Regulating Safe Design and Planning of Construction Works

A review of strategies for regulating OHS in the design and planning of buildings, structures and other construction projects

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• produce regular reports on national and international developments in OHS regulation;
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1. The Rationale for Safe Design and Planning in Construction

This paper examines the regulation of safe design and planning of construction works. Eliminating and controlling risks to health and safety "at the source", as early as possible in the life cycle of work and workplaces, is a well recognised strategy for preventing or minimising occupational fatalities, injuries and disease. A commitment to "eliminate hazards at the design stage" is one of five priorities expressed in *The National OHS Strategy 2002–2012*, endorsed by the Australian Workplace Relations Ministers’ Council in May 2002 (NOHSC, 2002a&b).

For buildings, structures and other construction works a “safe design” approach begins in the design and planning phase with an emphasis on making choices about the design, methods of construction and materials used, based on occupational health and safety (OHS) considerations. Ideally, construction works would be designed and planned so as to eliminate or minimise risks to: (1) workers engaged in construction work, including initial construction, modifications and demolition; (2) those who use and occupy the completed buildings and structures as workplaces; (3) and those who maintain, clean and repair these workplaces. The opportunities to address OHS in the design and planning of construction works are considerable. In this early phase it is possible to design out hazards and/or incorporate risk control measures that are compatible with the original design concept, and with the structural and functional requirements of a construction project.

As well as designers, those initiating or procuring construction works also influence OHS outcomes through the design features, timeframes, financial aspects and other requirements they specify or impose. This can be a positive influence, encouraging those responsible for design and construction to address OHS matters. Conversely, tight schedules or budgetary constraints may make it impossible to address OHS effectively. Other upstream factors impacting on OHS include poorly considered architectural options, poor organisation and planning, poor selection and coordination of the multiple contractors engaged, and poor coordination and cooperation between the different parties involved in the respective phases of design and planning, and construction (HSC, 2003: 1; Lorent, 1998: 8).

In 1992, a concerted effort was initiated to improve OHS in the European construction industry, and in the subsequent maintenance and repair of buildings and structures (but not end use and occupancy). This was Directive 92/57/EEC “on the implementation of minimum safety and health requirements at temporary or mobile construction sites”, commonly referred to as the *Construction Site Directive* (European Commission, 1992). This directive is now adopted in the law of all member states of the European Union and represents the most far-reaching regulatory initiative to improve attention to OHS in the design and planning of construction works. In the UK the design and planning elements of the *Construction Site Directive* are adopted, with some amendments, in the *Construction (Design and Management) Regulations 1994* (CDM regulations).

In Australia, a wide ranging inquiry into the building and construction industry (“The Cole Royal Commission”) recommended that the National Occupational

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1 For simplicity, the term “construction works” is used in this paper to include all construction work in relation to buildings, structures and other projects involving structural or civil engineering works.
Health and Safety Commission should investigate and report on whether any measures in the CDM regulations should be adopted in Australia, as part of a series of measures to improve OHS in the building and construction industry (Cole, 2003: 54). There is also some existing law relevant to safe design and construction.

This paper begins by examining the existing regulatory regime in Australia including the potential for legal action under the common law, the action that might be expected of designers of construction works to guard against common law action, the obligations of designers under OHS statute law and design obligations under the Building Code of Australia (Section 2). The paper then examines the European approach to safe design and planning of construction works, with particular reference to the UK CDM Regulations (Section 3). The impact of the European regulatory initiatives is discussed, on the basis of available evaluation and research (Section 4). Finally, taking account of existing Australian law and insights drawn from European experience, the paper outlines some directions for Australian OHS law, with the aim of enhancing safe design and planning of construction works for the benefit of workers engaged in construction, as well as subsequent use and maintenance of buildings, structures and other construction works (Section 5).

2. Australian Law and the Safe Design and Planning of Construction

2.1 The common law and safe design of construction works

Legal action could arise in several ways under the common law. First, as the relationships between the parties engaged in construction works involve contractual agreements, an action could be initiated for an alleged breach of contract, such as failure to address OHS matters in the design, in contravention of an expressed or implied term of a contract. However, it is important to note that while contracts can specify terms and conditions in relation to OHS matters, a contract cannot be used by one party to impose responsibility on another, for OHS matters that are not properly the responsibility of that person. Moreover, a person cannot "contract away" responsibility. Where the nature of a person’s relationship to another gives rise to a duty of care, the duty is “non-delegable” (see Hughes v Percival [1883] 8 App Cas 443 at 446; Kondis v State Transport Authority [1986] 154 CLR 672 at 686, 55 ALR 42; Burnie Port Authority v General Jones Pty Ltd [1994] 179 CLR 520, 120 ALR 42; R v Associated Octel Co Ltd [1996] All ER 846; R v Gateway Foodmarkets Ltd [1997] 3 All ER 78).

Common law action could also arise for the tort of negligence in the event of injury or loss. To be successful in a negligence action a plaintiff will first have to prove that a duty of care was owed by the defendant. Some early cases established that those owing a duty of care might include those who design buildings and structures (see Voli v Inglewood Shire Council [1963] 110 CLR 74; Bevan Investments Ltd v Blakhall and Struthers [1973] 2 NZLR 45; and Greaves and Co (Contractors) v Baynham Meikle [1975] 3 All ER 99). (For a discussion of the relevant principles for determining whether a duty of care is owed see Davies and Malkin, 2003: 106-122; Luntz and Hambly, 2002: 129-208).

Once it is established that a duty of care is owed in a particular case, a plaintiff must then prove that the defendant breached the standard of care required to discharge the
duty of care. The standard of reasonable care depends on the knowledge that the defendant actually has, or ought to have. This in turn influences the risks of injury that s/he can foresee (for relevant cases see Davies and Malkin, 2003: 22-63; Luntz and Hambly, 2002: 209-280). Over the years case law has established that to be foreseeable a risk need only be a genuine possibility which is “not far-fetched or fanciful”. It need not be probable (see Wyong Council v Shirt [1980] 146 CLR 40, 29 ALR 217). However, recent statutory reform of the law of negligence in a number of Australian jurisdictions, may narrow the standard of care required in future actions. For example, the NSW Civil Liability Act 2002, s 5B and the Queensland Civil Liability Act 2003, s 9 establish the criteria that the risk must be both foreseeable and “not insignificant”.

If a risk is not far-fetched or fanciful, nor insignificant, the so-called "negligence calculus" provides a framework for deciding what precautions the defendant can reasonably be expected to have taken. The calculus has four components: (1) the probability that the harm would occur if care were not taken; (2) the likely seriousness of that harm; (3) the burden of taking precautions to avoid the harm; and (4) the social utility of the risk-creating activity (Davies and Malkin, 2003: 47; Luntz and Hambly, 2002: 210). These principles have been enshrined under the NSW Civil Liability Act 2002, s 5B and the Queensland Civil Liability Act 2003, s 9, as the basis for determining whether a reasonable person would have taken precautions against a particular risk of harm.

Also to be proved in negligence action is “causation”, that is, whether the breach caused the injury or other damage sustained by the plaintiff. Furthermore, the injury or damage must not be too remote a consequence of the defendant’s negligence, that is, the damage is a reasonably foreseeable consequence (see Davies and Malkin, 2003: 64-105; Luntz and Hambly, 2002: 292-373 for relevant cases). Causation is also addressed by the statutes reforming the law of negligence. For example, under the NSW Civil Liability Act 2002, s 5D, determination that negligence caused particular harm will require that “the negligence was a necessary condition of the harm ("factual causation")” and that “it is appropriate for the scope of the negligent person’s liability to extend to the harm so caused (”scope of liability”).

Thus the law of negligence suggests that persons responsible for design and planning of construction works, whether as engineers, architects, clients or otherwise, would be prudent to take certain action, including: (1) informing themselves of the reasonably foreseeable risks of harm associated with their construction works; and (2) determining and taking precautions that are reasonable and practicable, including ensuring that there is adequate and comprehensive warning of any residual risk that it is not reasonable or practicable to eliminate. Failure to take these steps could leave open the possibility of negligence action.

In addition to the potential for legal action for the tort of negligence, there is also the possibility of action for the tort of breach of statutory duty, where a person sustains injury or loss caused by an alleged breach. A pre-requisite for such action is that there is a relevant obligation under a statute or regulation. For example, the

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2 Similar criteria have been introduced or are in train under statutory reforms in other jurisdictions.
3 See similar requirements in train under Bills regarding civil liability in other jurisdictions.
4 It is too early to tell the significance of these reforms.
OHS statutes of Western Australia, South Australia and Queensland establish the obligations of designers of buildings and structures (as discussed further in Section 2.2). To succeed in an action for breach of statutory duty, a further pre-requisite is that such action is permitted, or at least not explicitly prevented, under the relevant statute. The South Australian OHS statute does permit breach of statutory duty actions (see OHSWA (SA): s 6(2)), while the Queensland and Western Australian OHS statutes are silent on the matter, and it is therefore likely that such actions are also possible in these jurisdictions.

The elements to be proved in an action for breach of statutory duty are: (1) the plaintiff is a member of the class of people that the statute or regulations aim to protect; (2) the statutory obligation is aimed at preventing the kind of harm suffered by the plaintiff; (3) the action is taken against a person on whom the statutory obligation is placed; (4) on the balance of probabilities, the statutory obligation has been breached; and (5) the plaintiff was injured as a result of the breach (Davies and Malkin, 2003: 260-276; Luntz and Hambly, 2002: 621-656). A breach of statutory duty action is less onerous than a negligence action as there is no need to establish foreseeability of risk or practicability of precautions. Proving these elements will only be necessary if they are part of the statutory duty that is the basis of the action.

