



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
8512C2023

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
PAUL REYNOLDS 304-558-0468

RFQ COPY

TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

DIVISION OF HIGHWAYS
 TRAFFIC ENGINEERING DIVISION
 BUILDING 5, ROOM A550
 1900 KANAWHA BOULEVARD EAST
 CHARLESTON, WV
 25305-0430

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
11/07/2011				

BID OPENING DATE: 11/22/2011 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		220-53		
<p>ENERGY ABSORPTION SYSTEM ATTENUATING DEVICES</p> <p>REQUEST FOR QUOTATION</p> <p>THE WEST VIRGINIA STATE DIVISION OF PURCHASING FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF HIGHWAYS IS SOLICITING BIDS TO PROVIDE ENERGY ABSORPTION SYSTEM DEVICES PER THE ATTACHED SPECIFICATIONS.</p> <p>EXHIBIT 3</p> <p>LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE UPON AWARD AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.</p> <p>UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.</p> <p>RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

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GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
5. Payment may only be made after the delivery and acceptance of goods or services.
6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.htm and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.
15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).



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<p>ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICE SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN EXHIBIT 4</p> <p>LOCAL GOVERNMENT BODIES: UNLESS THE VENDOR INDICATES IN THE BID HIS REFUSAL TO EXTEND THE PRICES, TERMS, AND CONDITIONS OF THE BID TO COUNTY, SCHOOL, MUNICIPAL AND OTHER LOCAL GOVERNMENT BODIES, THE BID SHALL EXTEND TO POLITICAL SUBDIVISIONS OF THE STATE OF WEST VIRGINIA. IF THE VENDOR DOES NOT WISH TO EXTEND THE PRICES, TERMS, AND CONDITIONS OF THE BID TO ALL POLITICAL SUBDIVISIONS OF THE STATE, THE VENDOR MUST CLEARLY INDICATE SUCH REFUSAL IN HIS BID. SUCH REFUSAL SHALL NOT PREJUDICE THE AWARD OF THIS CONTRACT IN ANY MANNER.</p> <p>REV. 3/88</p> <p>PURCHASING CARD ACCEPTANCE: THE STATE OF WEST VIRGINIA CURRENTLY UTILIZES A VISA PURCHASING CARD PROGRAM WHICH IS ISSUED THROUGH A BANK. THE SUCCESSFUL VENDOR MUST ACCEPT THE STATE OF WEST VIRGINIA VISA PURCHASING CARD FOR PAYMENT OF ALL ORDERS PLACED BY ANY STATE AGENCY AS A CONDITION OF AWARD.</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

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LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
NOTICE						
A SIGNED BID MUST BE SUBMITTED TO:						
DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130						
THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:						
SEALED BID						
BUYER:				PAUL REYNOLDS	FILE 33	
RFQ. NO.:				8512C2023		
BID OPENING DATE:				11/22/2011		
BID OPENING TIME:				01:30 P.M.		
PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:						

CONTACT PERSON (PLEASE PRINT CLEARLY):						

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Specifications

Purpose: The purpose of this contract shall be to furnish materials required for the maintenance, replacement, or installation of Energy Absorption System GREAT (Guardrail Energy Absorbing Terminal) attenuating devices, Energy Absorption System Quadguard attenuating devices, Energy Absorption System Quadguard-II attenuating devices, Energy Absorption System Quadguard-HS attenuating devices, and Trinity Industries TRACC attenuating devices.

1.0 DEFINITIONS

- A. The "Agency" shall be defined as the West Virginia Division of Highways
- B. The "Vendor" shall be defined as the successful bidder.
- C. The "Contract" shall be defined as the binding agreement that is entered into between the State of West Virginia and the Vendor to provide the services as herein specified.
- D. "Release Order" shall be defined as order placed against the Contract by the Agency.
- E. Mandatory Requirements: The terms "must", "will", "shall", "minimum", "maximum", or "is/are required" identify a mandatory item or factor. Decisions regarding compliance with any mandatory requirements shall be at the sole discretion of the State.

2.0 SCOPE OF WORK

Technical Requirements: The successful Vendor shall provide individual replacement components for Energy Absorption System GREAT (Guardrail Energy Absorbing Terminal) attenuating devices, Energy Absorption System Quadguard attenuating devices, Energy Absorption System Quadguard-II attenuating devices, Energy Absorption System Quadguard-HS attenuating devices, and Trinity Industries TRACC attenuating devices. The successful Vendor(s) shall also supply complete units upon request (excludes GREAT attenuating devices).

- 2.1 Complete descriptions of the individual parts are included as part of the bid schedule. The bid schedule also includes references to the appropriate manufacturer installation drawing, also included as part of this Contract for reference.

This Contract also includes items for the purchase of complete Quadguard, Quadguard-II, Quadguard-HS, and TRACC units for use at the Agency's discretion.

2.2 Freight

2.2.1 All shipments are to be FOB Destination.

2.2.2 The Vendor shall be responsible for all freight charges incurred as a result of the purchases under this Contract. For orders where expedited delivery is requested and authorized by the Agency, the Vendor may invoice for these charges provided that it will be given as a "pass through" cost to the Agency. No markup shall be permitted for expedited delivery. See Section 3.2.3 for more information. Note, the Agency understands that expedited delivery of GREAT system parts is normally not possible within the time frame stipulated. Therefore, any expedited delivery request associated with any Release Order which includes any parts for GREAT impact attenuating systems shall be disregarded. The Vendor shall not invoice for any extra freight charges for any such order regardless of the delivery turnaround time associated with any non-GREAT parts included as part of any such order, and the provisions of 2.3.2 shall apply.

2.3 Delivery

2.3.1 This Contract may be utilized by multiple recipients statewide, each having a unique delivery address.

2.3.2 Release Orders shall be delivered in full within a maximum of twenty-one (21) Calendar Days ARO. If the vendor is unable to deliver in full within twenty-one (21) Calendar Days, the Vendor shall be subject to a \$50.00 per Calendar Day penalty at the purchasing organizations discretion for each Calendar Day beyond twenty-one (21) Calendar Days ARO. This penalty shall be assessed by subtracting the penalty from the payment due to the Vendor upon full delivery of the Release Order.

2.3.3 All large components shall be shipped adequately secured on pallets for ease in unloading. Large components shall be easily identifiable or the packaging shall be labeled indicating the contained parts. All accessory hardware and relatively small components shall be appropriately packaged and labeled. Any material delivered not meeting the above requirements shall be subject to being returned to the Vendor at the Vendor's expense.

2.3.4 Delivery is an integral part of this contract and failure to comply will be cause to initiate a WV-82, Vendor Performance Form. This form will officially notify the West Virginia Division of Purchasing and the Vendor of unsatisfactory performance in the execution of this contract and the requirements herein.

3.0 ORDERING AND INVOICING

3.1 Release Orders

3.1.1 For all orders, the Agency will issue to the Vendor a WV-35 Release Order. Issuance of the Release Order shall contain the type of merchandise to be purchased and shall serve as the authorization to process the order.

3.2 Payment

3.2.1 The State of West Virginia currently utilizes a VISA purchasing card program which is issued through a local bank. The Vendor must accept the State of West Virginia purchasing card for payment of all orders placed against this Contract.

3.2.2 The Vendor must supply a credit card receipt, sales receipt, or cash register receipt. Charges must not be applied until merchandise is received in full by the Agency.

3.2.3 For orders where expedited delivery has been requested by the Agency per Section 2.2.2, the Vendor may add actual shipping costs (prepaid) to the invoice as a separate item. In this case, the Vendor shall attach a copy of the freight bill to the invoice sent to the Agency. All such orders shall be delivered in full within ten (10) Calendar Days ARO. If any such order is not received in full within ten (10) Calendar Days ARO, the Vendor may not add shipping costs as described above to the invoice and the order will be treated as a normal non-expedited order with the provisions of Section 2.3.2 to apply.

4.0 AWARD

4.1 Contract Sections

4.1.1 This Contract shall be awarded in its' entirety. The Vendor shall be required to provide a bid for all Items listed.

BID SCHEDULE

The following estimated quantities are for bid purposes only. Actual quantities will be determined by the needs of the West Virginia Division of Highways and may be increased or decreased:

ITEM NUMBER	ESTIMATED QUANTITY	DESCRIPTION	PART DETAIL SHEET(S)	COST	(DOH USE ONLY) INVENTORY SUBCODE
		Energy Absorption Systems GREAT Attenuators			
		GREAT panels and parts			
1	1	GREAT thrie-beam fender panel w/ connection to diaphragm hardware, mushroom bolt assembly, and deflector assembly	5		311000
2	1	GREAT complete mushroom bolt and deflector assembly	5		312000
3	1	GREAT concrete block backup deflector panel w/ connection to fender panel hardware	14		313000
4	1	GREAT concrete block backup side panel w/ connection to fender panel hardware	8		NA
5	1	GREAT steel backup side panel w/ connection to backup hardware	11, 12		NA
6	1	GREAT extension panel w/ connection to backup and thrie to w-beam panel hardware	14		314000
7	1	GREAT NJ barrier backup left side 4" offset transition panel w/ support bracket, connection to support bracket hardware, and connection to steel backup hardware	11		315000
8	1	GREAT NJ barrier backup right side 4" offset transition panel w/ support bracket, connection to support bracket hardware, and connection to steel backup hardware	11		316000
9	1	GREAT thrie beam to w-beam transition panel w/ connection to extension panel and w-beam hardware	14		317000
		GREAT diaphragms and parts			
10	1	GREAT 24" diaphragm w/ cable guide assembly and cable guide connection h/w	4		321000
11	1	GREAT 30" diaphragm w/ cable guide assembly and cable guide connection h/w	4		322000
		GREAT restraining cables and parts			
12	1	GREAT 5 bay restraining cable w/ connection hardware and 6 ea. 3x3x1/4 washer bars	6		331000
13	1	GREAT 6 bay restraining cable w/ connection hardware and 6 ea. 3x3x1/4 washer bars	6		332000
14	1	GREAT 7 bay restraining cable w/ connection hardware and 6 ea. 3x3x1/4 washer bars	6		333000
15	1	GREAT cable guide assembly w/ connection to diaphragm hardware	4		NA
16	1	GREAT front anchor plate for restraining cable w/ connection to foundation MP-3 anchors	6		NA
17	1	GREAT rear anchor plate for restraining cable w/ connection to foundation MP-3 anchors	6		NA
		GREAT nose cover and parts			
18	1	GREAT nose cover w/ connection to diaphragm hardware (does not include legs)	3		341000
19	1	GREAT nose support legs (2 ea.) w/ tabs and connection to nose cover hardware	3		342000
		GREAT chain rail assemblies and parts			
20	1	GREAT 8 ft. 11 in. "A" chain rail section w/ proof coil chains	7		NA
21	1	GREAT 9 ft. 3-1/4 in. "A" chain rail section w/ proof coil chains	7		NA
22	1	GREAT 18 ft. "B" chain rail section w/ proof coil chains	7		NA
23	1	GREAT 9 ft. "B" or "C" chain rail section w/ proof coil chains	7		351000
24	1	GREAT 3 ft. "C" chain rail section w/ proof coil chains	7		352000
25	1	GREAT 6 ft. "C" chain rail section w/ proof coil chains	7		353000
26	1	GREAT proof coil chain w/ clevis & keeper pin	7		354000

GREAT backups and parts					
27	1	GREAT NJ barrier 30" metal backup	10		NA
28	1	GREAT NJ barrier 24" uni-directional metal backup	9		NA
29	1	GREAT NJ barrier 24" bi-directional metal backup	10		NA
30	1	GREAT NJ barrier 30" metal backup right attachment bracket w/ attachment to metal backup hardware	10		NA
31	1	GREAT NJ barrier 30" metal backup left attachment bracket w/ attachment to metal backup hardware	10		NA
32	1	GREAT NJ barrier 24 inch uni-directional metal backup right attachment bracket w/ attachment to metal backup hardware (for barrier measuring 6 inches at top)	9		NA
33	1	GREAT NJ barrier 24 inch uni-directional metal backup left attachment bracket w/ attachment to metal backup hardware (for barrier measuring 6 inches at top)	9		NA
34	1	GREAT NJ barrier 24 inch uni-directional metal backup right attachment bracket w/ attachment to metal backup hardware for NJ barrier measuring 7 to 16 inches at top)	9		NA
35	1	GREAT NJ barrier 24 inch uni-directional metal backup left attachment bracket w/ attachment to metal backup hardware for NJ barrier measuring 7 to 16 inches at top)	9		NA
36	1	GREAT NJ barrier 24 inch bi-directional metal backup right attachment bracket w/ attachment to metal backup hardware	10		NA
37	1	GREAT NJ barrier 24 inch bi-directional metal backup left attachment bracket w/ attachment to metal backup hardware	10		NA
38	1	GREAT w-beam post steel backup w/ connection to w-beam post hardware	12		NA
39	1	GREAT 24" tension strut backup w/ 9 ft. 3-1/4 in. section "A" chain rail w/ proof coil chains (24" units)	13		NA
40	1	GREAT 30" tension strut backup w/ 9 ft. 3-1/4 in. section "A" chain rail w/ proof coil chains (30" units)	13		NA
GREAT cartridges and parts					
41	1	GREAT Hexfoam II Type 51 cartridge	NA		371000
42	1	GREAT concrete block backup cartridge support bracket	8		NA
43	1	GREAT NJ barrier metal backup cartridge support bracket w/ connection hardware	11		NA
Energy Absorption Systems Quadguard Attenuators					
Quadguard 24" to 36" units					
Quadguard diaphragms and parts (24" to 36")					
44	1	Quadguard 24" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	15		811100
45	1	Quadguard 30" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	15		811200
46	1	Quadguard 36" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	15		811300
Quadguard nose cover and parts (24" to 36")					
47	1	Quadguard yellow bell nose cover w/ cartridge support bracket, nose support legs, nose attachment brackets, pull-out brackets, and connection to diaphragm hardware (fits 24" and 30" units)	16		812100
48	1	Quadguard yellow bell nose cover w/ cartridge support bracket, nose support legs, nose attachment brackets, pull-out brackets, and connection to diaphragm hardware (fits 36" units)	16		812100

		Quadguard backups and parts (24" to 36")			
49	1	Quadguard 24" tension strut backup with cartridge support bracket, side panel, and side panel connection hardware.	19		NA
50	1	Quadguard 30" tension strut backup with cartridge support bracket, side panel, and side panel connection hardware.	19		NA
51	1	Quadguard 36" tension strut backup with cartridge support bracket, side panel, and side panel connection hardware.	19		NA
52	1	Quadguard concrete block backup 24" front face w/ side panel and side panel connection hardware.	20		NA
53	1	Quadguard concrete block backup 30" front face w/ side panel and side panel connection hardware.	20		NA
54	1	Quadguard concrete block backup 36" front face w/ side panel and side panel connection hardware.	20		NA
		Quadguard panels and parts (24" to 36")			
55	1	Quadguard quad beam to w-beam transition panel w/ diagonal brace, diagonal brace connection hardware, and connection to post #2 bar washers (24" unit)	23		814100
56	1	Quadguard quad beam to w-beam transition panel w/ diagonal brace, diagonal brace connection hardware, brace blockouts, and connection to post #2 bar washers (30" unit)	23		814200
57	1	Quadguard quad beam to w-beam transition panel w/ diagonal brace, diagonal brace connection hardware, brace blockouts, and connection to post #2 bar washers (36" unit)	23		814300
58	1	Quadguard quad beam to thrie beam transition panel w/ diagonal brace, diagonal brace connection hardware, and connection to post #2 bar washers (24" unit)	24		814400
59	1	Quadguard quad beam to thrie beam transition panel w/ diagonal brace, diagonal brace connection hardware, brace blockouts, and connection to post #2 bar washers (30" unit)	24		814500
60	1	Quadguard quad beam to thrie beam transition panel w/ diagonal brace, diagonal brace connection hardware, brace blockouts, and connection to post #2 bar washers (36" unit)	24		814600

		Quadguard 69" and 90" units			
		Quadguard diaphragms and parts (69" and 90" units)			
61	1	Quadguard 26.50" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821100
62	1	Quadguard 26.95" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821110
63	1	Quadguard 32.80" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821120
64	1	Quadguard 35.94" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821130
65	1	Quadguard 39.09" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821140
66	1	Quadguard 42.24" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821150
67	1	Quadguard 45.39" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides (NOTE: For 120" units, use Item #89)	26		821160
68	1	Quadguard 48.54" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821170
69	1	Quadguard 50.12" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821180
70	1	Quadguard 51.69" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821190
71	1	Quadguard 54.84" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821200
72	1	Quadguard 57.99" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821210
73	1	Quadguard 59.57" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821220
74	1	Quadguard 61.14" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821230
75	1	Quadguard 64.29" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821240
76	1	Quadguard 68.07" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821250
77	1	Quadguard 70.59" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821260
78	1	Quadguard 73.74" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821270
79	1	Quadguard 76.89" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821280
80	1	Quadguard 80.04" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		821290
		Quadguard nose cover and parts (69" and 90" units)			
81	1	Quadguard 69" yellow belt nose cover w/ cartridge support bracket, nose attachment brackets, pullout brackets, nose attachment hardware, pullout bracket hardware, and nose attachment bracket hardware (fits 69" 3-7 bay units)	27		822100
82	1	Quadguard 90" yellow belt nose cover w/ cartridge support bracket, nose attachment brackets, pullout brackets, nose attachment hardware, pullout bracket hardware, and nose attachment bracket hardware (fits 69" to 90" units)	27		822100

		Quadguard backups and parts (69" and 90")			
83	1	Quadguard tension strut backup w/ side panel, hinge plates, telespar struts, cartridge support bracket, support bracket locking bar, and connection hardware (69" unit)	29		NA
84	1	Quadguard tension strut backup w/ side panel, hinge plates, telespar struts, cartridge support bracket, support bracket locking bar, and connection hardware. (90" unit)	29		NA
85	1	Quadguard concrete block backup front face w/ hinge plate, side panel, telespar struts, and connection hardware. (69" unit)	30		NA
86	1	Quadguard concrete block backup front face w/ hinge plate, side panel, telespar struts, and connection hardware. (90" unit)	30		NA
		Quadguard panels and parts (69" and 90")			
87	1	Quadguard quad beam to w-beam transition panel w/ pivot support bracket, support bracket hardware, and connection to post #2 bar washers (69" and 90" units)	31		824100
88	1	Quadguard quad beam to thrie beam transition panel w/ pivot support bracket, support bracket hardware, and connection to post #2 bar washers (69" and 90" units)	32		824200
		Quadguard 120" units			
		Quadguard diaphragms and parts (120" units)			
89	1	Quadguard 45.39" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	35		841100
NA	NA	Quadguard 57.99" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides USE LINE ITEM 72	26	NA	NA
NA	NA	Quadguard 70.59" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides USE LINE ITEM 77	26	NA	NA
90	1	Quadguard 82.68" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		841200
91	1	Quadguard 95.31" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		841250
92	1	Quadguard 108" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides	26		841300
		Quadguard backups and parts (120" units)			
93	1	Complete Quadguard tension strut backup w/ center section, right section, left section, side panels, hinge plates, telespar struts, cartridge support bracket, support bracket locking bar, and all connection hardware	33		NA
94	1	Replacement 120" Quadguard tension strut backup right section w/ side panels, hinge plates, telespar struts, and all required connection h/w	33		NA
95	1	Replacement 120" Quadguard tension strut backup left section w/ side panels, hinge plates, telespar struts, and all required connection h/w	33		NA
		Quadguard nose cover and parts (120" units)			
96	1	Quadguard 120" yellow bell nose cover w/ cartridge support bracket, nose attachment brackets, pullout brackets, nose attachment hardware, pullout bracket hardware, and nose attachment bracket hardware (fits 120" units)	27 (installation similar)		842100

		Energy Absorption Systems Quadguard - HS Attenuators		
		Quadguard-HS 24" to 36" units		
		Quadguard-HS diaphragms and parts (24" to 36")		
NOTE: SPECIAL DIAPHRAGMS AND DIAPHRAGM COMPONENTS FOR DIAPHRAGMS 1 THRU 3 FROM THE FRONT ARE LISTED BELOW. FOR ALL OTHER PARTS, USE				
97	1	Quadguard-HS 24" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides (diaphragms 1 thru 3 only)	34	851100
98	1	Quadguard-HS 30" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides (diaphragms 1 thru 3 only)	34	851200
99	1	Quadguard-HS 36" diaphragm w/ monorail guides, cartridge support brackets, and hardware for guides (diaphragms 1 thru 3 only)	34	851300
100	1	Diaphragm #3 bumper assembly with bumper and hardware (for 24" to 36" units)	62	NA
101	1	Diaphragm #2 bumper/spacer assembly with bumper, spacer, and hardware (for 24" to 36" units)	62	NA
102	1	Diaphragm #1 spacer assembly with spacer and hardware (for 24" to 36" units)	62	NA
		Quadguard-HS nose covers (24" to 36")		
103	1	Quadguard-HS yellow bell nose cover w/ nose attachment brackets, pull-out brackets, and connection to diaphragm hardware (fits 24" and 30" units)	80/81	852100
104	1	Quadguard-HS yellow bell nose cover w/ nose attachment brackets, pull-out brackets, and connection to diaphragm hardware (fits 36" units)	80/81	852200
105	BLANK			
106				
		Quadguard common parts (all units)		
		Quadguard panels and parts (all units)		
107	1	Quadguard mushroom bolt assembly	17	831100
108	1	Quadguard fender panel w/ connection to diaphragm hardware and mushroom bolt assembly	17	831200
109	1	Quadguard NJ barrier backup left side 4 inch offset transition panel w/ support bracket, and connection to support bracket hardware.	22	831300
110	1	Quadguard NJ barrier backup right side 4 inch offset transition panel w/ support bracket, and connection to support bracket hardware.	22	831400
111	1	Quadguard NJ barrier backup left side 9 inch offset transition panel w/ support bracket, and connection to support bracket hardware. (not to be used for traffic approaching rear of unit)	NA	NA
112	1	Quadguard NJ barrier backup right side 9 inch offset transition panel w/ support bracket and connection to support bracket hardware. (not to be used for traffic approaching rear of unit)	NA	NA
		Quadguard backups and parts (all units)		
113	1	Quadguard concrete block backup end shoe attachment w/connection to block MP-3 anchors	21	832100
114	1	Quadguard concrete block backup wheel deflector w/ connection to block MP-3 anchors	25	832200
		Quadguard monorails and parts (all units)		
115	1	Quadguard one bay monorail section	18, 28	833100
116	1	Quadguard two bay monorail section	18, 28	833200
117	1	Quadguard three bay monorail section	18, 28	833300
118	1	Quadguard monorail end cap w/ connection to monorail hardware	18, 28	833400
		Quadguard cartridges (all units)		
119	1	Quadguard type I cartridge	NA	834100
120	1	Quadguard type II cartridge	NA	834200
		Quadguard miscellaneous parts (all units)		
121	1	Quadguard diaphragm cartridge support bracket	26	835100
122	1	Quadguard flex belt nose clamp	16 / 27 / 79	NA

		Energy Absorption Systems Quadguard II Attenuators		
		Quadguard II 24" to 48" units		
		Quadguard II diaphragms and parts (24" to 48")		
NOTE: THE STANDARD 48" QUADGUARD DIAPHRAGM BELOW IS UNIQUE TO THE QUADGUARD II SYSTEM, BUT ONLY BASED ON ITS' WIDTH. STANDARD				
123	1	Quadguard-II 48" diaphragm w/ monorail guides, cartridge support brackets, monorail shims, and hardware for guides	15	861100
124	1	Quadguard II diaphragm shim for 24" to 48" diaphragms (2 ea. required for each diaphragm)	85	NA
		Quadguard II nose cover and parts (24" to 48")		
125	1	Quadguard II "narrow" yellow metal nose cover w/ cartridge support brackets and connection to diaphragm hardware (fits 24" to 48" units) * see item 126 for additional part for 48" unit noses	82	862100
126	1	Quadguard II "narrow" yellow metal nose cover 12" spacer with connection hardware. (supplemental part required for nose covers used with 48" design width units)	83	862200
		Quadguard II 69" to 120" units		
		Quadguard II nose cover and parts (69" to 120")		
127	1	Quadguard II "wide" yellow metal nose cover w/ cartridge support brackets and connection to diaphragm hardware (fits 69" to 120" units)	84	863100

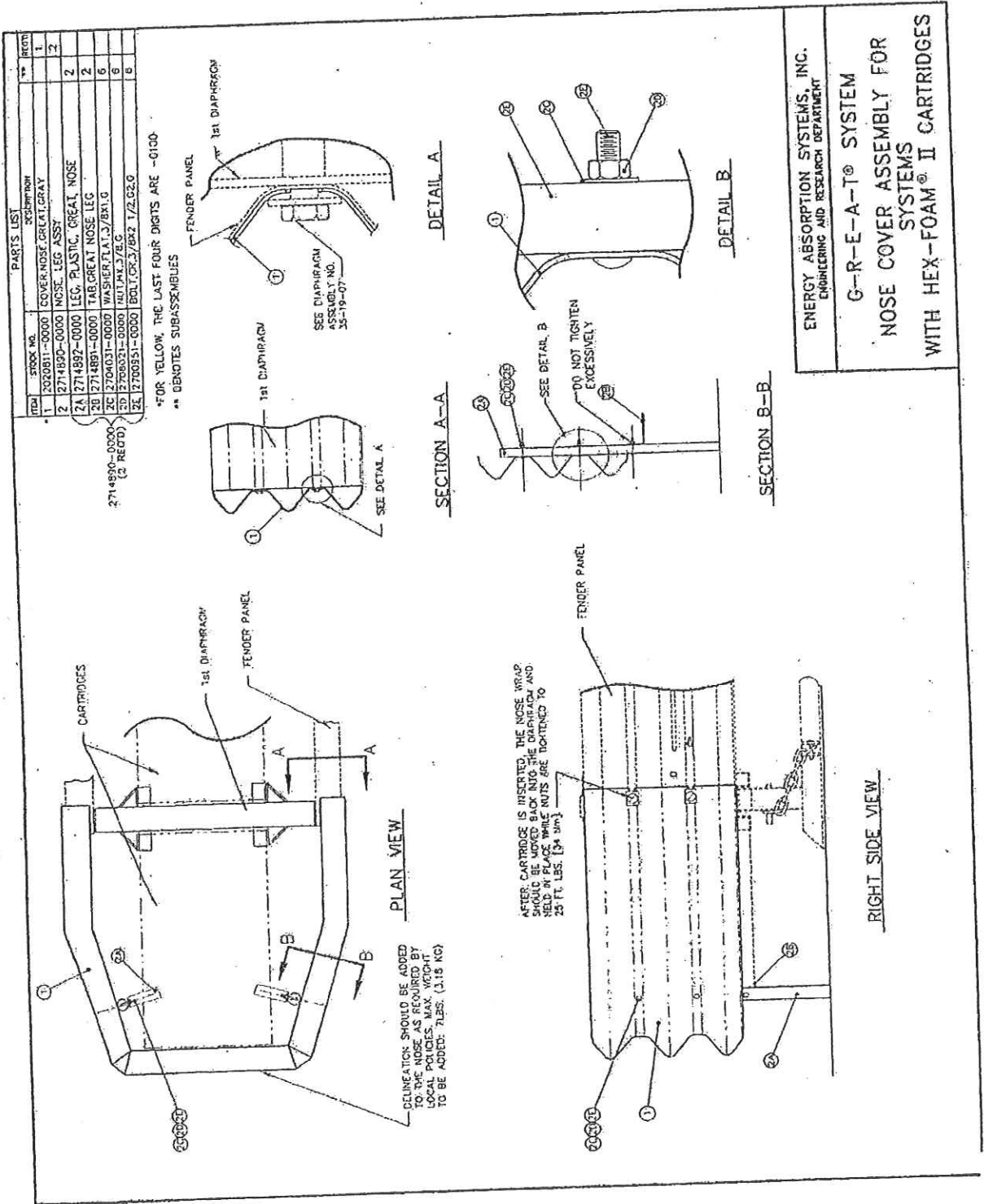
142	1	Quadguard unit, 6-bay, 90" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
143	1	Quadguard unit, 6-bay, 120" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
144	1	Quadguard unit, 6-bay, 24" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
145	1	Quadguard unit, 6-bay, 30" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
146	1	Quadguard unit, 6-bay, 36" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
147	1	Quadguard unit, 6-bay, 69" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
148	1	Quadguard unit, 6-bay, 90" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
149	1	Quadguard unit, 6-bay, 120" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
150	1	Quadguard-HS unit, 24" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
151	1	Quadguard-HS unit, 30" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
152	1	Quadguard-HS unit, 36" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
153	1	Quadguard-HS unit, 24" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
154	1	Quadguard-HS unit, 30" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
155	1	Quadguard-HS unit, 36" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA

170	1	Quadguard-II unit, 6-bay, 126" width, concrete backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
171	1	Quadguard-II unit, 5-bay, 24" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
172	1	Quadguard-II unit, 5-bay, 30" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
173	1	Quadguard-II unit, 5-bay, 36" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
174	1	Quadguard-II unit, 5-bay, 48" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
175	1	Quadguard-II unit, 5-bay, 69" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
176	1	Quadguard-II unit, 5-bay, 90" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA
177	1	Quadguard-II unit, 6-bay, 126" width, tension strut backup installation (to include all parts, components, hardware, anchoring studs, and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA		NA

		Trinity Industries TRACC Attenuators		
		TRACC common parts		
		Base components		
178	1	TRACC base module assembly (part # 25982A) pre-assembled w/ cross ties, nut holder plates, & shoulder studs. Does not include rip plates or doubler plates.	49, 50	NA
179	1	Left end shoe (part # 25955A) w/ attachment h/w	49, 50	NA
180	1	Right end shoe (part # 25954A) w/ attachment h/w	49, 50	NA
181	1	Front anchor weldment (part # 25956A) w/ attachment h/w.	49, 50	NA
182	1	3'-1" rear extension plate (part # 25961G) w/ attachment h/w (for 9-bay units)	49, 50	NA
183	1	2'-0 1/2" rear extension plate (part # 25995G) w/ attachment h/w (for 6-bay units)	55, 56	NA
		9-bay unit rip plate components		
184	1	Rip plate, stage 3, bottom (part # 25964G)	49, 50	211100
185	1	Rip plate, stage 3, middle (part # 25965G)	49, 50	211150
186	1	Rip plate, stage 3, top (part # 25966G)	49, 50	211200
187	1	Rip plate, stage 2, (part # 25963G)	49, 50	211250
		6-bay unit rip plate components		
188	1	Rip plate, stage 3, bottom (part # 25993G)	55, 56	211300
189	1	Rip plate, stage 3, middle (part # 25992G)	55, 56	211350
190	1	Rip plate, stage 3, top (part # 25991G)	55, 56	211400
191	1	Rip plate, stage 2, (part # 25990G)	55, 56	211450
		doubler plates		
192	1	doubler plate (part # 25960G) w/ removable bolts.	49, 50	211500
193	1	11-1/2" rear doubler plate for 6-bay unit only (part # 25996G) w/ removable bolts	55, 56	211550
		fender panels		
194	1	"two-bay" fender panel (part # 25973) w/ attachment to diaphragm and adjacent fender panel h/w	51, 52, 53, 54	212100
195	1	"one-bay" fender panel (part # 25974) w/ attachment to diaphragm and adjacent fender panel h/w	51, 52, 53, 54	212150
		sled and frames (diaphragms)		
196	1	24" frame (diaphragm) (part # 25971)	51, 52, 53, 54	213100
197	1	24" front sled (part # 25970) w/ shredder assembly (part # 25975) pre-assembled	51, 52, 53, 54	213150
198	1	shredder assembly (part # 25975) w/ hitch pin clip (part # 3253) and 3/4" x 2" clevis pin (part # 4425)	51, 52, 53, 54	213200
199	1	24" end frame (part # 25972A) w/ connection to 24" concrete block h/w, connection to NJ shape h/w (including transition adaptor (part # PC33356G) & adaptor connection to wall h/w), & connection to constant slope barrier h/w.	43, 44, 45, 46, 47, 48, 51, 52	NA
200	1	end frame (part # 33405 - 1/2 of split end frame for 33" and 39" units) w/ connection to barrier h/w (33" and 39" only)	57, 58	NA
201	1	1-1/2" WT-Frame extension (part # 33406) w/ connection to frame h/w (33" units only)	57, 58	213250
202	1	3" WT-Frame extension (part # 33471) w/ connection to frame h/w (39" units only)	59, 60, 61	213300
203	1	WT-Joint plate (part # 33467) w/ 3x1/4 fender panel plate and connection h/w (39" units only)	59, 60, 61	213350
		TRACC to w-beam transition components		
204	1	Lower and Upper W-beam (part # PC33344A) w/ connection to end frame h/w & splice connection h/w	36, 37	214100
205	1	W-beam (part # PC105G) w/ splice connection h/w	36, 37	214150
206	1	Backup post (post #1) (part # PC564G) w/ connection to end frame h/w	36, 37	NA
207	1	Backup post (post #1) w/ end plate (part # PC33345A) w/ connection to end frame h/w	38	NA
208	1	Support post (post # 2, 3) (part # PC33393G)	36, 37	NA
209	1	Support post (post # 4-9) (part # PC33346G)	36, 37	NA
210	1	Wood block (part # PC6144B) w/ connection to support post and beam h/w	36, 37	NA
211	1	Wood block (part # PC6142B) w/ connection to support post and beam h/w	36, 37	NA
212	1	Wood block (part # PC6145B) w/ connection to support post and beam h/w	36, 37	NA
213	1	Wood block (part # PC6146B) w/ connection to support post and beam h/w	36, 37	NA
214	1	Wood block (part # PC6147B) w/ connection to support post and beam h/w	36, 37	NA
215	1	Wood block (part # PC6143B) w/ connection to support post and beam h/w	36, 37	NA
216	1	Wood block (part # PC6141B) w/ connection to support post and beam h/w	36, 37	NA

		TRACC to thrie beam transition components		
217	1	Right transition panel (part # PC33371A) w/ connection to end frame h/w and splice h/w	39, 40	214200
218	1	Left transition panel (part # PC33372A) w/ connection to end frame h/w and splice h/w	39, 40	214250
219	1	Backup post (post #1) (part # PC564G) w/ connection to end frame h/w	39, 40	NA
220	1	Backup post (post #1) w/ end plate (part # PC33345A) w/ connection to end frame h/w	41	NA
221	1	Steel Support post (post # 2-4) (part # PC33346G)	39, 40	NA
222	1	Wood block (part # PC6143) w/ connection to support post and beam h/w (for use w/ steel supports)	39, 40	NA
223	1	Wood Support post (post # 2-4) (part # PC6137B)	42	NA
224	1	Wood block (part # PC6138B) w/ connection to support post and beam h/w (for use with wood supports)	42	NA
		TRACC to 24" concrete block transition components		
225	1	24" concrete block end shoe (part # PC33367G) w/ connection to barrier h/w	43, 44	214300
		TRACC to NJ barrier transition components		
226	1	Lower W-beam (part # PC33360A) w/ connection to end frame h/w	45, 46	214350
227	1	Lower terminal (part # PC33380G) w/ connection to barrier and beam h/w	45, 46	214400
228	1	Upper W-beam (part # PC33359A) w/ connection to end frame h/w, wood blocks (part numbers PC6135B and PC6136B), and wood block connection h/w	45, 46	214450
229	1	Upper terminal (part # PC33380G) w/ connection to barrier and beam h/w	45, 46	214500
		TRACC to single slope barrier components		
230	1	Lower W-beam (part # PC33360A) w/ connection to end frame h/w.	47, 48	214550
231	1	Upper W-beam (part # PC33359A) w/ connection to end frame h/w, wood blocks (part numbers PC6533B and PC6534B), and wood block connection h/w	47, 48	214600
232	1	Upper and Lower terminal (part # PC926G) w/ connection to barrier and beam h/w	47, 48	214650
		TRACC miscellaneous hardware		
233	1	1/2" cable clamp (part # 4324)	59, 60, 61	215100
234	1	WT-cable clamp plate (part # 33470)	59, 60, 61	215150
235	1	1/2" cable (part # 6713)	59, 60, 61	215200
236	1	plate washer assembly w/ 5/8 bolt (part # 5306), 3 ea. plate washers (part # 19737), 5/8 fw (part # 4372), and 5/8 nut (part # 3361)	51, 52, 53, 54	215250
		TRACC nose cover		
237	1	TRACC plastic nose piece w/ attachment hardware (part # 6532B)	59	215300
		Complete TRACC Units		
238	1	TRACC unit, NCHRP-350 Test Level 2, 24" width, to be delivered pre-assembled (to include all anchoring studs and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
239	1	TRACC unit, NCHRP-350 Test Level 3, 24" width, to be delivered pre-assembled (to include all anchoring studs and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
240	1	TRACC unit, NCHRP-350 Test Level 2, 30" width, to be delivered pre-assembled (to include all anchoring studs and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA
241	1	TRACC unit, NCHRP-350 Test Level 3, 30" width, to be delivered pre-assembled (to include all anchoring studs and anchoring stud epoxy required for concrete installation) THIS ITEM MAY ONLY BE ORDERED BY THE TRAFFIC ENGINEERING DIVISION	NA	NA

**PAGES 1 THROUGH 2
NOT INCLUDED**



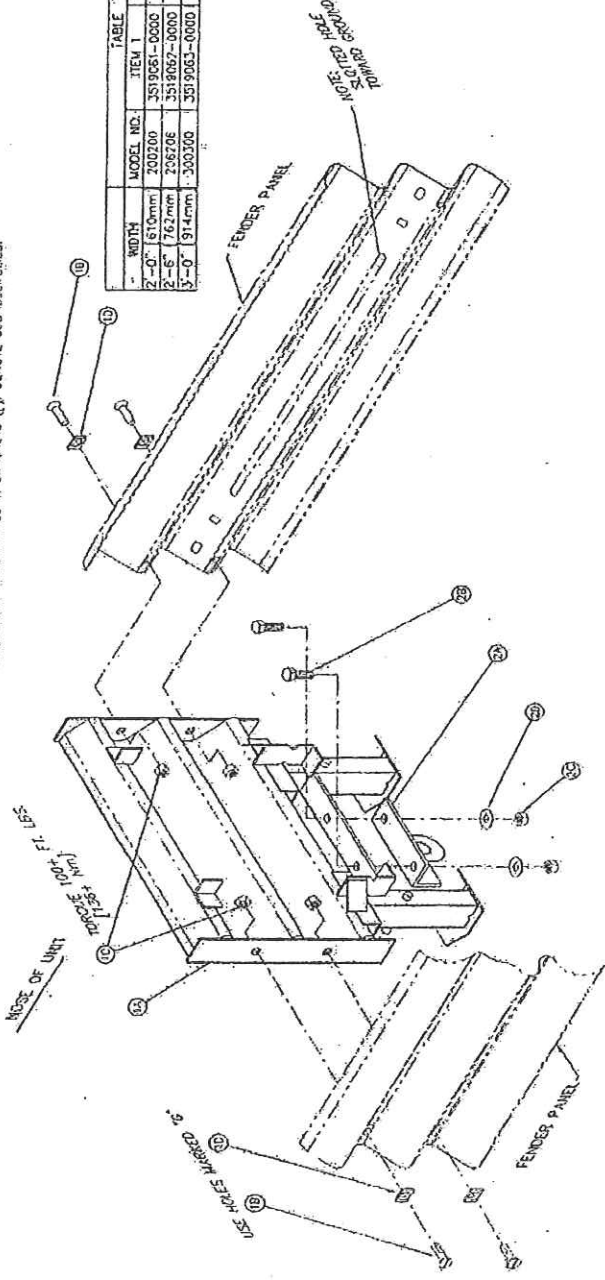
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-T® SYSTEM
NOSE COVER ASSEMBLY FOR
SYSTEMS
WITH HEX-FOAM® II CARTRIDGES

PARTS LIST														
ITEM	STOCK NO.	DESCRIPTION	NO. OF UNITS											
1	SEE TABLE	DIAPHRAGM ASSY. TB	1	2	3	4	5	6	7	8	9	10	11	12
1A	SEE TABLE	DIAPHRAGM TB	1	2	3	4	5	6	7	8	9	10	11	12
1B	2706761-0000	SCREW, FLAT, SLOTTED, 3/4" x 2, G	1	2	3	4	5	6	7	8	9	10	11	12
1C	2704091-0000	NUT, HEX, 3/4" x 2, G	4	8	12	16	20	24	28	32	36	40	44	48
1D	2708791-0000	WASHER, FENDER PANEL	4	8	12	16	20	24	28	32	36	40	44	48
2	2725240-0000	CABLE GUIDE, ASSY. GREAT	1	2	3	4	5	6	7	8	9	10	11	12
2A	2725241-0000	CABLE GUIDE, GREAT	1	2	3	4	5	6	7	8	9	10	11	12
2B	2720011-0000	BOLT, HEX, 3/4" x 2, G5, G	2	4	6	8	10	12	14	16	18	20	22	24
2C	2720091-0000	NUT, HEX, 3/4" x 2, G	2	4	6	8	10	12	14	16	18	20	22	24
2D	2720091-0000	WASHER, FLAT, 3/4" x 2, G	2	4	6	8	10	12	14	16	18	20	22	24

NOTE: ITEMS & QUANTITIES IN BRACKETS () DENOTE SUBASSEMBLIES.

