CRASH CUSHION TYPE 6 —APPROVED SYSTEMS LIST

CLASS	SPEED (MPH)	ATTENUATOR				SYSTEM	SUGGESTED
		MODEL	PRODUCT NAME	MANUFACTURER	WIDTH	LENGTH	AADT* RANGE
В	45 & LESS	TL2	SCI 70 GM IMPACT ATTENUATOR SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	13'-6"	≤12,000
			3-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	13'-0"	
	OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≤12,000
			6-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	22'-0"	
С	C OVER 45	OVER 45 TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≥8,000
5			QUADGUARD ELITE M10	VALTIR OF DALLAS, TEXAS	24"	27'-2"	
5 D	OVER 45	TL3	REACT M	VALTIR OF DALLAS, TEXAS	38 ¾"	22'- 2¾"	≥15,000

*ANNUAL AVERAGE DAILY TRAFFIC - THE SUGGESTED AADT RANGE IN THE TABLE IS PROVIDED FOR GUIDANCE ONLY AND SHALL NOT SUPERSEDE THE APPLICATION OF SOUND ENGINEERING JUDGMENT.

THE CONTRACTOR SHALL INSTALL A PRODUCT FROM THE APPROVED SYSTEMS LIST ABOVE OF THE CLASS AND TEST LEVEL REQUIRED IN THE PLANS.

~ NOTES ~

- 1. IN THE PLAN AND ELEVATION DRAWINGS, A TYPE 6 CRASH CUSHION IS SHOWN ATTACHED TO A CONCRETE MEDIAN BARRIER AS A REPRESENTATIVE CONFIGURATION. THE TYPE 6 CRASH CUSHION MAY BE CONNECTED TO BARRIERS SUCH AS W-BEAM GUARDRAIL, THRIE-BEAM, OR CONCRETE BARRIER, OR MAY BE USED TO SHIELD NARROW ROADWAY FEATURES.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING TYPE 6 CRASH CUSHIONS STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS. SYSTEMS SHALL NOT BE MODIFIED, ALTERED, OR SUBSTITUTED FROM THEIR APPROVED CONFIGURATIONS WITHOUT WRITTEN APPROVAL FROM THE MANUFACTURER AND THE ENGINEER.
- PREPARE THE SITE AND INSTALL FOUNDATION PADS APPROPRIATE FOR PERMANENT INSTALLATIONS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FOLLOW ALL MANUFACTURER INSTRUCTIONS FOR MATERIALS, THICKNESS, SPECIFICATIONS, AND ANCHORING. ALL WORK AND MATERIALS ASSOCIATED WITH THE FOUNDATION PAD ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 BID ITEM.
- A PROPER TRANSITION PANEL OR SIDE PANEL MUST BE INSTALLED ON EACH SIDE OF THE CRASH CUSHION BACKUP THAT FACES APPROACHING TRAFFIC. CONSULT THE PLANS TO DETERMINE TRAFFIC DIRECTION AND THE TYPE OF BARRIER OR ROADWAY FEATURE BEING SHIELDED. REFER TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR TRANSITION DESIGN AND INSTALLATION DETAILS. SELECT THE APPROPRIATE TRANSITION TYPE AND ALL REQUIRED COMPONENTS. ALL WORK AND MATERIALS RELATED TO THE TRANSITION ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 BID ITEM.
- CRASH CUSHION TYPE 6 CLASS C AND CLASS D ARE INTENDED FOR LOCATIONS WHERE A HIGH FREQUENCY OF IMPACTS MAY BE EXPECTED AND WHERE MAINTENANCE WILL BE DIFFICULT, TYPICALLY IN HIGH-SPEED, HIGH-TRAFFIC AREAS. THESE SYSTEMS ARE DESIGNED TO PROVIDE LOW-MAINTENANCE AND/OR SELF-RESTORING PERFORMANCE. WHEN SELECTING THE CLASS OF CRASH CUSHION TO INSTALL, CONSIDER THE EXPECTED IMPACT FREQUENCY, TRAFFIC CONDITIONS, AND MAINTENANCE ACCESSIBILITY.
- NOSE ASSEMBLY (OBJECT MARKER TYPE 3, AS REQUIRED). SEE MUTCD FOR STRIPE DIRECTION AND ORIENTATION.
- BACKUP ASSEMBLY PER MANUFACTURER'S ASSEMBLY INSTRUCTIONS

BID ITEMS AND UNIT TO BID

CRASH CUSHION TY 6 CLASS lacktriangle , lacktriangle . lacktriangle .

