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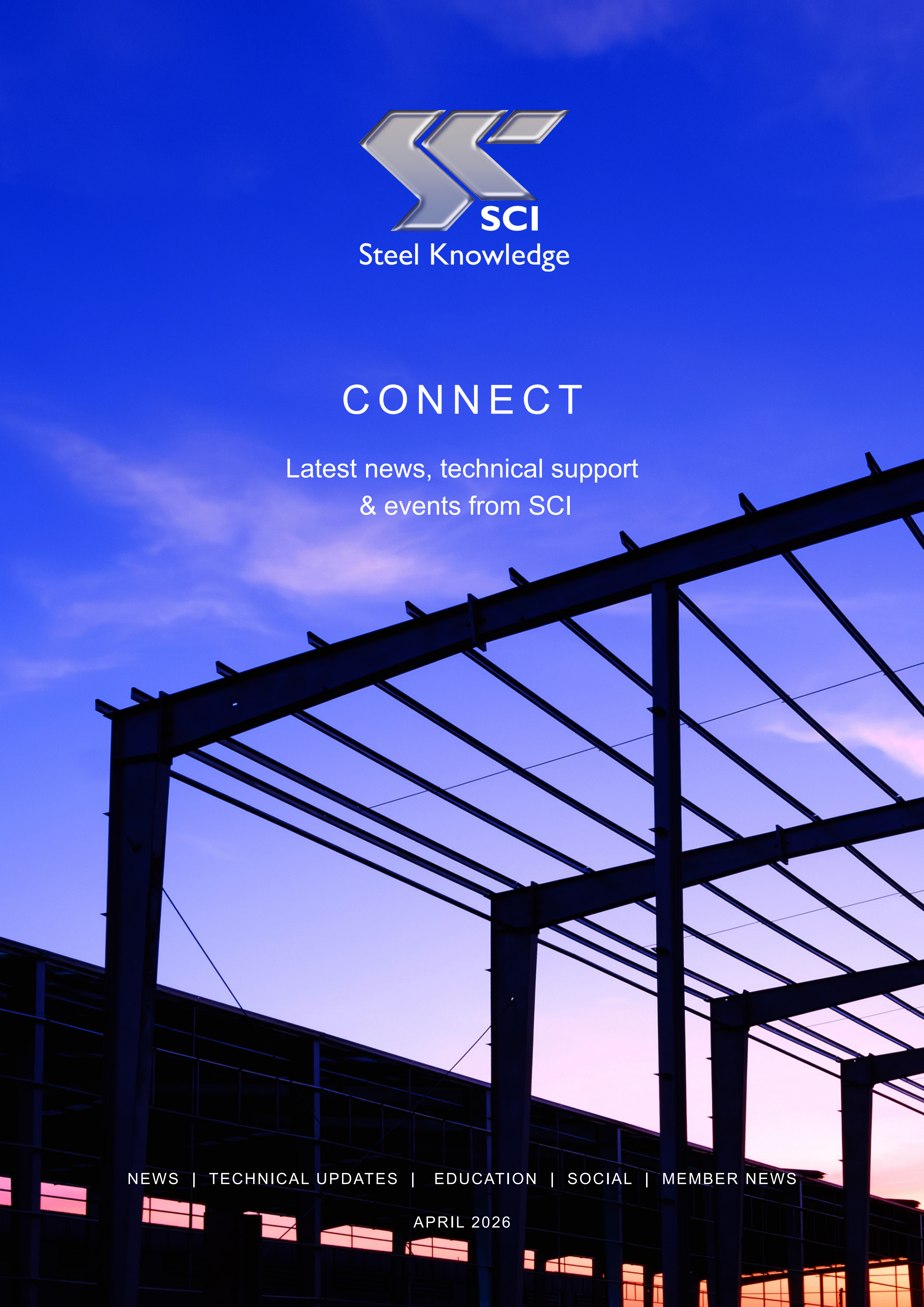


NEWS | TECHNICAL UPDATES | EDUCATION | SOCIAL | MEMBER NEWS

APRIL 2026

NEWS

A ROUND UP OF THE LATEST NEWS

SCI NEWS

UK STEEL STRATEGY

I'm sure we will have more comments on the UK Steel Strategy in future communications, but here are some initial thoughts on the recent published document.

Of course, we welcome initiatives that will help protect UK steel production, but even if it can help achieve that objective, this strategy looks dangerously like it will damage the UK steel construction sector as a whole. Our biggest concern is that, almost throughout the document, there is a confusion that 'steel production' and 'steel sector' are the same thing. They are clearly not. Steel production is important, steelwork fabrication is important, and the market for steelwork in construction is important. All of these should be addressed by any Government strategy – you won't sell more steel into a shrinking market and with reduced processing capability.

A major concern is that it is unclear from reading the strategy, and listening to the news around it, whether quotas and tariffs will be applied to imported fabricated steel, as well as imported 'raw' steel. Penalising steel is bad enough at a time when we do not have the capability to produce the types of steel that are often demanded – it will increase the cost of fabricated steelwork in the UK, thereby damaging businesses in the supply chain and damaging the market. But an exception, if that is what is intended, for steel once it is fabricated would be a complete disaster for the UK fabrication industry.

Our other major concern is whether the strategy, despite alluding to it, will fail to 'force' UK produced and fabricated steel to be used in public procurement projects. Wording, such as 'ensure routine consideration', of using UK steel, and encouraging 'early engagement' with UK steel producers sounds very non-committal.

We need three things – only apply tariffs to steel of a type that is also produced in the UK (so the scope can increase, if desired, once we have EAF production), don't create a situation that penalises UK fabrication, ensure that UK produced and fabricated steel is the only solution for public procurement projects.

Dr Graham Couchman, CEO, SCI
Connect with Graham on LinkedIn

SCI MEMBER ADVISORY DESK SERVICE

SCI Members enjoy unlimited access to technical articles publications and updates in their entirety on Steelbiz, our Information Portal.

STEELBIZ

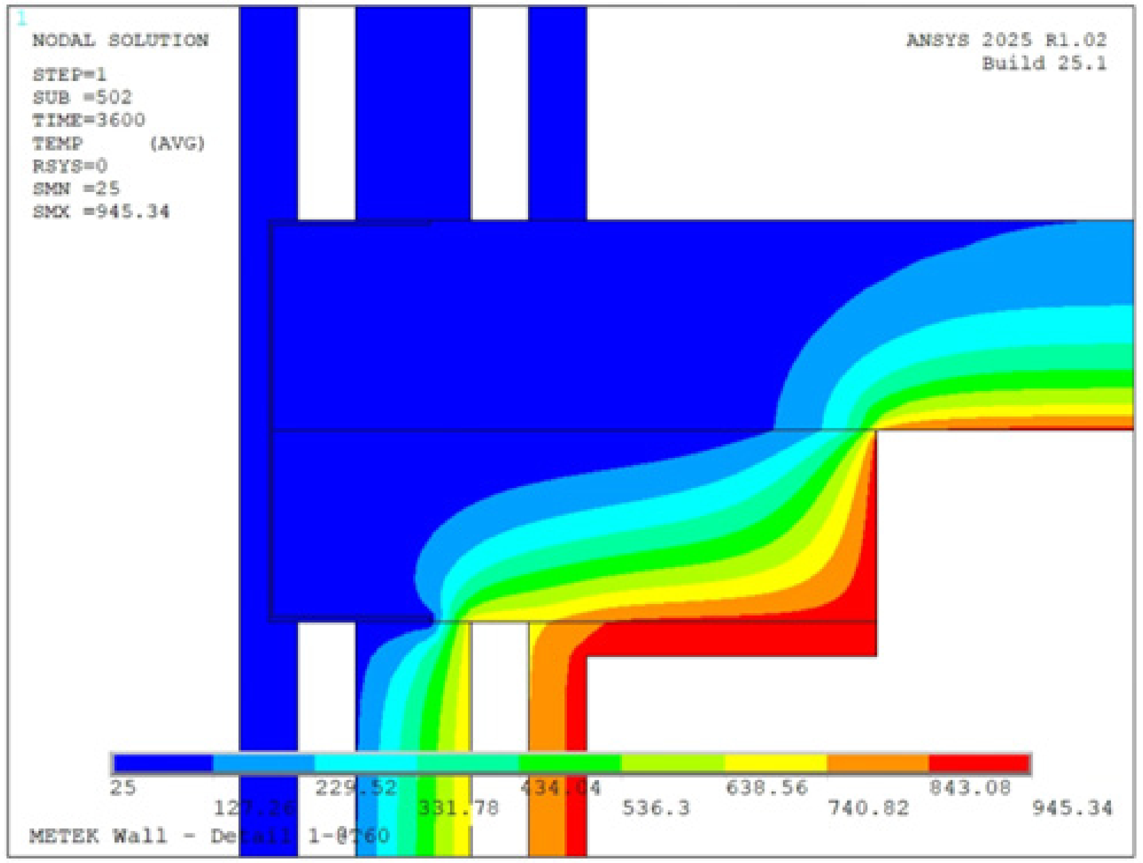
HOW DO WE DESIGN FOR FIRE AND HOW *SHOULD* WE DO IT?

SCI held a very successful event at BRE in January, with over 150 attendees listening to presentations, mainly about fire, and visiting labs, including the Burn Hall. For very understandable reasons, there has been an intense focus on how we achieve fire resistance since the Grenfell tragedy. This has not only illustrated that there is a lack of information to support some very old rules, but also, of course, that construction has changed since those rules (often based on tests) were written. But in this article, reflecting some of the content from our event, I want to focus on two areas where we clearly could do better.