TABLE		
WIDTH	MODEL NO.	ITEM 1A (ITEM 1A)
2'-0" (510mm)	200200	3519061-0000 2720051-0000
2'-6" (762mm)	206206	3518062-0000 2720071-0000
3'-0" (914mm)	300300	3519063-0000 2720081-0000



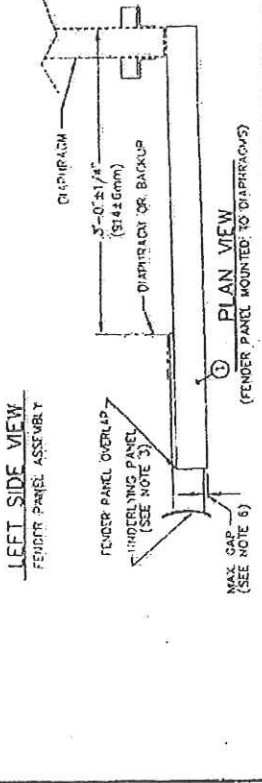
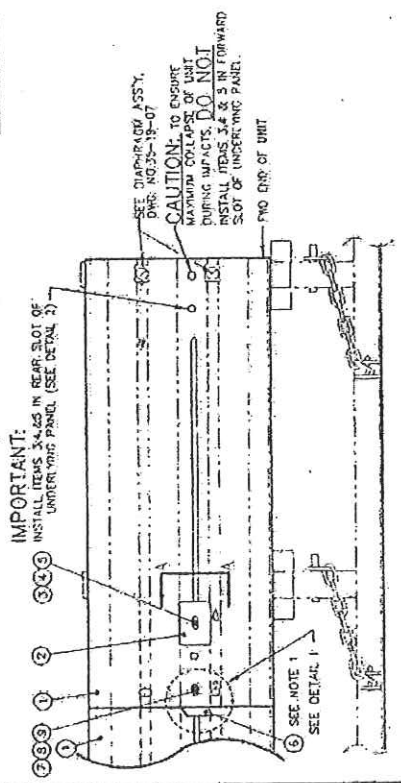
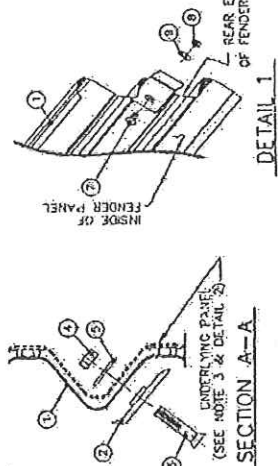
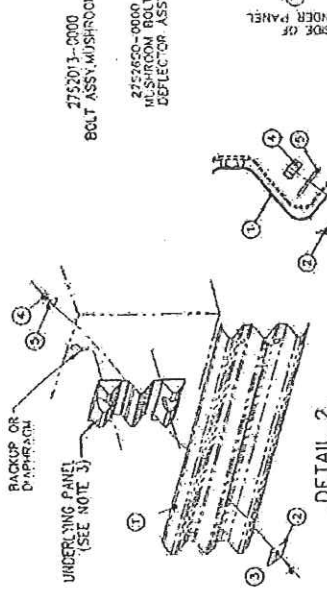
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-T® SYSTEM
DIAPHRAGM ASSEMBLY
FOR
HEX-FOAM® II CARTRIDGES

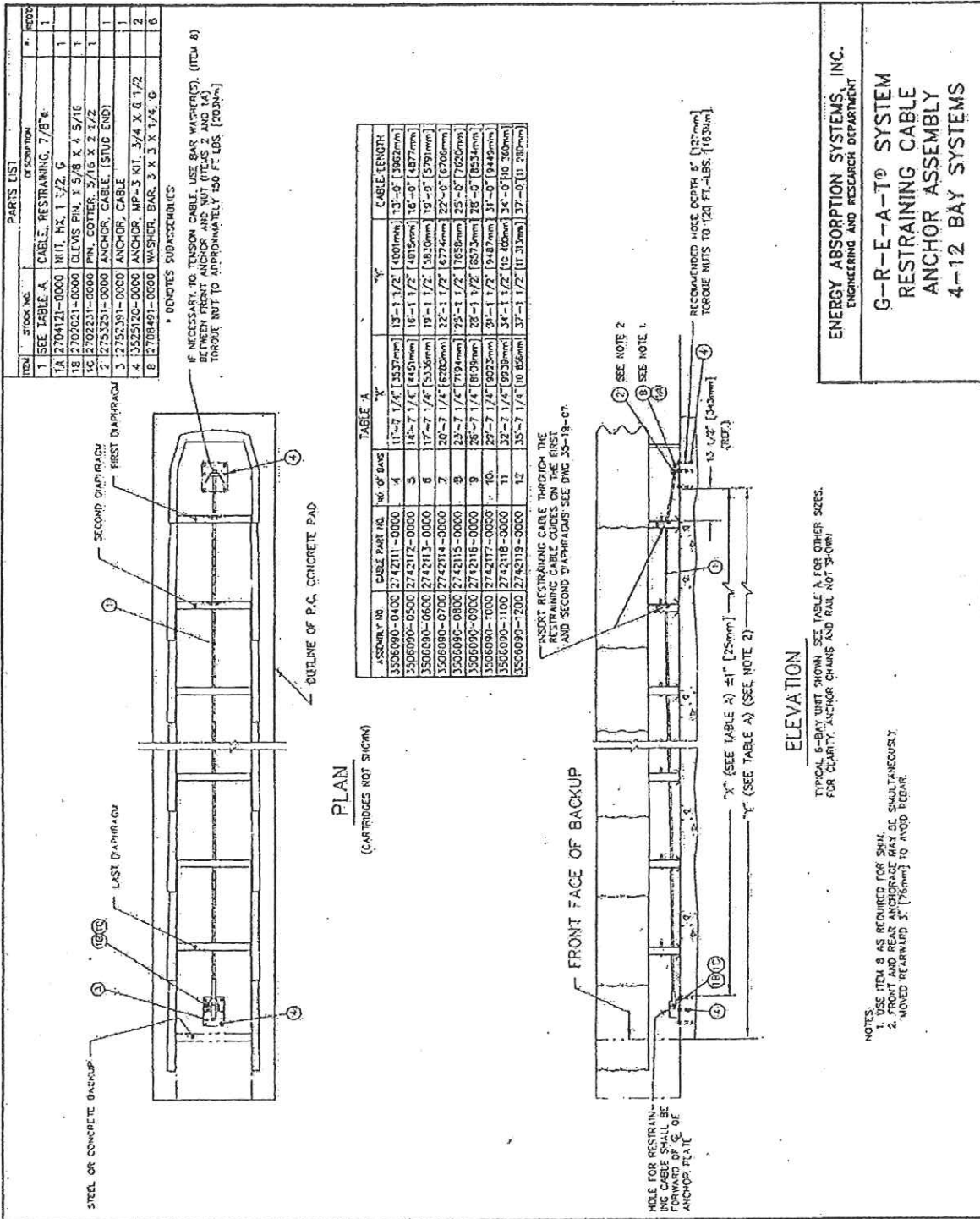
NOTES:
1. RESTRAINING CABLE GUIDE ASSEMBLY (ITEMS 2A, 2B, 2C, & 2D) REQUIRED ON FIRST DIAPHRAGM ONLY. ON 3-BAY UNITS, REQUIRED ON FRONT TWO DIAPHRAGMS ONLY. 4-BAY UNITS AND LONGER.

PARTS LIST														
ITEM	SYMBOL NO.	DESCRIPTION	NO. OF BAYS											
			1	2	3	4	5	6	7	8	9	10	11	12
1	2738111-0000	PANEL TB FENDER												
2	2708153-0000	WASHER AL SHROOM FORGED C												
3	2701731-0100	BOLT 1/2 S/BX3 GR.P ALLEN SOCKET												
4	2704141-0000	NUT 1/2 X 5/8 G												
5	2708191-0000	WASHER BAR 2X2X1/4 G												
6	2732651-0000	DEFLECTOR MUSHROOM BOLT												
7	2706181-0000	SCREW 1/2 X 1 SLOTTED G												
8	2701011-0000	NUT 1/2 X 7/8 G												
9	2708011-0000	WASHER FLAT 1/2 X 3/8 G												

- NOTES:
- ITEM 6 TO BE BOLTED TO ITEM 1, BEFORE ITEM 1 IS INSTALLED.
 - ITEM 4 TO BE INSTALLED AND TIGHTENED, USING A 3/8" (10mm) ALLEN WRENCH AND TORQUE WRENCH TO 80 LBS ± 10% LB. (61.5 Nm ± 13 Nm).
 - UNDERLYING PANEL IS EITHER ANOTHER FENDER PANEL, OR IN THE CASE OF THE LAST FENDER PANEL, IT COULD BE A BACKUP SIDE PANEL, EXTENSION PANEL, OR TRANSITION PANEL.
 - WARNING: THE MUSHROOM DEFLECTORS MUST BE USED ON ALL EXCEPT THE LAST BAY. FAILURE TO USE THE MUSHROOM DEFLECTORS COULD CAUSE THE FENDER PANELS TO CATCH ON THE MUSHROOM DEFLECTORS DURING AN IMPACT.
 - WARNING: DO NOT FASTEN THE LAST FENDER PANEL, RIGIDLY TO THE UNDERLYING PANEL. ADDITIONAL FASTENERS BEHIND THE MUSHROOM ASSEMBLY, THE LAST PANEL, MUST BE ABLE TO SLIDE TO ALLOW THE LAST CARTRIDGE TO BE CRUSHED.
 - MAXIMUM GAP: 1/4" (6mm) MAX. ON ANY SIDE WHERE TRAFFIC APPROACHES FROM REAR; 1/2" (13mm) MAX. ON ANY SIDE WHERE TRAFFIC APPROACHES NOSE HEAD-ON.



ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT
G-R-E-A-T® SYSTEM
THREE-BEAM FENDER
PANEL ASSEMBLY



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY.	RECD.
1	SEE TABLE A	CABLE, RESTRAINING, 7/8" G.		1
1A	2704121-0000	NUT, HEX, 1 1/2, G.		1
1B	2702023-0000	CLEVIS PIN, 1 5/8 X 1 5/16		1
1C	2702231-0000	PN. COTTER, 3/16 X 2 1/2		1
2	2753351-0000	ANCHOR, CABLE, (STUD END)		1
3	2752391-0000	ANCHOR, CABLE		1
4	3525120-0000	ANCHOR, MP-3 KIT, 3/4 X 6 1/2		2
5	2708191-0000	WASHER, BAR, 3 X 3 X 1/4, G.		6

* DENOTES SUBASSEMBLIES
 IF NECESSARY, TO TENSION CABLE, USE BAR WASHER(S) (ITEM 5) BETWEEN FRONT ANCHOR AND NUT (ITEMS 2 AND 1A) THROUGH NUT TO APPROXIMATELY 150 FT. LBS. [20.3kN]

TABLE A

ASSEMBLY NO.	CABLE PART NO.	NO. OF BAYS	LENGTH	CABLE LENGTH
3506090-0400	2742111-0000	4	11'-7 1/4" [3537mm]	12'-1 1/2" [4001mm]
3506090-0500	2742112-0000	5	14'-7 1/4" [4455mm]	16'-0" [4877mm]
3506090-0600	2742113-0000	6	17'-7 1/4" [5356mm]	19'-0" [5791mm]
3506090-0700	2742114-0000	7	20'-7 1/4" [6256mm]	22'-0" [6706mm]
3506090-0800	2742115-0000	8	23'-7 1/4" [7156mm]	25'-0" [7620mm]
3506090-0900	2742116-0000	9	26'-7 1/4" [8056mm]	28'-0" [8534mm]
3506090-1000	2742117-0000	10	29'-7 1/4" [8956mm]	31'-0" [9449mm]
3506090-1100	2742118-0000	11	32'-7 1/4" [9856mm]	34'-0" [10360mm]
3506090-1200	2742119-0000	12	35'-7 1/4" [10756mm]	37'-0" [11260mm]

STEEL OR CONCRETE BACKUP
 LAST DIAPHRAGM
 SECOND DIAPHRAGM
 FIRST DIAPHRAGM
 OUTLINE OF P.C. CONCRETE PAD

PLAN
 (CARTRIDGES NOT SHOWN)

FRONT FACE OF BACKUP

INSERT RESTRAINING CABLE THROUGH THE RESTRAINING CABLE GUIDES ON THE FIRST AND SECOND DIAPHRAGMS SEE DWG 30-19-01

13 1/2" [343mm] (REF.)

X" (SEE TABLE A) ±1" [25mm] (SEE NOTE 2)
 Y" (SEE TABLE A) (SEE NOTE 2)

RECOMMENDED HOLE DEPTH 5" [127mm]
 TORQUE NUTS TO 120 FT.-LBS. [16.3kN]

SEE NOTE 2
 SEE NOTE 1

HOLE FOR RESTRAINING CABLE SHALL BE FORWARDED FROM FACE OF ANCHOR PLATE

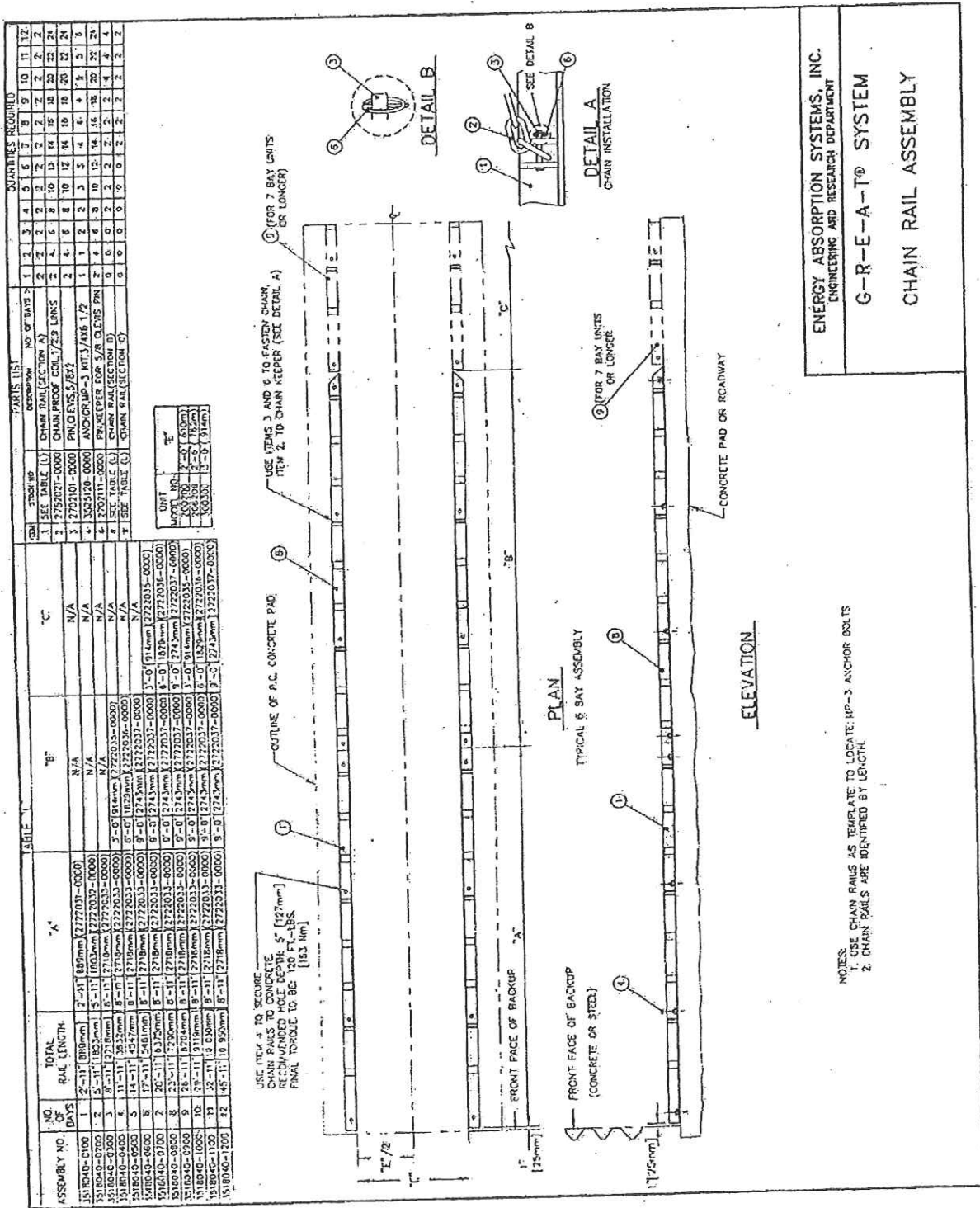
ELEVATION

TYPICAL 6-BAY UNIT SHOWN. SEE TABLE A FOR OTHER SIZES. FOR CLARITY, ANCHOR CHAINS AND RAIL NOT SHOWN

- NOTES:
- USE ITEM 8 AS REQUIRED FOR SHIP.
 - FRONT AND REAR ANCHORAGE MAY BE SIMULTANEOUSLY MOVED REARWARD 3" [76mm] TO AVOID PEELING.

ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-T® SYSTEM
 RESTRAINING CABLE
 ANCHOR ASSEMBLY
 4-12 BAY SYSTEMS

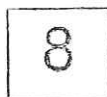
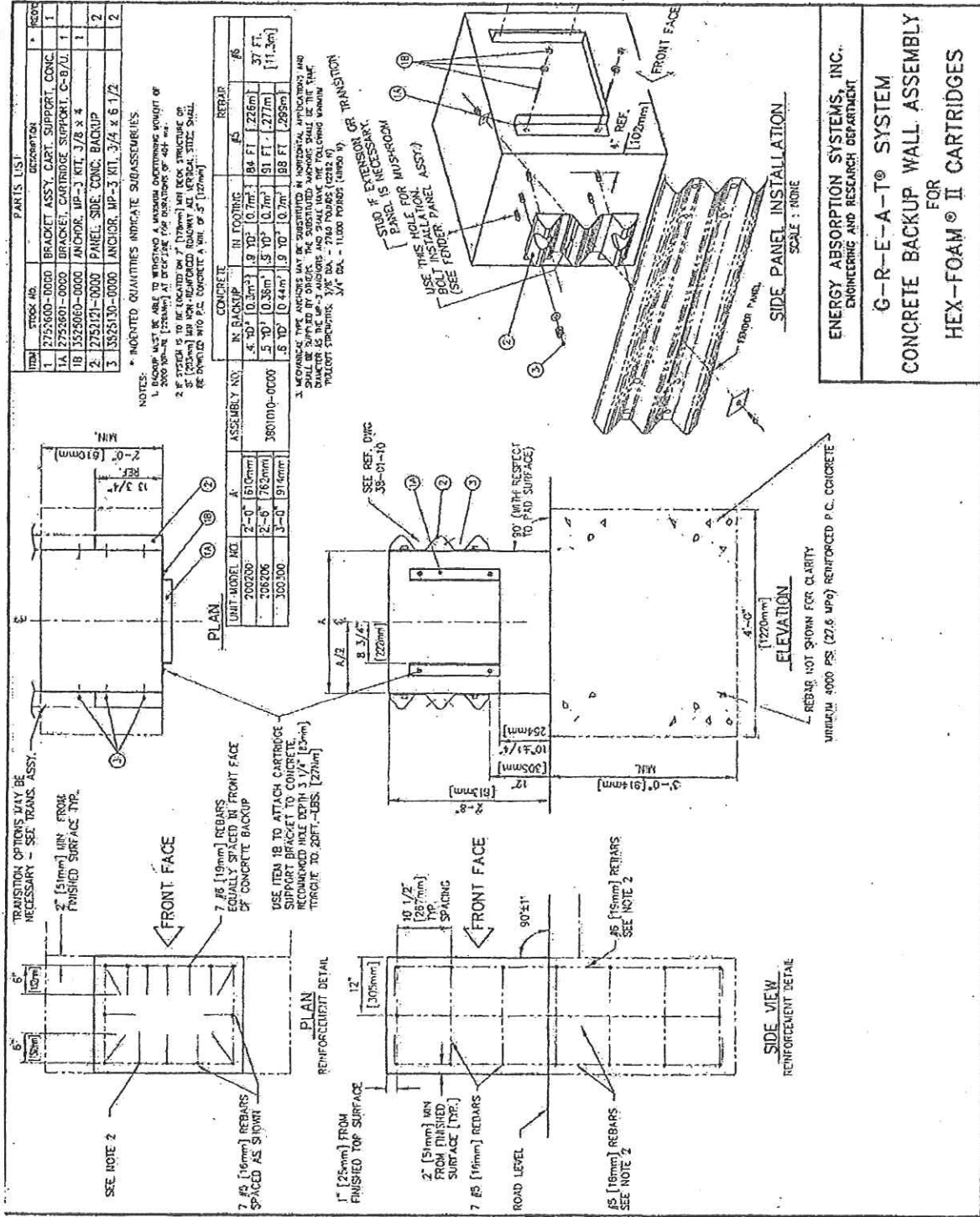


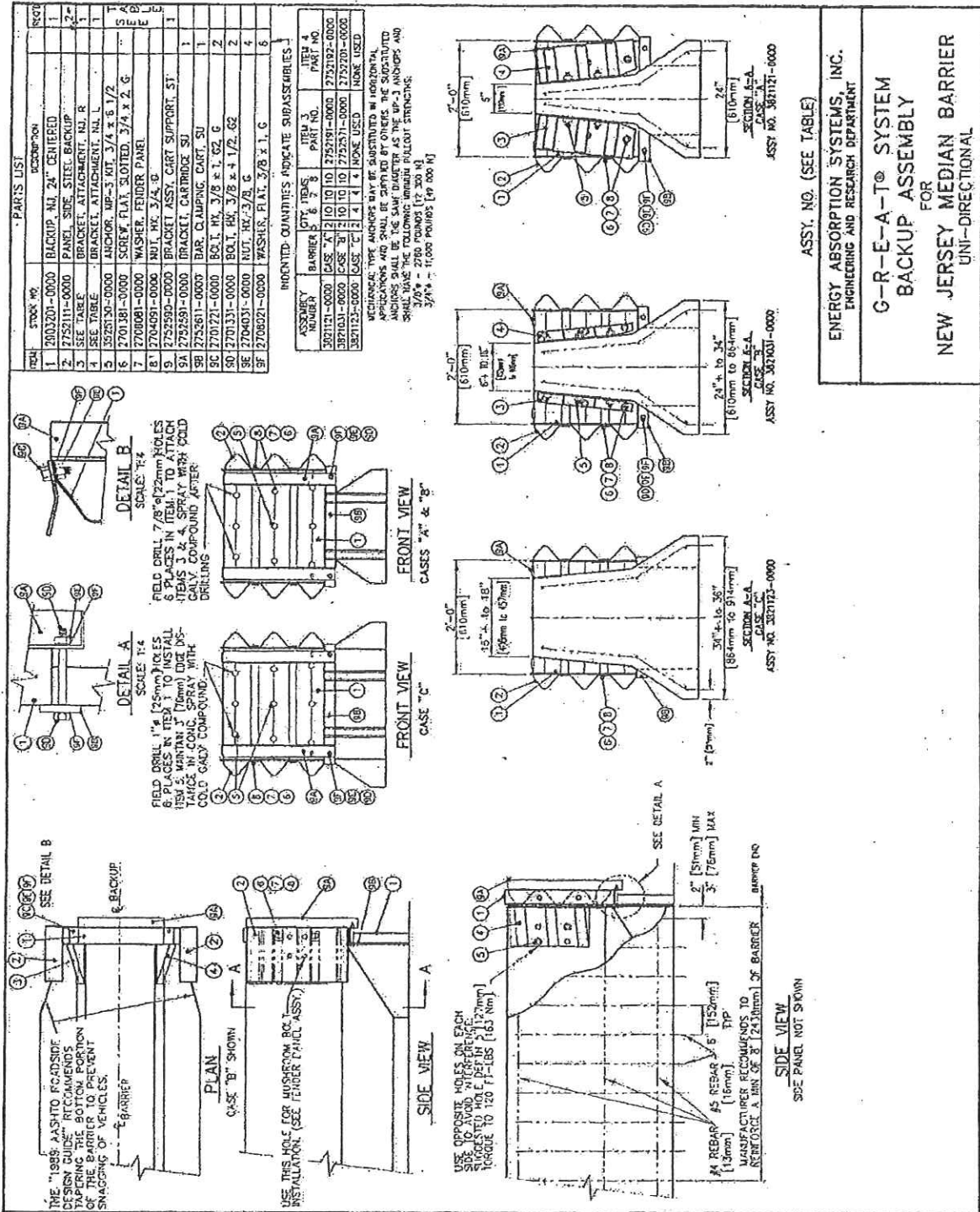
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-T® SYSTEM

CHAIN RAIL ASSEMBLY

NOTES:
1. USE CHAIN RAILS AS TEMPLATE TO LOCATE MP-3 ANCHOR BOLTS
2. CHAIN RAILS ARE IDENTIFIED BY LENGTH.

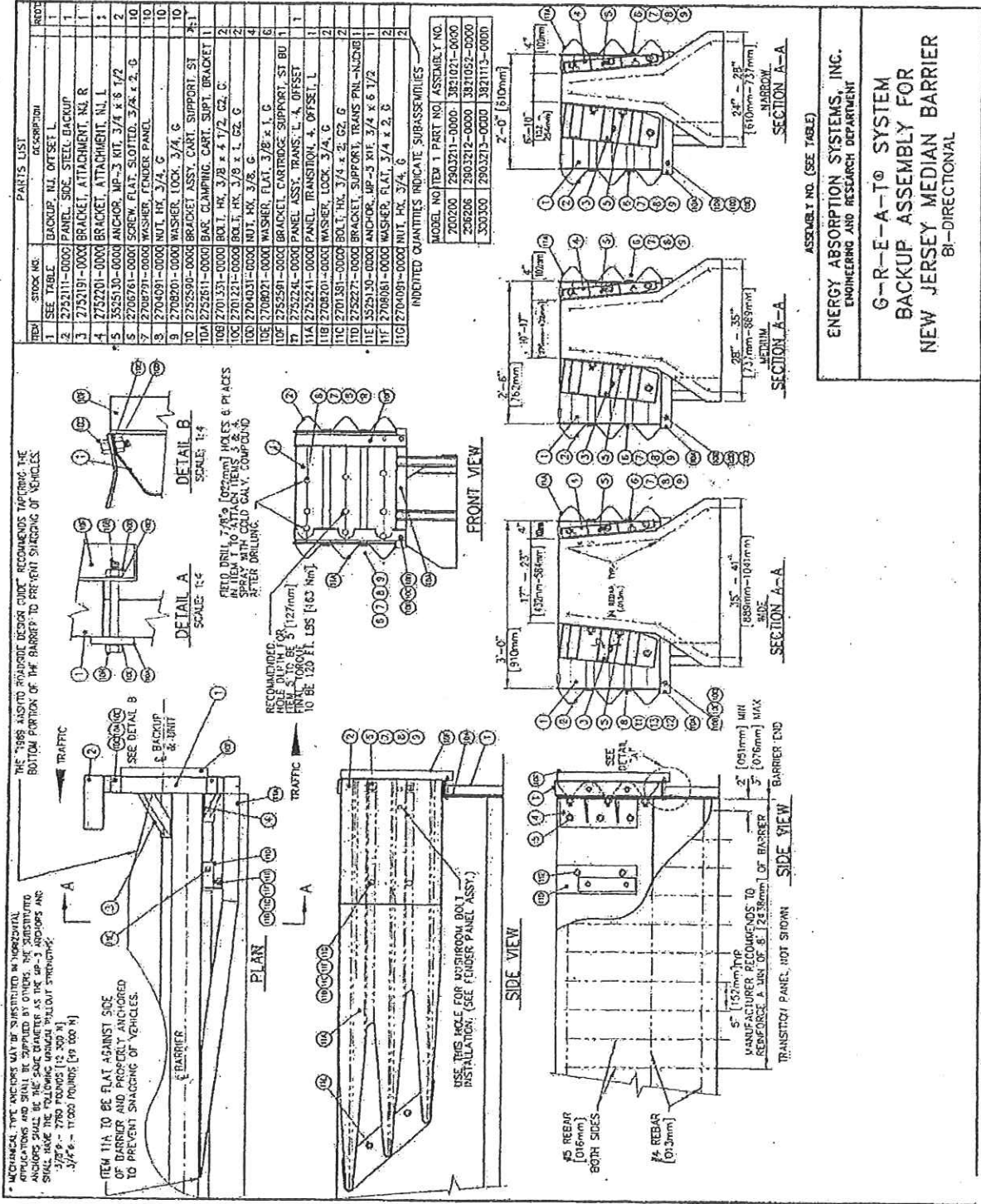


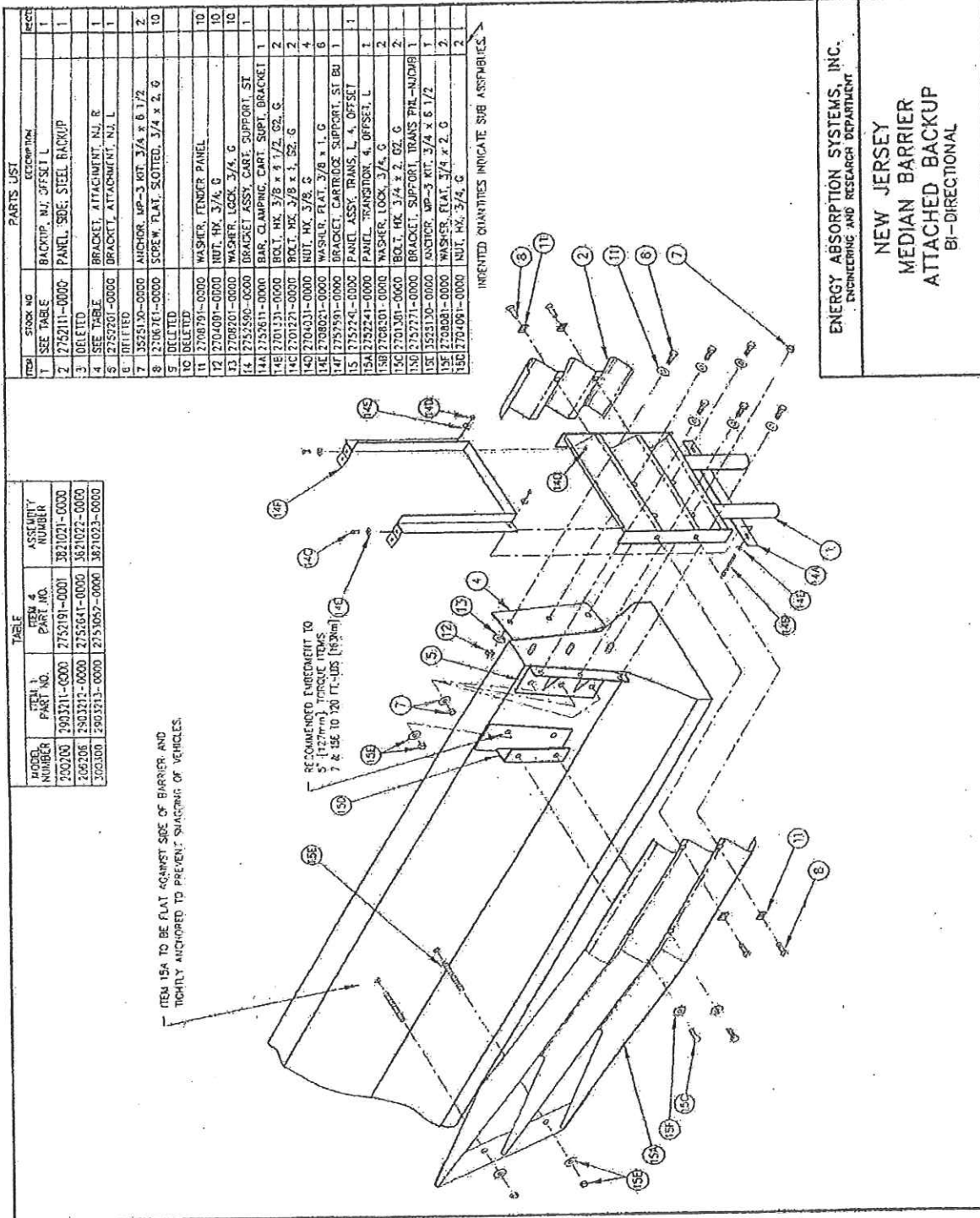


ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-TO SYSTEM
BACKUP ASSEMBLY
FOR
NEW JERSEY MEDIAN BARRIER
UNI-DIRECTIONAL

ASSY. NO. (SEE TABLE)





ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

NEW JERSEY
MEDIAN BARRIER
ATTACHED BACKUP
BI-DIRECTIONAL

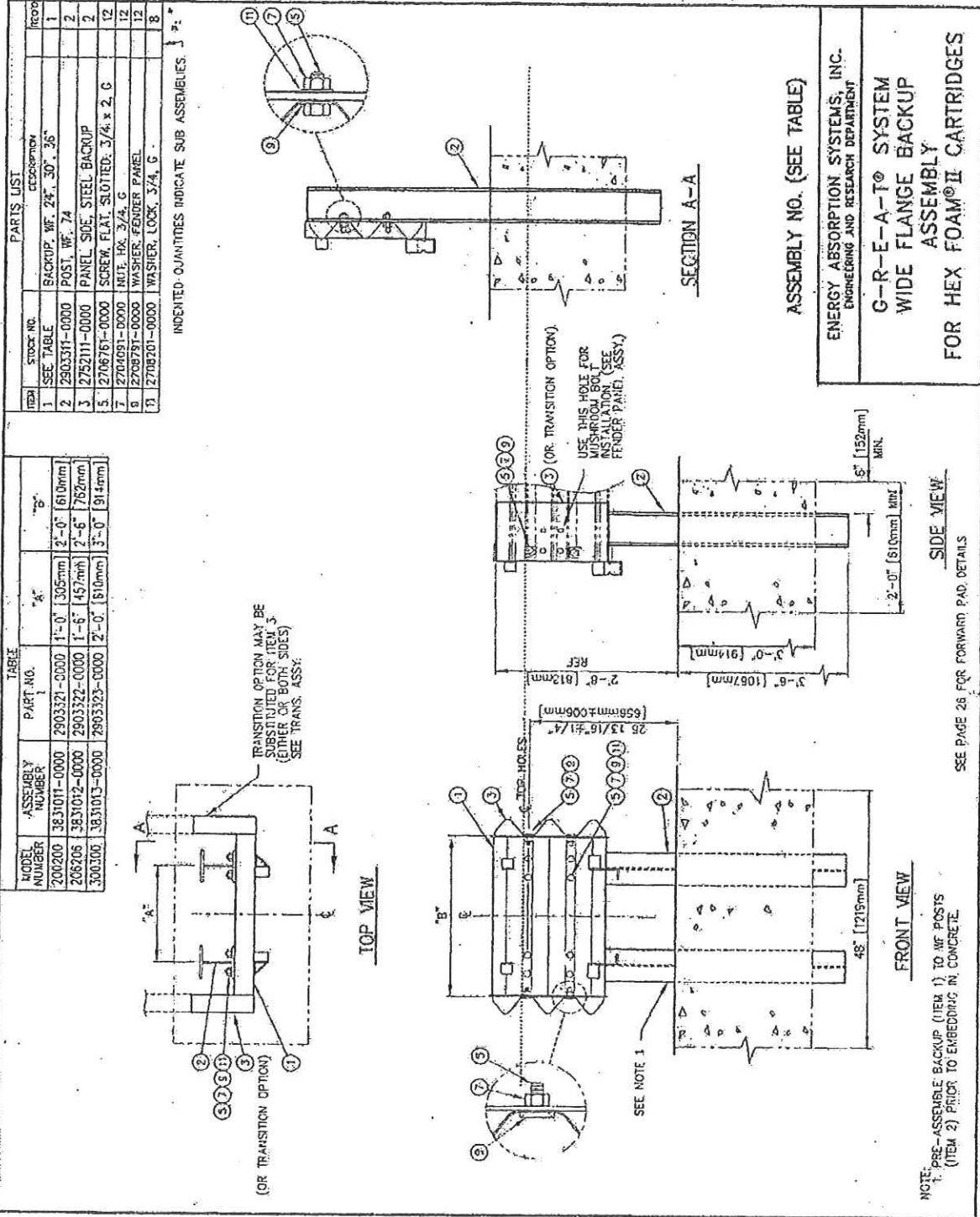
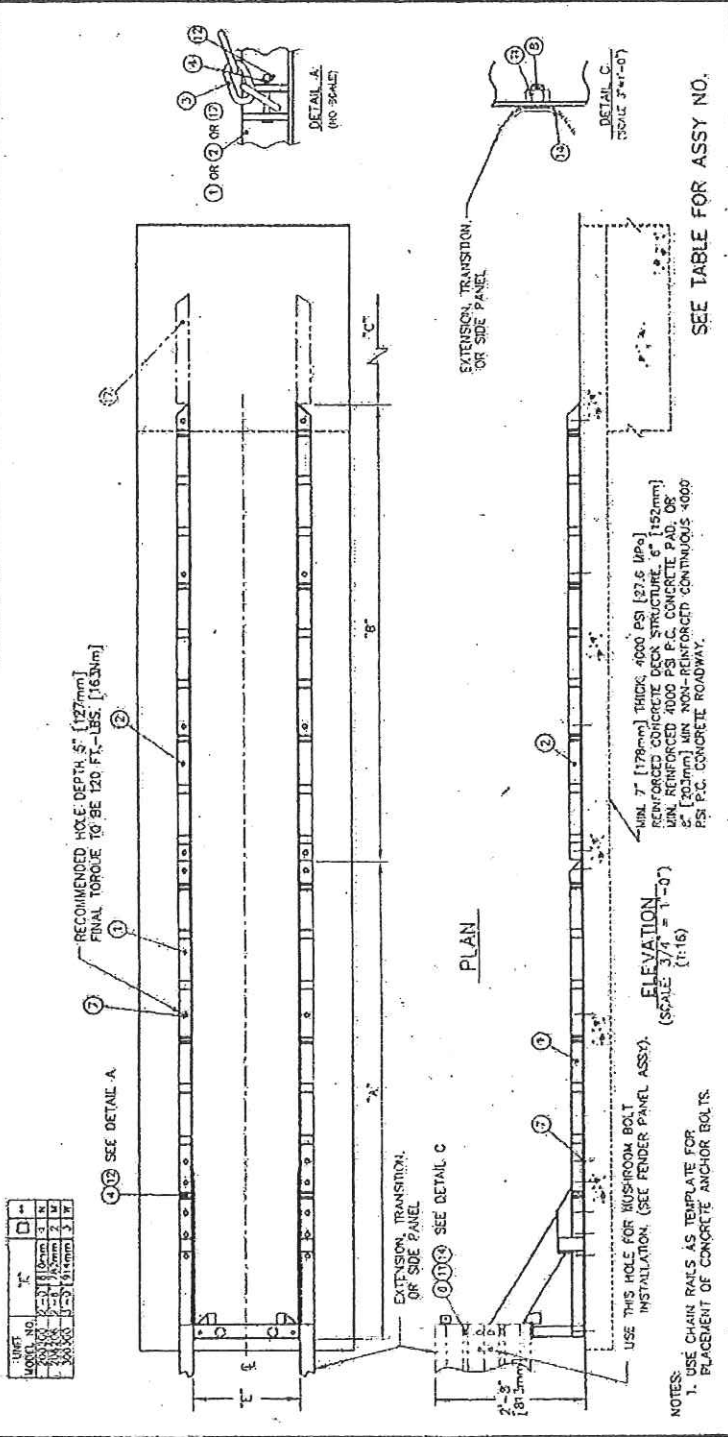


TABLE 1

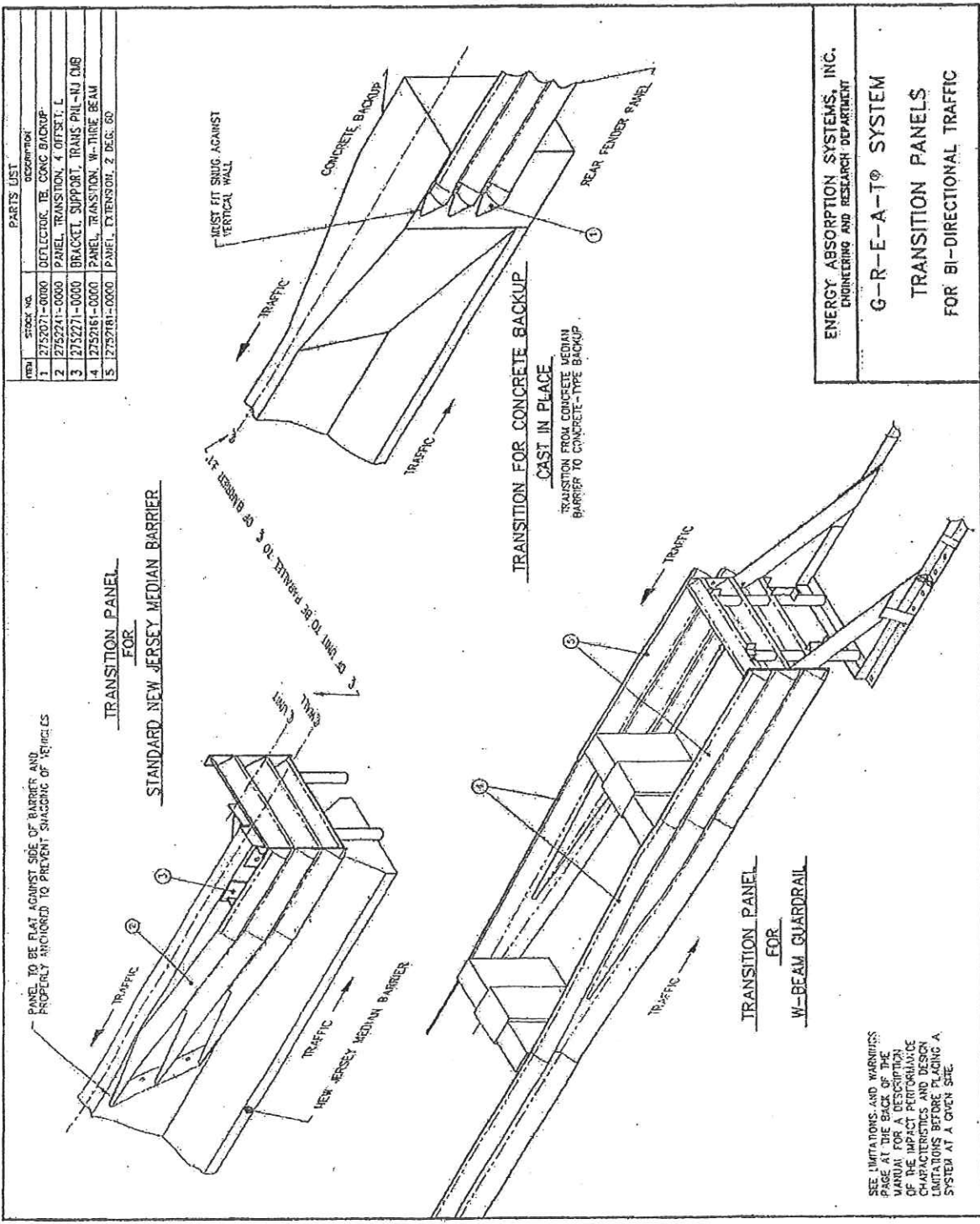
ASSEMBLY NO.	NO. OF PANEL LENGTH	TOTAL PANEL LENGTH		"B" (ITEM 2)	"C" (ITEM 1)	PARTS LIST											
		NO. OF PANELS	NO. OF BOLTS			STOCK NO.	RECOMMEN	QUANTITIES REQUIRED									
						1	2	3	4	5	6	7	8	9	10	11	12
341011	1	10'-0"	10'-0"	10'-0"	10'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341012	2	15'-0"	15'-0"	15'-0"	15'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341013	3	20'-0"	20'-0"	20'-0"	20'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341014	4	25'-0"	25'-0"	25'-0"	25'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341015	5	30'-0"	30'-0"	30'-0"	30'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341016	6	35'-0"	35'-0"	35'-0"	35'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341017	7	40'-0"	40'-0"	40'-0"	40'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341018	8	45'-0"	45'-0"	45'-0"	45'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341019	9	50'-0"	50'-0"	50'-0"	50'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341020	10	55'-0"	55'-0"	55'-0"	55'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341021	11	60'-0"	60'-0"	60'-0"	60'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341022	12	65'-0"	65'-0"	65'-0"	65'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341023	13	70'-0"	70'-0"	70'-0"	70'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341024	14	75'-0"	75'-0"	75'-0"	75'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341025	15	80'-0"	80'-0"	80'-0"	80'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341026	16	85'-0"	85'-0"	85'-0"	85'-0"	0	0	0	0	0	0	0	0	0	0	0	0
341027	17	90'-0"	90'-0"	90'-0"	90'-0"	0	0	0	0	0	0	0	0	0	0	0	0



SEE TABLE FOR ASSY NO.

