
British Standard

Safety fences and barriers for highways

Part 6. Specification for components for
open box beam safety fence (double height)

Barrières et glissières de sécurité sur autoroutes

Partie 6. Eléments des barrières de sécurité (à double hauteur) à poutres en auge — Spécifications

Sicherheitszäune und Leitplanken an Autobahnen

Teil 6. Einzelteile von Doppelleitplanken mit offenem Kastenprofil

Foreword

This Part of BS 6579 has been prepared under the direction of the Road Engineering Standards Committee. The other Parts of BS 6579 either published or in preparation are:

- Part 1 Specification for components for tensioned corrugated beam safety fence on Z posts
- Part 2 Specification for tensioned corrugated beam fence on offset brackets
- Part 3 Specification for tensioned rectangular hollow section beam safety fence (100 mm × 100 mm)
- Part 4 Specification for tensioned rectangular hollow section beam safety fence (200 mm × 100 mm)
- Part 5 Specification for open box beam safety fence (single height)
- Part 7 Specification for untensioned corrugated beam safety fences
- Part 8 Specification for concrete safety barriers

Appendix A and appendix C provide additional information helpful to the users of the components. Appendix B deals with methods of transition to bridge parapets and other types of safety fence.

Fences detailed in Parts 1 to 7 have been developed already and approved for use on roads in the United Kingdom.

The designs are based on the results of static and dynamic tests carried out in the past on components and complete systems under the direction of the Transport and Road Research Laboratory (TRRL).

The safety barrier detailed in Part 8 is for use only on certain roads at the date of publication of this standard.

If further types are developed, BS 6579 will be revised and increased in scope to cover additions and variations.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Contents

	Page
Foreword	Inside front cover
Committees responsible	Back cover
Specification	
0 Introduction	2
1 Scope	2
2 Definitions	2
3 Components	3
4 Tolerances	3
5 Protective finish	4
6 Marking	4
Appendices	
A Vehicle safety fences and barriers for highways: type characteristics	5
B Transition between safety fences, bridge parapets and other types of safety fence	6
C List of components	6
D Limiting radius of installation on a curve	7
E Transport handling and storage	7
F Information to be supplied	7
Tables	
1 Safety fences and barriers: type characteristics	5
2 List of components	6
3 Limiting radius of installation on a curve	7
Figures	
1 General arrangement of an open box beam safety fence (double height)	8
2 Section through fence, and details of beams and posts	9
3 Detail of anchorages for expansion joints	10
4 Connection to steel parapet	11
5 Typical connection to aluminium parapet	12
6 Connection to typical concrete parapet	13
7 Diagrammatical representation of fences and barriers	14

Specification

0 Introduction

0.1 The objective of providing safety fences or barriers adjacent to a highway is to reduce the consequences of vehicles leaving the carriageway and entering areas where it would be unsafe for them to travel.

Safety fences are intended to absorb some of the energy of impact and to redirect the errant vehicle so that it follows, within a narrow angle, the line of the fence in the direction of the traffic and does not overturn.

Safety barriers are intended to provide containment without significant deflection or deformation under impact, and to re-direct errant vehicles along the line of the barrier in the direction of traffic.

0.2 The safety fences and barriers for ground mounting which are the subject of BS 6579 are for use in conjunction with parapets on bridges and other structures, which are the subject of BS 6779 : Part 1. Although definitions in both standards have been chosen so as to align as closely as possible, there are some cases where a definition is applicable only to a particular Part of BS 6579 and does not apply generally.

0.3 No direct guidance is given in BS 6579 on the situation where safety fences and barriers should be erected or on the choice of the types described in the various Parts, but information pertaining to general characteristics of different types of safety fences is given in appendix A.

0.4 There are various situations and various methods by which transition between a safety fence or safety barrier and a bridge parapet can be assured without impairing the overall protection afforded to users of the highway. For details see appendix B.

0.5 Connection to a bridge parapet is to be made by using the special connections shown in the drawings. These vary according to the material of the parapet.

0.6 It is important to recognize that the performance of a safety fence can be affected by factors that are not covered by the specifications for the components. These factors include the choice of intermediate posts to suit the ground conditions and the erection and maintenance of the fence.

0.7 Figure 1 illustrates the general arrangement of a double height open box beam safety fence for which the components specified in this Part of BS 6579 are intended. Appendix C gives a list of components required for this type of safety fence. It is essential that the anchorages be set in concrete as illustrated in the figure. Intermediate posts (see figure 2), however, are to be either driven or set in concrete into the ground, or mounted on bridge decks using 'bridge deck posts' as shown in figure 2.

0.8 Where an open box beam safety fence is used on a curve, the limiting radius of the installation should be as given in appendix D.

0.9 The approach to the safety fence should be set back away from the traffic and flared as shown in figure 1. The flare length should be at least 10 times the set-back.

0.10 The fence described in this Part of BS 6579 should be connected at each end to a length of at least 9 m of single height open box safety fence with an anchorage, except where the fence is connected directly to a bridge parapet. There are therefore no anchorages included for the lower rail.

0.11 Enquiries concerning the availability of detailed drawings providing information on manufacture and installation should be made to the Department of Transport Headquarters* or Regional Offices of the Department.

0.12 In appendix E important recommendations are given on the transport, handling and storage of components prior to assembly on site and appendix F lists information that should be provided when making an enquiry or order.

