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HEALTH AND SAFETY COMMISSION

CONSTRUCTION INDUSTRY ADVISORY COMMITTEE (CONIAC)

Designers – current state of knowledge and current initiatives

Summary

This paper summarises some of HSE's recent work with designers, and associated research. Presentations will be made at CONIAC on 27 March to develop these themes.

Issue

1. Maximising the contribution that designers can make:
 - In reducing health and safety risks; and
 - In delivering the construction 'Revitalising' targets.

Timing

2. For consideration with other designer-related papers at meeting M1/2003.

Background

3. Designers are uniquely placed to influence standards of health and safety achieved during construction and, subsequently, during cleaning, maintenance and repair - when some 50% of fatal accidents currently occur, often related to earlier design decisions - and demolition. Designers also have opportunities to influence the health and safety of those who use the structures they have designed.

4. As with other sectors of the construction industry, a very small number of large design houses carry out the overwhelming share of design work and a large number of very small practices complete the remainder. Likewise, the design of a single

project can be carried out through extended supply chains and involve a wide range of businesses and people.

5. The introduction of CDM provided for the first time specific duties on designers and considerable store was set on making a step-change in the industry's health and safety performance through opportunities to address issues at source, 'design out' risk and 'design in' processes that were safe and without risk to health. However, there are concerns that:

- The potential for the benefits from designer involvement have not been fully realised and that
- Designers have not fully engaged in reducing risks.

6. This special 'designer review' by CONIAC at meeting M1/2003 provides an opportunity to address why this is so and what can be done to remove the barriers that are preventing change.

7. A considerable amount of work was carried out by HSE in the early development of CDM, in the run-up to their launch and immediately thereafter to inform and stimulate designers and their 'umbrella' bodies. A wide range of guidance was also made available to designers by HSC/E and others (e.g. CIRIA 166, etc).

8. More recently, HSE has carried forward a number of initiatives as a part of the continuing shift in the focus of interventions upstream from the site to those in the supply chain, including design offices.

9. This paper summarises some of these initiatives. Some aspects of the work are in hand at the time of writing and presentations to meeting M1/2003 will inform members of the latest position.

Work underway:

Information

10. HSE has attempted to map the guidance that is available to designers. We recognise that the map is inevitably incomplete due to the large volume of material that is available from a wide range of sources. The map is attached for information at Annex 1.

11. HSE has considered the publication of further designer guidance. Targeted at micro-businesses, we have in mind a series of 2-sided 'Designer Information Sheets' jointly produced with CIC.

Audits

12. During 2001 HSE piloted the use of in-depth designer audits through visits involving discipline specialists. The visits helped to enforce CDM, to gauge the value of the approach and to prove the methodology. Examples of the audit sheets used at that time are attached at Annex 2.

13. The key findings were that:

- designers do not fully understand how to discharge CDM Reg 13 duties
- many design companies were not committed to CDM principles

Design risk assessments (DRAs)

- DRAs were not fit for purpose. They:
 - i. were too long
 - ii. did not provide contractors with sufficient information, in particular, containing little or no essential hazard information.
 - iii. typically amounted to:
 1. A statement of a hazard followed by a statement of what the contractor should supply to satisfy the law; or
 2. A statement requiring contractors to supply a method statement before the work started.

CDM Commitment

- Most firms had a CDM manual. However, they were not well used nor kept up to date. In some cases, they were not available in the drawing office. Very few contained anything that resembled a company-wide CDM policy on hazardous operations.
- there was no evidence that designers were learning from completed projects.
- there was widespread ignorance of some basic health and safety issues e.g. safety with lanyards and anchorages.
- there was a surprising lack of CDM knowledge in design staff (in contrast to their senior managers). Typically, these staff did not see it as their job to

apply the CDM principles; and, in many cases, they could they list the common hazards on construction sites.

- very few designers had regular contact with planning supervisors and, in most cases, had never met them.

Training

• There were questions about:

- iv. commitment. In many practices, a principal had received some form of CDM training but mechanisms for cascading the knowledge down were lacking.
- v. the quality of available training. Many designers said that their inadequate DRAs were based on examples tabled at training courses.

14. A further programme of around a dozen designer audits is currently underway in the North West and is being jointly conducted by a mixed team of Construction Division staff including discipline specialists and frontline inspectors. We will be able to report on how these went, and whether the findings were similar or not, on 27 March. (NB. Audits have been conducted elsewhere, but not in quite so concerted a fashion).

