Structural-Safety
SCOSS and CROSS

The Institution of Structural Engineers | ice Institution of Civil Engineers | HSE

CROSS

Confidential Reporting on Structural Safety

Newsletter 56 | October 2019

Editorial

Another milestone has been reached with the establishment of **CROSS-US>** in America. As their website says *"CROSS-US is a confidential system that captures and shares lessons learned from structural safety issues which might not otherwise be available to the public. Anyone is invited to confidentially submit reports of structural failures, near misses, concerns, and incidents for anonymous development of analysis commentary by subject matter experts, and to use the valuable information posted."* It is sponsored by SEI (Structural Engineering Institute), a division of ASCE (American Association of Civil Engineers) which has 150,000 members in 177 countries.

Glenn R. Bell, F.SEI, F.ASCE, FIStructE, Director of CROSS-US says *"learning from the performance of our built environment should be part of every Structural Engineer's education and be embedded in industry practice."* He and co-director Andy Herrmann have assembled a formidable panel of experts to provide advice on reports and are embarking on a series of promotional activities to make structural engineers and others in North America aware of the scheme.

They join CROSS-UK, CROSS-AUS (Australasia) and CROSS-SA (Southern Africa) as part of an expanding international network to share safety information for the benefit of the construction industries worldwide and the public.

At the recent IABSE (International Association of Bridge and Structural Engineers) in New York, CROSS-US engaged with, and gained support from, the Forensic Engineering Group whose members represent many countries.

DIRECTOR:
Alastair Soane

This is also the first anniversary of the launch of CROSS-AUS at ASCE 2018 by last year's President of IStructE Faith Wainwright. It has grown in stature, it too has established a formidable panel of experts, made many contacts within the industry, and published Newsletters. There have been several major issues with building safety in Australia during the year, so the initiatives from Director Mike Fordyce and his colleagues are timely and are helping to influence change.

CROSS relies upon receiving reports to enable it to function - and there is always a need for more. Names and identifying details are never revealed or published, nobody is ever blamed, and all reports with associated expert comments on the database are available at no cost.

If you have experienced a safety related concern or event relating to design, construction, operation, or indeed during demolition of a structure, then please submit a report so that others can learn.

Alastair Soane

CROSS
VISIT: **www.structural-safety.org>** EMAIL: **newsletters@structural-safety.org>**

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HOW TO REPORT
For more information, please visit the **How to Report>** page.

If you have experienced a safety issue that you can share with CROSS, please **Submit a CROSS Report>**.

If you want to submit a report by post, please send an email to **cross@structural-safety.org>** asking for instructions.

KEY
- (R) CROSS Report
- (C) CROSS Panel Comments
- (N) News
- (I) Information
- > Denotes a hyperlink

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Confidential Reporting on Structural Safety
VISIT: www.structural-safety.org EMAIL: newsletters@structural-safety.org

858: Repeating the same mistakes

R REPORT

As part of the correspondents' role in investigating engineering failures, it has struck them how regularly certain shortcomings arise; that is, different engineers keep repeating the same mistakes. The correspondent has decided to submit a CROSS report so that they can share these common errors with a wider audience and thereby help to reduce the regularity with which such simple errors are made.

- **The design of padstones:** These have been seen to be undersized or sized inappropriately (as a result of misunderstanding the extent to which the characteristic compressive strength of masonry can be increased locally below concentrated loads), or there is a lack of consideration concerning the implications of several padstones in close proximity and the interaction between them, or failing to take account of the effect of window and door openings.
- **Design of steel beams for torsion:** Excessive torsional rotation of steel beams has been identified as an issue, for example where edge beams support masonry cladding, because the engineer has not considered the offset nature of the loading, the destabilising nature of the loading, or the lack of lateral restraint to the steel beam.
- **Incorrect use of wind loading pressure coefficients:** Examples have been seen where general building pressure coefficients have been used for local elements (e.g. parapets, canopies and individual cladding elements). Such general pressure coefficients are likely to underestimate the forces. Care must be taken to use the correct pressure coefficients, which can be significantly higher for local elements such as parapets and canopies than the general building pressure coefficients.
- **Steel connections:** A particular issue identified is the engineer designing the steel members on the assumption that no moment is transferred through the beam to column connection, but the fabricator then detailing the connection such that significant moment transfer occurs. This can result in the relevant column being overstressed.
- **Structural interfaces in domestic buildings:** Not clearly detailing critical structural interfaces in situations where the implementation is left to a builder without further input from the engineer. The correspondent has seen examples of ad-hoc timber connections in roof structures and pockets cut into reinforced concrete beams, severely reducing their capacity. In such cases, the engineer had not produced a detail and the building contractor effectively produced their own design. Fortunately, these cases were found before construction was completed.
- **Generic design:** Use of generic designs in unsuitable locations. Examples include street furniture not suitably designed for the wind loads on seafront location and parapet copings not suitably designed for resisting the wind loads on high-rise buildings.
- **Masonry cladding:** Inadequate allowance for differential vertical movement in masonry-clad concrete framed buildings. This was an issue that came to the fore in the 1970s and was well-publicised. However, architects and engineers seem to have forgotten these lessons and the correspondent has recently seen many examples of inadequate movement joints. This is potentially serious, as the loads which are imposed on the masonry once the joints have closed can be sufficient to cause spalling and, in extreme cases, the masonry ties could be overstressed.

