP 3: ROTATE HIT INDICATOR TO HORIZONTAL POSITION AND BEND TRIGGER CLIP AROUND TOP OF 2ND DIAPHRAGM

		ASSEMBLY NO. 610237B ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD [®] LMC/ELITE SYSTEM HIT INDICATOR, W/HARDWARE, LMC/ELITE/ELITE M10		SCALE: 1:8 PART: 610237 SHEET: 1 of 2

REFERENCES

DESIGNER	T. Busse	DATE	08/19/98
DRAWN	RBB	DATE	9/11/98
CHECKED	KM	DATE	9/4/98
APPROVED	RBB	DATE	9/10/98
DATE	610237		
NEXT ASSEMBLY:			

Revisions	Date	Rev.	By	Chk.	App.
ADDED ITEMS 5 & 6, AND REVISED NOTES (ECO 2765)	9/18/09	B	NWL	JME	FJP
WAS 354046-1-000,ADD SHEET 2:ECO 3139	3/22/12	C	DPH	JME	MJB
ITEM 5 WAS 116892G	8/13/12	D	NWL	JME	RCB

QuadGuard[®] Elite System Hit Indicator Assembly

DWG 610237 Sheet 2 of 2

ITEM	STOCK NO.	DESCRIPTION	RECD
PARTS LIST			

STEP 3: ROTATE HIT INDICATOR TO HORIZONTAL POSITION AND BEND TRIGGER CLIP AROUND TOP OF 2ND DIAPHRAGM

STEP 1: POSITION HIT INDICATOR ON 1ST DIAPHRAGM. CENTER HIT INDICATOR (ITEM 1) 2 1/2" FROM EDGE OF DIAPHRAM FOR 24" SYSTEMS. DRILL ONE Ø1/4" HOLE AS NEEDED TO SET BRACKET TAB IN DIAPHRAGM. BRACKET SHOULD BE CENTERED ON TOP SURFACE OF DIAPHRAGM.

STEP 2: ATTACH HIT INDICATOR TO 1ST DIAPHRAGM. OPTION 1: MATCH DRILL TWO Ø9/16" HOLES AS NEEDED IN DIAPHRAGM. USE ITEMS 2, 3 & 4 TO ATTACH BRACKET. OPTION 2: USE SELF DRILLING + TAP SCREWS (ITEM 5) ALONG WITH FLAT WASHER (ITEM 6) TO ATTACH BRACKET.

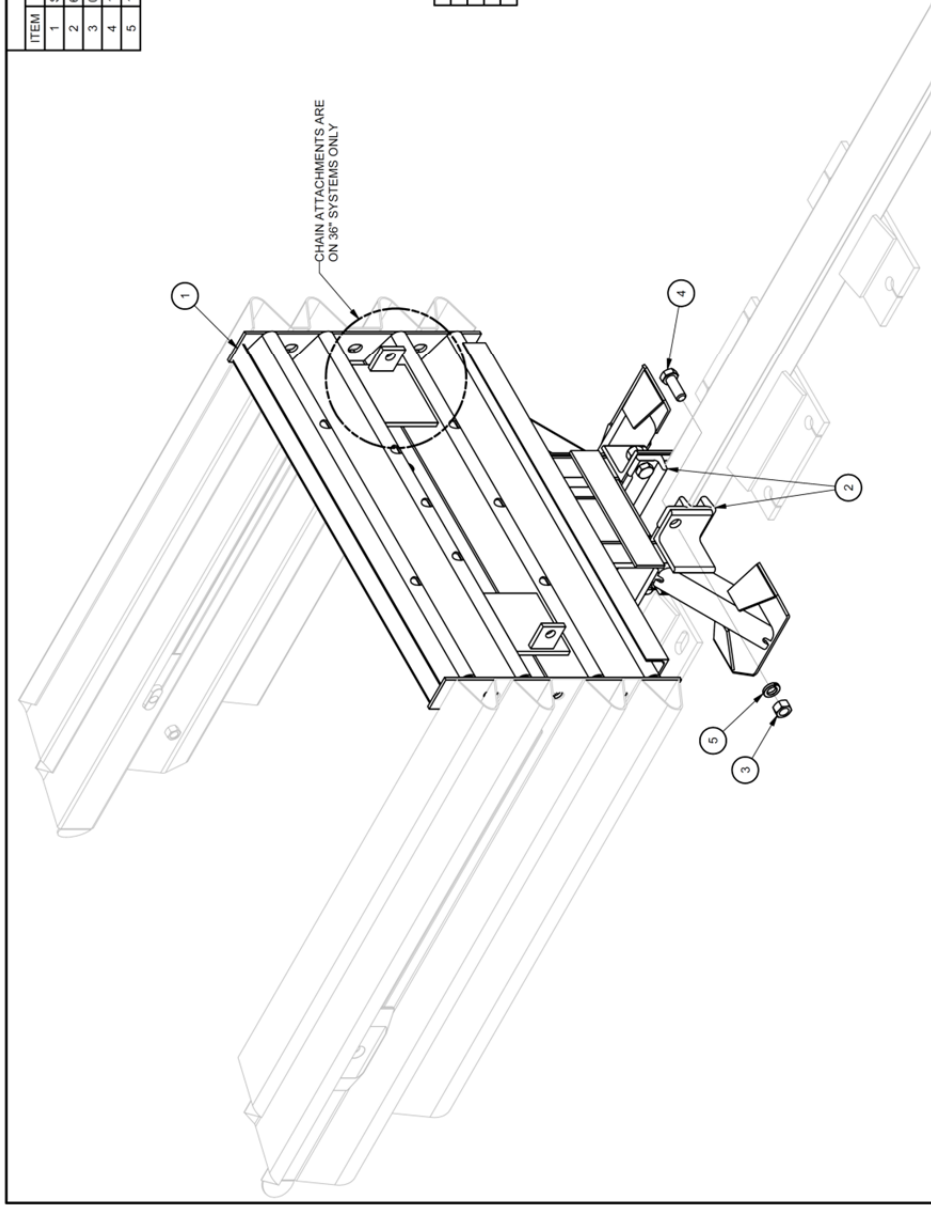
DESIGNED BY: T. Busse	DATE: 08/19/98	ASSEMBLY NO.: 610237B	ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT
DESIGNED BY: RBB	DATE: 9/11/98		QUADGUARD[®] LMC/ELITE SYSTEM HIT INDICATOR, W/HARDWARE, LMC/ELITE/ELITE M10
CHECKED BY: KM	DATE: 9/4/98		
APPROVED BY: RBB	DATE: 9/10/98		
DATE PLOTTED: 610237			SCALE: 1:8
NEXT ASSEMBLY:			PAGE: 2 of 2

REFERENCES			
Revisions	Date	Rev	By/Ckd/App.
ADDED SHEET/ECO 3139	3/22/02	C	DPH/JME/MLB
SEE SHEET 1	8/13/02	D	DPH / /

DWG 607187

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	SEE TABLE	DIAPHRAGM,QE,36,QGE	1
2	611388G	MONORAIL GUIDE,QG,G	2
3	003704G	NUT,HX,3/4,G	4
4	113555G	BOLT,HX,3/4X2,G8,G	4
5	118089G	WASHER,LOCK,3/4,G	4

Table		
WIDTH	ASSEMBLY NO.	ITEM 1 PART NO.
24"	607187B	607620B
30"	607188B	607626B
36"	607190B	607632B



ASSEMBLY NO. (SEE TABLE) ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT QUADGUARD® ELITE™ SYSTEM DIAPHRAGM ASSY, QGE, 24, 30, 36		SCALE: N.T.S. DRAWING: 607187 SHEET: 1 of 1 REV: B
DATE: 8/22/2002 DESIGNED BY: L. Conter CHECKED BY: S. Trappesser APPROVED BY: D. Ollom FILE: 607187.dwg PART ASSEMBLY	DATE: 9/3/2002 DATE: 8/30/2002	REFERENCES

Revision	Date	Rev	By	Chk	App.
ECO 2436: REDRAWN IN INVENTOR, ITEM 1 PART NO. IN TABLE FOR 36" WIDTH WAS 2281019-0000.	8/19/08	A	DDS	DK	ARVB
PART NUMBER WAS 3540464-0000	8/25/11	/	DDS	/	/
ADD 7 OUTSIDE HOLES TO MID OF DIAPHRAGM LEGS AND	2/20/11	B	DPH	JME	MJB

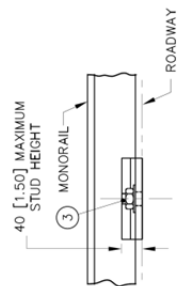
QuadGuard® Elite System Diaphragm Assembly, QGE, 24, 30, 36