Promotional events

15. Also in the North West, we are holding a 'Designer Awareness Day' (DAD) at Haydock Park on 11 March. This will be followed up by an exercise taking designers onto the sites where their designs are being constructed to discuss downstream hazards and risks arising from their decisions or the way information has been transferred. Further DADs are planned for next year as a part of HSE's Construction Priority Programme's commitment to reach out to micro businesses and SMEs.

Research

16. European research has suggested that up to 60% of site accidents were, in part, the consequence of decisions made before site work commenced. HSE has undertaken a similar exercise through a desk top review of 70 accident investigation reports. Our conclusions from this relatively small number were broadly similar to the European research. Our admittedly subjective assessment suggests that in approximately:

- 40% of the incidents, designers had clearly not discharged their duties;

- in 35%, design decisions were not involved/relevant; and
- in 25%, designers had hardly or not fully discharged their duties.

17. The European research is currently being reviewed in the Irish Republic, and we too have invited an external reviewer to repeat our analysis. We are also going to repeat the process with a second year's sample data. This HSE research has tended to focus on major injuries, but to supplement this Loughborough University are conducting a root cause analysis on an unbiased sample of construction accidents.

18. Finally, we have also undertaken research on undergraduate training. The first part of the research was published as CRR 392 in 2001. It concluded that, although there were pockets of good practice, the teaching of risk management was poor or non-existent in the majority of cases; it was clear that health and safety teaching had not been integrated into courses. One reason for the poor take-up was due to the lack of a specific obligation for health and safety teaching in the accreditation bodies' requirements; only the Joint Board of Moderators had specified this, though RIBA has subsequently done so. (The courses were those accredited through the Joint Board of Moderators, the Architects Registration Board, Royal Institution of Chartered Surveyors and the Chartered Institute of Building).

19. The second part of the project was to produce appropriate teaching aids. The first part had concluded that web-based material was the preferred option, so a website (<http://www.learning-hse.com/>) was developed to provide case studies and health and safety background information for lecturers and students. This was officially launched on 19 September 2002 to coincide with the launch of the Construction Discussion Document. Despite its title, ownership of the site does not currently lie with HSE, though it may do so subsequently. Symonds has agreed to maintain the site for a year until a permanent home can be found for it. The website has already been well received by a number of organisations, though the absence of material suitable for architectural and surveying students is proving to be a drawback for those disciplines.

20. The third part of the project will commence in September 2003 and will revisit universities to see whether the website and other drivers have improved the

integration of health and safety into courses. A report of the third part will be available in March 2004.

Action

21. CONIAC members are invited to:

- Note the work currently in hand by HSE
- Consider what further can be done by stakeholders - especially members' constituent bodies - to enhance health and safety standards through the application of good design.

Contacts

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ANNEX 1

	Item	Brief Description	Observations/Comments
A). EXISTING HSE GUIDANCE			
1	'The CONIAC Green Book'	General guidance for designers; published when CDM came into force.	Still relevant as it sets out designer strategies but is now be dated. Replacement under active consideration, along with practical guidance in form of info sheets.
2	CDM ACoP HS(G) 224	Guidance with examples for designers	Hard and Web copy
3	HSE Enforcement Policy Statement	HSE	Part of the 10 Point Strategy to "design it in". Hard and Web copy
4	Reducing Risks Protecting People (December 2001)	HSE Books	ALARP principles – hard copy
5	Policy and Guidance on reducing risks as low as reasonably practicable in Design	HSE principles and guidelines to assist HSE in its judgment that duty holders have reduced risks to as low as reasonably practicable in design	In suite of documents on ALARP, on the HSE web site - www.hse.gov.uk/dst/alarp3.htm 6 pages with references to other HSE guidance.
6	CIS 41	Guidance Note on Designers for Construction; part of CDM suite of guidance notes (CIS 39-45)	Generic information but old and requires updating. Removing CIS 41 may unbalance the suite of guidance.
7	HSG 150	Short generic guidance	Current. Hardcopy, wwt website & HSE Direct
8	Safer Driver Safer Workplace CD-ROM	HSE	Inc. construction site (11 fatalities in 2000/01- moving vehicles), distribution depot, farm and warehouse – provides advice for designers to highlight potential problems.
B). EXISTING EXTERNAL GUIDANCE			
9	CIRIA suite on CDM for designers (CIRIA Report 166)	Produced by Ove Arup on behalf of CIRIA. Practical guidance to designers on ways of meeting their duties under CDM	Update was subject of an unsuccessful bid for PII funding this year.
10	Professional Guidance (eg RIBA, ICE, RCIA, etc)	RIBA Plan Of Work - last updated 1998. Produced by RIBA. Acknowledges CDM to some degree	RIBA could improve the CDM content and compatibility of this document. Could also incorporate latest thinking on 'Integrated Teams'
11	RICS Construction 2002	Booklet 'Surveying Safety: a commitment to personal safety'	Practical guidance for surveyors on identification of residual risk and duty to advise client on Reg 13 duties.
12	Institution of Civil Engineers booklet "Health and Safety in Construction" (superseded)	Duties and responsibilities of Members of the Institution as professional Civil Engineers in terms of health and safety under Common, Statute and Contract Law and the Institutions Rules of Professional Conduct)	Now superseded by Health and Safety in Construction – Guidance for Construction Professionals (2002) - (Below)

