SELF CERTIFICATION

Proposals for the self-certification of work in the construction industry appear to be increasing in response to pressures for greater efficiency in construction processes. Two such areas of work are being discussed by SCOSS.

The first area is the self-certification of work under the Building Regulations. In October 1999, the DETR Building Regulations Division issued a Consultation Paper entitled: The Building Act 1984 Taking Forward Self-Certification Under the Building Regulations. The Paper generated correspondence in the Verulam column of The Structural Engineer and elsewhere in the press. Some comments expressed concerns that self-certification can have adverse effects on safety. The essence of the concerns was that commercial pressures on consultants and contractors would force them to put profit before safety.

The open letter sent out by the Wessex Area Local Government Structural Engineers in February highlighted concerns that public safety is being compromised and stated that an independent third-party design check is believed to be essential on issues relating to safety.

The second area of SCOSS discussion on self-certification concerns the testing and checking of materials and components during the construction process, particularly in civil engineering works. The trend away from independent testing and checking appears to be due to the adoption of design and build contracts and of ISO 9000 quality systems. As a result testing and checking is carried out by employees of the producer/contractor. The concern is that they may not have the resources, ability, experience, willingness or status to carry out sufficient checking, spot problems and ensure that inadequacies are dealt with. In some cases of inadequate testing and checking, structural safety may be prejudiced. The real issue is whether the use of a quality assurance system justifies the withdrawal of independent third party inspection and testing. Questions are:

• What are the circumstances where quality management systems are sufficient from a structural safety point of view?

• Where is independent third party checking an essential alternative or addition to self certification?

• In modern procurement environments, is risk assessment the way to decide on whether independent third party checking should be used?
Seven of the ten warmest years on record were in the 1990s. Globally 1998 was the hottest year ever recorded. It is expected that global climate will continue to change throughout the next century, particularly if no additional action is taken to mitigate greenhouse gas emissions. Substantial uncertainties remain in the predictions of the extent of the changes that will occur. It is generally accepted however that, with global warming, more extreme and variable weather can be expected: more gales, more floods, more heat waves, more droughts. For the UK, hazards to structural safety from the climate may arise from several variables, including:

- Extreme winds.
- Extreme precipitation, especially snow.
- Extreme precipitation leading to flooding.
- Periods of drought and high temperatures leading to ground movements.

The design and assessment of structures normally takes these hazards into account using predictions of climate based on historical local meteorological information. At present predictions of future meteorological conditions are not sufficiently certain to enable increases of design loads to be adopted with confidence. More onerous design loads cannot be justified just on the basis that increases in actual loads might occur.

Increased flooding, greater extreme winds, precipitation and/or temperatures would nevertheless increase risks of structural failure and damage. Levels of structural safety (and serviceability) would, in effect, be reduced. To counter such adverse trends, more emphasis could be given in design and assessment to offsetting the increased

A wind-damaged building. If greater extreme winds due to climate change occur, more wind damage to structures can be expected.

Photo: Building Research Establishment Limited
uncertainty by providing for future enhancement of structural capacity and other aspects of performance. Then, if more severe conditions actually arise, structures can be more easily retrofitted. At the same time the enormous task of strengthening the huge population of older existing structures would have to be considered.

CORPORATE KILLING

A consultation paper has been published by the Home Office (Reforming the Law on Involuntary Manslaughter: The Governments Proposals). The proposals contain a new offence "corporate killing," a specific offence which is intended to make companies accountable in the criminal law where they fall far below what can be expected in the circumstances. Corporate killing, which it is proposed, will apply to any trade or business undertaking, will carry a maximum penalty of an unlimited fine and a remedial order to correct the original cause of any accident: directors might also be liable to disqualification.

It is proposed that in England and Wales, enforcing organisations such as the Health and Safety Executive, would investigate and prosecute the new offence, in addition to the police and Crown Prosecution Service.

The consultation period for the government’s proposals closed on 1 September 2000. SCOSS supports the overall concept of the proposals and has submitted comments on them.

CAST IRON FRAMED BUILDINGS

Many cast iron-framed buildings still exist and are in everyday use. SCOSS has recently received reports of two incidents concerning the safety of this type of structure.

In one case, a change of use had not been controlled effectively. Vehicle access within the building was extended to areas where the cast iron columns were unprotected against vehicle impact. An unacceptable risk was thus introduced since cast iron columns can be severely damaged by sudden impact loads. Building owners should be aware of the potential sensitivity of this type of structure to accidental impact damage.

In the second case, the partial collapse of a five-storey cast iron-framed former cotton mill occurred during refurbishment work causing three fatalities. Existing structures of this type can be very sensitive to disturbance. Where refurbishment is planned, it is essential for a suitably experienced engineer to assess the robustness and stability of the structure prior to the work and during all stages of structural alteration. A 1998 Institution of Civil Engineers’ Design and Practice Guide ‘Structural Appraisal of Iron Framed Textile Mills’ gives details of how the robustness of such structures may be assessed and, uncertainty by providing for future enhancement of structural capacity and other aspects of performance. Then, if more severe conditions actually arise, structures can be more easily retrofitted. At the same time the enormous task of strengthening the huge population of older existing structures would have to be considered.

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where necessary, improved. Advice may also be found in 'Appraisal of Existing Iron and Steel Structures' published by the Steel Construction Institute in 1997.

**PLY-WEB BEAM COLLAPSE**

In July 2000, SCOSS received an unsolicited report of a recent collapse of a flat roof supported by ply-web beams. The roof was built in 1970. Investigation showed that the support beams failed primarily because, during manufacture, joints were not glued or traces of glue were so thin that adhesion could not be relied on. The beams had supported the roof since 1970 by utilising the mechanical fixings intended for fabrication purposes only. Previously the roof had been inspected and deemed to be satisfactory. However the inspector would have seen no sign to indicate the manufacturing defect in the form of omitted adhesive. Other buildings of similar construction may have similarly weak roofs. Possible deficiencies in gluing should be borne in mind when roof structures of this type are appraised.

![Collapsed ply-web roof beam](image)

**MULTI-STOREY CAR PARK STRUCTURES**

Interim Guidance on inspection and maintenance of multi-storey car park structures was issued on 24 July 2000 by the Institution of Civil Engineers National Steering Committee on Inspection of Multi-Storey Car Parks. The Guidance was prepared following concerns, summarised in SCOSS Reports, about recent structural failures and deterioration of car park structures. More detailed guidance is planned for issue in 2001.

**CONTACT INVITATION**

Readers are invited to express views, on a confidential basis if they wish, on the topics discussed in this Bulletin or on structural safety issues and trends relating to structural safety more generally. For more information contact Dr John Menzies Tel. 01923 675106, Fax 01923 680965; or John Fenn Tel. 0207 201 9133, Fax 0207 201 9165. E-mail scoss@istructe.org.uk