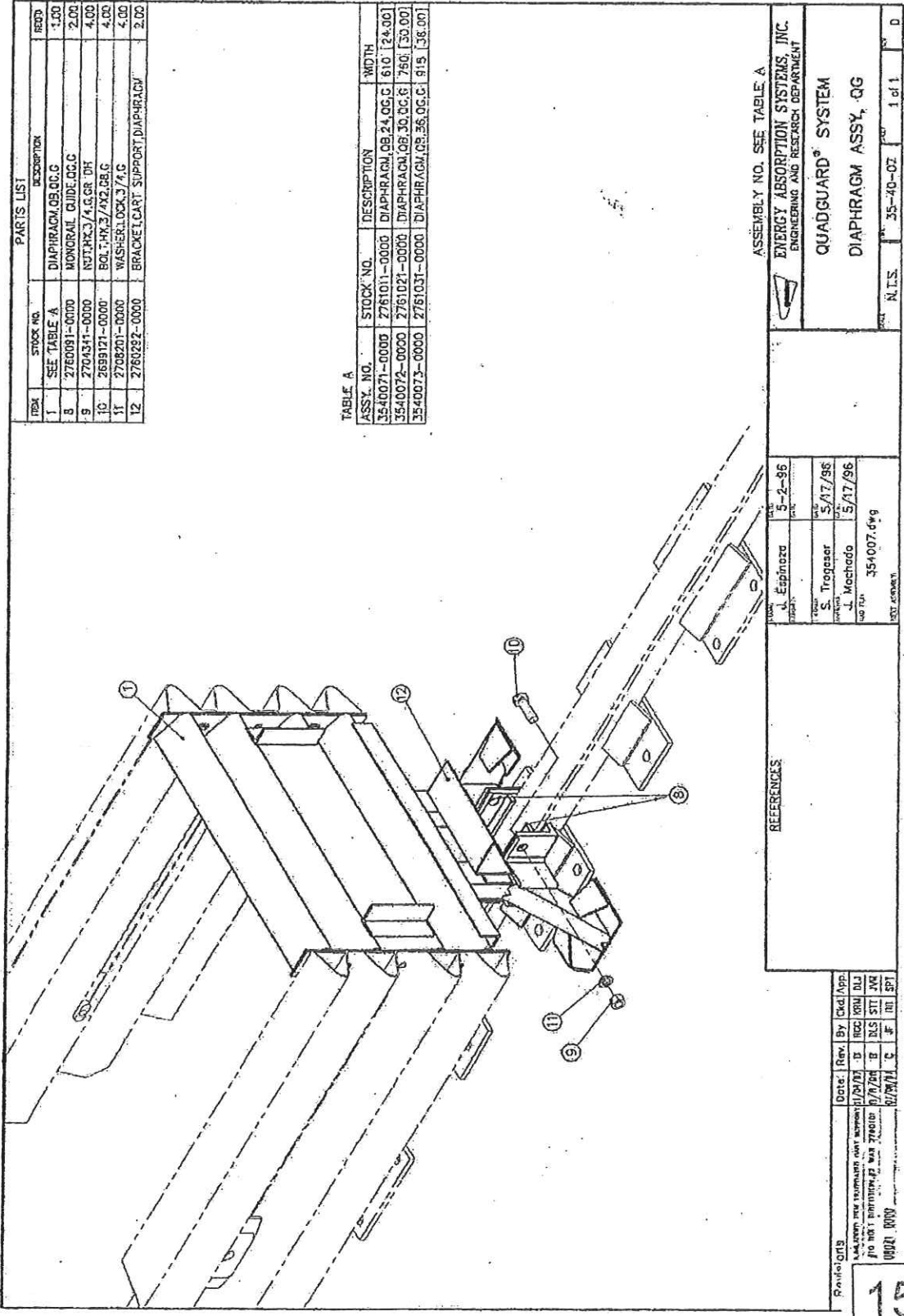
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

G-R-E-A-T® SYSTEM
TENSION STRUT BACKUP &
CHAIN RAIL ASSEMBLY



SEE LIMITATIONS AND WARNINGS PAGE AT THE BACK OF THE MANUAL FOR A DETAILED CHARACTERISTIC AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE.

**QUADGUARD SYSTEM
FOR NARROW HAZARDS**



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE 'A'	DIAPHRAGM, 08, 00, C, G	1.00
8	2760091-0000	MONORAIL GUIDE, 00, C, G	2.00
9	2760341-0000	NUT, PK, 3/4, S, GR, DHT	4.00
10	2699121-0000	BOLT, HK, 3/4, X2, 08, C	4.00
11	2768201-0000	WASHER, LOCK, 3/4, C	4.00
12	2760292-0000	BRACKET, CART SUPPORT, DIAPHRAGM	2.00

TABLE 'A'

ASSY. NO.	STOCK NO.	DESCRIPTION	WIDTH
3540071-0000	2761011-0000	DIAPHRAGM, 08, 24, 00, C, G	610 [24.00]
3540072-0000	2761021-0000	DIAPHRAGM, 08, 30, 00, C, G	750 [30.00]
3540073-0000	2761031-0000	DIAPHRAGM, 08, 36, 00, C, G	915 [36.00]

ASSEMBLY NO. SEE TABLE 'A'

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
DIAPHRAGM ASSY., QG

N.I.S. 35-40-02 1 of 1 D

REV. 5-2-86
J. Espinosa

REV. 5/17/86
S. Trageser

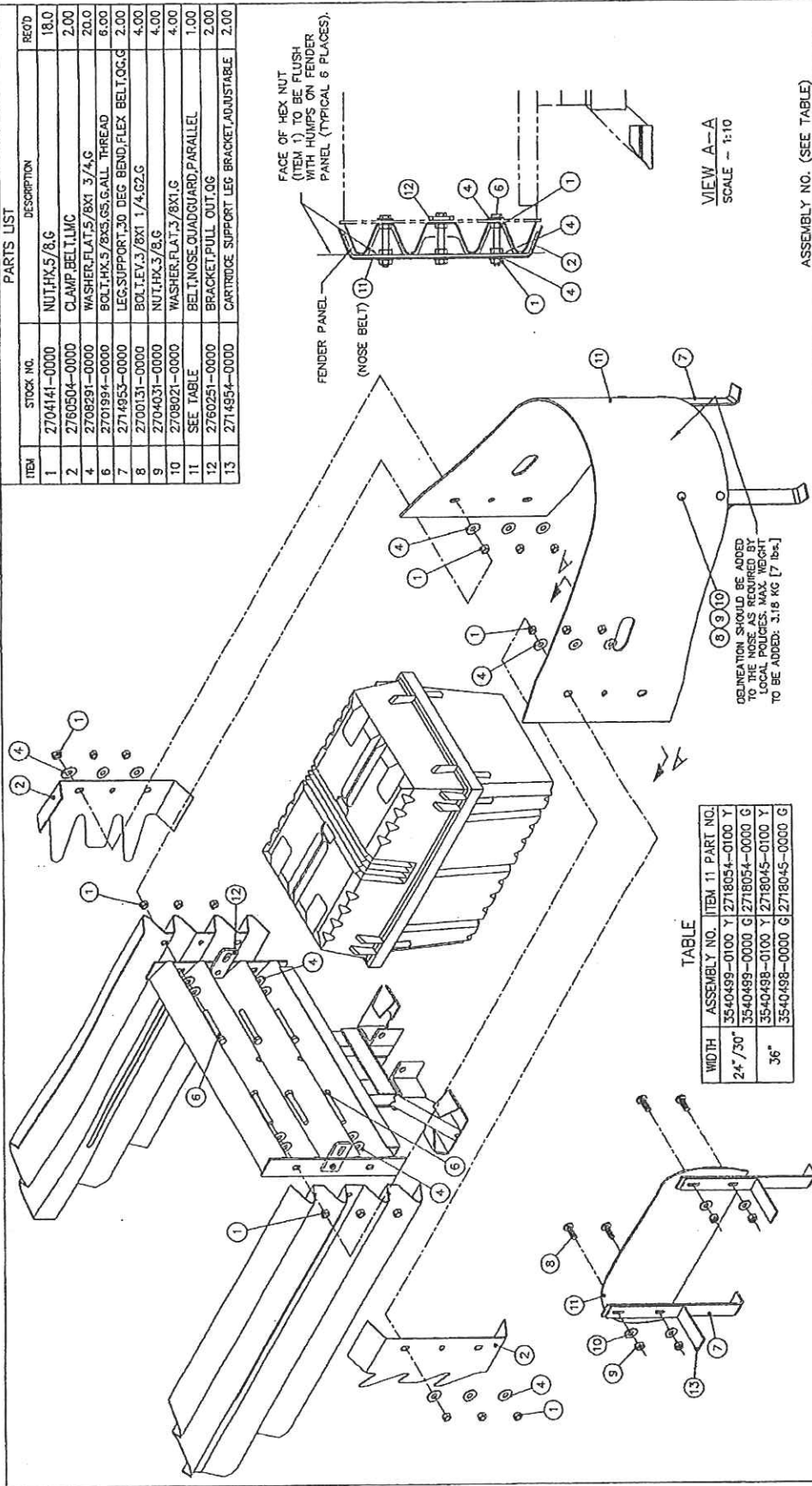
REV. 5/17/86
J. Machado

354007.6wg
EST. 000000

REFERENCES

Date:	Rev.:	By:	Chk.:	App.:
8/29/83	0	REC	RM	DLJ
8/7/84	0	NLS	STI	JAK
8/29/84	0	JF	INT	SPT

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	2704141-0000	NUT, HX.5/8,G	18,0
2	2760504-0000	CLAMP BELT, LMC	2,00
4	2701994-0000	WASHER, FLAT, 5/8X1.3/4,G	20,0
6	2701994-0000	BOLT, HX.5/8X5.65,G, ALL THREAD	6,00
7	2714953-0000	LEG, SUPPORT, 30 DEG BEND, FLEX BELT, QG,G	4,00
8	2700131-0000	BOLT, EV.3/8X1.1/4,GZ,G	4,00
9	2704031-0000	NUT, HX.3/8,G	4,00
10	2708921-0000	WASHER, FLAT, 3/8X1,G	4,00
11	SEE TABLE	BELT, NOSE, QUADGUARD, PARALLEL	1,00
12	2760251-0000	BRACKET, PULL OUT, QG	2,00
13	2714954-0000	CARTRIDGE, SUPPORT LEG BRACKET, ADJUSTABLE	2,00



TABLE

WIDTH	ASSEMBLY NO.	ITEM 11	PART NO.
24" / 30"	3540499-0100	Y	2718054-0100
36"	3540499-0100	G	2718054-0000
	3540499-0100	Y	2718045-0100
	3540499-0000	G	2718045-0000

ASSEMBLY NO. (SEE TABLE)

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
NOSE ASSY, QG, 24, 30, 36, ALSO
QG CZ ON A PLATE, W/BELTING

DATE	BY	CHKD	APP.
12/28/98	D. Stears		
12/30/98	BB		
12/30/98	SPT		

DESCRIPTION: D. Stears
 APPROVAL: BB
 DATE: 12/30/98
 COO: 3540498.dwg
 ACCT: 3540498

REFERENCES

DATE	REV.	BY	CHKD	APP.
10/01/00	D	LWC	RCB	ACF
4/03/00	C	DK	BB	//

Revisions
 ITEM 7 WAS 2714952-0000, ADD ITEM 13
 DRAWING WAS 3540498-0000
 CHANGED BY: TRISTAN WATSON, 2000-01-09

SCALE - 1:10

VIEW A-A

FACE OF HEX NUT (ITEM 1) TO BE FLUSH WITH HUMPS ON FENDER PANEL (TYPICAL 6 PLACES).

DEFORMATION SHOULD BE ADDED TO THE NOSE BELT AT THE LOCAL POLICES. MAX. HEIGHT TO BE ADDED: 3/16 KC [7 lbs.]

1 of 1

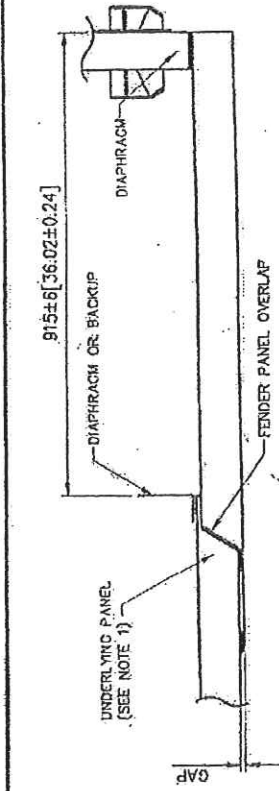
35-40-49

D

16

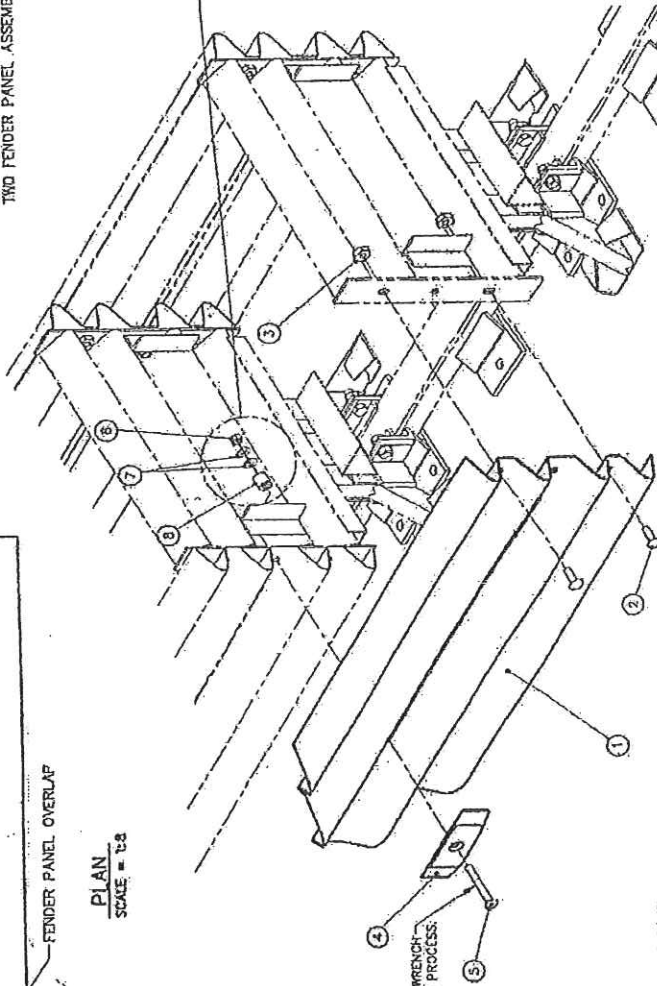
ITEM	STOCK NO.	DESCRIPTION	REQD
1	2760081-0000	PANEL,FENDER,QG,C	1.00
2	2698371-0000	BOLT,RAIL,5/8X2,C	2.00
3	2704191-0000	NUT,RA,5/8,C,RAIL	2.00
4	2708841-0000	WASHER,MUSHROOM,CAS,00,C	1.00
5	2706604-0000	SCREW,FL,5/8X3,GB,C,SOCKET	1.00
6	2704141-0000	NUT,RA,5/8,C	1.00
7	2708291-0000	WASHER,FLAT,5/8X1 3/4,C	1.00
8	2021611-0000	BUSHING,ELASTOMERIC,32X18X32	1.00

TWO FENDER PANEL ASSEMBLIES REQUIRED PER BAY.



PLAN
SCALE = 1:8

CAUTION
20 [0.78] MAX.
FOR PROPER IMPACT
PERFORMANCE.



THE BUSHING (ITEM 8) SHOULD BE COMPRESSED 1 TO 3 mm (1/16" TO 1/8") TO COMPLETE THE ASSEMBLY. ONE TO FOUR WASHERS (ITEM 7) SHOULD BE USED TO ACCOMPLISH THIS. DO NOT OVER COMPRESS THE ELASTOMERIC BUSHING! DO NOT TIGHTEN NUT MORE THAN 2 FULL TURNS AFTER WASHER(S) (ITEM 7) BEGINS TO COMPRESS BUSHING.

USE A 3/8" ALLOY WRENCH DURING THE ASSEMBLY PROCESS.

- NOTES:
1. UNDERLYING PANEL IS EITHER ANOTHER FENDER PANEL, OR, IN THE CASE OF THE LAST FENDER PANEL, IT COULD BE A BACKUP SIDE PANEL, EXTENSION PANEL OR TRANSITION PANEL.
 2. UNITS OF MEASUREMENT ARE IN MILLIMETERS (INCHES), UNLESS OTHERWISE NOTED.

Revisors	Date	Rev.	By	Chk.	App.
	10/27/95	6	ROC	SIT	KRM
	01/11/96	7	E	DB	DLJ
CHG NOTE 3 & ADDD CAUTION LABEL					
	4/12/96	8	DM	AKI	SPY

REFERENCES

DESIGNED BY	J. Espinoza	DATE	5/21/95
CHECKED BY	J.W./MFO	DATE	3/1/96
APPROVED BY	S. Trageser	DATE	5/21/96
DATE	J. Machiedo	DATE	5/21/96
SCALE	354004.dwg		
REV. HISTORY	ALL MODELS		

ASSEMBLY NO. 3540040-0000
 ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT
 QUADGUARD® SYSTEM
 FENDER PANEL ASSY. QG

**QUADGUARD SYSTEM
 FOR NARROW HAZARDS**

QUADGUARD SYSTEM FOR NARROW HAZARDS

TABLE 1

ASSEMBLY NO.	TOTAL RAIL LENGTH	*ITEM 1	*ITEM 2	*ITEM 3	*ITEM 5	VAL. OF BAYS
3540060-0100	0	0	0	0	0	1
3540060-0200	815 (36.0)	1	0	0	2	2
3540060-0300	1830 (72.0)	0	1	0	3	3
3540060-0400	2745 (108.1)	0	0	1	4	4
3540060-0500	3660 (144.1)	1	0	0	5	5
3540060-0600	4575 (180.1)	0	1	1	6	6
3540060-0700	5490 (216.1)	0	0	2	7	7
3540060-0800	6405 (252.1)	1	0	2	8	8
3540060-0900	7320 (288.2)	0	1	2	9	9
3540060-1000	8235 (324.2)	0	0	3	10	10
3540060-1100	9150 (360.2)	1	0	3	12	12
3540060-1200	10065 (396.2)	0	1	3	13	13

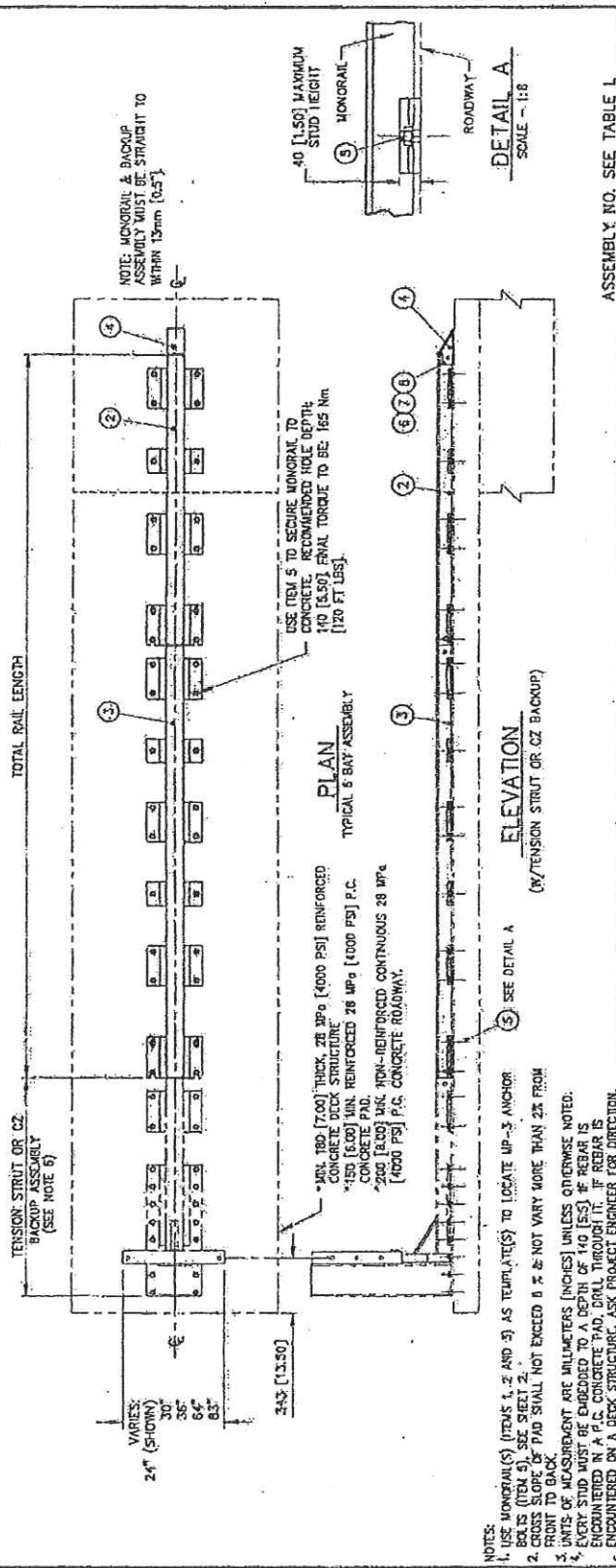
NOT APPLICABLE FOR 65° & 90° OR CZ CG SYSTEMS.

NOT APPLICABLE FOR CZ CG SYSTEMS

PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	2760051-0000	MONORAIL ONE BAY,CG,C	*
2	2760061-0000	MONORAIL TWO BAYS,CG,C	*
3	2760071-0000	MONORAIL THREE BAYS,CG,C	*
4	2760041-0000	END CAP MONORAIL,CG,C	1.00
5	3525300-0000	ANCHOR,WP-3,PT-NIT/3/4X7,VT	*
6	2699571-0000	BOLT,HX,5/8X3-1/2,CS,C	1.00
7	2701141-0000	NUT,HX,5/8,C	1.00
8	2708231-0000	WASHER,LOCK,5/8,C	1.00

* SEE TABLE



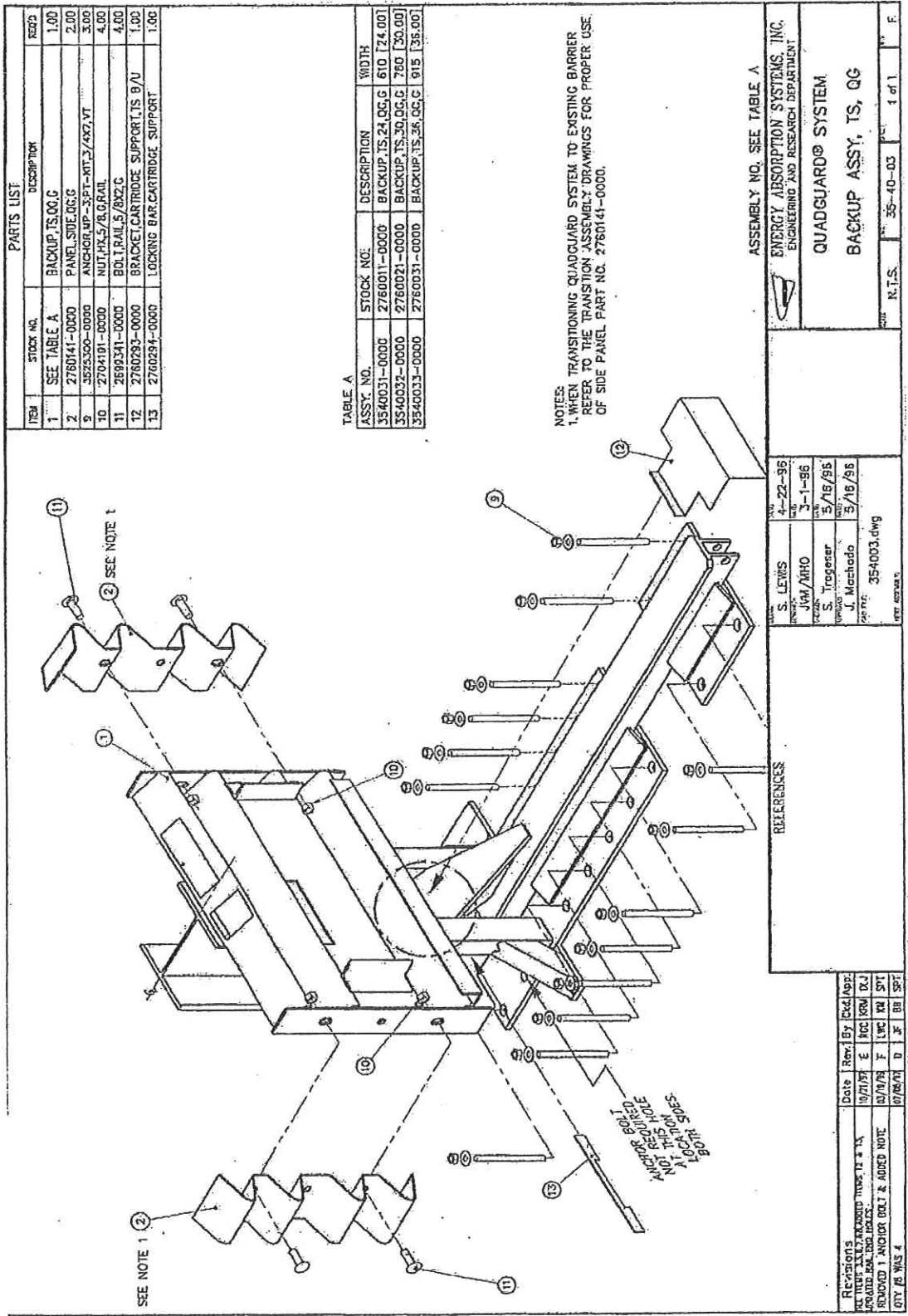
ASSEMBLY NO. SEE TABLE 1

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
MONORAIL ASSY, QG

DATE: 5-8-96
BY: MHD/JVM
CHECKED: S. Trappesser
DATE: 5/17/96
BY: M. Oberth
DATE: 5/17/96
DRAWING NO.: 354006.dwg
APP. BY: [Signature]

REV. NO. 1



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE A	BACKUP, TS, QG, C	1.00
2	2760141-0000	PANEL, SIDE, QG, C	2.00
3	3523300-0000	ANCHOR, WP-3FT-MT-3/4X7, VT	3.00
4	2704191-0000	NUT, HK, 5/8, G, RAIL	4.00
5	2599341-0000	BOLT, RAIL, 5/8X2, C	4.00
6	2760293-0000	BRACKET, CARTRIDGE, SUPPORT, TS, B/U	1.00
7	2760294-0000	LOCKING BAR, CARTRIDGE, SUPPORT	1.00

TABLE A

ASSY. NO.	STOCK NO.	DESCRIPTION	WIDTH
3540031-0000	2760011-0000	BACKUP, TS, 24, QG, C	610 [24.00]
3540032-0000	2760021-0000	BACKUP, TS, 30, QG, C	750 [30.00]
3540033-0000	2760031-0000	BACKUP, TS, 36, QG, C	915 [36.00]

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.

ASSEMBLY NO. SEE TABLE A
 ENERGY ADSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT
 QUADGUARD® SYSTEM
 BACKUP ASSY, TS, QG

REV. NO. 4-22-96
 S. LEWIS
 JWM/ARHO
 S. Yodanis
 J. Machado
 354003.dwg

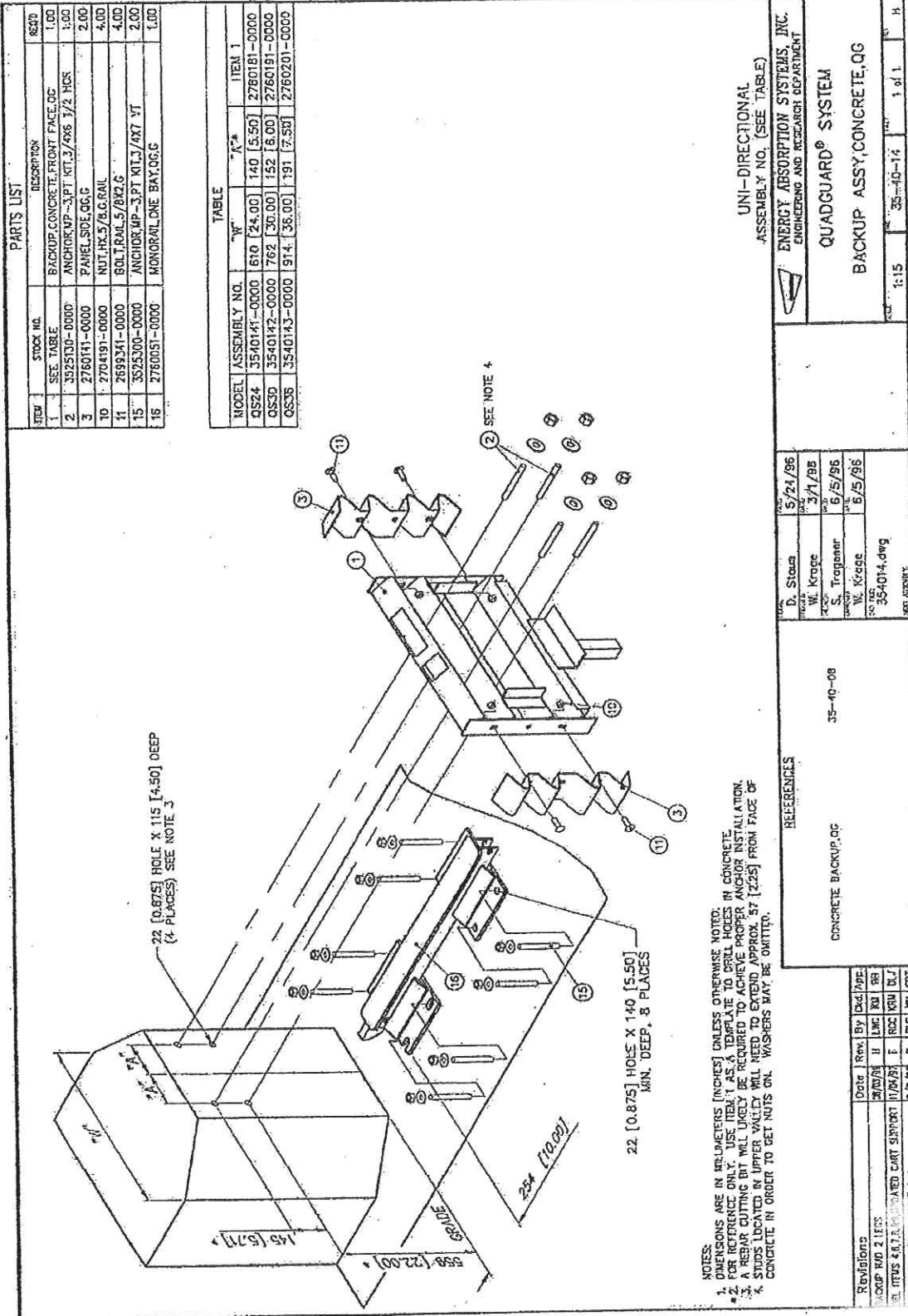
REFERENCES

Date	Rev.	By	Chk.	App.
07/07/94	E	ROC	KRM	D.J.
07/07/94	F	LUC	MR	SPT
07/08/94	D	JE	BB	SPT

Revisions
 REV. 1: 11/27/93, REWORK DRAWING 13 & 14
 REWORK FOR 1300 HAZARD
 REWORK 1 ANCHOR ONLY & ADDED NOTE
 QTY 10 WKS 4

QUADGUARD SYSTEM
FOR NARROW HAZARDS

**QUADGUARD SYSTEM
FOR NARROW HAZARDS**



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE	BACKUP CONCRETE FRONT FACE, OC	1.00
2	3525300-0000	ANCHOR MP-3PT KIT, 3/4X6 1/2 HCR	1.00
3	2760111-0000	PANEL SIDE, OC, C	2.00
10	2704191-0000	NUT, HK, 5/8, C, GAL	4.00
11	2699341-0000	BOLT, RM, 5/8X2, G	4.00
15	3525300-0000	ANCHOR MP-3PT KIT, 3/4X7 VT	2.00
16	2760051-0000	MONORAIL ONE BAY, OC, C	1.00

TABLE

MODEL	ASSEMBLY NO.	"W"	"K"	ITEM 1
QS24	3540141-0000	610 [24.00]	140 [5.50]	2760181-0000
QS30	3540142-0000	762 [30.00]	152 [6.00]	2760191-0000
QS36	3540143-0000	914 [36.00]	191 [7.50]	2760201-0000

NOTES:
 1. DIMENSIONS ARE IN MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 2. FOR REFERENCE ONLY. USE ITEM 1 AS A TEMPLATE TO DRILL HOLES IN CONCRETE.
 3. A REBAR CUTTING BIT WILL LIKELY BE REQUIRED TO ACHIEVE PROPER ANCHOR INSTALLATION.
 4. STUDS LOCATED IN UPPER VALLEY WILL NEED TO EXTEND APPROX. 57 [2.25] FROM FACE OF CONCRETE IN ORDER TO GET NUTS ON. WASHERS MAY BE OMITTED.

UNI-DIRECTIONAL
 ASSEMBLY NO. (SEE TABLE)
 ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT
 QUADGUARD® SYSTEM
 BACKUP ASSY, CONCRETE, OC

DATE	BY	DESCRIPTION
5/24/96	D. Stouss	REVISED
3/1/98	W. Krage	REVISED
6/5/96	S. Trappner	REVISED
5/5/96	W. Krage	REVISED

354014.dwg
 354014.dwg
 354014.dwg

CONCRETE BACKUP, OC
 35-40-08

REFERENCES

REV	DATE	BY	DESCRIPTION
1	2/27/96	W. Krage	REVISED
2	11/24/96	F. BCC	REVISED
3	7/2/96	C. BCS	REVISED

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	2760271-0000	SIDE PANEL/END SHOE, QG	1.00
2	3525130-0000	ANCHOR, MP-3, PT 101.5/ANX 1/2 HOR	1.00

CONCRETE BACKUP

TENSION STRUT BACKUP

LEFT SIDE APPLICATION

RIGHT SIDE APPLICATION

NOTES:

1. DIMENSIONS ARE IN MILLIMETERS (INCHES).

2. USE END SHOE AS TEMPLATE FOR DRILLING.

RECOMMENDED HOLE DEPTH 127 (5.00).

ANCHOR SIZE: 10mm (3/8") DIA. (1.25") (TYP).

ANCHOR SPACING: 150mm (6") ON CENTER WITH OUTSIDE SURFACE OF ANCHOR.

REFERENCES

ASSEMBLY NO. 3540150-0000

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
END SHOE ASSY, QG

DATE: 5/22/96
BY: D. Slous
CHECKED: S. Truesher
DATE: 5/5/96
BY: W. Kregle

DATE: 3540150.dwg
BY: [unclear]

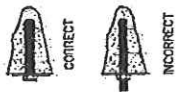
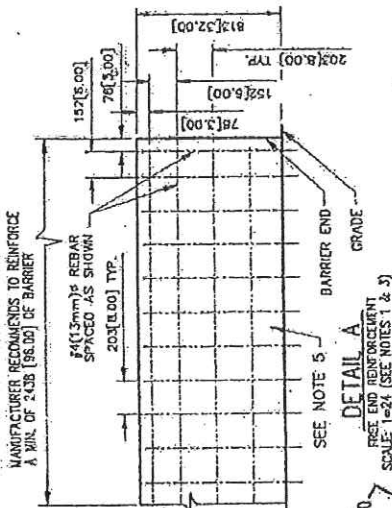
Rev.	By	Date	Desc.
1	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
2	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
3	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
4	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
5	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
6	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
7	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
8	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
9	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
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13	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
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18	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
19	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
20	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
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27	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
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89	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
90	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
91	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
92	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
93	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
94	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
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96	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
97	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
98	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
99	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O
100	DLB	8/17/95	REV TO SHOW LIFE FOR CONC B/O

**QUADGUARD SYSTEM
FOR NARROW HAZARDS**

QUADGUARD SYSTEM FOR NARROW HAZARDS

PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE	PANEL TRANSITION 4 OFFSET DC	1.00
2	2760301-0000	BRACKET SUPPORT 4 TRANS TO CRB	1.00
3	3525130-0000	ANCHOR WP-3PT KIT 3/4" x 1/2" HOR	1.00
4	2695341-0000	BOLT RAIL 5/8x2.G	3.00
5	2704191-0000	NUT PKLS 5/8x2 RAIL	3.00



DETAIL B
NOT TO SCALE

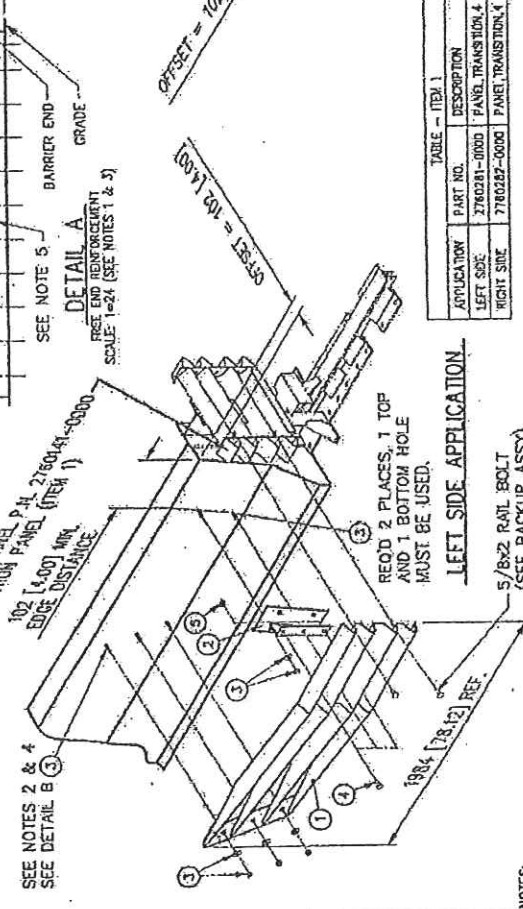
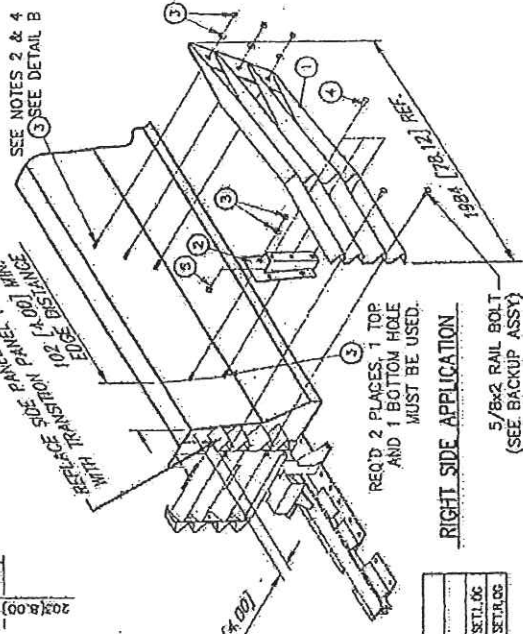


TABLE - ITEM 1

APPLICATION	PART NO.	DESCRIPTION
LEFT SIDE	2760301-0000	PANEL TRANSITION 4 OFFSET DC
RIGHT SIDE	2760302-0000	PANEL TRANSITION 4 OFFSET DC

5. MR. 27.6 MPa [4000 PSI] P.C. CONCRETE MEDIAN BARRIER.
 3. IMPACT FORCES COULD BE TRANSFERRED INTO TERMINAL END OF THE BARRIER. ADEQUATE ANCHORAGE IS REQUIRED FOR PROPER IMPACT PERFORMANCE.
 4. ANCHOR STUD END SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR. NOT, SEE DETAIL B.

