Index 430 Crash Cushion Details

Design Criteria

AASHTO Roadside Design Guide 4th Edition 2011; ***Plans Preparation Manual*** Volume 1, Chapter 4, Roadside Safety; National Cooperative Highway Research Program (NCHRP) Report 350, and ***AASHTO Manual for Assessing Safety Hardware,*** MASH 2009;

Design Assumptions and Limitations

See ***Plans Preparation Manual*** Volume 1 (Chapter 4), notes on the ***Design Standard***, and limiting conditions as shown on the Qualified Products List (QPL) webpage, manufacturer's specifications and the approved crash cushion drawings posted on the QPL.

Crash cushions are selected based on their physical and functional characteristics (see PPM, Volume 1, Chapter 4, Section 4.5.2 Selection). Index 430 is applicable for permanent crash cushion installations which shield the ends of Concrete Barrier Walls and Guardrail, only.

Standard crash cushion design is based on shielding the ends of either concrete barrier wall or guardrail. The design length of a crash cushion is established by a given design speed and the shortest crash cushion option available for that design speed. The design length of the crash cushion is included within the limits of the Length of Need (see Design Standard, Index 400 for Length of Need requirements).

The design length for concrete barrier wall is measured from the Beginning of Length of Need to the end of the crash cushion concrete foundation. The design length for guardrail is measured from the Beginning of Length of Need to the downstream end of the manufacturer's transition, which is at the center of Post 1 for the Standard Guardrail Transition. All Crash Cushions are located by the station of their downstream ends.

Establish the location station for crash cushions and barrier ends based on the design length of the shortest crash cushion for a given design speed.

All permanent crash cushion concrete foundations shall fit within Length Restrictions and space constraints as shown in the plans. Quantify and summarize the location of all crash cushions in the "SUMMARY OF PERMANENT CRASH CUSHIONS" summary table (see PPM, Volume 2, Exhibit SQ-4).

Note:

For limited access roadway off-ramps, design all crash cushions at these locations based on the design speed of the mainline facility.

For additional design information on the selection and location of temporary crash cushions in work zones, see PPM, Volume 1, Chapter 10.

Plan Content Requirements

See ***PPM*** Volume 1, Chapter 4 and Volume 2, Exhibit SQ-4.

Summarize Permanent Crash Cushions in the plans according to the:

1. Location (Station and Side),
2. Barrier System (either Concrete Barrier Wall or Guardrail),
3. Design Length (selected from the applications charts),
4. Design Speed (based on facility type and designation),
5. Crash Test Level (see NCHRP Report 350 or AASHTO's MASH 2009),
6. Hazard Width (see PPM, Volume 2, Exhibit SQ-4), and
7. Length Restriction (based on site specific space constraints).

Payment

The cost of providing the foundation and any incidental items incurred in furnishing and installing crash cushions shall be included in the pay item for providing the crash cushion.

Item number	Item description	Unit Measure
544-75-140	Crash Cushion – Optional, Less than 50	EA

See the Basis of Estimates and the Standard Specifications for Road and Bridge Construction (Section 544) for additional information on payment, pay item use and compensation.