An example of a breach of statutory obligation action against a designer of a structure is Slivak v Lurgi (Australia) Pty Ltd [2001] 205 CLR 304. The plaintiff sued the designer for injuries sustained during the construction of a structure. Under consideration was the designer's duty under the SA Occupational Health, Safety and Welfare Act 1986, s 24(2a)(a), which requires a person who designs a structure to ensure, so far as is reasonably practicable, that it is designed so that persons required to erect it are, in doing so, safe from injury and risks to health (see also Section 2.2 below). In Slivak v Lurgi, liability was denied on the basis that the designer had ensured the safety of the design, so far as reasonably practicable, and the statutory duty had not been breached. The High Court provided some guidance about the scope of the SA designer’s duty, confirming that it applies to matters that are within the power of the designer to perform, supervise or check (205 CLR: 319).

2.2 OHS statute law and safe design in construction

The Australian OHS statutes and regulations establish general duties as well as specific obligations in relation to particular risks. In keeping with the high risk nature of the construction industry, OHS regulations typically address key risks in construction including the potential for falls, excavation work, trenching and demolition. Regulations also address a wider range of risks including plant, hazardous substances, fire and explosion, electrical safety, confined spaces and so on. The responsible party under these regulations is generally the employer, the self-employed or workers involved (including principal contractors and subcontractors). However, in three jurisdictions (Western Australia, Queensland and South Australia) the OHS statutes also establish obligations of designers of buildings and structures.
Western Australia

Under the *Occupational Safety and Health Act 1984* (OSHA (WA): s23(3a)) a person who designs or constructs any building or structure for use at a workplace shall, so far as is practicable, ensure that the design and construction of the building or structure is such that: (a) persons who properly construct, maintain, repair or service the building or structure; and (b) persons who properly use the building or structure, are not, in doing so, exposed to hazards. The duty addresses OHS in relation to those involved in construction, those who maintain, repair or service the building or structure, and end users. Two WA codes of practice, for excavation and for prevention of falls, are also relevant to design of construction works (see Worksafe Western Australia Commission, 1996 and 1997).

Recently, the *Final Report: Review of the Occupational Safety and Health Act 1984 (WA)* recommended the development of an approved code of practice to emphasise the duties of those who design and construct buildings and structures, and to clarify the responsibilities of architects, engineers and other designers (Laing, 2002: 82-83). It was argued that awareness of the duty under OSHA (WA: s 23(3a)) was low and that designs were still being prepared without due regard to the safety of those involved in constructing, maintaining, repairing, cleaning and servicing buildings.

Queensland

The report of the *Building and Construction Industry (Workplace Health and Safety) Taskforce* recommended a statutory obligation to “provide some assistance in bringing health and safety issues to the attention of designers who have the capacity to either design risks out or minimise exposure” (Crittal, 2000: 35). However, unlike the duty of care under OSHA (WA), the duty incorporated under the Queensland statute (WHSA (Qld): s 34B) does not extend to OHS issues affecting those involved in construction. A person who designs a building or other structure (or part thereof), which is intended to be used as a workplace, has an obligation to ensure that, when the building “is being used as a workplace and for the purpose for which it was designed”, relevant persons will not be exposed to risk to their health or safety arising out of the design (WHSA (Qld): s 34B). This is a new obligation which came into effect on 1 June 2003.

Examples included under the Queensland Act clarify that it is workers occupying the building or structure and those cleaning, servicing and maintaining it, who should be protected. Specific mention is made of anchorage points for window cleaners, lighting in plant rooms, access for maintenance and access for servicing of air conditioning units. The designer’s obligation is to be determined with regard to “standards of design prevailing when the designer designed the building or structure” (WHSA: s 34B(2) and “applies only to the extent that the content of the design of the building or other structure or part falls under the control of the designer” (WHSA: s 34B(3)).

South Australia

The *Occupational Health, Safety and Welfare Act 1986* and *Occupational Health, Safety and Welfare Regulations 1995* distinguish the duties of designers of buildings from the duties of designers of structures. Under OHSWA (SA), s 23A, a person who designs a building that is reasonably expected to comprise or include a
workplace must ensure, so far as reasonably practicable, that the building is designed so that people who might work in, on or about the workplace are, in doing so, safe from injury and risks to health. The principal focus of the duty appears to be OHS considerations in the end use of the building as a workplace, although there is some ambiguity about this. It might be argued that people who work in, on or about the workplace could extend to those who work on it during construction. However, there is no relevant case law on this. Under OHSWA (SA), s 24(2a), a person who designs a structure that is to be erected in the course of any work must ensure, so as reasonably practicable, that the structure is designed so that persons who are required to erect it are safe from injury and risks to health. Further, under OHSWA (SA), s 24(2a)(d), the person erecting the structure must ensure, so far as reasonably practicable, that it is safe during the course of its erection and subsequent use.

A unique feature of the SA OHSW Regulations is the application of a number of provisions to the design of buildings and structures. Under OHSWR (SA: Div 1.2 and Schedule 2) designers of buildings must comply with regulations relating to access and egress, facilities, drinking water, arrangements for sickness, seating, floors of buildings, fragile roofing materials, space for occupants, design of confined spaces, electrical installations, provision and maintenance of residual current devices (RCDs), proximity to exposed cables, emergency preparedness and facilities, lighting, design of manual handling, noise control, prevention of falls, remote and isolated work, storage, traffic control, ventilation, asbestos, lead, abrasive blasting, demolition work, and specific work to be performed in the building (electroplating, foundry work, spray painting, welding). Schedule 2 to the SA regulations also requires that designers of structures must comply with a similar set of requirements.

If more than one duty holder may have responsibility, then responsibility is to be shared between the parties. Each person is required to comply with that regulation to its full extent and without regard to the fact that another person or persons are also under an obligation to comply with the regulation (OHSWR (SA): r 1.2.14 paragraph (3)). All parties have access to the general defence set down under OHSWR (SA) regulation 1.2.15, if the person accused can prove that "the offence relates to a matter over which the accused did not have control and could not reasonably have been expected to have control." This interpretation of the statutory duty is reinforced by the case of Slivak v Lurgi (Australia) Pty Ltd [2001] 205 CLR 304 in which the High Court held that the designer’s duty applies to matters within the power of the designer to control, supervise, perform or check.

**New South Wales**

While the NSW Occupational Health and Safety Act 2000 does not establish general duties in relation to the design or planning of buildings, structures or other construction works, in 1998 the NSW WorkCover Authority initiated a project intended to stimulate action to address OHS upstream in the design and planning of construction works. A Construction Memorandum of Understanding (MOU) was signed between the NSW Government and 17 major contractors in the construction industry, with the aim of encouraging cooperation and collective responsibility in the management of OHS risks (WorkCover NSW, 2001). The MOU specified performance indicators to be met by signatory contractors, over a two-year period,
in the areas of sub-contractor management, line management training, safety in design and workplace consultation.

Evaluation of the impact of the MOU revealed a poor response to safe design aspects. Only seven of the 17 signatories had required a review of design and its OHS implications in their contract conditions. Six of these indicated that they had assessed safe design for major elements of a project, and only two indicated that they assess safe design for the whole project (WorkCover NSW, 2001: 52). Industry participants observed that there was too much focus on paperwork at the expense of ensuring OHS compliance (WorkCover NSW, 2001: 94-95). Several barriers to improving OHS in the construction industry were identified, including the fact that OHS in design was generally not addressed by clients, the design profession and principal contractors, and the fact that poor programming practices and unrealistic timeframes contribute to unsafe working environments (WorkCover NSW, 2001: 102). These are matters central to the European Union’s Construction Site Directive which is discussed further in Section 3 and 4.

2.3 Regulation of safe design under Australian building legislation

The Building Code of Australia 1996 (BCA) is concerned with safeguarding people from injury, illness or loss of amenity in the use of a building including authorised emergency activities such as rescue operations and fire fighting. It aims to make reasonable provision for access and circulation in the design of a building, taking its use and location into account, and to protect adjoining buildings from structural damage, or damage as the result of a fire in a building (ABCB, 1996).

The BCA has been adopted into building legislation by all states and territories and is administered by these jurisdictions. The legislation sets down the technical requirements to be fulfilled in order to gain approval of a building proposal. It empowers regulation of certain aspects of the building process, and contains the administrative provisions necessary to give effect to the legislation including: plan submission and approval procedures, building permits, inspections during and after construction, provision of evidentiary certificates, issue of certificates of occupancy or compliance, review and enforcement of standards, fees and charges.

While the BCA is comprehensive in its approach to regulating some aspects of design, choice of materials and methods of construction, its scope is considerably narrower than the OHS statutes and regulations, and it is concerned with a limited range of OHS matters. These include structural safety, occupant space, fire resistance, access and egress, fire-fighting equipment, mechanical ventilation, lift installations, and certain aspects of health and amenity. Moreover, the BCA is concerned with minimising risks arising in buildings once they are constructed - it is not concerned with OHS in the construction phase.

While the BCA’s principal audience, architects and engineers, is the same group that OHS authorities seek to harness to address OHS upstream in construction works, there are no indications at present of the scope of the BCA being broadened to embrace a wider range of OHS considerations.
2.4 Summary of relevant Australian law

Designers of buildings and structures have some obligations established under Australian law, although the nature of the obligations differs according to the source of law (common law or statute law) and the jurisdiction in which the designer operates. A composite summary of designers’ obligations is presented in Table 1, which also indicates how the current law applies to OHS in different phases of construction works. The obligations include duties of a general nature as well as obligations to address specific risks. They provide a starting point for considering further regulation of upstream responsibilities in construction works. However, the obligations of designers are currently more developed in relation to end use, maintenance and repair of buildings and structures. There is minimal regulation of design to protect OHS of workers engaged in the construction phase. Moreover, wider issues of planning and coordination of construction works are not addressed.

