



As discussed in [Guards & Barriers 1A](#), the various local Building Regulations for the UK and Éire make reference to other Codes and Standards with regards the design and assessment of barriers in and around buildings.

Table 1 - UK & Ireland building regulations related to guarding

Country	Building Regulations	Section
England & Wales	Approved Document K [1]	K2 – Protection from Falling
Scotland	Domestic Handbook [2] Non-Domestic Handbook [3]	Section 4.4 – Pedestrian Protective Barriers
Northern Ireland	Technical Booklet H [4]	Section 5 – Guarding
Éire	Technical Guidance Document K [5]	Section 2 – Pedestrian and Vehicle Barriers

This document provides an overview of the various documents and their applicability with regards to the requirements of Building Regulations.

CODES OF PRACTICE

The following codes of practice are referenced by Building Regulations in UK and Éire and should be considered alongside Building Regulations when designing guarding.

Table 2 - Codes of Practice applicable to glazing acting as guarding

Codes of Practice
EN 1990:2002 [6]
EN 1991-1-1:2002 [7, 8, 9]
PD 6688-1-1:2011 [10]
BS 6180:2011 [11]
BS 6262-4:2005 [12]

EN 1990:2002 – EUROCODE – BASIS OF STRUCTURAL DESIGN

EN 1990:2002 [6, 13] as well as relevant National Annex documents provides the basic principles of Eurocodes, which encompasses safety, serviceability and durability of structures.

BS 6180:2011 - BARRIERS IN AND ABOUT BUILDINGS. CODE OF PRACTICE

BS 6180:2011 [11] is referenced by all the aforementioned Building Regulations, and provides guidance on the design of three barrier types, where glass or glazing is under consideration; full height barriers, free-standing barriers and glass infill panels.

The Code makes reference to design parameters for the deflection of glass under loading, as well as designing for stress and containment. These requirements are outlined in [Guards & Barriers 3A, 3B & 3C](#). However, BS 6180:2011 should be consulted directly when designing barriers in accordance with this Code.

Load requirements are also contained within BS 6180:2011, and match the requirements of EN 1991-1-1:2002 discussed below, and detailed in [Guards & Barriers 2A](#).

BS 6180:2011 also provides some guidance on glass types for specific barriers with regards design and containment Reference should also be made to the requirements of other sections of Building Regulations where glass types and human impact is a consideration.

EN 1991-1-1:2002 - EUROCODE 1. ACTIONS ON STRUCTURES – PART 1-1. GENERAL ACTIONS. DENSITIES, SELF-WEIGHT, IMPOSED LOADS FOR BUILDINGS

EN 1991-1-1:2002 [7, 8, 9] as well as relevant National Annex documents provides load scenarios for barriers, as detailed in [Guards & Barriers 2A](#). The loads are based upon the building occupancy and area.

PD 6688-1-1:2011 - RECOMMENDATIONS FOR THE DESIGN OF STRUCTURES TO BS EN 1991-1-1, 2011

PD 6688-1-1:2011 [10] provides additional uniformly distributed loads (UDL) and concentrated point loads, as also defined in BS 6180:2011. The building occupancy and situations are aligned with EN 1991-1-1:2002. The loads are detailed in detailed in [Guards & Barriers 2A](#).

BS 6262-4:2005 - GLAZING FOR BUILDINGS - CODE OF PRACTICE FOR SAFETY RELATED TO HUMAN IMPACT

This Code of Practice provides details of recommended glass types in vertical applications for locations where glazing may be subjected to human impact. For barriers, this is an inherent function of their design and so the requirements of this Code and other areas of Building Regulations should be carefully considered alongside other requirements.

ASSOCIATED BUILDING REGULATIONS

Whilst Building Regulation documents provide the requirements for glazing and barriers, they do not provide specific details or guidance on applicable glass types. For glass types, requirements and guidance is provided by other sections of local Building Regulations, where human safety from impact is considered, as below:

Table 3 - UK & Ireland building regulations related to safety glass

Country	Building Regulations	Section
England & Wales	Approved Document K [1]	K4 – Protection Against Impact With Glazing
Scotland	Domestic Handbook [2] Non-Domestic Handbook [3]	Section 4.8 – Danger from Accidents
Northern Ireland	Technical Booklet V [14]	Section 2 – Limiting the Risk of Impact with Glazing
Éire	Technical Guidance Document D [15]	Section 1 - Materials

TEST STANDARDS

The following test methods are used determined the performance of glass and glazing under impact loads, which is relevant for containment as well as safe breakage characteristics.

