**CRASH CUSHION ATTENUATORS**

<table>
<thead>
<tr>
<th>QUAD (N)</th>
<th>QUAD (W)</th>
<th>QGELITE (N)</th>
<th>QGELITE (W)</th>
<th>REACT (N)</th>
<th>REACT (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUADGUARD II SYSTEM (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td>QUADGUARD II SYSTEM (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td>QGELITE® ELITE CRASH CUSHION SYSTEM (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td>QGELITE® ELITE CRASH CUSHION SYSTEM (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td>REUSABLE ENERGY ABSORBING CRASH TERMINAL (NARROW) by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td>REUSABLE ENERGY ABSORBING CRASH TERMINAL (WIDE) by ENERGY ABSORPTION SYSTEMS, INC.</td>
</tr>
</tbody>
</table>

- **Non-gating, Redirective crash cushion system**
- Meets TL-2 and TL-3
- Permanent or Temporary Work Zone Applications
- Requires Paved Pad

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- Requires Paved Pad

### BACKUP WIDTH:

- **24”, 30”, and 36”**

- **60”, 96” or 120”**

- **24” – 120” (50 mph or less)**

- **24” – 120” (50 mph or less)**

- **24” – 120” (50 mph or less)**

- **24” – 120” (50 mph or less)**

### HEIGHT:

- **2’-8”**

- **3’-10”**

### LENGTH:

- **7 Bay – 18’-0” (45 mph or less)**

- **7 Bay – 18’-0” (45 mph or less)**

- **7 Bay – 18’-0” (45 mph or less)**

- **7 Bay – 18’-0” (45 mph or less)**

### Latest Statewide Standard:

- **QUAD(N)-10**

- **QUAD(W)-10**

- **QGELITE(N)-10**

- **QGELITE(W)-10**

- **REACT(N)-12**

- **REACT(W)-03**

* 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

Updated: 4/26/12
## CRASH CUSHION ATTENUATORS

<table>
<thead>
<tr>
<th>TRACC (N)</th>
<th>TRACC (W)</th>
<th>TAU II (N)</th>
<th>TAU II (W)</th>
<th>SMART CUSHION (N)</th>
<th>SMART CUSHION (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRINITY ATTENUATING CRASH CUSHION (NARROW)</td>
<td>TRINITY ATTENUATING CRASH CUSHION (WIDE)</td>
<td>TAU-II (NARROW)</td>
<td>TAU-II (WIDE)</td>
<td>SCI 100 GM - SMART CUSHION (NARROW)</td>
<td>SCI 100 GM - SMART CUSHION (WIDE)</td>
</tr>
<tr>
<td>by Trinity Industries</td>
<td>by Trinity Industries</td>
<td>by BARRIER SYSTEMS INC.</td>
<td>by BARRIER SYSTEMS INC.</td>
<td>by SCI Products, Inc.</td>
<td>by SCI Products, Inc.</td>
</tr>
</tbody>
</table>

- **Non-gating, Reductive crash cushion system**
  - Meets TL-2 and TL-3
  - Requires Paved Pad

- **Shoulder Protection**
  - Point Protection
  - Median Protection
  - Gore Two-Side Protection

- **Backup Width**
  - FASTRACC: 24"
  - TRACC: 24"
  - SHORTTRACC: 24"

- **FASTRACC Height**: 2'-8" (NARROW)
  - SHORTRACC: 2'-8" (NARROW)

- **SHORTRACC Length**: 14'-3" (55 mph or less) – TL-2
  - TRAC Length: 21'-3" (50 mph or greater) – TL-3
  - FASTRACC Length: 26'-3" (50 mph or greater) – TL-3

- **Gore Two-Side Protection**
  - Shoulder Protection
  - Point Protection
  - Median Protection

- **Shoulder Protection**
  - Point Protection
  - Median Protection
  - Gore Two-Side Protection

- **Backup Width**
  - 24" to 28"

- **Backup Width**: 30" up to 102" in 6" increments

- **BACKUP WIDTH**: FASTRACC: 24"
  - TRACC: 24"
  - SHORTTRACC: 24"

- **Latest Statewide Standard**: TRACC (N) – 05
  - TRACC (W) – 05

- **Height**: 2'-8"

- **FASTRACC Height**: 2'-8" (NARROW)
  - SHORTRACC Height: 2'-8" (NARROW)

- **Width of Flap**: 25'-9" (70 mph)
  - Varies with Width of Back-up Needed

- **Capacity or fully tested (70mph)**

- **NCHRP 350: TL 2 < 45 mph; TL 3 > 60 mph**

- **Updated: 4/26/12**

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* Capacity or fully tested (70mph).
## CRASH CUSHION ATTENUATORS

