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Code of practice for temporary works procedures and the permissible stress design of falsework

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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 May 2019. It was prepared by Subcommittee B/514/26, *Falsework*, under the authority of Technical Committee B/514, *Access and support equipment*. A list of organizations represented on these committees can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 5975:2008+A1:2011, which is withdrawn.

Information about this document

This is a revision of Section 1 and Section 2 of this British Standard. Section 3 on the permissible stress design of falsework remains unchanged. The following principal changes have been introduced in this revision.

- BS 5975 was always intended to be used by all organizations involved in temporary works and provided details of the procedure for contractors to adopt, but lacked detail about the procedures for clients, permanent works designers and temporary works designers to adopt. The detail on these procedures is now included.
- The text has been updated to take account of the Construction (Design and Management) Regulations 2015 (CDM) [1], particularly in respect to the interface between the design of permanent works and the design of temporary works.
- The terms and definitions have been updated.
- The principal contractor's temporary works co-ordinator (PC's TWC) retains overall responsibility for the temporary works on the site, but where another contractor manages their own temporary works within that site, they have their own procedures and appoint their own TWC. The committee understood that some organizations were using the temporary works supervisor (TWS) of sub-contractors to act as de-facto TWCs but this is incorrect and the text has been changed to reflect this.
- Section 2 has been updated to include recommendations for designers on the partial factors to be used in limit state design of temporary works and on design considerations to be applied for all temporary works design.
- Although a full revision of Section 3 has not been undertaken at this point, an important safety point was brought to the committee's attention and a relevant note has been added in **16.3.5**.

The following matters, from the partial revision in 2011, were re-considered and it was confirmed they were to be retained in this revision.

The European standard on falsework, BS EN 12812, exists in parallel with this British Standard. It specifies performance requirements for the design of falsework in accordance with one of three classes: A, B1 and B2. Limit state design methods are specified for design classes B1 and B2. It does not provide guidance for the structural design of Class A. It is recommended that Section 3 is used to provide guidance for Class A falsework.

BS EN 12812 does not provide guidance on procedures necessary for the successful management of work on site. The recommendations of the Advisory Committee on Falsework (the Bragg Report [2]) in respect of the temporary works co-ordinator have not been included in BS EN 12812.

Subsequent to the revision of BS EN 12812, this British Standard was updated in 2011, to BS 5975:2008+A1:2011, and the principal changes introduced by that amendment were as follows.

- The term temporary works co-ordinator (TWC) was adopted to reflect the need for procedural controls of all temporary works and to recognize that the majority of contractors already control temporary works in this manner.
- Information on the wind loading on falsework and attached formwork, together with the effects of shielding of falsework members in unclad structures, in accordance with BS EN 1991-1-4:2005+A1 and the UK National Annex (NA) was retained.
- The section for the design of falsework was substantially rewritten, in BS 5975:2008+A1:2011, to bring it up-to-date with current practice and materials. It defines the conditions for top restrained and free standing falsework and the dependency of the former on the stability of the permanent works and plate action of the formwork.

Although BS EN 1991-1-4:2005+A1:2010 is widely applicable, its application in accordance with its National Annex (NA to BS EN 1991-1-4:2005+A1:2010) restricts its use to the UK. For other locations covered by BS EN 1991-1-4, users can refer to the relevant National Annex. For locations outside of those covered by BS EN 1991-1-4, local design codes can be used to calculate the peak velocity pressure.

Users of this British Standard are reminded that it might be necessary for them to appraise third parties, with whom they are not in contractual relations, of certain provisions in this code of practice.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

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

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 does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

Introduction

This British Standard was first published in 1982. It reflected the recommendations of the Bragg Report [2] and used, as the main reference document during the drafting stages, the report on falsework by the Joint Committee of the Concrete Society and the Institution of Structural Engineers [3]. These two reports were published in the 1970s following a number of significant collapses and an apparent lack of authoritative guidance.

The standard drew together all those aspects that need to be considered when preparing a falsework design using permissible stress methods, and in so doing included recommendations for materials, design and work on site. Because the success of temporary works is closely tied up with its management, this British Standard describes procedures as well as technical aspects. The standard provides guidance on the accuracy of construction required in order to be able to adopt the recommended design approaches.