Table 4 – Test standards applicable to glazing acting as guarding

Test Standards
EN 12600:2002 [16]
BS 6206:1981 [17]

EN 12600:2002 EN 12600:2002 - GLASS IN BUILDING - PENDULUM TEST - IMPACT TEST METHOD AND CLASSIFICATION FOR FLAT GLASS

EN 12600:2002 [16] is the current test method for the classifying glass, for use in buildings, with regards to impact performance and mode of breakage. This test method is applicable to CE marking under the Construction Products Regulation [18].

As well as being referenced by Building Regulations for determining suitable glass types by classification, this is also referenced by BS 6180:2011 with regards to containment.

BS 6206:1981 - SPECIFICATION FOR IMPACT PERFORMANCE REQUIREMENTS FOR FLAT SAFETY GLASS AND SAFETY PLASTICS FOR USE IN BUILDINGS

BS 6206:1981 [17] is a test method for determining the classification of glass and plastic glazing materials under impact. Where glass is under consideration as a material, this standard has been replaced by EN 12600:2002. As such, glass is no longer classified for impact performance using this standard.

COMPLIANCE

When determining the load requirements for a building, local Building Control (or the equivalent certifying authority) should be consulted to ensure that the requirements for the specification will meet the requirements that will be placed upon the building when undergoing final approval.

Full consideration should be given to the requirements of Building Regulations as well as Eurocodes and any associated applicable documents.

REFERENCES

- [1] HM Government, *The Building Regulations 2010 - Approved Document K - Protection from falling, collision and impact*, 2013.
- [2] Riaghaltas na h-Alba, *Technical Handbook 2015 - Domestic*, Riaghaltas na h-Alba, 2015.
- [3] Riaghaltas na h-Alba, *Technical Handbook 2015 - Non-Domestic*, Riaghaltas na h-Alba, 2015.
- [4] Department of Finance and Personnel, *Building Regulations (Northern Ireland) 2012 Guidance - Technical Booklet H - Stairs, ramps, guarding and protection from impact*, DFPNI, 2012.
- [5] Environment, Community and Local Government (Éire), *Building Regulations 2014 - Technical Guidance Document K - Stairways, Ladders, Ramps and Guards*, Government Publications (Éire), 2014.
- [6] European Committee for Standardization, *EN 1990:2002 - Basis of structural design*, CEN, 2002.
- [7] European Committee for Standardization, *EN 1991-1-1:2002 - Eurocode 1. Actions on structures. General actions. Densities, self-weight, imposed loads for buildings*, CEN, 2002.
- [8] European Committee for Standardization, *NA to BS EN 1991-1-1:2002 - UK National Annex to Eurocode 1. Actions on structures. General actions. Densities, self-weight, imposed loads for buildings*, CEN, 2002.
- [9] European Committee for Standardization, *NA to IS EN 1991-1-1:2002 - Irish Annex to Eurocode 1 - Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings*, CEN, 2002.
- [10] British Standards Institute, *PD 6688-1-1:2011 - Recommendations for the design of structures to BS EN 1991-1-1*, 2011: BSI.
- [11] British Standards Institute, *BS 6180:2011 - Barriers in and about buildings. Code of practice*, BSI, 2011.
- [12] British Standards Institute, *BS 6262-4:2005 - Glazing for buildings - Code of practice for safety related to human impact*, BSI, 2005.
- [13] European Committee for Standardization, *NA to BS EN 1990:2002+A1:2005 - UK National Annex for Eurocode - Basis of structural design*, BSI, 2002.
- [14] Department of Finance and Personnel, *Building Regulations (Northern Ireland) 2012 Guidance - Technical Booklet V - Glazing*, DFPNI, 2012.
- [15] Environment, Community and Local Government (Éire), *Building Regulations 2013 - Technical Guidance Document D - Materials and Workmanship*, Government Publications (Éire), 2013.
- [16] European Committee for Standardization, *EN 12600:2002 - Glass in building - Pendulum test - Impact test method and classification for flat glass*, CEN, 2002.
- [17] British Standards Institute, *BS 6206:1981 - Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*, BSI, 1981.
- [18] European Parliament, *Regulation (EU) 305/2011 - Construction Products Regulation*, Official Journal of the European Union.