AS/NZS 3845.1:2015

Australian/New Zealand Standard™

Road safety barrier systems and devices

Part 1: Road safety barrier systems

STANDARDS Australia

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Australian Steel Institute
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CE-033, Road Safety Barriers, to supersede, in part, AS/NZS 3845:1999, *Road safety barrier systems*.

This Standard is Part 1 of a series of two Standards on road safety barrier systems and devices. This Part 1 sets out the requirements for permanent and temporary safety barriers systems that include longitudinal road safety barriers, terminals, crash cushions, interfaces including transitions, and longitudinal barrier gates. Part 2 sets out the requirements for both permanent and temporary road safety devices that include bollards, pedestrian fences and channelizers, truck or trailer mounted attenuators, and sign support structures and poles.

Notes to the text contain information and guidance. They are not an integral part of the Standard.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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FOREWORD

In 2006, the National Highway Cooperative Research Program of the US Transportation Research Board was revising the testing conditions documented in NCHRP Report 350. At this time, Standards Australia and Standards New Zealand decided to revise AS/NZS 3845:1999 in line with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

At about the same time, the Safe System approach has become the underlying philosophy for road safety. It is recognized that road crashes are the major cause of societal suffering, preventable death and injury and a major cost burden of the order of tens of billions of dollars on health systems and society in general. Some governments have recognized this societal burden and, as a result, have adopted a safe system approach in their action plans to reduce deaths and injuries on roads. The Safe System approach is based on human injury tolerance to impact forces. The Safe System approach acknowledges that humans make errors, but that the road traffic system should be designed to compensate for that error such that the road user will survive the consequences of mistakes made. Refer to OECD, [2008]. *Towards Zero: Ambitious road safety targets and the safe system approach*, International Transport Forum, ISBN 978-92-821-0195-7.

In a Safe System if a road user travels in accordance with all traffic laws and on a safe road in a safe vehicle, but finds through no fault of their own they become involved in a crash, the crash should not result in death or serious injury. Similarly, if a driver does make an error then a Safe System should react to minimize the consequences of the error. In a Safe System, the regulatory system should strongly discourage socially unacceptable road use behaviour. Thus all road user training and behaviour management, vehicle development and regulation, and road design and traffic management systems should be considered as a holistic inter-related system and governed according to this paradigm. The Safe System comprises four major interconnected elements, safe users, safe roads and roadsides, safe vehicles and safe speeds.

Road safety barriers contributing to safer roads

Road safety barriers are an integral component of the safer roads element of the Safe System approach. However, there are a limited number of ways in which road safety barrier systems can operate. Some systems and devices attempt to dissipate the kinetic energy of a vehicle crash by one or more of the following mechanisms:

(a) Heat through friction.

(b) Elastic movement of the device or components of the vehicle, or both.

(c) Plastic deformation of portions of the device or the vehicle, or both.

(d) Fracture of elements of the device or the vehicle, or both.

(e) Physical displacement of the device or the vehicle, or both, such as lifting the vehicle.

Energy should not be dissipated in unexpected or uncontrolled ways. For instance, unintended snagging of a vehicle on an element of the system can cause violent rolling and yawing, which may result in fatal or serious injuries to vehicle occupants. The unintended snagging of the rider on an element of the system can cause fatal or serious injuries. Road safety barrier systems that fail to control the exit path may unnecessarily involve nearby vehicles in a crash.

The majority of passenger vehicles have been designed to meet New Car Assessment Programmes (NCAP) and, in Australia, the Australian Design Rules (ADRs) with a reasonable crash survivability outcome for the occupants. This means that road environments can be designed by taking into consideration safer vehicle technology.

It should not be expected that a road safety barrier system will provide complete protection for vehicle occupants over the wide range of variables that could apply in a crash, such as vehicle mass, dimensions, speed and orientation of the vehicle on impact. It should be recognized that the effect on vehicle occupants of impacting a road safety barrier should be more forgiving than the effect on vehicle occupants of impacting the hazard that it is shielding.

The AS/NZS 3845 series of Standards and the Austroads guides to road design and the operation of Austroads safety barrier assessment processes support each other. Austroads guides describe the road and roadside configurations that identify where road safety barriers may need to be installed and the appropriate longitudinal and transverse location of these barriers. This series of Standards sets out the requirements of road safety barrier systems. Road Authorities may review the information specified by the Standards and, consider the usefulness of road safety barrier systems for use on their road network.

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Australian/New Zealand Standard
Road safety barrier systems and devices

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out the requirements for both permanent and temporary road safety barrier systems including—

(a) longitudinal road safety barriers (rigid, semi-rigid and flexible);

(b) terminals;

(c) crash cushions;

(d) interfaces, including transitions; and

(e) longitudinal barrier gates.

NOTE: Bollards, pedestrian fences and channelizers, truck or trailer mounted attenuators, truck underrun barriers, sign support structures and poles are specified in AS/NZS 3845.2*.

The intention of this Standard is to ensure that road safety barriers and systems are crashworthy when impacted by a vehicle under specified conditions and in most cases provide redirection and containment capability when impacted by a vehicle or provide controlled absorption of the kinetic energy of a vehicle that is on a collision course with a more hazardous obstacle or with other road users.

This Standard includes the following.

(i) Testing methods and data.

(ii) Considerations in the evaluation process.

(iii) Manufacturing requirements.

(iv) Issues to be addressed in specifying road safety barrier systems including documentation required.

(v) Erection and maintenance practices necessary to achieve expected performance.

(vi) Minimum site conditions (cross slope, placement of kerbs or similar) that enable the system to have acceptable system performance when impacted.

(vii) Steps to evaluate the nature of repairs necessary following a crash.

This Standard makes significant reference to MASH and NCHRP 350. It also references some relevant European CEN Standards.

NOTE: Refer to the Commentary in Paragraph A1 of Appendix A for further details about barrier classification types.

* To be published.