NOTES:
 1. THE CONCRETE BARRIER REINFORCEMENT SHOWN IN DETAIL "A" IS RECOMMENDED TO ENSURE ADEQUATE BARRIER INTEGRITY FOR PROPER IMPACT PERFORMANCE. IT IS APPROPRIATE FOR A STANDARD SAFETY SHAPED BARRIER WITH A 610 [24.00] BASE AND A 150 [6.00] TOP. VARIATIONS MAY BE REVIEWED AND DETERMINATIONS MADE AS TO REASONABLE EQUIVALENCE BY PROJECT ENGINEER.
 2. USE TRANSITION PANEL AS TEMPLATE FOR DRILLING. RECOMMENDED HOLE GIRTH 122 [5.00] BRAL TORQUE TO BE 163Nm [120 Ft-LBS] (TYP).
 3. REVISIONS

REVISIONS

Date	Rev.	By	Check App.
10/21/96	D	SEE 1004 SPT	
07/25/96	E	005 RIN SPT	
04/23/96	F	106 KQ1 SPT	

DATE: 09/21/96
 DRAWN BY: J. WELCH
 CHECKED BY: B. BURTON
 DESIGNED BY: S. TURNER
 PROJECT NO: 354018.dwg
 USER: jcw

REFERENCES:
 LEFT ASSEMBLY NO. 354018L-0000
 RIGHT ASSEMBLY NO. 354018R-0000
 ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT

TRANSITION ASSY. 4 OFFSET, 0G

N.T.S. 35-40-TB 1 of 1 F

PARTS LIST		RECD			
ITEM	STOCK NO.	DESCRIPTION	N	M	W
1	2760371-0000	QUADGUARD TO W-BEAM TRANS. PANEL	1	1	1
2	2760341-0000	DIAGONAL BRACE	1	1	1
3	2699341-0000	BOLT, 1/2" X 1/2" - 20	4	6	6
4	2704191-0000	NUT, 1/2" X 1/2" - 20	4	6	6
5	2708671-0000	WASHER BAR, 1/2" X 1/4" X 2 1/2" / HOLE	2	2	2
6	2760342-0000	DIAGONAL BRACE BLOCKOUT, 3"	0	1	0
7	2760343-0000	DIAGONAL BRACE BLOCKOUT, 6"	0	0	1

DETAIL A
FINAL CONFIGURATION OF DIAGONAL BRACE FOR MEDIUM OR WIDE (762[30.00] OR 814[30.00]) SYSTEMS

DETAIL A
FINAL CONFIGURATION OF DIAGONAL BRACE FOR NARROW (610[24.00]) SYSTEMS

DIAGONAL BRACE ASSEMBLY

NOTES:
 1. PANEL OVERLAP SHOWN IS FOR TRAFFIC DIRECTION SHOWN. ACTUAL OVERLAP SHALL BE DETERMINED BY THE SIZE AND POSITION OF THE BRACE ASSEMBLY IN TRAFFIC DIRECTION.
 2. RIGHT SIDE OF ROAD APPLICATION SHOWN. ASSEMBLY MAY BE USED ON EITHER OR BOTH SIDES FOR LEFT, MEDIUM OR CORE APPLICATIONS. SEE NOTE 1.
 3. THIS ASSEMBLY IS NOT INCLUDED IN THE MODEL NUMBER AND MUST BE ORDERED SEPARATELY.
 4. ENERGY ABSORPTION SYSTEMS, INC. SUPPLIES THE STOCK ITEMS SHOWN IN THE PARTS LIST. ALL OTHER COMPONENTS OF THE DOWNSTREAM GUARDRAIL ARE STANDARD HIGHWAY MATERIALS AND MAY BE OBTAINED FROM YOUR LOCAL HIGHWAY SUPPLY VENDORS.

REVISIONS

Revisions	Date	Rev. By	Checked By
ADDED 1667 FOR MED. & WIDE SYSTEMS	07/11/91	A	GF BB SPT
UPDATED CARTRIDGE SUPPORT BRACKETS	10/24/97	E	RCC/KRM SPT
STANDARD GUARDRAIL OVER LAY 2	04/14/99	C	LWC RB KM

REFERENCES

Rev.	Date	By	Checked By
T. Busse	09/20/96		
J.M.	8/21/96		
S.H.	10/14/96		
J. Meacham	10/14/96		

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

TRANSITION ASSEMBLY
QUAD-BEAM TO W-BEAM

R.T.S. 35-40-21 1 of 2 C

QUADGUARD SYSTEM FOR NARROW HAZARDS

PARTS LIST		REQD		
ITEM	STOCK NO.	DESCRIPTION	N	W
1	2760331-0000	GUARDRAIL TO THREE-BEAM TRANS. PANEL	1	1
2	2760341-0000	DIAGONAL BRACE	1	1
3	2899341-0000	EXTR. PANEL 57/8X2 G	4	0
4	2704191-0000	NUT, HK. 5/8 X G. RAIL	4	0
5	2708871-0000	WASHER, PAR. 1/8 X 1 1/4 X 2 W/ HOLE	2	2
6	2760342-0000	DIAGONAL BRACE BLOCKOUT, 3"	0	1
7	2760343-0000	DIAGONAL BRACE BLOCKOUT, 6"	0	1

ASHTO SPEC. # W/3/8 GUARDRAIL BOLT AND RECESSED NUT

ASHTO SPEC # W/3/8 5/8 FLAT WASHER

ASHTO SPEC # W/3/8 BAR WASHER

POST #1 IS NOT BOLTED DIRECTLY TO TRANSITION PANEL. COUNTERSINK HOLES AS NEEDED

REPLACE SIDE PANEL PNL 2760141-0000 WITH TRANSITION PANEL (ITEM 1)

SEE DIAGONAL BRACE ASSEMBLY & DETAIL A

ALL OTHERS TO BE STANDARD ASHTO SEE NOTE 3

SEE NOTE 1

SEE NOTE 2

SEE NOTE 3

SYSTEM WIDTH	ASSEMBLY #	BLOCKOUT
516 [24.00]	N 354022H-0000	NOT REQD
762 [30.00]	M 354022H-0000	ITEM #5*
914 [36.00]	W 354022W-0000	ITEM #7*

*SEE PARTS LIST ABOVE FOR QTY REQD

SEE CHART

BACKLIP

POST #1

BLOCKOUT

DETAIL A

FINAL CONFIGURATION OF DIAGONAL BRACE FOR MEDIUM & WIDE (782[30.00] OR 914[36.00]) SYSTEMS

DETAIL A

BACKLIP

DETAIL A

FINAL CONFIGURATION OF DIAGONAL BRACE FOR NARROW (610[24.00]) SYSTEMS

SEE CHART

DIAGONAL BRACE ASSEMBLY

REFERENCES

REV	DATE	BY	CHKD	APP
05/23/98				
09/21/98				
10/14/98				
10/14/98				

T. Brasse
JFR
J. Mobergo
354022.dwg
10/14/98

NOTES:

- PANEL OVERLAP SHOWN IS FOR TRAFFIC DIRECTION SHOWN. ACTUAL OVERLAP SHALL BE DETERMINED BY THE SITE CONDITIONS AND PROJECT ENGINEER PER TRAFFIC DIRECTION. USE STANDARD GUARDRAIL CONNECTION.
- RIGHT SIDE OF ROAD APPLICATION SHOWN. ASSEMBLY MAY BE USED ON EITHER OR BOTH SIDES FOR LEFT, RIGHT, MEDIUM OR STANDARD CONNECTIONS. SEE NOTE 1 FOR CONNECTIONS. THIS ASSEMBLY MUST BE ORDERED SEPARATELY.
- ENERGY ABSORPTION SYSTEMS, INC. SUPPLIES THE STOCK ITEMS SHOWN IN THE PARTS LIST. ALL OTHER COMPONENTS OF THE DOWNSTREAM GUARDRAIL ARE STANDARD HIGHWAY MATERIALS AND MAY BE OBTAINED FROM YOUR LOCAL HIGHWAY SUPPLY VENDORS.

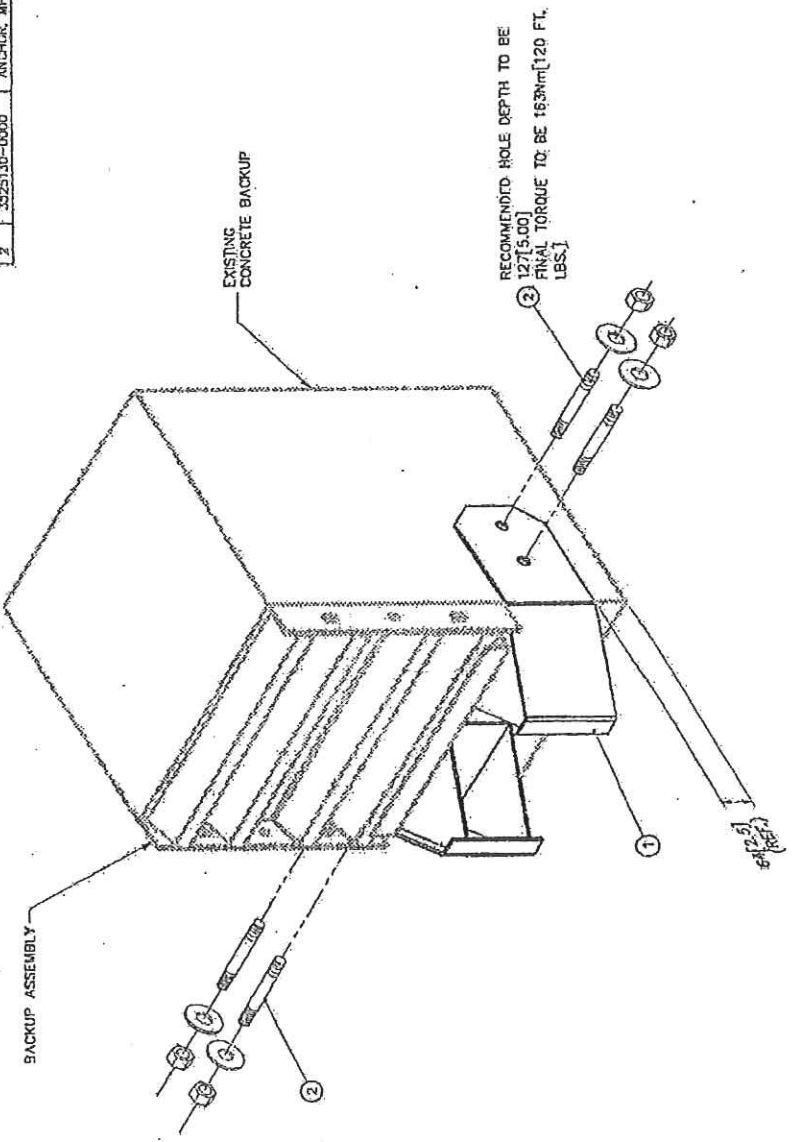
Revisions

NO.	DATE	REV.	BY	CHKD	APP.
ADDED	06/27/98	FOR MCL. & MOD. SYSTEMS	JFR	BB	SPT

QUADGUARD SYSTEM FOR NARROW HAZARDS

PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	2760311-0000	DEFLECTOR, CONCRETE BACKUP, DG	2
2	3525130-0000	ANCHOR, WP-3 KIT, 3/4x6 1/2, HORIZ	1



NOTE:
1. USE DEFLECTOR AS A TEMPLATE TO LOCATE AND DRILL 2310.88± HOLES.
2. DIMENSIONS ARE IN MILLIMETERS [INCHES], UNLESS OTHERWISE NOTED.

Revisions	Date	Rev	By	Des/ App.
CH'D PART NO. TO ASSY NO.	10/29/78	A	RCQ	SMI WK
CH'D TITLE BLOCK	11/14/81	B	SC	BR/SPT

RELEASES:

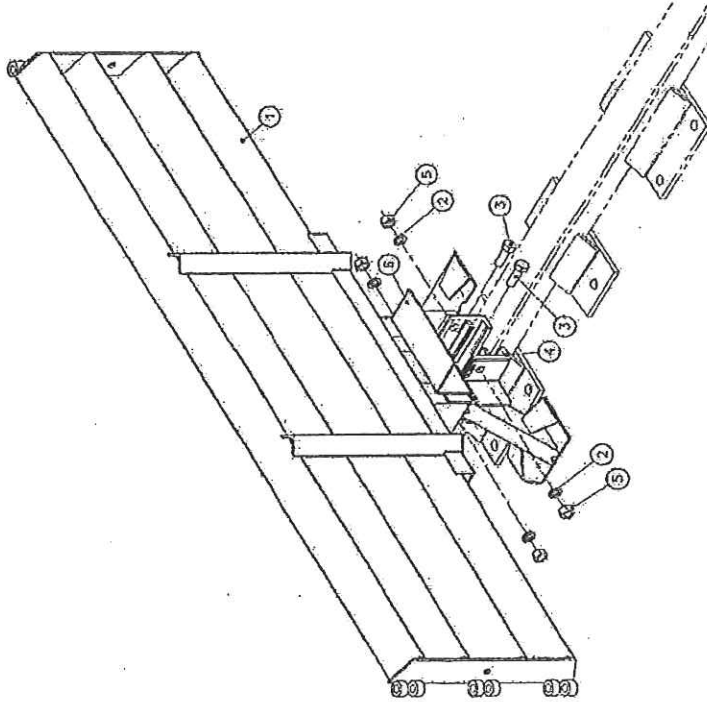
DATE	BY	FOR
08/29/78	R. CUMMINS	REVISED
08/21/78	H. IRACE	REVISED
03/23/78	SMI	REVISED
03/29/78	WCK	REVISED
CON. NO. 35-020.0w9		
DEFLECTOR		

ASSY NO. 3540200-0000
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT
DEFLECTOR ASSEMBLY,
CONCRETE BACKUP
RETROFIT, QG

**QUADGUARD SYSTEM
FOR NARROW HAZARDS**

**QUADGUARD SYSTEM
FOR WIDE HAZARDS**

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE A	DIAPHRAGM, OR, D.C.C.	1.00
2	2708201-0000	WASHER, LOCK, 3/4 G	4.00
3	2709121-0000	BOLT, FN, 3/4 X 2.0, DR.C	4.00
4	2760081-0000	MONORAIL GUIDE, D.C.C	2.00
5	2704341-0000	NUT, FN, 3/4 G, CR. DR.	4.00
6	2760297-0000	BRACKET, CARTRIDGE, SUPPORT, DIAPHRAGM	2.00



ASSEMBLY NO.	DESCRIPTION	ITEM 1 PART NO.
35-0340-0673	DIAPHRAGM ASSY, OR, 0873	2761041-0673
35-0340-0733	DIAPHRAGM ASSY, OR, 0733	2761041-0733
35-0340-0833	DIAPHRAGM ASSY, OR, 0833	2761041-0833
35-0340-0913	DIAPHRAGM ASSY, OR, 0913	2761041-0913
35-0340-0993	DIAPHRAGM ASSY, OR, 0993	2761041-0993
35-0340-1073	DIAPHRAGM ASSY, OR, 1073	2761041-1073
35-0340-1153	DIAPHRAGM ASSY, OR, 1153	2761041-1153
35-0340-1233	DIAPHRAGM ASSY, OR, 1233	2761041-1233
35-0340-1273	DIAPHRAGM ASSY, OR, 1273	2761041-1273
35-0340-1313	DIAPHRAGM ASSY, OR, 1313	2761041-1313
35-0340-1363	DIAPHRAGM ASSY, OR, 1363	2761041-1363
35-0340-1473	DIAPHRAGM ASSY, OR, 1473	2761041-1473
35-0340-1513	DIAPHRAGM ASSY, OR, 1513	2761041-1513
35-0340-1553	DIAPHRAGM ASSY, OR, 1553	2761041-1553
35-0340-1633	DIAPHRAGM ASSY, OR, 1633	2761041-1633
35-0340-1729	DIAPHRAGM ASSY, OR, 1729	2761041-1729
35-0340-1763	DIAPHRAGM ASSY, OR, 1763	2761041-1763
35-0340-1873	DIAPHRAGM ASSY, OR, 1873	2761041-1873
35-0340-1953	DIAPHRAGM ASSY, OR, 1953	2761041-1953
35-0340-2033	DIAPHRAGM ASSY, OR, 2033	2761041-2033

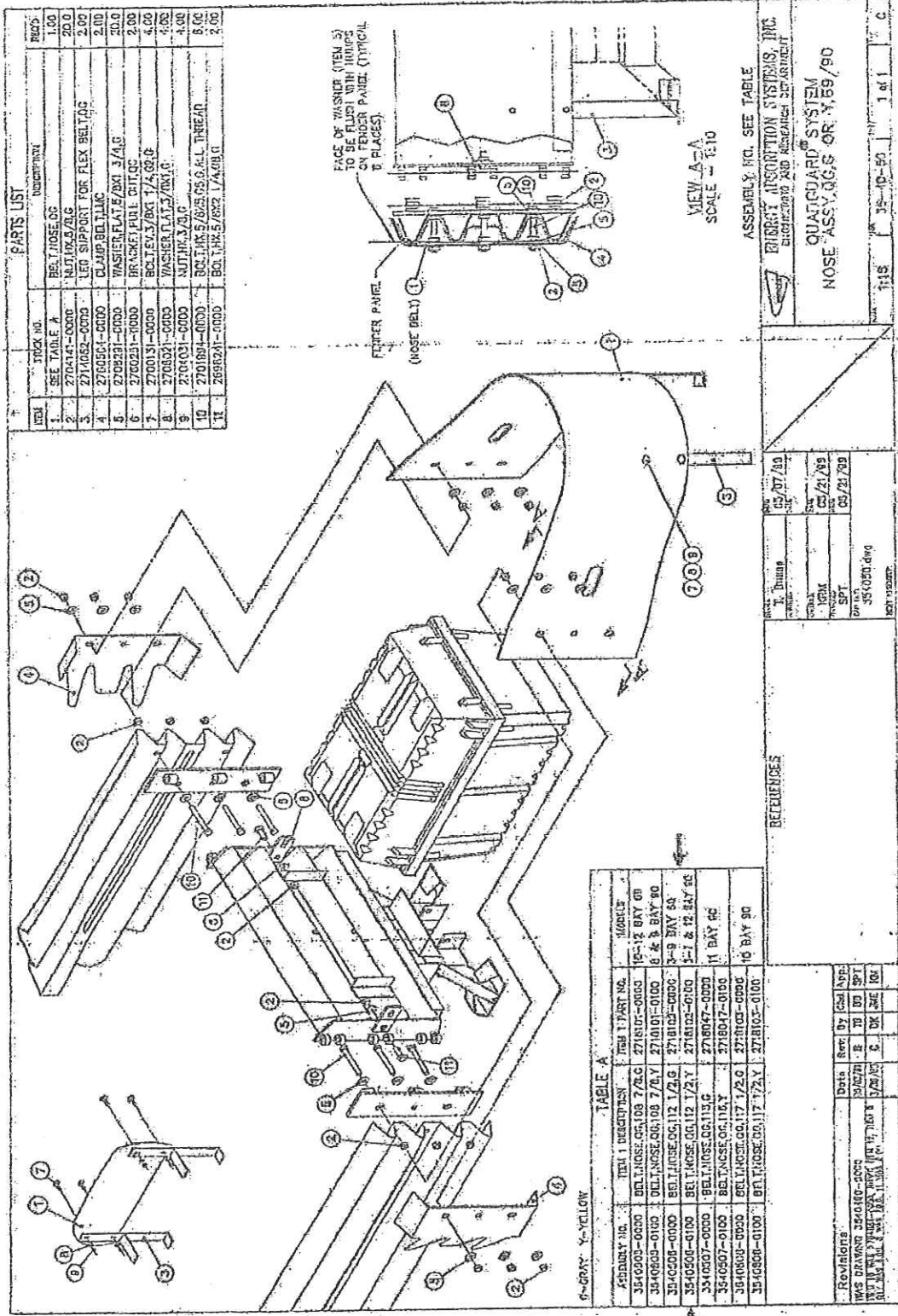
(SEE TABLE A)

ASSEMBLY NO. 3540340-	
ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
QUADGUARD SYSTEM DIAPHRAGM ASSY, OR, WIDE	
QTY: 1:12	3540340-0000
1 of 2	

REFERENCES:

DATE	BY	REVISION
9/12/97	D. Stear	1
7/13/97	J. Mechols	2
7/2/97	KRU	3
7/7/97	J. Mechols	4
35-0340-0000.dwg		
REV. USARBY		

Date	Rev.	By	Chk.	App.
9/2/98	1	C	DDS	STI
10/22/98	2	H	TPK	MM
9/20/98	1	I	DLS	KU
DELETED ITEMS 2, 4, 5, 6. RE-NUMBERED				
SEE SHEET 2				
REV. CHG TO MATC. SHEET 2				



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE A	BELT HOSE, CG	1.00
2	270414-0000	NUT, 1/2 X 3/8	20.0
3	271052-0070	LEG SUPPORT FOR FLEX BELTAS	2.00
4	270050-0000	CLAMP BELT, MC	2.00
5	270021-0000	WASHER, FLAT, 5/16 X 3/4, CG	20.0
6	270021-0000	BRACKET, PANEL, CUT, CG	2.00
7	270031-0000	BELT, FLEX, 3/8 X 1 1/4, CG, Q	4.00
8	270021-0000	WASHER, FLAT, 5/16 X 3/4, CG	4.00
9	270003-0000	NUT, 1/2 X 3/8	4.00
10	270104-0000	BOLT, 1/2 X 3/8 X 3.0, ALL THREAD	8.00
11	269021-0000	BOL, 1/4 X 5/8 X 2.7, 1/4, 0, 0, 0	2.00

TABLE A

ASSEMBLY NO.	ITEM 1 DESCRIPTION	ITEM 1 PART NO.	QTY
35-0000-0100	BELT HOSE, CG, 108 7/8 X 3	271052-0000	15-12 BAY 00
35-0000-0100	BELT HOSE, CG, 108 7/8 X 3	271010-0100	6 & 8 BAY 00
35-0000-0100	BELT HOSE, CG, 112 1/2 X 3	271010-0000	8-9 BAY 00
35-0000-0100	BELT HOSE, CG, 112 1/2 X 3	271010-0100	4-7 & 12 BAY 00
35-0000-0100	BELT HOSE, CG, 113 X 3	271010-0000	11 BAY 00
35-0000-0100	BELT HOSE, CG, 113 X 3	271010-0100	10 BAY 00

REVISIONS

NO.	DATE	BY	CHK	APP	DESCRIPTION
1	05/21/89	SP	SP	SP	ISSUED FOR PRODUCTION
2	05/21/89	SP	SP	SP	ISSUED FOR PRODUCTION
3	05/21/89	SP	SP	SP	ISSUED FOR PRODUCTION

DATE: 05/07/89
 DRAWN BY: T. DUNN
 CHECKED BY: NRM
 APPROVED BY: SPT
 FILE NO: 35-0000.dwg
 SHEET NO: 1 OF 1

ASSEMBLY NO. SEE TABLE
ENERGY ACQUISITION SYSTEMS, INC.
 2600 W. 10TH AVE. DENVER, CO 80202
QUARTICULAR SYSTEM
 NOSE ASSY, QCS OR, 1/59/90

**QUADGUARD SYSTEM
FOR WIDE HAZARDS**

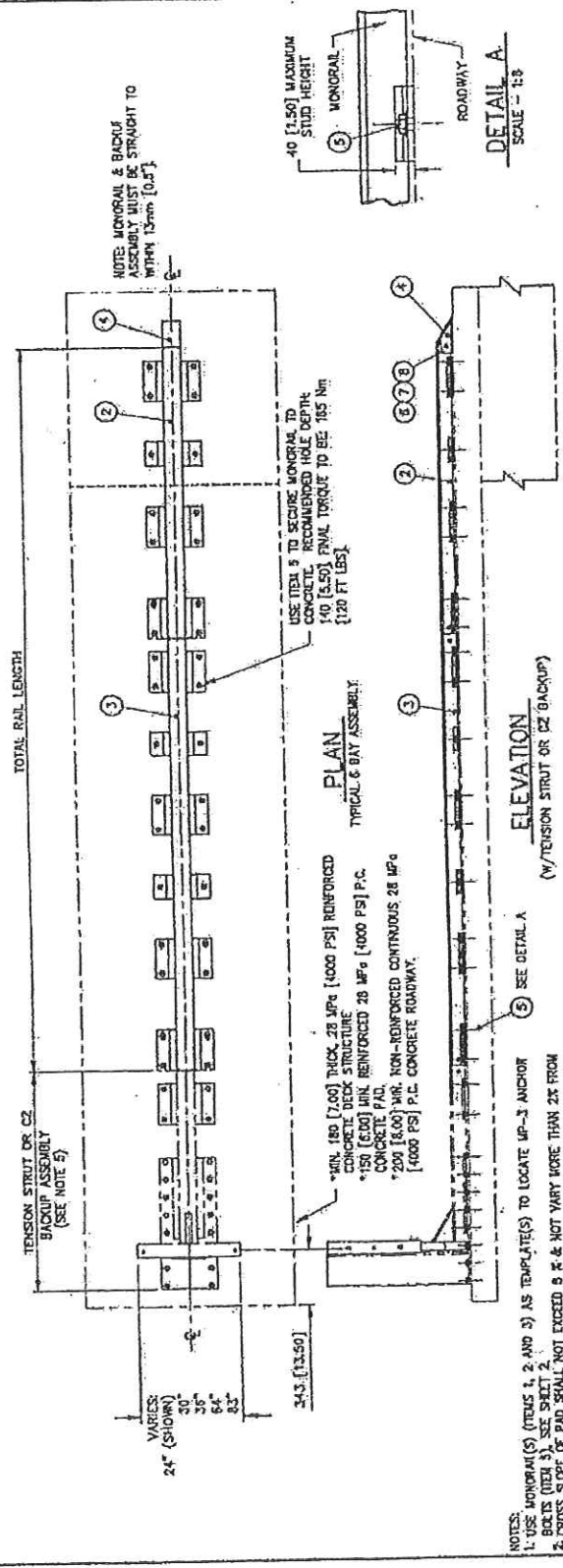
TABLE 1						
ASSEMBLY NO.	RAIL RAIL LENGTH	*ITEM 1	*ITEM 2	*ITEM 3	*ITEM 5	NO. OF BAYS
35-00060-0100	0	0	0	0	0	1
35-00060-0200	615 (36.0)	1	0	0	0	2
35-00060-0300	1230 (72.0)	0	1	0	0	3
35-00060-0400	1845 (108.1)	0	0	1	0	4
35-00060-0500	2460 (144.1)	0	0	0	1	5
35-00060-0600	3075 (180.1)	0	0	1	1	6
35-00060-0700	3690 (216.1)	0	0	0	2	7
35-00060-0800	4305 (252.1)	0	0	0	2	8
35-00060-0900	4920 (288.2)	0	1	2	9	9
35-00060-1000	5535 (324.2)	0	0	3	10	10
35-00060-1100	6150 (360.2)	1	0	0	3	12
35-00060-1200	6765 (396.2)	0	1	3	13	12

NOT APPLICABLE FOR 60° & 90° OR CZ OR C2 SYSTEMS

NOT APPLICABLE FOR C2 OR C2 SYSTEMS

PARTS LIST		
REV	STOCK NO.	DESCRIPTION
1	2760051-0000	MONORAIL ONE BAY, OC, C
2	2760061-0000	MONORAIL TWO BAYS, OC, C
3	2760071-0000	MONORAIL THREE BAYS, OC, C
4	2760041-0000	END CAP, MONORAIL, OC, C
5	3525300-0000	ANCHOR, MP-3, PT-NIT, 3/4X7, VT
6	2699571-0000	BOLT, HX, 5/8X3 1/2, GS, C
7	2704141-0000	NUT, HX, 3/8, D
8	27082731-0000	WASHER, LOCK, 5/8, C

* SEE TABLE



- NOTES:
1. USE MONORAIL(S) (ITEMS 1, 2, AND 3) AS TEMPLATE(S) TO LOCATE MP-3 ANCHOR BOLTS (ITEM 5). SEE SHEET 2.
 2. CROSS SLOPE OF PAD SHALL NOT EXCEED 5% & NOT VARY MORE THAN 2% FROM FRONT TO BACK.
 3. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 4. EVERY STUD MUST BE EMBEDDED TO A DEPTH OF 140 [5.5] IF REBAR IS ENCOUNTERED BY A P.C. CONCRETE PAD, DRILL THROUGH IT. IF REBAR IS ENCOUNTERED ON A DECK STRUCTURE, ASK PROJECT ENGINEER FOR DIRECTION.
 5. FOR C2 SYSTEMS, SEE DRAWING 35-40-24 ALSO.

ASSEMBLY NO. SEE TABLE L

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
MONORAIL ASSY, QG

DATE: 5-8-98
BY: D. Stone
CHKD: MHO/JVA
SCALE: 3-1-86

DATE: 5/17/96
BY: S. Tragester
CHKD: M. Oberth

DATE: 5/17/98
BY: M. Oberth
CHKD: 354006.dwg

REV. 1 of 3

DATE: 35-40-06

N.T.S.

REFERENCES:

Revision	Date	Rev.	By	Chk/App.
ITEM 2 WAS 270991-0000	03/03/98	X	IB	BE KM
ITEM 3 REDESIGNED	05/07/98	L	LMC KM	SPT
NO. OF BAYS	1	2	3	4
1	2	3	4	5

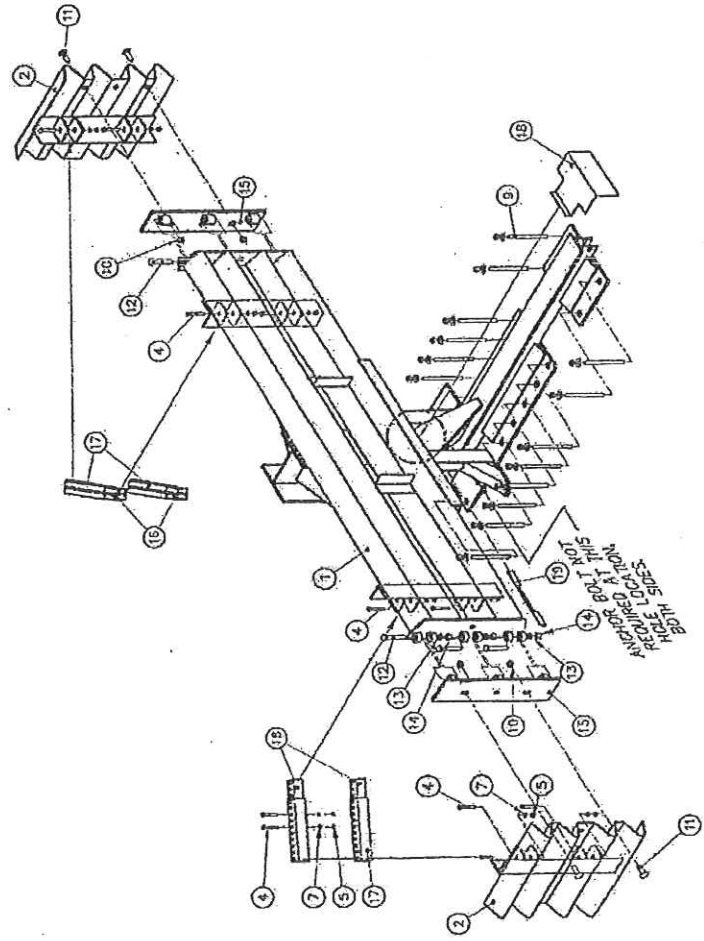
PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE A	BACKUP ASSY, 00 WIDE, G	1.00
2	2760471-0000	PANEL, SIDE, 00 WIDE, G	2.00
4	2689601-0000	BOLT, HX, 3/8X3 1/2, CZ, C, ALL THREAD	16.0
5	2704031-0000	NUT, HX, 3/8	16.0
7	2708041-0000	WASHER, LOCK, 3/8, G	16.0
8	3523300-0000	ANCHOR, WP-3, PT-40T, 3/4X7, VT	3.00
10	2704191-0000	NUT, HX, 5/8, O, RAL	4.00
11	2693341-0000	BOLT, HX, 5/8X4, OS, G	4.00
12	2701991-0000	BOLT, HX, 5/8X4, OS, G	6.00
13	2708231-0000	WASHER, LOCK, 5/8, G	6.00
14	2704141-0000	NUT, HX, 5/8, G	6.00
15	2760435-0000	HINGE, PLATE, FENDER, PANEL, 00, G	2.00
16	2760501-0000	TEL ST 1 3/4X1 3/4X120A, HHS, G, 10" LG	4.00
17	2760502-0000	TEL ST 2X2X120A, HHS, G, 10" LONG	4.00
18	2760293-0000	BRACKET, CARTRIDGE SUPPORT, TS B/U	1.00
19	2760294-0000	LOCKING BAR, CART SUPPORT, 00, G	1.00

TABLE A

ASSY. NO.	STOCK NO.	DESCRIPTION	WIDTH
3540391-0000	2760451-0000	BACKUP, TS, 64.00 WIDE, G	1620 [84"]
3540392-0000	2760452-0000	BACKUP, TS, 81.00 WIDE, G	2100 [85"]

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.



ASSEMBLY NO. SEE TABLE A
 ENERGY ADSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT
 QUADGUARD® SYSTEM
 BACKUP ASSY, TS, 00 WIDE

REFERENCES

REV.	DATE	BY	APP.
1	7/1/97	D. Stous	
2	6/2/97	J. Machado	
3	7/17/97	B. Kröge	
4	7/17/97	J. Machado	

3540390-0000.dwg
 1:20
 1 of 1

Revisions

Date	Rev'd	By	App.
12/20/96	E	CR/BAK	SPT
07/19/97	C	LWC	KW SPT
12/10/95	D	DK	BB SPT

ITEM IS WAS 2760471-0000
 RESIGNED Y ANCHOR BOLT & LOCKED NUT.
 COMPUTED DIMENSIONS. ITEM IS WAS 2760435-0000

QUADGUARD SYSTEM
FOR WIDE HAZARDS

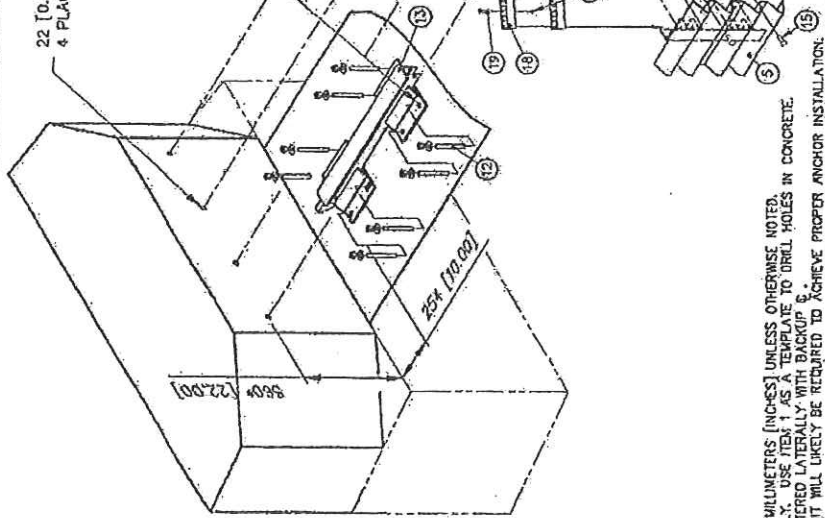
QUADGUARD SYSTEM FOR WIDE HAZARDS

REV	STOCK NO.	DESCRIPTION	QTY
1	SEE TABLE	BACKUP FACE, CONC. OG WIDE G	1.00
2	3525130-0000	ANCHOR, MP-3 FT INT, 3/4 X 1/2 HOR	1.00
3	2760435-0000	HINGE PLATE, FENDER PANEL, OG G	2.00
5	2760471-0000	PANEL, SIDE, OG WIDE G	2.00
6	2760031-0000	NUT, HX, 3/8 G	16.0
10	2701991-0000	BOLT, HX, 5/8 X 4.05 G	6.00
11	2708231-0000	WASHER, LOCK, 5/8 G	6.00
12	3525300-0000	ANCHOR, MP-3 FT INT, 3/4 X 1/2 VT	2.00
13	2760051-0000	MONORAIL, ONE BAY, OG G	1.00
14	2704141-0000	NUT, HX, 5/8 G	6.00
15	2701811-0000	BOLT, RAIL, 5/8 X 1 1/4 G	4.00
16	2704191-0000	NUT, HX, 3/8 G, RAIL	4.00
17	2760501-0000	TEL ST 1 3/4 X 1 3/4 X 1/2 CA, H4S, G, 10' LG	4.00
18	2760502-0000	TEL ST 2 X 2 X 1/2 CA, H2S, G, 10' LONG	4.00
19	2698601-0000	BOLT, HX, 3/8 X 3 1/2 G, ALL THREAD	16.0

ASSTY. NO.	ITEM 1	DESCRIPTION	WIDTH
3540401-0000	2760491-0000	BACKUP FACE, CONC, 64.05 WIDE G	18.20 (64")
3540402-0000	2760481-0000	BACKUP FACE, CONC, 63.05 WIDE G	21.00 (83")

22 [.875] HOLE X 115 [4.50] DEEP
4 PLACES - SEE NOTE 3

22 [.875] HOLE X 140 [5.50] MIN. DEEP, 8 PLACES
USE ITEM 13 AS TEMPLATE



- NOTES:
1. DIMENSIONS ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE NOTED.
 2. FOR REFERENCE ONLY, USE ITEM 1 AS A TEMPLATE TO DRILL HOLES IN CONCRETE.
 3. ITEM 13 TO BE CENTERED LATERALLY WITH BACKUP 5.
 4. A REBAR CUTTING BIT WILL LIKELY BE REQUIRED TO ACHIEVE PROPER ANCHOR INSTALLATION.

REFERENCES

CONCRETE, BACKUP, OG WIDE 35-40-41

Revisions	Date	Rev.	By	Chk/App.
ITEM 10 WAS 2893871-0000	12/20/94	D	LWC/BMK	SPT
ADDED LEGS	7/8/93	B	CLS	MM SPT
CHCD ITEM 3, WAS 2760133-0000	12/9/94	C	TOK	RM BB

DATE	D. STATUS	DATE
7/8/97	J. Machado	5/27/97
	B. Korman	7/17/97
	S. Troggs	7/17/97

35-40400-0000.dwg
REV. 000003

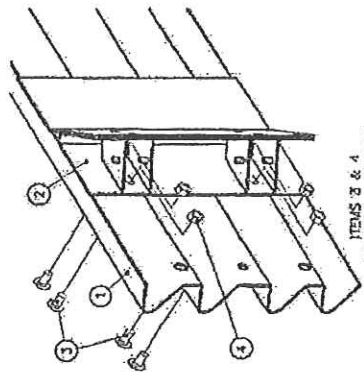
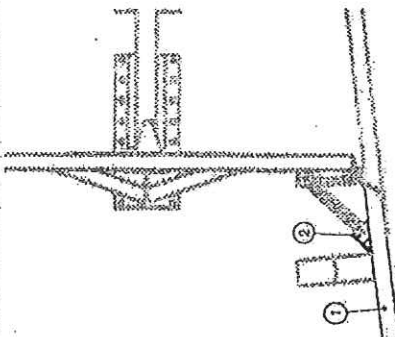
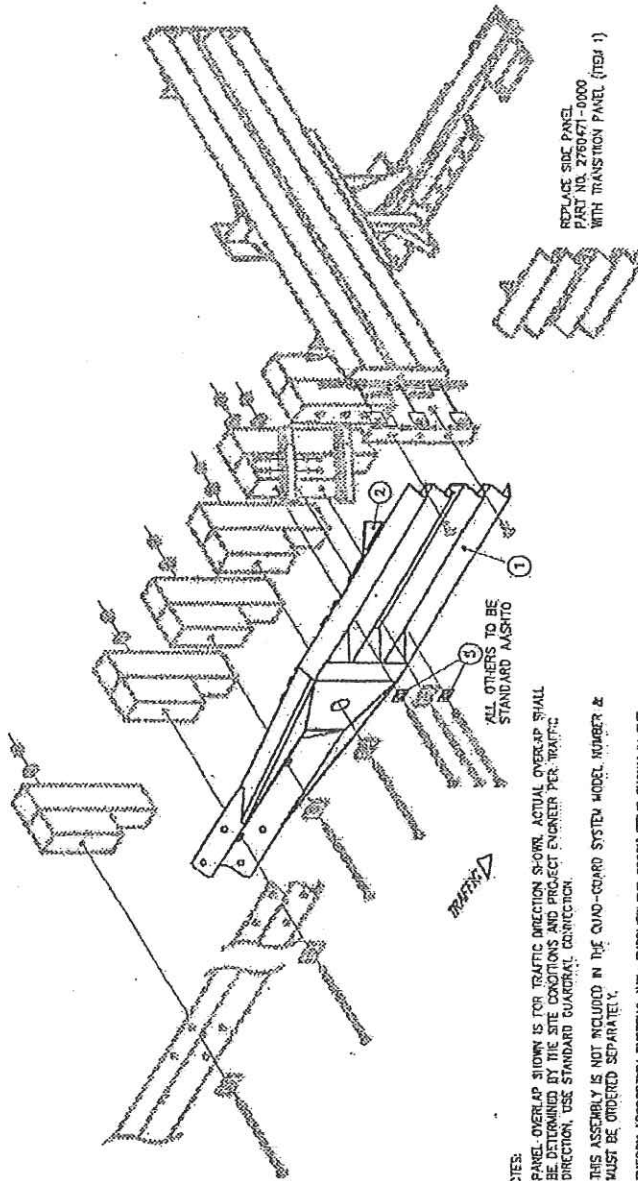
ASSEMBLY NO. (SEE TABLE)
ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

BACKUP ASSY, CONCRETE, OG WIDE

1:25 3540400-0000 1 of 1 D

**QUADGUARD SYSTEM
FOR WIDE HAZARDS**

ITEM	STOCK NO.	DESCRIPTION	QTY
1	2780211-0000	QUADGUARD TO W-BEAM TRANS. PANEL	1.00
2	2760303-0000	BRACKET, PIVOT SUPPORT, TRANS. CC	1.00
3	2701811-0000	BOLTS, RAILS, 5/8" X 1 1/4"	4.00
4	2704191-0000	NUTS, HEX, 5/8"	4.00
5	2708871-0000	WASHER, BAR, 1/2" X 1 1/4" X 2, W/ANGLE	2.00



- NOTES:
1. PANEL OVERLAP SHOWN IS FOR TRAFFIC DIRECTION SHOWN. ACTUAL OVERLAP SHALL BE DETERMINED BY THE SITE CONDITIONS AND PROJECT ENGINEER PER TRAFFIC DIRECTION. USE STANDARD GUARDRAIL CONNECTION.
 2. THIS ASSEMBLY IS NOT INCLUDED IN THE QUAD-GUARD SYSTEM MODEL NUMBER & MUST BE ORDERED SEPARATELY.
 3. ENERGY ABSORPTION SYSTEMS, INC., SUPPLIES THE STOCK ITEMS SHOWN IN THE PARTS LIST WITH THE ASSEMBLY NUMBER. ALL OTHER COMPONENTS OF THE DOWNSTREAM GUARDRAIL (POSTS, HARDWARE AND RAIL FITMENTS) ARE STANDARD HIGHWAY MATERIALS AND MAY BE OBTAINED FROM YOUR LOCAL HIGHWAY SUPPLY VENDORS.
 4. PANEL MAY BE USED ON LEFT AND/OR RIGHT SIDE.