Table 1: Summary of Obligations of Designers of Buildings and Structures Under Existing Australian Law

<table>
<thead>
<tr>
<th>Obligation</th>
<th>Source</th>
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<tbody>
<tr>
<td><strong>Construction phase and end use, maintenance &amp; repair</strong></td>
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</tbody>
</table>
| Designers (architects and engineers) owe a duty of care to persons who could be exposed to risks arising from their designs:  
  • to identify reasonably foreseeable risks of harm (what a reasonable person in that position would know)  
  • to determine reasonable precautions to avoid harm, taking account of probability and seriousness of harm, burden of taking precautions and social utility of risk creating activity. | Common law of negligence |
| **Construction phase** | |
| Designers of buildings and structures must ensure that persons who properly construct the building or structure are not exposed to hazards. | WHSA (WA), s 23(3a) |
| Designers of structures must ensure that persons who are required to erect the structure are safe from injury and risks to health. | OHSWA (SA), s 24(2a) |
| **Specific hazards/preventive measures** to be addressed: safe access and egress (WA); guard rails and edge protection (WA); temporary work platforms (WA); prefabrication and assembly of materials (WA); access and egress (SA); design of confined spaces (SA); electrical installations (SA); provision of RCDs (SA); emergency facilities (SA); lighting (SA); noise control (SA); prevention of falls (WA, SA); remote and isolated work (SA); storage (SA); traffic control (SA); ventilation (SA); plant design (SA); asbestos (SA); lead (SA); specific work eg abrasive blasting, demolition work, electroplating, excavation, foundry work, logging, spray painting, welding (SA). | Approved Code of Practice – Prevention of Falls (WA)  
Approved Code of Practice – Excavation (WA)  
OHSW Regs (SA), Schedule 2 |

5 OHS statutory duties are qualified by “practicable”, “reasonably practicable”, “reasonable precautions and due diligence” (as for the relevant OHS statutes).
Table 1: Summary of Obligations of Designers (continued)

<table>
<thead>
<tr>
<th>End use and occupancy – including maintenance and repair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Designers of buildings must ensure that design is such that persons who properly use, maintain, repair or service the building or structure are not exposed to hazards (WA)/ risks arising out of the design (Qld)/ safe from injury and risks to health (SA).</td>
<td>OSHA (WA), s 23(3a) WHSA (Qld), s 34B OHSWA (SA), s 23A</td>
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<tr>
<td>Designers of structures must ensure that:</td>
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<tr>
<td>• the design is such that persons who properly use, maintain, repair or service the building or structure are not exposed to hazards (WA)</td>
<td>OSHA (WA), s 23(3a)</td>
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<tr>
<td>• when the structure is being used as a workplace relevant persons will not be exposed to risk to their health or safety arising out of the design (Qld).</td>
<td>WHSA (Qld), s 34A</td>
</tr>
<tr>
<td>Designers obligations extend to matters within their control.</td>
<td>Common law of breach of statutory duty; Qld and SA OHS statutes</td>
</tr>
<tr>
<td><strong>Specific hazards/preventive measures</strong> to be addressed: structural safety (BCA); anchorage points for window cleaners (Qld); guard rails and edge protection (WA); temporary work platforms (WA); prefabrication and assembly of materials (WA); prevention of falls, general (WA, SA); lighting in plant rooms (Qld); lighting, general (SA); access and egress (WA, SA, Qld, BCA); amenities (SA); drinking water (SA); arrangements for sickness (SA); seating (SA); floors of buildings (SA); fragile roofing materials (SA); space for occupants (SA, BCA); lift installations (BCA, all OHS regs); design of confined spaces (SA); electrical installations (SA); provision and maintenance of residual current devices (SA); proximity to exposed cables (SA); fire resistance (BCA); emergency facilities (SA, BCA); design of manual handling (SA); noise control (SA); remote and isolated work (SA); storage (SA); traffic control (SA); ventilation (SA); asbestos (SA); facilities for specific hazardous work to be performed in the building or structure (abrasive blasting, electroplating, foundry work, spray painting, welding); demolition work (SA).</td>
<td>Building Code of Australia OHSW Regs (SA), Schedule 2 ACOP – Prevention of Falls (WA) WHSA (Qld), s 34A</td>
</tr>
<tr>
<td><strong>Administrative requirements:</strong></td>
<td></td>
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<tr>
<td>• Plan submission and approval procedures</td>
<td>Building Code of Australia</td>
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<td>• Building permits</td>
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<tr>
<td>• Inspections during and after construction</td>
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<tr>
<td>• Provision of evidentiary certificates</td>
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<tr>
<td>• Issue of certificates of occupancy or compliance</td>
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3. The European Approach to Regulating Construction Site Safety

The EU Construction Site Directive

A more concerted effort has been made to improve OHS in the construction industry in the European Union, through the Construction Site Directive “on the implementation of minimum safety and health requirements at temporary or mobile construction sites” (European Commission, 1992). The primary concern of the Construction Site Directive is planning and coordination of construction works, underpinned by improved transfer of information between the different parties involved in the design and planning phase, and the construction phase of projects. The Directive also establishes the responsibilities of the parties involved in the construction phase.

The Directive has now been transposed into national legislation by all EU member states and is administered by the European Commission in conjunction with the labour or OHS inspectorate in each member state. The discussion below focuses on the design and planning requirements of the EU Directive and its implementation by member states, with specific reference to the UK Construction (Design and Management) Regulations 1994 (CDM Regulations). There is considerable variation in the law of member states, which is drawn out in this discussion.

Application and responsibility

The Directive and the corresponding law of the member states apply broadly to construction sites where building and civil engineering work are carried out, including both original construction of a building or structure as well as subsequent work carried out on the structure (Gottfried, Trani and Dias, 1999; ISSA, 2001). The definition of “construction work” under the CDM regulations extends to alteration, conversion, fitting out, commissioning, renovation, repair, upkeep, redecoration or other maintenance, de-commissioning, demolition or dismantling of a structure. Also included are site preparation; assembly or disassembly of prefabricated elements; removal of product or waste resulting from demolition or dismantling; and the installation, commissioning, maintenance, repair or removal of services normally fixed within or to a structure. However, the CDM regulations do not apply to work that is not notifiable (see further below) and where there will be less than five people on site at any one time, unless the work involves demolition or dismantling of a structure.

The Construction Site Directive places principal responsibility on the “client” who is a natural or legal person for whom a project is carried out, or with the “project supervisor” who is a natural or legal person acting on behalf of the client (Directive Articles 2 and 3). A consistent approach to responsibility is adopted in most member states. The rationale underpinning the key role assigned to the client is that the client is the person:

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6 This paper focuses on the upstream, design planning aspects of the European law.
7 As amended in 2000 to clarify the obligations of designers.
8 Construction includes earthworks, assembly and disassembly of prefabricated products, conversion or fitting out, alterations, renovations, repairs, dismantling, demolition, upkeep, maintenance, painting, cleaning and drainage (see definition in Article 2 and Annex 1 to the Construction Site Directive)
in whose interest situations may possibly be created which endanger the safety and health of the employees. Through his financial specifications and contract negotiations, the client … dictates many conditions for the construction process to which the businesses involved can, in part, only react on a makeshift basis (Berger, 1999: 60).

The client (or their agent, the project supervisor) must appoint one or more persons to coordinate OHS matters during design and planning, and the construction phase. The coordinator draws up an OHS plan (or ensures that this is done) and prepares an OHS file (the plan and file are discussed further below). Under the UK CDM regulations the coordinator is called the “planning supervisor”. In most member states, designers do not have specific obligations although they do have a role to play (Gottfried et al, 1999). Coordinators appointed by the client are expected to work with designers (and/or they may be the designer in some cases) to facilitate attention to OHS issues in design and planning. Some countries take this further by designating specific responsibilities of designers (this is the case in Sweden, Denmark, Finland, UK and Ireland). Table 2 summarises the responsible parties under the UK CDM regulations and outlines their responsibilities.

**Table 2: Key Duty Holders Under the UK Construction (Design and Management) Regulations 1994**

<table>
<thead>
<tr>
<th>The CDM Regulations place duties on several parties who can contribute to the OHS management of construction works. These parties include clients (including developers and agents appointed by a client to act on their behalf), designers, the planning supervisor and the principal contractor.</th>
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</thead>
</table>

- **The client** must appoint persons, who are competent and have allocated resources, to carry out their role under the CDM Regulations. The client must:
  - appoint the planning supervisor and provide information to him/her that is relevant to OHS;
  - appoint the principal contractor;
  - ensure that a designer, if engaged, is competent;
  - ensure that the health and safety plan is prepared; and
  - ensure that s/he receives the health and safety file at the end of the project.

- **The designer** must ensure that the client is aware of his/her duties and that OHS matters are addressed in the design of the project. Designers have responsibility for OHS in all designs that they prepare directly, as well as designs prepared by their employees or other persons under their control.

- **The planning supervisor** must ensure project notification; that OHS matters are addressed in the design; cooperation between designers; give advice to the client and contractors to enable them to comply with the regulations; ensure that a health and safety plan and the file are prepared.

- **The principal contractor** must coordinate OHS matters in the construction phase of the project, including the development of the construction phase health and safety plan and contributing to the health and safety file.
Notification of construction work

The Directive requires that the client (or agent) gives prior notice of the project to the competent authority, for work scheduled to last longer than 30 working days and involving more than 20 workers simultaneously, or where the volume of work is scheduled to exceed 500 person days (Article 3). Notice must be given “before work starts” on the construction phase.

