

NEWSLETTER No 29, JANUARY 2013

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Reports sent to CROSS are de-identified, categorised, and sometimes edited for clarification, before being reviewed by the CROSS panel of experts. The panel makes comments that are intended to assist those who may be faced with similar issues. In the Newsletters the reports are shown in black text and the comments are shown below these in green italics. Reports and comments are also given on the web site data base.

This Newsletter gives six examples of reports on the quality of documentation accompanying some products. Correct and unambiguous documentation is essential for maintaining structural safety and is relied upon by designers, suppliers, contractors, and end users. Whilst the examples are related to steel products, other components and manufactured goods may have similar issues.

The matter is of concern to SCOSS and an Alert will shortly be issued to give more emphasis to the importance of checking the correctness of statements made about products before they are incorporated in construction works. Guidance on how to identify false or misleading documentation is needed and any help or advice that can be given by readers will be most welcome.

Two other reports deal with responsibilities: the first with the dangers of divided design and the second with the demolition of an unstable wall.

The CROSS programme depends on receiving reports and individuals and firms are encouraged to participate by sending concerns in confidence to structural-safety.

259 QUALITY OF SOME IMPORTED STEEL COMPONENTS

We are aware, says a reporter, that the construction industry is procuring many materials such as steel plates, structural sections, and metal castings from outside the UK and that these are often found to have some issues in meeting specification. We have, he continues, had several experiences where the strength and characteristics of castings, plates, and manufactured 'off the shelf' products, did not meet the project specifications. Products have also been received with paperwork that demonstrates compliance with specification but when destructively tested did not meet the properties given in the accompanying certificates.

Comments

There are six reports related to certification (259, 299, 326, 331, 338 and 284) and comments for this group are given after report 284 on page 4.

299 DOCUMENTATION FOR IMPORTED LARGE DIAMETER STEEL PINS

When designing a large pin connection for an external walkway bridge linking two buildings in the UK a reporter specified 60mm diameter solid circular bar for the pin. Due to the loads, higher grade S355 material was selected, and due to the thickness and external exposure, J2 subgrade was chosen. As the quantities were small and timescales tight, the reporter took the precaution of ensuring suitable material was available from a stockholder. He was assured that it was. Since the specification (S355J2G3) is not common-place and the element was of critical importance the reporter

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What should be reported?

- concerns which may require industry or regulatory action
- lessons learned which will help others
- near misses and near hits
- trends in failure

Benefits

- unique source of information
- better quality of design and construction
- possible reductions in deaths and injuries
- lower costs to the industry
- improved reliability

Supporters

- Association for Consultancy and Engineering
- Bridge Users Forum
- British Parking Association
- Communities and Local Government
- Construction Industry Council
- Department of the Environment
- DRD Roads Services in Northern Ireland
- Health & Safety Executive
- Highways Agency
- Institution of Civil Engineers
- Institution of Structural Engineers
- Local Authority Building Control
- Scottish Building Standards Agency
- Temporary Works Forum
- UK Bridges Board

To find reports in the data base go to the **Quick Search** box on any page of the [Structural-Safety](#) site and enter a subject e.g. "wall" and a list of summarised reports will follow. Searches can be refined using **Search data base** facility.

requested a certificate confirming the grade. When received, this indeed certified S355J2G3 material and revealed the material had originated outside the UK. However, a note on the form stated that the material was tested normalised and supplied as rolled. The implication is that the required ductility was not available from the material as supplied and in fact no information on the ductility / brittle fracture performance of the material was available. In short, the supplied material was not as advertised by the certificate and would only achieve the specified grade if subjected to normalising - a heat treatment process. The layout of the form had misled both the stockholder and the steel fabricator, neither of whom were aware that the material was potentially unsuitable. The problem was resolved by heat treating (normalising) the steel pins. However it highlights the possibility that foreign steel, with poor, confusing or misleading documentation, is being used on safety critical structures in the UK

Comments

See page 4.

326 RAPEX NOTIFICATION ON SOME IMPORTED RHS STOCK

A Government Department in an EU country issued a letter warning about the potential importation of structural steel products that do not comply with the requirements of Council Directive 89/106/EEC - the 'Construction Products Directive'. It said that the product failures can arise in hot-formed longitudinally welded hollow profiles and cold-formed longitudinally welded hollow profiles of unalloyed construction steels of types S355J2H and S235JRH with nominal dimensions from 80 x 80 x 6mm to 500 x 300 x 12.5 mm. Such products fall within the remit of *EN 10210-1.2006 – Hot finished structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions* and *EN 10219-1.2006 – Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions*. Due to incorrect aluminium content, these steel products are only suitable for welding in limited applications. In broad terms, there is a risk of failure to the welds without warning. In light of the potential seriousness of the risk, a RAPEX notification was issued. Given the potential seriousness in connection with product failure arising from such hollow profiles, the Department asked building control authorities to make enquiries to ascertain where such products have been used and take all appropriate action in the event that the importation of any such hollow profiles is identified.