C COMMENTS

Like the reporter, the safety issues which the CROSS Panel see are often repeated. Many of the points raised in this report are obvious in hindsight to the experienced designer, most likely because they have encountered the issues themselves in the past, but they will not be at all obvious to less experienced designers.

Perhaps it is worth bearing in mind that if a career lasts 40 years, then around 2.5% of expertise leaves the industry each year, to be replaced by young entrants - therefore we all must be active in our learning and the promulgation of learning.

One way in which engineers may maintain and develop their knowledge of structural safety is to read CROSS reports. It is encouraging to see the IStructE taking the

I INFORMATION

What should be reported to CROSS?

Structural failures and collapses, or safety concerns about the design, construction or use of structures.

Near misses, or observations relating to failures or collapses (which have not been uncovered through formal investigation) are also welcomed. Reports do not have to be about current activities so long as they are relevant.

Small scale events are important - they can be the precursors to more major failures. No concern is too small to be reported and conversely nothing is too large.

Your report might relate to a specific experience or it could be based on a series of experiences indicating a trend.

Benefits of CROSS

- Share lessons learned to prevent future failures
- Spurs the development of safety improvements
- Unique source of information
- Improved quality of design and constructon
- Possible reduction in injuries and fatalities
- Lower costs to the industry

Supporters of CROSS

- Association for Consultancy and Engineering (ACE)
- Bridge Owners Forum
- British Parking Association (BPA)
- Building Research Establishment (BRE)
- Chartered Association of Building Engineers (CABE)
- Civil Engineering Contractors Association (CECA)
- Confidential Incident Reporting and Analysis Service (CIRAS)
- Constructing Excellence
- Construction Industry Council (CIC)
- Department of the Environment (DOE)
- DRD Roads Services in Northern Ireland
- Get It Right Initiative (GIRI)
- Health and Safety Executive (HSE)
- Highways England
- Institution of Civil Engineers (ICE)
- Institution of Structural Engineers (IStructE)
- Local Authority Building Control (LABC)
- Ministry of Housing, Communities and Local Government (MHCLG)
- Network Rail
- Royal Institute of British Architects (RIBA)
- Royal Institute of Chartered Surveyors (RICS)
- Temporary Works Forum (TWf)
- UK Bridges Board

lead on this, whereby from 2020 members must declare that they have studied CROSS and SCOSS reports as part of their annual CPD commitment. Furthermore, during the Professional Review Interview, which is a key part of the qualifying route to Chartered and Associate-Membership, candidates will be expected to demonstrate that they are using CROSS and SCOSS reports to satisfy the Institution's training objectives.

The reporter is thanked for sharing this collection of issues which they have encountered through their investigation work, and CROSS would welcome more reports from those who are directly involved in such engineering issues.

SUBMIT REPORT>

SUBMIT FEEDBACK>

N NEWS

CROSS-US podcast

Episode 8 of the Engineering Management Institute's Structural Engineering Channel podcast provides an overview of CROSS and details of the launch of CROSS in the USA.

Listen to podcast>

852: Rotting of cross-laminated timber (CLT) roof panels

R REPORT

The reporter was asked to check the roof of a building which had been leaking for a few years but was still occupied. The roof consisted of flat cross-laminated timber (CLT) panels with falls provided by firring pieces with insulation and supporting marine ply under the single ply membrane.