The first area concerns the design process. For almost all 'ordinary' buildings, the structural engineer carries out analysis and design for ambient conditions, with load levels, resistances and stiffnesses to suit. They then identify elements that are to be fire protected. A degree of protection is then chosen to keep the steel temperatures below a certain level. That will ensure the reduction in material properties, as temperatures increase, does not exceed the reduction in loads for the fire limit state as opposed to the ultimate (ambient) limit state. By doing so, the designer knows that ambient design will be critical, so does not need to explicitly check the fire case. Getting that process right is not as easy as it may seem, not helped by the fact we have identified that some of the guidance commonly used contains errors. But it may not be an efficient process either, in terms of both money and material usage. Repeating the structural analysis and design for the fire case could result in slightly increased member sizes that did not require any fire protection – so an overall more economic solution. Structural engineers, not fire protection experts, have the knowledge to do this and should (be paid to) use it.

The other area I want to talk briefly about is physical testing versus numerical modelling. Of course, there is something reassuring about doing a physical test, but that test needs to represent what will be built. Some checking authorities take that to its extreme, suggesting everything needs to be tested. But that is impossible. There are clearly significant practical restrictions that cannot be ignored, primarily concerning size and shape of specimen, and the ability to apply load.

I suggest a numerical model that is properly calibrated, using supporting 'localised' physical tests, can give a much better indication of performance than an unrepresentative test. Consider the example of a perimeter wall for a portal frame 'shed'. This could be, say, 18 m high and very long, and comprise the frame columns, secondary steelwork spanning between those columns, and cladding attached to the secondary steelwork. On the other hand, the standardised test for cladding, to show its fire resistance, uses a specimen that is typically 3 m square, with no primary frame included, and attached to the furnace at top, bottom and on one side. To assume the tested specimen is able to demonstrate the performance of the complete wall is naïve. Far better to build a numerical model that includes all relevant components and has representative geometry. This is the sort of work we are doing more and more at SCI, and the results are being accepted.



Numerical model of a composite slab framing in to a light steel wall

365 DAYS OF STEEL (BY BRUNO DURSIN)

Richard Joseph Neutra (8 April 1892 – 16 April 1970) was an Austrian-American architect. Those who followed the 365 Days of Steel series on LinkedIn will have noticed that the author is a huge fan of mid-century Modernism and Neutra certainly was one of the most prominent modernist architects in the U.S. His most notable works include the Kaufmann Desert House in Palm Springs, California.

Neutra attended the Technische Hochschule in Vienna from 1911 until 1917, and at the same time the private architecture school of Adolf Loos. He joined the office of Erich Mendelsohn in Berlin, before moving to America in 1923. Neutra worked briefly for Frank Lloyd Wright before accepting an invitation from his close friend and university companion Rudolf Schindler to work together in California. In 1926, he established his own practice and designed many noteworthy buildings and houses, among them the Lovell House, the Von Sternberg House, the Tremaine House and the magnificent Kaufmann Desert House.

Conceived as a ship in the desert, Neutra evaded regulations that prohibited second storeys by adding a 'gloriette', a covered roof terrace supported by vertical columns that could be reached by a slender outdoor stairway. The house plan is one of Neutra's 'four-courters' which put the social area, be it open or enclosed, toward the centre and so leaves each dwelling area open to its own private court. The Kaufmann Desert House was restored by Marmol Radziner + Associates in the mid-1990s.

The 365 Days of Steel publication is exclusively available to SCI customers in the UK. You can order your copy by emailing sales@steel-sci.com

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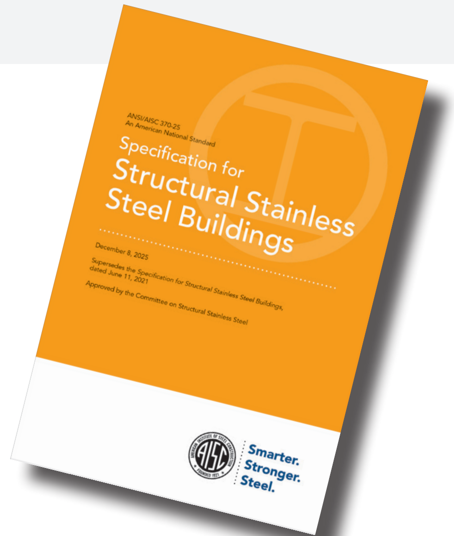
BOLTED TO LAST

Designing stainless steel bolted connections is now easier than ever with the release of the new American Institute of Steel Construction (AISC) publication Design Guide 41.

Co-authored by SCI's Nancy Baddoo and Dr Francisco Meza, along with Jason Provines, American Institute of Steel Construction's latest design guide, Structural Joints Using Stainless Steel Bolts, aligns seamlessly with RCSC specifications to provide clear, actionable guidance on high-strength stainless bolting. Design Guide 41 is the new go-to resource for more confident connection design.

COMING SOON...

The second edition of the AISC 370 Specification for Structural Stainless Steel Buildings is now nearing publication, and we're excited to share its newly unveiled official cover. SCI's Nancy Baddoo and Dr Francisco Meza have played an active role in shaping this updated release, contributing their expertise as members of the committee.



NEW BW INDUSTRIES DESIGN TOOL LAUNCHED BY SCI

SCI is delighted to announce the release of a new web-based design tool for BW Industries, developed to design secondary steelwork products including purlins, rails, eaves beams and mezzanine joists. The software has been developed using the new software platform created by SCI, with bespoke design procedures tailored to BW Industries' products and requirements.

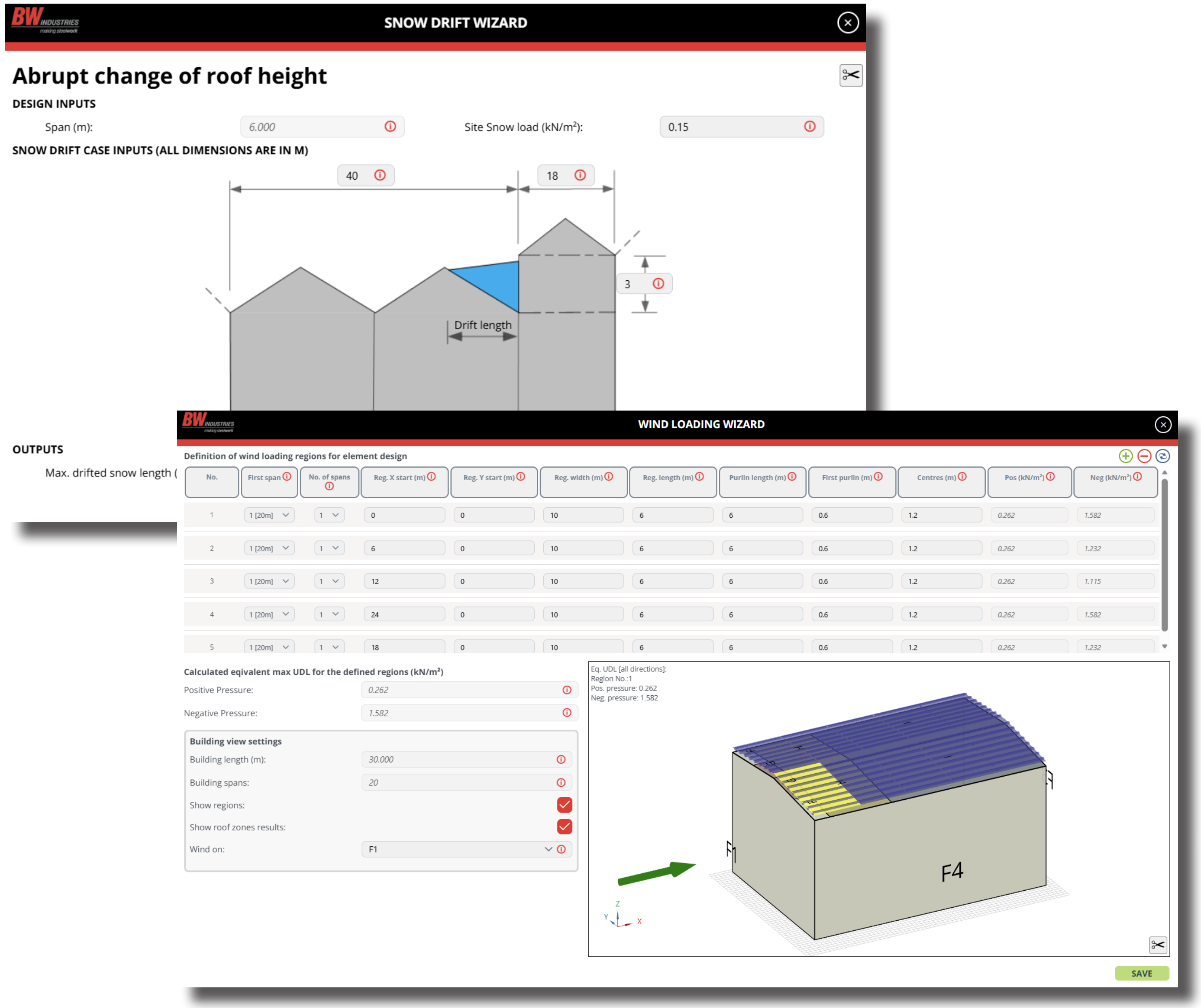
The tool enables engineers to design in accordance with current standards and automatically applies site-specific wind loading using SCI's SCIPHYR wind analysis engine. Loads can be defined through intuitive wizards, while engineers retain full control over the final design inputs. Once the loading has been defined, the software determines the optimum steel sections that meet both strength and serviceability requirements.

Each design is supported by a detailed calculation report, giving engineers, reviewers and third-party checkers confidence in the results. By combining wind calculations, design checks and section optimisation within a single system, the software reduces the need for separate manual assessments and repeated section trials. This helps to shorten design times, improve consistency and reduce the risk of error.