CLASS B, C OR D, AS REQUIRED

EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED

ADD SUFFIX "1" TO BID ITEM TO INDICATE A BACK-UP SYSTEM OTHER THAN CONCRETE, SEE RBC-110

USER: matthew sipes

BID ITEMS AS APPLICABLE

EACH OBJECT MARKER TY 3 (AS REQUIRED)

USE WITH CUR. STD. DWG.

RBC-110



HILL AND SMITH

SMART CUSHION

QUADGUARD M10

TRAFFIC





REACT M



(4) TRANSITION PANEL ~ PLAN ~ TRAFFIC USE FOUNDATION PADS SUITABLE (3) FOR PERMANENT INSTALLATIONS. SEE MANUFACTURER'S INSTRUCTIONS. (4) TRANSITION PANEL ~ ELEVATION ~

SYSTEM LENGTH

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS



COMMONWEALTH OF KENTUCKY TEAM KENTUCKY DEPARTMENT OF HIGHWAYS

CRASH CUSHIONS

SHEET 001: CRASH CUSHION TYPE 6 (ONE AND TWO DIRECTION)

STANDARD DRAWING NUMBER RBE-105-00

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CRASH CUSHION TYPE 7 — APPROVED SYSTEMS LIST

SPEED SPEED		ATTENUATOR				SYSTEM	SUGGESTED
	(MPH)	MODEL	PRODUCT NAME	MANUFACTURER	WIDTH	LENGTH	AADT* RANGE
В	OVER 45	TL3	QUADGUARD M WIDE	VALTIR OF DALLAS, TEXAS	69"	22'-0"	≤12,000
C (5)	OVER 45	TL3	QUADGUARD ELITE M10 WIDE	VALTIR OF DALLAS, TEXAS	69"	27'-1"	≥8,000

*ANNUAL AVERAGE DAILY TRAFFIC - THE SUGGESTED AADT RANGE IN THE TABLE IS PROVIDED FOR GUIDANCE ONLY AND SHALL NOT SUPERSEDE THE APPLICATION OF SOUND ENGINEERING JUDGMENT.

~ NOTES ~

- 1. IN THE PLAN AND ELEVATION DRAWINGS, A TYPE 7 CRASH CUSHION IS SHOWN AS A REPRESENTATIVE CONFIGURATION. THE CONTRACTOR SHALL INSTALL A PRODUCT FROM THE APPROVED SYSTEMS LIST ABOVE OF THE CLASS REQUIRED IN THE PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING TYPE 7 CRASH CUSHIONS STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS. SYSTEMS SHALL NOT BE MODIFIED, ALTERED, OR SUBSTITUTED FROM THEIR APPROVED CONFIGURATIONS WITHOUT WRITTEN APPROVAL FROM THE MANUFACTURER AND THE ENGINEER.
- PREPARE THE SITE AND INSTALL FOUNDATION PADS APPROPRIATE FOR PERMANENT INSTALLATIONS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FOLLOW ALL MANUFACTURER INSTRUCTIONS FOR MATERIALS, THICKNESS, SPECIFICATIONS, AND ANCHORING. ALL WORK AND MATERIALS ASSOCIATED WITH THE FOUNDATION PAD ARE INCIDENTAL TO THE CRASH CUSHION TYPE 7 BID ITEM.
- A PROPER TRANSITION PANEL OR SIDE PANEL MUST BE INSTALLED ON EACH SIDE OF THE CRASH CUSHION BACKUP THAT ROADWAY FEATURE BEING SHIELDED. REFER TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR TRANSITION DESIGN AND INSTALLATION DETAILS. SELECT THE APPROPRIATE TRANSITION TYPE AND ALL REQUIRED COMPONENTS. ALL WORK AND MATERIALS RELATED TO THE TRANSITION ARE INCIDENTAL TO THE CRASH CUSHION TYPE 7 BID ITEM.
- CRASH CUSHION TYPE 7 CLASS C IS INTENDED FOR LOCATIONS WHERE A HIGH FREQUENCY OF IMPACTS MAY BE EXPECTED AND WHERE MAINTENANCE WILL BE DIFFICULT, TYPICALLY IN HIGH-SPEED, HIGH-TRAFFIC AREAS. THIS SYSTEM IS DESIGNED TO PROVIDE LOW-MAINTENANCE AND/OR SELF-RESTORING PERFORMANCE. WHEN SELECTING THE CLASS OF CRASH CUSHION TO INSTALL, CONSIDER THE EXPECTED IMPACT FREQUENCY, TRAFFIC CONDITIONS, AND MAINTENANCE ACCESSIBILITY.
- NOSE ASSEMBLY (OBJECT MARKER TYPE 3, AS REQUIRED). SEE MUTCD FOR STRIPE DIRECTION AND ORIENTATION.
- SPECIAL-WIDTH UNITS ARE AVAILABLE FROM MANUFACTURERS. WHEN SUCH UNITS ARE REQUIRED, THEIR DETAILS SHALL BE DEVELOPED AND SHOWN ELSEWHERE IN THE PLANS.