As part of their investigation, CLT panels on the roof, parapets and terrace were exposed. Inspection found that not only was the ply under the membrane rotten, but areas of CLT had also severely rotted. The reporter was shocked to see that in some areas, three of the typical five plies in the CLT panels had rotted through both on parapets and roof panels. Sloping sections of roof with the membrane on top of insulation seemed fine.

The reporter speculates that the issue is due to hidden water entrapped between an impervious roof membrane and the effectively impervious CLT panels. They were told that the roof had been allowed to become wet during construction, but it is not clear if the water which caused the rotting developed during construction or was allowed in following construction due to incorrect design and detailing.

The remedial works for the heavily damaged areas resulted in replacement of much of the flat roof areas using parallel chord timber trusses with metal webs for the longer spans, with more traditional joists used elsewhere. Less damaged areas were repaired by replacing the ply under the membrane, and in other areas, steel beams were connected to the CLT wall panels with shear rings cut into the panels.

C COMMENTS

CLT, like timber in general, will rot when excess moisture is present over long periods of time. It is worth considering how the CLT became exposed to water in the first place. The reporter speculates that the water could have developed during construction. It could also be due to condensation, or leaks in the waterproof membrane, or both.

It should be assumed that water vapour will pass through the CLT and into the construction above, unless specially treated to be impervious. With an impervious roof covering, such as the single ply membrane in this case, there are two ways in which the roof could be constructed; either with a cold deck or a warm deck. The 2002 BRE report **Thermal insulation: avoiding risks>** states that the preferred option is a warm deck roof and that the cold deck roof is considered a poor option in the temperate, humid climate of the UK, where sufficient ventilation may not be achieved in sheltered locations or in windless conditions, even when the roof is correctly designed.

What the reporter describes could be condensed water vapour dripping back into the building due to poor detailing or construction of the roof covering. **BS 5250:2011 Code of practice for control of condensation in buildings>** gives guidance on the risks associated with excessive humidity in buildings, notably mould growth and condensation, which can compromise the integrity of the building fabric. It describes the principal sources of water vapour, its transportation and deposition, and provides guidance on how to manage those risks during design, construction and operation.

The 2011 BRE paper **CLT - An introduction to low-impact building materials>** provides a broad view of the benefits and limitations of CLT for those considering its use in construction projects.

This report also highlights a theme that occurs in many CROSS reports which is of 'inspectability'. The object of an inspection is to detect a problem before it progresses far enough to become structurally dangerous. In this case, it looks as if there was no way of telling that the timber was rotting until degradation had progressed too far. With a trend for increasingly greater use of CLT in buildings, including tall buildings, it is important to ensure protection of the material from water and from other potential hazards.

Figure 1
Rotting of a CLT panel

SUBMIT REPORT>

SUBMIT FEEDBACK>

857: Fire resistance of multi-storey car parks

R REPORT

The February 2018 **SCOSS Alert on Fire in Multi-Storey Car Parks>** highlighted the risk of fire spreading between cars in a multi-storey car park. Fortunately, the car park where that fire occurred was constructed of reinforced concrete and had a fire resistance considerably greater than the minimum 15 minutes required by Approved Document B to the Building Regulations.

However, according to the **Merseyside Fire & Rescue Service Protection Report>** on the fire, the use of slots in the floors for drainage, combined with aluminium gutters and PVC downpipes allowed the fire to spread rapidly between floors and the structure was severely damaged.

The reporter visited a recently constructed car park which contained some of the design issues discussed in the Merseyside Fire & Rescue Service Protection Report. They find it difficult to believe that this car park could survive for significantly more than 15 minutes in a fire without collapsing.

If a fire similar to the December 2017 Liverpool fire occurred in this car park, the reporter feels it is likely that it would spread even more rapidly and that after little more than 15 minutes, floor areas and the structural frame would begin to fail, allowing burning cars to fall on to the deck below. Complete collapse of the structure would probably not take long.

The reporter visited a recently constructed car park which contained some of the design issues discussed in the Merseyside Fire & Rescue Service Protection Report. They find it difficult to believe that this car park could survive for significantly more than 15 minutes in a fire without collapsing.

