Design dilemmas

The art of clarity is something to which all designers should aspire © Alamy

According to **Paul Fenwick**, there are two key health and safety challenges facing designers: how to get risk management information effectively to those who require it; and what and how much risk information to provide.

Designers are in a unique position to reduce the risks that arise throughout the life of a construction project, and beyond. Their earliest decisions fundamentally affect the health and safety of construction work, and their duties extend past the construction phase. Consequently, designers need to adopt a 'cradle to grave' approach, and consider the health and safety of those who will construct, maintain, repair, clean, refurbish, and eventually remove or demolish the structure. Those who will use the workplace must also be borne in mind.

However, for many clients, contractors, and CDM coordinators designer risk assessment is a thorny subject.

Defined by the Construction (Design and Management) Regulations, which were revised in 2007, designers are: "Those who have a trade or business, which involves them in preparing designs for construction work, including preparing drawings, design details, specifications, bills of quantities, and the specification (or prohibition) of articles and substances, as well as all the related analysis, calculations and preparatory work."

The introduction of the revised CDM Regulations was intended, in part, to discourage unnecessary paperwork and reduce the bureaucratic burden associated with construction projects. The revised Regulations aimed to underline the importance of effective communication of the significant risks identified within the design elements of a construction project, or those risks that could be unfamiliar to a contractor or others who use the design. In this respect, the general consensus is that the Regulations have failed.

Duty-holders are still regularly presented with a plethora of generic, superfluous documentation, which bears little relevance to the specific health and safety issues associated with the project. These are of

little benefit – if any – to a competent contractor, or end-user.

And, in cases where the designer does include valuable information, which identifies those unusual or significant residual risks, it can often be hidden within the masses of generic information that the designer has churned out – a classic case of not being able to see the wood for the trees!

Two major obstacles

Essentially, designers have to overcome two major hurdles in order to meet their duty to provide suitable and sufficient health and safety information about all aspects of their design. Firstly, how to get risk management information effectively to those who require it – the right information to the right people at the right time, and secondly, specifically what and how much information do they provide.

When designers have carried out their design work and concluded that there are risks that can't be avoided by practicable means, they must provide information that others are likely to need in order to help them identify and manage the remaining risks. This information is essential for parties who have to refer to the design information in the future, such as maintenance and facilities personnel, or refurbishment and demolition contractors.

The traditional method of communicating this information has generally been in the form of standalone designer risk-assessment sheets. However, recognised best practice now advocates that designers convey specific risk information directly, via their drawings. This is because those intending to carry out construction and maintenance activities are more likely to refer to drawings, rather than search through reams of A4 sheets, which tend to be kept in a file on a shelf somewhere, gathering dust.

Designer risk information is intended to provide a broad indication of the designer's assumptions regarding the precautions necessary for dealing with the residual risks associated with their design. The level of detail should be proportionate to the nature of the hazards identified and the associated level of risk. In practice, the quality and relevance of the risk assessment may be directly attributed to the capabilities, experience and resources of the designer – both as an individual and at a company level.

According to James Ritchie, head of corporate affairs for the Association for Project Safety, designers can essentially be divided into four categories: 'enlightened'; 'give it a go'; 'don't have time'; and 'not my problem'.

Enlightened designers

'Enlightened' designers wholeheartedly comply with the spirit of the CDM Regulations. They provide specific information about the significant risks with which a competent contractor would be unfamiliar. Such designers will have already considered issues

"Duty-holders are still regularly presented with a plethora of generic, superfluous documentation, which bears little relevance to the specific health and safety issues associated with the project"

such as site planning, construction traffic movement, site access and egress, and building and maintenance issues long before the appointment of a CDM coordinator.

Enlightened designers are proactive. They collate specific residual risk information and identify to the client any gaps in the existing health and safety information that will require additional investigation. Enlightened designers coordinate their designs with other members of the project team, in order to determine exactly where their element of design starts and ends.