DWG 3540482-0000

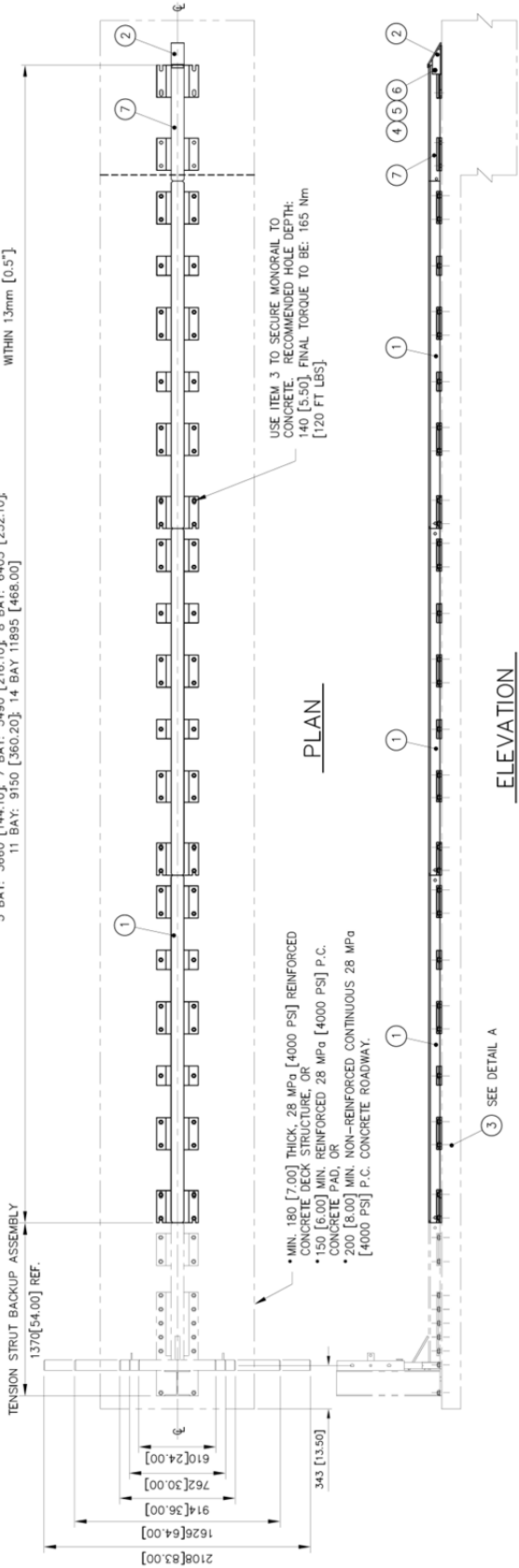
PARTS LIST		5 BAY	7 BAY	8 BAY	11 BAY	14 BAY
ITEM	STOCK NO.	DESCRIPTION	RECD	RECD	RECD	RECD
1	2760071-0000	MONORAIL, THREE BAYS, OG, G	1.00	2.00	3.00	4.00
2	2760041-0000	END CAP, MONORAIL, OG, G	1.00	1.00	1.00	1.00
3	3525300-0000	ANCHOR, MP-3, PT-KIT, 3/4X7, VT	4.00	7.0	8.00	12.0
4	2699571-0000	BOLT, HX, 5/8X3 1/2, G5, G	1.00	1.00	1.00	1.00
5	2704141-0000	NUT, HX, 5/8, G	1.00	1.00	1.00	1.00
6	2708231-0000	WASHER, LOCK, 5/8, G	1.00	1.00	1.00	1.00
7	2760051-0000	MONORAIL, ONE BAY, OG, G	1.00	N/A	1.00	1.00

NOTE: MONORAIL & BACKUP ASSEMBLY MUST BE STRAIGHT TO WITHIN 13mm [0.5"]

TOTAL RAIL LENGTH:
5 BAY: 3660 [144.10]; 7 BAY: 5490 [216.10]; 8 BAY: 6405 [252.10];
11 BAY: 9150 [360.20]; 14 BAY: 11895 [468.00]



DETAIL A



PLAN

ELEVATION

(W/TENSION STRUT BACKUP)

- NOTES:
- USE MONORAILS (ITEMS 1 & 7) AS TEMPLATES TO LOCATE MP-3 ANCHOR BOLTS (ITEM 3).
 - CROSS SLOPE OF PAD SHALL NOT EXCEED 8% NOR VARY MORE THAN 2% FROM FRONT TO BACK.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - EVERY STUD MUST BE EMBEDDED TO A DEPTH OF 140 [5.5] IF REBAR IS ENCOUNTERED IN A P.C. CONCRETE PAD, DRILL THROUGH IT. IF REBAR IS ENCOUNTERED ON A DECK STRUCTURE, DO NOT DRILL THROUGH REBAR WITHOUT FIRST GETTING PERMISSION FROM A PROJECT ENGINEER.

REFERENCES

DESIGNED BY	D. Stous	DATE	11/6/98
CHECKED BY	KRM	DATE	3/19/99
APPROVED BY	RBB	DATE	3/22/99
DRAWING NO.	3540482-0000.dwg		
PROJECT NO.	3540482-0000		

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

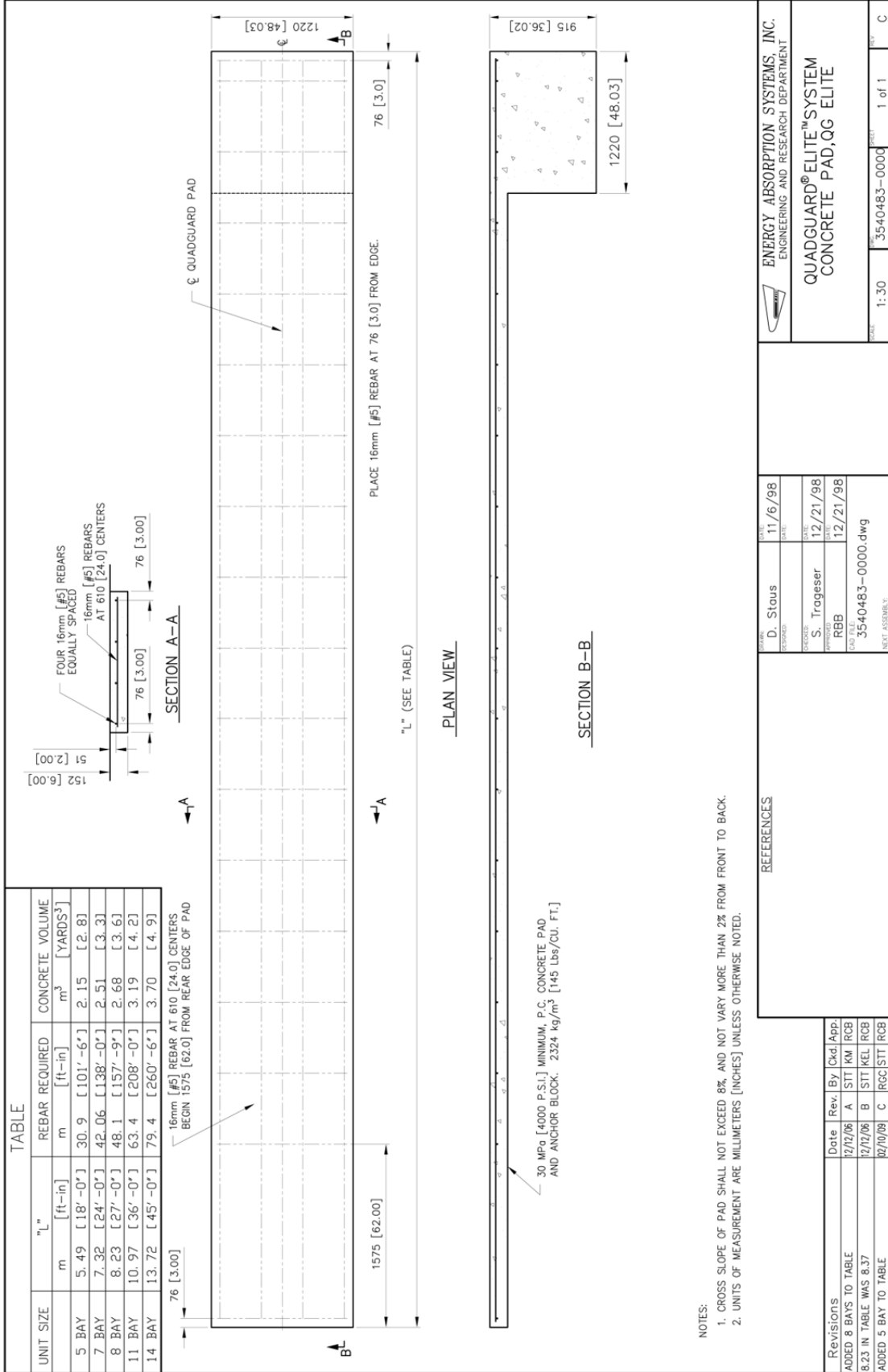
QUADGUARD® ELITE™ SYSTEM
MONORAIL ASSY, QGE
FOR 5, 7, 8, 11 & 14 BAY SYSTEMS

SCALE: 1:32

Revisions	Date	Rev. By	Chd. App.
REMOVED HOLES IN TOP VIEW, WAS 30 MPa	5/24/03	A	WML/ACF/STI
ADDED 8 BAY SYSTEM	12/12/06	B	STI/KM/SPT
ADDED 5 BAY SYSTEM	09/20/08	C	STI/KRM/JMT