In the member states there is a similar requirement for notification (Gottfried et al, 1999). However, the timing of notification varies between countries. In some instances the timing of notification is not sufficiently in advance of the construction phase to alert the relevant authority during the planning/design process. For example, in Finland notice must be given as soon as possible but no later than two weeks after construction work begins (Lakki and Sauni, 1999: 46). In Germany, notice is required not more than two weeks before the construction site is established. In the UK, the CDM regulations require the planning supervisor to ensure that notice of the project is given “as soon as practicable” after his/her appointment. With late notification there is little opportunity for regulatory authorities to intervene to address weaknesses in the design and planning phase, except after the event.

Design and planning of the construction project

The *Construction Site* Directive requires the client (or agent) to apply general prevention principles of risk assessment and control, and to designate responsibility for OHS, during various stages of design and preparation of the project. In particular, this is required when decisions are made about architectural, technical or organisational aspects, in order to plan the various items or stages of work, and when estimating the period of time required to complete work stages (Article 4).

The law of the member states establishes similar responsibilities in design and planning, although in countries where designers have specific legal duties they take on some or all of this responsibility (Gottfried et al, 1999). For example, under the CDM Regulations both the designer and the planning supervisor must: (1) ensure that the client is aware of his/her duties; (2) ensure that any design s/he prepares avoids foreseeable OHS risks in construction; (3) combat OHS risks at source; (4) give priority to measures that protect all persons at or affected by the work (collective measures), over measures which only protect an individual; (5) ensure that the design includes adequate information about any aspect of the project which might affect OHS; and (6) co-operate with the planning supervisor and other designers to enable each to comply the regulations.

Neither the *Construction Site Directive* nor the law of member states identifies particular preventive measures to be implemented or OHS outcomes to be achieved in the design and planning for a project. This is in contrast to the construction phase for which minimum OHS requirements are established, to be complied with by employers or self-employed persons. The minimum requirements, which are specified in Annex IV to the Directive, address: stability and solidity; energy distribution; emergency routes and exits; fire detection and fire fighting; ventilation; exposure to noise, dust and fumes; temperature; lighting; doors and gates; traffic routes; loading bays and ramps; first aid; rest rooms, meal and accommodation
areas; falling objects; falls from heights; scaffolding and leaders; lifting devices; excavation and materials handling; demolition; metal or concrete frameworks; and temporary fragility or instability of the structure. While there is nothing to prevent those responsible for design and planning from using these minimum requirements as a point of reference, they are not required to address them. Arguably an opportunity to focus attention on some OHS matters worthy of consideration in the design and planning phase is missed by allocating these more specific matters to the role of the employer and self-employed during the construction phase, and not identifying specific OHS matters to be addressed in design and planning.

**Training for coordinators of OHS**

An important area of difference in the law of the member states is the extent to which there are requirements for training for coordinators of OHS matters (the planning supervisor in the UK). There are three approaches: (1) the national authorities *do not regulate* training and qualification and courses are offered by private providers (UK, Ireland, Netherlands, Denmark, Portugal and Sweden); (2) the national authorities *establish core course content and duration* but delivery is by private providers (Germany, Austria and Portugal); and (3) training and qualifications are *regulated* (Luxembourg, France, Belgium and Greece) (Zachmann, 1999: 4).

The UK CDM regulations simply require that the planning supervisor and the designer “have competence” and “have adequate resources” to carry out their responsibilities. The role of planning supervisor is often carried out by an architectural practice, consulting engineers, project managers or contractors with design and construction experience. In contrast, in Germany core training requirements are established covering design and preparation of buildings, building operations, construction of specific/difficult buildings, OHS (general), OHS (construction), OHS (specific/difficult buildings or structures), coordination of project design and preparation, coordination of project execution, social competence and professional practical knowledge (Mahlstedt, Waninger and Wienhold, 2000). Under Belgian and French law three levels of training are established, with a total of 680 hours together with industry experience in Belgium and the equivalent of 30 days training in France (ISSA, 2001; Lorent, 1999: 14).

**The safety and health plan**

The *Construction Site Directive* requires the client, or agent, to ensure that prior to setting up the construction site a safety and health plan (OHS plan) is drawn up by the planning and design phase coordinator (Article 3). Derogations from the requirement to produce an OHS plan may be allowed but not for work involving particular risks which include: earth falls; engulfment in swampland; falling from a height; chemical or biological hazards; ionizing radiation; work near high voltage power lines; risk of drowning; wells underground earthworks and tunnels; divers using air supply system; workers in caissons with compressed air supply; use of explosives; assembly or dismantling of heavy, prefabricated components. The law of most member states similarly requires the client, or agent, to ensure that an OHS plan is drawn up, prior to setting up the construction site. In practice this is done by the project coordinator. In the UK and Ireland the planning (project) supervisor is responsible for developing the plan (Gottfried et al, 1999; ISSA, 2001).
Some countries prescribe the contents of the OHS plan. For example, the UK CDM regulations require that the plan includes: a general description of the construction work; details of the time for completion and any intermediate stages; known or reasonably foreseeable risks to any person carrying out the construction work; other information necessary for any contractor to have in order to demonstrate competence, allocation of adequate resources and compliance with requirements. Other member states do not prescribe the contents of the OHS plan but, in some countries, the plan must be submitted with building plans in order to obtain the approval of the building authorities for the project (Papaioannu, 1999: 65; Casals, Etxeberria and Salgado, 1999: 128).

Safety and health file

According to the Construction Site Directive the coordinator draws up a safety and health file (OHS file) on the characteristics of the project (Article 5). The file is to contain relevant health and safety information to be taken into account during subsequent works (for example maintenance, repair and renovation of the structure). The file is initiated by the project coordinator in the planning phase and added to by the project coordinator and contractors involved in the construction phase. In the law of most member states the client (or agent) must ensure that an OHS file is prepared (Gottfried et al, 1999). In most countries, including the UK, it is the role of the coordinator in the design and planning phase to initiate the file, which is added to by designers, and the coordinator and contractors involved in the construction phase. In addition to maintenance and repair, at least one country (Denmark) emphasises the need to address OHS issues for the end user (Hellidi, 1999: 38).

The contents of the OHS file are prescribed in some member states. Other countries provide guidance on the contents of the file, through government or industry bodies. For example, in Germany, the Berufsgenossenschaften for the construction industry sets down the contents of the file (Berger, 1999: 56). In Finland, the content of the safety and health file is quite detailed. It must address: general OHS instructions and regulations; hazardous substances and materials; occupational hygiene; stressors; dangerous works and work phases; hazards and hazardous conditions related to the use of machinery and equipment; hazards arising from traffic and other nearby activities; equipment, structures and other things that may constitute a hazard; other problems and hazards characteristic of the project (Lakka and Sauni, 1999: 47). In the UK, the Health and Safety Executive’s Information Sheet - Construction Sheet no 44 (HSE, undated), advises that the file might include design criteria, construction methods and materials used, details of services, plant and equipment, "as built" and "as installed" drawings, operation and maintenance manuals (with maintenance facilities and procedures for the structure). Further the HSE advises that the client should keep the file available for planning supervisors and contractors in the event of future work on the structure.

Table 3, over page, presents a composite summary of the European approach to regulating design and planning of construction works, identifying some sources of national variation.

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9 The industry based, workers compensation authority.
Table 3: Summary of European Obligations for Design and Planning

<table>
<thead>
<tr>
<th>Obligation</th>
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<tbody>
<tr>
<td><strong>Client (or agent) must ensure:</strong></td>
</tr>
<tr>
<td>• one or more persons to coordinate OHS matters during the design and planning phase (EU, UK)</td>
</tr>
<tr>
<td>• that the principal contractor is appointed for the construction phase (EU, UK)</td>
</tr>
<tr>
<td>• that a designer, if engaged, is competent (UK)</td>
</tr>
<tr>
<td>• that the OHS plan is prepared (EU, UK)</td>
</tr>
<tr>
<td>• s/he receives the health and safety file at the end of the project (EU, UK)</td>
</tr>
<tr>
<td>• notification of the project before construction work starts (EU) - required for work scheduled to last longer than 30 working days and involving more than 20 workers simultaneously, or where the volume of work is scheduled to exceed 500 person days.</td>
</tr>
<tr>
<td><strong>Coordinator of OHS in design and planning phase (planning supervisor in UK) must ensure that:</strong></td>
</tr>
<tr>
<td>• OHS plan is prepared (EU, UK)</td>
</tr>
<tr>
<td>• OHS file is prepared (EU, UK)</td>
</tr>
<tr>
<td>• OHS is addressed by designer (EU, UK)</td>
</tr>
<tr>
<td>• there is cooperation between designers (UK)</td>
</tr>
<tr>
<td>• notification of the project, as soon as practicable after the appointment of the planning supervisor (UK) - required if the construction phase will be longer than 30 days or will involve more than 500 person days of construction work</td>
</tr>
<tr>
<td>• advice is provided to the client and contractors (UK)</td>
</tr>
<tr>
<td><strong>Designer must:</strong></td>
</tr>
<tr>
<td>• take account of general principles of prevention (EU)</td>
</tr>
<tr>
<td>• ensure that OHS matters are addressed in the design of the project (UK)</td>
</tr>
<tr>
<td>• take account of any OHS plan or file (EU)</td>
</tr>
<tr>
<td>• cooperate with the OHS coordinator and provide them with information about particular risks (EU)</td>
</tr>
<tr>
<td>• ensure that client is aware of his/her duties (UK)</td>
</tr>
<tr>
<td><strong>Coordinators training and qualifications:</strong></td>
</tr>
<tr>
<td>• not regulated (UK, Ireland, Netherlands, Denmark, Portugal and Sweden);</td>
</tr>
<tr>
<td>• in accordance with framework set by national authority (Germany, Austria and Portugal);</td>
</tr>
<tr>
<td>• regulated by national authority (Luxembourg, France, Belgium and Greece).</td>
</tr>
</tbody>
</table>