13	Health and Safety in Construction – Guidance for Construction Professionals	John Barber (2002) produced under the joint aegis of the Institution of Civil Engineers’ Health and Safety Board and Advisory Panel on Legal Affairs	Guidance on the responsibilities of construction professionals, inc. civil & criminal law, MHSW Reg, Risk Assessment, CDM Regs., particularly relevant to designers duties.
14	Guidance for Safer Temporary Traffic Management (2002)	Highways Agency with contributions from others inc. HSE	Updated the earlier 3 rd Edition guidance of DTp/CSS/HSE for CDM Regs inc. designers’ roles and duties. http://www.highways.gov.uk/aboutus/corpdocs/gstt_may_02/01.htm
15	Control of Risk: A Guide to the Systematic Management of Risk from Construction” (1995)	CIRIA Report	Readable and pen picture case studies help make point. The risk manager’s tool boxes provide insight of procedures and techniques.
16	The Engineering Council – Code of Professional Practice – “Engineers and Risk Issues” (1992)	Effective from 1 st March 1993, endorsed by Lloyd’s register and HSE,	Issued to 290,000 registered engineers and technicians from the 44 engineering institutions and to encourage greater awareness, understanding and effective management of risk issues.
17	An Engineer’s Responsibility for Safety” (1992) with a Foreword by The Hon. Mr Justice Fennell, OBE.	Hazards Forum	Proposed syllabus for undergraduate awareness course on an engineer’s responsibility for safety.
18	The Royal Academy of Engineering, Amended Draft Guidelines for Warning of Preventable Disasters,	Offered to the Professional Institutions by The Fellowship of Engineering	Sets out suggested courses of action to assist engineers in acting in a responsible, prompt and disciplined manner when faced with potentially disastrous situations. www.raeng.org.uk
19	Ethics in Engineering”, Third Edition, 1996	Text book - McGraw-Hill Int. Editions,	Cases studies of previous disasters are used to examine issues behind disasters and moral and ethical considerations
20	Risk Management Method for UK Reservoirs	CIRIA Report C542	Guidance developed for the application of risk assessment and risk management procedures for large UK reservoir practice for clients/owners/designers.
21	Trade association guidance (eg CPA)	A wide range of information is available.	Not mapped.

ANNEX 2

GUIDANCE ON ASSESSMENT INDICATORS

COMMITMENT TO CDM

Evidence of a commitment to implement the CDM Regulations and create a culture that encourages the active participation of the workforce in the CDM effort, can be abstracted from an examination of a company's CDM policy document and from its attitude to staff training.

Table 1: Evidence about the CDM Policy Document

Inspection of a policy document should give an indication of whether the company is committed to implementation of the CDM regulations. This should be inspected and should show that:

- Practice principals are involved in CDM;
- The principles behind CDM are explained;
- CDM is not moribund;
- The company is learning from previous projects;

Consequently, a company's CDM policy document should contain evidence of [at least] some of the following:

CDM Policy document Indicator	sat	some	none	N/A
<p>Practice principals support CDM The Document is supported by a practice principal and is the responsibility of a named individual with authority - eg, statement of intent: The Board of directors have appointed.....as having particular responsibility for CDM and to whom reference should be made in the vent of a difficulty in the implementation of or non-compliance with the company's stated policy - It is signed by [at least] one company principal</p>				
<p>The Document is available in the drawing office and seen - People who have seen sign it off as seen</p>				
<p>CDM is not moribund The Document is regularly updated/reviewed - Look at revisions page, which should give: • number of revisions; • reason for revision;</p>				
<p>Company is continually learning Updates [with reasons] are transmitted to design staff</p>				
<p>The Document sets out the company policy for CDM related processes, which follow the CDM principles, eg, - painting of structural steelwork - Scabbling of concrete - avoided - Joints in concrete - cracks induced not saw-cut</p>				
<p>The Document contains a list of the Major Hazards encountered on construction sites</p>				
<p>The Document sets out the basic training requirements</p>				
<p>The Document sets out quite clearly how the design process is to be audited and assigns responsibilities for each stage - initial hazard identification [ihi] - Review of ihi - Final review of hazards - Information required to manage residual hazard - Final review & production of design risk assessment</p>				