QuadGuard® Elite System Monorail Assembly, QGE for 5, 7, 8, 11 & 14 Bay Systems

DWG 3540483-0000



NOTES:
1. CROSS SLOPE OF PAD SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
2. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

REFERENCES

Date	Rev.	By	Chk	App.
12/12/06	A	SIT	KM	RCB
12/12/06	B	SIT	KEEL	RCB
02/10/09	C	RGCC	STT	RCB

ADDED 8 BAYS TO TABLE

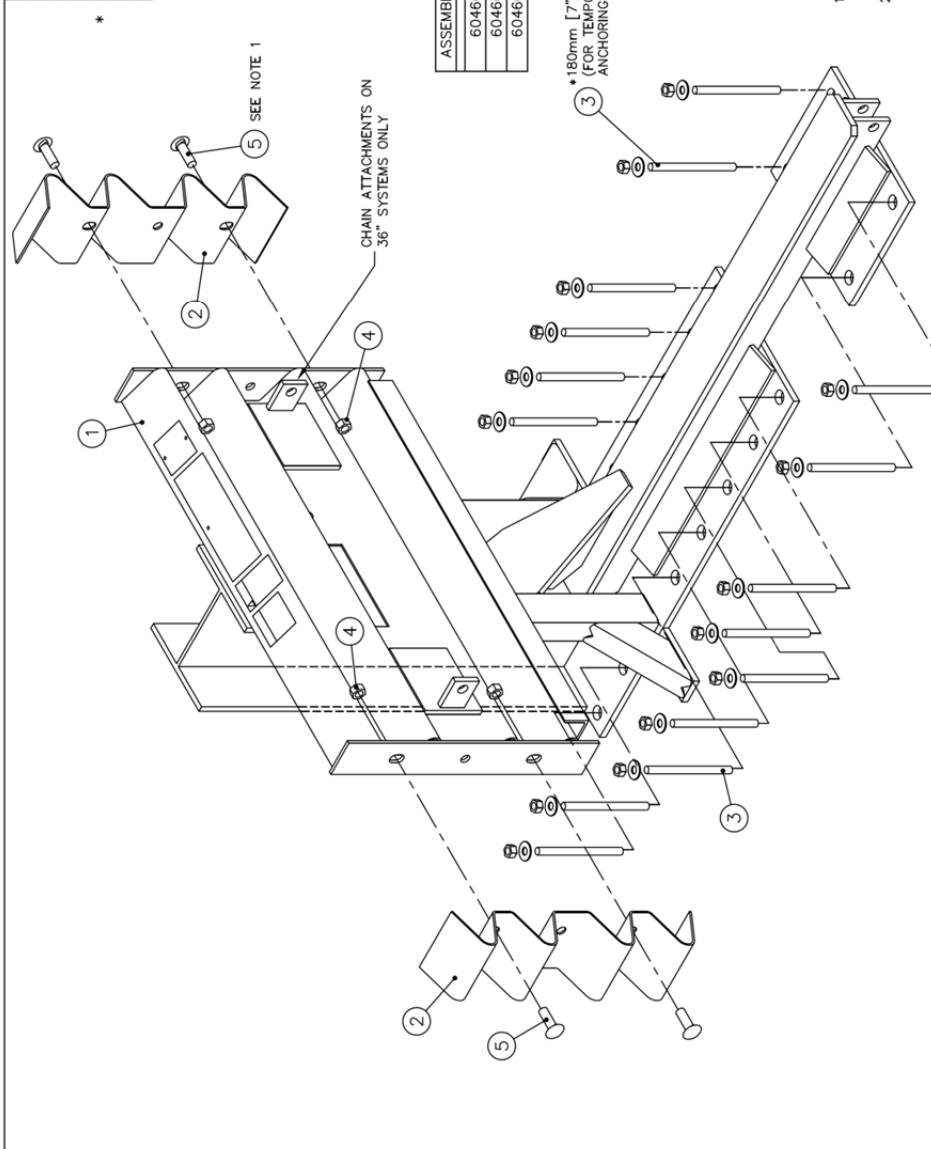
ADDED 5 BAY TO TABLE

QuadGuard® Elite System Concrete Foundation, QG Elite

DWG 604603

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	SEE TABLE	BACKUP, TS, QG ELITE, W/DECALS	1.00
2	611898G	PANEL, SIDE, QG, G	2.00
3	603673B	ANCHOR, MP-3, PT-KIT, 3/4X7, VT	3.00
4	003340G	NUT, HX, 5/8, G, RAIL	4.00
5	003400G	BOLT, RAIL, 5/8X2, G	4.00

* FOR TEMPORARY INSTALLATION, SEE NOTE BELOW AND DWG. 35-40-24L



TABLE

ASSEMBLY NO.	ITEM	PART NUMBER	DESCRIPTION
604603B		604744B	BACKUP, TS, 24, QG ELITE, W/DECALS
604604B	1	604751B	BACKUP, TS, 30, QG ELITE, W/DECALS
604605B		604764B	BACKUP, TS, 36, QG ELITE, W/DECALS

NOTES:
 1. WHEN TRANSITIONING QUADGUARD SYSTEM TO EXISTING BARRIER REFER TO THE TRANSITION ASSEMBLY DRAWINGS FOR PROPER USE OF SIDE PANEL PART NO. 2760141-0000.
 2. DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

ASSEMBLY NO. SEE TABLE

ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD® ELITE™ SYSTEM
BACKUP ASSY, TS, QGE, 24, 30, 36
SCALE N.T.S. DWG. 604603
1 of 1

REFERENCES

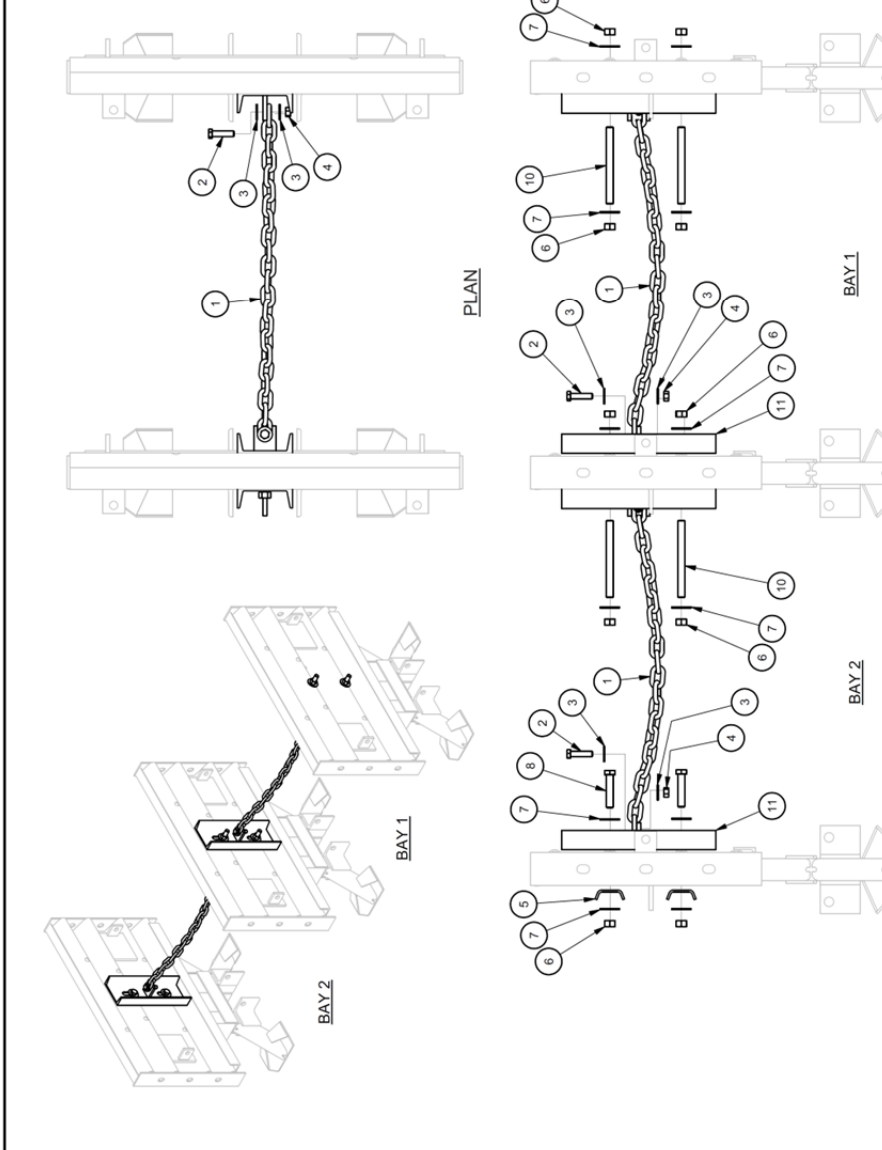
DATE 11/11/96	DATE 11/11/98
DESIGNED BY S. VAN OGLE	DESIGNED BY R. Blaski
CHECKED BY KRM	CHECKED BY KRM
APPROVED BY RBB	APPROVED BY RBB
DATE 3/19/99	DATE 3/23/99
DWG FILE 604603.dwg	NOT ASSIGNED