Alongside the technical benefits, the software also delivers commercial value. Faster and more efficient design workflows can help manufacturers respond more quickly to project requirements, while built-in optimisation routines can support more efficient designs. By making products easier for engineers to specify, bespoke tools such as this can also help improve project delivery and strengthen a manufacturer's market offering.

SCI has a long history of developing bespoke software for the steel construction sector, combining expertise in structural engineering with specialist software development. The BW Industries Design Software is part of a new generation of SCI engineering tools, developed using modern technologies with a long-term vision. It highlights how companies can work with SCI to improve efficiency, support technical confidence and deliver business benefit.

For more information, contact: software@steel-sci.com.



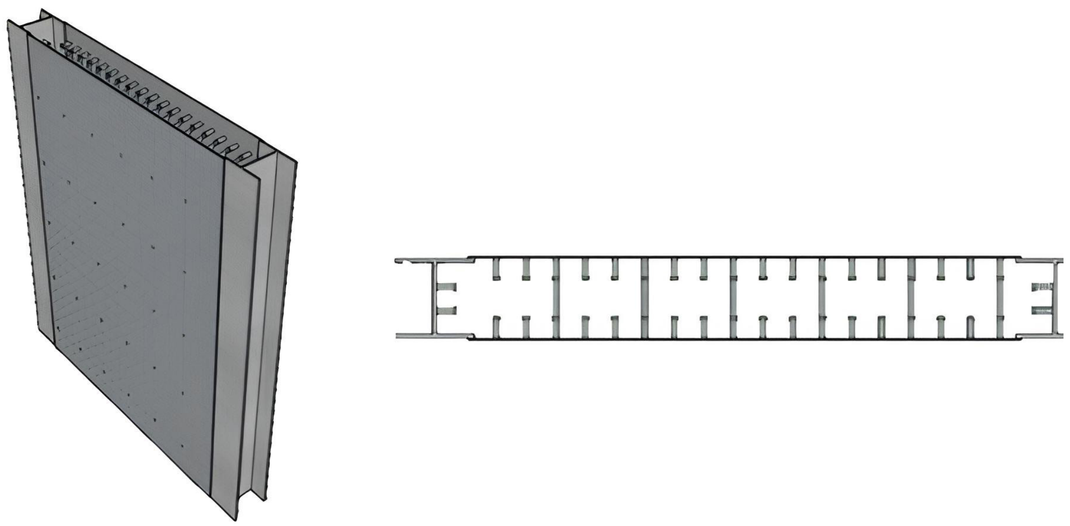
NEW MODULAR STEEL SHEAR WALL CONCEPT PROVES PERFORMANCE IN FULL-SCALE TESTING PROGRAMME

Shear wall systems are essential in tall buildings, providing lateral stiffness, controlling drift, and ensuring safe behaviour under extreme loading. Within a joint initiative involving SCI, ArcelorMittal Global R&D (AM) and the Karlsruhe Institute of Technology (KIT), a novel modular shear wall concept has been developed.

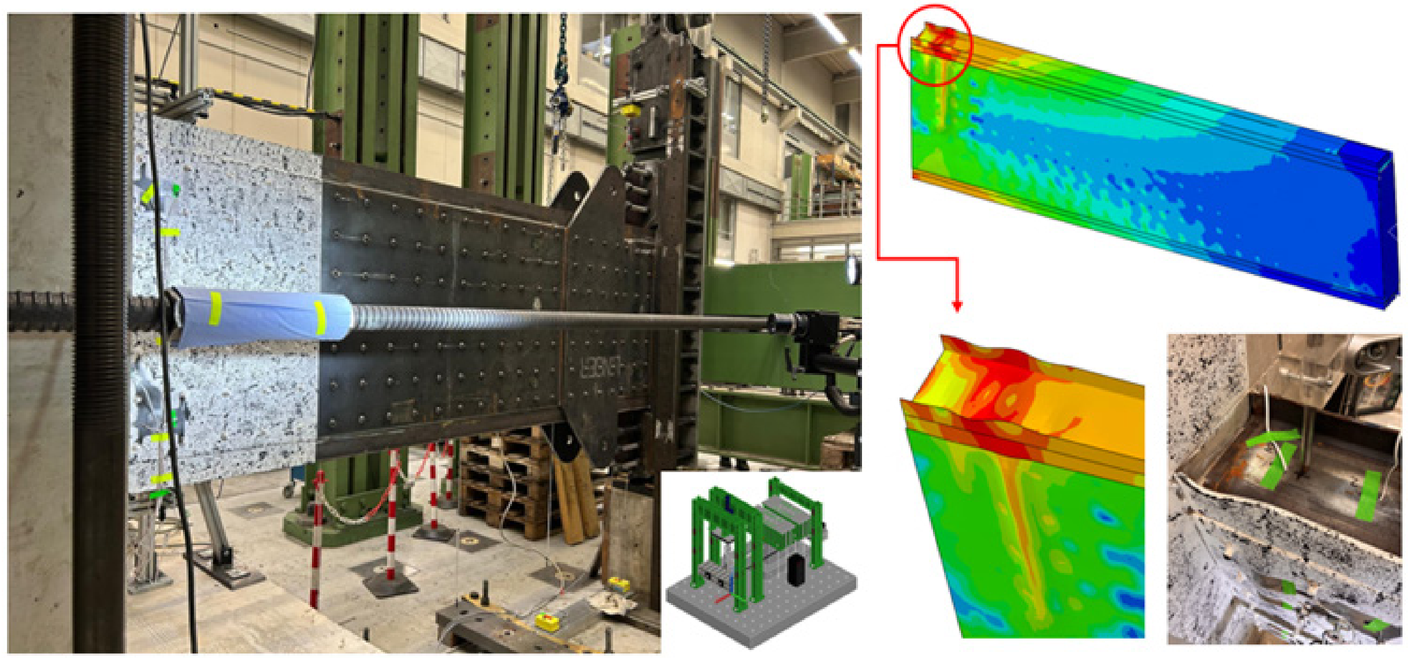
The system departs from conventional plate-based composite solutions by integrating hot-rolled H-section posts with thin steel plates to improve material efficiency, enable prefabrication and achieve faster construction compared with traditional reinforced-concrete cores.

To validate the solution, a comprehensive experimental campaign was conducted on wall specimens at KIT. Design and detailing of the wall specimens and their foundations was carried out by SCI using design rules set out in SCI Design Guide P414. Pre-testing planning also included the preparation of foundation reinforcement layouts, determining concrete strength targets, deciding on execution classes, specifying manufacturing tolerances and instrumentation layout design.

The experimental campaign consisted of two major phases: an initial static test and a subsequent cyclic loading programme, both intended to provide robust experimental validation of the concept.



New proposed concept for shear wall system focused on composite H-section



Test set-up at KIT

Preliminary numerical analyses were conducted to evaluate the expected maximum loads and corresponding failure modes. The predicted values remained within a 5% margin of error, and the anticipated failure mechanisms were confirmed during testing, demonstrating the reliability of the modelling approach. Overall, the experimental campaign successfully validated the application of the concept.

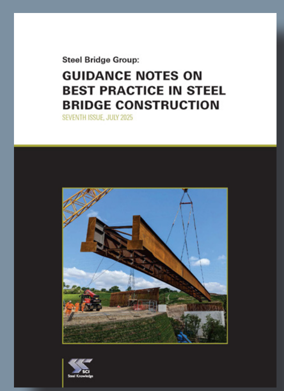
The next steps involve adapting structural design and verification rules to achieve consistent and reliable assessment of the structural behaviour with simplified methods. These rules are intended to be proposed for incorporation into future design standards, providing engineers with a clear framework to safely and efficiently design buildings using this solution.

Group photo with Bassam Burgan (SCI), Agemar Manny (members from KIT team), and Omer Anwaar, Jie Yang and Miguel Candeias (ArcelorMittal Global R&D)

PUBLICATIONS

719 SCI publications have been purchased/ downloaded from the SCI Shop so far this year.

The current bestselling publication is:
P185: Steel Bridge Group: Guidance Notes on Best Practice in Steel Bridge Construction (7th Edition)



SCI SHOP

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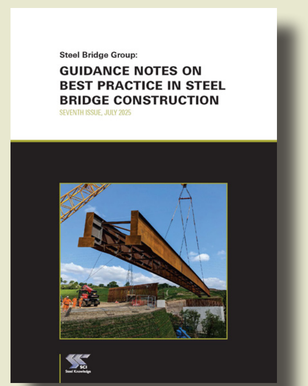
2,256 resources have been viewed/ downloaded by SCI members so far this year.

The most popular resource currently is:
P185: Steel Bridge Group: Guidance Notes on Best Practice in Steel Bridge Construction (7th Edition)



STEELBIZ

TECHNICAL UPDATES

View the latest technical information on steel in buildings and construction, through our own technical information website.

STEELBIZ

EUROCODE GENERATION 2 UPDATE

With Generation 2 Eurocodes on the horizon, due to replace the current documents in April 2028, work is currently being undertaken in various BSI committees to decide on any national variations and provide additional information as permitted by the codes. BCSA has led on the development of those needed for Eurocode 3, and that for Eurocode 4 Part 1-1, which takes a very simplistic approach, has been developed with SCI input via the relevant BSI committee.

