

Presentation on TG20 Scaffolding Erection Procedure

Rob Lynch, CEO, Lyndon Scaffolding and Chairman, NASC Technical Committee



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Rob explained, following on from the HSE reports of untrained scaffolders, that Lyndon Scaffolding **did not employ any sub-contractors**, because they attached so much importance to standards of work in this high risk activity. The Company did a lot of work with an emphasis on Engineering Design and employed four civil Engineers for that purpose.

On the subject of standards, Rob referred to the National Access and Scaffolding Confederation (NASC), where there were only 170 members in the UK,, in a population of about 4,000 Scaffolders! Standards were maintained at a very high level and he said that two large firms were under the threat of expulsion at the moment, because they had failed to achieve the required performance.

He went on to say that the new procedure had been introduced initially in 2005, as a direct result of the European-inspired BSEN 12811 Design Code. At the same time, the existing BS5973 for Tube and Fitting Scaffolds had been withdrawn, although it had not been discredited in any way and it apparently left the industry in confusion! The New BS was a Design Code containing formulae, rather than an erection guide with practical illustrations of installations! He added that both codes were not law and there was no obligation to follow them.

Because of the difference in European and UK approaches, Rob said, the changeover caused much disquiet in the scaffolding industry and EN12811 was seen to be an impractical document because: -

- It requires a design for every scaffold and every alteration would cause a construction standstill – to what end, as the existing BS was not defective?
- The methodology is extremely complex and time consuming. The wording is not explicit enough and the literal meaning does not achieve its intention.
- The new Design code gives no assistance as to how a safe scaffold erection should be achieved. This gave a major problem with the many incompetent/untrained scaffolders in the industry.
- It sets out free access along the working platform, with no ledger bracing. That is fine for the user but bad for the scaffolder, particularly when work progresses up the scaffold.
- The UK Scaffolding Industry did not have a representative on the EU Committee which drafted the new standard and this aggravated its incompatibility.
- The Industry was still trying to come to terms with the Work at Heights Regulations 2005 (WAHR) when it also needed help with EN12811.

The key to the solution was in WAHR Regulation 8(b), Schedule 3, PART 2(b), Paragraph 7, which says:

7. Strength and stability calculations for scaffolding shall be carried out unless -
 - (a) a note of the calculations, covering the structural arrangements contemplated, is available; or
 - (b) *it is assembled in conformity with a generally recognised standard configuration.*

As (a) was deemed to be impractical, compliance was sought under (b), as it supported the use of BS5973. On that basis the NASC TG20:05 was compiled in 2005 to give an erection guide to support the principles of BSEN 12811. However, Rob stated, in attempting to meet all the requirements of free access, a potentially unsafe method of work was created, that was worse than keeping BS5973.

Hence, a review of TG20:05 was undertaken, which resulted in TG20:08, with the aim of:

- Including a larger number of standard scaffolds, incorporating 5-board wide scaffolds and inside boards.
- Erections supported by full scale calculations and tests, whilst being informed by custom and practice.
- Benefitting from direct input by HSE into the drafting of the document to give a more .
- Include a much wider input from NASC Membership in order to achieve ‘buy-in’.
- Give a much wider scope than BS 5973, including more scaffolds more options and now covering Scotland where BS5973 had been excluded for years.

So what will change? The basic principles of BS5973 will remain in place as it provided sound construction designs and techniques, so this will mean that scaffolders will not have to ‘re-invent the wheel’! What it will mean is that TG20:08 will substantiate the design with proven test figures. It will also mean that design engineers will use a different process to ‘justify’ the design but the visible differences will be minimal. Some of the physical differences are: -

- A requirement for more facade/sway bracing. Previously one brace was needed in every 15 bays; now it is one in every 6 bays.
- There is now a requirement for more consideration of ties and tie loadings, possibly resulting in more ties. For example Rob commented, the rating of an unsheeted tie is now 0.3 tonnes and it has to be inserted with a proprietary Hilti Tool. Rob went on to warn that it is also crucial to assess whether the building fabric can support such loadings.
- With sheeted scaffolds, the tie loading goes up to 1.8 tonnes – a massive six-fold increase on the unsheeted rating. not many scaffolders would appreciate this massive difference and the knowledge should focus their minds on standards when they are erecting the structure!