They go on to say that if the fire did spread rapidly, then firefighters could not enter the building to try to put the fire out, because of the danger of collapse. This would negate the assumption behind the 15 minute fire rating for multi-storey car parks, which is that firefighters should be able to get in and extinguish a car fire before it spreads to more than 2 or 3 vehicles.

The reporter also highlights that if the structure were to collapse, it might not collapse tidily onto its own footprint, and could instead fall laterally, discharging burning cars on to the ground well outside of its own footprint.

The reporter concludes that despite the publication of the SCOSS Alert in February 2018, this form construction is still permitted by Approved Document B to the Building Regulations and could be used for multi-storey car parks up to 30 metres high.

C COMMENTS

It is disappointing to hear that the lessons from the Kings Dock car park fire in December 2017 are in some cases not being learned for the design of new car parks. The SCOSS Alert on Fire in Multi-Storey Car Parks was published to help those who own, commission, design, construct, or maintain multi-storey car parks to learn the lessons from this event.

As recently as September 2019, there was a **severe fire at a multi-storey car park in Cork>** which destroyed up to 60 cars and it was reported that the blaze quickly spread to other cars in the area. A worrying trend of severe multi-storey car park fires may be developing. In February 2018, there was a **car fire on the 7th floor of the 100 storey John Hancock Centre in Chicago>** which was controlled by sprinklers until the fire services arrived, possibly preventing its spread to other vehicles.

Structural-Safety worked with the British Parking Association (BPA) to submit evidence to the **technical review of Approved Document B of the building regulations>** in March 2019 which called for further research to be conducted into the risk of fire spread in car parks. In September 2019, MHCLG published the analysis of responses to the call for evidence, which for car parks stated that *"There was wide support for a review of standards for car parks whether basement, otherwise enclosed, semi open or open. The nature of the Liverpool fire, some basement incidents and the changing nature of vehicles were all seen as in need of review."* The report states that the Government will work with industry and the Building Regulations Advisory Committee (BRAC) to consider the full range of technical areas raised in the Call for Evidence and determine a detailed plan for taking this review forward.

The reporter mentions compliance with Approved Document B, but it is important to remember that the structure must comply with the Building Regulations themselves. In particular, Regulation 8, Limitation on requirements, states:

> *Parts A to D, F to K, N and P (except for paragraphs G2, H2 and J7) of Schedule 1 shall not require anything to be done except for the purpose of securing reasonable standards of health and safety for persons in or about buildings (and any others who may be affected by buildings, or matters connected with buildings).*

Note that Regulation 8 requires the health and safety of those 'about buildings' and 'who may be affected by buildings' to be safeguarded as well as those 'in' buildings. Safety depends on assuring the structure, as a whole, possesses certain attributes. One of these is to permit the safe escape of occupants, but as the reporter points out, safety for firefighters, minimising the risk of fire spread to neighbouring buildings and risk of structural collapse outside of the building footprint are others.

SUBMIT REPORT>

SUBMIT FEEDBACK>

680: Late detection of flange/web splitting on steel beam

R REPORT

When loading fabricated members for a steel truss to be installed as part of a roof in a large industrial building on to a delivery lorry, a slight but unusual ridge was noticed by a reporter in the paint longitudinally along the interface between the flange and web for a hot rolled steel I section chord member. The beam, which was painted, was not deep and the web thickness was thin.

The paint was subsequently removed and revealed a crack. A section of the flange was then cut out to investigate the crack with a view to carrying out a local welded repair if possible. When the flange was cut across its width, well beyond both ends of the visible crack, the flange fell away revealing rusting at the connection of the flange to the web, extending further than originally thought. A crack through the web appears to have existed undetected and there was no significant connection between the flange and the web, says the reporter.

Despite having rigorous quality assurance/ inspection procedures in place, this issue appears to have slipped through many 'nets'. The reporter states that only the vigilance of yard staff has potentially averted disaster since, had the flange been subjected to significant compression, local flange/web buckling could have occurred leading to failure of the member and possibly the truss.

The reporter feels that while this may be an isolated incident, others should be alerted to it due to the difficulty in detection, which could result in hidden and dangerous defects.

C COMMENTS

This is an unusual case which the CROSS Panel have not come across before, demonstrating that new safety issues continue to come to light. The fact that the crack surface was rusty as shown in the picture, suggests that it must have been there for a considerable period of time.