Revisions	Date	Rev. By	Chk'd App.
MAX 3000-2000, ADDED ANCHOR TO SECOND HOLE FROM SEAR BOTH SIDES. REMOVED NOTE & UPDATE TO DIMS (ECO 318)	11/7/11	A	WWL, JME, ST
REMOVED ITEMS 6, 7 & 8 (ECO 3737)	11/11/13	B	WWL, JME, ARV

QuadGuard® Elite System Backup Assembly, Tension Strut, QGE, 24, 30, 36

DWG 3540075-0000

ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2517915-0000	CHAIN, 3/8, GRADE 40, 29.5, G	2
2	113473G	BOLT, HX, 1/2X2.95, G	4
3	118099G	WASHER, FLAT, 1/2X1.98, G	8
4	115939G	NUT, HX, 1/2, G	4
5	2760507-0000	SHIM, NOSE CLAMP, G	2
6	115970G	NUT, HX, 5/8, G	10
7	003300G	WASHER, FLAT, 5/8 X 1.34, G	12
8	2698572-0000	BOLT, HX, 5/8X3.52, G	2
9	605449G	BRACKET, CHAIN MOUNT, VERT TAB, G	2
10	116810G	ROD, THREADED, 5/8X7.95, G	4
11	605448B	BRACKET, CHAIN MOUNT, HORIZ TAB	2



MODEL NO.	CHAIN ASSEMBLIES REQUIRED
QS2400E	1
QS3000E	1
QS3600E	1
QS2407E	1
QS3607E	1
QS3607E	1
QN4807E	1
QS6907E	NOT APPLICABLE
QS9007E	NOT APPLICABLE
QS2400E	1
QS3000E	1
QS3600E	1
QN4800E	1
QS9000E	NOT APPLICABLE
QS6900E	NOT APPLICABLE
QS2411E	1
QS3011E	1
QS3611E	1
QN4811E	1
QS6911E	NOT APPLICABLE
QS9011E	NOT APPLICABLE
QS2414E	1
QS3014E	1
QS3614E	1
QN4814E	1

* CHAIN ASSEMBLY REQUIRED IN FIRST AND SECOND BAYS ON APPLICABLE SYSTEMS (SEE TABLE A).

ASSEMBLY NO. 3540075-0000

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

CHAIN ASSY, QGE, 24, 30, 36, 48
BAY 1 AND 2

DATE	6/17/2008
BY	D. Standridge
DATE	6/4/2008
BY	Anthony Van Brocklin
DATE	7/11/2008
BY	JME
DATE	7/15/2008
BY	AVB
DATE	3540075-0000.lsw

Revision	Date	Rev	By	Chk	App
1	1/12/08	A	WVW	STT	AVB

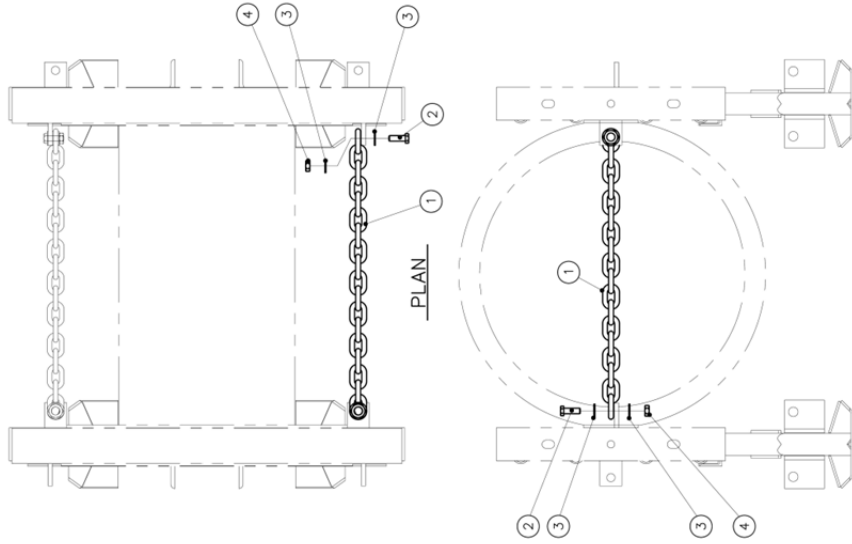
Chain Assembly, QGE, 24, 30 36 Bay 1 & 2

SCALE	1=10	SHEET	1	of	1	REV	A
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DWG 3540491-0000

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	2517212-0000	CHAIN, 3/8", GRADE 40, 31,G	1.00
2	2701210-0000	BOLT, HX, 1/2X2,G5,G	2.00
3	2708011-0000	WASHER, FLAT, 1/2X1 3/8,G	4.00
4	2704011-0000	NUT, HX, 1/2,G	2.00

TABLE A	
MODEL NO.	CHAIN ASSEMBLIES REQUIRED
QS2405E	NOT APPLICABLE
QS3005E	NOT APPLICABLE
QS3605E	6
QN4805E	6
QS6905E	6
QS9005E	6
QS2407E	NOT APPLICABLE
QS3007E	NOT APPLICABLE
QS3607E	10
QN4807E	10
QS6907E	10
QS9007E	10
QS2408E	NOT APPLICABLE
QS3008E	NOT APPLICABLE
QS3608E	12
QN4808E	12
QS6908E	12
QS9008E	12
QS2411E	NOT APPLICABLE
QS3011E	NOT APPLICABLE
QS3611E	18
QN4811E	18
QS6911E	18
QS9011E	18
QS2414E	NOT APPLICABLE
QS3014E	NOT APPLICABLE
QS3614E	24
QN4814E	24



* TWO CHAIN ASSEMBLIES REQUIRED IN ALL BAYS EXCEPT FIRST & SECOND BAYS ON APPLICABLE SYSTEMS (SEE TABLE A).

NOTE:
1. SEE TABLE A FOR QUANTITY OF CHAIN ASSEMBLIES NEEDED.

ASSY NO. 3540491-0000

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

CHAIN ASSY, QGE

DESIGNED BY	S. VAN OGLE	DATE	11/12/98
DESIGNED BY	RBB	DATE	11/12/98
DESIGNED BY	KRM	DATE	3/2/99
DESIGNED BY	RBB	DATE	3/16/99
DWG NO.	3540491-0000.DWG		
PROJECT	3540491-0000		
SCALE	1:10		
REV.	1	OF	1

REFERENCES

Revisions	Date	Rev.	By	Ckd.	App.
ADDED QN#s TO TABLE A	06/27/07	C	RCG	STT	RCB
ADDED 5 BAY TO TABLE A	02/12/09	D	RCG	STT	RCB
ITEM 2 WAS: 2701071-0000 (ECO 2694)	17/23/08	E	WML	STT	FJP

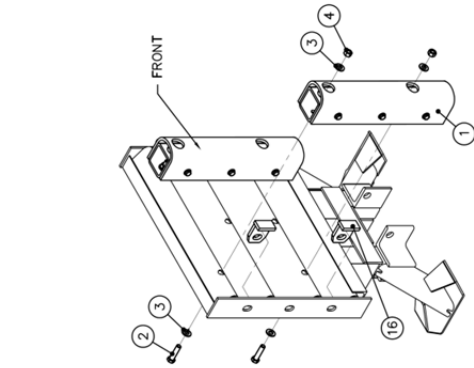
Chain Assembly, QGE

DWG 605040 Sheet 1 of 2

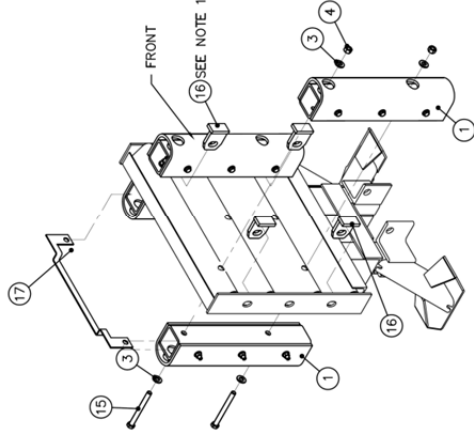
PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	RECD
1	605707B	BUMPER ASSEMBLY,ELITE,24,30,36	8.00
2	113472G	BOLT,HX,1/2X2,G2,G	4.00
3	118009G	WASHER,FLAT,1/2X1 3/8,G	24.0
4	115939G	NUT,HX,1/2,G	12.0
8	606648B	CYLINDER ASSY,ELITE,QE1	*
9	606647B	CYLINDER ASSY,ELITE,QE2	*
12	618547G	TUBE,CABLE JACKET	*
13	113851G	CABLE ASSEMBLY,CYLINDER RETAINER	*
14	114108G	CLAMP,WIRE ROPE,1/2	*
15	113487G	BOLT,HX,1/2X5,G	8.00
16	615612G	TAB,STOP	8.00
17	605463B	BRACKET,HIT INDICATOR	1.00

* SEE TABLE

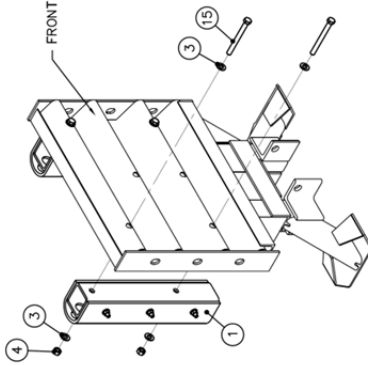
SYSTEM	ASSY NO.	ITEM NUMBER			
		8	9	12	13
5 BAY SYSTEM	605040B	3	0	6	4
7 BAY SYSTEM	605042B	3	2	10	6
8 BAY SYSTEM	605044B	3	3	12	7
11 BAY SYSTEM	605037B	3	6	18	10
14 BAY SYSTEM	605039B	3	9	24	13



DIAPHRAGM 3



DIAPHRAGM 2



DIAPHRAGM 1

NOTE:
1. PLACE ONLY ON DIAPHRAGMS 2 AND 3.

