









CRASH CUSHION ATTENUATORS ♦

					
<p>QUAD (N) QUADGUARD II SYSTEM (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>	<p>QUAD (W) QUADGUARD II SYSTEM (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>	<p>QGELITE (N) QUADGUARD® ELITE CRASH CUSHION SYSTEM (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>	<p>QGELITE (W) QUADGUARD® ELITE CRASH CUSHION SYSTEM (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>	<p>REACT (N) REUSABLE ENERGY ABSORBING CRASH TERMINAL (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>	<p>REACT (W) REUSABLE ENERGY ABSORBING CRASH TERMINAL (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</p> <p>www.energyabsorption.com</p>
<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad
<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection
<p>BACKUP WIDTH: 24", 30", and 36"</p>	<p>BACKUP WIDTH: 69" and 90"</p>	<p>BACKUP WIDTH: 24" to 36"</p>	<p>BACKUP WIDTH: 69" or 90"</p>	<p>BACKUP WIDTH: 30"-36" – Concrete Backup 24" – Self Contained Backup</p>	<p>BACKUP WIDTH: 60, 96" or 120"</p>
<p>HEIGHT: 2'-8"</p>	<p>HEIGHT: 2'-8"</p>	<p>HEIGHT: 2'-8"</p>	<p>HEIGHT: 2'-8"</p>	<p>HEIGHT: 4'-3 1/2"</p>	<p>HEIGHT: 3'-10"</p>
<p>LENGTH: 2 Bay – 9'-0" (45 mph or less) – TL-2 3 Bay – 12'-0" (50 mph) 4 Bay – 15'-0" (55 mph) 5 Bay – 18'-0" (60 mph) 6 Bay – 21'-0" (65 mph) *8 Bay – 27'-0" (70 mph)</p>	<p>LENGTH: 3 Bay – 12'-0" (50 mph or less) 4 Bay – 15'-0" (55 mph) 5 Bay – 18'-0" (60 mph) 6 Bay – 21'-0" (65 mph) *8 Bay – 27'-0" (70 mph)</p>	<p>LENGTH: 5 Bay – 18'-0" (45 mph or less) – TL-2 8 Bay – 27'-1" (50 mph or Greater) *11 Bay – 36'-0" (70 mph)</p>	<p>LENGTH: 7 Bay – 18'-0" (45 mph or less) – TL-2 8 Bay – 27'-1" (50 mph or Greater) – TL-3 *11 Bay – 36'-0" (70 mph)</p>	<p>LENGTH: 4-B – 15'-3" (45 mph) 4-C – 13'-9" (45 mph) 6-B – 21'-3" (62 mph) - REACT II 6-C – 19'-5" (62 mph) – REACT II * HS-B – 30'-3" (70 mph) * HS-C – 28'-9" (70 mph)</p>	<p>LENGTH: (≥ 60 mph) for Backup Width 60" ⇒ 30'-10" for Backup Width 96" ⇒ 34'-9" for Backup Width 120" ⇒ 33'-10"</p>
<p>Latest Statewide Standard: QUAD(N)-10</p>	<p>Latest Statewide Standard: QUAD(W)-10</p>	<p>Latest Statewide Standard: QGELITE(N)-10</p>	<p>Latest Statewide Standard: QGELITE(W)-10</p>	<p>Latest Statewide Standard: REACT(N)-12</p>	<p>Latest Statewide Standard: REACT(W)-03</p>

♦ This table is provided for informational purposes only, refer to manufacturer's details for the most up to date information.