**OHS plan must include (UK):**
- a general description of the construction work;
- details of the time for completion of the project, and any intermediate stages;
- details of known or reasonably foreseeable risks to the health or safety of any person carrying out the construction work;
- any other information which the planning supervisor knows or could ascertain by making reasonable enquiries, which is necessary for any contractor to have in order to demonstrate competence, allocation of adequate resources and comply with requirements.
- submission of OHS plan for approval of the building authorities (Greece, Spain)

**OHS file must contain:**
- OHS information relevant to construction and subsequent maintenance work (EU)
- OHS information for end users (Denmark)
- general work safety instructions and regulations; hazardous substances and materials; occupational hygiene; stressors at work; dangerous works and work phases; hazards of the work environment; hazardous conditions; hazards and limitations related to use of machinery and equipment; hazards, impediments and constraints to work arising from traffic and other nearby activities; equipment, structures and other things that may constitute a hazard; other problems and hazards characteristic of the project (Finland).
4. Impact of the *Construction Site Directive* and the Law of Member States

While there is a sound rationale for addressing OHS upstream, in the design and planning of construction works, the evidence of the impact of the *Construction Site Directive* and associated law is at best equivocal. Few member states claim a downward trend in construction industry *incident frequency rates* since introducing law based on this Directive (Gottfried et al, 1999). One country that does make such a claim is the Netherlands which reports both a declining incident rate and a slow decline in the total number of absent days, days spent in a hospital and number of severe accidents (Schaeffer and Munck, 1999: 101). Finland also experienced a downward trend in the incidence rate from 105 per million hours worked in 1990 to around 80 in 1997. However, it is unclear if this was due to factors in the construction industry as the manufacturing and transport industries experienced a similar reduction. Also, in the same period construction fatalities initially dropped and then started to rise again (Lakka and Sauni, 1999: 41-43). In the United Kingdom trends in the incident rate were similarly initially positive with a downward trend from 1993/94 to 1997/98 of 10%, but with fluctuations up and down during that period (Caldwell, 1999: 142). However, the annual fatality rate peaked at 105 in 2000/01, before declining to 80 in 2001/02 and 71 in 2002/03 (Bomel, 2001: 0.5; HSE, 2003). Moreover, the fatality rate in scaffolding (1 in 5,400), in roofing (1 in 3,800) and in steel erectors (1 in 3,000) all exceeded the HSE’s own guideline of an intolerable risk (1 in 10,000) (Entec, 2000: v).

Notwithstanding the poor incident rates, there are some *general perceptions* of benefits related to increased awareness of clients, designers and others involved in design and planning of construction works (Caldwell, 1999: 146; Entec, 2000: 66; Gottfried, 1999: 96; McCabe, 1999: 81; Önsten and Patay 139). Some of the benefits reported, from different countries, are:

- increasing attention to pre-planning of construction site safety by clients and designers and use of the OHS plan as a risk assessment tool (Lakka and Sauni, 1999: 48; Lorent, 1999: 18-19);
- dissemination and transfer of information between the parties and greater emphasis on consultation (Lorent, 1999: 18; Schaeffer and Munck, 1999: 108);
- greater designer awareness of the OHS aspects of architectural, structural and product choices for construction safety, and opportunities to eliminate or reduce hazards in the design process (Caldwell, 1999: 146; Lorent, 1999: 18-19);
- designers and architects receiving information sooner in the procurement process enabling more attention to OHS in designs (Caldwell, 1999: 146);
- coordinators assessing foreseeable risks, settling disputes and encouraging a project culture with the aim of creating a safety culture (Lorent, 1999: 18-19);
- reduced scheduling problems and risks arising from two or more activities conducted at the same time by organising activities at different times and/or in separate areas (Lorent, 1999: 18-19);
- greater potential to planning OHS training for workers when risks are recognised in advance and an increase in the amount of OHS training undertaken (Lorent, 1999: 23; McCabe, 1999: 81); and
- selection of more economical construction methods, application of collective safety precautions, and cost-optimised handling of materials and waste (Berger, 1999:60).
However, *evaluation studies* suggest there is considerable variation in industry practice and a lack of understanding and little application of the requirements (Griffiths and Phillips, 2001: 538; Lakka and Sauni, 1999: 48; Papaioannu, 1999: 66; Schaeffer and Munck, 1999: 108). There is a lack of OHS awareness and training amongst those taking on the role of coordinator (planning supervisor), and those involved report increased bureaucracy, paperwork, workload and costs (McCabe, 1999: 81; The Consultancy Company, 1997: 55). In general, there is a tendency for documentation (OHS plans and files) to be generic and not tailored to the particular project under consideration (Caldwell, 1999: 147; Entec, 2000: 30; and see also Johnstone, 1999 for similar findings in relation to OHS plans in the Queensland construction industry). The generic character of some plans may extend to photocopying typical OHS plans so as to have one to show to the inspection body, rather than developing them specifically for the project (Dias, 1999: 119). On the other hand, there is a perception that some plans are unnecessarily long (to safeguard the compiler) and essential information is obscured by irrelevant material (Baxendale and Jones, 2000: 38; Caldwell, 1999: 147). Even where procedures and documentation have improved, implementation on site remains a major issue (Entec, 2000: 30). These problems are perhaps not surprising in a regulatory regime in which the key elements are process and documentation requirements, which does not incorporate specific outcomes or measures for hazard management, and which gives the duty holder considerable discretion in how to comply.

The UK's requirement for “competency” of planning supervisors has proved difficult to ensure in the absence of specific criteria for determining suitable qualifications and experience (Baxendale and Jones, 2000: 37-38; Caldwell, 1999: 147; Entec, 2000). There is also a low uptake of training amongst designers, in the absence of mandatory training - only 8% of designers targeted for HSE inspection had been training in the CDM regulations (Rigby, 2003). A number of commentators from the member states advocate mandatory training of the parties with a key role in design and planning. Proponents argue that competency criteria should be consistently defined in the law of member states to enable mutual recognition of training programs and qualifications (Lorent, 1999: 23; Hellidi, 1999: 27; McCabe, 1999: 81; Gottfried, 1999: 97; Dias, 1999: 119; Önsten and Patay, 1999: 136).

Lorent (1999: 23-24) recommends that training should cover: (1) *knowledge* of OHS regulations, OHS in contracts, planning methods, construction risks, site organisation, maintenance of the structure, management of activities in the vicinity of the construction site; (2) *capacity* to read a plan, contract specifications and tenders and assess risks involved, assess risks involved in maintenance and use of the structure, formulate proposals to avoid, reduce or combat risks at the source, establish an OHS plan and file, organise site layout, coordinate contractors, cooperate and exchange information between parties; and (3) *communication skills* to exchange information, present measures required, utilise participative structures and negotiate with the client to impose the necessary measures. These competencies are equally applicable to coordinators and designers. However, designers also require specialised knowledge in order to integrate and address OHS in their designs (as discussed further below).
There are also insights from evaluation studies about the role of the client, the coordinator (planning supervisor) and designers, and the failure in practice to fulfil the expectations of the law. The CDM regulations (and the Construction Directive) envisage that the client will drive attention to OHS but research suggests that they “are often ignorant of their role and are detached from their projects” (Entec 2000, viii, 36 and 63). One-off clients, or those that commission construction projects infrequently, have a particularly poor understanding and clients in general rely on other groups including designers and planning supervisors to advise them of their duties, rather than leading and resourcing attention to OHS as CDM requires (Entec, 2000; The Consultancy Company, 1997: 55). Rather than the client appointing a planning supervisor promptly to coordinate OHS aspects of design and planning, it is more common for a client, unaware of his/her responsibilities, to appoint a designer and progress to the design of the project. Appointment of the planning supervisor may then occur rather late in the process when there is little opportunity to impact on OHS aspects of the design and plan (Baxendale and Jones, 2000: 37-38).

In addition to the problem of delayed appointment of the planning supervisor, the actual value of this appointment has been questioned (HSE, 2002a; Totterdell, 2000). “The role of the planning supervisor is contentious and the debate is not helped by their inappropriate title – their legal duties don’t involve either planning or supervision” (HSE, 2002a: 30). The role is considered redundant and paper driven rather than contributing competence to the design and planning process. The HSE has canvassed the possibility of transferring responsibility for notification of projects, and ensuring the preparation of the OHS plan and file to the lead designer. Unlike the role of planning supervisor, a lead designer is typically appointed early in the design of construction works and arguably provides “a natural focus for the co-ordination of design work” (HSE, 2002a: 31) (see also The Consultancy Company, 1997: 161; and Totterdell, 2000: 45-46 for a discussion of the lead designing taking on the planning supervisor role).

While the role of designer may be a more natural one in industry practice, it is not yet a natural focus for addressing OHS. Designers, who include architects, engineers and related technical drafting persons, are also not giving OHS a high enough priority and there has been little improvement in producing designs that are safe to construct (Entec, 2000: 37; Rigby, 2003). Designers have been slow to respond to the need for risk assessment and the subsequent requirement to pass this information on to the planning supervisor (Baxendale and Jones, 2000: 37-38). Some of the reasons for the failure to address OHS effectively in the design phase (offered by designers as well as others in the construction industry in the Entec study) are: designers have limited understanding and experience of buildability issues and other on site OHS issues; the differences in risks for different trades are not well understood; and OHS issues over the life time of a building are not well understood. Moreover, design risk assessments are often undertaken when the design is nearly complete and unlikely to be changed (Entec, 2000: 41, 70-71).