The crack cannot be due to lamellar tearing as this only occurs where there is welding, and this beam was a hot rolled I section. The beam was painted, not galvanized, so Liquid Metal Assisted Cracking (LMAC) can also be ruled out. It is possible for steel to have laminations, but this crack is across the thickness of the web.

The most likely conclusion is that the manufacturing of the hot rolled I section did not comply with the required standard. The advice is to be alert, conduct visual inspections and only purchase steel from organisations who meet the appropriate manufacturing standard. For steelwork, BCSA/TATA Steel publication **Steel Construction - CE Marking>** is a useful document and states that in order for steelwork contractors to demonstrate their right to CE Mark their products, they must provide the following three documents:

1. Factory Production Control (FPC) Certificate - issued by a notified body
2. Welding Certificate - issued by a notified body
3. Declaration of Performance (DoP) - issued by the steelwork contractor

SUBMIT REPORT>

SUBMIT FEEDBACK>

Figure 2
Flange/web splitting on steel beam (approximate crack location shown in red on sketch to the right)

N NEWS

CROSS feature in BBC Radio 4 Analsyis show on maintenance

CROSS helped BBC Radio 4 with their analysis show on maintenace of infrastructure. The show is 28 minutes long, and CROSS is discussed 11 minutes in by Structural-Safety member David MacKenzie.

Listen to analysis show>

N NEWS

RAAC Learning Group

Following the publicaiton of the **SCOSS Alert on Failure of Reinforced Autoclaved Aerated Concrete (RAAC) Planks>**, SCOSS established an RAAC Learning Group at the request of readers who wanted to share experiences with others working on similar projects.

Find out more about RAAC Learning Group>

N NEWS

Safety of hanging systems: lessons from CROSS reports

The IStructE have published an article from Structural-Safety member Allan Mann on the safety of hanging systems, which explores the reasons why hanging system fail and suggests that increased design attention is required to assure system safety.

Read IStructE article on safety of hanging systems>

849: Safe use of lifting magnets

R REPORT

A two-tonne footway panel lift using magnetic lifting equipment was abandoned, averting a potential low-probability high-consequence event, says a reporter. The number and safe working load of the lifting magnets, the centre of gravity of the panel, shackles, slings, lifting frame and crane load chart capacity were all reviewed and approved. However, the 7mm thick panel was less than the minimum material thickness required to obtain a 'closed circuit' and 100% magnetic clamping force. This significantly compromised the hold integrity of the lifting magnets. Without sufficient magnetic clamping force, the panel was dropped uncontrolled without serious damage.

The operation was reported as a close call noting that the lifting magnets hired required a minimum flat steel thickness of 60mm to achieve the one-tonne per magnet safe working load. The lift was abandoned until suitable lifting magnets were sourced from a different supplier capable of achieving the safe working load with the constraint of the 7mm thick panel.

The reporter points out that anyone who specifies a particular method of work is considered a designer under the Construction (Design and Management) Regulations 2015. By proposing to source lifting magnets instead of fabricating lifting eyes to fit the panel, the contractor specified a method of work, effectively taking on the role of the designer, says the reporter.

The reporter aims to highlight the following key points from this incident:

- During procurement, lifting magnet suppliers have a duty of care to inform the industry of the factors affecting the safe working load.
- Air gaps, material type, contact area and material thickness affect the magnetic clamping force between lifting magnets and the load.
- The capacity of the crane, lifting frame, slings and shackles are often checked in risk assessments and lifting checklists. Risk assessments and lifting checklists should be revised to allow for other available products in the market.
- A holistic understanding of plant and equipment procured through hire companies along with the risks associated in their safe use must be communicated to the operatives on site.

C COMMENTS

It is fortunate that this event was a close call rather than what might have happened if the lift had proceeded. The report highlights a risk since non-specialists would be most unlikely to have the experience to understand constraints that might apply to this lifting methodology. An important but often overlooked safety mitigation measure is to have a prescribed exclusion zone so persons are excluded from any potential for fall during lifting operations.

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)> place duties on people and companies who own, operate or have control over lifting equipment. In most cases, lifting equipment is also work equipment so the **Provision and Use of Work Equipment Regulations 1998 (PUWER)>** will also apply (including inspection and maintenance). All lifting operations involving lifting equipment must be properly planned by a competent person, appropriately supervised and carried out in a safe manner. The **Lifting Equipment Engineers Association (LEEA) website>** contains useful information on this topic.

