

## AD 519:

## Equivalent horizontal forces and combinations of actions

Recent questions to SCI's Advisory Desk have shown that some designers are unclear whether [equivalent horizontal forces](#) (EHFs) should be applied to a structural frame in serviceability and accidental load combinations.

EHFs are intended to allow for frame imperfections such as a lack of verticality (the frame is out of plumb), which is a geometrical imperfection as described in BS EN 1993-1-1:2005 clauses 5.3.1 and 5.3.2. A lack of verticality of the structural frame produces lateral effects, since the vertical loads are eccentric to the base positions. Frame imperfections lead to increased design

forces in a [stability bracing system](#), or increased sway moments in a [continuous frame](#). EHFs must be included in all ultimate limit state verifications, unless the condition discussed below is satisfied.

Serviceability load cases are intended to determine the effects of variable actions on the users of a building and on brittle finishes. EHFs do not have to be included in serviceability load combinations.

Accidental combinations of actions are an ultimate limit state verification and therefore the EHFs should be included.

EHF do not need to be included in ultimate

limit state verifications when the externally applied lateral loads are relatively high compared to the vertical loads. As noted in BS EN 1993-1-1 clause 5.3.2 (4), EHFs need not be included when:

$$H_{Ed} \geq 0.15 V_{Ed}$$

where:

$H_{Ed}$  is the design value of the horizontal loads,  
 $V_{Ed}$  is the design value of the vertical loads.

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## New and revised codes and standards

From BSI Updates November and December 2023

## BS EN PUBLICATIONS

## BS EN 1990:2023

Eurocode. Basis of structural and geotechnical design  
*supersedes BS EN 1990:2002+A1:2005 and BS EN 1997-1:2004+A1:2013, which remain current*

## BS EN ISO 6507-1:2023

Metallic materials. Vickers hardness test. Test method  
*supersedes BS EN ISO 6507-1:2018*

## BS EN ISO 14919:2023

Thermal spraying. Wires, rods and cords for flame and arc spraying. Classification and technical supply conditions  
*supersedes BS EN ISO 14919:2015*

## BS IMPLEMENTATIONS

## BS ISO 630-6:2023

Structural steels. Technical delivery conditions for seismic-proof improved structural steels for building  
*no current standard is superseded*

## BS ISO 4990:2023

Steel castings. General technical delivery requirements  
*supersedes BS ISO 4990:2015*

## BS ISO 9477:2023

High-strength cast steels for general engineering and structural purposes  
*supersedes BS ISO 9477:2015*

## CORRIGENDA TO BRITISH STANDARDS

## BS EN ISO 25980:2023

Health and safety in welding and allied processes. Transparent welding curtains, strips and screens for arc welding processes  
*Corrigendum, November 2023*

## BRITISH STANDARDS REVIEWED AND CONFIRMED

## BS EN ISO 898-1:2013

Mechanical properties of fasteners made of carbon steel and alloy steel. Bolts, screws and studs with specified property classes. Coarse thread and fine pitch thread

## BS EN ISO 6507-2:2018

Metallic materials. Vickers hardness test. Verification and calibration of testing machines

## BS EN ISO 6507-4:2018

Metallic materials. Vickers hardness test. Tables of hardness values

## BS EN ISO 9692-1:2013

Welding and allied processes. Types of joint preparation. Manual metal arc welding, gas-shielded metal arc welding, gas welding, TIG welding and beam welding of steels

## NEW WORK STARTED

## EN ISO 148-1

Metallic materials. Charpy pendulum impact test. Test method  
*will supersede BS EN ISO 148-1:2016*

## EN ISO 2063-2

Thermal spraying. Zinc, aluminium and their alloys. Execution of corrosion protection systems  
*will supersede BS EN ISO 2063-2:2017*

## EN ISO 6892-2

Metallic materials. Tensile testing. Method of test at elevated temperature  
*will supersede BS EN ISO 6892-2:2018*

## EN ISO 9013:2017/A1

Thermal cutting. Classification of thermal cuts. Geometrical product specification and quality tolerances  
*will supersede BS EN ISO 9013:2017*

## EN ISO 14001:2015/A1

Environmental management systems. Requirements with guidance for use  
*will supersede None*

## EN ISO 14918

Thermal spraying. Qualification testing of thermal sprayers  
*will supersede BS EN ISO 14918:2018*

## ISO 4354

Wind actions on structures  
*will supersede None*

## DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT - ADOPTIONS

## 23/30466771 DC

BS EN 18001 Curtain walling. Environmental Product Declarations. Product category rules for curtain walling  
*Comments for the above document were required by 21 November, 2023*

## 23/30477421 DC

BS ISO 16733-1 Fire safety engineering. Selection of design fire scenarios and design fires. Selection of design fire scenarios  
*Comments for the above document were required by 4 December, 2023*

## 23/30445352 DC

BS EN ISO 6506-1 Metallic materials. Brinell hardness test. Test method  
*Comments for the above document were required by 16 December, 2023*