As a reminder, the National Annexes to the current Eurocodes, and indeed the Generation 2 documents, are allowed to contain three types of information:

- Choice for Nationally Determined Parameters (NDPs), for which recommended values are given in the code but the opportunity to revise these is explicitly stated. These are often simple numerical values.
- Whether to adopt so-called Informative Annexes, reject them, or replace them with something else. With Normative Annexes there is no national choice.
- Identify any Complementary Information (CI, which we used to call Non-Conflicting Complementary Information, NCCI, to emphasise that it was not allowed to contradict the code), either by direct reference or general reference to material produced by organisations such as SCI. In some cases the CI may be included in the NA itself, but this seems unwieldy. General reference has the benefit of not limiting the information to documents available at the time of writing the NA.

With many parts of Eurocode 3 already published by BSI, and Eurocode 4 expected to be published in the next few months, designers will soon have the National Annexes that are needed to actually use those documents.

Also worth noting is that we are simultaneously going through a process of agreeing so-called early amendments. Some believe that early amendments were inevitable, if just to update cross-references as new Eurocode parts are published. The first ones published could not refer to documents that were not yet in the public domain. Of course a sensible alternative would have been to hold back until all Eurocode parts and their National Annexes were available, then release the complete set.

Cross-references aside, unfortunately the opportunity has also been taken to make technical changes to what was created, sometimes primarily due to different personal perspectives of those involved in different stages of the process. The overarching committee that governs all this, CEN/TC250, is trying to limit changes to 5%, but it seems there are always excuses to include more.

WHAT IS FIRE RESISTANCE?

Despite the fact that post-Grenfell much traditional practice is being questioned, hence the numerous recent articles in New Steel Construction, designers in the steel construction sector are very familiar with the concept of designing to achieve fire resistance. Normally sufficient passive protection is applied to ensure that ambient temperature design governs – there is no need to explicitly design for the fire limit state with reduced loads and reduced material properties. In this article Dr Graham Couchman considers what the concept of fire resistance actually means, in particular the use of standard time-temperature curves and standardised resistance periods, and why we try to achieve them. He concludes that whilst the concept of fire resistance is well established and easy to use, we should not be closed to considering other approaches.

The paper The Rise and Rise of Fire resistance by Angus Law and Luke Bisby [1] provided much of the background presented in this paper, and is gratefully acknowledged. It was published in the Fire Safety Journal and the intention here is to take that knowledge to a wider/different audience, for whom it is equally relevant and valuable. Input from Dr Craig English of Semper is also gratefully acknowledged.

Some background

A key time in the development of the concept of fire resistance was 1903, when following a Fire Prevention Congress in London a paper was published that contained four key concepts. Firstly that the term 'fire resisting' was more appropriate for use in construction than 'fire proof'. Secondly, that systems should be classified according to whether they provided 'temporary', 'partial' or 'full protection'. This concept was extended to the third concept of time periods, with resistance for at least 45 minutes, 90 minutes and 150 minutes respectively. Finally, it was proposed that fire testing should be standardised, in terms of duration of exposure, minimum temperature, required loading, and minimum specimen size.

'Full protection' has been interpreted as meaning the structure could survive burn-out of the fire compartment's contents without intervention by fire and rescue services. Options for lower levels of protection were recognised as being practically (commercially) necessary. At the time these definitions were based on a combination of test and real fire experience, which may be a critical point where blurring between real situations and standardised tests started to occur. An obvious example is that the standard time-temperature curve we use in most testing today has temperature that increases up to an asymptote, whereas if contents have burned out then clearly at some point the temperature will start to drop. In 1928, Ingberg made an attempt to link the severity of a real fire to an equivalent period of exposure in a standard fire test – the concept of 'equivalence', which was recognised at the time as having limitations.

Legislation took hold of these concepts, and a century later they are still being widely used. Perhaps this is due to a lack of practical alternatives, but it is still very important to recognise the limitations of such an approach.

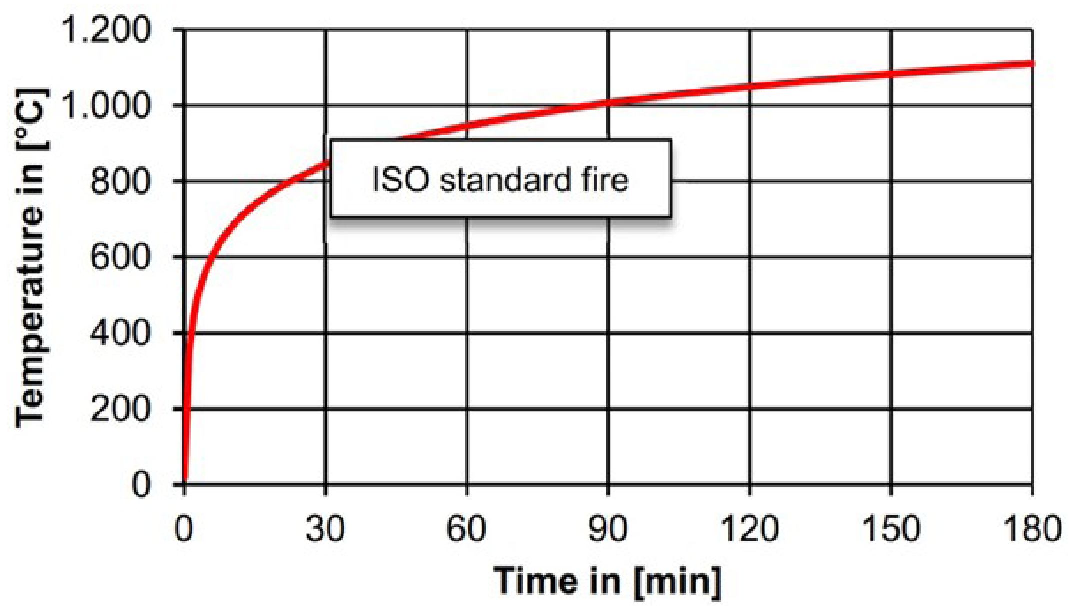


Figure 1 - ISO standard 'fire curve'

Application today

The background summary previously discussed, illustrates that the whole area of design for the fire limit state is a bit messy and confused. That confusion seems to be exacerbated in the minds of many by a further blurring, namely that between Building Regulations and Approved Documents (or their equivalent in other nations). Approved Documents were introduced in 1985, and provide ways in which compliance with the Regulations can be demonstrated, for example by testing a specimen in a standard fire test and achieving a stated resistance period. But Approved Document provisions are not the only way of showing regulatory compliance, and indeed in some cases they may even be inappropriate. In the past two years, we have seen this dis-joint in the context of load bearing light steel framed walls – Approved Document B2 (AD-B) requires/allows such walls to be tested with a one-sided fire, but clearly some such types of wall could be exposed to two-sided fire (Figure 2) and simply satisfying the AD-B provisions is now recognised as not then being appropriate [3].

The fact that periods of resistance recommended in AD-B vary according to building type seems sensible if they have a relationship with burn out of compartment contents. The fact the resistance period increases with building height appears to be illogical if a relationship with burn out is claimed – an apartment in a multi-storey building will not contain more calorific content than one in a three-storey structure, so why does the resistance period go up? Law and Bisby suggest this may have less to do with logic and more to do with harmonizing different regulations. However, they also note that whether those creating the recommendations appreciated it or not, the adoption of longer periods for taller buildings does increase the effective ‘factor of safety’. There is logic to ensuring that taller buildings are more resistant to fires that are not ‘average’, because of the consequences.

It is worth adding that when sprinklers are provided the resistance period may reduce.

Alternatives and possible developments

The approach described has been criticised for several obvious reasons:

- The standard heating curve does not look like a real fire, particularly its lack of a cooling phase.
- Test furnaces are difficult to control, and the thermal and mechanical boundary conditions are unrealistic.
- The ‘equivalence’ method fails to take into account a number of relevant factors.

Perhaps less obviously, it has long been understood that methods given in typical guidance (AD-B, BS 9999, BS 9991) [2, 4, 5] provide no explicit measure of building fire safety. The same is true of the deterministic approaches set out in fire engineering codes, such as BS 79746. Not knowing what safety level one’s fire design provides is the reason why the Hackitt review recommended the use of outcome-based approaches, and why safety cases are now being prepared for tall residential buildings in order to determine which of them is in a potentially unsafe condition (despite having quite possibly satisfied regulatory requirements).

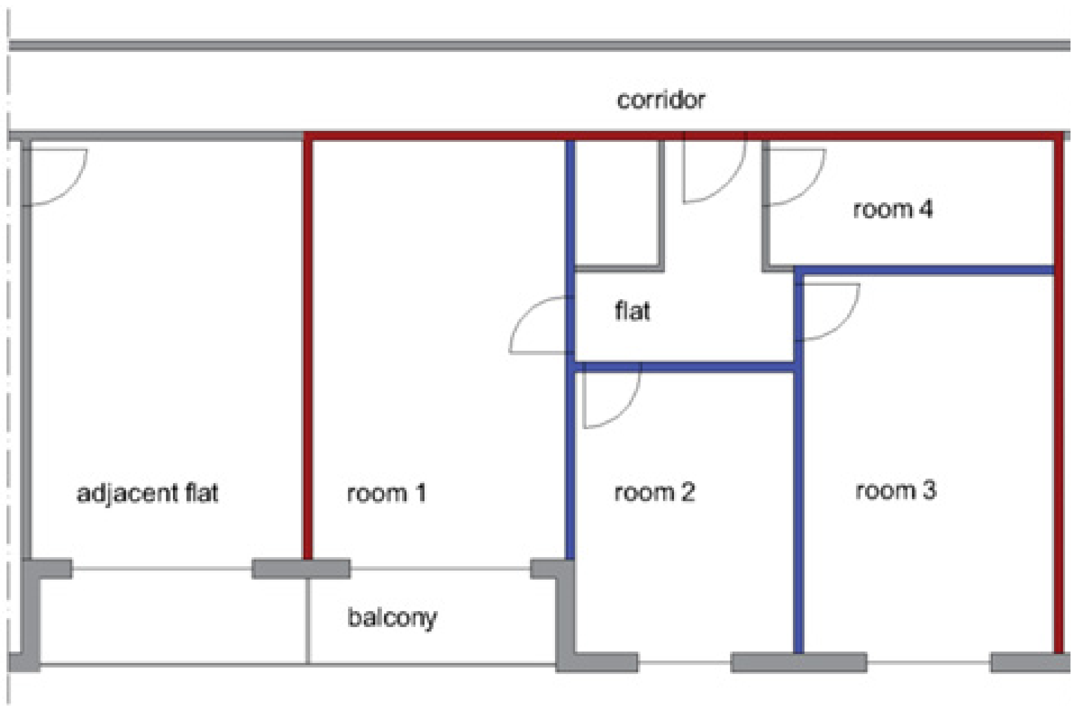


Figure 2 - Walls in red would be exposed to fire from one side only. Walls in blue could be exposed to fire from two sides

For the currently very topical case of car parks a simple alternative would be to consider the heat release rate of different vehicles and how the fire may spread between them [7], and then be able to more accurately quantify the consequences such fires may have on the structure. Those consequences would lead to more informed decisions concerning the level of fire protection, if any, that is required to satisfy life safety, property and environmental objectives.