Revisions	Date	Rev	By	Chk	App
REPOSITIONED ITEM 17 TO REAR OF DIAPHRAGM	2/15/10	H	STT	KRM	FJP
ADDED BRACKET TO REAR OF DIAPHRAGM	10/17/11	1	WWL	JME	AJC
UPDATED DWG & BOM TO REFLECTS (ECO 3180)	11/13/13	J	WWL	/	/
SEE SHEET 2 (ECO 3737)					

REFERENCES

DATE	D. Status	DATE
11/13/98	RBB	11/13/98
3/19/99	KRM	3/19/99
3/23/99	RBB	3/23/99

CAD FILE: 605040.dwg
 NOT ASSEMBLY:

ASSEMBLY NO. (SEE TABLE)

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® ELITE™ SYSTEM

BAY ASSY, QGE, 24,30,36,48

SCALE: 1/15

DWG: 605040

SHEET: 1 of 2

REV: J

QuadGuard® Elite System Bay Assembly, QGE, 24, 30, 36, 48

DWG 605040 Sheet 2 of 2

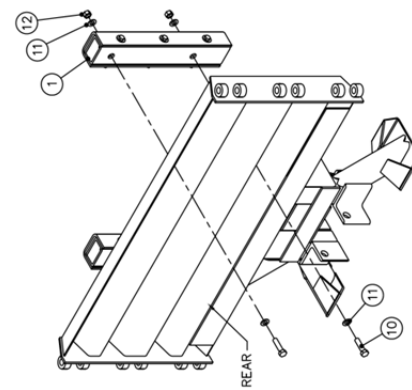
ITEM	STOCK NO.	PARTS LIST DESCRIPTION	RECD

DWG 605041 Sheet 1 of 2

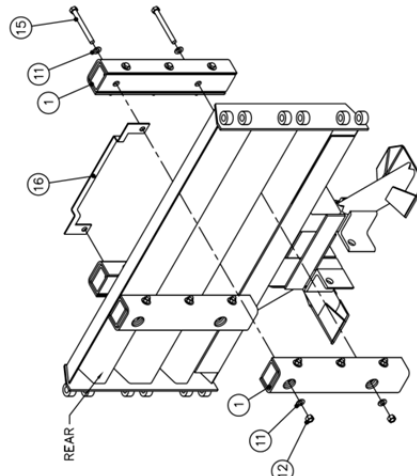
SYSTEM		ASSY NO.		ITEM NO.					
		5	6	7	8	9			
5 BAY SYSTEM	605041B	3	0	6	4	8			
7 BAY SYSTEM	605043B	3	2	10	6	12			
8 BAY SYSTEM	605045B	3	3	12	7	14			
11 BAY SYSTEM	605038B	3	6	18	10	20			

ITEM	STOCK NO.	DESCRIPTION	PARTS LIST
1	605705B	BUMPER ASSY,OG	8.00
5	606646B	CYLINDER ASSY,ELITE,OE1	*
6	606647B	CYLINDER ASSY,ELITE,OE2	*
7	618547G	TUBE,CABLE JACKET	*
8	113851C	CABLE ASSEMBLY,CYLINDER RETAINER	*
9	114108G	CLAMP,WIRE ROPE,1/2	*
10	114108G	BOLT,HX,1/2X2,G2,G	4.00
11	118009G	WASHER,FLAT,1/2X1 3/8,G	24.0
12	115939G	NUT,HX,1/2,G	12.0
15	113487G	BOLT,HX,1/2X5,G2,G	8.00
16	605463B	BRACKET,HIT INDICATOR	1.00

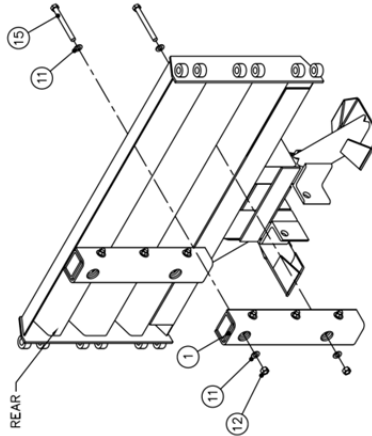
* SEE TABLE



DIAPHRAGM_3



DIAPHRAGM_2



DIAPHRAGM_1

Revisions	Date	Rev.	By	Ckd.	App.
ADDED ITEM 16 (ECO 2765)	9/18/09	F	WWL	JME	F,P
WAS 3524084-0000, ITEM 7, WAS 26727-0000	10/18/11	G	WWL	JME	A,C
REPLACED LID & BOM TO ROMACS (ECO 3186)	11/13/13	H	WWL	/	/
SEE SHEET 2					

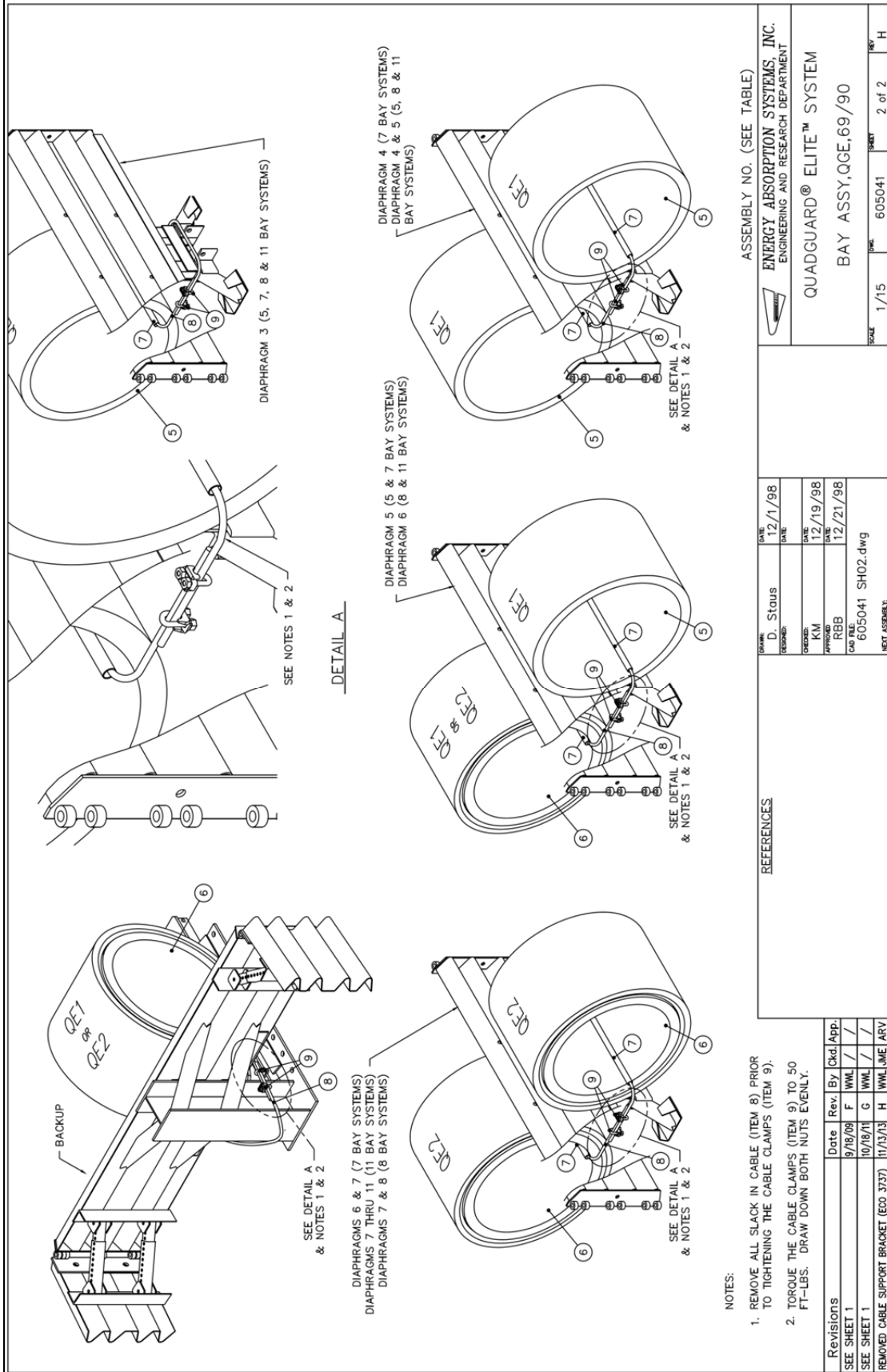
DATE	BY	DESCRIPTION
11/13/98	D. Staus	DESIGN
11/13/98	RBB	CHKD
3/19/99	KRM	APPD
3/23/99	RBB	APPD
DWG FILE: 605041.dwg		
NEXT ASSEMBLY:		

SCALE	DATE	SHEET	REV
1/15	605041	1 of 2	H

ASSEMBLY NO. (SEE TABLE)
ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT
QUADGUARD® ELITE™ SYSTEM
BAY ASSY,QGE,69/90

QuadGuard® Elite System Bay Assembly, QGE, 69/90

DWG 605041 Sheet 2 of 2



NOTES:

1. REMOVE ALL SLACK IN CABLE (ITEM 8) PRIOR TO TIGHTENING THE CABLE CLAMPS (ITEM 9).
2. TORQUE THE CABLE CLAMPS (ITEM 9) TO 50 FT-LBS. DRAW DOWN BOTH NUTS EVENLY.