Comments

[RAPEX](#) is the EU rapid alert system that facilitates the rapid exchange of information between Member States and the Commission on measures taken to prevent or restrict the marketing or use of products posing a serious risk to the health and safety of consumers with the exception of food, pharmaceutical and medical devices, which are covered by other mechanisms. Since 1 January 2010, as regards goods subject to EU harmonisation regulation, the system also facilitates the rapid exchange of information on products posing a serious risk to the health and safety of professional users and on those posing a serious risk to other public interests protected via the relevant EU legislation (e.g. environment and security). Both measures ordered by national authorities and measures taken voluntarily by producers and distributors are reported by RAPEX.

BCSA (British Constructional Steelwork Association) issued a memorandum (No 156-12) to all of its members about this RAPEX Notification (notification number Article 22 of Regulation 765/08) in July 2012. An extract says: "The results of the testing showed that most of the sections were made of unkilld

or killed steel rather than fully killed steel required by the standards. Fully killed steel has a minimum aluminium content of 0.02%. All the steels tested by the German Authorities had aluminium content that fell below this value. Unkilled or killed steels are steels which have not been sufficiently deoxidised and can develop 'gases' during solidification with the formation of blow-holes. This may cause problems when welding and the advice from German authorities is that the products affected can only be welded to a limited extent and that the welds are at risk of failure."

See also the comments on page 4.

331 CERTIFICATION OF STEEL SHEET PILING

A Government Agency received a proposal to use steel sheet piles produced by an overseas manufacturer. To demonstrate compliance with standards, certification was supplied, indicating that these products carried CE marking. The certificates were passed from sub-contractor to main Contractor without comment. Only when the documents were examined by Agency staff were concerns raised about their authenticity.

Details on the certificates did not follow the requirements for CE marking of products, namely:

- compliance was quoted with a non-harmonised standard
- the assessment was not carried out by a Notified Body
- other supplied detail suggested that this certificate was invalid.

The information was passed to a local Trading Standards Office (who has authority to investigate such matters, though they do not necessarily have the expertise and detailed knowledge of construction products). Some technical support was provided by the Government Agency to facilitate the subsequent investigation. The 'certification company' was found to be a shell company with no base in the EU, and other information was found to be false. The breach was discovered before the purchase of the sheet piles and as there was no prospect of a prosecution, the investigation was halted. Details of the case were entered on Trading Standards' National Database, but it is possible that this situation may recur. One of the lessons learnt was that supply chains must appreciate their responsibility to ensure that they have acted with 'due care' and rigorously check product certification.

Comments

See page 4.

338 CONCERN ABOUT CE MARKING FOR REINFORCING STEELS

The chairman of UKCARES wrote after reading with interest CROSS [Newsletter Number 27](#), its associated summary reports and their related comments. The theme in the Newsletter was one of confidence in compliance, and the various reports seemed to question the validity of third party certification, particularly in a globalised context. He was particularly interested in Report 254 ([Steel connector failures and forged certificates](#)) which makes reference to the risks associated with CE Marking. He goes on to say that CARES and many of its stakeholders, including clients, designers, contractors and manufacturers, have similar concerns and consider that the Schemes operated by CARES have a greater value in risk reduction than is provided by CE Marking. The group is currently going through an exercise to articulate the enhanced protection to clients provided by the CARES Schemes and to identify possible mitigation measures to assist clients when the Construction Products Regulations are in operation. They would be very happy to hear of concerns that CROSS readers may have in relation to certification of any kind, including CE Marking, particularly in those product areas in which CARES is involved. i.e. steel and steel products related to construction. In this way, CARES might be able to provide direct answers to those concerns.

Comments (extract from CARES web site)

[CARES](#) is an independent, not-for-profit certification body, established in 1983 to provide confidence to the users, purchasers and specifiers of constructional steels through a regime of regulation, testing and inspection. It operates for the benefit of the construction industry offering certification schemes for companies that produce materials, components or offer services, primarily to the reinforced concrete industry. Clients can specify CARES approved companies and products with confidence that they will comply with the relevant product or system standards and without the need for verification testing by the purchaser or contractor.