The HSE published **guidance on the Construction (Design and Management) Regulations 2015>** which states that a designer is an organisation or individual, who:

a. prepares or modifies a design for a construction project (including the design of temporary works); or
b. arranges for, or instructs someone else to do so.

The document goes on to say that the term 'design' includes drawings, design details, specifications, bills of quantity and calculations prepared for the purpose of a design. Designers include architects, architectural technologists, consulting engineers, quantity surveyors, interior designers, temporary work engineers, chartered surveyors, technicians or anyone who specifies or alters a design.

Magnetic lifting is routinely and safely used in many industries, for example in ship building, where there is more familiarity with the methodology.

SUBMIT REPORT>

SUBMIT FEEDBACK>

N NEWS

Guidance on care and management of historic fibrous plaster in the UK

In June 2019, Historic England published guidance for conservation professionals and building managers responsible for buildings with fibrous plaster in the UK, which is a topic that CROSS has published safety reports on.

View guidance on historic fibrous plaster>

N NEWS

Advice for owners of residential buildings with balconies

In June 2019, MHCLG published advice on the risks arising from balconies on residential buildings. Safety risks with balconies is a topic which SCOSS are monitoring and expect to publish a safety alert on in the near future.

View MHCLG advice on balconies>

N NEWS

New Structural-Safety members

Julie Bregulla, Director of Fire & Building Technology at BRE, and Steven Odunmbaku, Engineering Policy Manager at NHBC, were recently invited to become members of Structural-Safety. You can view all of the Structural-Safety members on the people page of the Structural-Safety website.

View Structural-Safety members>

675: Collapse of unsupported trench

R REPORT

A worker was trapped within a partially collapsed excavation whilst undertaking the construction of a ~10m long, 1m wide and 2m deep trench. The excavation was unsupported and was not suitably benched/sloped.

The reporter lists the following causes:

- **Ground investigation:** The geotechnical investigations identified ground water at ~1m deep. The bottom of the trench was designed to be below the ground water level identified from the geotechnical investigation and therefore within the ground water zone, indicating that the design did not properly consider this information.
- **Design risk assessment:** The design risk assessment did not identify key risks for the construction team to mitigate. Namely, ingress of ground water and the potential for trench collapse.
- **Design review:** Temporary works requirements were not clearly identified and resolved. It was not physically possible to complete the works with a benched/sloped excavation. Therefore, it should have been identified that temporary works were required.
- **Plan of work:** The plan of work did not adequately cover the full activities of the trench construction.
- **Close call reporting:** Concerns were previously raised to the site management team when conducting similar work in a trench. These concerns were not recorded or acted upon.
- **Site inspections:** Site inspections did not identify potential hazards for the works.
- **Supervision:** Supervision on site allowed or instructed the worker to enter an unsupported trench.

C COMMENTS

The first report in this Newsletter referred to 'repeating the same mistakes'. There cannot be a better example of repeating the same mistakes than this case. It is of continued concern to hear of yet another unsupported trench collapse. All excavations are inherently dangerous and something as deep as 2m requires proper engineering consideration for assuring wall stability. The worker is lucky to be alive as collapsing unsupported trenches have often had fatal consequences.

There are countless news stories of collapsing excavations having fatal consequences, including a **contractor being fined £2.6 million>** after an employee died when a trench he was working in collapsed on him, and below is a list of just a few CROSS reports on this topic.

128 House collapse>
214 Need for licensed builders>
368 Potentially dangerous excavation>
576 Worker trapped in excavation>
800 Retaining wall excavation collapse>
AUS-6 Lift pit excavation hazards>

There is valuable industry guidance on the support of excavations, including HSE's article on **structural stability during excavations>**. This report also highlights the need for suitable temporary works procedures on construction sites that follow the principles of **BS 5975 Code of practice for temporary works procedures and the permissible stress design of falsework>**.

In June 2019, the Temporary Works Forum (TWf) published guidance on **The safe management of temporary works - The basics for small and medium-sized enterprises (SMEs)>**. A competent Temporary Works Coordinator (TWC) should be able to identify and addressed the risk of a trench collapse. Those in the industry with the knowledge and contacts to do so, must help to inform workers and supervisors of the inherent dangers of trenches.