Revisions	Date	Rev. By	Ckd	App.
SEE SHEET 1	9/15/09	F	WML	/
SEE SHEET 1	10/18/11	G	WML	/
REMOVED CABLE SUPPORT BRACKET (ECO 3737)	11/13/13	H	WML	JME ARV

REFERENCES

DRAWN	DATE
D. Staus	12/1/98
REVISIONS	DATE
KM	12/19/98
APPROVED	DATE
RBB	12/21/98
CAD FILE	605041 SH02.dwg
NEXT ASSEMBLY:	

ASSEMBLY NO. (SEE TABLE)	
ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
QUAGUARD® ELITE™ SYSTEM	
BAY ASSY, QGE, 69/90	
SCALE	1/15
TYPE	605041
SHEET	2 of 2
REV	H

DWG 611557

ITEM	STOCK NO.	DESCRIPTION	QTY.
1	605099B	BELT, NOSE, 84.5/8, QGE, 24&30, G	1
2	115970G	NUT, HX, 5/8, G	4
3	606699B	CYLINDER, NOSE, HDPE, 28X20	1
4	606530B	CLAMP, NOSE BELT, QG	2
5	605449B	BRACKET, CHAIN MOUNT, VERT TAB, G	1
6	614666B	STOP TAB, WRAP, WELDMENT	6
7	612263B	PLATE, NOSE CYLINDER	1
8	115539G	NUT, HX, 1/2, G	2
9	118082G	WASHER, LOCK, 1/2, G	2
10	118009G	WASHER, FLAT, 1/2X1.38, G	2
11	116810G	ROD, THREADED, 5/8X7.95, G	4
12	113478G	BOLT, HX, 1/2X3.05, G	2
13	118062G	WASHER, FLAT, 5/8 X 1.3/4, G	10
14	118870G	BOLT, HX, 5/8X2.65, G	6
15	118100G	WASHER, LOCK, 5/8, G	4
16	118614G	BOLT, RAIL, 5/8X2.95, G	6
17	003340G	NUT, HX, 5/8, G, RAIL	6

SECTION A-A
SCALE 1/10

ASSEMBLY NO. (SEE TABLE)

DESIGNED BY	S. Chioda	DATE	11/30/1998
CHECKED BY	KRM	DATE	3/2/1999
APPROVED BY	RBB	DATE	3/16/1999
FILE	611557.dwg		

ASSEMBLY NO.	ITEM 1 DESCRIPTION	ITEM 1 PART NO.	MODELS
611557B	BELT, NOSE, QGE, 2150, G	605099B	24 & 30
611558B	BELT, NOSE, QGE, 2150, Y	605100B	
611559B	BELT, NOSE, QGE, 2390, G	605105B	
611560B	BELT, NOSE, QGE, 2390, Y	605106B	36

Revision	Date	Rev	By	Chk	App.
ITEM 5 WAS: 2160010-0000 (ECO 2490)	1/13/08	C	MM	STT	AVB
ECO 3307 (ITEM 12 WAS 2701081-0000 - 14 WAS 118066)	5/22/12	D	DOWN	JME	AJC
11/02/02, UPDATED TO COMMAS (ECO 3431)	8/13/12	E	WW	JME	AVB

ENERGY ABSORPTION SYSTEMS
ENGINEERING AND RESEARCH DEPARTMENT

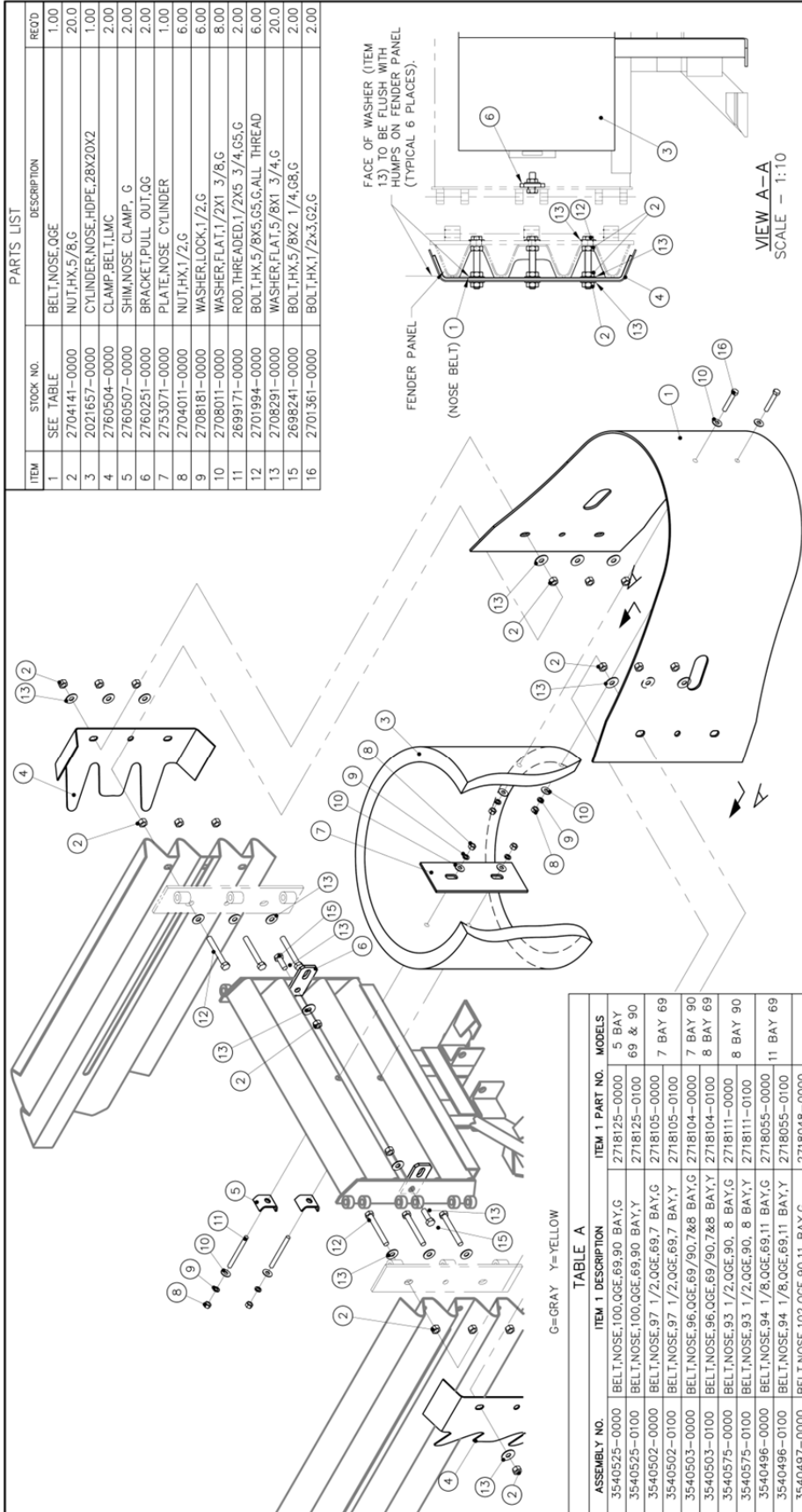
QUADGUARD® ELITE™ SYSTEM

NOSE ASSY, QGE, 24, 30 & 36, G OR Y

SCALE: 1=13 SHEET: 611557 1 of 1 REV: E

QuadGuard® Elite System Nose Assembly, QGE, 24, 30, & 36, G or Y

DWG 3540496-0000



ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	SEE TABLE	BELT, NOSE, QGE	1.00
2	2704141-0000	NUT, HX, 5/8, G	20.0
3	2021657-0000	CYLINDER, NOSE, HDPE, 28X20X2	1.00
4	2760504-0000	CLAMP, BELT, LMC	2.00
5	2760507-0000	SHIM, NOSE, CLAMP, G	2.00
6	2760251-0000	BRACKET, PULL, OUT, QG	2.00
7	2753071-0000	PLATE, NOSE, CYLINDER	1.00
8	2704011-0000	NUT, HX, 1/2, G	6.00
9	2708181-0000	WASHER, LOCK, 1/2, G	6.00
10	2708011-0000	WASHER, FLAT, 1/2X1, 3/8, G	8.00
11	2699171-0000	ROD, THREADED, 1/2X5, 3/4, G5, G	2.00
12	2701994-0000	BOLT, HX, 5/8X5, G5, G, ALL THREAD	6.00
13	2708291-0000	WASHER, FLAT, 5/8X1, 3/4, G	20.0
15	2698241-0000	BOLT, HX, 5/8X2, 1/4, GB, G	2.00
16	2701361-0000	BOLT, HX, 1/2X3, G2, G	2.00