It appears that the potential benefits of designer involvement have not been fully realised and designers have not fully engaged in reducing risks (HSC, 2003: 2). However, Bomel (2000: 0.13) recommends that “work be done to understand the challenges they face in terms of process and timing, and in terms of their knowledge
and experience”. The difficulties encountered by designers are also canvassed by Baxendale and Jones (2000: 38) who observe that industry custom and practice is to judge designs in terms of fitness for purpose, aesthetics and buildability. There is a challenge for designers to seek out and find other construction methods that give the same or similar results to the more inherently high risk options. However, architects in particular may be “constrained by their lack of knowledge of construction materials, the construction process and the use of specialist construction techniques” with the result that their capacity to identify and eliminate risks in their designs is limited (The Consultancy Company, 1997: 134). Respondents to the HSE’s public discussion paper Revitalising Health and Safety in Construction sought real examples and case studies, providing examples of good design (with reasons) and bad design (with reasons), as well as specialist area guidance in relation to mechanical, electrical and other risks (HSE, 2002c: 23).

From a US perspective, Gambatese and Hinze (1999: 644-666) argue that designers’ poor awareness arises from a lack of formal education about construction worker safety, their minimal involvement in overseeing worksite OHS and the structural separation of the design and construction functions in the traditional design-bid-build model. The “cases in which construction worker safety is considered during design tend to be in design-build firms where the design and construction components are part of the same company” (Hecker and Gambatese, 2003: 339). Gambatese and Hinze (1999: 643) propose that designers’ lack of knowledge needs to be met by demonstrating the possibilities for improving construction OHS in the design of buildings and structures, by accumulating suggestions for doing so. They report on the development of a database of more than 400 design solutions to construction phase OHS problems, many of which address principal sources of occupational injury on construction sites. Table 4 (over page) presents some of the design solutions identified by Gambatese and Hinze (1999), together with others identified by Lorent (1999: 19) and Berger (1999: 60). The examples help to illustrate how a general duty can translate into practical action by defining OHS outcomes to be achieved.

Over and above perceived weaknesses in the existing law, the absence of a concerted and consistent approach to enforcement may provide further explanation of the apparently weak impact of the law on the design and planning of construction works. The HSE enforces the CDM regulations using a combination of improvement and prohibition notices, and prosecution. Reported enforcement of the CDM regulations in 2000/2001 involved 220 enforcement notices, about half being prohibition notices and the other half being improvement notices, and 32 successful prosecutions with an average fine of £6050 (HSE, 2001: 6). There is a much higher level of enforcement of OHS in the construction phase with breaches of the Construction (Health, Safety and Welfare) Regulations attracting almost 2,893 enforcement notices, mostly prohibition notices, and successful prosecutions for 161 serious breaches of the legislation.

While participants in the Entec (2000) study identified the CDM regulations as the biggest external influence on the industry, they also expressed concern that enforcement of the CDM regulations is not providing a sufficient deterrent for non-compliance. They perceived that a low level of inspections and prosecutions was failing to provide sufficient deterrence for poor OHS performance. As the HSE (2001: 6) data indicate, enforcement does occur. It is possible that the perception of
limited enforcement is exacerbated by the very large number of contractors in the construction industry (163,000 according to the HSE, 2001: 4). The extended supply chains typical of the building and construction industry also apply in the design and planning phase which can involve a range of businesses (HSC, 2003: 2).

Table 4: Examples of Design Solutions for Safe Construction

<table>
<thead>
<tr>
<th>Provide adequate clearance between the structure and overhead power lines by burying, disconnecting or re-routing cables before construction begins, to avoid the hazard when operating cranes and other tall equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design components to facilitate pre-fabrication in the shop or on the ground so they are erected in place as complete assemblies, reducing worker exposures to falls from heights or being struck by falling objects.</td>
</tr>
<tr>
<td>Assemble and finish components off-site to minimise noisy machinery such as pneumatic drills, circular saws and sanders.</td>
</tr>
<tr>
<td>Choose blocks and panels that are easy to handle.</td>
</tr>
<tr>
<td>Design parapets to a height that complies with guardrail requirements, eliminating the need to construct guardrails during construction and future roof maintenance.</td>
</tr>
<tr>
<td>Design beam-to-column double connections to have continual support for beams during the connection process by adding a beam seat, extra bolt hole, or other redundant connection point, that provides continual support for beams during erection - to eliminate falls due to unexpected vibrations, mis-alignment and unexpected construction loads.</td>
</tr>
<tr>
<td>Design and schedule a permanent stairway constructed at the beginning of construction to help prevent falls and other hazards associated with temporary stairs and scaffolding.</td>
</tr>
<tr>
<td>Cover passages, entrances and exits well designed for construction work and future use.</td>
</tr>
<tr>
<td>Design maintenance operations to be done from ground level or from the structure, for example window cleaning bays or gangways integrated into the structural frame.</td>
</tr>
<tr>
<td>Design and position anchorage and hoisting points.</td>
</tr>
<tr>
<td>Avoid fragile roofing materials.</td>
</tr>
<tr>
<td>Replace conventional ceiling recesses with porous concrete blocks (as filling material) that can be drilled as required and avoid the risk of stumbling.</td>
</tr>
<tr>
<td>Design reinforcing steel to be closely spaced in a grid pattern to provide a continuous walking surface free of tripping hazards.</td>
</tr>
</tbody>
</table>

The HSE also observes that working with clients and designers requires more time than addressing immediate issues on a construction site (HSE, 2001: 7). Nonetheless, inspectors with the HSE’s Construction Division have increased their efforts to focus designers’ attention on OHS considerations through a design review process. In March 2003 inspectors met, usually on-site, with the planning supervisor
and lead designer of 123 construction works (Rigby, 2003). Only 33% of designers were considered to be aware of their responsibilities under CDM and had adequately addressed the buildability of the project. The risk assessment process was poor in 34% of designs. In addition, inspectors confront a practical problem in both identifying the parties responsible for design and planning, and in being aware of projects in sufficient time to engage with the parties responsible, before key decisions are “locked in” (Rigby, 2003: 8). Suggested solutions to this problem are direct notification by the lead designer and a minimum 28 day period following notification of work, before commencing construction work, in order to allow time for plans to be fully developed and assessed (Entec, 2000: 41; HSE, 2002a: 31).

In summary, there has been considerable interest in the European Union's regulatory model for managing OHS in construction works. It is the first of its kind in attempting to improve OHS in the construction phase and subsequent maintenance by improved planning and attention to OHS in the design of these projects. However, the evidence so far suggests that the desired improvements in OHS performance have not been achieved. With OHS legislative interventions it is always difficult to determine to what extent the intervention influences change, in view of a wide range of other factors that may influence the decisions and actions of the regulated group. If improvements in performance are discerned, can they be attributed to the legislation? If improvements are not apparent, is this due to non-compliance with legislation that is sound in its capacity to deliver improved OHS outcomes, if it is implemented? Or, is the legislation flawed in the sense that even if complied with, it would not achieve improved OHS outcomes. With the Construction Site Directive and associated law of member states there is cause for concern that there are problems with the legislation itself and that those who do endeavour to comply, are hampered by a lack of know how and direction about the OHS outcomes to be achieved. While some effort has gone into documentation in the form of plans and files, this has not translated into the prevention of injuries, disease and death.

For Australian regulators, considering the merits of the European approach, and the UK CDM regulations in particular, there is reason to be cautious about directly transplanting European law into the Australian context, without at least addressing the recognised problem areas. The following section canvasses some possible alternatives to regulating safe design and planning of construction works that take account of these problems.

5. Regulating for Safe Design of Construction Works - Some Proposals

Existing regimes regulating the role of upstream parties are either piecemeal (under Australian OHS law) or far-reaching but general in their approach, and uncertain in their effectiveness (the European regime). Rather than simply transplanting existing UK (or European) regulatory requirements into the Australian building and construction industry, this report argues that more effective prevention of occupational fatalities, injuries and disease can be achieved by designing regulation that specifically addresses Australian regulatory goals, seeks out the most effective forms of regulation to achieve these goals, and takes account of the successes and
warnings from overseas' experience. As a starting point seven goals are proposed as
the framework for regulating safe design and planning of construction works.

**Goals**

The *first* goal is to enhance consideration of OHS matters in the design and
planning of a wide range of construction works, and to improve OHS for a range of
persons who could be affected by these works. The *second* goal is to engage all
parties with real control or influence in the design and/or planning of construction
works in OHS risk management. These parties include the client procuring
construction works, developers and designers. The *third* goal is to ensure that
foreseeable risks are comprehensively identified and eliminated or minimised "at
the source", that is, as early as possible in the design, choice of materials and
methods, planning and organisation of work, selection and coordination of
contractors. *Fourth*, regulation in this area should aim to ensure the OHS
knowledge and capability of those involved in design/planning decisions. A *fifth*
goal is to ensure that key information is transferred from the design/planning phase
to the principal contractor and other contractors engaged in the construction phase,
and those engaged in subsequent work in, on or about the structure. *Sixth*,
regulatory requirements should be readily enforceable by timely identification of
construction works in the design/planning phase to enable inspectors to engage with
clients, designers and developers prior to commencement of construction works.
*Seventh*, for greater impact, the regulatory regime should be nationally uniform.

These goals are now considered in turn, outlining regulatory approaches to advance
each goal, taking account of existing Australian and European law, to canvass
possible problems and solutions.

**Application to a wide range of construction works and persons affected
by them**

While the Cole Royal Commission (Cole, 2003) proposes measures to protect OHS
in the construction phase, the National Occupational Health and Safety Commission
(NOHSC, 2002a) has a wider goal of enhancing safe design in relation to all aspects
of work. Thus the first goal expressed here is to ensure that risks are addressed in
relation to: (1) construction work including initial construction, modifications and
demolition, and others who could be affected by this work; (2) maintenance, repair
and cleaning, and others who could be affected by this work; and (3) end use and
occupancy of buildings and other structures. It is proposed that obligations should
apply to each of these phases.