* Capacity or fully tested (70mph)
NCHRP 350: TL 2 ≤ 45 mph; TL 3 ≥ 60 mph

CRASH CUSHION ATTENUATORS ♦

					
TRACC(N) TRINITY ATTENUATING CRASH CUSHION (NARROW) by Trinity Industries www.highwayguardrail.com	TRACC (W) TRINITY ATTENUATING CRASH CUSHION (WIDE) by Trinity Industries www.highwayguardrail.com	TAU II(N) TAU-II™ (NARROW) by BARRIER SYSTEMS INC. www.barriersystemsinc.com	TAU II(W) TAU-II™ (WIDE) by BARRIER SYSTEMS INC. www.barriersystemsinc.com	SMART CUSHION (N) SCI 100 GM - SMART CUSHION (NARROW) by SCI Products, Inc. www.workareaprotection.com	SMART CUSHION (W) SCI 100 GM - SMART CUSHION (WIDE) by SCI Products, Inc. www.workareaprotection.com
<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-3 and TL-2 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad
<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection
BACKUP WIDTH: FASTRACC: 24" TRACC: 24" SHORTTRACC: 24"	BACKUP WIDTH: WideFASTRACC: 71" – 139" WideTRACC: 58" – 127" WideSHORT: 39" – 108"	BACKUP WIDTH: 24" to 28"	BACKUP WIDTH: 30" up to 102" in 6" increments	BACKUP WIDTH: 24" to 36"	BACKUP WIDTH: 41" to 120"
FASTRACC HEIGHT: 2'-8" TRACC HEIGHT: 2'-8" SHORTTRACC HEIGHT: 2'-8"	HEIGHT: 2'-8"	HEIGHT: 2'-8"	HEIGHT: 2'-8"	HEIGHT: 2'-9 3/8"	HEIGHT: 2'-9 3/8"
SHORTTRACC LENGTH: 14'-3" (45 mph or less) – TL-2 TRACC LENGTH: 21'-3" (50 mph or greater) – TL-3 FASTRACC LENGTH: * 25'-9" (70 mph)	WideSHORT LENGTH: 14'-1" to 37'-3"+ (45 mph or less) – TL-2 WideTRACC LENGTH: 21'-0" to 44'-2"+ (50 mph or greater) – TL-3 WideFASTRACC LENGTH: * 25'-8" to 48'-10"+ (70 mph) Varies with Width of Back-up Needed	LENGTH: 4 Bay – 12'-0" (45 mph or less) – TL-2 5 Bay – 15'-0" (50 mph) 7 Bay – 20'-6" (55 mph) 8 Bay – 23'-6" (60 mph) 9 Bay – 26'-0" (65 mph) * 11 Bay – 32'-0" (70 mph) 12 Bay – 35'-0" (75 mph)	LENGTH: 4 Bay – 14'-0" (45 mph or less) – TL-2 5 Bay – 16'-0" (50 mph) 7 Bay – 22'-0" (55 mph) 8 Bay – 25'-0" (60 mph) * 10 Bay – 32'-0" (70 mph)	LENGTH: 13'-8 1/4" (45 mph or less) – TL-2 21'-8 1/4" (60 mph or greater) – TL-3	LENGTH: 13' – 8 1/4" (45 mph or less) – TL-2 21'-8 1/4" (45 mph or less) – TL-3 Varies with Width of Back-up Needed
Latest Statewide Standard: TRACC(N) – 05	Latest Statewide Standard: TRACC(W)-05	Latest Statewide Standard: TAU-II(N)-05	Latest Statewide Standard: TAU-II(W)-05	Latest Statewide Standard: SMT(N)-06	Latest Statewide Standard: SMT(W)-06

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CRASH CUSHION ATTENUATORS ♦

		
<p align="center">HEART HYBRID ENERGY ABSORBING REUSABLE TERMINAL BY TRINITY INDUSTRIES www.highwayguardrail.com</p>	<p align="center">QUEST QUEST by ENERGY ABSORPTION SYSTEMS, INC. www.energyabsorption.com</p>	<p align="center">BEAT-SSC BOX BEAM BURSTING ENERGY ABSORBING TERMINAL – SINGLE SIDE CRASH CUSHION by ROAD SYSTEMS INC. www.roadsystems.com</p>
<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-2 & TL-3 • Permanent or Temporary Work Zone Applications • Connects to W beam, Thrie Beam, Concrete Barrier, Vertical Concrete Barrier • Requires Paved Pad 	<ul style="list-style-type: none"> • Non-gating, Redirective crash cushion system • Meets TL-3 • Connects to Rigid Barriers • Does <u>not</u> Require Paved Surface
<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Median Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection
<p align="center">BACKUP WIDTH: 28"</p>	<p align="center">BACKUP WIDTH: 24" 30" 36"</p>	<p align="center">BACKUP WIDTH: 24"</p>
<p align="center">HEIGHT: 2'-8 1/4"</p>	<p align="center">HEIGHT: 2'-7"</p>	<p align="center">HEIGHT: 2'-4"</p>
<p align="center">LENGTH: 15' – 9 1/2" (45 mph or Less) – TL-2 28'-3" (50 mph or Greater) – TL-3 * 30'-9" (70 mph)</p>	<p align="center">LENGTH: 22' – 0" (45 mph or Less) – TL-2 28'-0" (50 or greater) – TL-3 * 34'-9" (70 mph)</p>	<p align="center">LENGTH: 28'-0" (TL-3)</p>
<p align="center">Latest Statewide Standard: HEART-10</p>	<p align="center">Latest Statewide Standard: QUEST-10</p>	<p align="center">Latest Statewide Standard: SSCC-03A</p>

