

## AD 473:

# Holes in beams for temporary lifting attachments

The SCI has been asked to consider the requirement of clause 6.2.5(6) in BS EN 1993-1-1, which covers the allowance for fastener holes when calculating cross sectional resistance in bending. The clause states that ordinary fastener holes need not be allowed for, provided they are filled by fasteners.

This requirement can lead to problems when – for example – bolts must be placed in holes used for temporary lifting brackets, which then prevents other components such as precast units or decking sitting correctly on the top flange.

BS 5950 presents a less restrictive rule for members in bending in clause 4.2.5.5. According to BS 5950, no allowance need be made for bolt holes in a compression flange in bending.

SCI recommend that, within limits, bolt holes in the compression flange of beams used for temporary attachments need not be allowed for

and need not be filled with bolts. In an element with holes subject to compression, if the flange yields locally, the strength of the material increases as the cross section deforms, due to strain hardening.

Some limitation on the reduction in cross section is appropriate, to prevent multiple holes in a cross section being neglected on the basis of the above recommendation.

SCI consider there is no requirement to apply the material factor  $\gamma_{M2} = 1.1$  (from the UK NA, used in the net area tension checks) when calculating the compression resistance. SCI recommend that the resistance of the net section of the flange in compression may be based on the ultimate strength.

At full utilisation, the assumed design resistance of the flange is  $f_y A_g$

The resistance of the net area in compression may be taken as  $f_u A_{net}$

No allowance for bolt holes need be made when

$$A_{net} > \frac{f_y A_g}{f_u}$$

If the member is not fully utilised, the design resistance of the flange may be based on a reduced stress when completing the above verification.

In the final condition, for example in a composite beam, holes in the top flange for temporary lifting attachments have little impact.

It should be noted that this advice contradicts the specific requirements of the Eurocode, so should be agreed with the designer with overall responsibility for the structure. In due course it is hoped that this advice will be presented in the NSSS.

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## New and revised codes and standards

From BSI Updates October 2021

### BS EN PUBLICATIONS

#### BS EN ISO 7539-9:2021

Corrosion of metals and alloys. Stress corrosion testing. Preparation and use of pre-cracked specimens for tests under rising load or rising displacement  
*supersedes BS EN ISO 7539-9:2008*

### UPDATED BRITISH STANDARDS

#### BS EN 15804:2012+A2:2019

Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products  
*Corrigendum, September 2021; Corrigendum, July 2020*

### NEW WORK STARTED

#### ISO 6819

Steel wire rod for bridge cable wire  
*will supersede None*

#### ISO 12480-1

Cranes. Safe use. General  
*will supersede None*

### DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT – NATIONAL BRITISH STANDARDS

#### 21/30428100 DC

BS 9991. Fire safety in the design, management and use of residential buildings. Code of practice  
*Comments for the above document were required by 30 October, 2021*

### DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT – ADOPTIONS

#### 21/30375473 DC

BS EN ISO 12006-3 Building construction. Organization of information about construction works. Framework for object-oriented information  
*Comments for the above document were required by 2 October, 2021*

#### 21/30412922 DC

BS EN ISO 15610 Specification and qualification of welding procedures for metallic materials. Qualification based on tested welding consumables  
*Comments for the above document were required by 16 October, 2021*

#### 21/30427267 DC

BS EN ISO 29481-3 Building information models. Information delivery manual. Data schema and code  
*Comments for the above document were required by 24 October, 2021*

#### 21/30432410 DC

BS ISO 8504-4 Preparation of steel substrates before application of paints and related products. Surface preparation methods. Acid pickling  
*Comments for the above document were required by 30 October, 2021*

#### 21/30437144 DC

BS EN 14439 Cranes. Tower cranes  
*Comments for the above document were required by 5 October, 2021*

### CEN EUROPEAN STANDARDS

#### EN ISO 13918:2018/A1:2021

Welding. Studs and ceramic ferrules for arc stud welding

### ISO PUBLICATIONS

#### ISO 3834-1:2021

Quality requirements for fusion welding of metallic materials. Criteria for the selection of the appropriate level of quality requirements  
*Will be implemented as an identical British Standard*