1 Scope

This Part of BS 6579 specifies the requirements for the components to be used in the construction of the double height open box beam type of safety fence. Requirements are given for the materials and dimensions of the components and for protective finishes.

This Part of BS 6579 does not cover erection of the assembled fence (see clause 0).

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 6579 the following definitions apply.

2.1 safety fence. An installation provided for the protection of users of the highway consisting of horizontal beams mounted on posts.

2.2 safety barrier. An installation provided for the protection of users of the highway which is continuously in contact with its supporting foundation.

2.3 single sided safety fence. A safety fence having its beams on the side of the mounting posts nearest to the traffic.

2.4 double height safety fence. A safety fence with two beams on one side of the mounting posts.

2.5 full height anchorage. A cross-braced anchorage frame extending to the full height of a safety fence.

*Department of Transport, St Christopher House, Southwark Street, London SE1 0TE.

The following terms and definitions are included for information only.

traffic face. The face of a safety fence or barrier that is nearer to the vehicular traffic flow.

impacting vehicle. A vehicle striking a safety fence or barrier whether or not it is re-directed.

terminal. The end-section of the length of a safety fence within which the connection to another safety fence or parapet is made.

initial installation length. The length of safety fence obtained by measuring the distance from the centre lines of the two double height open box anchorage frame posts which are furthest apart.

3 Components

3.1 Beams

All beams shall be formed from steel of 5 mm stock thickness complying with grade 43A of BS 4360 (see figure 2).

3.2 Posts and anchorages

3.2.1 All posts and anchorages shall be made from steel complying with BS 4360 and to the following grades:

- | | |
|-----------------------------|------------|
| (a) posts: | grade 43A; |
| (b) full height anchorages: | |
| plates and angles: | grade 43A; |
| sections: | grade 43C. |

3.2.2 Posts and anchorages shall conform to the appropriate dimensional requirements shown in figures 2 and 3.

3.3 Fish plates

Flanged channel section plates (see figure 2) shall be formed from steel, 6 mm stock thickness, complying with grade 43A of BS 4360 and used in pairs for connecting the adjacent beams lengthways, the plates being designed to transmit bending to the adjacent beams.

NOTE. Special plates, which should be painted red for the purpose of identification, are narrower, and when used in conjunction with the half length beams enable the fence to be installed to a curve (see appendix D).

3.4 Mounting brackets

Where the beam is mounted on the vertical face of a structure other than on posts, hexagonal shaped brackets for absorbing impact energy shall be provided between the beam and the structure. They shall be fabricated from steel complying with grade 43A of BS 4360. Where the mounting of brackets is such that a parallel face is not presented to the carriageway, an adaptor platform, also fabricated from steel complying with grade 43A of BS 4360 shall be provided and attached to the bridge pier or structure by means of anchor bolts (see figure 1).

3.5 Clamp plates

Clamp plates fabricated in steel, 6 mm stock thickness, complying with grade 43A of BS 4360 shall be inserted into the open box beams so as to register on the flanges and shall be used to clamp the beam to the posts or to the off-set brackets or spacers (see figure 1).

3.6 Off-set brackets (spacers)

Off-set brackets fabricated in steel, 6 mm stock thickness, complying with grade 43A of BS 4360 shall be connected to both beams and be attached to the posts by means of a 12 mm diameter shear bolt.

3.7 Tie bar

The beams shall be connected together between the posts to provide additional stiffness to the fence by means of flat tie bars, 50 mm wide $\times$ 12 mm stock thickness $\times$ 610 mm long, fabricated in steel complying with grade 43A of BS 4360, bolted to clamp plates inserted into the back of the open section.

3.8 Fasteners

Bolts, screws, nuts and washers, as listed in table 2, shall be manufactured in steel as follows.

- Bolts and screws shall be of ISO metric black hexagon type, complying with grade 4.6 of BS 4190.
- Nuts shall be ISO metric black hexagon nuts, complying with grade 4 of BS 4190.
- Washers shall be black complying with BS 4320, form E or F as listed in table 2.
- Stainless steel bolts and nuts shall comply with grade A4.80 of BS 6105.
- Stainless steel washers shall comply with grade 304S15 of BS 1449 : Part 2.

NOTE. The items listed in (a), (b) and (c) are to be galvanized.

3.9 Reinforcing rings

Reinforcement for use in concrete foundations shall be made from 10 mm diameter steel rod complying with grade 250 of BS 4449.

4 Tolerances

4.1 Tolerances on dimensions of components shall be in accordance with the relevant figure of this Part of BS 6579.

4.2 Deviation from the specified dimensions for materials and fabricated components shall be measured before galvanizing.

5 Protective finish

All steel components excluding reinforcing rings shall be hot dip galvanized, in accordance with BS 729, after fabrication.

NOTE. Where the purchaser wishes the components to be painted by the supplier he should specify his requirements with the enquiry or order.

6 Marking

Every beam, fish plate, mounting bracket and post or anchorage shall be marked with:

- (a) the number of this British Standard, i.e. BS 6579*;
- (b) manufacturers' identification mark;
- (c) digits indicating month and year of manufacture.
(Note for example 10/88 indicates manufacture during October 1988.)

*Marking BS 6579 on or in relation to a product represents a manufacturers' declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the appropriate Part of BS 6579. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.