Rob went on to say that EN12811 would have some adverse effects on Large/High rise, Load-bearing, and Sheeted scaffolds. Primarily, this was due to the fact that: -

- There was a different way of looking at effective length, which gave 2 metres between lifts and no bracing on the rear facade which was weaker and reduces the effective length
- A different “Wind Code” is being introduced that allowed higher wind loads to be tolerated.
- These two effects are cumulative.

All of this will impact on complexity, affect buildability and, therefore, costs. There is an element of increased bureaucracy in all of this, Rob added and, in some cases, special designs were *not* needed. The fundamental laws of physics have not changed but the new standard has put a different focus on scaffolding that is a good thing if it makes people stop and think a bit more deeply about what they are doing.

Looking now at the implications for procuring a safely erected scaffold, Rob commented, these are the important criteria to observe: -

- The key element is to engage a competent firm of scaffolders and that means one that is a NASC Member – check on www.nasc.org.uk
- Then check that they employ the correct grade of erector
 - ◆ CISRS* Scaffolder as a minimum requirement
 - ◆ For more complex scaffold structures, a CISRS Advanced Scaffolder must undertake direct supervision of the gang.
- * Construction Industry Scaffolders Record Scheme – administered jointly by NASC and CITB
- Know exactly what the scaffold is required to do: -
 - ◆ Identify the loadings
 - ◆ What is going to be placed on it
 - ◆ What trades will work on it. Sometimes, scaffolds were erected for use by one trade and, later, used by a totally different one.
 - ◆ If weather or dust protection is required. You should know that wind will easily pull a sheeted scaffold out of position!
- Whether it needs a special design. Although every scaffold needs a certain level of ‘design’, not all invariably need special calculations or Computer Aided Design programs. Here are some that do: -
 - ◆ Support scaffolds, loading gantries, bridges, temporary roofs, advertising hoardings
 - ◆ Pedestrian footbridges, cantilevers, heavy duty ramps, any public access way
 - ◆ Any structure subject to vibration, high loading, long term duration.

For guidance on on a more comprehensive list, visit the following HSE link: -

<http://www.hse.gov.uk/construction/scaffoldinginfo.htm>

Rob added that this list had existed for some time but the introduction of the new standard had just made people realise that they need to observe it more closely! If you really want to test a scaffolder’s competence – ask him where the ties are – he probably won’t know.

Also look at this HSE link for background information on common scaffolding terms:

http://www.nasc.org.uk/Introduction_to_Scaffolding

Members' Questions

Gerry Mulholland opened question time by commenting about an old SGB Scaffolding claim to employ hard scaffolders – but not harder than concrete! He added that his company, **Laing O'Rourke**, had adopted more “Off-site” construction methods, where components on the top of structures were pre-fabricated and lifted into position by crane – without the need for scaffolding.

Bob Cole asked if Lyndon used harnesses. Rob replied that harnesses were a top priority, but that they also used other means of protection. However, even though there were parts of the day when they were not needed, the scaffolders wore them all the time so that there was no excuse for them not being readily available. Rob added that it was mainly other trades that fell off scaffolding – not scaffolders!

Mark Hoare of Birmingham University asked why the European Standard did not use tubes and fittings. Rob said that it was due to historical practices and offered the comment that it involved less training than in UK and the structures were less safe at heights. In addition, the EU System designs left gaps next to the buildings.

Ed Friend asked what advice could be given to small clients. Rob replied that TG20:08 gives calculation on design dimensions and the rule of thumb was a 2 metre bay with a 2 metre height.

John Dowling, of Balfour Beatty Construction asked if beam components featured in TG20 and Rob replied that they did not as design calculations would be needed.

John Jacobs of Jacobs Feasey Associates asked if there were any appropriate Scaffolding Design Qualifications available. Rob said that there were none, as most Degree courses were not relevant.

As there were no more questions, the Chairman closed the meeting and thanked Rob for a most informative presentation, after which the members showed their appreciation in the traditional way.