



CO-CONSTRUCT

# Services Co-ordination with Structural Beams



## Guidance for a defect-free interface

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Interface  
Engineering  
Publications is a  
Co-Construct  
initiative  
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## What is Co-Construct?

**Co-Construct** is a network of five leading construction research and information organisations – Concrete Society, BSRIA, CIRIA, TRADA and SCI – who are working together to produce a single point of communication for construction professionals.

**BSRIA** covers all aspects of mechanical and electrical services in buildings, including heating, air conditioning, and ventilation. Its services to industry include information, collaborative research, consultancy, testing and certification. It also has a worldwide market research and intelligence group, and offers hire calibration and sale of instruments to the industry.

The **Construction Industry Research and Information Association (CIRIA)** works with the construction industry to develop and implement best practice, leading to better performance. CIRIA's independence and wide membership base makes it uniquely placed to bring together all parties with an interest in improving performance.

**The Concrete Society** is renowned for providing impartial information and technical reports on concrete specification and best practice. The Society operates an independent advisory service and offers networking through its regions and clubs.

**The Steel Construction Institute (SCI)** is an independent, international, member-based organisation with a mission to develop and promote the effective use of steel in construction. SCI specialises in providing advanced internet-based solutions for the construction industry.

**TRADA** provides timber information, research and consultancy for the construction industry. The fully confidential range of expert services extends from strategic planning and market analysis through to product development, technical advice, training and publications.

For more information on Co-Construct visit [www.construction.co.uk](http://www.construction.co.uk).

## Services Co-ordination with Structural Beams

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## What are Interface Engineering Publications?

Interface Engineering Publications (IEP) are a series of guides that aim to bridge the gaps in technical knowledge at the interfaces between construction packages. The publications involve reformatting existing professional knowledge, developed independently by Co-Construct members, into a single source of guidance.

The objective of IEPs are to reduce failures on site, to create greater understanding of shared processes by clients, designers and contractors, and to improve construction quality and the in-use performance of building systems.

**Services Co-ordination with Structural Beams** was jointly researched, edited and produced by BSRIA and The Steel Construction Institute in order to provide comprehensive guidance in a single publication. All the information has been drawn from current research and existing publications, and cross-referenced with the latest regulatory requirements.

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# Introduction

The office boom of the early 1980s led to many innovations: facade engineering, myriad forms of air conditioning, and many new designs of steel structures. Trendsetting developers discovered that the choice of structural beam had a fundamental effect on the efficiency and speed of construction. By running services through holes in structural beams – and designing those beams with services distribution in mind – developers were able to reduce storey heights, increase lettable area, and save on the cost of the external envelope.

However, real reductions in capital cost only accrue from properly co-ordinated design, where the structure and services are designed in harmony, and where the policy of integration is followed through to installation. For less well co-ordinated projects, the theoretical savings can be more than wiped out by lack of detailed co-ordination. The resulting problems can only be solved through costly improvisation by site contractors.

This guide, the second in a series called Interface Engineering Publications, aims to provide guidance on the best ways to engineer the interface between structural design and services distribution. BSRIA and The Steel Construction Institute (SCI) have pooled their technical knowledge to provide structural and services engineers with consistent, interlocking advice.

The publication largely contains material repackaged from existing BSRIA and SCI guidance. Details of the original publications, relevant European and British Standards and other references for further reading are provided at the end of this publication.

Much of the guidance in this publication concentrates on the technical aspects of a well co-ordinated design. It argues that structural engineers must invite their services colleagues to take part in option analysis, to design the beam openings to cater for the favoured services systems, and to help resolve the inevitable conflicts that occur in ceiling voids. The risk from not doing so will be increased time or cost overruns during installation, largely caused by the need to adapt ductwork and pipework, and to provide additional fittings required to make services go together.

The key message is that structural design must not be carried out in isolation from the design of the building services. All parties to the design process should make it clear to the client – and the client's representatives – that savings will only be achieved if services are installed so they will perform properly, and in a manner that enables them to be maintained.

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