ASSEMBLY NO. 3540211-0000		ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT	
QUAD-GUARD™ TRANSITION ASSEMBLY, QUAD-BEAM™ TO W-BEAM-WIDE		N.T.S. 3540211-0000 1 of 2 B	
REV.	DATE	BY	CHK/APP.
1	5/29/97	J. M. [unclear]	[unclear]
2	6/7/96	[unclear]	[unclear]
3	3/6/97	[unclear]	[unclear]
4	3/6/97	[unclear]	[unclear]

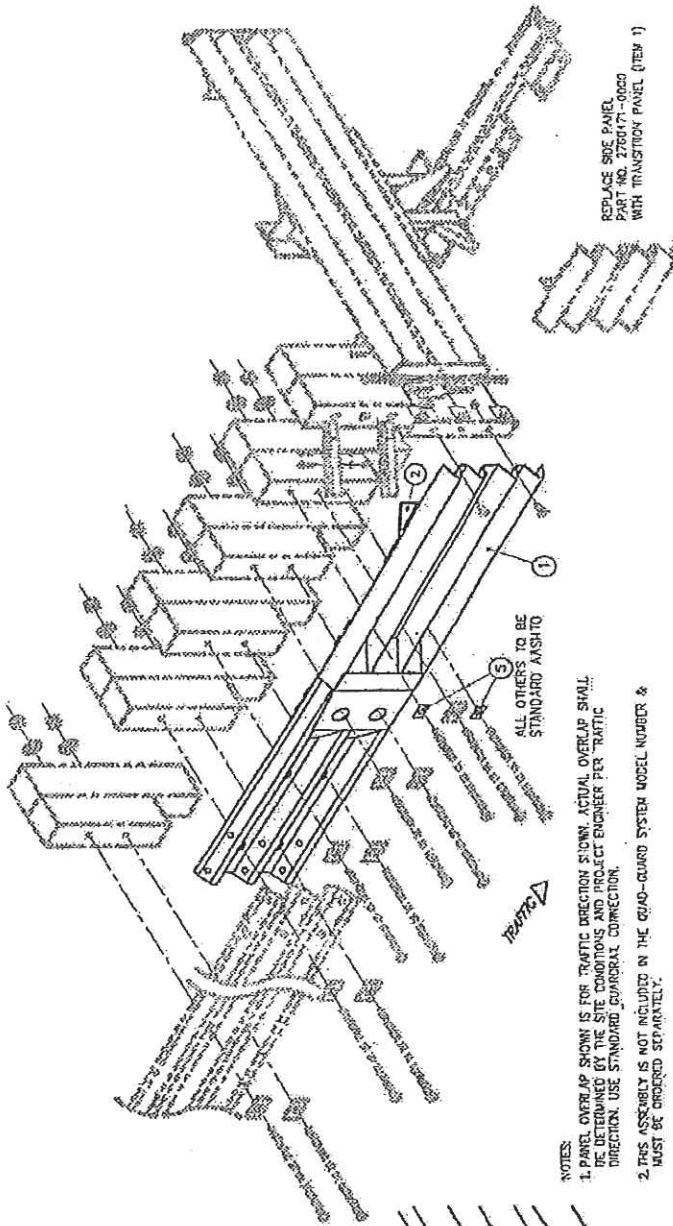
REFERENCES

ITEM 2 ASSEMBLY

Revisions	Date	Rev.	By	Chk/App.
UPDATE BOLT LAYOUT FOR ITEM 2 ASST	1/27/94	B	RCS	KU JM

**QUADGUARD SYSTEM
FOR WIDE HAZARDS**

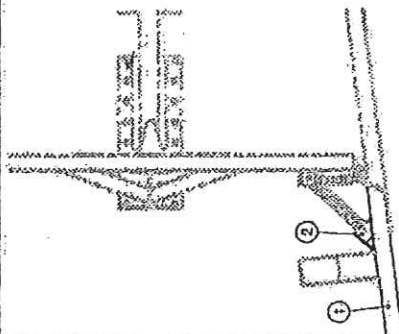
PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	2760331-0000	QUADGUARD TO THREE-BEAM TRANS. PANEL	1.00
2	2760503-0000	BRACKET/PANEL SUPPORT TRANS. QG	1.00
3	2701801-0000	BOLT, GALV. 5/8" X 1 1/4", C	4.00
4	2704101-0000	RIT, HX, 5/8" S	4.00
5	2708671-0000	WASHER, GALV. 1/2" X 1 1/4", W/1/16"	2.00



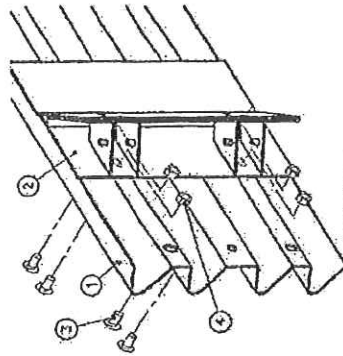
NOTES:
 1. PANEL OVERLAP SHOWN IS FOR TRAFFIC DIRECTION SHOWN. ACTUAL OVERLAP SHALL BE DETERMINED BY THE SITE CONDITIONS AND PROJECT ENGINEER PER TRAFFIC DIRECTION. USE STANDARD CORNER CONNECTION.
 2. THIS ASSEMBLY IS NOT INCLUDED IN THE QUAD-GUARD SYSTEM MODEL NUMBER & MUST BE ORDERED SEPARATELY.
 3. ENERGY ABSORPTION SYSTEMS, INC., SUPPLIES THE STOCK ITEMS SHOWN IN THE PARTS LIST. THE ASSEMBLY, BEAM, AND COMPONENTS OF THE QUADGUARD SYSTEM ARE STANDARD ELEMENTS. STANDARD MATERIALS AND MAY BE OBTAINED FROM YOUR LOCAL HIGHWAY SUPPLY VENDORS.

4. PANEL MAY BE USED ON LEFT AND/OR RIGHT SIDE.

REPLACE SIDE PANEL
 PART NO. 2760771-0000
 WITH TRANSITION PANEL (ITEM 1)



DETAIL A



ITEMS 3 & 4
 REQUIRED 1 PLACES

ITEM 2 ASSEMBLY

Revisions	Date	Rev.	By	Des/App.
MULTIPLE REVS.	10/29/87	A	DLS	KM, JWM
UPDATED BOLT LAYOUT FOR ITEM 2 ASSEMBLY	10/29/89	B	RCC	BB, SPT

REFERENCES

REV.	DATE	BY	APP.
03/28/87	03/28/87	JWM	JWM
05/03/87	05/03/87	KSM	KSM
06/03/87	06/03/87	J. Machado	J. Machado

ASSEMBLY NO. 3540221-0000
 ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT

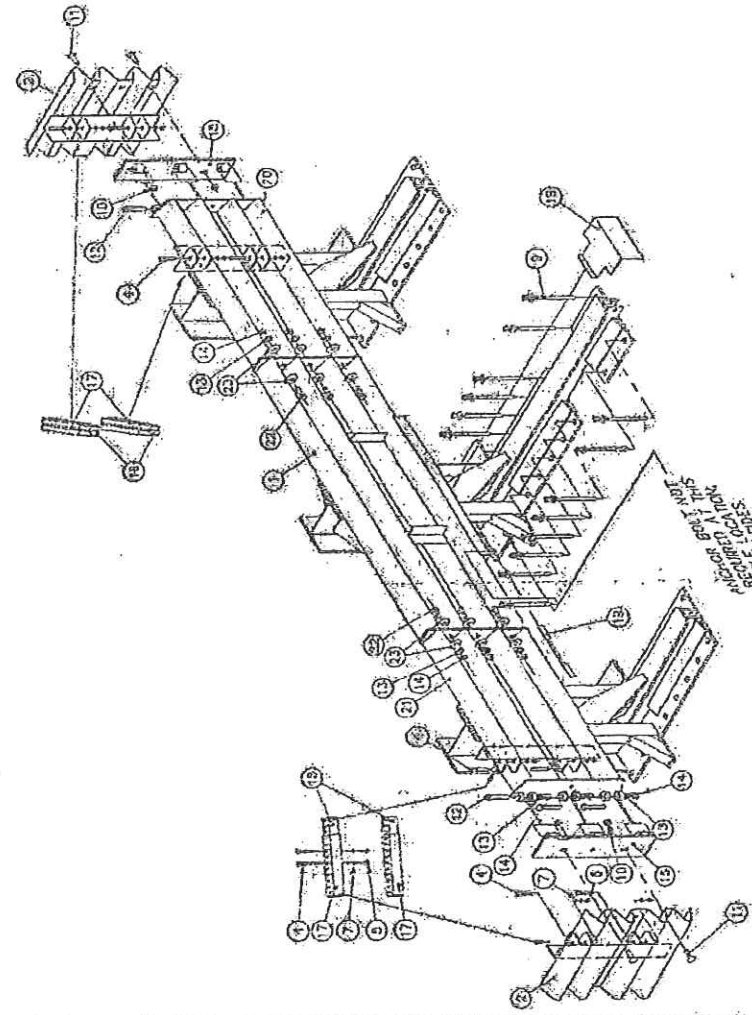
QUAD-GUARD™
 TRANSITION ASSEMBLY,
 QUAD-BEAM™ TO THREE-BEAM - WIDE

REV. N.I.S. 3540221-0000 1 of 2 B

PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
1	276048-0000	BACKUP, 15, 120, 0G WIDE CENTER SECTION	1.00
2	276047-0000	PANEL SIDE, 0G WIDE LG	2.00
3	260980-0000	BOLT, PK 3/8X3 1/2, 2.62, C, ALL THREAD	16.0
4	270163-0000	NUT, PK 3/8 G	16.0
5	270090-0000	WASHER, 1.00X1 1/8 G	16.0
6	352336-0000	ANCHOR, 1/2"-5/16"-NUTS/4X7/16"	8.00
7	270191-0000	NUT, PK 5/8 G, RAL	4.00
8	289034-0000	DOT, 1/2" X 1/2" X 1/2" G	4.00
9	270189-0000	BOLT, PK 5/8X5/8 G	6.00
10	270023-0000	WASHER, 1.00X5/8 G	12.0
11	270044-0000	NUT, PK 5/8 G	12.0
12	270045-0000	INNER PLATE, TENDER PANEL, 0.0	2.00
13	270046-0000	TEL ST 1 3/4 X 1 3/4 X 2 1/2, 26X14X5, 10" LONG	4.00
14	270022-0000	BRACKET, CARTRIDGE SUPPORT, IS B/A	1.00
15	270024-0000	LOCKING BAR, PART SUPPORT, 0G	1.00
16	270040-0000	BACKUP, 15, 120, 0G WIDE AT SECTION	1.00
17	270041-0000	BOLT, 1/2" X 1/2" X 1/2" G	6.00
18	270021-0000	WASHER, 1.00 X 5/8 G	12.0

NOTES:
 1. WHEN TRANSFORMING QUADGUARD SYSTEM TO EXISTING BARRIER, REFER TO THE TRANSITION ASSEMBLY DRAWINGS FOR PROPER USE OF SIDE PANEL, TIE BAR AND DIAGONAL BRACES, ITEMS 16 & 17.



ASSEMBLY NO. 601210-0000
ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT

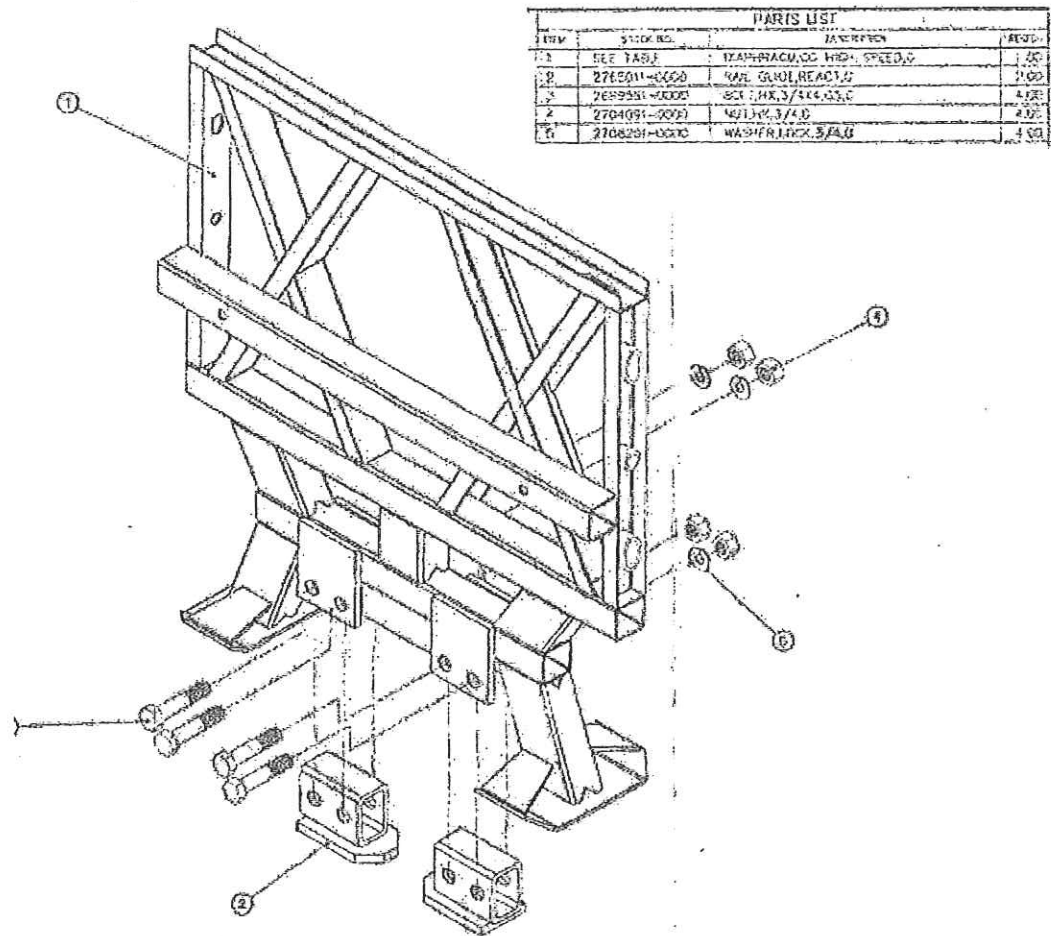
QUADGUARD® SYSTEM
BACKUP ASSY, TS, 120, 0G WIDE

DATE: 01/08/76
 BY: H. HUYEN
 CHECKED: BB
 DESIGNED: SPJ
 DRAWING NO: 601210-0013-00
 REV: 01/19/70

REFERENCES:

Rev	Date	By	Old App
1	02/01/70	SPJ	001/STT/SPJ

307 CHANGED TO MATCH SMT 2



NOTE: THIS DIAPHRAGM TO BE USED ONLY FOR DIAPHRAGMS 1 THRU 3 ON THE QUADGUARD-HS

PARTS LIST		DESCRIPTION		QTY.	
ITEM	STOCK NO.				
1	273 0041-1153	DIAPHRAGM CG EXTR. WIDE 1153 G		1	
2	273 211 0000	SOLE NOUDURE ST. O		2	
3	273 0061 0000	SOLE TX 24X1 CG G		4	
4	273 0091 0000	SOLE TX 24X1 CG G		4	
5	273 0031 0000	SOLE TX 24X1 CG G		4	
6	273 0021 0000	SOLE TX 24X1 CG G		4	
7	273 0011 0000	SOLE TX 24X1 CG G		4	
8	273 0001 0000	SOLE TX 24X1 CG G		2	

NOTES:

1. ASSEMBLE ITEMS 2 WITH FASTENERS AS SHOWN.

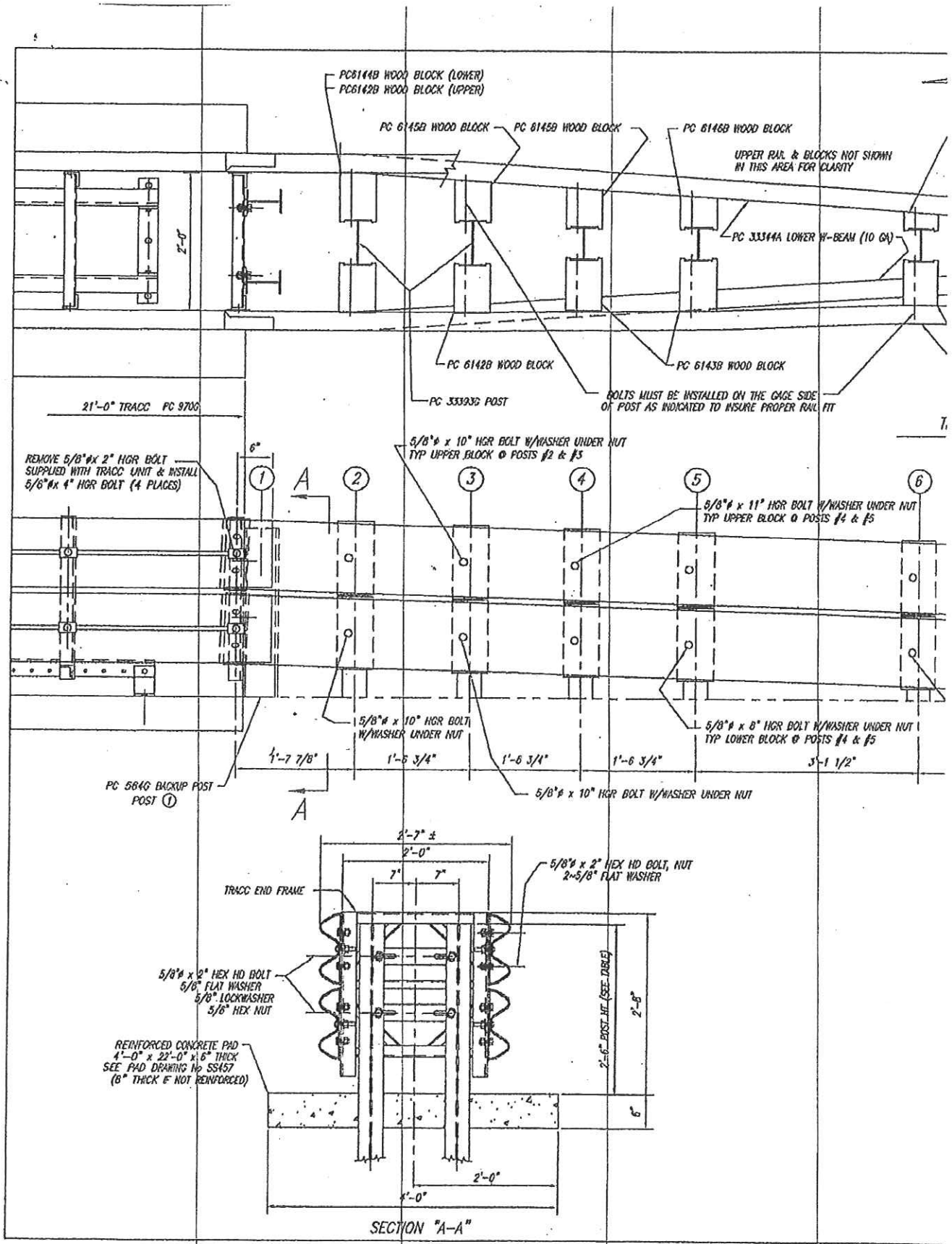
ASSEMBLY NO. 8010432-1153

ENERGY ABSORPTION SYSTEMS, INC.
Product Code: 8010432-1153

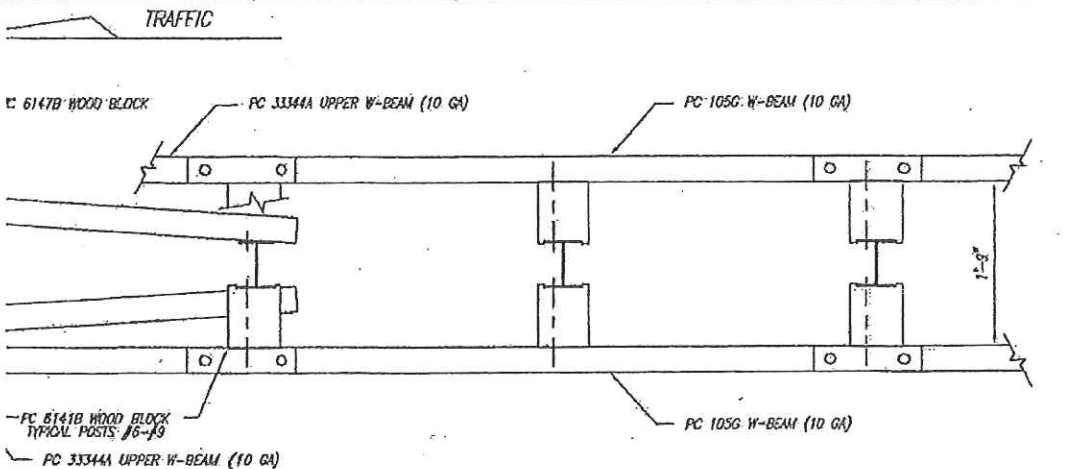
DIAPHRAGM ASSY, CG, EX-WIDE, 1153

376-1 8010432-1153 1 of 1

DATE	BY	REV	DESCRIPTION
11/17/2003	ST	1	INITIAL RELEASE
10/16/2003	A. Franklin	1	REVISED
11/10/2003	A. Franklin	1	REVISED
11/10/2003	ST	1	REVISED
11/17/2003	ST	1	REVISED

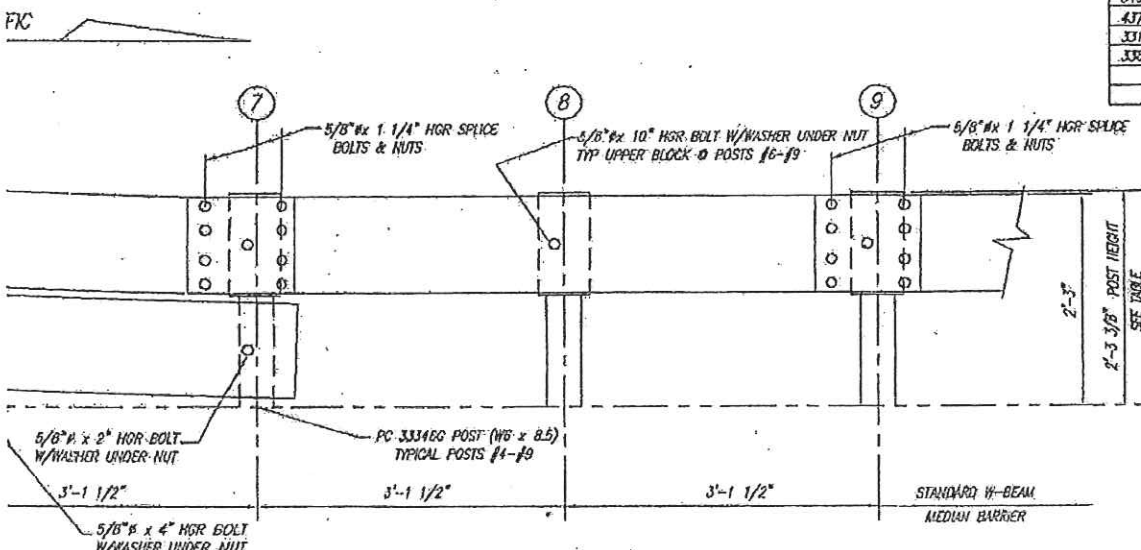


MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 37



TRACC TRANSITION BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
105G	2	10/6.5/TRACC (GLWRORAIL)
561G	2	BACKUP POST (WS x 2.5 x 6'-6")
33344A	4	10/12.6/TRACC (GLWRORAIL)
33333C	2	POST WS x 13 x 7'-6"
33346G	6	POST WS x 8.5 x 6'-6"
6141B	8	RTD WD BLOCK 1'-1 (6 x 8)
6142B	4	RTD WD BLOCK 1'-1 (6 x 8.3/4)
6143B	4	RTD WD BLOCK 1'-1 (6 x 9 1/4)
6144B	2	RTD TPRD WD BLK 1'-1 (6 x 8 9/16)
6145B	4	RTD TPRD WD BLK 1'-1 (6 x 7 1/4)
6146B	2	RTD TPRD WD BLK 1'-1 (6 x 5.15/16)
6147B	2	RTD TPRD WD BLK 1'-1 (6 x 3 3/8)
HARDWARE		
3510G	4	5/8" x 11" HGR POST BOLT
3500G	16	5/8" x 10" HGR POST BOLT
3480G	4	5/8" x 6" HGR POST BOLT
4432G	6	5/8" x 4" HGR POST BOLT
3400G	2	5/8" x 2" HGR POST BOLT
3360G	32	5/8" x 1 1/4" HGR SPUCE BOLT
3340G	60	5/8" HGR HEX NUT
3300G	32	5/8" FLAT WASHER (O HGR POST BOLT)
3404G	12	5/8" x 2" HEX HD BOLT (A325)
4372G	20	5/8" WASHER
3310G	4	5/8" LOCKWASHER
3361G	12	5/8" HEX NUT



POST HEIGHT TABLE

POST NO	HEIGHT
①	2'-0"
②	2'-7 3/8"
③	2'-6 3/4"
④	2'-6 1/8"
⑤	2'-5 1/2"
⑥	2'-4 3/8"
⑦	2'-3 3/8"
⑧	2'-3 3/8"
⑨	2'-3 3/8"

REV.	BY	DATE	REMARKS
1	BT	8-7-01	REVISED POSTS #2 & #3 AND LENGTH OF TRANSITION

TRACC

TRACC TRANSITION TO
W-BEAM MEDIAN BARRIER
PLAN, ELEVATION & SECTIONS
(ALL DRIVEN POSTS)

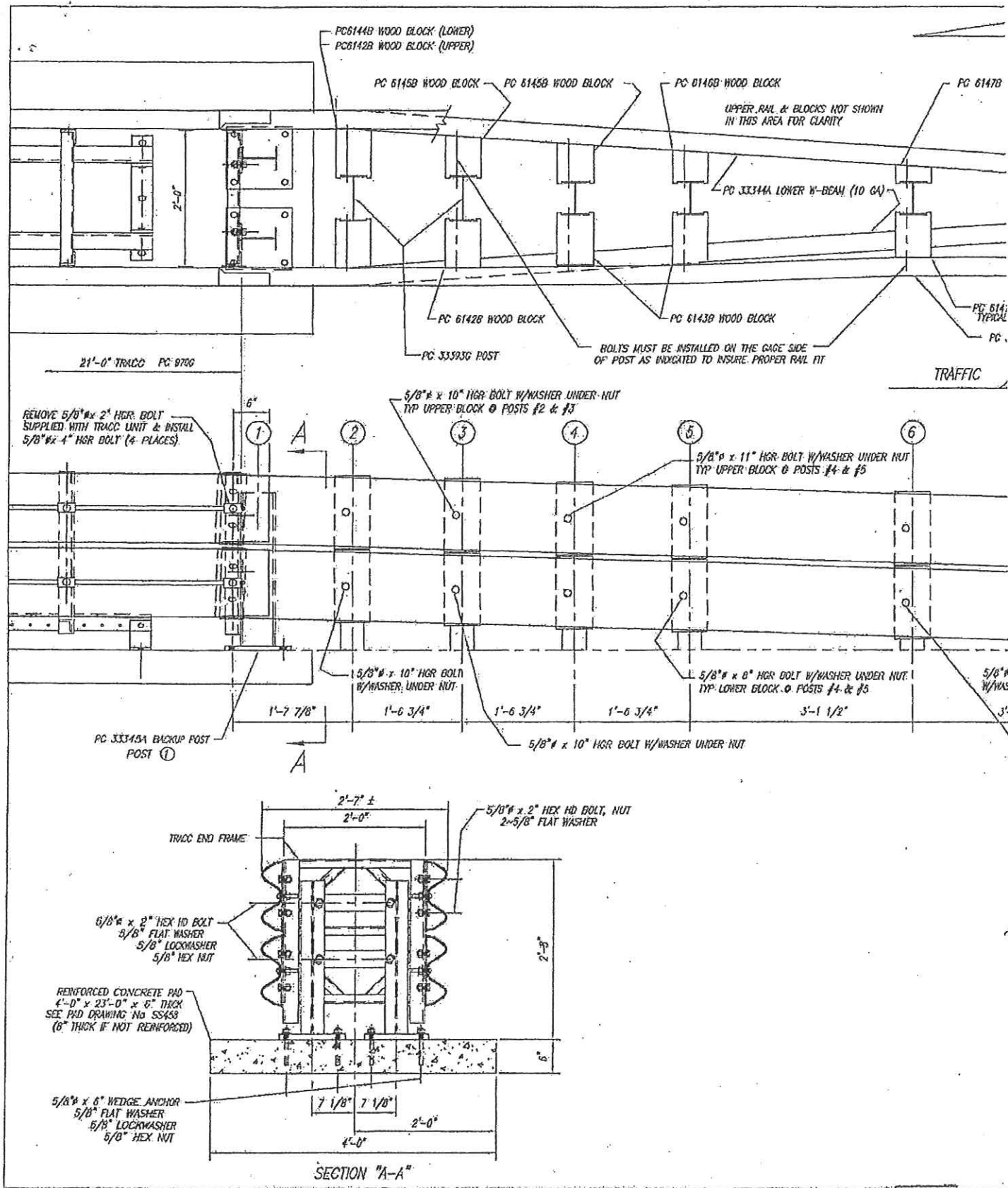
TRINITY INDUSTRIES, INC.
HIGHWAY SAFETY PRODUCTS
2525 STEMMONS FREEWAY, DALLAS, TX 75356

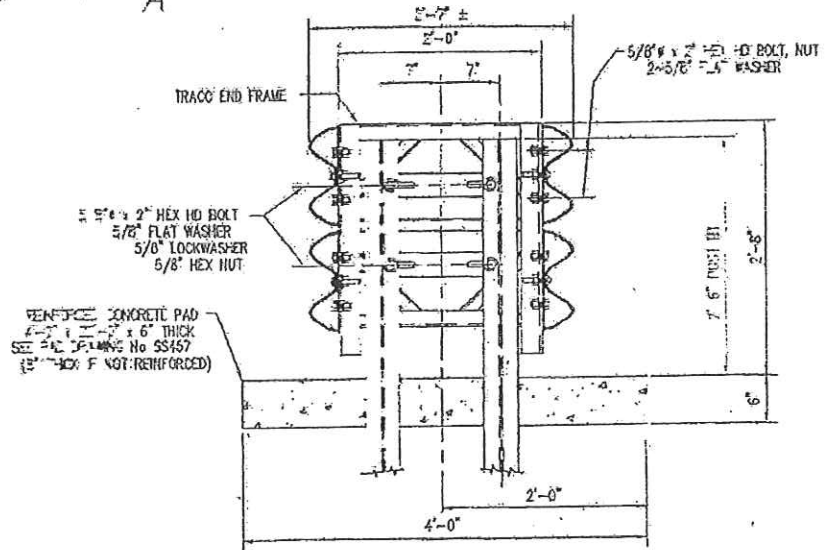
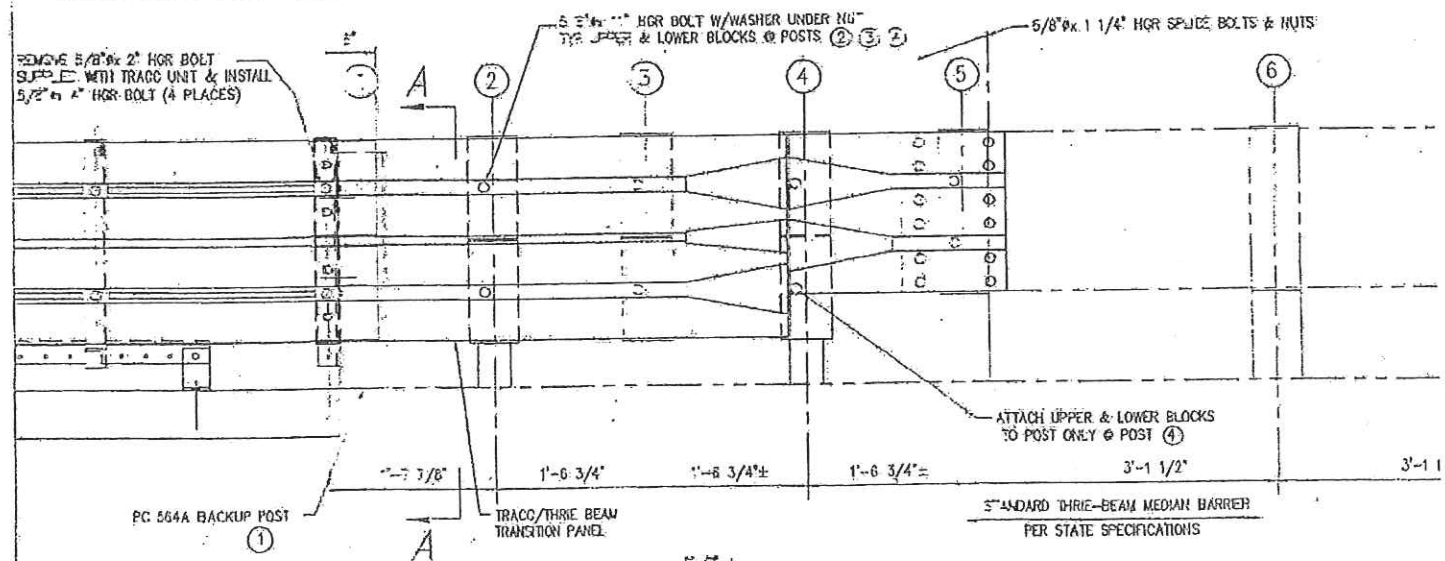
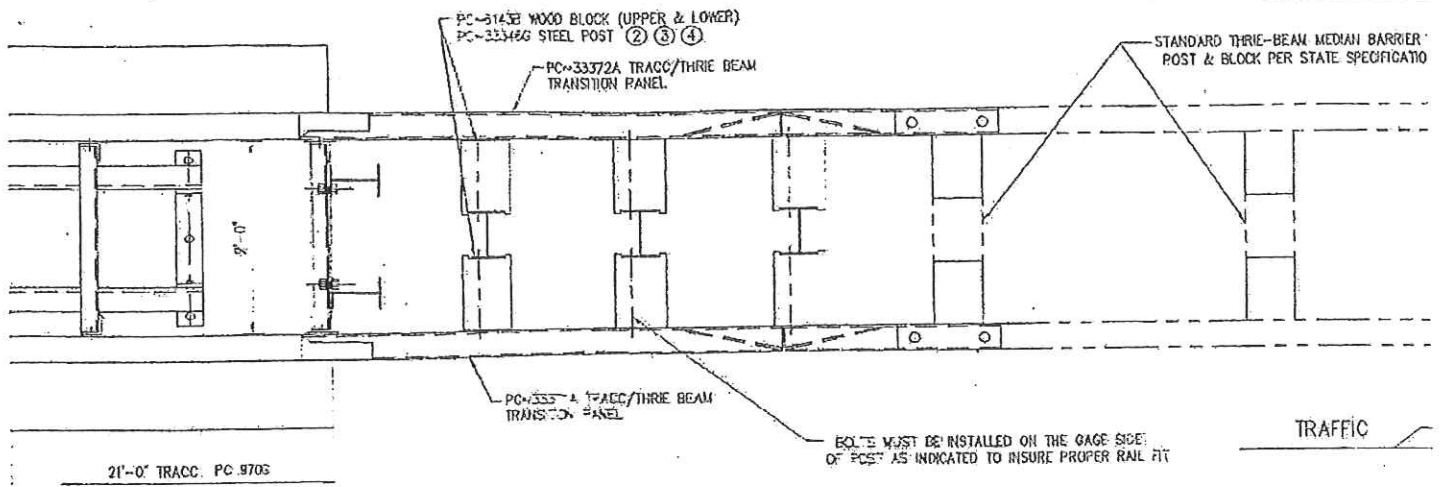
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CHECKED	
APPROVED	
DATE	8/16/00
ENG. FILE #	SS453-01E
SHEET	ET OF 1
DRAWING NO.	SS 453
REV	1

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37

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 36

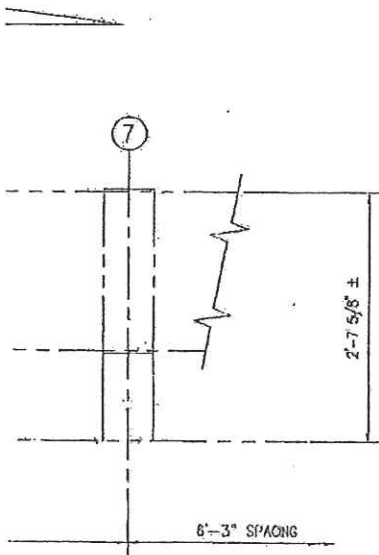
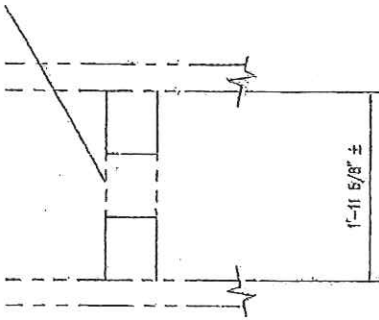




39

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 40

TRAFFIC



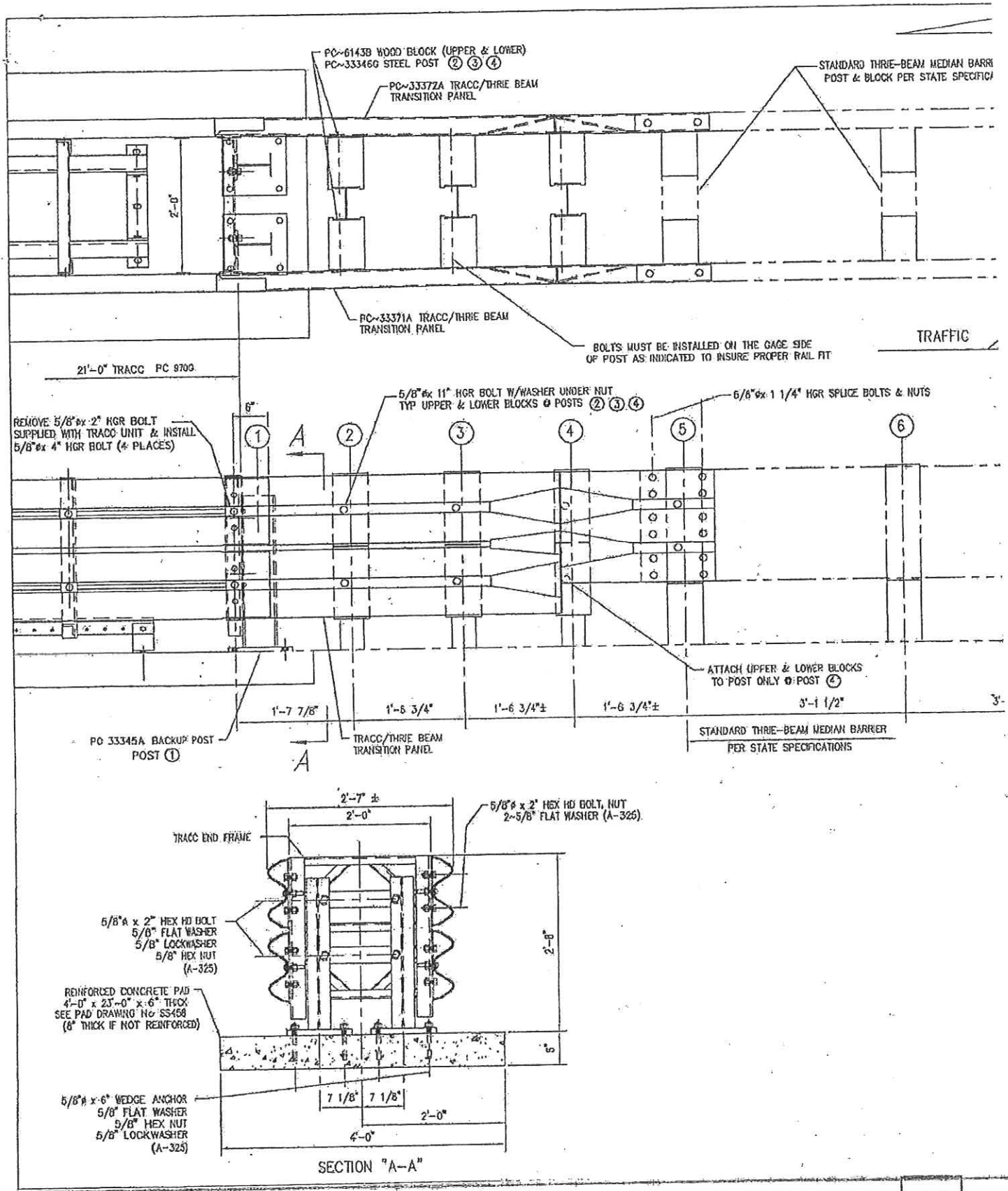
TRACC TRANSITION BILL OF MATERIAL

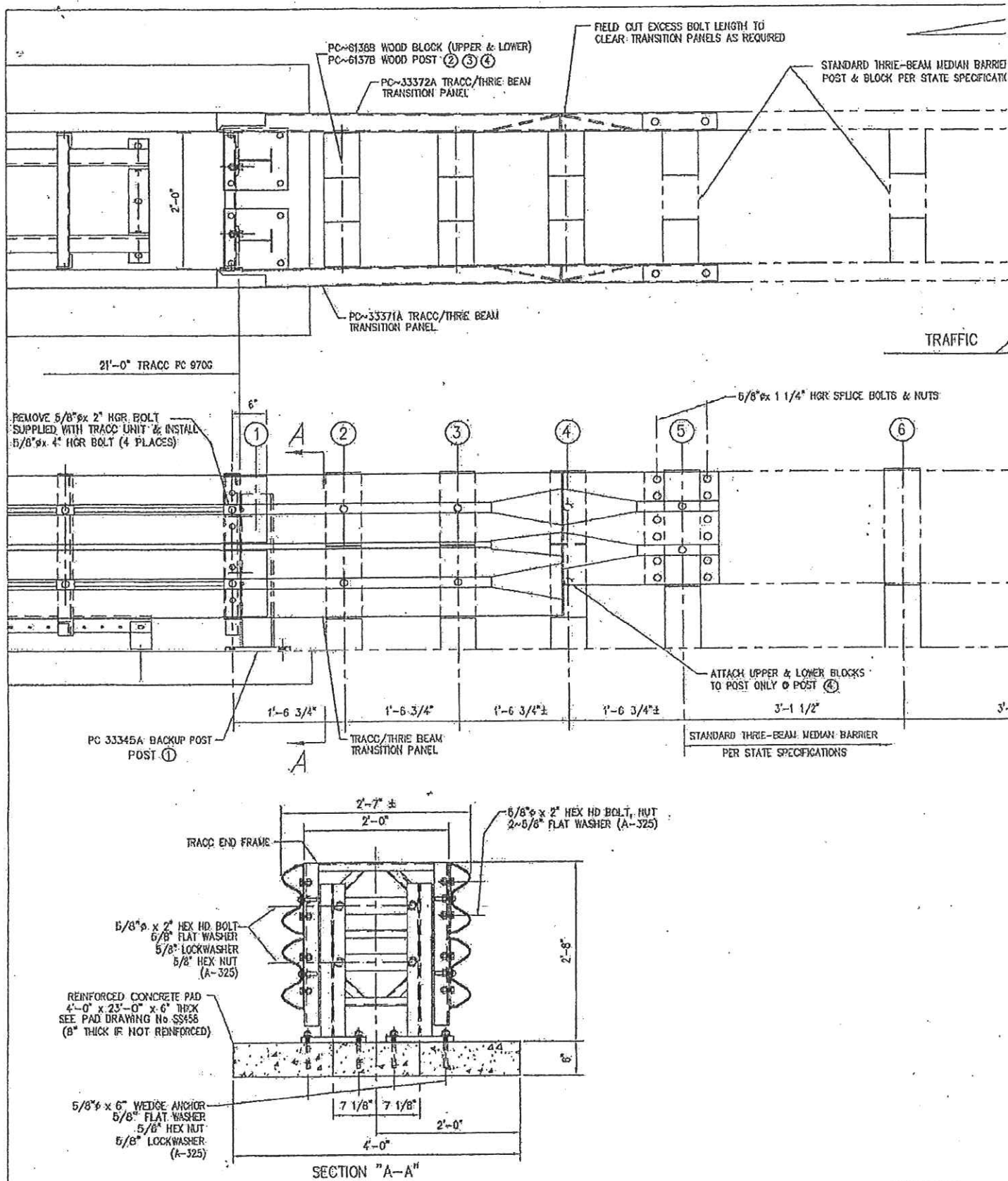
PRODUCT CODE	QTY	DESCRIPTION
E64G	2	POST W8 x 8.6 x 6'-6"
6143B	12	RTD WD BLOCK 1'-1 (6 x 9 1/4)
33346G	3	POST W8 x 8.5 x 6'-6"
33371A	1	TRACC/THRIE BEAM TRANSITION PANEL
33372A	1	TRACC/THRIE BEAM TRANSITION PANEL
HARDWARE		
4432G	4	5/8"Ø x 4" HGR POST BOLT
3510G	12	5/8"Ø x 11" HGR POST BOLT
3360G	24	5/8"Ø x 1 1/4" HGR SPLICE BOLT
3340G	36	5/8" HGR HEX NUT
3300G	12	5/8" FLAT WASHER (Ø HGR POST BOLTS)
3404G	12	5/8"Ø x 2" HEX HD BOLT (A325)
4372G	20	5/8" WASHER
3310G	4	5/8" LOCKWASHER
3361G	12	5/8" HEX NUT

