DESIGN AND CDM

A joined up approach to the principles of good (safe) design.

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Firstly - what is design in terms of CDM?

Design, as outlined in CDM:

> *"design" includes drawings, design details, specifications and bills of quantities (including specification of articles or substances) relating to a structure, and calculations prepared for the purpose of a design;*

In which case 'Design' is not the sole domain of consultants, architects or structural engineers

The term 'Designer' with respect to CDM extends to clients, contractors site staff if they are making decisions about how the 'Structure' is to function, be built, used, maintained and removed

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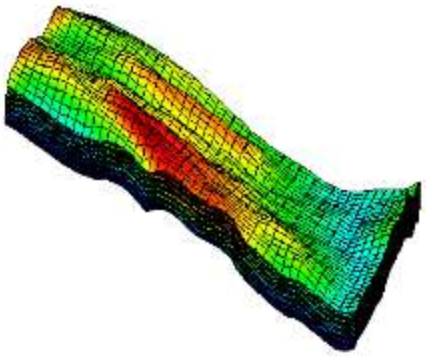
What is design?

In most cases, design is easy to identify:



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What is design?

But not always:




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Essentials

Most projects require more than one contractor so under current regulations, The Client has a duty to appoint a Principal Designer

Even where there is no statutory duty to appoint (single contractor), it is good practice to appoint somebody to review and coordinate design activities

Early appointment (as soon as is Practicable) is advisable as the Client needs to understand their role in ensuring good design takes place and allow time to plan

It is the Client's duty to ensure the Principal Designers are competent to carry out their role and continue to do so

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Which raises some fundamental questions

Does the Client fully understand their role in CDM?

Is there sufficient time to plan?

Is there full engagement between designers and clients in terms of design?

Do designers fully engage with contractors and spend time understanding the process?

Does everyone involved in design, recognise ‘design’?

Do those undertaking design, fully understand their duties and how to discharge them?

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Key Principal Designer duties

Plan, manage and monitor the pre-construction phase to ensure that, so far as is reasonably practicable, the project is carried out without risks to health or safety

Assist the client with pre construction information

Liaise with the Principal Contractor about ongoing design

Take into account the general principles of prevention

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Principles of Prevention

These apply to all design works

In line with general duties under The Act and Management Regulations

- Eliminate
- Reduce
- Inform

Relies on the designer understanding the construction process and the intended use, removal and maintenance of the structure

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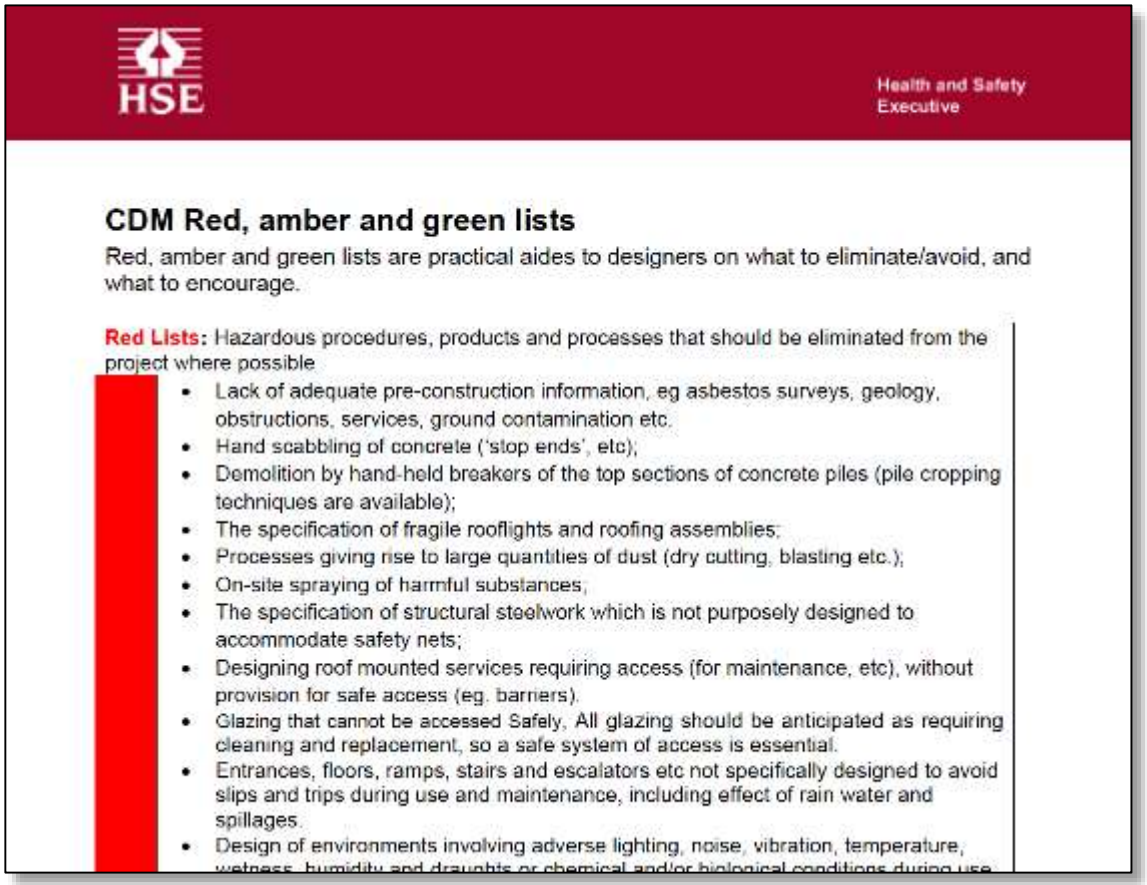
For the general construction industry



HSE

Health and Safety Executive

CDM Red, amber and green lists

Red, amber and green lists are practical aides to designers on what to eliminate/avoid, and what to encourage.