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CRASH CUSHION ATTENUATORS ♦

NON-DIRECTIVE CRASH CUSHIONS

					
ABSORB 350	ACZ 350	SAND-FILLED PLASTIC MODULE ARRAYS	FITCH UNIVERSAL MODULE CRASH CUSHION (FITCH SAND BARRELS)	TRAFFIX SAND BARRELS	CRASHGARD SAND BARREL
ABSORB 350 by BARRIER SYSTEMS INC. www.barriersystemsinc.com	ACZ 350 by ENERGY ABSORPTION SYSTEMS, INC. www.energyabsorption.com	ENERGITE III by ENERGY ABSORPTION SYSTEMS, INC. www.energyabsorption.com	FITCH UNIVERSAL BARREL by ENERGY ABSORPTION SYSTEMS, INC. www.energyabsorption.com	BIG SANDY by TRAFFIX DEVICES, INC. www.trafficdevices.com	CRASHGARD SAND BARREL by PLASTIC SAFETY SYSTEMS INC. www.plasticsafety.com
<ul style="list-style-type: none"> • Gating, Non-Redirective, Water-filled • Meets TL-2 and TL-3 • Temporary Work Zone Application Only • Connects to Temporary Concrete Barrier (limited to barrier height of 33" or less) • Does <u>not</u> Require Paved Surface 	<ul style="list-style-type: none"> • Gating, Non-Redirective, Water-filled • Meets TL-2 and TL-3 • Temporary Work Zone Application Only • Connects to Temporary Concrete • Does <u>not</u> Require Paved Surface 	<ul style="list-style-type: none"> • Gating, Non-Redirective, Sand-filled • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Gating, Non-Redirective, Sand-filled • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Gating, Non-Redirective, Sand-filled • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad 	<ul style="list-style-type: none"> • Gating, Non-Redirective, Sand-filled • Meets TL-2 and TL-3 • Permanent or Temporary Work Zone Applications • Requires Paved Pad
<ul style="list-style-type: none"> • Shoulder Protection • Point Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Gore Two-Side Protection 	<ul style="list-style-type: none"> • Shoulder Protection • Point Protection • Gore Two-Side Protection
BACKUP WIDTH: 24" to 33"	BACKUP WIDTH: 24"	BACKUP WIDTH: 24"	BACKUP WIDTH: 24"	BACKUP WIDTH: 24"	BACKUP WIDTH: 24"
HEIGHT: 2'-8 1/4"	HEIGHT: 2'-9"	HEIGHT: 33"	HEIGHT: 32" to 36"	HEIGHT: 32" to 36"	HEIGHT: 32" to 36"
LENGTH: 5 Element – 20'-0" (45 mph or Less) 6 Element – 23'-0" (50 mph) 7 Element – 26'-0" (55 mph) 9 Element – 32'-0" (60 mph) 10 Element – 35'-0" (65 mph) 12 Element – 42'-0" (70 mph)	LENGTH: 31'-7" (45 mph or Less) – TL-2 31'-7" (50 mph or Greater) – TL-3	LENGTH: Variable – See VIA(SFPM) (30 to 65 mph)	LENGTH: Variable – See VIA(SFPM) (30 to 65 mph)	LENGTH: Variable – See VIA(SFPM) (30 to 65 mph)	LENGTH: Variable – See VIA(SFPM) (30 to 65 mph)
Latest Statewide Standard: ABSORB-10	Latest Statewide Standard: ACZ(350)-10	Latest Statewide Standard: VIA(SFPM)-10	Latest Statewide Standard: VIA(SFPM)-10	Latest Statewide Standard: VIA(SFPM)-10	Latest Statewide Standard: VIA(SFPM)-10