<table>
<thead>
<tr>
<th>CRASH CUSHION ATTENUATORS</th>
<th>HEART QUEST BEAT-SSCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYBRID ENERGY ABSORBING REUSABLE TERMINAL</strong></td>
<td><strong>QUEST</strong> by <strong>ENERGY ABSORPTION SYSTEMS, INC.</strong></td>
</tr>
<tr>
<td><strong>from</strong> TRINITY INDUSTRIES</td>
<td><strong>from</strong> <a href="http://www.energyabsorption.com">www.energyabsorption.com</a></td>
</tr>
<tr>
<td><em>Non-gating, Redirective crash cushion system</em></td>
<td><em>Non-gating, Redirective crash cushion system</em></td>
</tr>
<tr>
<td><em>Meets TL-3</em></td>
<td><em>Meets TL-2 &amp; TL-3</em></td>
</tr>
<tr>
<td><em>Permanent or Temporary Work Zone Applications</em></td>
<td><em>Connects to W beam, Thrie Beam, Concrete Barrier, Vertical Concrete Barrier</em></td>
</tr>
<tr>
<td><em>Requires Paved Pad</em></td>
<td><em>Requires Paved Pad</em></td>
</tr>
<tr>
<td><strong>SHOULDER PROTECTION</strong></td>
<td><strong>SHOULDER PROTECTION</strong></td>
</tr>
<tr>
<td><strong>POINT PROTECTION</strong></td>
<td><strong>POINT PROTECTION</strong></td>
</tr>
<tr>
<td><strong>MID Median Protection</strong></td>
<td><strong>MID Median Protection</strong></td>
</tr>
<tr>
<td><strong>GORE Two-Side Protection</strong></td>
<td><strong>GORE Two-Side Protection</strong></td>
</tr>
<tr>
<td><strong>BACKUP WIDTH:</strong> 28&quot;</td>
<td><strong>BACKUP WIDTH:</strong> 24&quot;</td>
</tr>
<tr>
<td><strong>HEIGHT:</strong> 2'-8 ¼&quot;</td>
<td><strong>HEIGHT:</strong> 2'-7&quot;</td>
</tr>
<tr>
<td><strong>LENGTH:</strong> 15' – 9 ½&quot; (45 mph or Less) – TL-2</td>
<td><strong>LENGTH:</strong> 22' – 0&quot; (45 mph or Less) – TL-2</td>
</tr>
<tr>
<td>28'-3&quot; (50 mph or Greater) – TL-3</td>
<td>28'-0&quot; (50 or greater) – TL-3</td>
</tr>
<tr>
<td>30'-9&quot; (70 mph)</td>
<td>* 34'-0&quot; (70 mph)</td>
</tr>
<tr>
<td>Latest Statewide Standard: HEART-10</td>
<td>Latest Statewide Standard: QUEST-10</td>
</tr>
</tbody>
</table>

* 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

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## CRASH CUSHION ATTENUATORS

### NON-DIRECTIVE CRASH CUSHIONS

<table>
<thead>
<tr>
<th>Non-Directive Crash Cushion</th>
<th>Capacity or Fully Tested (70mph)</th>
<th>NCHRP 350: TL 2 ≤ 45 mph; TL 3 ≥ 60 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABSORB 350</strong></td>
<td>by BARRIER SYSTEMS INC.</td>
<td><a href="http://www.barriersystemsinc.com">www.barriersystemsinc.com</a></td>
</tr>
<tr>
<td><strong>ACZ 350</strong></td>
<td>by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td><a href="http://www.energyabsorption.com">www.energyabsorption.com</a></td>
</tr>
<tr>
<td><strong>SAND-FILLED PLASTIC MODULE ARRAYS</strong></td>
<td>by ENERGY ABSORPTION SYSTEMS, INC.</td>
<td><a href="http://www.energyabsorption.com">www.energyabsorption.com</a></td>
</tr>
<tr>
<td><strong>FITCH UNIVERSAL MODULE CRASH CUSHION (FITCH SAND BARRELS)</strong></td>
<td>by TRAFFIX DEVICES, INC.</td>
<td><a href="http://www.traffixdevices.com">www.traffixdevices.com</a></td>
</tr>
<tr>
<td><strong>CRASHGARD SAND BARREL</strong></td>
<td>by PLASTIC SAFETY SYSTEMS INC.</td>
<td><a href="http://www.plasticsafety.com">www.plasticsafety.com</a></td>
</tr>
</tbody>
</table>

- **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 not Require Paved Surface**

- **Gating, Non-Redirective, Sand-filled**
- **Meets TL-2 and TL-3**
- **Temporary Work Zone Application Only**
- **Connects to Temporary Concrete**
- **Does not Require Paved Surface**