They also provide clear and succinct information, which can be easily identified and understood, via outline hazard notes and associated pictorial symbols on drawings. This medium of communication is particularly relevant when considering the traditional demographic trends within the construction industry – for example, there is a high percentage of foreign workers who may not speak or understand English particularly well, and may have difficulty interpreting pages of text.

Enlightened designers are also appreciative of their audience. Drawings are replicated in A3 size, for ease of photocopying on site, and in PDF format to aid electronic document transfer. The benefit of presenting risk information within drawings is tangible. Contract managers and quantity surveyors, among others, can more readily identify the specific health and safety issues associated with the project during the tender stage. This will have the effect of generating a more realistic tender bid and, consequently, it is more likely that the project will be completed on time, within budget, and with reduced life-cycle costs passed on to the end user.

A recognised set of pictorial symbols, synonymous with those used throughout the construction industry, is used to convey significant health and safety risks, and is supplemented by text boxes to ensure maximum clarity of information. Technical jargon is restricted, wherever possible, so that it does not detract from the core health and safety message.

Exactly how much emphasis a designer places on the management of risk associated with their design may directly correlate to the individual's training and experience. In the past, many design institutes have not focused on training graduates in health and safety risk management. Furthermore, many design graduates enter practice without any first-hand

experience of how a construction site operates. Consequently, how can they be expected to comprehend the implications of their design on 'buildability'?

This situation has now been recognised by a number of leading institutions, including the Royal Institute of British Architects, which has produced a training DVD entitled 'Health and safety – Safeguarding people: achieving design excellence', aimed at architects and other construction professionals.

'Give it a go' designers

A lack of knowledge often results in the individual adopting a scatter-gun approach to design risk assessment – the 'give it a go' designer. Such individuals give little thought as to the purpose of the information they provide. They strive enthusiastically to meet their statutory duties but, through a lack of experience or understanding of the spirit of the CDM Regulations, simply end up generating mountains of generic waffle.

A common misconception held by 'give it a go' designers is that every significant health and safety risk associated with their design must be highlighted. They overlook the fact that the cornerstone of the CDM Regulations is the appointment of 'competent' duty-holders within the project team.

The desire to cover all bases may be fuelled by the all-pervading blame culture, seemingly synonymous with anything remotely connected to health and safety. For some strange reason, it is often believed that burying people under a mountain of risk assessments is a good way to abdicate responsibility in the event of something going wrong. To the 'give it a go' designer, risk management is regarded as more about protecting oneself from litigation than accident prevention.

Take a scenario involving excavation works – it could be seen as patronising in the extreme for the designer to issue a 'risk assessment' that does little more than highlight the generic risks associated with the works (falls from height into the excavation, trench collapse, surcharging, etc.) while identifying PPE requirements and method statements as the sole means of control. What actual benefit can be derived from the designer producing this kind of information?

A competent contractor should be well-acquainted with the generic hazards, risks and control measures associated with carrying out their core activity. What they may not be aware of are the significant risks associated specifically with the individual project – for example, that in-filled basements, originating from former Victorian terraced dwellings demolished in the 1960s, are present within the vicinity of the site. These may contain a host of potential substances hazardous to health and warrant further site investigation prior to commencing construction activities.

The legacy of poor design: this air-handling equipment was mounted double-stacked on the roof. Owing to the associated pipe work, safe access to the equipment within the units was not possible as there was no space for either a scaffold to be erected, or ladder to be positioned correctly. A double-decked access gantry has since been retrofitted.

The uncooperative and plain ignorant

Fortunately, the remaining types of designer seem to be few and far between. Nevertheless, examples of the 'don't have time' and 'not my problem' approach can still be encountered.

Many CDM coordinators will bear testament to the fact that, despite their best efforts, they have, on occasion, not been provided with any proof that the designer has considered the residual risks that may be present in their design, or access-for-maintenance strategy. Requests for information may simply be ignored. And while it may be all-too easy to become sanctimonious and suggest that the CDM coordinator has failed in their duties, the reality can often prove very different.