BID ITEMS AND UNIT TO BID

CRASH CUSHION TY 7 CLASS 👤 TL3

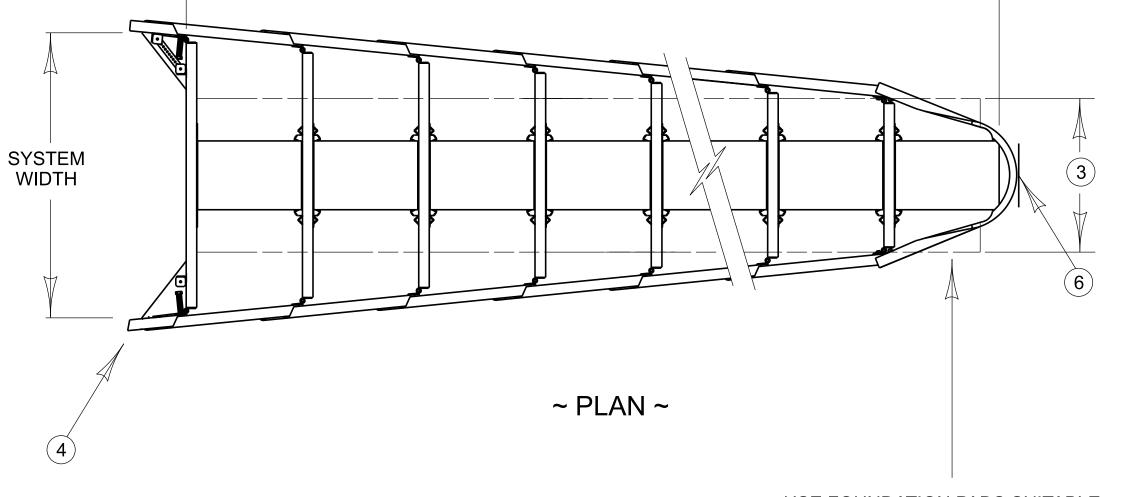
EACH

CLASS B OR C AS REQUIRED.

OBJECT MARKER TY 3 (AS REQUIRED) **EACH**

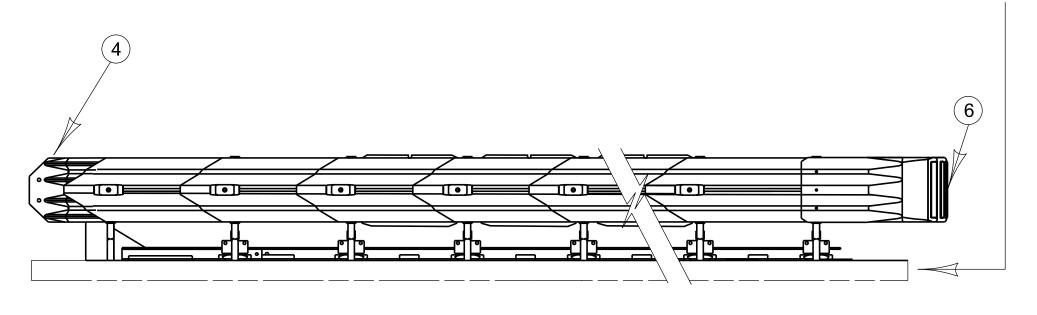






SYSTEM LENGTH

USE FOUNDATION PADS SUITABLE (3) FOR PERMANENT INSTALLATIONS. SEE MANUFACTURER'S INSTRUCTIONS.