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* CRASH CUSHION SUMMARY

LOC. NO.	LOCATION	DIRECTION OF TRAFFIC	DESIGN SPEED (MPH)	FOUNDATION PAD			BACKWALL DIMENSIONS		
				EXISTING	PROPOSED	PROPOSED THICKNESS	WIDTH	HEIGHT	THICKNESS
1	SB IH 35 - ENTRANCE RAMP SOUTH. OF RM 620	UNIDIRECTIONAL	55	CONCRETE	CONCRETE (UNREINFORCED)	8"	6'-4''	3'-6''	1'-0''
2	SB IH 35 - 51ST. ST. EXIT	UNIDIRECTIONAL	65	BRIDGE DECK	BRIDGE DECK	N/A	5'-2''	3'-2''	7 1/2"
3	NBFR SPLIT TO AIRPORT BLVD.	UNIDIRECTIONAL	55	HMACP	HMACP	8"	6'-6''	3'-0''	11"
4	NB IH 35 - AIRPORT BLVD. EXIT, LOWER LEVEL (237A)	UNIDIRECTIONAL	65	CONCRETE	CONCRETE (UNREINFORCED)	8"	6"-10	3'-6''	9/2" / 1'-9"
5	SB IH 35 - 32ND ST. EXIT, LOWER LEVEL (EXIT 236A)	UNIDIRECTIONAL	65	CONCRETE	CONCRETE (UNREINFORCED)	8"	7'-0''	2'-11"	11" / 1'-9"
6	NB IH 35 - 36TH ST. EXIT, LOWER LEVEL (EXIT 236)	UNIDIRECTIONAL	65	CONCRETE	CONCRETE (UNREINFORCED)	8"	7'-10"	3'-6''	11" / 2'-3"
7	SB IH 35 - M.L.K. BLVD. EXIT, LOWER LEVEL (EXIT 235A)	UNIDIRECTIONAL	65	CONCRETE	CONCRETE (UNREINFORCED)	8"	4'-6''	3'-5''	1'-2''
8	SB IH 35 - M.L.K. BLVD. EXIT, UPPER LEVEL (EXIT 235A)	UNIDIRECTIONAL	65	BRIDGE DECK	BRIDGE DECK	N/A	5'-0''	3'-0''	9"
9	SB LP1 FROM WB 1ST TO SBLP 1 / LAKE AUSTIN BVLD. SPLIT	UNIDIRECTIONAL	55	BRIDGE DECK	BRIDGE DECK	N/A	3'-11"	3'-4''	1'-0''
10	SB LP1 1ST. ST. & 5TH. ST. SPLIT, LAKE AUSTIN INTERCHANGE	UNIDIRECTIONAL	55	BRIDGE DECK	BRIDGE DECK	N/A	6'-31/2"	3'-4 1/2"	1'-0''
11	NB LP1 EXIT TO 1ST. & 5TH ST. SPLIT	UNIDIRECTIONAL	65	BRIDGE DECK	BRIDGE DECK	N/A	8'-1''	2'-9 1/2"	11 1/2"
12	(US 183) NB AIRPORT BLVD. 1ST ST., 5TH ST. & 7TH ST. SPLIT	UNIDIRECTIONAL	55	CONCRETE	CONCRETE (UNREINFORCED)	8"	6'-5''	6'-1''	1'-0''

* Selection of crash cushion attenuators to be used at each location is limited to the types shown in the plans.

LEVELS DISPLAYED	
1	

EXAMPLE



CRASH CUSHION SUMMARY SHEET

FILE:	DN:	CK:	DW:	CK:	
© TxDOT	DIST	FEDERAL AID PROJECT		SHEET	
REVISIONS					
COUNTY		CONTROL	SECT	JOB	HIGHWAY