- **Shoulder Protection**
- **Point Protection**

- **Shoulder Protection**
- **Point Protection**

- **Shoulder Protection**
- **Point Protection**
- **Gore Two-Side Protection**

- **Shoulder Protection**
- **Point Protection**
- **Gore Two-Side Protection**

- **Shoulder Protection**
- **Point Protection**
- **Gore Two-Side Protection**

- 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**

- **BACKUP WIDTH:** 24” to 33”
- **HEIGHT:** 2'-8 ¼”
- **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)

- **BACKUP WIDTH:** 24’
- **HEIGHT:** 2’-9”
- **LENGTH:**
  - 31’-7” (45 mph or Less) – TL-2
  - 31’-7” (50 mph or Greater) – TL-3

- **BACKUP WIDTH:** 24’
- **HEIGHT:** 3’
- **LENGTH:**
  - Variable – See VIA(SFPM) (30 to 65 mph)

- **BACKUP WIDTH:** 24’
- **HEIGHT:** 3’-6”
- **LENGTH:**
  - Variable – See VIA(SFPM) (30 to 65 mph)

- **BACKUP WIDTH:** 24’
- **HEIGHT:** 3’-6”
- **LENGTH:**
  - Variable – See VIA(SFPM) (30 to 65 mph)

- **LATEST STATEWIDE STANDARD:**
  - **ABSORB-10**
  - **ACZ(350)-10**
  - **VIA(SFPM)-10**
  - **VIA(SFPM)-10**
  - **VIA(SFPM)-10**

*Capacity or fully tested (70mph)*

Updated: 4/26/12
## CRASH CUSHION SUMMARY

<table>
<thead>
<tr>
<th>LOC NO.</th>
<th>LOCATION</th>
<th>DIRECTION OF TRAFFIC</th>
<th>DESIGN SPEED (MPH)</th>
<th>FOUNDATION PAD</th>
<th>PROPOSED THICKNESS</th>
<th>BACKWALL DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SB IN 35 - ENTRANCE RAMP SOUTH, OF FM 620</td>
<td>UNIDIRECTIONAL</td>
<td>55</td>
<td>CONCRETE</td>
<td>CONCRETE (UNREINFORCED)</td>
<td>8'</td>
</tr>
<tr>
<td>2</td>
<td>SB IN 35 - 51ST ST, EXIT</td>
<td>UNIDIRECTIONAL</td>
<td>65</td>
<td>BRIDGE DECK</td>
<td>BRIDGE DECK</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>HWY SPLIT TO AIRPORT BLVD.</td>
<td>UNIDIRECTIONAL</td>
<td>65</td>
<td>BRIDGE DECK</td>
<td>BRIDGE DECK</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>HS IN 35 - AIRPORT BLVD, EXIT, LOWER LEVEL (237A)</td>
<td>UNIDIRECTIONAL</td>
<td>65</td>
<td>CONCRETE</td>
<td>CONCRETE (UNREINFORCED)</td>
<td>8'</td>
</tr>
<tr>
<td>5</td>
<td>SB IN 35 - 320 ST, EXIT, LOWER LEVEL (EXIT 236A)</td>
<td>UNIDIRECTIONAL</td>
<td>65</td>
<td>CONCRETE</td>
<td>CONCRETE (UNREINFORCED)</td>
<td>8'</td>
</tr>
</tbody>
</table>
| 6       | HS IN 35 - 36TH ST, EXIT, LOWER LEVEL (EXIT 236B) | UNIDIRECTIONAL | 65 | CONCRETE | CONCRETE (UNREINFORCED) | 8' | 7'-10" | 3'-6" | 11" / 2'-1-3"
| 7       | SB IN 35 - M.L.K. BLVD. EXIT, EXIT 235A | UNIDIRECTIONAL | 65 | CONCRETE | CONCRETE (UNREINFORCED) | 8' | 4'-6" | 3'-5" | 1'-0" |
| 8       | SB IN 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 LPI | UNIDIRECTIONAL | 55 | BRIDGE DECK | BRIDGE DECK | N/A | 3'-11" | 3'-4" | 1'-0" |
| 10      | NB LPI | UNIDIRECTIONAL | 55 | BRIDGE DECK | BRIDGE DECK | N/A | 6'-31/2" | 3'-4-1/2" | 1'-0" |
| 11      | SB LPI | UNIDIRECTIONAL | 65 | BRIDGE DECK | BRIDGE DECK | N/A | 6'-11" | 2'-9" | 1'-1/2 |
| 12      | NB EXIT 1ST. & 5TH ST. | UNIDIRECTIONAL | 55 | CONCRETE | CONCRETE (UNREINFORCED) | 8' | 6'-5" | 6'-11" | 1'-0" |

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