~ ELEVATION ~



VALTIR QUADGUARD M WIDE

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.

COMMONWEALTH OF KENTUCKY TEAM KENTUCKY DEPARTMENT OF HIGHWAYS

CRASH CUSHIONS

SHEET 002: CRASH CUSHION TYPE 7 CLASS B AND C (ONE AND TWO DIRECTION)

STANDARD DRAWING NUMBER RBE-105-00

CRASH CUSHION TYPE 6 CLASS T — APPROVED SYSTEMS LIST

SPEED (MPH)		ATTENU	SYSTEM	SUGGESTED			
	MODEL	PRODUCT NAME	MANUFACTURER	WIDTH	LENGTH	AADT* RANGE	
45 & LESS	TL2	SCI 70 GM IMPACT ATTENUATOR SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	13'-6"	≤12,000	
		3-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	13'-0"		
OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≤12,000	
		6-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	22'-0"		
OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≥8,000	
		QUADGUARD ELITE M10	VALTIR OF DALLAS, TEXAS	24"	27'-2"		
OVER 45	TL3	REACT M	VALTIR OF DALLAS, TEXAS	38 ¾"	22'- 2¾"	≥15,000	

*ANNUAL AVERAGE DAILY TRAFFIC - THE SUGGESTED ADT RANGE IN THE TABLE IS PROVIDED FOR GUIDANCE ONLY AND SHALL NOT SUPERSEDE THE APPLICATION OF SOUND ENGINEERING JUDGMENT.

TYPE 6 CLASS T CRASH CUSHIONS ARE TEMPORARY DEVICES USED IN WORK ZONES AS PART OF TEMPORARY TRAFFIC CONTROL TO SHIELD THE BLUNT ENDS OF RIGID OBJECTS, SUCH AS TEMPORARY CONCRETE BARRIERS.

~ NOTES ~

- 1. IN THE PLAN AND ELEVATION DRAWINGS, A TYPE 6 CLASS T CRASH CUSHION IS SHOWN ATTACHED TO A TEMPORARY CONCRETE BARRIER AS A REPRESENTATIVE CONFIGURATION. WHEN INSTALLING A CRASH CUSHION TYPE 6 CLASS T, CONTRACTORS MAY SELECT ANY DEVICE FROM THE APPROVED SYSTEMS LIST ABOVE, PROVIDED THE SELECTED SYSTEM MEETS THE TEST LEVEL SPECIFIED IN THE PLANS AND IS APPROPRIATE FOR THE WORK ZONE.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING TYPE 6 CLASS T CRASH CUSHIONS STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS. SYSTEMS SHALL NOT BE MODIFIED, ALTERED, OR SUBSTITUTED FROM THEIR APPROVED CONFIGURATIONS WITHOUT WRITTEN APPROVAL FROM THE MANUFACTURER AND THE ENGINEER.
- PREPARE THE SITE AND INSTALL FOUNDATION PADS APPROPRIATE FOR TEMPORARY INSTALLATIONS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FOLLOW ALL MANUFACTURER INSTRUCTIONS FOR MATERIALS, THICKNESS, SPECIFICATIONS, AND ANCHORING. ALL WORK AND MATERIALS ASSOCIATED WITH THE FOUNDATION PAD ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 CLASS T BID ITEM.
- A PROPER TRANSITION PANEL OR SIDE PANEL MUST BE INSTALLED ON EACH SIDE OF THE CRASH CUSHION BACKUP THAT FACES APPROACHING TRAFFIC. CONSULT THE PLANS TO DETERMINE TRAFFIC DIRECTION AND THE TYPE OF BARRIER OR WORK ZONE FEATURE BEING SHIELDED. REFER TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR TRANSITION DESIGN AND INSTALLATION DETAILS. SELECT THE APPROPRIATE TRANSITION TYPE AND ALL REQUIRED COMPONENTS. ALL WORK AND MATERIALS RELATED TO THE TRANSITION ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 CLASS T BID ITEM.
- WHEN SELECTING THE ATTENUATOR TO INSTALL, CONSIDER THE EXPECTED IMPACT FREQUENCY, TRAFFIC CONDITIONS. AND MAINTENANCE ACCESSIBILITY.
- WHEN REQUIRED BY THE PLANS OR ENGINEER, RELOCATE CRASH CUSHION TYPE 6 CLASS T AS DIRECTED. THE BID ITEM 'RELOCATE CRASH CUSHION' INCLUDES THE UNIT'S REMOVAL AND RE-INSTALLATION.