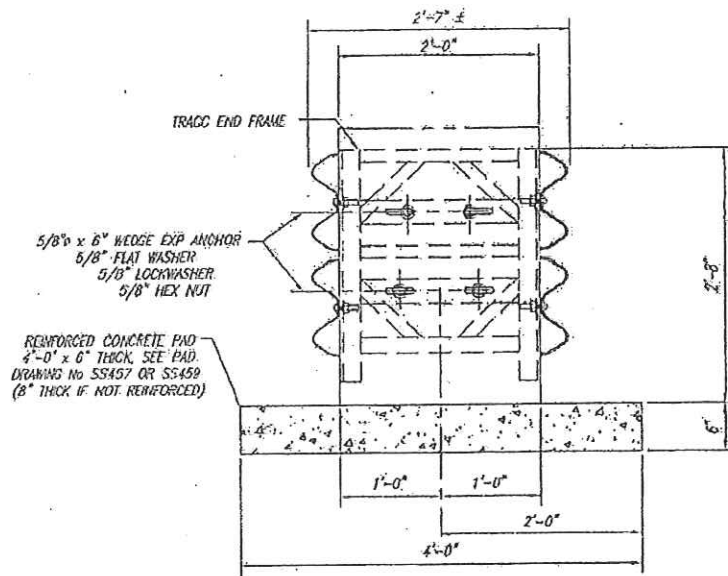
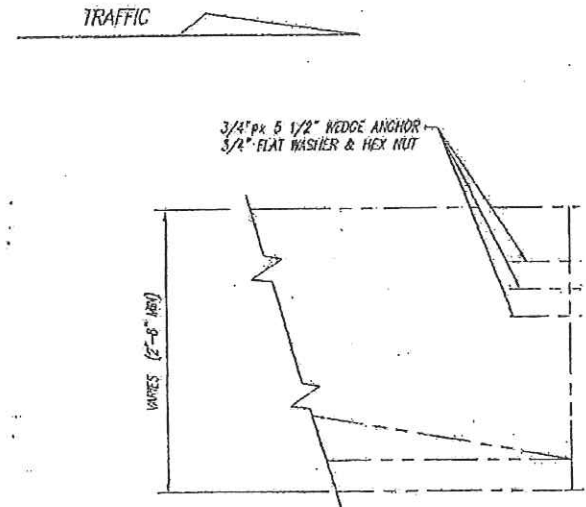
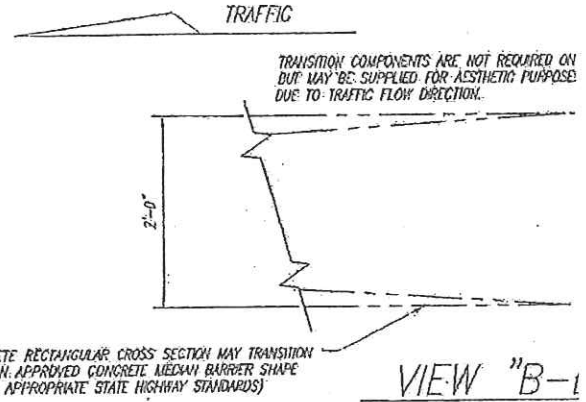
REV.	CHK'D	BY	DATE	REMARKS					
				TRACC					
TRACC TRANSITION TO THRIE BEAM MEDIAN BARRIER PLAN, ELEVATION & SECTIONS (ALL DRIVEN POSTS)							DRAWN	B.T.	
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356							CHECKED	DATE	
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							DATE	8-22-00	
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356							DWG FILE #	SS454-01E.	
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356							SITING	ET OF 1	
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356							DRAWING NO.	SS. 454	
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356							REV.	0	

40

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 39



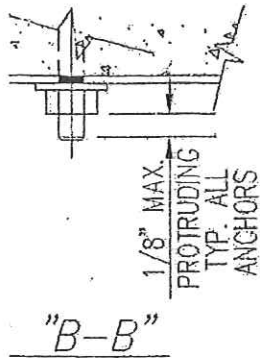
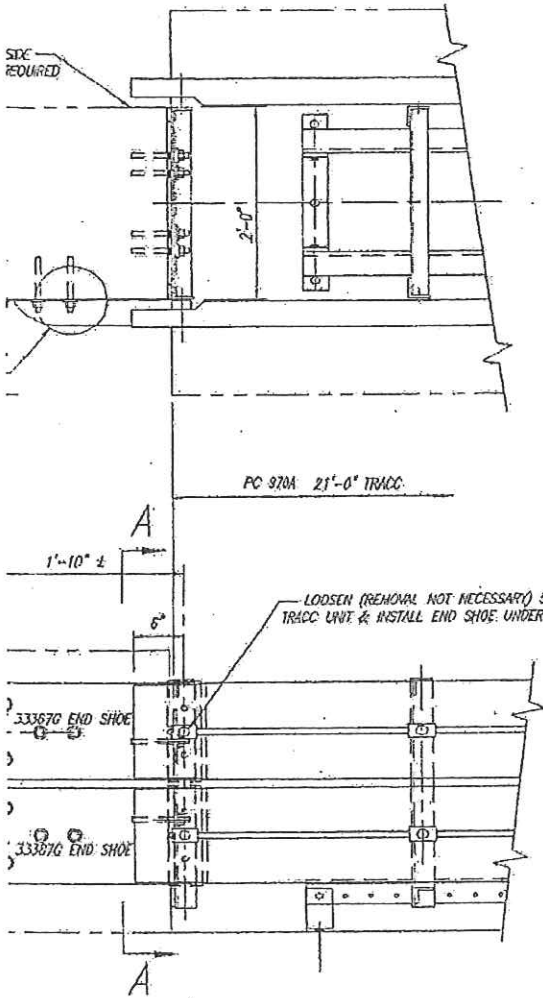




SECTION "A-A"

43

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 44



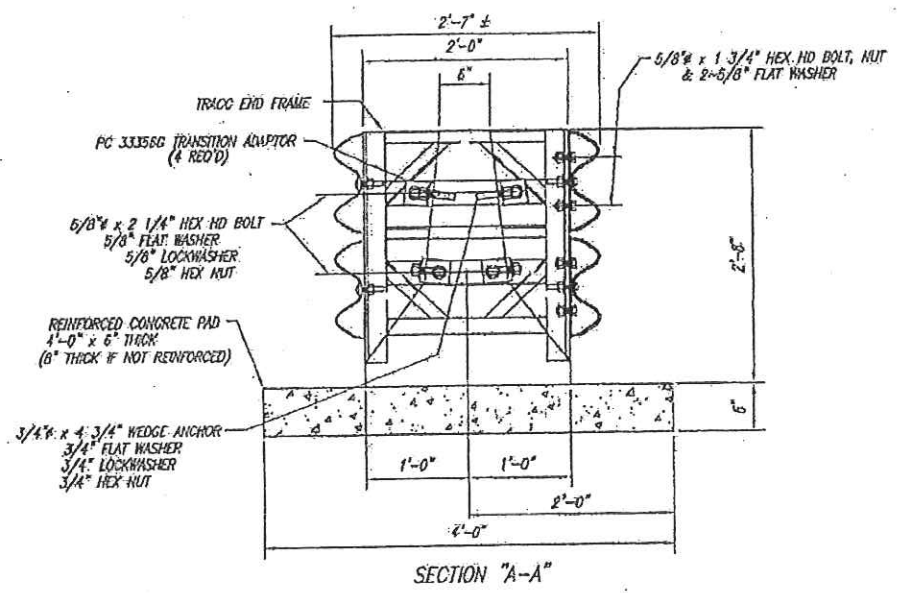
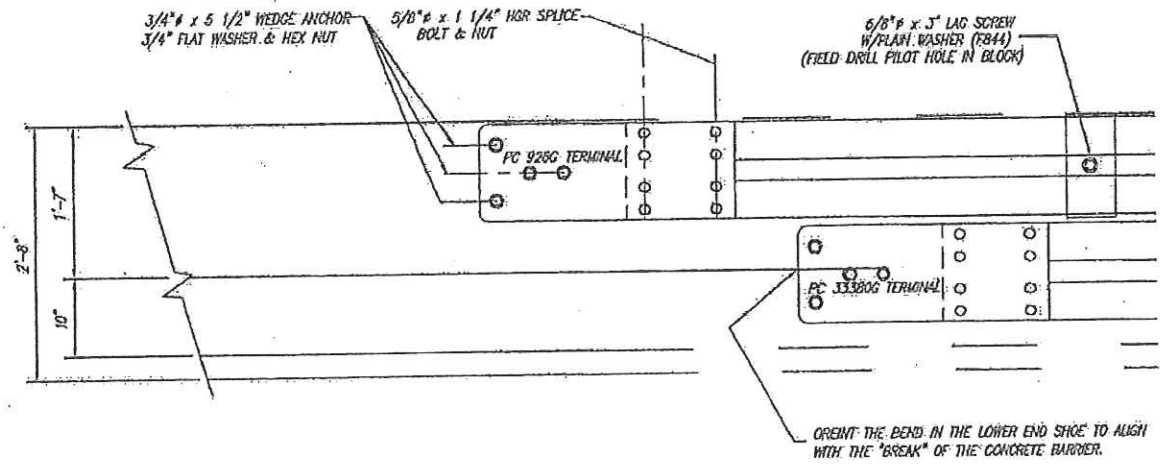
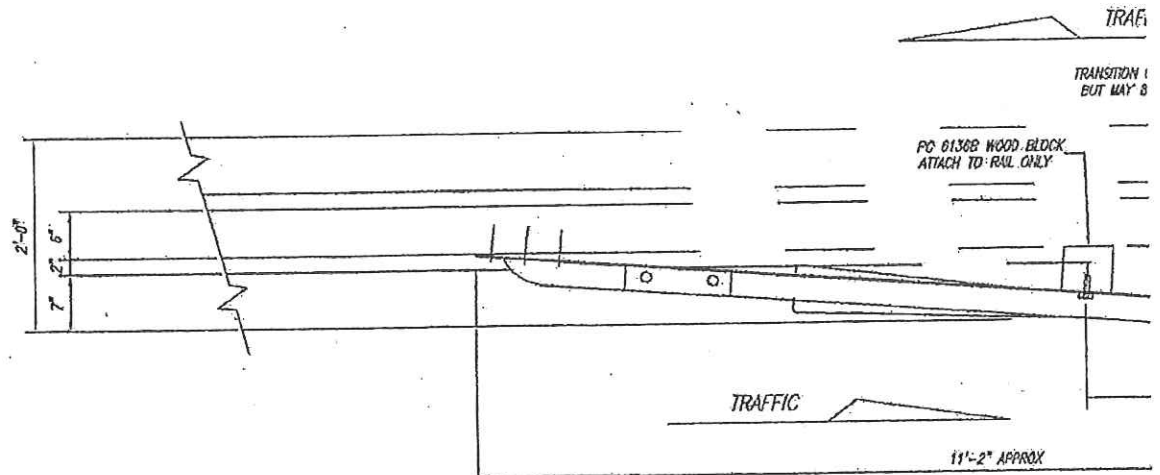
TRACC TRANSITION BILL OF MATERIAL		
PRODUCT CODE	QTY	DESCRIPTION
33367D	2	TRACC 100A END SHOE
HARDWARE		
3310G	4	5/8" LOCKWASHER
4451G	4	5/8" x 6" WEDGE EXP ANCHOR
4688G	8	3/4" x 5 1/2" WEDGE EXP ANCHOR

1	B.T.	LJL	11/19/03	ADDED EXPANSION BOLT VIEW B-B
REV.	CHK'D	BY	DATE	REMARKS
				TRACC
TRACC TRANSITION TO VERTICAL CONCRETE WALL, PIER, PARAPET OR BARRIER: PLAN, ELEVATION & SECTIONS				DRAWN B.T. CHECKED APPROVED DATE 9-7-00 EXD FILE # SS456-DIE SHEET: E1 OF 1 DRAWING NO. SS 456 REV. 1
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEMMONS FREEWAY, DALLAS, TX 75356				

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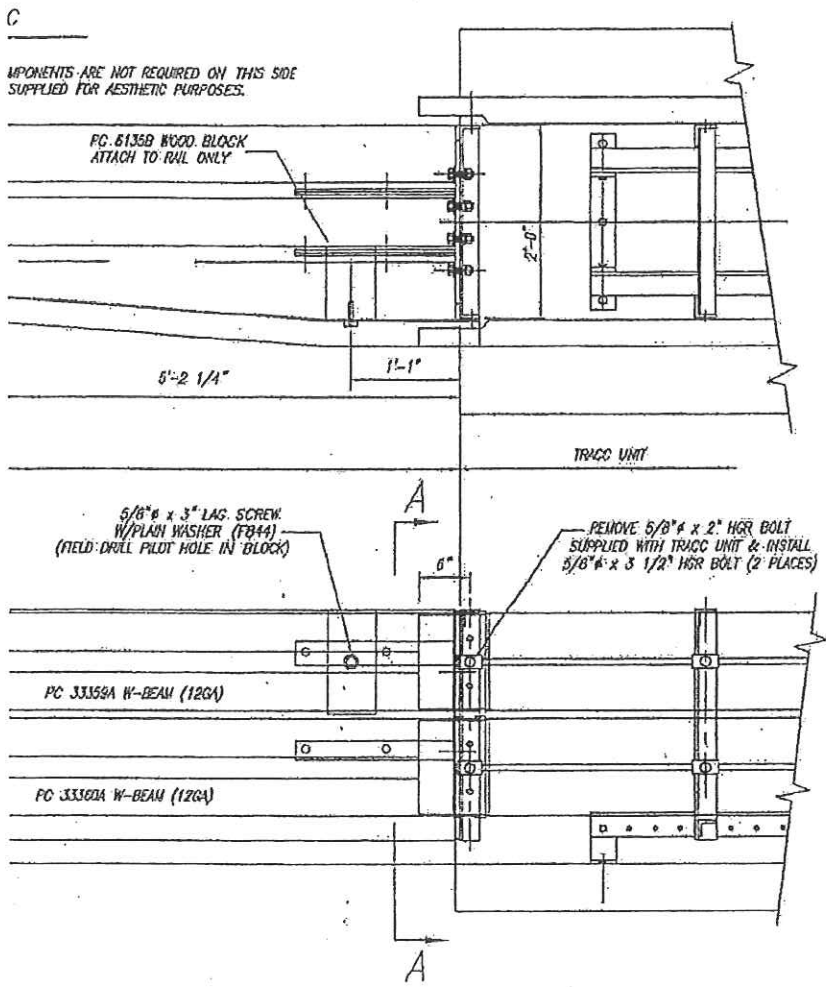
44

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 43



45

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 46



TRACC TRANSITION BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
926G	1	10/END SHOE/EXTRA HOLE (UPPER)
61356	1	TAPERED HD BLK 1'-1" (6 x 6 1/2)
61358	1	TAPERED HD BLK 1'-1" (6 x 5 3/4)
33356C	4	TRANSITION ADAPTOR PLATE
33358A	1	12/100"/TRACC (UPPER GUARDRAIL)
33360A	1	12/610.5"/TRACC (LOWER GUARDRAIL)
33360G	7	10/END SHOE/EXTRA HOLE/BEND (LOWER)
HARDWARE		
3360C	16	5/8" x 1 1/4" HGR SPLICE BOLT
3435C	2	5/8" x 3 1/2" HGR POST BOLT
4412G	2	5/8" x 3" LAG SCREW
6306G	4	5/8" x 2 1/4" HEX HD BOLT (A325)
3391G	4	5/8" x 1 3/4" HEX HD BOLT (A325)
3300G	2	5/8" WASHER (F844)
3340G	16	5/8" HGR NUT
4372G	12	5/8" WASHER (F436)
3310G	4	5/8" LOCKWASHER
3361G	8	5/8" HEX NUT (A563 DH)
4688C	8	3/4" x 5 1/2" WEDGE ANCHOR
6138C	8	3/4" x 4 3/4" WEDGE ANCHOR
4689C	8	3/4" LOCKWASHER
3701C	16	3/4" WASHER
3710C	16	3/4" HEX NUT

REV.	CHK'D	BY	DATE	REMARKS
0	SAR		6-20-05	UPDATED PART NUMBERS
1	LH		6-18-02	CHANGED BLOCK POSITION ON TOP PANEL; ADDED LOWER END SHOE NOTE
4	BT		8-2-00	DELETED PC4717, PC33361 & 62, ADDED PC928 & PC33380, ENG QTY HARDWARE
3	BT		3-29-00	DELETED PC4421, ADDED PC4412
2	BT		11-5-99	DELETED PC6139, 6140, 6307 & 4441, ADDED PC6135, 6136 & 4412
1	BT		6-30-99	DELETED PC333570 & 33358, ADDED 2 MORE PC33356; CHGD SECT A-A & HGR

TRACC

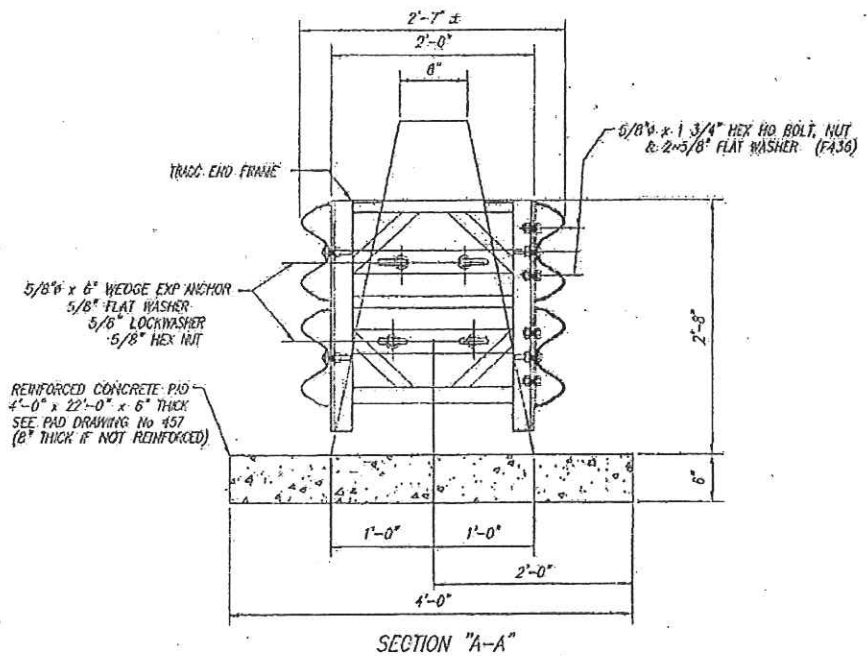
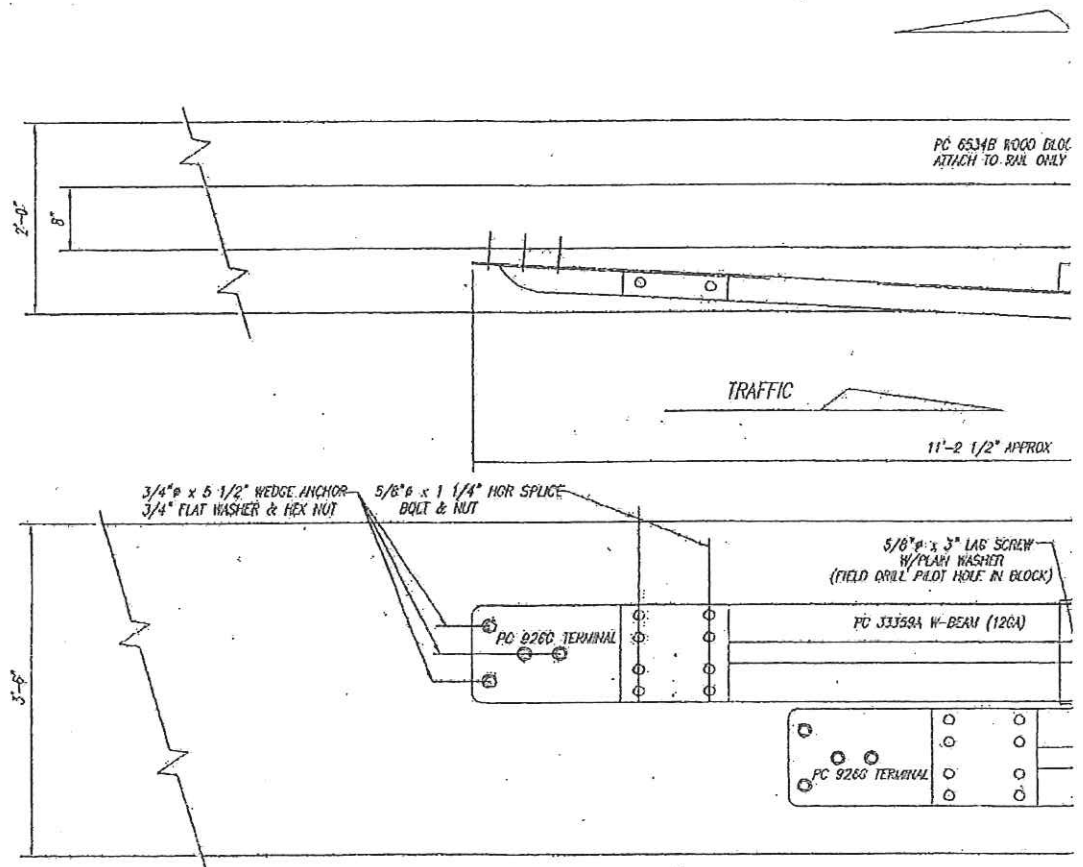
TRACC TRANSITION TO
CONCRETE SAFETY SHAPE BARRIER
PLAN, ELEVATION & SECTIONS

TRINITY INDUSTRIES, INC.
HIGHWAY SAFETY PRODUCTS

DRAWN	BT
CHECKED	
APPROVED	
DATE	05/10/02
ENG. FILE #	65461-01E
SHEET #	ET OF 1
DRAWING NO.	33
REV.	

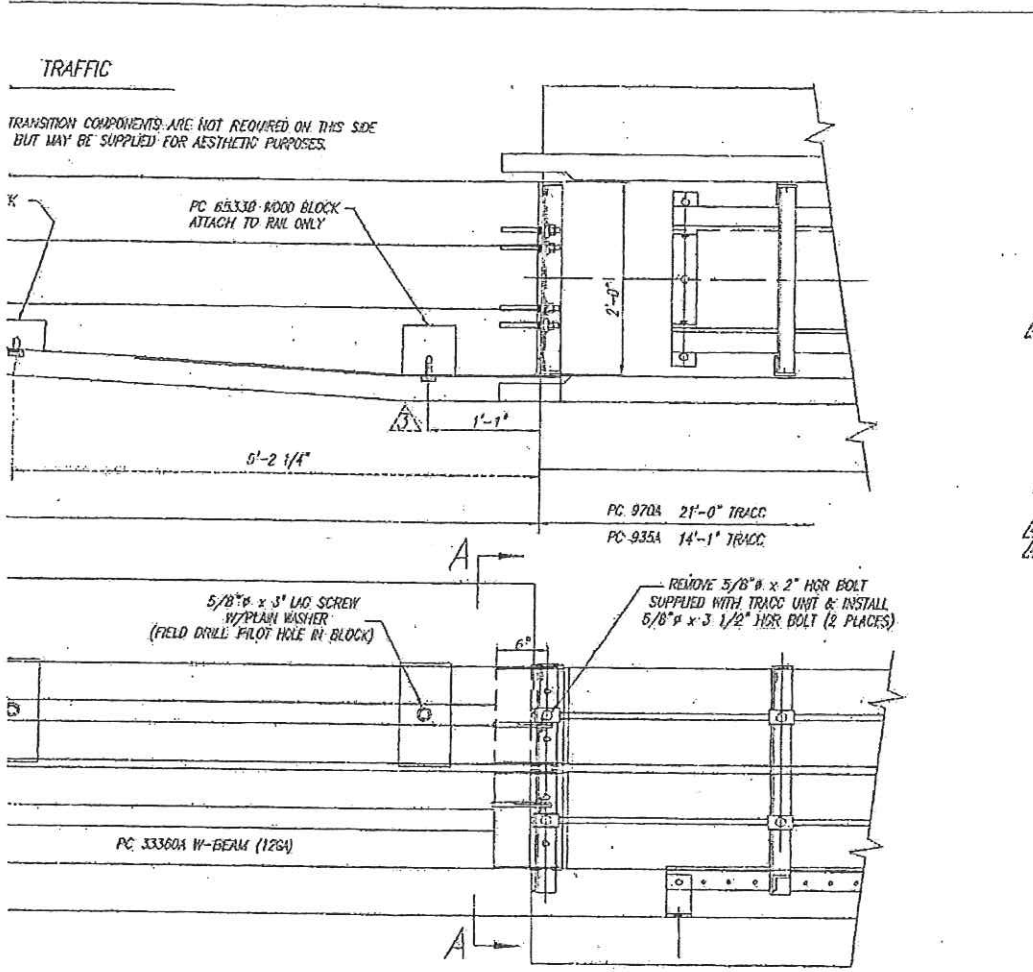
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MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 45



47

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 48



TRACC TRANSITION BILL OF MATERIAL		
PRODUCT CODE	QTY	DESCRIPTION
9266	2	10/END SHOE
65339	1	1/4\"/>
65349	1	1/4\"/>
33358A	1	12/10\"/>
33359A	1	12/6\"/>
HARDWARE		
33535	16	5/8\"/>
33916	4	5/8\"/>
34355	2	5/8\"/>
44126	2	5/8\"/>
33002	6	5/8\"/>
33406	16	5/8\"/>
43726	8	5/8\"/>
33102	4	5/8\"/>
33510	8	5/8\"/>
44516	4	5/8\"/>
46285	8	3/4\"/>
37016	8	3/4\"/>
37106	8	3/4\"/>

REV.	CHKD BY	DATE	REMARKS
4	LH	08/27/03	REVISED QUANTITY OF 3/4\"/>
3	BT	01/29/03	CHANGED BLOCK LOCATION
2	LH	01/21/03	CHANGED BLOCKS & THEIR LOCATION ON TOP PANEL
1	BT	8-2-00	DELETED PC33361 & PC 4717, ADDED PC6215, CHG. QTY HARDWARE

TRACC

TRACC TRANSITION TO
CONCRETE BARRIER SINGLE SLOPE
PLAN, ELEVATION & SECTIONS

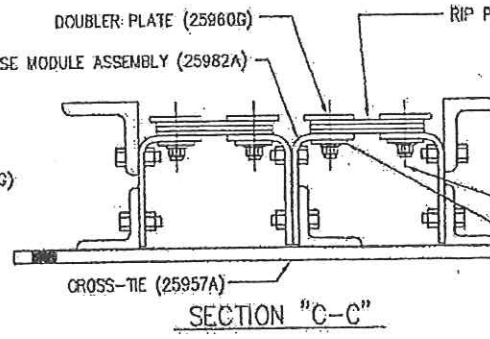
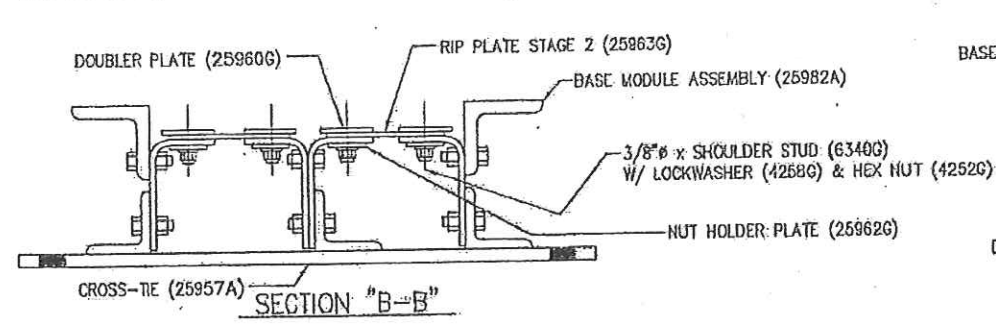
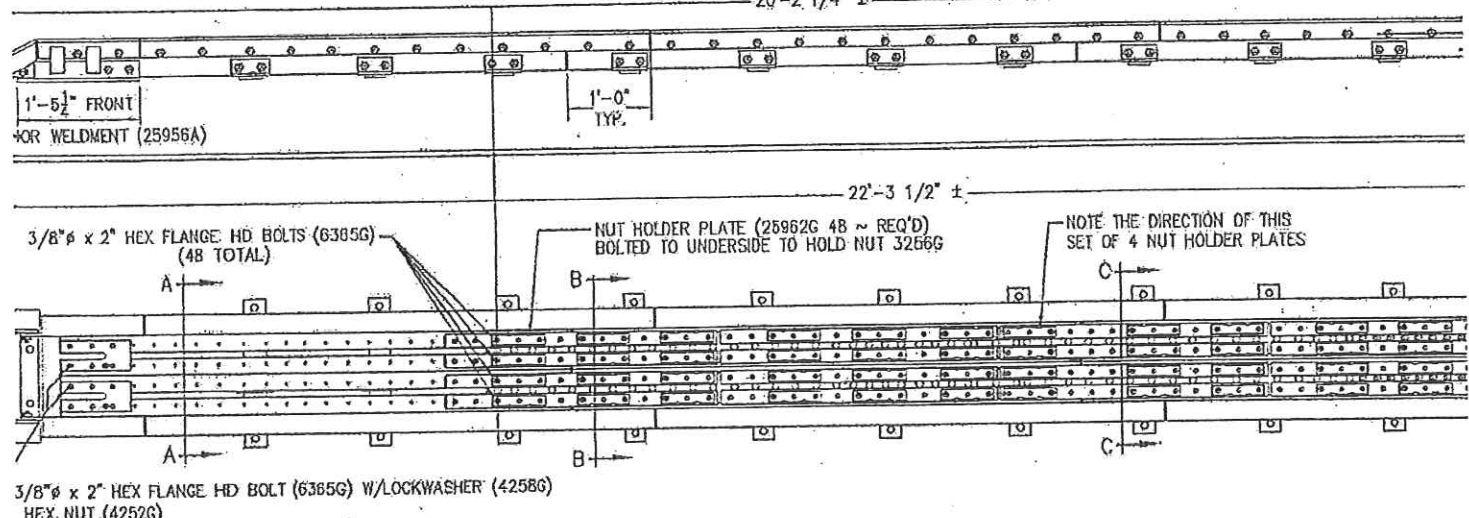
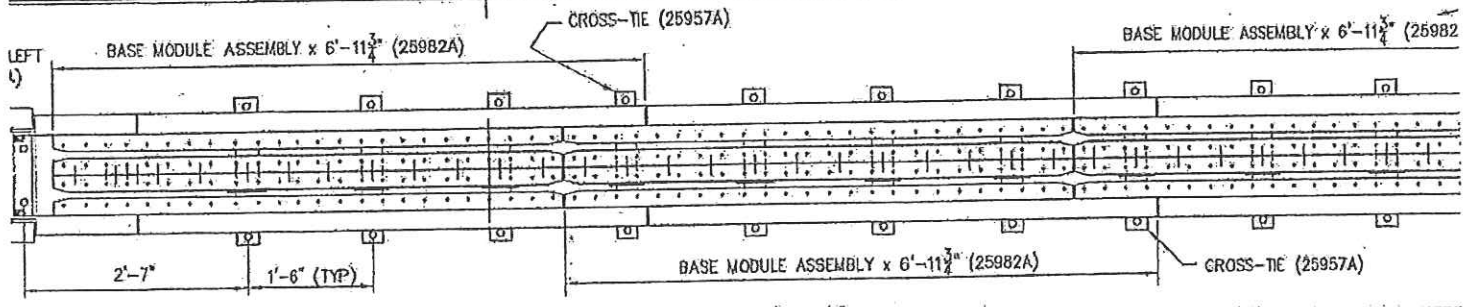
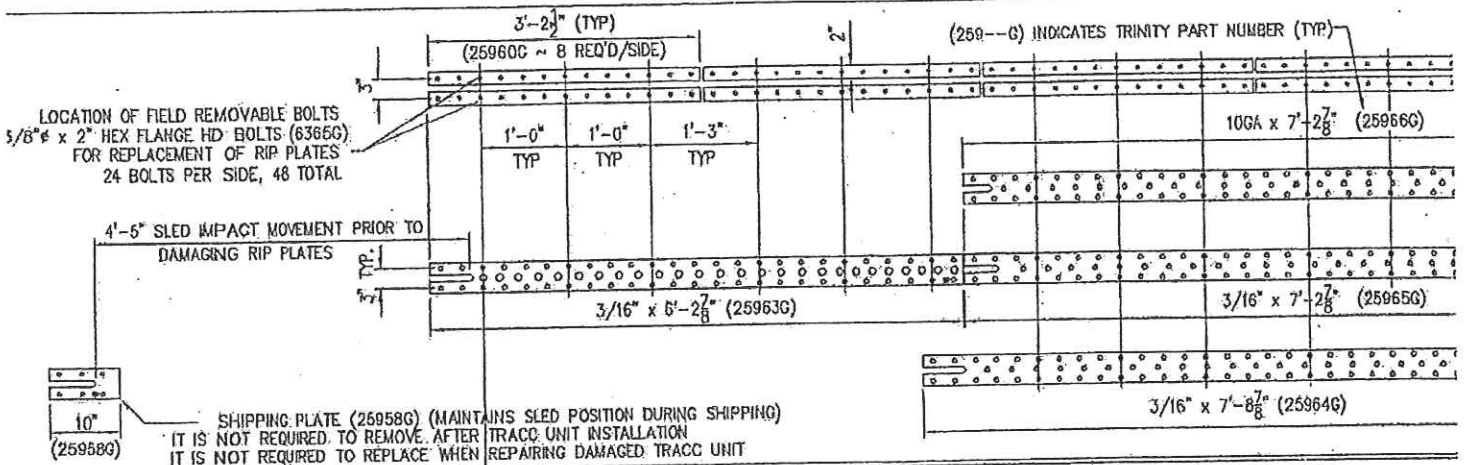
TRINITY INDUSTRIES, INC.
HIGHWAY SAFETY PRODUCTS
2525 STEVENS FREEWAY, DALLAS, TX 75356

DRAWN B.T.	
CHECKED	
APPROVED	
DATE	11/05/99
ENG. FILE #	SS462-01E
SHEET NO.	EI OF 1
DRAWING NO.	SS 462
REV.	4

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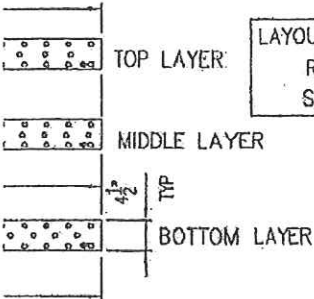
48

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 47



MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 50

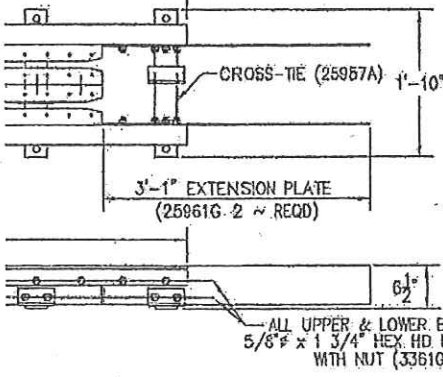
DOUBLER PLATES



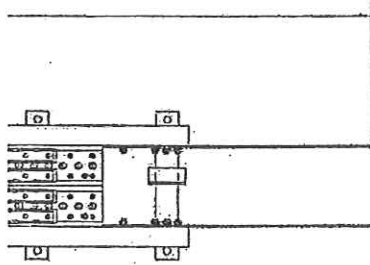
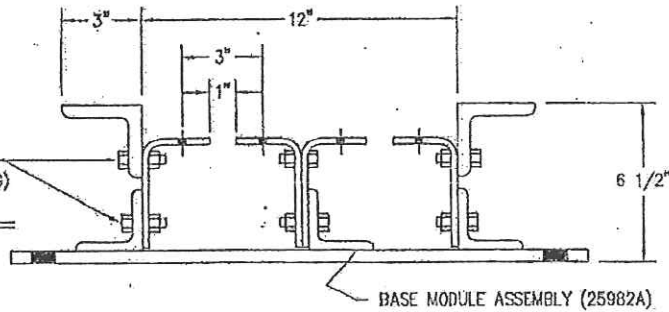
LAYOUT SCHEMATIC, TOP VIEW
RIP PLATES FOR ONE
SIDE OF TRACC BASE

TRACC BASE (25981A) BILL OF MATERIALS				
Part #	Description	Qty	WT. EACH (#)	TOTAL WT.
03256G	3/8" Shoulder Nut	48	0.030	1.44
03361G	5/8" Heavy Hex Nut (A663 DH)	40	0.120	4.8
03391G	5/8" x 1 3/4" Hex Head Bolt (A32B)	40	0.210	8.4
04252G	3/8" Hex Nut	180	0.030	5.4
04258G	3/8" Lock Washer	180	0.006	1.08
06340G	3/8" X 1 1/2" Shoulder Stud	178	0.060	10.68
06365G	3/8" x 2" Hex Flange Head Bolt (GR-5)	50	0.070	3.5
25954A	End Shoe, Right	1	11.000	11
25955A	End Shoe, Left	1	11.000	11
25956A	Front Anchor Weldment	1	67.000	67
25957A	Cross Tie	3	18.000	54
25958G	Rip Plate, Stage 1 (Shipping Plate)	2	0.800	1.6
25960G	Doublers	16	8.000	128
25961G	Extension Plate, Rear	2	16.000	32
25962G	Nut Holder (Nut Retainer Plate)	48	0.600	24
25963G	Rip Plate, Stage 2	2	17.000	34
25964G	Rip Plate, Stage 3, Bottom	2	22.000	44
25965G	Rip Plate, Stage 3, Middle	2	20.000	40
25966G	Rip Plate, Stage 3, Top	2	15.000	30
25982A	Base Module Assembly	3	328.000	987
			TOTAL WEIGHT	1498.80

NOTE:
SEE DRAWING PN 25982 FOR ASSEMBLY
OF BASE MODULE COMPONENTS.