SUBMIT REPORT>

SUBMIT FEEDBACK>

N NEWS

Firm fined £1.3m over falling debris

A company has been fined £1.3m> after a woman was killed by a water tank cover which blew off from a roof.

Between 2005 and 2007, CROSS collected information from Local Authorities in Scotland on materials and debris that had fallen from buildings, and concerns about materials or components that might fall. The findings from this project were published in the 2008 report **Confidential Reporting on Structural Safety for Scottish Buildings>**.

If you are aware of any damage caused to structures from weather effects, please submit a confidential report to CROSS to help the industry learn more about the impact of weather effects.

Submit CROSS report on weather damage>

N NEWS

Fire safety: Approved Document B update

Approved Document B, which is statuatory guidance for building regulation in England covering fire safety matters within and around buildings, was updated in September 2019.

View Approved Document B update>

N NEWS

HSE article: Ensuring structural stability during demolition and refurbishment work

In May 2019, the HSE published an article looking at the learning points from incidents that have occurred during demolition and significant refurbishment work.

Read HSE article on ensuring structural stability>

730: Collapsed scaffolding

REPORT

Scaffolding was erected in order to support a temporary roof as part of a first-floor extension to a school building. Following modest levels of snow fall in the winter, the scaffolding collapsed inwards, says a reporter. The wind speeds were low and not thought to be a contributing factor to the collapse.

The reporter expected such a structure to be designed for snow loading in accordance with current standards, so concluded that the scaffolding was not constructed properly. However, when they visited the site after the collapsed scaffolding was reconstructed, they were unable to obtain any information from site personnel on the causes of the collapse.

The reporter climbs scaffolding frequently in the course of their work and this event highlighted to them the importance of carrying out a continual 'risk assessment' before and during use of scaffolding.

COMMENTS

The design and construction of scaffolding requires the same degree of competence and quality as does permanent works and if this is not the case, then collapses can occur. If the scaffolding was being used (at least in part) as a means of access and a working platform, as well to support a temporary roof, then **BS EN 12811-1 Temporary works equipment - Scaffolds - Performance requirements and general design>** and **TG20:13 Good Practice Guidance for Tube and Fitting Scaffolding>** provide industry guidance for the design for tube and fitting scaffolding. The **Work at Height Regulations 2005>** set out the requirements for inspection (nominally every 7 days).

The scaffolding is also temporary works, so the principles of **BS 5975:2019 Code of practice for temporary works procedures and the permissible stress design of falsework>**, published in May 2019, also applies. How often is scaffolding of this nature subject to an independent check?

Again, there is a collection of CROSS reports on safety issues concerned with scaffolding.

79 Scaffold collapse>
111 Unauthorised scaffolding>
152 Scaffold collapse and slipping clips>
219 Deficiencies on access scaffold>
230 Defective imported scaffold ties>
407 Unsafe timber scaffolding>
430 Failure of anchor bolts holding suspended scaffold>
436 Mobile scaffold tower falls 7 storeys>
571 Injuries from falling scaffold tube>
575 Scaffold overturn>
701 Designed scaffold built incorrectly>
702 Scaffold lifting beams incorrectly installed>

SUBMIT REPORT>

SUBMIT FEEDBACK>

NEWS

CROSS Forum event (with free pizza)

The next CROSS Forum event will take place at 6pm on Thursday 7 November 2019 at the IStructE HQ in London.

Keynote speaker Neil Gibbins, past president of the Institution of Fire Engineers (IFE) and CEO of IFE from 2015 to 2018, will talk about 'competence post-Grenfell' and highlight how the industry is changing to avoid further disasters.

Two early career engineers from the ICE and the IStructE will then deliver short presentations on a CROSS report of their choice.

Price & Myers> and **SD Structures>** are kindly sponsoring a pizza and drinks reception after the talks.

Book a place at CROSS Forum event>

PARTICIPATION

The success of the CROSS scheme depends on receiving reports, and individuals and firms are encouraged to participate by sending reports on safety issues in confidence to **CROSS>**.

FEEDBACK

If you have any comments or questions regarding this CROSS Newsletter, please **Submit Feedback>**.

CPD PRESENTATIONS

Structural-Safety are giving lunchtime presentations to organisations who are interested in learning more about the work that Structural-Safety (CROSS and SCOSS) do, including sharing examples of safety issues to learn from.

For more information contact **events@structural-safety.org>**.

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