G=GRAY Y=YELLOW

ASSEMBLY NO.	ITEM 1 DESCRIPTION	ITEM 1 PART NO.	MODELS
3540525-0000	BELT, NOSE, 100, QGE, 69, 90 BAY, G	2718125-0000	5 BAY
3540525-0100	BELT, NOSE, 100, QGE, 69, 90 BAY, Y	2718125-0100	69 & 90
3540502-0000	BELT, NOSE, 97 1/2, QGE, 69, 7 BAY, G	2718105-0000	7 BAY 69
3540502-0100	BELT, NOSE, 97 1/2, QGE, 69, 7 BAY, Y	2718105-0100	7 BAY 90
3540503-0000	BELT, NOSE, 96, QGE, 69/90, 7&8 BAY, G	2718104-0000	7 BAY 90
3540503-0100	BELT, NOSE, 96, QGE, 69/90, 7&8 BAY, Y	2718104-0100	8 BAY 69
3540575-0000	BELT, NOSE, 93 1/2, QGE, 90, 8 BAY, G	2718111-0000	8 BAY 90
3540575-0100	BELT, NOSE, 93 1/2, QGE, 90, 8 BAY, Y	2718111-0100	11 BAY 69
3540496-0000	BELT, NOSE, 94 1/8, QGE, 69, 11 BAY, G	2718055-0000	11 BAY 69
3540496-0100	BELT, NOSE, 94 1/8, QGE, 69, 11 BAY, Y	2718055-0100	11 BAY 90
3540497-0000	BELT, NOSE, 102, QGE, 90, 11 BAY, G	2718048-0000	11 BAY 90
3540497-0100	BELT, NOSE, 102, QGE, 90, 11 BAY, Y	2718048-0100	

TABLE A

REFERENCES

DESIGNED BY	S. Cholda	DATE	12/03/98
APPROVED BY	K. Mortensen	DATE	3/19/99
DATE FILED	R. Blaski	DATE	3/23/99
FILE NO.	3540496-0000.dwg		
PROJECT NO.	3540496-0000		
SHEET NO.	1 of 1		

ASSEMBLY NO. SEE TABLE

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® ELITE™ SYSTEM
NOSE ASSY, QGE, G OR Y, 69/90

Revisions	Date	Rev.	By	Ckd.	App.
ITEM 12 WAS 2699841-0000, REMOVED ITEM 14	5/22/00	B	DK	KM	SPT
ADDED 8 BAYS: CORRECTED TABLE	10/09/07	C	STI	KRM	RCB
ADDED 5 BAY TO TABLE A	10/12/08	D	RCB	STI	RCB

QuadGuard® Elite System Nose Assembly, QGE, G or Y, 69/90

DWG 3540501 Sheet 1 of 4

ITEM	STOCK NO.	DESCRIPTION	RECD
1	*	DIAPHRAGM,QB,QG,G	1.00
2	2704341-0000	NUT,HX.3/4,G,GR DH	4.00
3	2708201-0000	WASHER,LOCK,3/4,G	4.00
4	2699121-0000	BOLT,HX.3/4X2,G8,G	4.00
5	2760091-0000	MONORAIL GUIDE,QG,G	2.00
6	2760435-0000	HINGE PLATE,FENDER PANEL,QG,G	2.00
7	2701991-0000	BOLT,HX.5/8X4,G5,G	6.00
8	2704141-0000	NUT,HX.5/8,G	6.00
9	2708231-0000	WASHER,LOCK,5/8,G	6.00

* SEE TABLES A, B, C, D, E, F, G & H SHEETS 2, 3 & 4

VIEW FRONT SIDE
DIAPHRAGM #3 ONLY HAS CHAIN TABS ON THE BACK SIDE

VIEW BACK SIDE
DIAPHRAGM #1 AND #2

DATE	BY	CHKD	APP.
1/6/99	D. Staus		
1/6/99	R. Blowski		
1/15/99	KRM		
1/15/99	RBB		

DIAPHRAGM #3 ONLY HAS CHAIN TABS ON THE BACK SIDE

VIEW FRONT SIDE
DIAPHRAGM #4-1

VIEW BACK SIDE
DIAPHRAGM #1 AND #2

(SEE TABLES A, B, C, ETC.)
ASSEMBLY NO. 3540

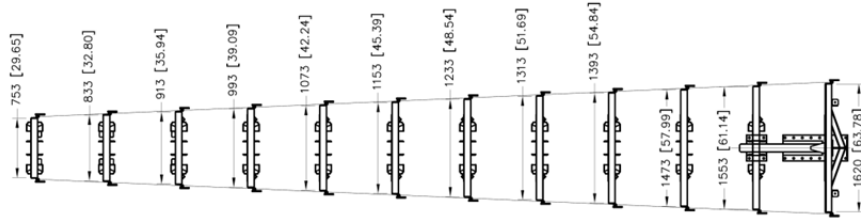
<p>REFERENCES</p>	<p>ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT</p> <p>QUADGUARD® ELITE™ SYSTEMS DIAPHRAGM ASSY, QGE,69/90</p>
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<p>Revisions</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Date</th> <th>Rev.</th> <th>By</th> <th>Chd.</th> <th>App.</th> </tr> </thead> <tbody> <tr> <td>12/04/09</td> <td>D</td> <td>WLL</td> <td>JME</td> <td>PAS</td> </tr> <tr> <td>1/14/10</td> <td>E</td> <td>DDS</td> <td>JME</td> <td>AVRE</td> </tr> <tr> <td>8/9/11</td> <td>F</td> <td>DDS</td> <td>JME</td> <td>KRM</td> </tr> </tbody> </table> <p>REMOVED BUMPERS FROM ITEM 1 (ECO 2813) ECO 2843; SEE SHEET 4 FOR CHANGES ASSEMBLY NO. WAS 354050-—</p>	Date	Rev.	By	Chd.	App.	12/04/09	D	WLL	JME	PAS	1/14/10	E	DDS	JME	AVRE	8/9/11	F	DDS	JME	KRM	<p>SCALE: 1:12</p> <p>REV: 1 of 4</p> <p style="text-align: right;">F</p>
Date	Rev.	By	Chd.	App.																	
12/04/09	D	WLL	JME	PAS																	
1/14/10	E	DDS	JME	AVRE																	
8/9/11	F	DDS	JME	KRM																	

QuadGuard® Elite System Diaphragm Assembly, QGE, 69/90

TABLE A "69"

ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-0753	DIAPHRAGM ASSY,OG,0753	2761046-0753
3540501-0833	DIAPHRAGM ASSY,OG,0833	2761046-0833
3540501-0913	DIAPHRAGM ASSY,OG,0913	2761046-0913
3540342-0993	DIAPHRAGM ASSY,OG,0993	2761042-0993
3540342-1073	DIAPHRAGM ASSY,OG,1073	2761042-1073
3540342-1153	DIAPHRAGM ASSY,OG,1153	2761042-1153
3540342-1233	DIAPHRAGM ASSY,OG,1233	2761042-1233
3540342-1313	DIAPHRAGM ASSY,OG,1313	2761042-1313
3540342-1393	DIAPHRAGM ASSY,OG,1393	2761042-1393
3540342-1473	DIAPHRAGM ASSY,OG,1473	2761042-1473
3540342-1553	DIAPHRAGM ASSY,OG,1553	2761042-1553

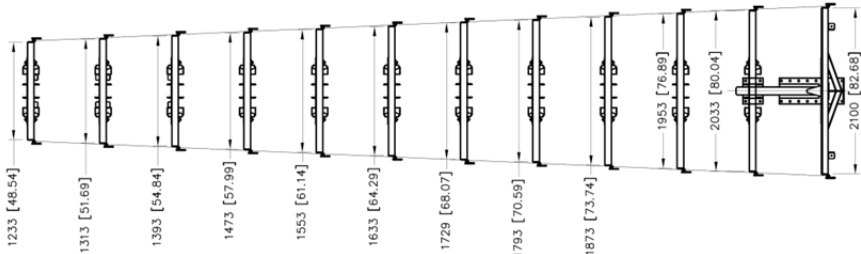


11 BAY QuadGuard Systems - 1753 (69)

NOTE: 1. DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

TABLE B "90"

ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-1233	DIAPHRAGM ASSY,OG,1233	2761046-1233
3540501-1313	DIAPHRAGM ASSY,OG,1313	2761046-1313
3540501-1393	DIAPHRAGM ASSY,OG,1393	2761046-1393
3540342-1473	DIAPHRAGM ASSY,OG,1473	2761042-1473
3540342-1553	DIAPHRAGM ASSY,OG,1553	2761042-1553
3540342-1633	DIAPHRAGM ASSY,OG,1633	2761042-1633
3540342-1729	DIAPHRAGM ASSY,OG,1729	2761042-1729
3540342-1793	DIAPHRAGM ASSY,OG,1793	2761042-1793
3540342-1873	DIAPHRAGM ASSY,OG,1873	2761042-1873
3540342-1953	DIAPHRAGM ASSY,OG,1953	2761042-1953
3540342-2033	DIAPHRAGM ASSY,OG,2033	2761042-2033



11 BAY QuadGuard Systems - 2286 (90)

REFERENCES

DATE	BY	APP.
1/6/99	D. Staus	
1/6/99	R. Blaske	
1/15/99	KRM	
1/18/99	RBB	
3540501-0000	SH02.dwg	

REVISIONS

Date	Rev.	By	Chd	App.
12/04/09	D	WML	/	/
1/14/10	E	DDS	IME	ARVB
8/9/11	F	DDS	IME	KRM

ASSEMBLY NO. 3540

(SEE TABLES A & B)

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® ELITE SYSTEMS™
DIAPHRAGM ASSEMBLY,
QGE,69/90
11 BAY

SCALE: 1=60

3540501-0000

2 of 4

QuadGuard® Elite System Diaphragm Assembly, QGE, 69/90 11 Bay

DWG 3540501 Sheet 3 of 4

TABLE C "69" (7 BAYS)			TABLE D "90" (7 BAYS)			TABLE E "69" (8 BAYS)			TABLE F "90" (8 BAYS)		
ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.	ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.	ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.	ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-1073	DIAPHRAGM ASSY.QG.1073	2761046-1073	3540501-0993	DIAPHRAGM ASSY.QG.0993	2761046-0993	3540501-0833	DIAPHRAGM ASSY.QG.0833	2761046-0833	3540501-0993	DIAPHRAGM ASSY.QG.0993	2761046-0993
3540501-1153	DIAPHRAGM ASSY.QG.1153	2761046-1153	3540501-1313	DIAPHRAGM ASSY.QG.1313	2761046-1313	3540501-1153	DIAPHRAGM ASSY.QG.1153	2761046-1153	3540501-1153	DIAPHRAGM ASSY.QG.1153	2761046-1153
3540342-1233	DIAPHRAGM ASSY.QG.1233	2761042-1233	3540342-1313	DIAPHRAGM ASSY.QG.1313	2761042-1313	3540342-1233	DIAPHRAGM ASSY.QG.1233	2761042-1233	3540342-1313	DIAPHRAGM ASSY.QG.1313	2761042-1313
3540342-1393	DIAPHRAGM ASSY.QG.1393	2761042-1393	3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473	3540342-1313	DIAPHRAGM ASSY.QG.1313	2761042-1313	3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473
3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473	3540342-1553	DIAPHRAGM ASSY.QG.1553	2761042-1553	3540342-1393	DIAPHRAGM ASSY.QG.1393	2761042-1393	3540342-1793	DIAPHRAGM ASSY.QG.1793	2761042-1793
3540342-1553	DIAPHRAGM ASSY.QG.1553	2761042-1553				3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473	3540342-1953	DIAPHRAGM ASSY.QG.1953	2761042-1953

TABLE D "90" (7 BAYS)			TABLE E "69" (8 BAYS)			TABLE F "90" (8 BAYS)		
ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.	ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.	ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-0993	DIAPHRAGM ASSY.QG.0993	2761046-0993	3540501-0833	DIAPHRAGM ASSY.QG.0833	2761046-0833	3540501-0993	DIAPHRAGM ASSY.QG.0993	2761046-0993
3540501-1153	DIAPHRAGM ASSY.QG.1153	2761046-1153	3540501-1313	DIAPHRAGM ASSY.QG.1313	2761046-1313	3540501-1153	DIAPHRAGM ASSY.QG.1153	2761046-1153
3540342-1233	DIAPHRAGM ASSY.QG.1233	2761042-1233	3540342-1313	DIAPHRAGM ASSY.QG.1313	2761042-1313	3540342-1233	DIAPHRAGM ASSY.QG.1233	2761042-1233
3540342-1393	DIAPHRAGM ASSY.QG.1393	2761042-1393	3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473	3540342-1313	DIAPHRAGM ASSY.QG.1313	2761042-1313
3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473	3540342-1553	DIAPHRAGM ASSY.QG.1553	2761042-1553	3540342-1473	DIAPHRAGM ASSY.QG.1473	2761042-1473
3540342-1553	DIAPHRAGM ASSY.QG.1553	2761042-1553				3540342-1793	DIAPHRAGM ASSY.QG.1793	2761042-1793
3540342-1793	DIAPHRAGM ASSY.QG.1793	2761042-1793	3540342-1953	DIAPHRAGM ASSY.QG.1953	2761042-1953	3540342-1953	DIAPHRAGM ASSY.QG.1953	2761042-1953

7 BAY QuadGuard Elite Systems -- 1753 (69)

7 BAY QuadGuard Elite Systems -- 2286 (90)

8 BAY QuadGuard Elite Systems -- 1753 (69)

8 BAY QuadGuard Elite Systems -- 2286 (90)

NOTE: 1-DIMENSIONS ARE IN MILLIMETERS [INCHES]
UNLESS OTHERWISE NOTED.

Revisions	Date	Rev.	By	Ckd.	App.
UPD8D 283046-153 DIAPHRAGM TO SHOW 1465 (SEE SHEET 1)	12/04/09	D	WML	JME	PAS
ECO 2843; SEE SHEET 4 FOR CHANGES	1/14/10	E	DDSI	JME	ARVB
ASSY. NO. IN CHARGE FOR 1313 AND OVERALL	8/9/11	F	DDSI	JME	KRM

REFERENCES

NO.	DESCRIPTION	DATE
1	D. Staus	1/6/99
2	R. Blaski	1/6/99
3	KRM	1/15/99
4	RBB	1/18/99
5	3540501-0000 SH03.dwg	

SCALE: 1=60

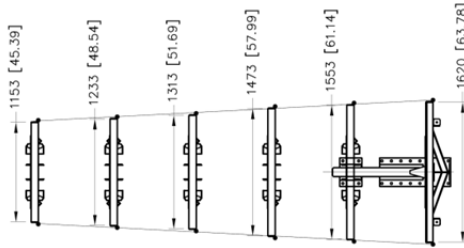
DATE: 3540501-0000

SHEET: 3 of 4

QuadGuard® Elite System Diaphragm Assembly, QGE, 69/90 7 & 8 Bay

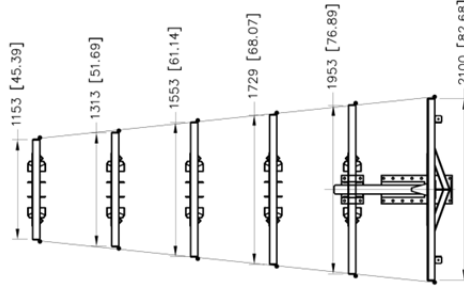
DWG 3540501 Sheet 4 of 4

TABLE G "69"		
ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-1153	DIAPHRAGM ASSY,OG,1153	2761046-1153
3540501-1233	DIAPHRAGM ASSY,OG,1233	2761046-1233
3540501-1313	DIAPHRAGM ASSY,OG,1313	2761046-1313
3540342-1473	DIAPHRAGM ASSY,OG,1473	2761042-1473
3540342-1553	DIAPHRAGM ASSY,OG,1553	2761042-1553



5_BAY_QuadGuard_Systems - 1753 (69)

TABLE H "90"		
ASSEMBLY NO.	DESCRIPTION	ITEM 1 STOCK NO.
3540501-1153	DIAPHRAGM ASSY,OG,1153	2761046-1153
3540501-1313	DIAPHRAGM ASSY,OG,1313	2761046-1313
3540501-1553	DIAPHRAGM ASSY,OG,1553	2761046-1553
3540342-1729	DIAPHRAGM ASSY,OG,1729	2761042-1729
3540342-1953	DIAPHRAGM ASSY,OG,1953	2761042-1953



5_BAY_QuadGuard_Systems - 2286 (90)

NOTE: 1. DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.

Revisions	Date	Rev	By	Ckd	App
SEE SHEET 1	12/04/08	D	WML	/	/
ECO 2843; UPDATED BOTH TABLES	1/14/10	E	DDSLJME	ARVB	
ASSEMBLY NO. WAS 3540501-	8/9/11	F	DDSLJME	KRM	

REFERENCES

DESIGNED BY	R. VENZON	DATE	06/11/09
CHECKED BY	S. TRAGESER	DATE	06/11/09
APPROVED BY	P. SEPULVEDA	DATE	06/11/09
DWG NO.	3540501-0000	SH04.DWG	
PROJECT	NEXT ASSEMBLY:		

(SEE TABLES G & H)

ASSEMBLY NO. 3540

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® ELITE SYSTEMS™
DIAPHRAGM ASSEMBLY,
QGE,69/90
5 BAY

SCALE	1=60	NO.	3540501-0000	REV	4 OF 4	REV	F
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QuadGuard® Elite System Diaphragm Assembly, QGE, 69/90 5 Bay



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