EACH

- NOSE ASSEMBLY (OBJECT MARKER TYPE 3, AS REQUIRED). SEE MUTCD FOR STRIPE DIRECTION AND ORIENTATION.
- CONSTRUCTION ZONE BACKUP ASSEMBLY PER MANUFACTURER'S ASSEMBLY INSTRUCTIONS

BID ITEMS AND UNIT TO BID

CRASH CUSHION TY 6 CLASS T

★ EITHER TL2 (TEST LEVEL 2) OR TL3 (TEST LEVEL 3), AS REQUIRED

RELOCATE CRASH CUSHION EACH OBJECT MARKER TY 3 (AS REQUIRED) EACH

HILL AND SMITH **SMART CUSHION**



(4) TRANSITION PANEL

TRAFFIC

(4) TRANSITION PANEL

TRAFFIC







SYSTEM LENGTH

USE FOUNDATION PADS SUITABLE FOR TEMPORARY WORK ZONE INSTALLATIONS.

SEE MANUFACTURER'S INSTRUCTIONS.

~ PLAN ~

~ ELEVATION ~



VALTIR REACT M

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY.

CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND

INSTALLATION INSTRUCTIONS.



SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.



CRASH CUSHIONS

SHEET 003: CRASH CUSHION TYPE 6 CLASS T (TL2 AND TL3)

STANDARD DRAWING NUMBER RBE-105-00

Standard Drawing Reference Report

RBE-105-00 CRASH CUSHION PACKET Effective with the December 11th, 2025 Letting

Design Notes

The Crash Cushion Packet RBE-105-00 contains details on KYTC's Crash Cushion Type 6, Type 7, and Type T.

Crash cushions, also called impact attenuators, are protective roadside devices that reduce the severity of collisions with fixed objects. They function by gradually decelerating vehicles during head-on impacts and redirecting vehicles away from hazards during side impacts. Their primary role is not to prevent crashes, but to make them survivable.

Crash cushions are used when roadside obstacles cannot be removed, relocated, or made breakaway. They commonly shield bridge piers, bridge railing ends, and median barrier ends; and are frequently placed in exit ramp gores or in front of other fixed objects within the clear zone.

Designers should select the appropriate crash cushion type based on **speed environment**, **installation type** (**permanent or temporary**), **obstacle width**, **maintenance expectations**, **and traffic volumes**. The ADT ranges provided in the Standard Drawing tables are for guidance purposes only and should not override the application of sound engineering judgment. Further guidance on these factors is provided below.

- **Speed Environment:** Use TL-2 crash cushions (*Types 6 and T*) on roadways with design speeds of 45 mph or less. Use TL-3 devices for roadways with speeds greater than 45 mph.
- **Installation Type (Permanent or Temporary):** *Types 6 and 7* are used for permanent installations, while *Type T* is used as a temporary work-zone device.
- **Obstacle Width:** *Types 6 and T* are designed to shield narrow obstacles, whereas *Type 7* accommodates wider obstacles up to approximately 69 inches.
- Durability and Maintenance:
 - Class B (Reusable): Major components of Class B Crash Cushions survive most impacts and can be reused, though some components must be replaced before the device is ready for another crash. The initial purchase and installation cost of Class B products is generally less than that of Class C and D devices. Available for Crash Cushion Types 6, 7, and T.
 - Class C (Low-Maintenance or Self-Restoring): These devices typically sustain little damage, can often be restored quickly, and are well-suited for locations where a high frequency of impacts may be expected or where maintenance will be difficult. Available for Crash Cushion Types 6, 7, and T.
 - Class D (Low-Maintenance and Self-Restoring): These cushions rebound and require minimal inspection after impact. They are the most expensive option and are valuable at locations where a high frequency of impacts may be expected and where maintenance will be difficult. Available for Crash Cushion Types 6 and T.