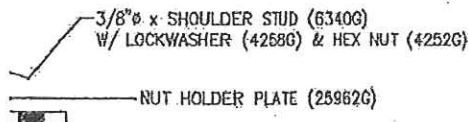


TRACC BASE ASSEMBLY
WITHOUT RIP PLATES
AND DOUBLER PLATES



COMPLETE TRACC BASE ASSEMBLY
WITH RIP PLATES AND DOUBLERS

ES STAGE 3 { (TOP) (25966G)
(MIDDLE) (25965G)
(BOTTOM) (25964G)

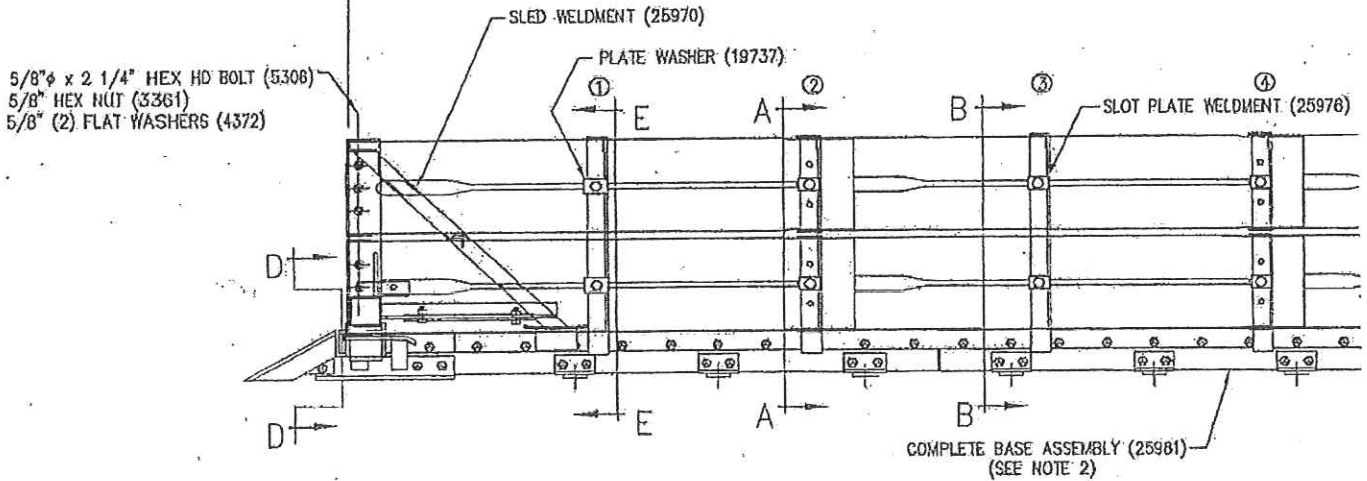
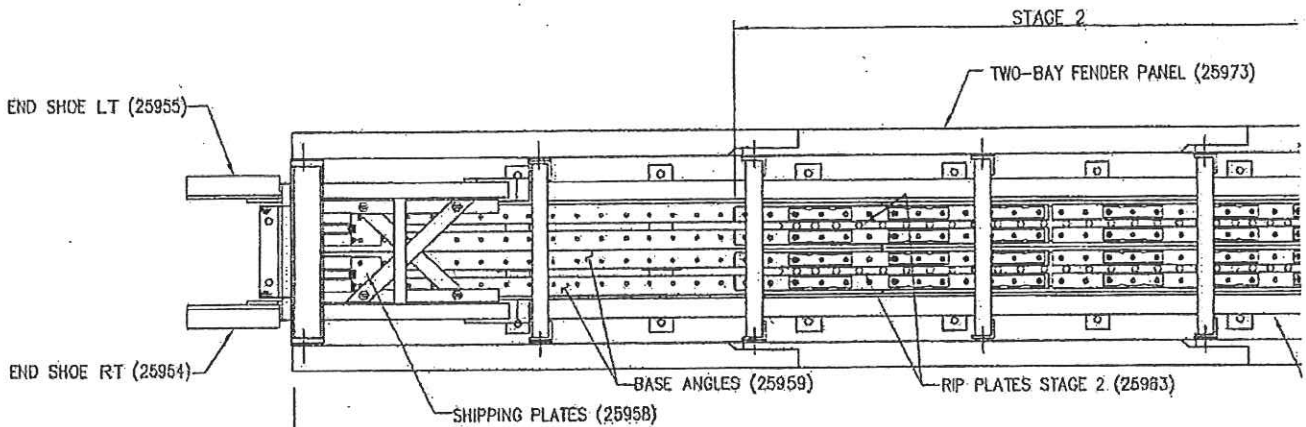


2	SAR	6/17/05	UPDATED PART NUMBERS
1	SG BT	5/13/05	REPLACED BEAM GUIDES & BASE ANGLES WITH BASE MODULES
REV.	CHKD	BY	DATE
TRACC CRASH-CUSHION ATTENUATING TERMINAL ASSEMBLED BASE UNIT PN 25981			DRAWN BT/LH CHECKED B.T. APPROVED DATE 04/22/05 ENG. FILE # SS1001-01E SHEET E1 OF 1 DRAWING NO. SS 1001/PN 25981 REV. 2
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEWARTS FREEWAY, DALLAS, TX 75207			

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50

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 49



TRACC. BILL OF MATERIAL (PN 25980)

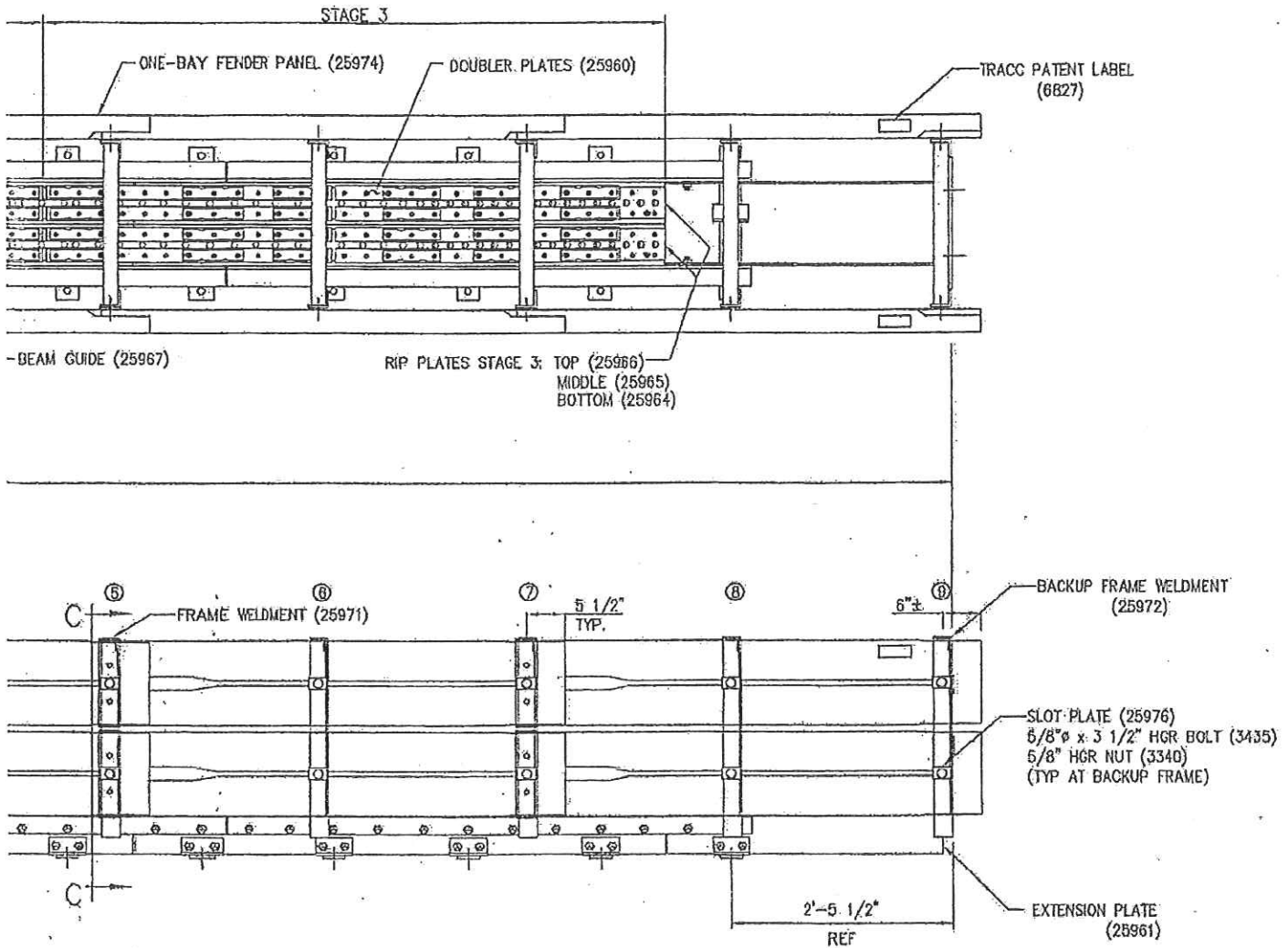
PART NUMBER	QTY	DESCRIPTION	WT/EA
19737G	12	1/4" x 3" x 2 1/4" TRACC WSHR	0.5#
25970A	1	SLED WELDMENT	185#
25971A	8	FRAME WELDMENT	60#
25972A	1	BACKUP FRAME WELDMENT	74#
25973A	16	TWO - BAY FENDER PANEL	49#
25974A	4	ONE - BAY FENDER PANEL	28#
25975A	2	SHREDDER ASSEMBLY	6#
25976A	32	SLOT PLATE	0.4#
25981A	1	ASSEMBLED BASE (NOTE 2)	1499#
TOTAL WEIGHT (EXCLUDES SHOP HRDWR)			3165#

SHOP HARDWARE (GALV A153)

PART NUMBER	QTY	DESCRIPTION	MATL SPEC
3253G	2	HITCH PIN CLIP	
3340G	32	5/8" HGR NUT	A563 GR A
3361G	46	5/8" HEX NUT	A563 GR DH
3391G	32	5/8"φ x 1 3/4" HEX HD BOLT	A325
3400G	12	5/8"φ x 2" HGR BOLT	A307 GR A
3435G	20	5/8"φ x 3 1/2" HGR BOLT	A307 GR A
4372G	88	5/8" FLAT WASHER	F436
4425G	2	3/4" X 2" CLEVIS PIN	
5306G	14	5/8"φ x 2 1/4" HEX HD BOLT	A325
6627B	2	TRACC PATENT LABEL	

51

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 52



- NOTES:
- 1.) FOR SECTIONAL VIEWS SEE SHEET E2 OF 2.
 - 2.) SEE DRAWING SS1001 (PN 25981) FOR ASSEMBLY OF ALL BASE COMPONENTS.

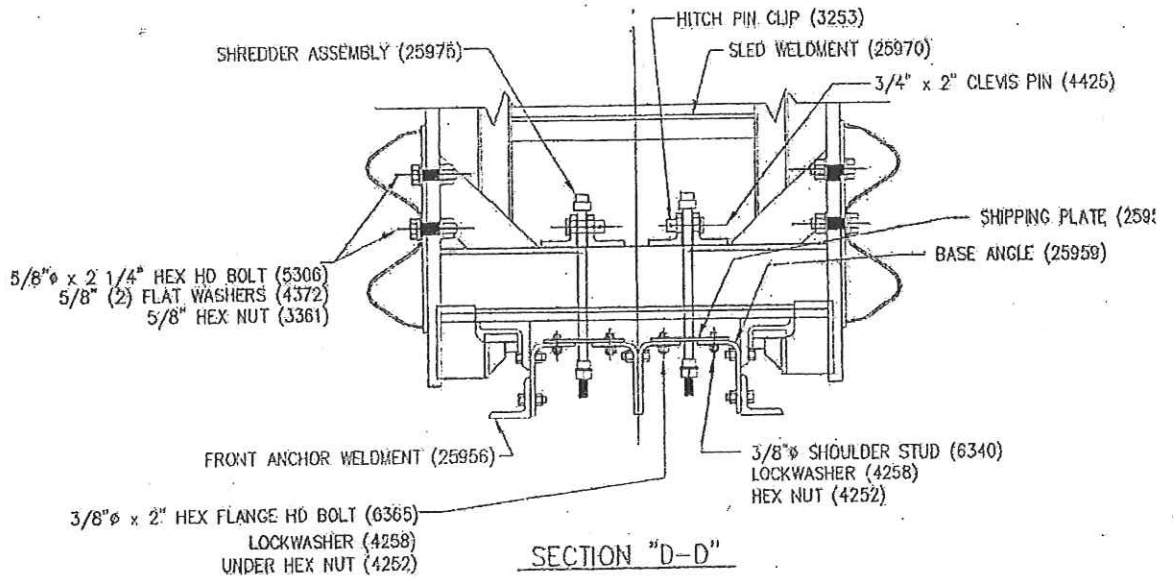
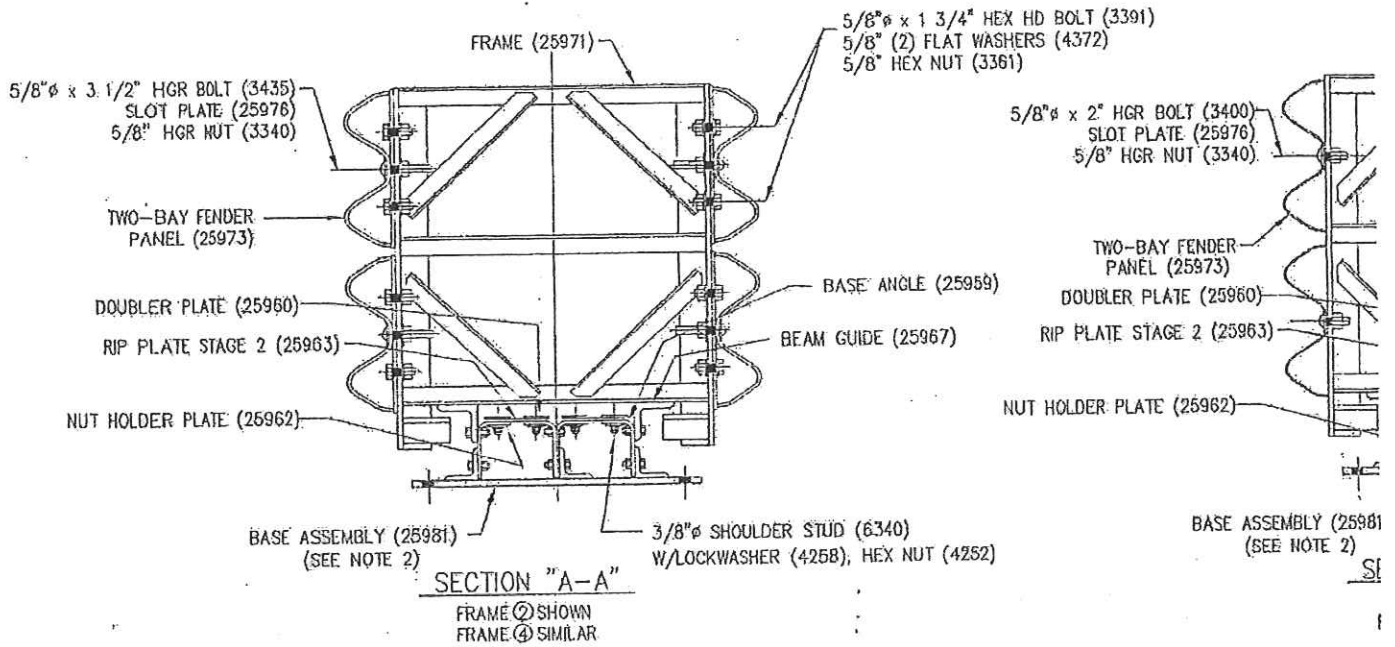
1	SAR	6/18/05	FIXED WEIGHT & ADDED STAGES 2 & 3
REV.	CHK'D BY	DATE	REMARKS
TRACC CRASH-CUSHION ATTENUATING TERMINAL PLAN, ELEVATION, & SECTION SHOP ASSEMBLY DETAILS PN 25980			
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEWARTS FREEWAY, DALLAS, TX 75207			DRAWN LH CHECKED BT APPROVED DATE 05/11/05 ENS. FILE # SS1002-01E SHEET E1 OF 2 DRAWING NO. 1000 001 25980

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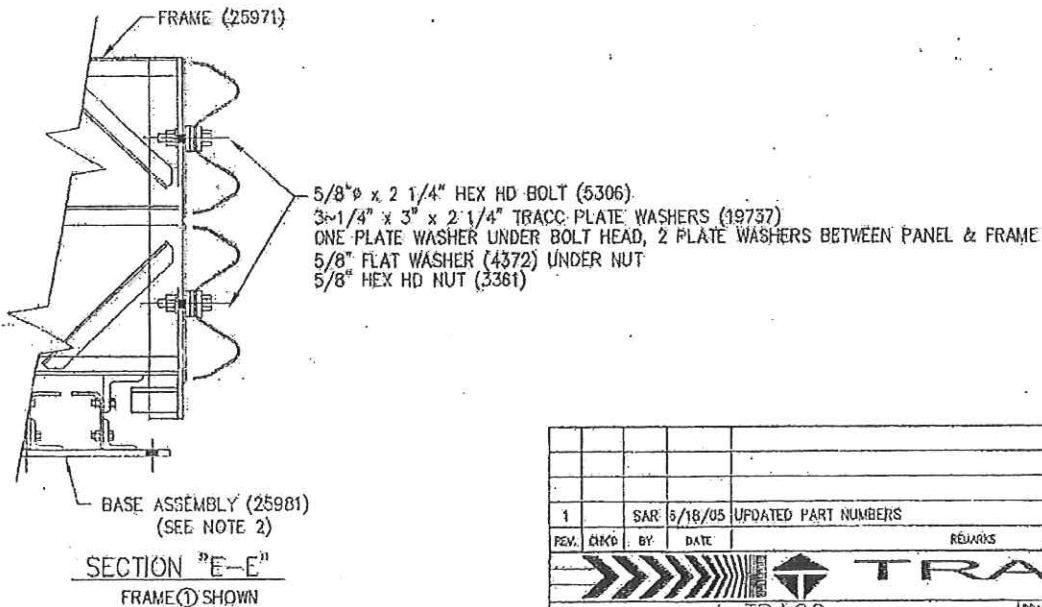
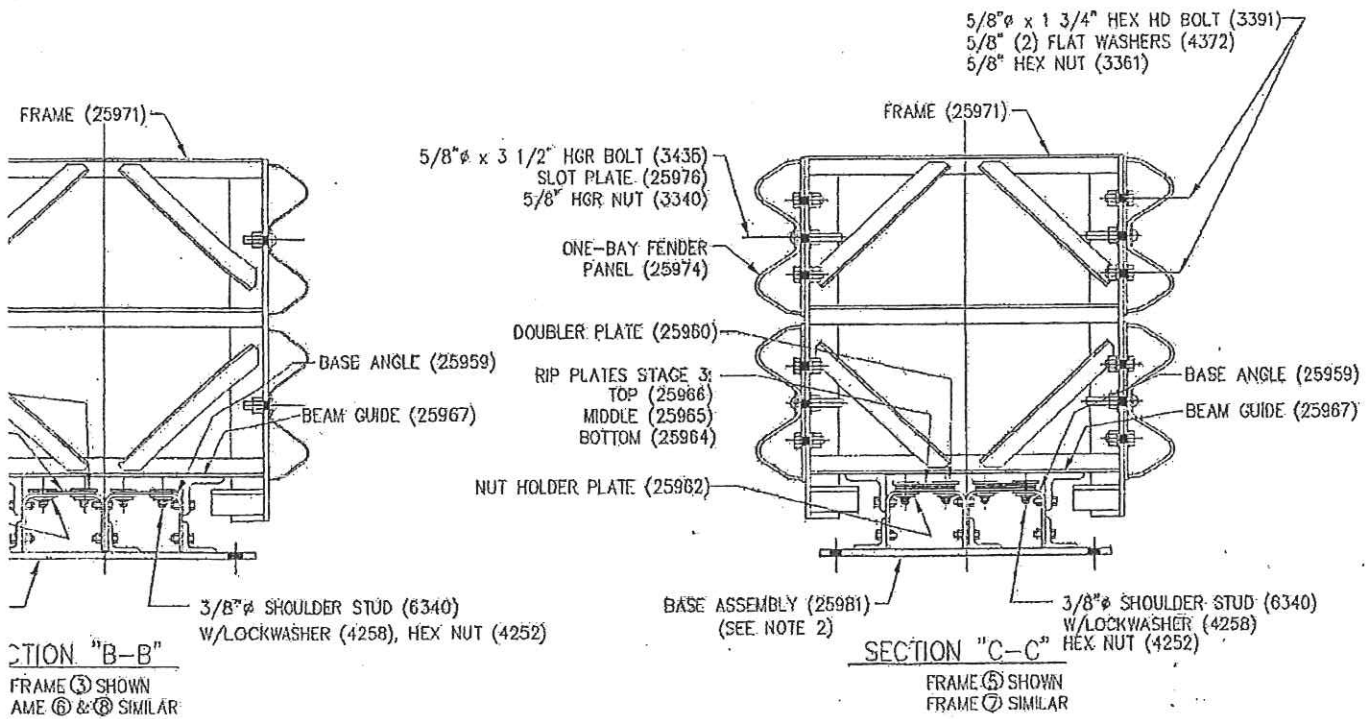
MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 51



NOTES:
1.) FOR PLAN & ELEV
2.) SEE DRAWING SS11
OF ALL BASE COM

53

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 54



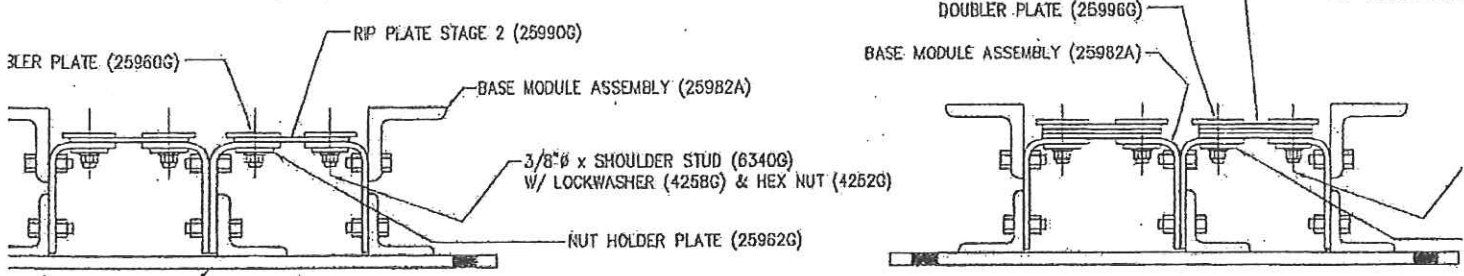
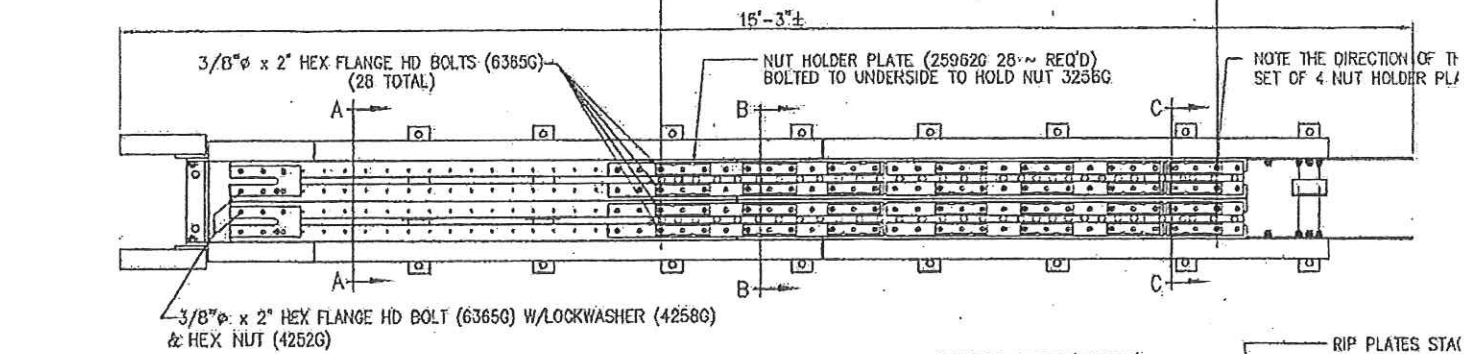
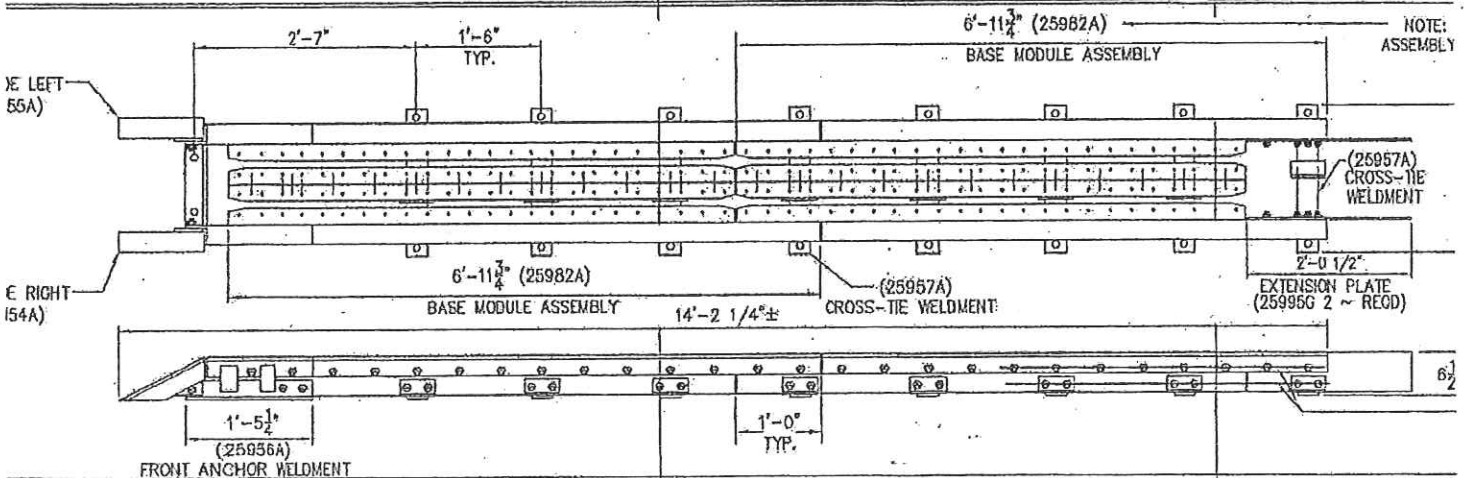
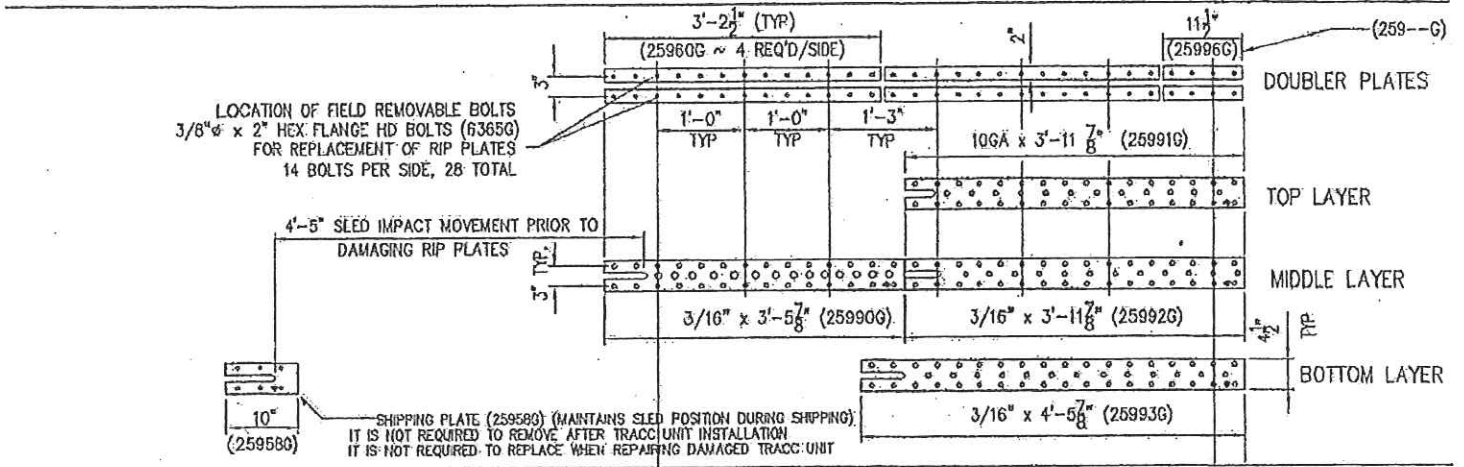
FRONT VIEW SEE SHEET E1 OF 2.
1 (PN 25981) FOR ASSEMBLY
INVENTS.

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1	SAR	5/16/05	UPDATED PART NUMBERS	
REV.	CHKD.	BY	DATE	REMARKS
TRACC CRASH-CUSHION ATTENUATING TERMINAL PLAN, ELEVATION & SECTIONS SHOP ASSEMBLY DETAILS PN 25980				
			DRAWN	L.H.
			CHECKED	B.T.
			APPROVED	
			DATE	05/11/05
			ENG. FILE #	SS1002-02E
			SKETCH	E2 OF 2
			DRAWING NO.	
			REV.	

54

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 53



55

MATCH RIGHT SIDE OF SHEET WITH LEFT SIDE OF SHEET 56

ICATES TRINITY PART NUMBER (TYP)

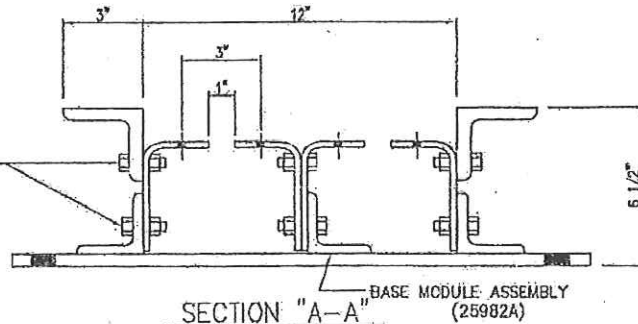
LAYOUT SCHEMATIC; TOP VIEW
RIP PLATES FOR ONE
SIDE OF TRACC BASE

DRAWING PN 25982 FOR
BASE MODULE COMPONENTS

TRACC BASE ASSEMBLY
WITHOUT RIP PLATES
AND DOUBLER PLATES

SHORTRACC BASE (25994A) BILL OF MATERIALS				
Part #	Description	Qty	WT. EACH (#)	TOTAL WT.
03256G	3/8" Shoulder Nut	28	0.03	0.84
03361G	5/8" Heavy Hex Nut (A563 DH)	30	0.12	3.6
03391G	5/8" x 1 3/4" Hex Head Bolt (A325)	30	0.21	6.3
04252G	3/8" Hex Nut	104	0.03	3.12
04258G	3/8" Lock Washer	104	0.006	0.624
06340G	3/8" X 1 1/2" Shoulder Stud	102	0.06	6.12
06365G	3/8" x 2" Hex Flange Head Bolt (GR-5)	30	0.07	2.1
25954A	End Shoe, Right	1	11.0	11
25955A	End Shoe, Left	1	11.0	11
25956A	Front Anchor Weldment	1	67.0	67
25957A	Cross Tie	2	18.0	36
25958G	Rip Plate, Stage 1 (Shipping Plate)	2	0.80	1.6
25960G	Doublers	8	8.0	64
25962G	Nut Holder (Nut Retainer Plate)	28	0.50	14
25982A	Base Module Assembly	2	329	658
25990G	Rip Plate, Stage 2	2	9.0	18
25991G	Rip Plate, Stage 3, Top	2	8.0	16
25992G	Rip Plate, Stage 3, Middle	2	11.0	22
25993G	Rip Plate, Stage 3, Bottom	2	12.0	24
25995G	Extension Plate, Rear	2	11.0	22
25996G	Doubler Plate, Stage-3 (11 1/2")	4	2.5	10
			TOTAL WEIGHT	997

ALL UPPER & LOWER BOLTS ARE
5/8" x 1 3/4" HEX HD BOLT (3391G)
WITH NUT (3361G)



COMPLETE TRACC BASE ASSEMBLY
WITH RIP PLATES AND DOUBLERS.

- (TOP) (25991G)
- (MIDDLE) (25992G)
- (BOTTOM) (25993G)

3/8" x SHOULDER STUD (6340G)
LOCKWASHER (4258G) & HEX NUT (4252G)

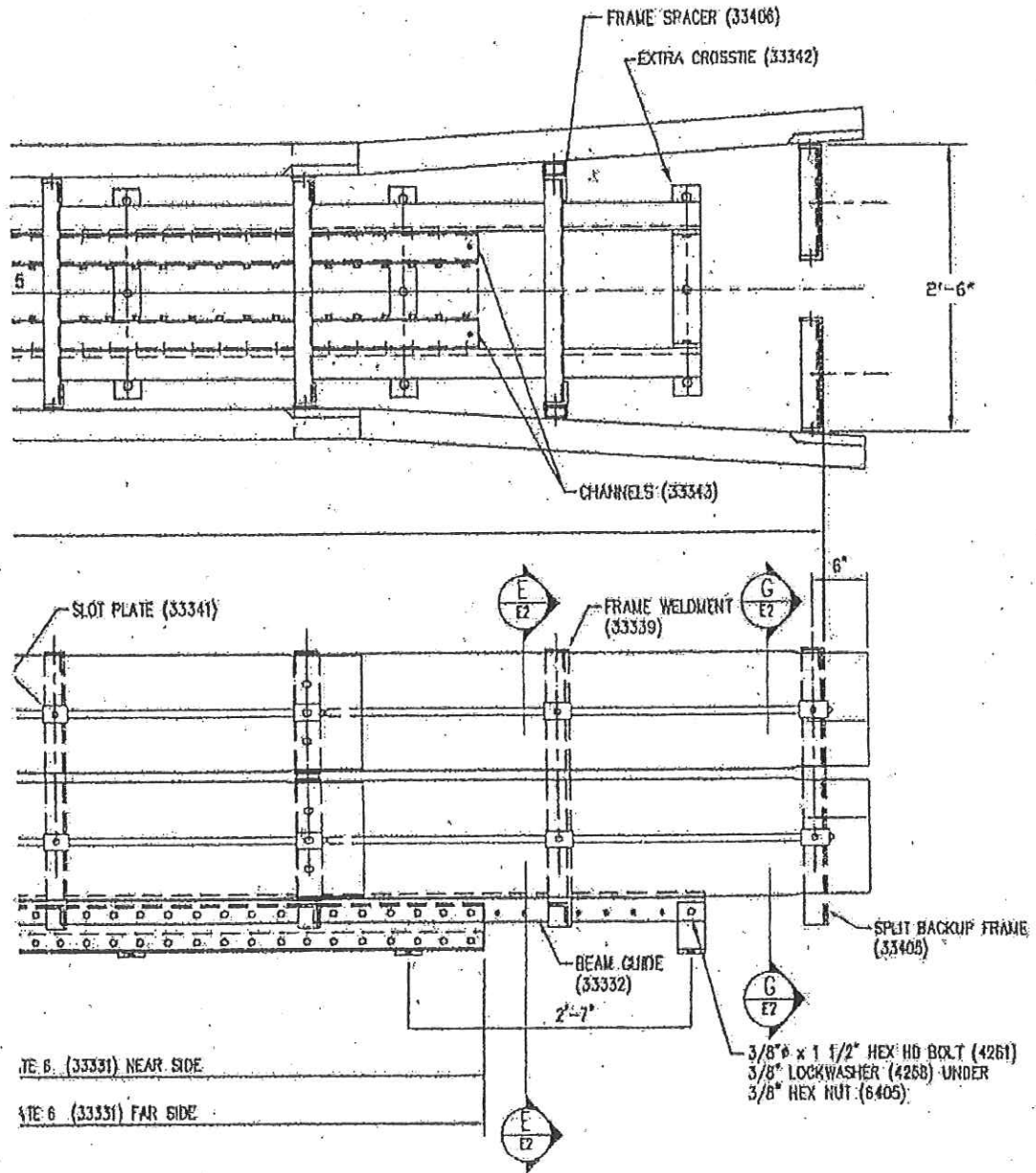
NUT HOLDER PLATE (25962G)

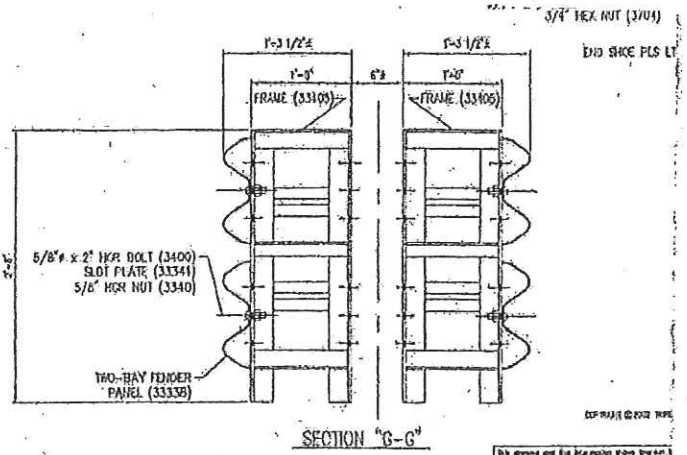
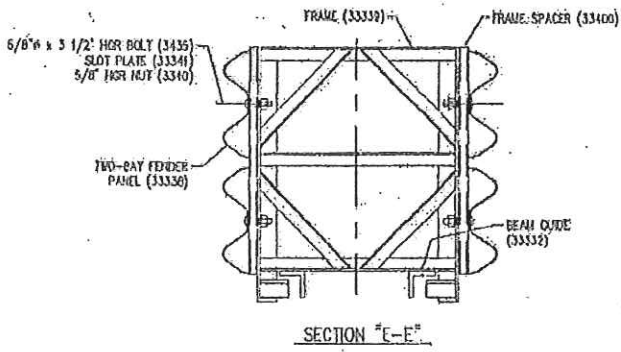
1	SAR	6/17/05	UPDATED PART NUMBERS
REV.	DATE	BY	REMARKS
SHORTRACC CRASH-CUSHION ATTENUATING TERMINAL ASSEMBLED BASE UNIT PN 25994			
TRINITY INDUSTRIES, INC. HIGHWAY SAFETY PRODUCTS 2525 STEWARTS FREEWAY, DALLAS, TX 75207			DRAWN LH CHECKED B.T. APPROVED DATE 05/16/05 ENG. FILE # SS1004-DIE SHEET 1 OF 1 DRAWING NO. SS 1004 / 05 25994

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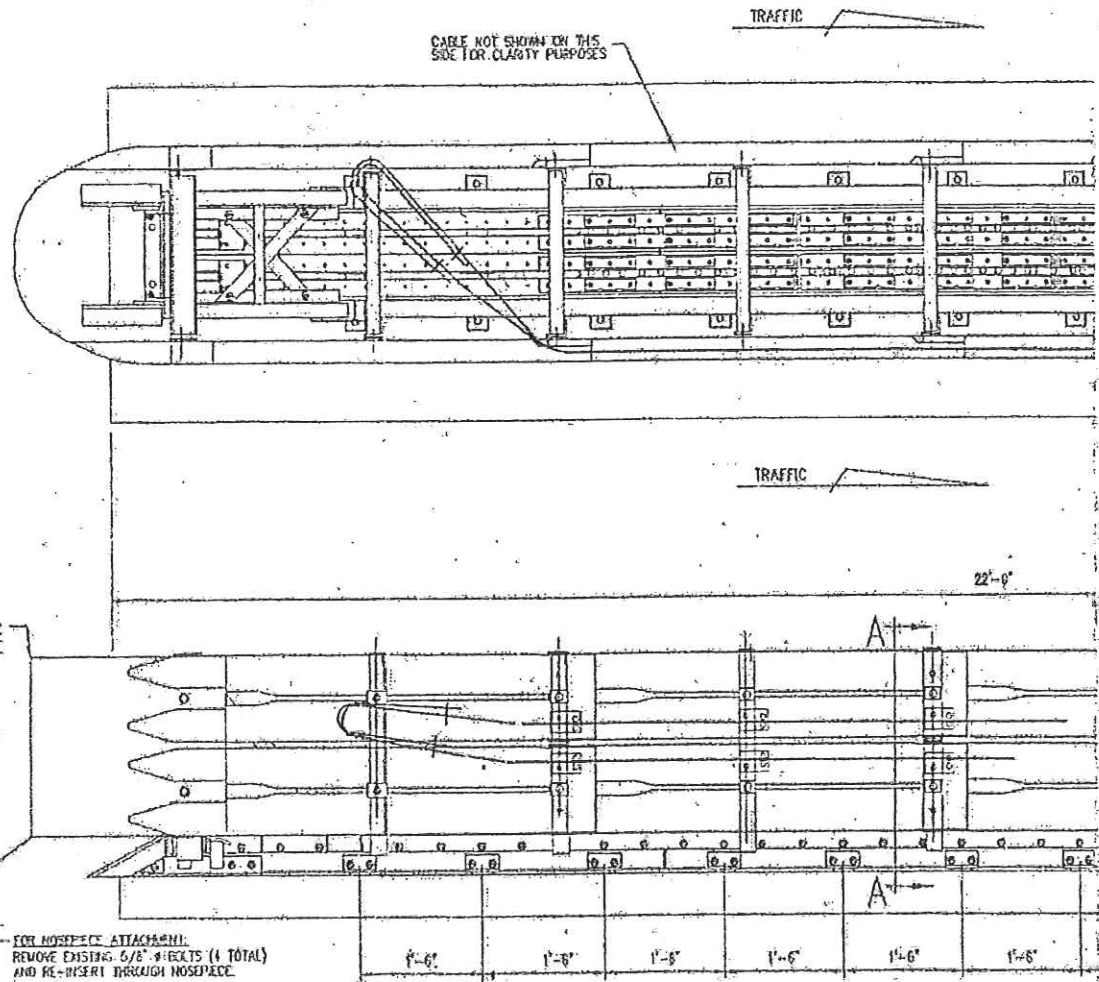
56

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET 55





ALL DIMENSIONS AND TOLERANCES UNLESS OTHERWISE SPECIFIED ARE IN INCHES. DIMENSIONS ARE GIVEN FOR THE PARTS AS SHOWN. DIMENSIONS ARE NOT TO BE USED AS A BASIS FOR THE DESIGN OF OTHER PARTS.



** PLASTIC NOSEPIECE

FOR NOSEPIECE ATTACHMENT:
REMOVE EXISTING 5/8" HEXTS (4 TOTAL)
AND RE-INSERT THROUGH NOSEPIECE.