See also the comments on page 4.

284 FALSE CE CERTIFICATES

This report is about falsified documents in circulation within the EU purporting to be CE certificates. In one case it was found that the organisation concerned, which has its origin in the Far East, had set up a company in Europe, which claimed to be a competent consulting organisation providing advice on the European Health and Safety Directive for a variety of products. Documentation from the company was shown to be false and among other errors one certificate was observed to have used a Notified Body Number for one class of products, which was clearly wrong because the Number is allocated to another class of products. The European company was closed down by the authorities but there is still an internet site offering certification services. Clues as to the illegitimate nature of the site can be found in obvious spelling mistakes and incorrect grammar. The reporter says that sadly the old story about “CE” standing for “Caveat Emptor” has a ring of truth about it.

Comments

Reports 259, 299, 326, 331, 338 and 284 follow a common theme and reveal a worrying trend. The fact that there are reports concerning different products suggests that these incidents are not rare. Designers and contractors may need to consider as a matter of ensuring structural safety whether to instigate routine testing of any product purchased from a source which is not well known. The globalisation of material supply and the introduction of CE marking are raising issues about the quality of material received on site. It is clear that CE marking alone may not offer the same level of confidence as quality schemes that have been used historically. CE marking is a standardised method of giving product characteristics against a harmonised EN. It is not a declaration of fitness for purpose in any particular circumstance of use and a reputable product manufacturer's technical information may be more useful if it gives advice on the use of the product in service.

There is confusion over when and if CE marked products need to be used especially in projects which are publically procured. In fact CE marking is a significant topic for Public Procurers. A related issue is the readiness of clients, designers, contractors, suppliers and manufacturers for the introduction of the CPR in July 2013. The [Construction Products Regulation](#) (305/2011/EU - CPR) – replacing the Construction Products Directive (89/106/EEC – CPD,) is laying down harmonised conditions for the marketing of construction products. Also of concern is whether in the UK the 'market surveillance' required is in place (via Trading Standards Organisations) and that they have the necessary resource and expertise. Detecting forgeries is not easy and in 2010 the UK Department for Business innovation and Skills issued a warning about organisations falsely claiming to be notified bodies which included the following. “The Department is aware of some cases where organisations either claim or present themselves so as to appear to be notified bodies (e.g. in websites and in their publicity materials), when they actually hold no such appointments. Such claims are misleading manufacturers and importers into using the services of organisations promoting themselves as notified bodies authorised to undertake conformity assessment and certification process, when in fact, they are not authorised to do so.

Practical guidance is needed and as an example [BCSA](#) has issued some simple, practical advice guidance to its members (memorandum No 193-10) on how to check a CE marked certificate. With their permission it is reproduced below.

“For most Steelwork Contractors purchasing CE Marked steel sections, bolts and welding consumables is still relatively new. It is therefore important that those ordering and checking goods are able to identify a valid CE Mark. All manufacturers of CE Marked products (steel sections, structural bolts etc.) are required to have an “EC certificate of conformity”. This should be signed by the “Notifying body” and show the specific range of grades & products covered. It is not a blanket certificate for all products. The manufacturer should only be CE marking those products listed on the Certificate. A copy of the certificate can be obtained from the manufacturer or the supplier.

- *EC Certificate of Conformity*
- *The EC Certificate is produced by the Notified Body and should include:*
- *Name and address of Notified Body*
- *Name and address of the manufacturer or his agent in the European Union*
- *Description of the product (type, identification, use...)*
- *Provisions to which the product conforms*
- *Particular conditions applicable to the use of the product*
- *The certificate's number*
- *Conditions and period of validity – where applicable*
- *Name and position of the person empowered to sign the certificate.*

The Notified body must be approved by the European Commission and the following website can be used to check this: <http://ec.europa.eu/enterprise/newapproach/nando/>. The manufacturer is also required to produce a "Declaration of conformity". Once again a copy can be obtained from the manufacturer or the supplier."

From the reports and the comments of the CROSS expert panel it would seem that guidance on the confidence given by, and the acceptability of, CE marking and the use of the Construction Products Regulation would be timely.