Despite the obvious logic and potential benefits, rather than the approach described above it seems likely that future developments in AD-B may include extending fire resistance periods for open sided car parks, and/or requiring sprinklers to reflect the greater fire risks associated with modern vehicles. A requirement for the use of sprinklers could reflect re-consideration of the purpose of Building Regulations – moving towards protecting assets as well as achieving the current objective of saving lives.

More complex fire engineering methods take a more realistic view of how structures behave in fire, not only in terms of fire load, but by allowing for variables such as the size of compartments and their ventilation, and the criticality of different structural elements when considering time to failure. Risks should also be assessed in the context of the exit strategy for occupants, access for fire and rescue services etc. Significant savings may be made when such an approach is used, and some structures will more than warrant this level of investment in design.

Conclusions

Design using standard fires and resistance periods is convenient, and it could be argued that this approach has been shown to produce appropriate structures given that structural failures in fire remain a rarity. It is important however that designers, specifiers, clients and other stakeholders recognise that achieving a certain fire resistance period in a standard test in not always necessary or even appropriate. As we try to construct more ‘carbon efficient’ structures we should not be content to always use approaches we know to be conservative.

References

[1] The rise and rise of fire resistance. Law and Bisby. Fire Safety Journal Vol. 116, September 2020

[2] Fire safety: Approved Document B.

[3] P442: Design of loadbearing light steel walls exposed to fire on two sides. SCI, 2024

[4] BS 9999:2017. Fire safety in the design, management and use of buildings. Code of practice. BSI.

[5] BS 9991:2024. Fire safety in the design, management and use of residential buildings. Code of practice. BSI.

[6] BS 7974:2019. Application of fire safety engineering principles to the design of buildings. BSI

[7] Open car parks in fire. Ozcelik. New Steel Construction, September 2024.

A REASSESSMENT OF THE DESIGN FOR FIRE RESISTANCE PERIODS IS WELL OVERDUE

At the recent SCI Technical Event (January 2026), Semper outlined a design approach for fire in car parks framed with steel. The suggested approach bypasses the design for fire resistance periods and in doing so, allows architects and engineers to determine fire protection requirements more accurately so that Building Regulatory requirements are satisfied. A summary of the approach and the reasons you may wish to consider using it, are given in this note.

Introduction

Part B3(1) of the Building Regulations requires load bearing elements to maintain stability for a reasonable period in fire. The term "reasonable period" is not defined and for this reason the industry has traditionally designed for the fire resistance periods in guidance such as Approved Document B. For steel, this normally necessitates some form of insulating material so the arbitrary acceptance criteria in the standard fire test (BS 476-20) can be achieved.

Given its popularity, you would think that the design for fire resistance periods somehow perfectly aligns with the life safety objectives in Building Regulations, but this is not the case. In fact, the entire concept is flawed and a reassessment of it is well overdue.

Semper's alternative approach allows structural fire protection to be specified based on the ability of a steel frame (protected or not) to satisfy Building Regulations requirements head on. The approach, which was originally developed for open-sided car parks, in light of recent events in Liverpool and Luton, can be used for any building type or height. An illustration of a typical open sided car park is given in Figure 1.

The approach has two simple aims:

1. To determine if a continuously growing fire can heat structural elements to such an extent that they hinder the ability of occupants to escape safely.
2. To determine if a continuously growing fire can heat structural elements to such an extent that they hinder the ability of fire fighters to carry out firefighting operations.

Semper's approach models the interchangeable events that occur as fire develops from beginning to finish. These events are mapped out using a technique first proposed in DD-240 (the pre-cursor to BS 7974) back in 1996. The structure of this is illustrated in Figure 2.

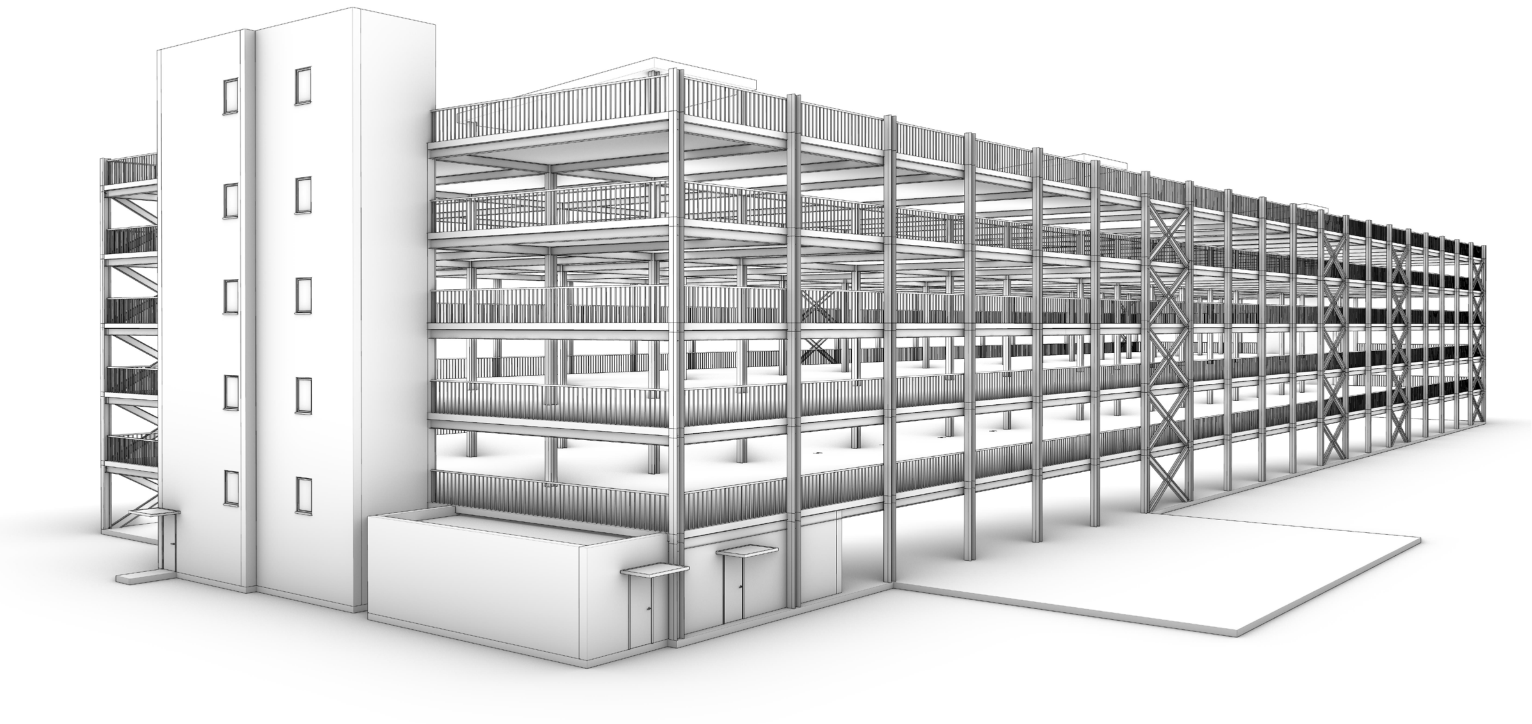


Figure 1
Typical open sided car park

Qualitative Design Review (QDR)

The QDR sets out the parameters of the study.

Fire growth model (FGM)

Data for the fire growth model typically comes from fire test data.

Fire detection model (FDM)

A fire detection time is determined using specific building information, data from the FGM and the outputs from a CFD (Computational Fluid Dynamics) model. The fire detection time is then fed into the fire service intervention model (FIM).

Fire service intervention model (FIM)

Using information in BS 7974-5 a fire service intervention time is calculated.

Fire spread model (FSM)

Data for the fire spread model comes from available research and is fed into the structural response model (SRM).

Occupant escape model (OEM)

As the fire develops, internal conditions (smoke obscuration and heat) are continuously monitored and compared with acceptance criteria for safe escape which are stated in BS 7974 and Part B1 in the Building Regulations. The calculated escape time is then fed into other models.

Structural response model (SRM)

Within the SRM a finite element model such as SAFIR is used to simulate structural response.

The analysis is deterministic and time based. It helps the designer to determine what risk a structural frame poses to life safety (occupant evacuation and fire fighter entry) and the necessity for structural fire protection as a means of satisfying various requirements in Parts B1, B3 and B5 of the Building Regulations. In many cases it can be used to show that passive structural fire protection is not required and this is particularly so in low rise steel framed building that are characterised by relatively short evacuation times.

