



Construction: Blueprint for Action

Edel Langan compares and contrasts the concept of safety in construction design from an international perspective, looking at the frameworks under which construction professionals in the UK, US, Australia and Ireland operate, and suggesting how the territories could learn from each other.

Safety in building design is concerned with eliminating or controlling health and safety risks as early as possible in the lifecycle of the construction project. There is much evidence of the degree of influence that designers can have on construction safety. However, that influence diminishes as the building schedule moves towards start-up, with the ideal period being during the concept and design phase.

Global approaches

In the US, design is influenced primarily via the application of research and the business-case approach. In 2005, the Occupational Safety and Health Administration (OSHA) formed a Design for Construction Safety Work Group, comprising academics and a range of professional organisations. The Work Group meets regularly to share information, as well as develop and disseminate construction-related compliance assistance tools. Furthermore, the National Institute for Occupational Safety and Health (NIOSH) has recognised Prevention through Design (PtD)¹ as a national initiative, to be developed across all industries, including construction. Its key functional areas include research, education, practice and policy.

Australia has undertaken significant research into the area of safety in design. Indeed, "eliminating hazards at the design stage" is listed as one of five national priorities in its National Occupational Health and Safety Strategy 2002-2012. Similar to the US, the Australian approach addresses a wide range of design areas, including building and structures, work environments, materials, machinery and equipment. This combination of specific strategies and action plans provides a comprehensive strategic framework to tackle the issue of safe design.

In the UK, safety in design is addressed primarily through legislation, and it was first enshrined in the Temporary and Mobile Construction Sites Directive of 1992, which required

safety and health considerations to be taken on board during the design and organisation of projects. Unlike Australia and the United States, the UK's high-level strategic publications do not explicitly acknowledge and address safety in design. Nonetheless, many of the strategic elements within such publications extend to safety in design in construction. The Construction Industry Priority Programme, for example, includes work streams aimed at addressing safety in design issues, and the CDM Regulations.

The latter focus on more than just addressing safety throughout the design process, of course. They aim to improve health and safety by requiring coordination and cooperation between the different parties involved in construction projects, and they establish a chain of responsibility, linking all stakeholders involved, in order to prevent any risks during the construction and maintenance lifecycles of the project.

The CDM coordinator, a new role introduced by the 2007 Regulations, is the client's advisor on health and safety issues during the design and planning phase of the works. It has been argued that this role should be the first appointment on any project, as a late start means the coordinator's work is compromised, as he or she is unable to influence the early work of designers and others.

It has also been suggested that the CDM coordinator should have specific powers to give directions to designers. This is already the case in Ireland, where the concept of safe design in construction is addressed via the Safety, Health and Welfare at Work (Construction) Regulations 2006. Here, the project supervisor design process (PSDP) – i.e. CDM coordinator – can ensure that their obligations are met by issuing a written direction to a designer or contractor. If the direction is not duly carried out, the issue is escalated via notification of the client and the Health and Safety Authority.

The situation in Australia is complicated by the fact that each state has its own particular set of regulations, so there is little consistency across jurisdictions – a situation that is not particularly helpful to the progression of safe design in construction. Nevertheless, legislative amendments in recent years are changing the way in which designers practise. Their obligations are now similar to those of UK

designers, the main difference being there is no legal requirement for a health and safety coordinator; instead, designers consult with the client, project manager, or builder to determine the most feasible control measures.

In general, although designers in Australia are reluctant to adopt the risk-assessment approach used in the UK owing to the excessive paperwork involved, it's likely that the practice of a documented risk-management approach will become a normal feature of design practice in the country.

In the United States, designers have legal obligations under the Occupational Safety & Health Act 1970 but outside of this, emphasis on safe design is, at best, piecemeal. American designers are generally primarily concerned about associated increased costs and exposure to additional liability for workers' safety.

With the business-case approach as the main impetus, large engineering and contracting firms are promoting the concept of safe design via a range of initiatives and practices. But a consistent approach is sorely needed, and it has been suggested that the US look towards the regulatory regimes in the EU and Australia to facilitate the inclusion of appropriate legislation without inappropriately shifting safety duties on to designers.

Practical tools

The United States Construction Industry Institute (CII) has developed more than 400 design suggestions to eliminate or reduce safety hazards. These are incorporated into a computer programme,² which alerts the user to project-specific construction hazards and provides ways to eliminate or reduce them in the construction, maintenance and decommissioning of the facility.

In Australia, the Construction Hazard Assessment Implication Review (CHAIR) allows designers, clients and other key stakeholders to come together to reduce construction maintenance, repair and demolition safety risks associated with design. Facilitated discussion is motivated by the use of prompt or guide words, and the process takes place at three stages: concept design, detailed design, and maintenance/ repair.

A body of regulatory and practical guidance has been produced in the UK, the main instrument being the Approved Code of Practice to the CDM Regulations. Similarly, the Irish Health and Safety Authority has published guidelines on the procurement, design and management requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006.

Industry has been pivotal in raising awareness of the issues designers have to address. The UK's Construction Industry Research Association (CIRIA),³ for example, has produced a number of practical guides to assist designers to discharge their legal obligations. In Ireland, relevant professional

bodies have come together to produce guidance publications such as 'Designing for Safety in Construction'.⁴

Education, education, education

Designers need to be equipped with not only a basic appreciation of safety in design but also a fundamental understanding of its rationale, principles and roles. Research in the UK into the inclusion of health and safety elements in undergraduate construction-related courses revealed some examples of good practice do exist, but accreditation bodies and universities/colleges have much to do in terms of setting adequate standards and integrating health and safety into the academic curriculum.

The integration of safe design into education systems and processes in Australia is an activity under the government's overall health and safety strategic action plan. Currently, the focus is on determining the status of health and safety in relevant programmes for design professionals. 'Safe design for engineering students' is a valuable resource package on how to design safe products, processes and systems, the overall aim of which is the recognition of safe design as an integral part of engineering practice. The package has received strong support from Engineers Australia, and a similar resource package for architects is currently in progress.

Although research in the US has attributed designers' lack of involvement in worker safety to their minimal education in addressing safety on the construction site there is still no indication that safety in design is scheduled to be addressed in the curricula of design-related programmes in the country.

Summary

It's clear that sustained progression of safety in design is a challenge for all countries, and both unique and common difficulties have been experienced by designers, regardless of the strategic approach, legislation, policies and practices that exist in their country. The regulatory regime adopted by the UK, although the most advanced, is not without its faults and it should look abroad to get a fresh perspective.

Research into the concept of safe design – in particular, understanding the business-case need for it – is crucial to its acceptance and implementation by industry. A combined approach of strategic action plans with measurable targets, publicity and educational campaigns will also help in this regard.

Rather than merely focusing on legal compliance, designers need to see the rationale and effects of implementing safety into their designs. This attitudinal and behavioural change will occur when we have the right balance of elements to develop knowledge, capacity and motivation to comply.

References and further information

- NIOSH Prevention through Design – www.cdc.gov/niosh/topics/PTD
- Construction Industry Institute 'Design for Construction Safety Toolbox' – www.designforconstructionsafety.org
- www.ciria.org
- Designing for Safety in Construction (2006) – Association of Consulting Engineers of Ireland (ACEI), Royal Institute of Architects of Ireland and the Institute of Engineers of Ireland
- Design Best Practice website – www.dbp.org.uk
- Safety in Design – www.safetyindesign.org
- Construction Industry Council (Safety in Design) – www.cic.org.uk
- Australia's Safe Design webpage – www.fsc.gov.au/ofsc/Forindustry/Safe+Design/Safedesign.htm

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