If the client or project manager are not supportive of the CDM-C, this makes it extremely difficult to obtain information from a designer who does not wish to cooperate. From a commercial standpoint, the CDM-C will have allocated a finite resource to each project and cannot afford to expend a disproportionate amount of time chasing up, or coaching those designers who are unaware of, or unwilling to comply fully with their statutory duties.

The role of the client

Under the CDM Regulations, it is incumbent on the client to ensure that the duty-holders when they appoint are competent and adequately resourced in order to meet their obligations.

Clients need to satisfy themselves that these duty-

holders are competent both in terms of their understanding of the construction process and approach to risk management. Simply being a member of a relevant construction institution, or similar professional body doesn't, by itself, necessarily imply competence.

Clients who are serious about raising the level of service delivery provided by those who they appoint should undertake a robust health and safety pre-qualification, encompassing both the organisation and individual employees. The pre-qualification process should be proportionate to the size and complexity of the projects they are intending to undertake.

Rather than creating yet another layer of bureaucracy for clients and service providers alike, such an investment in time and resources at the front end of a project will ultimately reap dividends, extending far beyond the projects completion.

A practical example

The Estate Services maintenance team at the University of Leeds has more reason than most to appoint designers of the 'enlightened' type. With close to 500 buildings and 80,000 fixed assets to maintain, and a capital development programme running into many hundreds of millions of pounds, it is essential that 'as built' information highlighting residual risks is presented in a clear and concise manner.

Due consideration must be given by the design team with respect to detailing the specific methodology and equipment required to permit safe access for the cleaning and maintenance of structures. This is of paramount importance, particularly when considering a client's brief, as it may require the construction of a 'signature building', incorporating innovative and cutting-edge design principles. Such innovative design may also produce radical access-for-maintenance strategies – for example, abseiling – which, in turn, will require a high degree of training, specialist equipment, and client management.

The Estate Services safety team has recently reviewed its health and safety pre-qualification strategy. Designers now wishing to be appointed by the University are required to submit specific examples of how they have previously managed risks associated with their design.

They must possess the requisite blend of knowledge, training and experience. Registered membership of a professional institution (such as the Institution of Civil Engineers' Construction Health, Safety and Welfare Register, or the Association for Project Safety's Designer Register), demonstrates to the team that the individual meets a defined level of competency in the application of health and safety within the construction process. Details of the training, undertaken within the previous two years, by each individual employee who will undertake work on behalf of the University is required, specifically in relation to CPD.

Previous experience of the organisation within the higher education sector is also sought. In addition, direct contact with former clients, fact-finding visits, and speaking to those who are now making use of the structure can prove invaluable when assessing a designer's competence.

The legacy of poor design – the initial location of these condenser units precluded safe access for maintenance. They have since been relocated.

In an attempt to standardise the project design team's approach to risk management, the appointed CDM-C is tasked with delivering a 'designer awareness', presentation produced by the Estates safety team for all construction works exceeding £1m in contract value. The CDM-C's duties are also extended to encompass monthly site monitoring. This site inspection also gives the CDM-C a three-dimensional opportunity to assess any residual risks associated with the future maintenance, cleaning, or occupation, which may become apparent as the scheme develops. Such issues may not be readily apparent when scrutinising a two-dimensional drawing.

Raising designer health and safety awareness also extends to the University's own employees. Estate Services employs an in-house design team, which works closely with each of the faculty departments, undertaking feasibility and detailed designs for various construction projects. The Estates safety team periodically conducts workshops, seminars and presentations to outline the statutory duties and responsibilities of a 'designer'. External service providers are also invited to attend the University and deliver various CPD-accredited seminars intended to keep staff updated with respect to recent design innovation, legislation and recognised best practice.

Conclusion

Undoubtedly, designers are faced with a very real problem of how to ensure that the information they provide is clear, precise and concise, and delivered in a format suitable for users. It is the 'enlightened' ones who achieve this seamlessly. ■

Paul Fenwick is a senior consultant currently seconded to the University of Leeds as lead CDM coordinator – see page 4 for more details