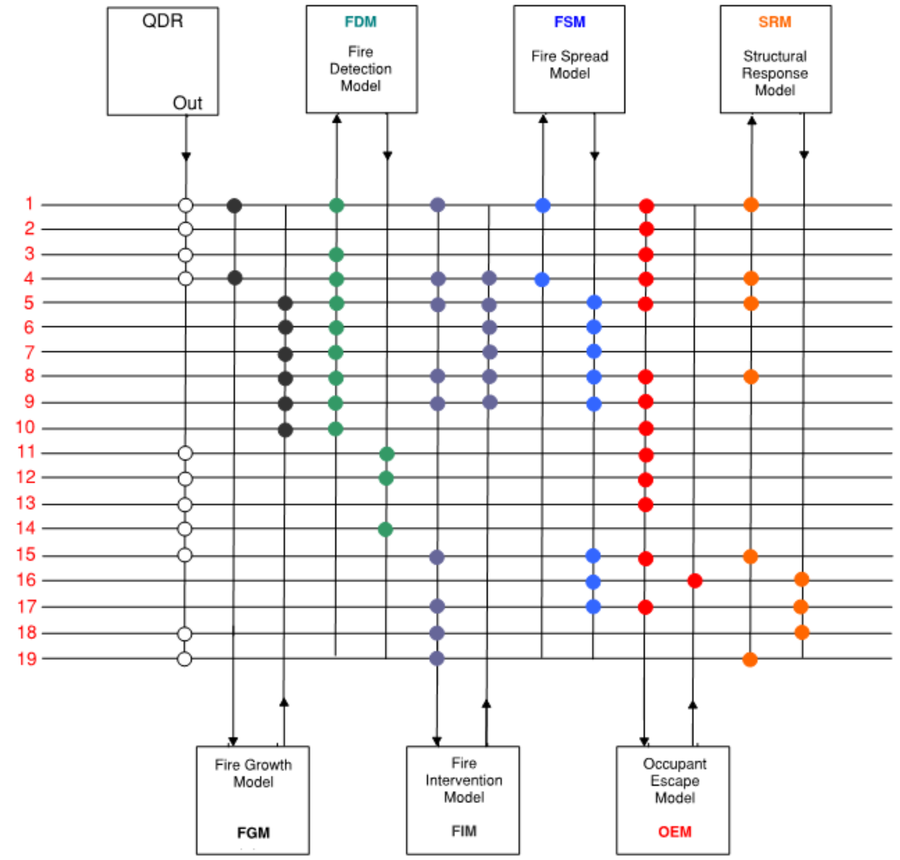
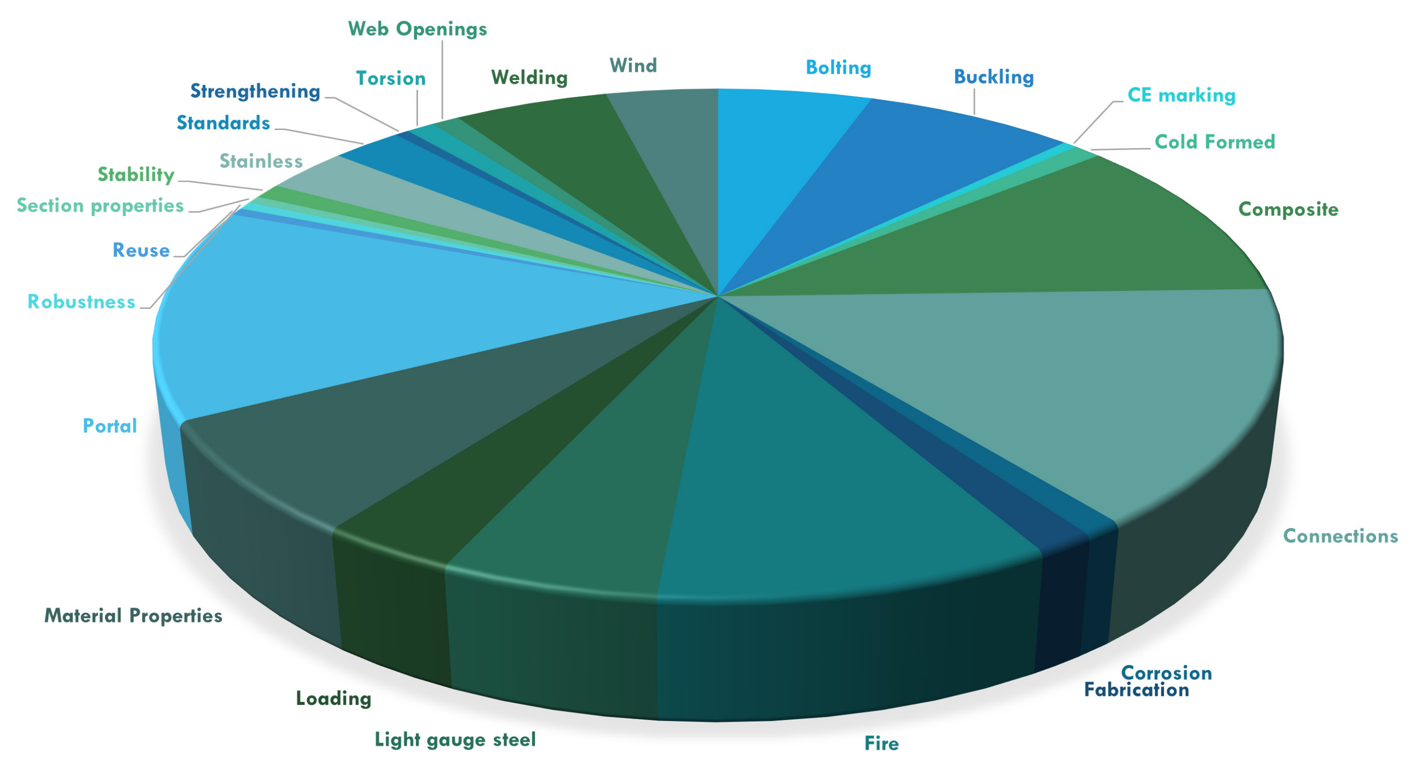


Figure 2

1. Building characteristics. 2 Occupant type. 3 Evacuation strategy. 4. Heat release rate of fire. 5. Radiation model. 6. Mass of smoke. 7. Rate of Co production. 8. Smoke temperature. 9. Smoke optical density. 10. Time of fire detection. 11. Time of fire alarm. 12. Occupant response time. 13. Occupant pre-movement time. 14. Time of fire service notification. 15. Local structural response. 16. Occupant evacuation time. 17. Remote structural response. 18. Fire service intervention time. 19. Fire service extinguishing capability.

ADVISORY STATISTICS

A category breakdown of the queries our Advisory team have received in the last quarter:



AD 500:

Tolerance at cantilever tips

SCI's advisory desk is often asked about the allowable tolerance for cantilever tips. Although BS EN 1090-2 and the National Structural Steelwork Specification (NSSS 7th) include a permitted deviation at the tip of a pre-set cantilever, this AD note recommends that the only reliable way of achieving a consistent alignment of several cantilevering elements is by including provision for adjustment. This AD note explains why the assessment of the permitted deviation is fraught with difficulties and gives examples of how provision for adjustment can be achieved.

Members can view the full Advisory Desk Note content here.

AD 551:

Deflection limits for light steel framed walls with masonry cladding

Guidance for the out-of-plane deflection limit to be applied to light steel framed walls with masonry cladding is provided in both ED017 and P402. The guidance in these publications is presented slightly differently which has caused ambiguity. The purpose of this advisory desk note is to provide clarity.

Members can view the full Advisory Desk Note content here.

THE FOLLOWING ADVISORY DESK NOTES ARE WRITTEN BY SCI AND PUBLISHED IN NSC

AD 549 - Steel decking and composite slab span types

Read the full Advisory Desk Note here

AD 550 - Stiffness classification for welded beam to column joints

Read the full Advisory Desk Note here

AD 552 - Errata in P362 – Steel building design; concise Eurocodes

Read the full Advisory Desk Note here

AD 553 – Provision of sprinklers and fire compartments in single-storey buildings

Read the full Advisory Desk Note here

TECHNICAL EXPERTISE

SCI provides its specialist expertise to companies working in steel from manufacture and design, to components and fabrication.

We help SCI members and clients design and improve their products and assist in differentiating them in a crowded marketplace through product innovation and independent assessment.

CONSULTANCY

EDUCATION

Our public courses and webinars keep engineers updated with the latest developments within steel design and equip them to design competently, efficiently and safely.

VIEW ALL TRAINING

PUBLIC COURSE

FIRE RESISTANCE OF LIGHT STEEL FRAMING

Delivered in 2 Sessions:
Pt 1: 21 Apr | Pt 2: 23 Apr
Time: 10:00am-12:00pm (UK)

This course will demonstrate how light steel framed buildings should be designed and detailed to provide fire resistance in accordance with UK Building Regulations.

It includes the testing and design requirements for loadbearing light steel framed walls and floors, constructed using cold formed steel sections and sheathed with gypsum-based boards to provide the necessary fire resistance. In some cases it is necessary to design loadbearing walls exposed to fire on two sides, design methods for this scenario will be included as there are no standardised fire tests available for this configuration. All delegates will be given PDF copies of SCI publications P424 - Fire resistance of light steel framing P438 - Cavity barriers in light steel framed buildings and P442 - Design of loadbearing light steel walls exposed to fire on two sides.