Table 2: Evidence for Attitude to Training

A company's commitment to training can be gauged by asking six basic questions from a random sample of persons in the drawing office, as follows:

Question	Grade/experience of designer								
	Senior designer			Graduate engineer			Technician/draftsman		
	1	2	3	1	2	3	1	2	3
1. What does CDM mean to you ?									
2. Which regulation applies specifically to designers?									
3. What must designers do under the regulations?									
4. Are you a designer under CDM ?									
5. Have you been on any CDM-related training courses?									
6. Where do you go for advice on CDM matters?									
7. Which is the other main set of regulations written for construction?									
8. What are the main hazards on construction sites?									

Companies fully committed would be able to demonstrate that

- They provide everybody involved in design with the necessary **relevant** training; ie, Everyone down to technicians & draftsmen would:
 - Know the regulations exist and be aware of related Regs, eg, CHSW; [Q1 & Q7]
 - Know which regulation applies specifically to designers; [Q2]- Understand that they must remove hazards, lessen hazards, inform about residual risks; [Q3]- Understand they are designers under CDM; [Q4]- Have been on a basic course [in-house is acceptable]; [Q 5]- Treat CDM as CPD - have been on subsequent courses [in-house acceptable]; [Q5]
- There is a system for downloading feedback from sites
- They share CDM-related knowledge, eg, the CDM documents are regularly updated; [Q6]
- There are regular refresher courses. [Q5]

They would have the majority of the boxes in table 2 ticked as for a satisfactory answer.

Companies partially" committed" to CDM because it is the law would be able to demonstrate that they provide full CDM training but only for senior staff . However, there would not normally be a method of downloading feedback from sites or for sharing CDM-related knowledge, eg, the company CDM documents are not regularly being updated.

Companies not committed would not have provided training for staff in CDM. Nor would they have any plans to.

Table 3: EVIDENCE FOR DESIGNER’S UNDERSTANDING OF CDM

UNDERSTANDING INDICATOR	AWARENESS			
	full	partial	low	N/A
General Knowledge [as demonstrated by]				
Understanding the need to be pro-active with other designers & PS				
Understanding of what constitutes a hazardous operation				
Understanding of the Regulations as they apply to designers				
Understand that they can contribute to the pre-tender H&S plan				
Know which regulation applies specifically to designers				
Understand the principle of remove risk, lessen risk, provide sufficient information to allow residual risk to be managed,				
Application of CDM principles [Can show that]				
They apply the CDM principles daily on every project				
They learn from previous projects ,eg, addenda to policy document				
They work in partnership with other duty holders, eg, Planning Supervisor				
CDM Risk Assessment is [partially] project specific - generic RAs which are “applicable” to every project is not good evidence				

Note : In a company fully aware of its duties under CDM, **all** senior management - partners, chief engineers; project principals - project engineers/architects, project mangers; and senior design staff - section leaders, should be able to demonstrate that they satisfy the indicators highlighted in Table 1. In addition, project principals and senior design staff would be able to able to satisfy all other indicators.

Table 4: EVIDENCE THAT CDM IS IMPLEMENTED EFFECTIVELY

Evidence for this is best abstracted during the “shopfloor” discussion at the design station. Some indicators of evidence, for use in assessment, are given below in Table 2.

EFFECTIVENESS ASSESSMENT INDICATOR	EVIDENCE THAT CDM IS A DESIGN ISSUE			
	satisfactory	some	none	N/A
Has identified the major hazards associated with constructing the component under design				
Applied the CDM principles effectively				
Considered practicable alternatives for the design				
Provided adequate information about the design for the pre-tender H&S plan. For example : -anticipated loads to which temporary works are to be designed; -propping requirements; -sequencing of work; -weights of principal items; -specification of lifting points etc.				
Provided adequate information for the H&S file. For example: -design philosophy for structure; -which elements can/cannot be moved without reference; -required maintenance procedures; -provisions for maintenance;				

These tables may form the report back to the designer, under a covering letter