With around 60 construction workers fatally injured in Australia each year and a
further 25 in every 1,000 receiving workers compensation for occupational injury
(Mitchell et al, 2003: 348), the construction phase warrants preventive action by all
those with real control and influence over OHS. For workers engaged in cleaning,
maintenance and repair on buildings and structures, and those who occupy
workplaces in end use, there are also OHS matters that are within the control and
influence of clients and designers. These matters go beyond those currently
addressed by Australian building legislation and are not well addressed by OHS
law, at least in relation to upstream duty holders.
Moreover, construction work should be broadly defined to encompass building and civil construction works, including both original construction as well as subsequent work carried out on a structure. Specifically, this should include: site preparation, earthworks, assembly and disassembly of prefabricated products, conversion or fitting out, installation or removal of services, alterations, renovations, repairs, upkeep, maintenance, dismantling, demolition, painting and decorating, cleaning and drainage, removal of waste.

It is proposed that initially obligations should apply to works that meet certain size and risk criteria, for example work that is notifiable, or where more than 5 persons will be on site at any time, or that involve demolition or dismantling. This is the same as the UK CDM Regulations (see also proposals for notification under "Timely identification of projects" below).

Engaging all parties with real control and influence

In practice, those with real control and influence over decisions in the design and planning of construction works include a range of design professionals and the clients who procure construction works. Where there is no design component involved, a client may deal directly with contractors to procure specific work. Any or all of these parties may be part of a chain of supply for particular construction works.

It is well recognised that clients can exert considerable influence, but are often not part of the construction industry, and hence are often unfamiliar with its risks and practices (Baxendale and Jones, 2000; Entec, 2000; The Consultancy Company, 1997). To this end it is proposed that the client’s obligation should be to not exert their influence in a manner that is harmful to OHS. For example, this could be expressed as a duty to ensure, so far as “reasonably practicable”[^10] that nothing is required in the design, organisation or scheduling of construction works which would necessitate the use of hazardous structural features, materials, procedures or practices, and could be avoided by design modifications, substitute materials or methods. Further to this, the client should be required to ensure that any designer and any principal contractor engaged by the client are competent (with reference to prescribed OHS competencies for construction works - see further at "OHS knowledge and capability for design/planning decisions"). The client should also ensure that an OHS file is prepared, that this is provided to the principal contractor for the construction phase, and that the client receives the OHS file at the end of the project (see further at "Transfer of key information from design/planning phase").

Decisions by designers influence structural features, methods of construction, materials used, organization and planning of construction works, amongst other matters that impact upon OHS risks, for those involved in construction as well as subsequent work in, on or about buildings and structures. Thus, where there is a design component to construction works, it is proposed that designers should have responsibility for addressing OHS matters within their control, and the lead designer in the design/planning phase would have certain additional responsibilities.

[^10]: As defined in the OHS statute for the jurisdiction. As confirmed by the High Court in Slivak v Lurgi (Australia) Pty Ltd [2001] 205 CLR: 304 at 322-323 this involves making a value judgement, in light of the facts and what was known at the time, and balancing the likelihood of the risk occurring against the cost, time and trouble necessary to avert that risk.
Designers should be required to ensure that reasonably foreseeable risks of harm are identified and that risks are eliminated or minimised as far as "reasonably practicable"\(^{11}\), in essence a codification of common law principles. Designers would also be required to cooperate with the client and other designers and to provide them with information. The lead designer for construction works would be responsible for notification of construction works and for compiling the OHS file (see further below). Corresponding obligations should also apply to the principal contractor for the construction phase of works, for notifiable works that do not involve a designer.

**Identification, elimination or minimisation of foreseeable risks, as far as "(reasonably) practicable"**

The obligation proposed above, to systematically identify and eliminate or minimise risks, is broad enough to cover the diversity of construction works and risks that could arise. However, there is some evidence to suggest that both designers and clients are not always attuned to the ways in which their decisions impact on OHS in construction, maintenance and repair, and end use. There is a danger that key risks might be overlooked with such a generic obligation alone. For this reason, an action oriented approach is proposed whereby duty holders are required to implement systematic OHS risk management and also to address particular OHS matters, which would be prescribed under OHS regulations.

One mechanism for providing this "scaffolding" is to identify a set of OHS matters to be addressed without specifying particular preventive measures or outcomes to be achieved (a “checklist” approach). This approach provides flexibility which may be desirable in view of the considerable diversity of construction works. Drawing on existing OHS regulations in Australia and overseas, Table 5 summarises some of the key OHS risks in construction works, maintenance, and end use of buildings and structures, which could provide the basis for a list of OHS matters to be addressed in design and planning.

An alternative approach is to apply the requirements of OHS regulations to those responsible for design and planning construction works. Currently, Australian OHS regulations establish specification standards, measurable performance targets or descriptive performance outcomes for a range of hazards (see Bluff and Gunningham, 2003 for an explanation of different types of standards). The regulations cover the kinds of matters listed in Table 5. However, regulations usually frame provisions as the responsibility of employers, self-employed persons or workers. An approach similar to the SA OHSW regulations offers the advantage of clarifying performance outcomes required and defining specific preventive measures when necessary to address significant risks, while applying these to all duty holders with control or influence over them. Some examples are presented in Table 6.

Whichever approach is taken, it is proposed that designers be required to identify how risks have been addressed and that this would be recorded in an OHS file (see further under "Transfer of key information from the design/planning phase").

\(^{11}\) As defined in the OHS statute for the jurisdiction.
<table>
<thead>
<tr>
<th>Table 5: Proposed Essential OHS Matters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical safety</strong></td>
</tr>
<tr>
<td>• electrical installations and RCDs</td>
</tr>
<tr>
<td>• proximity to exposed cables</td>
</tr>
<tr>
<td>• work near high voltage power lines</td>
</tr>
<tr>
<td><strong>Fire and emergency:</strong></td>
</tr>
<tr>
<td>• fire prevention and fire resistance</td>
</tr>
<tr>
<td>• fire detection and fire fighting</td>
</tr>
<tr>
<td>• emergency routes and exits</td>
</tr>
<tr>
<td>• other emergency facilities</td>
</tr>
<tr>
<td><strong>Movement of people and materials</strong></td>
</tr>
<tr>
<td>• safe access and egress</td>
</tr>
<tr>
<td>• traffic routes and traffic control</td>
</tr>
<tr>
<td>• loading bays and ramps</td>
</tr>
<tr>
<td><strong>Radiation</strong></td>
</tr>
<tr>
<td>• exposure to ionising radiation</td>
</tr>
<tr>
<td>• exposure to non-ionising radiation (electromagnetic radiation etc)</td>
</tr>
<tr>
<td><strong>Work environment</strong></td>
</tr>
<tr>
<td>• ventilation (for thermal comfort, general air quality and specific ventilation requirements for the work to be performed on the premises)</td>
</tr>
<tr>
<td>• temperature</td>
</tr>
<tr>
<td>• lighting (including lighting of plant rooms)</td>
</tr>
<tr>
<td>• acoustic properties and noise control (eg noise isolation, insulation and damping)</td>
</tr>
<tr>
<td>• seating</td>
</tr>
<tr>
<td>• floor surfaces for buildings</td>
</tr>
<tr>
<td>• space for occupants</td>
</tr>
<tr>
<td><strong>Plant</strong></td>
</tr>
<tr>
<td>• plant and machinery installed in the structure</td>
</tr>
<tr>
<td>• materials handling plant and equipment</td>
</tr>
<tr>
<td>• lift installations</td>
</tr>
<tr>
<td><strong>Design for specific work to be performed on the premises:</strong></td>
</tr>
<tr>
<td><strong>Amenities &amp; facilities:</strong></td>
</tr>
<tr>
<td>• storage</td>
</tr>
<tr>
<td>• first aid rooms/sick rooms</td>
</tr>
<tr>
<td>• rest rooms</td>
</tr>
<tr>
<td>• meal and accommodation areas</td>
</tr>
<tr>
<td>• amenities</td>
</tr>
<tr>
<td>• drinking water</td>
</tr>
</tbody>
</table>
A person who designs a confined space must ensure:
(a) so far as is reasonably practicable, that the design eliminates the need for persons to enter the confined space; and
(b) if entry may be required, that the confined space is provided with safe means of entry and exit

Reasonable steps must be taken to ensure reasonable traffic control at a workplace where vehicles are used, or are allowed to enter or leave, in order to minimize and danger caused by the movement or use of vehicles at the workplace.

If in the performance of work:
(a) a person must work below another; or
(b) there is a risk that a person could be injured by an object falling from above, overhead protection must, where reasonably practicable, be provided in order to prevent risks of injury.

**OHS knowledge and capability for design/planning decisions**

Several studies indicate a lack of knowledge, capability or motivation to address OHS matters in the design and planning of construction works (see Section 4). Moreover, generic requirements for “competence” of designers, in the UK, have not led to widespread uptake of OHS training and it has proved difficult to determine what competence means in the absence of defined criteria (Baxendale and Jones, 2000; Caldwell, 1999; Entec, 2000; Rigby, 2003). To address these weaknesses and ensure that key players have the necessary OHS know-how it is proposed that OHS competencies be prescribed for those with a key role, as lead designers and principal contractors. Firms engaged in design and planning would be required to ensure that suitably qualified persons are engaged and clients would be required to use appropriately qualified people. (See Lorent, 1999: 23-24 and Mahlstedt et al, 2000 for suggested OHS competencies).

**Transfer of key information from design/planning phase**

As emphasised, the intent is to focus effort on addressing OHS matters in the design and planning of construction works, recording action taken and passing on information to those involved in the construction phase, and in subsequent use or occupancy. The transfer of information is intended to facilitate risk management and development of work plans by the principal and other contractors performing construction and subsequent maintenance or repair work.