BOOK YOUR PLACE

PUBLIC COURSE

STEEL FRAMES & DISPROPORTIONATE COLLAPSE RULES

Delivered in 3 Sessions:
Pt 1: 11 May | Pt 2: 13 May Pt 3: 15 May
Time: 10:00am-12:00pm (UK)

This course provides a solid introduction into the design of steel framed buildings to avoid disproportionate collapse. The guidance provided is in accordance with the current Building Regulations, the Eurocodes and Approved Document A which all require that disproportionate collapse must be considered in the design of all buildings.

The course content includes an introduction to the concepts of disproportionate collapse, structural integrity and robustness, along with an explanation of all the regulatory and Eurocode 1 Part 1.7 requirements, strategies for compliance and workshops which enable delegates to apply some of the theory learnt during the course. understood.

BOOK YOUR PLACE

PUBLIC COURSE

GENERATION 2 EUROCODES: EN1994 1-1 STEEL-CONCRETE COMPOSITE STRUCTURES

Delivered in 2 Sessions:
Pt 1: 09 Jun | Pt 2: 11 Jun
Time: 10:00am-12:00pm (UK)

Over the course of two 2 hour sessions we will present detailed design rules for composite beams and slabs in accordance with Generation 2 Eurocode 4. These will cover ULS, SLS and fire design, for beams and slabs used in buildings. We will 'walk through' a worked example on beam design taken from an upcoming SCI Generation 2 publication (supplemental to P359).

Significant changes from the Generation 1 codes will be identified, as will sources of existing information currently used in the UK (e.g. P405) that can continue to be used as NCCI as an alternative to some of the new code rules.

All delegates will be given a PDF copy of P359, and a copy of the new publication when it is finalised.

BOOK YOUR PLACE

SCI MEMBER WEBINAR

GUIDANCE FOR PORTAL FRAMES IN BOUNDARY CONDITIONS

Date: 22 Apr
Time: 12:30-13:30pm (UK)

New guidance on the treatment of single storey buildings in fire boundary conditions was published in 2025, in response to the growing demand to prove a solution by analysis. The recommendations involve the provision of a so-called "capable member" to support the cladding and provide a demonstrable load path back to the primary steelwork. The webinar will cover the new guidance, the design of the capable member and the issues that the construction team must address. The presenter, David Brown, was responsible for drafting the new guidance.

BOOK YOUR PLACE

FREE-TO-ALL WEBINAR

WIND LOADS & SCIPHYR

Date: 29 Apr
Time: 12:30-13:30pm (UK)

Wind actions are important in the design of all buildings, especially for relatively lightweight structures such as single-storey buildings. Wind actions are critical for the design of secondary elements such facades, signboards, infill panels, purlins and siderails. The webinar will discuss how to factor in various topographic influences and directional variations in wind calculations, following BS 6399-2 or BS EN 1991-1-4 with the UK National Annex.

Join the webinar to discover SCI's wind analysis software SCIPHYR's capabilities and see how it can help your wind analysis design.

BOOK YOUR PLACE

SCI MEMBER WEBINAR

BASE DESIGN

Date: 13 May
Time: 12:30-13:30pm (UK)

A new Green Book has been developed, covering the design of steel bases. The new guidance covers the detailed design of bases with shear stubs and the essential verifications of holding down arrangements in the temporary condition. This webinar introduces the new publication, appropriate both for current designs and the Gen2 changes to be implemented in 2028.

BOOK YOUR PLACE

SCI Steel Knowledge

IN-HOUSE COURSES

Did you know that we also run all of our courses in-house, both online or in-person?

These can:
- cover standard course content;
- be tailored to your company specific requirements or;
- be created totally bespoke.

A flat rate is chargeable, regardless of the number of delegates.

EDUCATION@STEEL-SCI.COM

SCI Courses

SCI Webinars

2026 April

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21 Fire Resistance of Light Steel Framing	22 Guidance for Portal Frames in Boundary Conditions	23 Fire Resistance of Light Steel Framing	24	25
26	27	28	29 Wind loads & SCIPHYR	30		

2026 May

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11 Steel Frames & Disproportionate Collapse Rules	12	13 Steel Frames & Disproportionate Collapse Rules; Base Design	14	15 Steel Frames & Disproportionate Collapse Rules	16
17	18	19	20	21	22	23
24 / 31	25	26	27	28	29	30

SCI Courses

SCI Webinars

2026 June

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9 Generation 2 Eurocodes	10	11 Generation 2 Eurocodes	12	13
14	15	16	17 Design Assisted by Finite Element Analysis	18	19	20
21	22	23	24	25	26	27
28	29	30				

2026 July

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
		1 Eurocode Load Combinations	2	3	4	5
6	7 Torsion	8	9	10	11	12
13	14	15 Steel Frame Stability & Second Order Effects	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

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SCI BOOKSHOP

SCI's high quality publications continue to be used as the definitive guidance within the sector. SCI is focussed on providing the latest and best information to ensure best practice is maintained across every aspect of steel

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SOCIAL

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MEET THE TEAM: BOGDAN BALAN

Bogdan is a Principal Engineer at SCI and the Software Lead. He completed his PhD at Southampton University and a Master's degree at Imperial College London. After his PhD, he focused on software development, acting as Product Manager for various engineering software, including a new footfall vibration analysis software.

He joined SCI almost five years ago to broaden his expertise across different areas of engineering. Since then, his work ranged from contract negotiation and writing publications to bespoke finite element analysis.

What does your role at SCI involve?

BB: While I initially joined SCI looking to explore work beyond software development, I remain closely involved in this field as Software Lead. My work includes developing bespoke client software, such as the recently release BWI Design Software. This new light gauge steel design software also integrates our new wind analysis tool, SCIPHYR, which I have also led the development of.

One of the key benefits of working at SCI is the wide range of technical areas I get to work in. I have contributed to projects, such as the new guidance on embodied carbon (SCI P449). That work showed me that low carbon design is not complex or innovative, it is simply the sensible default unless there is a strong reason not to follow it. Being at SCI has also enabled me to be a member of the BCSA Connections Group, where I have had the opportunity to collaborate with world-class experts. And with my background in footfall induced vibrations, I also deliver webinars, run training courses, and answer Advisory Desk enquiries on the topic.

What is your favourite thing about working at SCI?

BB: My favourite aspect is definitely the diversity of projects I get involved in, along with the challenges they present. The variety keeps the work engaging and allows me to continuously expand my knowledge across different technical areas. I am also fortunate to work alongside incredibly talented, patient and helpful colleagues at SCI, which makes tackling these diverse challenges much more enjoyable.

What do you do in your spare time?

BB: I enjoy skiing, although I have not been able to do it as much as I would like in recent years. I am always looking forward to getting back on the slopes when the opportunity arises!

Bogdan Balan, Principar Engineer, SCI
Connect with Bogdan on LinkedIn

RUNNING WITH PURPOSE: LIAM TAKES ON THE LONDON MARATHON

We are proud to say that our Advisory Desk Lead, Liam, will be running the London Marathon on 26 April and will be raising money for a charity close to our heart, Cardiac Risk in the Young (CRY), in memory of a colleague's son.

Did you know every week in the UK, at least 12 apparently fit and healthy young people aged 35 and under die suddenly from undiagnosed heart conditions?

Since its formation in 1995, Cardiac Risk in the Young works to prevent these tragedies by funding research, providing cardiac screening for young people, raising awareness, and supporting families who have been affected.

To learn more about this fantastic cause, why Liam has chosen it and if you would like to make a donation, click here.

STEEL FRAMES DESIGNED FOR ROBUSTNESS

Probably not the type of steel frame you were expecting us to discuss, but the photo below shows how Dr Graham Couchman's Reynolds 653 steel tubing Bob Jackson survived being hit from behind by a Volkswagon i.d.3 (complete with heavy battery). Had the frame been made from the current material of choice for decent bikes, carbon fibre, it would have snapped. It really does nicely illustrate steel's ability to cope with accidental design situations. And for those with eagle eyes, the frame is not bent, it has a 'curly Hetchins' read triangle that makes it extremely comfortable, as well as robust. Thankfully, Graham survived with minor cuts to his hand and some bruises.

UPCOMING EVENTS

SCI's Dr Francisco Meza will be presenting at the North American Steel Construction Conference on **23rd April 2026,** in **Atlanta, USA**, discussing the AISC's Design Guide 41 and what's new in Stainless Steel.

OFFSITE AWARDS

We are thrilled to, once again, sponsor The Best Use of Steel Technology category at the Offsite Awards 2026 on **15 September 2026** in **Birmingham, UK**.

This category will reward the outstanding use of light gauge steel frame and related constructional steel elements in a project across any UK construction sector.

Including structural frame, walls, floors and roofing, cladding and complementary components, the entrant will have used steel as a key material in delivering a top quality, precision factory-controlled, sustainable offsite solution.

Special attention will be given to how steel has been used throughout the project, its material performance levels, circular economy principles and finished projects should clearly demonstrate how sustainability, cost-predictability, accuracy, transportability, speed of installation and wider principles of lean manufacture have been achieved.

Submit your entry here.

FABIG – FIRE AND BLAST INFORMATION GROUP

SCI's Fire And Blast Information Group (FABIG) will be collaborating, once again, with the Centre for Chemical Process Safety (CCPS), the European Process Safety Centre (EPSC), the IChemE Safety Centre (ISC), and the Mary Kay O'Connor Process Safety Centre (MKOPSC) to organise International Process Safety Day 2026, to be held on **2nd December 2026**.

This will be a virtual, full-day event, held on Tuesday 2nd December 2026. The IPSD 2026 will provide more than 8 hours of technical contents (incl. presentations, case studies and panel discussions) sharing advances in process safety. The programme will be repeated over a 24 hour period, so that delegates from all time zones will be able to view the full programme.