Red Lists: Hazardous procedures, products and processes that should be eliminated from the project where possible

- Lack of adequate pre-construction information, eg asbestos surveys, geology, obstructions, services, ground contamination etc.
- Hand scabbling of concrete ('stop ends', etc);
- Demolition by hand-held breakers of the top sections of concrete piles (pile cropping techniques are available);
- The specification of fragile rooflights and roofing assemblies;
- Processes giving rise to large quantities of dust (dry cutting, blasting etc.);
- On-site spraying of harmful substances;
- The specification of structural steelwork which is not purposely designed to accommodate safety nets;
- Designing roof mounted services requiring access (for maintenance, etc), without provision for safe access (eg. barriers).
- Glazing that cannot be accessed Safely. All glazing should be anticipated as requiring cleaning and replacement, so a safe system of access is essential.
- Entrances, floors, ramps, stairs and escalators etc not specifically designed to avoid slips and trips during use and maintenance, including effect of rain water and spillages.
- Design of environments involving adverse lighting, noise, vibration, temperature, wetness, humidity and draughts or chemical and/or biological conditions during use

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Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.

Green Lists: Products, processes and procedures to be positively encouraged.

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RED for Geotechnical Sites

- Lack of adequate pre-construction information – services maps and plans, ground contamination, geology, obstructions, access restrictions
- Entry into trial pits or trenches
- Specification of in situ testing within trial pits or trenches
- Setting up drilling rigs directly over mineshafts or shallow workings
- Laboratory processes and testing giving rise to dust – specimen preparation, sieving, compactions, rock cutting/sawing
- Physical testing of samples which may contain asbestos (Made Ground) – sieves, compactions
- Designing borehole locations adjacent to walls/obstructions where the rig guards cannot be operated efficiently
- Digging, drilling or boring into abandoned workings – collapse, hazardous gases, contaminated water
- Digging, drilling or boring into hazardous waste or on contaminated land – landfill, asbestos, hazardous gases
- Operating hand held rigs, drills or other vibrating power tools
- Processes giving rise to large levels of dust on site
- Operation of drilling rigs which cannot be guarded
- Designs requiring working at height without making allowance for the provision of a suitable working platform

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Amber for Geotechnical Sites

- Access routes and work sites where ground is soft / boggy / uneven
- Use of rigs which cannot be climbed safely – in compliance with Working at Height Regulations
- Using petrol or diesel fuelled plant within confined spaces
- Designs which require manual work which may lead to Musculoskeletal Disorders (MSD) i.e. lifting heavy core barrels, casings, core samples
- Designs requiring work within a confined space
- Need to use large rigs and cranes near 'live' railways and overhead electric power lines or where proximity to obstructions prevents guarding of rig
- Site layout that does not allow for adequate room for delivery and/or storage of materials or working
- Work on steep slopes which require scaffolding
- The specification of deep excavations
- Heavy plant or packaged consumables which cannot be handled using mechanical lifting devices
- Lifting of manhole covers
- Designs requiring work directly adjacent to a live highway

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Green for Geotechnical Sites

- Specifying adequate site supervision
- Provision of sufficient time to obtain service information if not provided by the Client
- Establish pro-active and simple systems to allow prompt reporting and collaborative responses to concerns/incidents/accidents
- Specifying NVQ and CPCS qualified operatives
- Procedures and equipment to eliminate/reduce Manual Handling – i.e. use of mechanical lifting devices, rig winches, support vehicles with mechanical lifting devices
- Using modified rigs or rigs with fit for purpose systems to eliminate the need to climb
- Consultation between all stakeholders and parties prior to site work starting
- Specifying a Desk Study and Field Reconnaissance prior to intrusive work
- Encourage the use of control measures to minimize the use of Personal Protective Equipment
- Designs that will reduce the impact of noise on residential properties
- Consider minimum welfare facilities needed for contract

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Client is key to success

If the Client is not experienced, they should seek competent advice and support

The Client should produce a client brief

Principal Designer should be appointed as soon as practicable

The Client must be realistic with budgets and timescales

The Client must ensure the continued competence of appointees

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Principal Designer

Must ensure the quality and suitability of pre construction information

Must ensure other designers discharge their duties

Must review designs regularly and discuss ongoing design changes with the Principal Contractor

Compile the Safety File at the end of the project

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Designers risk assessments, design reviews etc. etc.

Although there is requirement in CDM for designers to record or justify their design decisions, a risk register can be good a method of establishing how decision were reached and monitor the activities of all designers on the project

Often overlooked, is the need to consider temporary works in design reviews

Design risk assessments should not tell competent contractors how to do their work, nor contain obvious and easy to deal with issues.

Nothing should detract from the issues related to safety

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CDM over the years

The main thrusts of all revisions of CDM:

- The right information, must reach the right people, at the right time
- Designers need to consider how their specifications impact the safety of those involved throughout the projects life

That message hasn't changed

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Weak points

Few clients are experts in the geotechnical phase

Consultancies are volunteering to carry out duties without appointment

Companies acting as Principal Designers are going beyond their core expertise

There is a general lack of awareness regarding CDM and design in particular

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What to do?

There must be increased awareness among designers about how geotechnical information is obtained

Appointees must be clear about the scope of their works and stick to what they know

There must be greater awareness of what constitutes design

Selecting competent contractors and establishing trust

Recognition that the cheapest solution may not discharge designers duties

Improved planning of works including realistic timescales and budgets and managing client expectations