To minimise paperwork and focus on preventive action a single mechanism, the OHS file, is proposed to record action taken to address OHS in the design and planning phase and to transfer information downstream. To underpin coordination and preventive action it is proposed that the file should include: (1) a general description of the construction work; (2) details of the client, any designer(s) and any developer(s); (3) project duration and phasing of work; (4) plans and drawings; (5) construction methods and materials; (6) activities on the site; (7) details of services and installations on the site; (8) arrangements for communication and coordination between the parties engaged in the design/planning phase and the construction phase; (9) details of known or reasonably foreseeable risks and how
these have been addressed in design and/or planning of the construction work, with
reference to the essential OHS matters addressed; (10) details of risks unable to be
eliminated in design/planning and requiring action in construction phase to
minimise; (11) details of any technical standards used in design and any technical
reports from competent bodies.

The elements outlined above are intended to encourage a tailored approach to
addressing OHS risks in a particular project and to emphasise implementation of
preventive measures, rather than documentation and paper work for the sake of
compliance. The file would be a "live" document, added to by the principal
contractor involved in the construction phase and eventually passed on to the client.
The file might be used as a "gateway" in construction works in that it is necessary
to demonstrate that OHS requirements are adequately addressed before progressing
to the next phase. Principal contractors should not commence work in the
construction phase until an adequate OHS file, addressing essential OHS matters, is
available.

The lead designer in the design and planning phase would be responsible for
ensuring that the file is prepared, drawing together information from other parties
involved, and would provide the file to the principal contractor in the construction
phase. The file would be a "live" document, added to by the principal contractor and
eventually passed on to the client. Principal contractors should not commence work
until an adequate OHS file, addressing essential OHS matters, is available. For
construction works where there is no design involvement the principal contractor
for the works should ensure that the file is prepared, or that information is added to
an existing file for the building or structure.

Timely identification of projects
UK experience suggests the need for a mechanism to identify responsible parties in
good time, before key decisions are "locked in" (Entec, 2000: 41; Rigby, 2003: 8).
As suggested in responses to the HSE’s report Revitalising Health and Safety in
Construction (HSE, 2002a), it is normal industry practice for the lead designer to
make the key decisions in obtaining building or development approvals and this
person is therefore the logical party to be responsible notification. However, some
construction works might not involve a designer. In this case responsibility for
notification should rest with the principal contractor.

It is proposed that the requirement for notification would apply to construction
works of a certain size, for example, work that will last longer than 30 working days
and will involve more than 20 workers simultaneously, or where the volume of
work is scheduled to exceed 500 person days. To provide an incentive for early
notification, it is proposed that construction work not be allowed to commence
within 28 days of notification. The intent is to ensure notification in sufficient time
to enable the regulator to engage effectively with responsible parties.

A nationally uniform regulatory regime
Finally, in contemplating regulatory reform to require attention to OHS in the
design and planning of construction works, a fundamental consideration is that of
consistency between the Commonwealth, states and territories. A coordinated and
consistent response is required by regulators, which is currently lacking (see also
Section 2). One mechanism for achieving legislation that is uniform across jurisdictions, but still allows the states, territories and the Commonwealth to have input to regulatory requirements, is template legislation. The process requires governments to resolve differences of approach and drafting before the law is adopted, in entirety, in all jurisdictions (Johnstone, 1997: 98-99). It is proposed that the regulatory framework outlined above be developed as template duties for incorporation under the OHS statutes and template regulations to give effect to specific arrangements.

6. Conclusion

Australian OHS regulators have the advantage of hindsight as they consider possible regulation of design and planning of construction works, provided they take full account of emerging evidence from European experience. They also have some existing foundations in the requirements of OHS regulations which, in most jurisdictions, have applied to employers, the self-employed and workers but have generally not been applied to upstream parties in construction, even though the latter are in a position to control or influence many of the OHS matters addressed in regulations.

There is a sound rationale for extending the OHS statutes and regulations to those responsible for key decisions in the design and planning phase, whether as clients or as designers. The regulatory regime proposed in this paper is designed to engage those with real control and influence in the design and planning phase in OHS risk management, with the aim of enhancing OHS for workers in the construction phase, in maintenance and repair, and in end use and occupancy. The proposals are action oriented, rather than documentation based, and address the real need to develop the knowledge, capacity and motivation of the proposed duty holders. These are areas of weakness which, with the benefit of hindsight, are clearly apparent in the European (and UK) approach to regulating OHS in construction works.

Table 7 (over page) compares the key elements of the UK CDM Regulations and the requirements proposed for an Australian regime to regulate OHS in design and planning of construction works.
Table 7: Comparison of CDM Regulations and Proposed Australian Regime

<table>
<thead>
<tr>
<th><strong>CDM Regulations</strong></th>
<th><strong>Proposed Australian Regime</strong></th>
</tr>
</thead>
</table>
| Requirements established under regulations. | Requirements established by general duties under OHS statute, for client, designer and principal contractor, and specific requirements under regulations. 
Nationally uniform requirements established by template legislation and regulations. |
| **Object** to protect OHS of any person carrying out construction work or cleaning in or on a structure, or any person who may be affected by such work. | **Object** to protect persons engaged in (1) work in the construction phase, and others who could be affected by this work; (2) maintenance, repair and cleaning, and others who could be affected by this work; and (3) end use and occupancy of buildings and other structures. |
| **Construction work** defined to include any building, civil engineering or engineering construction work (with examples). | As for CDM Regulations |
| **Application** to all construction work but requirements in relation to appointment and role of planning supervisor, OHS plan, OHS file and consideration of OHS issues in design only apply to work that is notifiable, or where there will be more than 5 people on site at any time, or the work involves demolition or dismantling. | As for CDM Regulations |
| **Notification** if the construction phase will be longer than 30 days or will involve more than 500 person days of construction work. | **Notification** as for CDM Regulations but timely notification required – a minimum of 28 days required between notification and commencement of construction work. |
| Client must:  
• appoint planning supervisor and principal contractor  
• be satisfied that a person appointed as planning supervisor, principal contractor or designer has “competence” in relation to performing respective role under regulations  
• be satisfied that person appointed as planning supervisor, principal contractor or designer “will allocate adequate resources”  
• ensure that construction phase does not start unless an OHS plan has been prepared  
• ensure that planning supervisor is provided with “information relevant to the functions of the planning supervisor”  
• take reasonable steps to ensure that OHS file delivered to him/her is kept available for inspection. | Client must ensure, so far as “reasonably practicable”, that nothing is required in the design, organisation or scheduling of construction works which would necessitate the use of hazardous structural features, materials, procedures or practices, and could be avoided by design modifications, substitute materials or methods. 

Client must:  
• ensure that any designer and any principal contractor engaged by the client are competent (with reference to prescribed OHS competencies for construction works)  
• ensure that an OHS file is prepared and is provided to the principal contractor for the construction phase  
• ensure that client receives the OHS file at the end of the project. |
| Planning supervisor must:                                                                 | No requirement for planning supervisor. Responsibilities are performed by lead designer or principal contractor (for projects with no design element). |
| ---                                                                                     |                                                                                                                                   |
| • ensure notification of “notifiable” project                                            |                                                                                                                                 |
| • ensure, so far as reasonably practicable, that the design includes consideration of OHS (as per designer’s duty) |                                                                                                                                 |
| • take such steps as necessary to ensure cooperation between designers                  |                                                                                                                                 |
| • give adequate advice to client and contractor                                         |                                                                                                                                 |
| • ensure that an OHS file is prepared                                                   |                                                                                                                                 |
| • ensure that an OHS plan is prepared before arrangements are made for the contractor to carry out or manage construction work. |                                                                                                                                 |
| Designer must:                                                                          |                                                                                                                                   |
| • ensure that design includes adequate regard to: (a) avoiding foreseeable risks to OHS of any person carrying out construction work or cleaning in or on the structure, or any person who may be affected by such work; and (b) combating at source risks to OHS of any person carrying out construction work or cleaning in or on the structure, or any person who may be affected by such work; and (c) giving priority to measures that will protect all persons at work, or affected by the work (ie collective measures) |                                                                                                                                 |
| • address OHS matters to the extent that it is reasonable to expect the designer to address them at the time the design is prepared |                                                                                                                                 |
| • include “adequate information” about any aspect of the project, structure or materials which might affect OHS |                                                                                                                                 |
| • cooperate with planning supervisor and other designers to enable them to comply.      |                                                                                                                                 |
| Designer must:                                                                          |                                                                                                                                   |
| • ensure that reasonably foreseeable risks of harm are identified and eliminated or minimised as far as “reasonably practicable” |                                                                                                                                 |
| • ensure that essential OHS matters are addressed/essential OHS requirements are complied with |                                                                                                                                 |
| • cooperate with the client and other designers and to provide them with information   |                                                                                                                                 |
| Lead designer (or principal contractor where there is no design component) must:        |                                                                                                                                   |
| • ensure notification of construction works                                              |                                                                                                                                 |
| • ensure OHS file is compiled, recording how essential OHS matters have been addressed   |                                                                                                                                 |
| The plan must include: (1) a general description of the project; (2) timing of project; (3) details of OHS risks (4) information about competence and resources; (5) other information needed by the contractor. | There is no separate OHS plan. The OHS file is the mechanism for recording action taken to address OHS in the design and planning phase and for transferring information downstream. |
| The file must include: (1) a general description of the construction work; (2) details of the client, any designer(s) and any developer(s); (3) project duration and phasing; (4) plans and drawings; (5) construction methods and materials; (6) activities on the site; (7) details of services and installations on the site; (8) arrangements for communication and coordination between the parties engaged in design and planning, and construction phases; (9) details of known or reasonably foreseeable risks and how these have been addressed in design and/or planning, with reference to essential OHS matters; (10) details of risks unable to be eliminated in design/planning and requiring action in construction phase to minimise; (11) details of any technical standards used in design and any technical reports from competent bodies. |
References