Registration is free-of charge and will be open shortly.

MEMBER NEWS

View all SCI Member News on our News and Media website.

NEWS & MEDIA

WELCOME TO OUR NEW MEMBERS

A warm welcome to our newest members:

DeSimone | ARCEN | edge structures
hutchinson | Lyons O'Neill Structural Engineers | nosa
McMahon Associates | KILNBRIDGE | FOUNTAINBASE ENGINEERING

If you would like to discuss the value of SCI Membership, or to receive a bespoke quote and benefits tailored to suit your company, email us or call +44 (0) 1344 636 525.

edge structures

Edge Structures is a structural engineering design practice based in London.

Since being established in 2005, Edge Structures has been committed to providing innovative and practical solutions for complex engineering challenges. Our team of experienced and highly-skilled engineers bring together creativity, technical expertise, and industry-leading software tools to deliver cost-effective and sustainable designs.

Our business is run on an ethical basis so apart from providing a high standard of professional service we are interested in the wellbeing and development of our staff and making a positive contribution to the community.

Our practice covers a wide range of services, from feasibility, conceptual design and analysis to detailed construction drawings. We have a track record of delivering successful projects across a diverse range of sectors, including commercial, industrial, education, leisure, and residential.

Our design portfolio ranges from stadia to private houses and includes projects in the UK and overseas. We apply innovation and technical expertise to design outstanding buildings. Clients and architects come back to us time and again because of our wide spectrum of knowledge, proactive service, drive for economy and elegant design. Our business is run on an ethical basis so apart from providing a high standard of professional service we are interested in the wellbeing and development of our staff and making a positive contribution to the community and to the environment.

hutchinson

Hutchinson is a UK-based engineering and fabrication partner delivering high-integrity steel structures to critical infrastructure sectors across the UK and international markets. Founded in 1979, the family-owned business has evolved from its petrochemical origins into a multi-sector manufacturer supporting telecommunications, offshore wind, energy infrastructure, and emerging nuclear programmes.

Operating across multiple UK facilities, Hutchinson provides end-to-end fabrication capability, combining advanced plate processing, machining, welding and assembly with rigorous quality assurance and full material traceability. By maintaining strong in-house control over production, the company delivers consistent quality, reliability and programme certainty for clients operating in highly regulated and safety-critical environments.

Continuous investment in advanced manufacturing technologies, digital processes and workforce development enables Hutchinson to scale production while maintaining flexibility and precision.

A growing focus for Hutchinson is supporting the UK's energy transition, particularly within offshore wind supply chains, where scalable fabrication models help strengthen domestic manufacturing capability and regional economic growth. By enabling efficient delivery through UK ports and fabrication hubs, the company contributes to resilient and sustainable supply chains.

At the heart of Hutchinson is a people-first culture, with ongoing investment in apprenticeships, skills development, and long-term engineering and manufacturing careers. Combining heritage, innovation and collaboration, Hutchinson continues to support the infrastructure projects shaping the UK's industrial future.

Lyons | O'Neill
Structural Engineers

Lyons O'Neill is an award-winning, independent structural and civil engineering consultancy dedicated to delivering refined design solutions across the UK and Europe. Established on a foundation of dynamism and technical creativity, we have built a reputation for excellence by blending sector-leading expertise with a highly personalised approach to every commission.

Our portfolio reflects our versatility and depth, spanning a diverse range of scales and sectors. From high-end private residential developments and large-scale commercial hubs to specialised education and leisure facilities, we pride ourselves on delivering refined, site-specific engineering. Beyond traditional construction, our team possesses extensive experience in the sensitive conservation of historic buildings and the execution of bespoke commissions, including complex glass structures and large-scale art installations.

What sets Lyons O'Neill apart is our commitment to Director-led involvement throughout the project lifecycle. We believe that the best outcomes are born from true partnership. By working closely with clients and design teams, we foster innovation at every turn, proactively identifying and mitigating challenges before they arise.

Our practice is defined by:

- Creative Flair: Applying "out-of-the-box" thinking to complex structural puzzles.
- Transparent Communication: Ensuring all stakeholders are aligned through clear, honest dialogue.
- Outstanding Value: Optimising designs to ensure efficiency without compromising on architectural intent.

At Lyons O'Neill, we don't just engineer buildings; we provide the structural integrity and creative vision necessary to bring ambitious architecture to life.

McMahon Associates

McMahon Associates is an award-winning company established in 2003 by Peter McMahon and provide Engineering Consultancy services to our clients throughout Ireland and the UK.

Peter along with the other principal of the practice Muriel Kerr, have grown McMahon Associates over the past 25 years and are a lead provider in the construction industry.

We provide a range of consultancy services including Civil, Structural, Fire and Traffic Engineering, Project Management and Health & Safety to both the private and public sectors.

McMahon Associates believe in providing a quality service to all our clients and on all our projects and this is reinforced by the company's Integrated Management System which is externally accredited.

Our projects range in nature and scale however the one constant is the quality of design and construction.

nosa

Established in 2022, NOSA Limited is a Gibraltar-based firm of consultant engineers committed to delivering agile, cost-effective, and high-quality structural and civil engineering solutions across Gibraltar, neighbouring jurisdictions, and beyond.

The company is led by Jack Noble and Albano Sanchez, who together bring over 60 years of combined experience in the engineering industry. By creating NOSA, they have been able to bring their passion for sustainable, efficient and responsible design to the market.

We offer a comprehensive range of services including Structural, Geotechnical, Civil, Highways, Transport, Aviation Engineering as well as Health and Safety, Project Management and Supervision, and Building Information Modelling services.

What sets us apart is our commitment to excellence and our bilingual capabilities which allows us to serve clients seamlessly locally and across international jurisdictions. Most of our engineers hold Baseline Personnel Security Standard (BPSS) clearances for Ministry of Defence works, as well as recognised professional Charterships, giving clients the confidence that their projects are in qualified hands.

We have a robust portfolio and experience in several construction sectors, including Residential, Commercial, Airfield and Defence, for both private and public client; and our team have delivered projects in over 14 different countries.

At NOSA Limited, our mission has been to achieve extraordinary results by driving the boundaries of innovative and sustainable design, offering long lasting value. We carry this with a vision in mind, which is to influence and shape international communities from The Rock's solid foundation. We are proud to be a trusted engineering partner in Gibraltar — combining local knowledge with international reach.

KILNBRIDGE

The UK's Leading Structures Specialist

Kilnbridge Group delivers complex structural steelwork and specialist cladding and envelope solutions for major building and infrastructure projects across the UK. Our work combines engineering, buildability, fabrication, design and delivery expertise to support technically demanding schemes from early development through to installation. Our capability is strengthened by specialist concrete design and delivery expertise that enables us to develop integrated and highly buildable structural solutions in all materials.

Our experience spans primary steel structures, architectural steelwork and specialist cladding interfaces, particularly where projects involve constrained sites, live operational environments, challenging logistics and high-quality requirements. This experience is reflected in rail projects such as Gatwick, Beaulieu Park Station and Cambridge North, which demonstrate our capability across structural, cladding and architectural steelwork.

Our wider experience includes Stratford Waterfront / East Bank (including BBC Music Studios and Sadler's Wells East), Whitechapel, Waterloo Station, Wembley Bridges, and Mill Hill and Cockfosters station lift works, together with utility buildings such as Euston Compactor Building and Uxbridge Station. We have also delivered numerous bridges and strengthening projects which illustrate the type of geometrically complex and technically demanding steelwork we are keen to continue developing.

Central to our approach is practical engineering, design for manufacture and assembly, welding and quality assurance, and the integration of structural, architectural and cladding requirements into buildable project solutions. This is particularly important on transport and infrastructure work, where access, interfaces, programme certainty and safe delivery are critical.

As a new SCI member, we are keen not only to support the steel sector through project delivery, but also to contribute to technical development, best practice, future guidance and the practical application of emerging standards.

CAUNTON ENGINEERING PROGRESSES STEELWORK FOR LONDON DEVELOPMENT

'Caunton Engineering is currently fabricating and supplying structural steelwork for main contractor Midgard Ltd as part of the 88 Royal Mint Street development in East London.

The project forms the final phase of a 650,000 sq.ft scheme being delivered by Network Rail and IJM Land at Royal Mint Street in London E1, close to the Tower of London.

Caunton Engineering's contract includes the fabrication and supply of more than 1,200 tonnes of structural steelwork to support two major steel transfer structures for the 14-storey mixed-use development. The works include podium steelwork incorporating a series of substantial trusses designed to support the concrete building above.

The northern steel structure spans part of a Network Rail viaduct, while the southern structure is positioned directly above two encapsulated Docklands Light Railway lines. Supporting columns carry a series of trusses measuring up to 13 metres in length and 3.5 metres in height where they span over the DLR lines, maintaining a 5-metre clearance for passing trains.

Fabrication of these large trusses is currently underway in Caunton's workshops.

The development will deliver a 446-bedroom aparthotel alongside 79 residential units, again constructed above two active railway lines. It follows the successful completion of the first phase of the wider masterplan, Royal Mint Gardens, which opened in 2019 and delivered 315,000 sq.ft of mixed-use space, including three residential buildings of up to 15 storeys and 256 homes built over operational rail infrastructure.

Architectural design for the project is by Brewer Smith Brewer, with structural engineering by Whitby Wood.

Caunton Engineering is pleased to be contributing to this technically complex and high-profile development, which demonstrates the versatility of structural steel in delivering major urban schemes above operational transport infrastructure.'

For more information, visit www.caunton.co.uk

caunton ENGINEERING

SCI
Steel Knowledge

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