

BS 13700:2021



BSI Standards Publication

Permanent counterweighted guardrail systems — Specification

bsi.

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2021

Published by BSI Standards Limited 2021

ISBN 978 0 59 13352 3

ICS 3.34.99, 91.220

The following BSI references relate to the work on this document:

Committee reference B/514

Draft for comment 20/30415163 DC

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

Contents

	Page
Foreword	iii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
<i>Figure 1 — Free-standing counterweighted guardrail system – PCGS components</i>	3
4 General requirements	4
4.1 General	4
4.2 Materials	4
4.3 Non-metallic materials	4
4.4 Fasteners	5
4.5 Drainage	5
4.6 Finish	5
4.7 Welded assembly	5
5 Design requirements	5
5.1 General	5
5.2 Configuration	5
5.3 Counterweights	6
5.4 Partial safety factors	6
6 Test requirements	6
6.1 General	6
<i>Table 1 — Test requirements – Overview</i>	7
6.2 Static tests	7
<i>Figure 2 — Horizontally outwards – Guardrails and posts</i>	9
<i>Table 2 — Loadings and requirements for Figure 2</i>	9
<i>Figure 3 — Horizontally outwards – Toeboard (optional)</i>	10
<i>Table 3 — Loadings and requirements for Figure 3</i>	10
<i>Figure 4 — Vertically downwards – Guardrails and posts</i>	11
<i>Table 4 — Loadings and requirements for Figure 4</i>	11
<i>Figure 5 — Vertically downwards – Toeboard (optional)</i>	12
<i>Table 5 — Loadings and requirements for Figure 5</i>	12
<i>Figure 6 — Horizontally parallel – Guardrails and posts</i>	13
<i>Table 6 — Loadings and requirements for Figure 6</i>	13
<i>Figure 7 — Horizontally parallel – Toeboard (optional)</i>	14
<i>Table 7 — Loadings and requirements for Figure 7</i>	14
<i>Figure 8 — Vertically upwards – System</i>	15
<i>Table 8 — Loadings and requirements for Figure 8</i>	15
<i>Figure 9 — Working wind + horizontal outward load – Guardrails and posts (principal guardrail only)</i>	16
<i>Table 9 — Loadings and requirements for Figure 9</i>	16
<i>Figure 10 — Working wind – Horizontally outwards – Toeboard</i>	17
<i>Table 10 — Loadings and requirements for Figure 10</i>	17
6.3 Evaluation of the recorded test results	18
6.4 Working wind loading	18
6.5 Maximum velocity pressure	18
6.6 Application of the wind loads to the edge protection structure – Overturning	18
7 Test samples, equipment, and procedures	19
7.1 Samples	19
7.2 Test equipment	19

	<i>Figure 11 — Load cell position options</i>	20
7.3	Test procedure	20
7.4	Static horizontal test	21
7.5	Static vertical downward test	22
7.6	Static vertical upward test	23
7.7	Horizontal parallel test	23
7.8	Working wind horizontal test	24
7.9	Test report	25
8	Markings and instructions	25
8.1	Markings	26
8.2	Information to be given to the duty holder	26
	<i>Figure 12 — Positioning of end assembly elements</i>	27
9	Inspection, maintenance, testing and thorough examinations	28
9.1	General	28
9.2	Pre-use checks – Inspection	28
9.3	Thorough examination	28
Annex A	(informative) Example of preliminary design information	30
	<i>Table A.1 — Wind speed assessment</i>	31
Annex B	(informative) Wind speed calculation report	33
	<i>Table B.1 — Wind speed calculation report</i>	33
Annex C	(informative) Worked examples	35
	Bibliography	37

Summary of pages

This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 37, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 June 2021. It was prepared by Technical Committee B/514, *Access and support equipment*. A list of organizations represented on this committee can be obtained on request to its committee manager.

Information about this document

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies requirements for the design, performance, testing, inspection, marking and instructions for use of manufactured free-standing permanent guardrails that rely on mass and friction and are intended to protect workers from a fall hazard. These guardrails are not fixed to a structure.

This British Standard does not apply to:

- a) temporary counterweighted guardrails (see BS EN 13374);
- b) warning chains/posts used for demarcation;
- c) netting or infill panels used as barriers;
- d) guardrails that penetrate the structure and secure to the substrate;
- e) guardrails designed to support material-handling equipment; and
- f) guardrails intended for use on surfaces with a slope of more than 5°.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 1139-1.2](#), *Metal scaffolding — Part 1: Tubes — Section 1.2: Specification for aluminium tube*

BS EN 74 (all parts), *Couplers, spigot pins and baseplates for use in falsework and scaffolds*

BS EN 39, *Loose steel tubes for tube and coupler scaffolding — Technical delivery conditions*

BS EN 338, *Structural timber — Strength classes*¹⁾

BS EN 1990, *Eurocode — Basis of structural design*

NA+A1:2014 to BS EN 1993-1-1:2005+A1:2014, *UK National Annex to Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings*

NA to BS EN 1993-1-2, *Eurocode 3: Design of steel structures — Part 1-2: General rules — Structural fire design*

NA to BS EN 1993-1-3, *Eurocode 3: Design of steel structures — Part 1-3: General rules — Supplementary rules for cold-formed members and sheeting*

NA+A1:2015 to BS EN 1993-1-4:2006+A1:2015, *Eurocode 3: Design of steel structures — Part 1-4: General rules — Supplementary rules for stainless steels*

NA+A1:2016 to BS EN 1993-1-5:2006 Eurocode 3: Design of steel structures — Part 1-5: Plated structural elements

BS EN 1993-1-6, *Eurocode 3: Design of steel structures — Part 1-6: Strength and stability of shell structures*

NA to BS EN 1995-1-1, *Eurocode 5: Design of timber structures — Part 1-1: General — Common rules and rules for buildings*

NA to BS EN 1995-1-2, *Eurocode 5: Design of timber structures — Part 1-2: General — Structural fire design*

NA to BS EN 1999-1-1, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.