Recommendations are given on the actions that ought to be taken and possible ways of allocating the duties to individuals. The Bragg Report [2] recommended that the duty of ensuring that all the relevant procedures and checks are carried out be given to one individual in the construction organization, such an individual being known as the "temporary works co-ordinator". BS 5975:1982 endorsed such action, but adopted the narrower term "falsework co-ordinator", because the procedures section of the standard did not consider the other activities covered by the general term temporary works, such as scaffolding and excavations. The 2008 edition, incorporating procedures for all temporary works, reverted to the term "temporary works co-ordinator".

At the time of publication of the Bragg Report [2] the construction industry was very different from the industry we know today. Health and safety legislation was just beginning to bring improvements on sites. There was little sub-contracting of construction work and most trades were carried out by the main contractor's operatives.

Today very little construction work is carried out by the main contractor, now known as the principal contractor (PC), and in relation to health and safety legislation, the Construction (Design and Management) Regulations 2015 (CDM) [1] recognize the various contractors and sub-contractors which might be on site. The CDM Regulations require whoever appoints the PC, contractor or sub-contractor to check that the organization is competent to do the work. The organizations which are appointed also need to plan, manage and monitor their own work.

This philosophy was taken into account during this revision of BS 5975, to keep it aligned with health and safety legislation, and allow the contractors and sub-contractors to plan, manage and monitor their own work if they have the skills, knowledge, experience and organizational capability. The PC has overall responsibility for work on site and in keeping with the recommendations in the Bragg Report [2], the PC's temporary works co-ordinator (PC's TWC) has overall responsibility for all temporary works on the site, including those of contractors appointed by the client. With this in mind, procedures specific to other organizations, such as clients, designers, contractors and sub-contractors, and other roles have been introduced whilst ensuring responsibility is traceable from the PC's TWC to the PC's temporary works DI to the PC's board of directors.

The Bragg Report [2] made recommendations about courses on civil engineering, which B/514/26, the committee responsible for this British Standard, believe to be as relevant today as when they were written. This standard therefore endorses the Bragg Report recommendations.

Section 1: General

1 Scope

This British Standard gives recommendations and guidance on the procedural controls to be applied to all aspects of temporary works in the construction industry. It also includes guidance on design, specification, construction, use and dismantling of falsework. This standard gives guidance on permissible stress design of all falsework. The guidance also applies to the design of class A falsework[1] defined in BS EN 12812, the design of which is specifically excluded from BS EN 12812.

Section 1 gives recommendations in relation to training and education.

Section 2 gives recommendations for procedures to ensure that temporary works are conceived, designed, specified, constructed, used and dismantled all in a safe and controlled manner suitable for all construction projects. These procedures include clauses relating to all roles involved in temporary works: clients, permanent works designers, temporary works designers, contractors (including construction management organizations), suppliers and manufacturers.

Construction sites and methods adopted for controlling the temporary works vary. This British Standard recognizes that the extent of control measures required are greater on the larger or more complex projects, as can be encountered on major infrastructure projects, power stations, airports etc. Generally procedures are to be in accordance with this standard but additional client specific procedures might be required on major infrastructure projects.

Section 3 covers the design of temporary works and in particular the design of falsework and relevant formwork. In addition Section 3 covers: materials including material factors; loads and load factors; design of falsework, including both proprietary equipment and traditional scaffolding solutions; wind loading (reference to temporary and permanent stability) and reference to other British Standards for the design of structural steelwork, reinforced concrete and excavation support. Although Section 3 was written for permissible stress design, the design concepts and the service loads stated are applicable to limit state design. The loads, including wind loads, are the unfactored service loads and conform to both BS EN 1991-1-4 and BS EN 12812.

The structural design element in this British Standard is additional information necessary for the structural design of falsework. It can be used in conjunction with existing structural standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.[2]

BS 449-2:1969 (withdrawn), *Specification for the use of structural steel in building — Part 2: Metric units*

BS 648 (withdrawn), *Schedule of weights of building materials*

1 BS EN 12812 states that design class A is only to be adopted where: a) slabs have a cross-sectional area not exceeding 0.3 m^2 per metre width of slab; b) beams have a cross-sectional area not exceeding 0.5 m^2; c) the clear span of beams and slabs does not exceed 6.0 m; d) the height to the underside of the permanent structure does not exceed 3.5 m.

2 As Section 3 has not been updated as part of this revision, it refers to some standards which have now been withdrawn. These have been marked as such.