CROSS has previously published reports on quality and these include:

- *Report 70 [CE marking for structural steelwork](#) – Newsletter No 6*
- *Report 254 [Steel connector failures and forged certificates](#) – Newsletter No 27*
- *Report 256 [Adequacy of termination connectors for tensile bars](#) – Newsletter No 27*

229 LITIGATION ON DIVIDED RESPONSIBILITIES

Divided design responsibilities, says a reporter, are a common source of litigation. In two recent cases he reported on a steel frame relying on rigid connections for stability, and on a frame which needed rigid connections but the engineer's intent was not clear. Both projects required the frame suppliers to design the connections, a common subdivision of responsibilities. In the first case it was impossible to design rigid connections without heavy plating and stiffening in the columns and beams in a manner not anticipated at tender. The client refused to pay the extra cost which led to the claim. The frame designer had adopted a "minimum weight" approach and was found not to have met his obligations. In the second case a structural engineer made concept sizing errors in the connections of a frame. Rigid joints were required but the details provided led the frame supplier to assume the frame could have simple joints and be braced. Elaborate plated connections were needed when the frame supplier found that bracing would not be permitted. The client paid extra costs and delay and claimed these from the engineer who was found not to have met his obligations.

In both cases the connections were fundamental to structural stability and responsibility to adequately define them remained with the engineer, but while the engineers met their design responsibility for overall stability, they failed to adequately define the design interface and failed to adequately define connection design responsibilities expected of the contractor. In both cases the contractor was obliged to take on a greater design responsibility to ensure a safe structure was built. If engineers became more aware of their potentially wide legal liabilities it would encourage them to more thoroughly define the scope of the contractor's responsibilities. Where a contractor is to be responsible for certain aspects of the design this should be made clear in a legal agreement.

Comments

The UK's [National Structural Steelwork Specification](#) (NSSS) endeavors to define responsibilities and allocate them as between designer and steel contractor, and the information provided has to include that which defines overall frame stability. The problem about connections is one that repeats many times. Although a fabricator might carry out the detail design of the connections, there is a clear responsibility on the main designer to assure that a connection design is feasible. The whole stability and load transfer system of a steel frame (including a huge amount of its cost) is linked to connection design and it is a poor and potentially unsafe design that places an impossible burden on the detailer.

306 WALL COLLAPSE FROM BUILDING IN CITY CENTRE - WHO IS RESPONSIBLE?

A consulting engineer was asked to attend a site by the local Council because the roof of a privately owned factory building was in a dangerous condition. The Council had told the owner that this needed repair as the tenant in the building was at risk. At the time the owner did not want to employ the reporter's firm and the reporter assumed that he went elsewhere. Sometime afterwards the firm was again called out at the request of the Police as a wall had collapsed. It was by luck that no one was injured as the wall was 4-4.5m high, approximately 18m long, and nearly 40t of bricks collapsed into a road crushing three empty vehicles. It transpired that the owner had intended to re-develop the site and as a preliminary measure the roof of the building had been taken off thereby removing lateral restraint to the wall. The owner of the building said that he had been told that there were piers in this wall which would provide stability. It was easily proved by calculation that this would not be the case. The reporter asks who should be responsible.

Comments

CROSS has published many reports of wall collapses and it is clear that many in the construction industry (and owners) fail to grasp the potential risks of collapse and the consequences that can follow: deaths and serious injuries. Under CDM there are responsibilities during demolition to ensure stability at all times. Ultimately the responsibility remains with the

owner and it is up to him to employ suitably qualified persons to design or supervise a demolition contract. It is unclear from the report what the role of the local authority was in this case although it appears that the initial call out might have been as a result of a reported dangerous structure. Local authorities in England and Wales have powers under the Building Act 1984 (or London Building Acts (amendment) Act 1939, in the case of London) in relation to dangerous structures. These powers include requiring structures to be shored up repaired or removed and where the owner is unable or willing to do this, to carry out the works themselves. It is possible that the structure was assessed as not being imminently dangerous, and the owner took the option to demolish the building. If this was under a demolition contract, then it would come within HSE's remit. Had the three vehicles that were crushed been occupied the outcome would have been very different – there cannot be too many warnings about the risks associated with unstable walls.

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HOW TO REPORT

Please visit the web site
www.structural-safety.org
for more information.

When reading this Newsletter online
[click here](#) to go straight to the reporting
page.

Post reports to:
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Comments either on the scheme, or
non-confidential reports, can be sent
to structures@structural-safety.org

DATES FOR PUBLICATION OF CROSS NEWSLETTERS

Issue No 30	April 2013
Issue No 31	July 2013
Issue No 32	October 2013
Issue No 33	January 2014