

# Structural Safety Alerts



**Structural Safety Alerts are produced by Structural-Safety\* incorporating CROSS (Confidential Reporting on Structural Safety) and SCOSS (Standing Committee on Structural Safety) and the HSE (Health & Safety Executive). Structural Safety provides an insight into problems encountered on-site including post-failure analysis that identifies what went wrong.**

**Structural stability/integrity of steel frame buildings in their temporary and permanent condition**

CROSS (Confidential Reporting on Structural Safety) and SCOSS (Standing Committee on Structural Safety) and the HSE (Health & Safety Executive) provides guidance on precautions that can be taken to prevent the collapse of the steel frame structures.

The versatility of steel frame structures gives designers large possibilities to bring to life their

visions. Structural steel is an essential element in the commercial and residential construction. Steel is also very sustainable material ideal for new build structures, extensions or redevelopment. Steel frame structures are highly durable. However, occasionally the steel frame structures collapse during the construction phase. There were some cases in the recent years of the collapsed steel structure, and this alert is aimed at designers, steel suppliers, contractors, building control officers and local authorities. A whole or even partial collapse of the steel structure may lead to catastrophic consequences including fatalities and injuries of workers or occupants. The construction process is risky, and risk assessments should include the risk associated with the erection of steel frame, the effectiveness of any temporary structures and stability of structures. While engineers ensure the completed building will be safe and will meet the Building Regulations it is necessary to take into the account that this building under construction has to sufficiently support loads. No assumptions, but the detailed insight into the construction loading to ensure the safety.

The collapse can be caused by a failure in design or fabrication, but also by an error in the process of construction work. A small failure like for instance misalignment of welded joints, insufficient ties, poorly anchored ties,

undersized welds, inadequate load bearing- this all may lead to fracture of some parts and may trigger a much larger damage. Lateral stability is often considered as the reason of collapse. While working with steel structures, a collapse must be discussed at every stage of design and construction. The cooperation between design engineers and contractors is essential at every stage of steel frame erection process. For the professional advice on steel structures refer to The Institution of Structural Engineers "Practical guide to structural robustness and disproportionate collapse in buildings."

Steel sections are made by hot or cold rolling and are either bolted or welded together. In the UK, most of the structural steel has grade S275 and S355. The erection of the structural framework should be done by the professional contractor. Temporary bracing should be provided to resist wind loading on structural components. The erected structure should not be overloaded with the construction plant or other elements.

For more tips on structural safety for steel framework, refer to the Structural Safety Alert at [www.structural-safety.org](http://www.structural-safety.org).

**For more information visit the [www.structural-safety.org](http://www.structural-safety.org)**

*Source: The Institution of Structural Engineers, the Institution of Civil Engineers and the Health and Safety Executive*