These crash cushions approved for use by KYTC are proprietary products, and it is imperative that they be installed **strictly in accordance with the manufacturer's assembly instructions**. This is especially important for the **foundation pads**—for which manufacturers provide several approved designs—and the **transition components**, as installation details may vary but only **within the limits allowed by the manufacturer**. KYTC considers the **foundation pads**, **anchor hardware**, **and transition components** to be part of the overall crash cushion installation and **paid for as incidental to the crash cushion bid item**.

The **Crash Cushion Type 6** bid item will include the crash cushion class and test level in the bid item name (e.g., **CRASH CUSHION TY 6 CLASS B TL3**).

The Crash Cushion Type 7 bid item will include the crash cushion class only (e.g., CRASH CUSHION TYPE 7 CLASS C).

KYTC temporary crash cushions are **Type 6 Crash Cushions** intended for short-term use, such as in work zones. The bid item is listed as **Class T** with the required test level (e.g., **CRASH CUSHION TY 6 CLASS T TL3**).

In temporary applications, if the crash cushion remains in usable condition, it may be relocated and reinstalled as required by maintenance-of-traffic phasing. This work shall be paid for under the bid item **RELOCATE CRASH CUSHION**.

When applicable, an **Object Marker Type 3**, installed in accordance with the manufacturer's assembly instructions and the MUTCD, shall be placed on the nose assembly and paid for as **OBJECT MARKER TY 3**.

References

KYTC Standard Specifications for Road and Bridge Construction

- Section 725 Crash Cushions
- Section 814 Guardrail Systems

Highway Design Guidance Manual

- HD-800 ROADSIDE DESIGN
- HD-801.6 END TREATMENTS & CRASH CUSHIONS

Crash Test Reports

QuadGuard 3-Bay M10 TL-2	FHWA Letter CC-121 (7-30-2012)		
QuadGuard 6-Bay M10 TL-3	FHWA Letter CC-112 (2-9-2011) &		
_	CC-112C (9-21-2016)		
QuadGuard 6-Bay M10 Wide TL-3	FHWA Letter CC-112 (2-9-2011) &		
_	CC-112C (9-21-2016)		
QuadGuard Elite M10 TL-3	FHWA Letter CC-112A (5-7-2012)		
QuadGuard Elite M10 Wide TL-3	FHWA Letter CC-112A (5-7-2012)		
REACT M	FHWA Letter CC-169 (6-23-2021)		
	Test Report Number: TR-P38187-01-A		
	(9/24/2018) by Applus IDIADA KARCO		
SCI 70 GM SmartCushion TL-2	Engineering & SCI 70GM Smart Cushion		
	Approval Letter (8/20/2019) by California		
	Department of Transportation		
SCI 100 GM SmartCushion TL-3	FHWA Letter CC-128 (8-16-2016)		

Related Standard Drawings

RBI-006 GUARDRAIL INSTALLATIONS AT SIGN SUPPORTS

RBM-135 CONCRETE BARRIER WALLS

RBR-001 STEEL BEAM GUARDRAIL ("W" BEAM)

RBR-100 STEEL BEAM (THRIE BEAM)

Standard Drawing Revision History

Standard Drawing Number:	Description of Changes
RBE-105-00 [errata]	 Developed a Crash Cushion Reference Packet covering Type 6, Type 7, and Type T
Published Date: 2025-11-20	 systems (formerly Standard Drawings RBE-040, RBE-060, and RBE-100). Added a QR code providing direct access to the assembly instructions for each crash cushion. Revised Crash Cushion names to Type 6, Type 7, and Type T (previously Type VI, Type VII, and Type VI T, respectively).