EACH TRACC UNIT SHIPS 100% ASSEMBLED
(PLASTIC NOSE INSTALLED AFTER PLACEMENT)

* EACH CARTRIDGE INCLUDES 1 EACH: MIXER HT 150, CARTRIDGE (NOZZLE)
: FILLER HT 150 (FILLER TUBE)

WIDE TRACC BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
25905A	1	39" WIDETRACC UNIT ASS'LY
6668B	4	REFLECTIVE TAPE
E531B	1	YELLOW PLASTIC NOSEPIECE

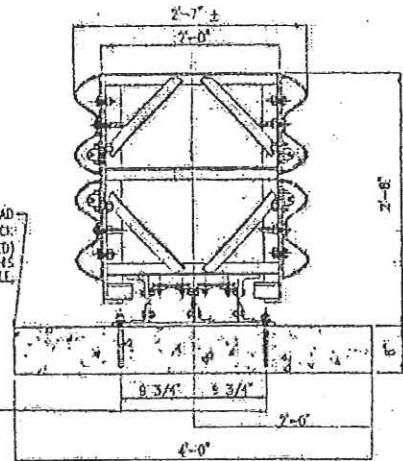
OPTIONAL TRACC ANCHOR ITEMS

PRODUCT CODE	DESCRIPTION
E205B	ADHESIVE DISPENSOR
E207B	MIXER HT HT150 (NOZZLE)
E208B	FILLER HT HT150 (FILLER TUBE)
E209B	BT TE-C+ 11/16-12 (11/16" x BT)

** ANCHOR HARDWARE (CONCRETE BASE)		
E204B	26	5/8" x 7 1/16" ANCHOR STUD
3310G	28	5/8" LOCKWASHER
3361C	28	5/8" HEX NUT
3360S	28	5/8" FLAT WASHER
E206B	2	ADHESIVE HT HT150(CARTRIDGE)
** ANCHOR HARDWARE (ASPHALT BASE)		
E535G	26	5/8" x 16" ALL THD ROD
3310G	28	5/8" LOCKWASHER
3361C	28	5/8" HEX NUT
3360G	26	5/8" FLAT WASHER
E206B	2	ADHESIVE HT HT150(CARTRIDGE)

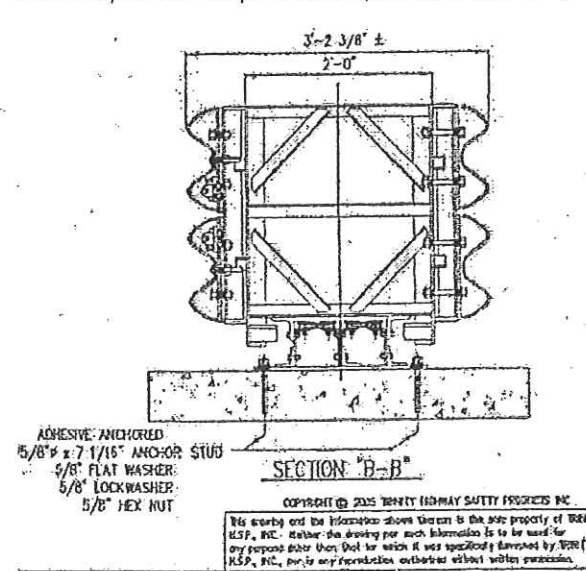
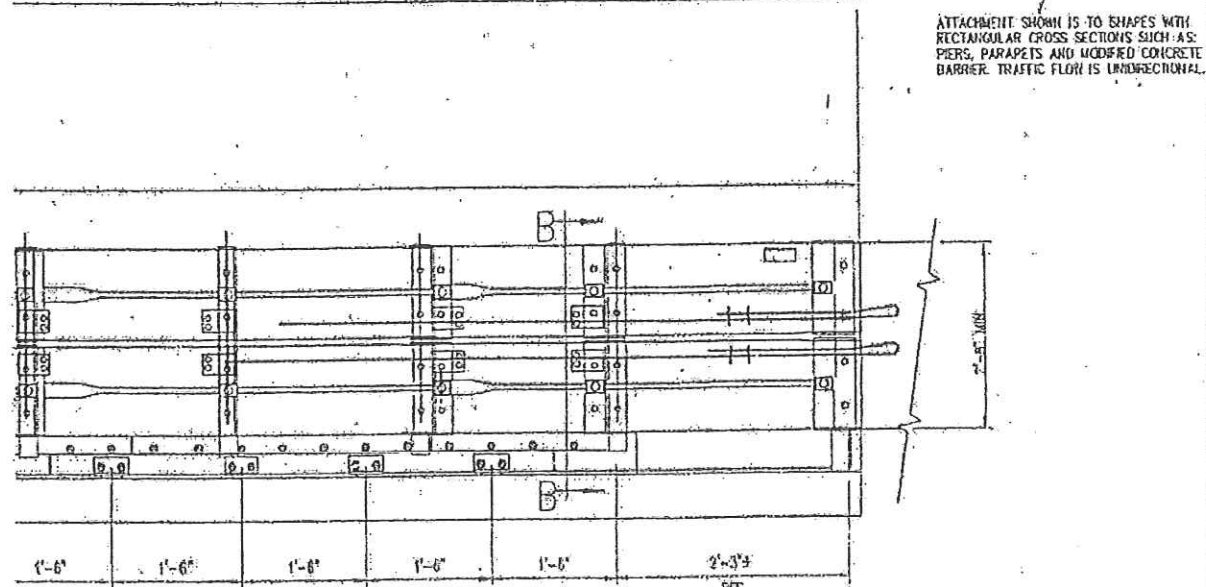
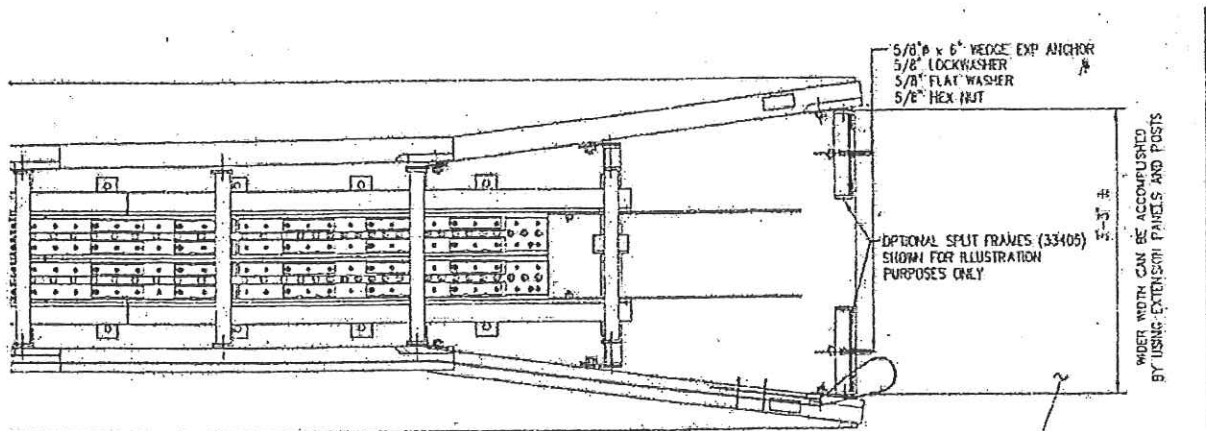
** SEE PRODUCT MANUAL

REINFORCED CONCRETE PAD
4'-0" x 22'-0" x 6" THICK
(6" THICK IF NOT REINFORCED)
REINFORCEMENT DRAWINGS FOR THIS
PAD AND OTHER SIZES ARE AVAILABLE.



ADHESIVE ANCHORED
5/8" x 7 1/16" ANCHOR STUD
5/8" FLAT WASHER
5/8" LOCKWASHER
5/8" HEX NUT

SECTION "A-A"



FOUNDATION NOTE:
6" REINFORCED CONCRETE PAD IS SHOWN

- OTHER OPTIONS ARE:
- a) 8" THICK MEDIUM UNREINFORCED CONCRETE
 - b) 8" MINIMUM THICK ASPHALT
 - c) 3" THICK (MIN) ASPHALT OVER 3" (MIN) CONCRETE
 - d) 6" THICK ASPHALT OVER 6" COMPACTED SUBBASE

REV	DATE	BY	DESCRIPTION
1	L.R. 06/12/05		MOVED LOCATION OF SLOT PLATES AT FRAMES 7 & 8

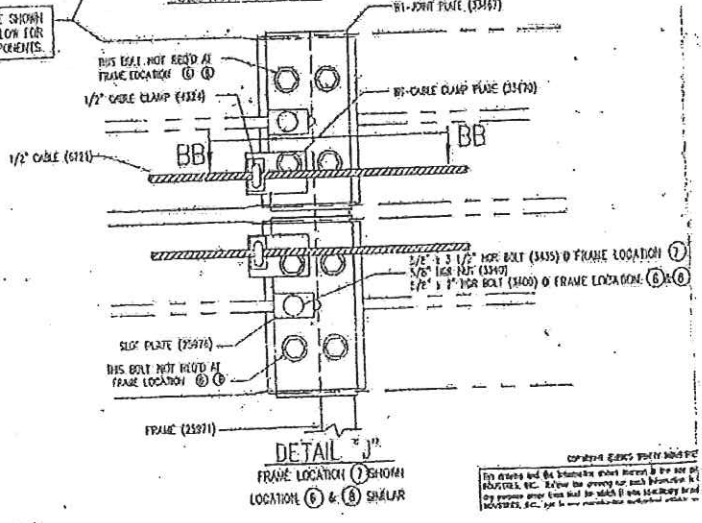
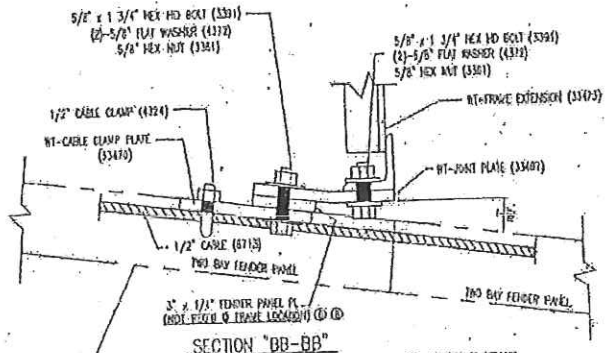
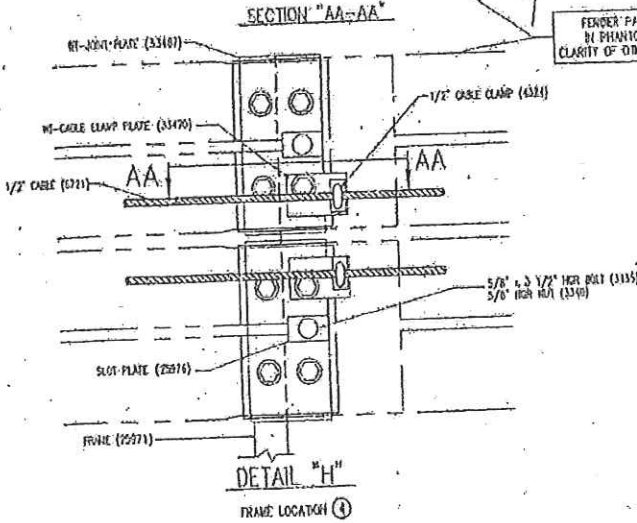
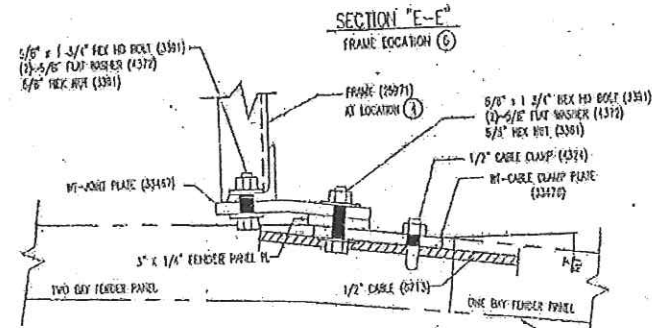
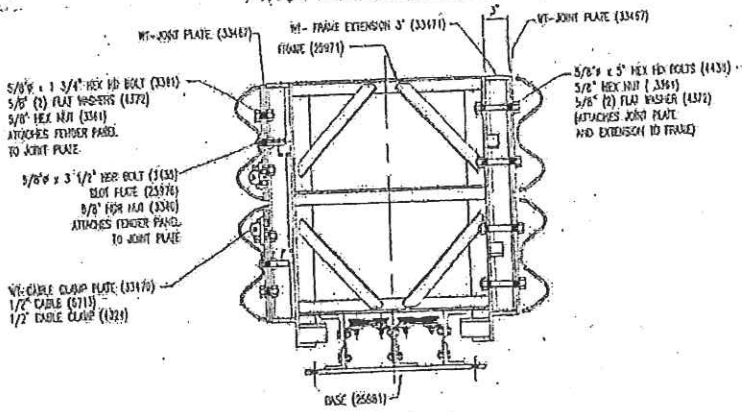
TRACC

39" WIDETRACC DOUBLE FLARE
CRASH-CUSHION ATTENUATING TERMINAL
PLAN, ELEVATION & SECTIONS
(UNIDIRECTIONAL, DIRECT ATTACHMENT)

TRINITY HIGHWAY SAFETY PRODUCTS, INC.
2525 STEWARTS FREEWAY,
DALLAS, TX 75207

DRAWN	C.H.
CHECKED	C.C.
DATE	10-26-05
DWG. FILE #	SS1021-01E
SHEET #	ET OF 1
DRAWING NO.	SS1021

MATCH LEFT SIDE OF SHEET WITH RIGHT SIDE OF SHEET



FENDER PANELS ARE SHOWN IN PHANTOM TO ALLOW FOR CLARITY OF OTHER COMPONENTS.

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QuadGuard[®] HS

Installation (cont'd.)

9) Install Bumper Assembly

- A. Use 1/2" x 3" bolts, 1/2" flat washers and 1/2" nuts to attach bumper to front of diaphragm 3. Hang cartridge support bracket onto the lower rear of diaphragm 3 as shown in Figure 29.

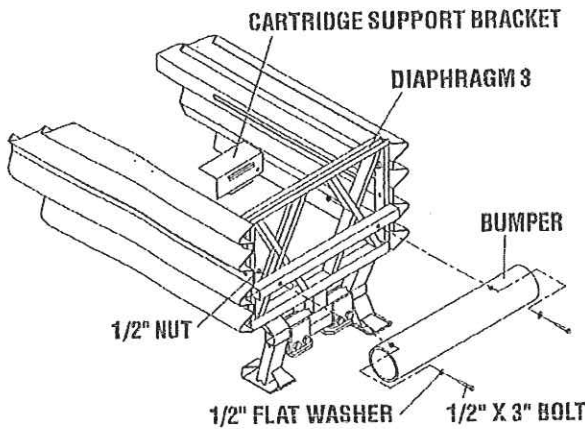


Figure 29

Bumper and Cartridge Support Bracket Installation (Diaphragm 3)

- B. Using 1/2" x 8" bolts, 1/2" flat washers and 1/2" nuts, attach bumper to front, and spacer to rear of diaphragm 2 as shown in Figure 30.

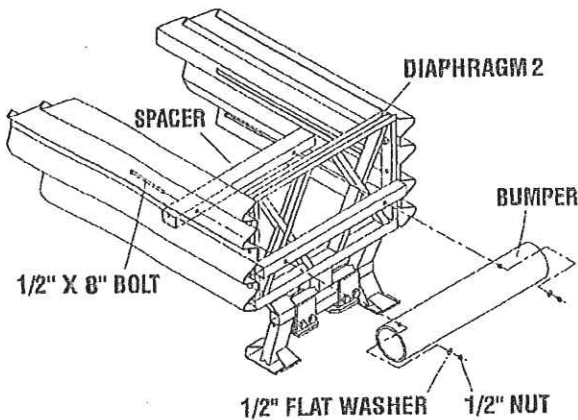


Figure 30

Bumper and Spacer Installation (Diaphragm 2)

- C. Using 1/2" x 8" bolts and 1/2" nuts, attach spacer to rear of diaphragm 1 as shown in Figure 31.

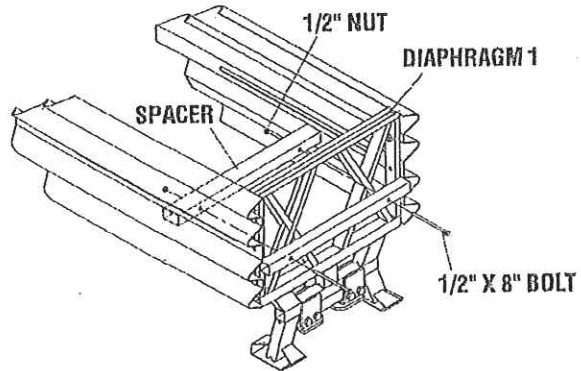


Figure 31

Spacer Installation (Diaphragm 1)

10) Install End Cap

Install end cap to the monorail as shown in Figure 32 and the monorail assembly drawing.

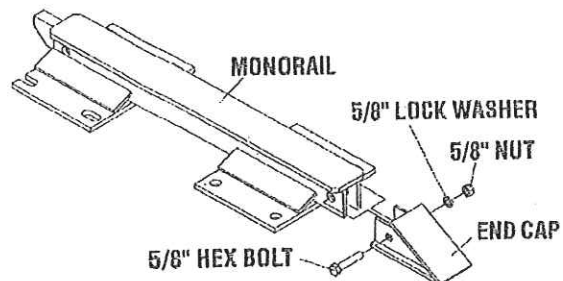
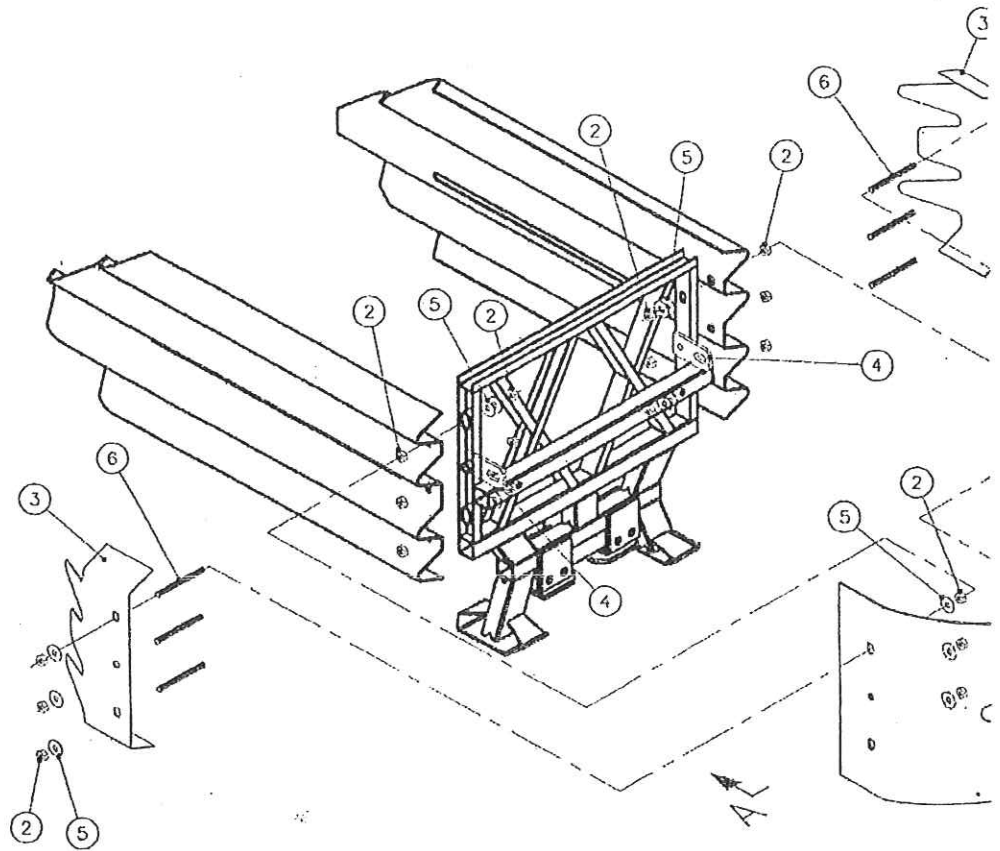


Figure 32

Monorail End Cap Installation

**PAGES 63 THROUGH 79
NOT INCLUDED**

QuadGuard® HS



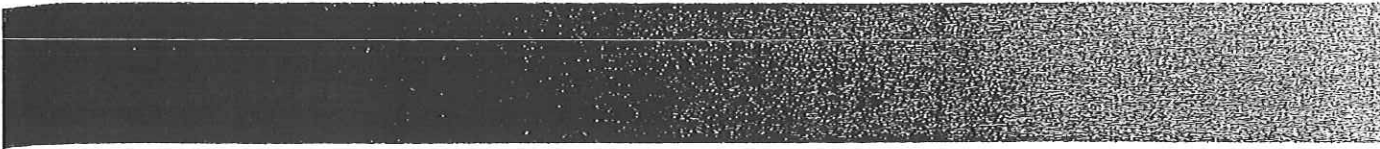
SYSTEM
24" OR
36

REFERENCES

Revisions	Date	Rev.	By	Ckd.	App.
ITEM 6 WAS 2701024-0000, ITEM 2 WAS 18.0	4/17/02	A	DDW	JME	DMO

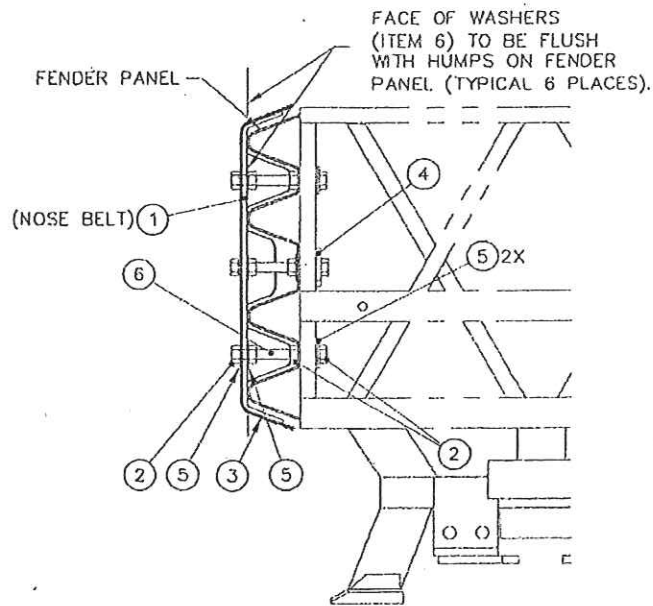
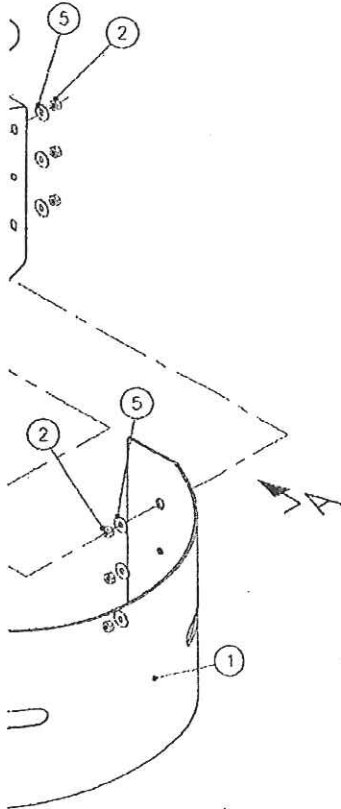


80



PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	SEE TABLE	BELT,NOSE,OG CEN	1.00
2	2704141-0000	NUT,HX,5/8,G	24.0
3	2760504-0000	CLAMP,BELT,LMC	2.00
4	2760251-0000	BRACKET,PULL OUT,OG	2.00
5	2708291-0000	WASHER,FLAT,5/8X1 3/4,G	20.0
6	2699016-0000	ROD,THREADED,5/8X6,G5,G	6.00

* 0 = GRAY, 1 = YELLOW



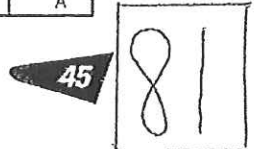
VIEW A-A
SCALE - 1:10

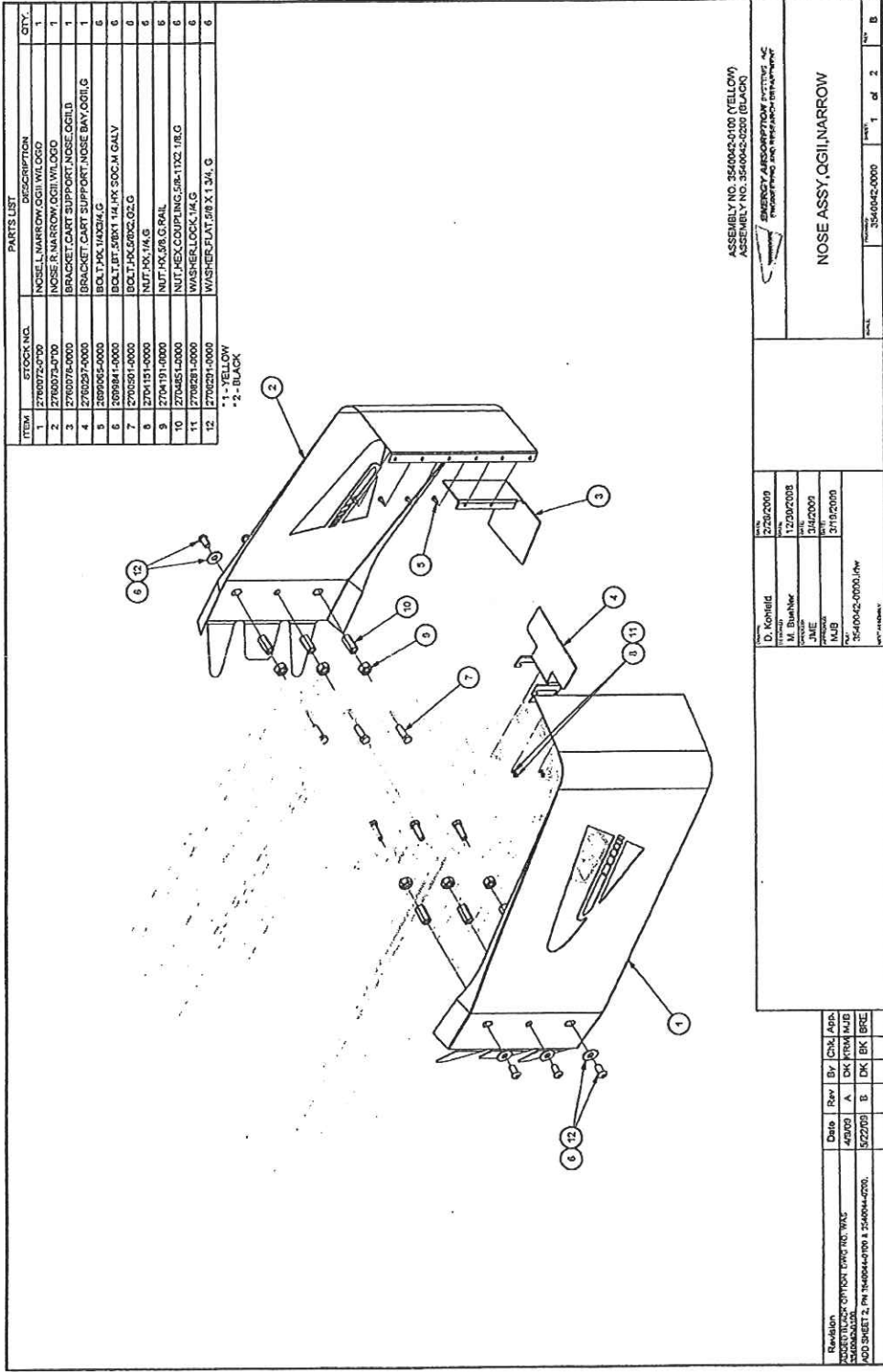
TABLE

WIDTH	BELT LENGTH	COLOR	ASSY NO.	ITEM 1 PART NO.
30"	1524	GRAY	3540611-0000	2718106-0000
	1524	YELLOW	3540611-0100	2718106-0100
4"	1780	GRAY	3540612-0000	2718108-0000
	1780	YELLOW	3540612-0100	2718108-0100

ASSEMBLY NO. - SEE TABLE

<table border="1"> <tr> <td>DESIGNED BY D. Webber</td> <td>DATE 7/26/01</td> </tr> <tr> <td>CHECKED BY Bret Eckert</td> <td>DATE 7/26/01</td> </tr> <tr> <td>APPROVED BY JME</td> <td>DATE 10/12/01</td> </tr> <tr> <td>CAD FILE: 354061.dwg</td> <td></td> </tr> </table>	DESIGNED BY D. Webber	DATE 7/26/01	CHECKED BY Bret Eckert	DATE 7/26/01	APPROVED BY JME	DATE 10/12/01	CAD FILE: 354061.dwg		<p>ENERGY ABSORPTION SYSTEMS, INC. ENGINEERING AND RESEARCH DEPARTMENT</p> <p>QUADGUARD HIGH SPEED SYSTEM NOSE ASSY</p>
DESIGNED BY D. Webber	DATE 7/26/01								
CHECKED BY Bret Eckert	DATE 7/26/01								
APPROVED BY JME	DATE 10/12/01								
CAD FILE: 354061.dwg									
<table border="1"> <tr> <td>SCALE 1:15</td> <td>FIG. 35-40-61</td> <td>SHEET 1 of 1</td> <td>REV A</td> </tr> </table>	SCALE 1:15	FIG. 35-40-61	SHEET 1 of 1	REV A					
SCALE 1:15	FIG. 35-40-61	SHEET 1 of 1	REV A						





PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2760072-0700	NOSE, L, NARROW, OGII, W/LOGO	1
2	2760073-0700	NOSE, R, NARROW, OGII, W/LOGO	1
3	2760076-0000	BRACKET, CART SUPPORT, NOSE, OGII, L	1
4	2760257-0000	BRACKET, CART SUPPORT, NOSE, BAY, OGII, G	1
5	2099065-0000	BOLT, HEX, 1/4X3/4, G	6
6	2099841-0000	BOLT, BT, 5/8X1 1/4, HEX, SOC, M, GALV	6
7	2705501-0000	BOLT, HEX, 5/8X2, 02, G	6
8	2704131-0000	NUT, HEX, 1/4, G	6
9	2704131-0000	NUT, HEX, 1/4, G, RAIL	6
10	2704851-0000	NUT, HEX, COUPLING, 5/8-11, 02, 1/4, G	6
11	2706251-0000	WASHER, LOCK, 1/4, G	6
12	2706251-0000	WASHER, PLAT, 3/8 X 1 3/4, G	6

*1 - YELLOW
*2 - BLACK

ASSEMBLY NO. 3540042-0100 (YELLOW)
ASSEMBLY NO. 3540042-0200 (BLACK)

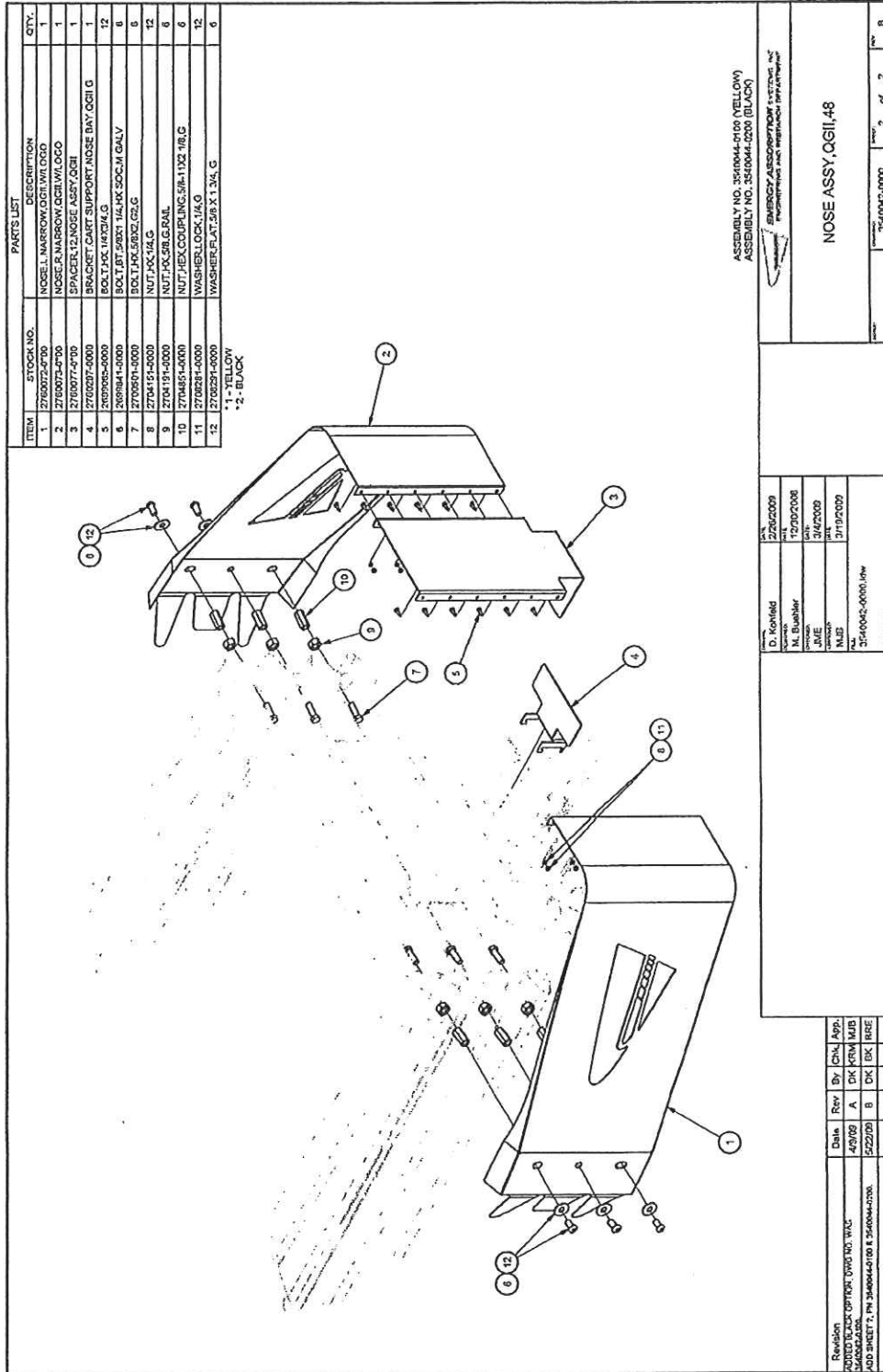
EMERGENCY ASSEMBLY INSTRUCTIONS
FOR THE NOSE ASSY, OGII, NARROW

NOSE ASSY, OGII, NARROW

REV. 1 of 2

DATE	25/07/2009
BY	M. B. BAKER
DATE	12/20/2008
BY	JHE
DATE	21/12/2009
BY	MJB
DATE	3540042-0000.rvt

Revision	Date	Rev	By	Chk	App
NOSE (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)	4/20/09	A	DK	KFM	MJB
ADD SHEET 2, Pn 1440044-0100 & 3540044-0200.	10/22/09	B	DK	BK	BRC



PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2702072-0000	NOSE L. NARROW QGII W/LOGO	1
2	2702072-0000	NOSE R. NARROW QGII W/LOGO	1
3	2702072-0000	SPACER 1/2 NOSE ASSY QGII	1
4	2702072-0000	BRACKET GASKET SUPPORT NOSE BAY QGII B	1
5	2032025-0000	BOLT PK 1/4X3/4 LG	12
6	2032025-0000	BOLT PK 1/4X3/4 LG	6
7	2702071-0000	BOLT PK 1/4X3/4 LG	6
8	2702071-0000	NUT PK 1/4 LG	12
9	2704191-0000	NUT PK 5/8 LG RAIL	6
10	2704191-0000	WASHER LOCK 1/4 O	6
11	2702021-0000	WASHER LOCK 1/4 O	12
12	2702021-0000	WASHER PLAT 5/8 X 1 3/4 C	6

*1 - YELLOW
*2 - BLACK

ASSEMBLY NO. 3540044-010 (YELLOW)
ASSEMBLY NO. 3540044-020 (BLACK)



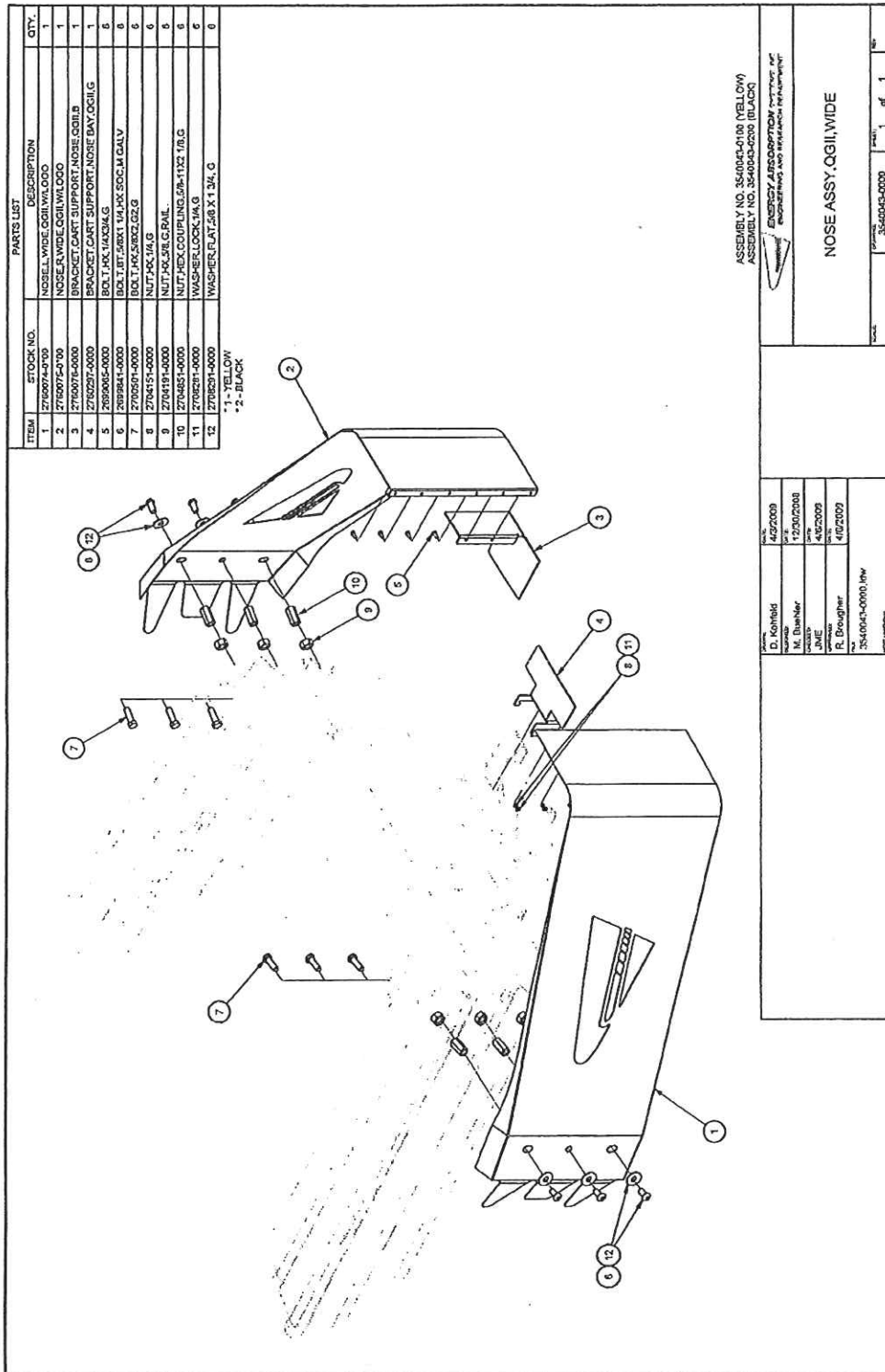
NOSE ASSY, QGII, 48

DATE	2/26/2009
BY	JME
CHKD	JME
DATE	3/4/2009
BY	JME
DATE	3/19/2009
BY	JME

Revision	Date	Rev	By	Chk	App
0000	4/5/08	A	CK	CK	MJB
0001	5/22/08	B	CK	CK	BBE

20000 BLACK OPTION, DWS NO. WAS
MAGNOLA
ADD SHEET 7, PN 3400044-010 & 3400044-020

2 of 2



PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2760074-0100	NOSE R. WIDE QGILW/OO	1
2	2760075-0100	NOSE R. WIDE QGILW/OO	1
3	2760076-0000	BRACKET CART SUPPORT NOSE QGILW	1
4	2760077-0000	BRACKET CART SUPPORT NOSE QGILW	1
5	2500045-0000	BOLT 1/4" X 1/2" L.G.	6
6	2500046-0000	BOLT 1/4" X 1/2" L.G.	6
7	2760078-0000	BOLT 1/4" X 3/8" L.G.	6
8	2760079-0000	NUT 1/4" X 1/2"	6
9	2760080-0000	NUT 1/4" X 3/8"	6
10	2760081-0000	NUT 1/4" X 3/8"	6
11	2760082-0000	WASHER LOCKING	6
12	2760083-0000	WASHER FLAT 2.08 X 1 3/4, G	6

*1 - YELLOW
*2 - BLACK

ASSEMBLY NO. 3540043-0100 (YELLOW)
ASSEMBLY NO. 3540043-0000 (BLACK)

ENGINEERING APPROVED FOR PRODUCTION
DATE: 4/27/09

NOSE ASSY, QGILWIDE

REV.	DATE	BY	CHKD.
1	4/27/09	D. Kohnold	
2	5/20/09	J. D. Dwyer	
3	4/27/09	J. D. Dwyer	
4	4/27/09	J. D. Dwyer	
5	4/27/09	J. D. Dwyer	

3540043-0000 (REV. 1)

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	2723315-000	SHIM, 1/8X3 5/8X8 G	2

DETAIL A
TYPICAL BOTH SIDES

ASSEMBLY NO. 3540078-0000	
SHIM KIT, DIAPHRAGM, RAIL GUIDE, QG II	
PARTS LIST: 1 of 1 DRAWING NO.: 3540078-0000	

D. Kennel Designer JUNE 1978 3540078-0000.DRW	2/27/2009 12/29/2008 3/4/2009 3/19/2009	
--	--	--

Revision	Date	Rev	By	CHK/APP
0001	06/27/09	A	MW/STT	MWB
0002	07/14/09	D	DK	JMC/ECB

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with West Virginia Code, §5A-3-37. (Does not apply to construction contracts). West Virginia Code, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the West Virginia Code. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

- 1. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% resident vendor preference for the reason checked: Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____ Signed: _____

Date: _____ Title: _____

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

RFQ No. _____

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, Limited Liability Company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code §61-5-3*), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: _____

Authorized Signature: _____ Date: _____

State of _____

County of _____, to-wit:

Taken, subscribed, and sworn to before me this ___ day of _____ 20___

My Commission expires _____, 20___

AFFIX SEAL HERE

NOTARY PUBLIC _____

