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Healthier building

with gypsum products

No. 1

THE CDM REGULATIONS & SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS, 1995

This publication sets out the principal health and safety objectives of the Construction (Design and Management) Regulations and the Republic of Ireland Safety, Health and Welfare at Work (Construction) Regulations with specific reference to the use of gypsum-based products in construction work. It is particularly pertinent to all those involved at the design and specification stages of a project.

GPDA
Gypsum Products Development Association

This publication can form part of a structured programme of CPD (Continuing Professional Development)

CDM Regulations and Gypsum Products

This publication addresses the health and safety aspects of specifying and working with gypsum based products in the light of new legislation. It confronts areas of potential risk in construction projects and discusses means of avoiding or minimising risk during the design process

In the past, the responsibility for health and safety matters rested largely with the main contractor. The Construction (Design and Management) Regulations, 1994 and the Republic of Ireland Safety, Health and Welfare At Work (Construction) Regulations, 1995 extend the duty of care at the pre-site stage to designers and clients. For the first time members of the design team now have new duties and opportunities to clearly set out health and safety issues relative to specific projects.

The Regulations have also created a new management role – the planning supervisor, who is entrusted with the overall responsibility for coordinating the health and safety aspects of design and initial planning.

The publications listed on page 7 are the main recommended references. If you are not familiar with the new legislation, the HSE's Approved Code of Practice, *Managing Construction for Health and Safety*, in particular, offers formal guidance on compliance with the provisions of the CDM Regulations. In the Republic of Ireland, the Health and Safety Authority have issued a number of guidelines, which are also listed.

While contractors have a duty to manage the risks on site, designers may be able to eliminate many of the risks before they get to site.

Members of the design team are not expected to take over the contractor's responsibility for health and safety on site. They are, however, expected to ensure that, as far as is reasonably practicable, projects are designed to avoid, or reduce risks which may arise to those constructing and maintaining the structure. Where there are residual risks, information must be provided to enable the contractor to allocate appropriate resources and devise safe systems of working.

During the design process, where complete avoidance of risks is not possible, designers should reduce risks at source wherever practicable. They should give priority to measures which will collectively protect all persons affected by the works.

These duties are the core requirements of the British and Republic of Ireland regulations for designer's consideration of risk. The design team will need to weigh their decisions on health and safety against other design considerations, which will include fitness for purpose, aesthetics, buildability and environmental impact.

The CDM regulations also emphasise the need to appoint competent contractors to carry out construction works. The planning supervisor and principal contractor have specific duties with regard to this and will find the following information useful when working with gypsum products.

Safe working with gypsum

In the context of construction as a whole, gypsum is a low risk material, being a substance which is not hazardous to health as defined in the COSHH Regulations or as good practice dictates in the Republic of Ireland. In this respect, health and safety is not a major issue in the deployment of gypsum products, provided that they are used in accordance with recognised good practice. Notwithstanding the low risk factor, the following appraisal seeks to recognise areas of potential health or safety concern which could arise in use.

The Healthier Building Campaign

The series *Healthier Building with Gypsum Products* addresses current concerns about the impact on health, the environment and efficiency of the way we build.

The series covers five topics:

1. Health and Safety - The CDM Regulations & Safety, Health and Welfare At Work (Construction) Regulations (July 1997)
2. Sustainable Development (July 1997)
3. The Building Regulations (July 1997)
4. Reduction of Waste (November 1997)
5. Efficient Building (November 1997)

The series is aimed at members of the design team and contractors. It is not intended to provide detailed design guidance, which is readily available in manufacturer's product literature, but rather to raise awareness of the issues involved.

The publications can form part of a structured programme of CPD (Continuing Professional Development).

Plaster has traditionally been supplied in 40kg bags. Following research by the Institute of Occupational Ergonomics at the University of Nottingham, funded by the GPDA, members have now adopted a maximum bag weight of 25kg. The smaller bag is beneficial in reducing manual strain, particularly when repetitive manual lifting is unavoidable.

Designers consideration of risk

The following aspects of gypsum based products must be taken into account by the design team in order to assess health and safety risks which may conceivably arise in use.

Dust

Dust is generated principally from the operations of opening and mixing bagged powder material, and the cutting and sanding of boarded material. This is a nuisance rather than a serious health hazard. The Health and Safety Executive stipulates Occupation Exposure Limits (OELs) for building materials. For gypsum products the stipulated limits are an OEL of 5mg/m^3 for respirable and 10mg/m^3 for inhalable airborne dust particles. These limits are unlikely to be exceeded except in poorly ventilated or confined spaces.

All operations where dust may be generated should be kept to a minimum and take place in well ventilated spaces.

Fibres

Gypsum plasters and insulation fibre material associated with gypsum constructions may irritate eyes or sensitive skin. The precautions, where necessary, fall within the contractor's normal site control and are unlikely to influence design or material specification.

The design may be influenced, however, by the need to limit the amount of irritant material within known confined working areas.

Handling

Gypsum products are produced and packaged in sizes and weights which take account of the need to be manhandled on site.

Designers should, however, be aware of the various options and limitations of handling materials. The use of mechanical handling methods, for example, can not only speed up construction but also avoids unnecessary strain on handlers and reduces the risk of manual handling injury.

Table of typical gypsum wallboard weights

Thickness	Board size (mm)	Typical weight (kg)
9.5mm	900 x 1800	10.5 – 13.8
	1200 x 2400	18.7 – 24.5
12.5mm	900 x 1800	13.7 – 19.4
	900 x 2400	18.4 – 25.9
	1200 x 2400	24.5 – 34.6
15mm	1200 x 2400	28.8 – 44.6
19mm	600 x 2400	20.2 – 25.2

Restrictive working

Risks to health and safety are greater in the restrictive working confines of basements, lift shafts and stair wells or when working at height.

Confined spaces, such as basements with restricted natural ventilation, should be identified at the design stage. Locations where it is likely there will be inadequate ventilation should be noted in order that suitable provision may be included in the Health and Safety plan. The contractor will then have the opportunity to plan suitable additional measures – for example, mechanical dust-extraction equipment, or the provision of dust masks – and adjust tenders as appropriate.

Apart from the obvious hazards associated with working at height, particular consideration may need to be given to the selection of components – sizes, weights, fixings and fabrication – relative to their use in difficult locations. It is necessary to consider how components may be safely manipulated into confined high level spaces or within spaces that are envisaged to be temporarily congested by a proliferation of scaffolding, ladders or overhead gantries.

Purpose-made trolleys were used to convey gypsum wallboard in this development at Broadgate.

Consideration of risk needs to give particular attention to areas such as lift shafts

Parallel working

There is now a greater need to be aware of the interaction of differing site activities where quite diverse trades may proceed simultaneously. With ever foreshortening construction times, for instance in so called 'fast track' projects, it is not uncommon for finishing trades, to be progressed on one level while major superstructure work takes shape directly above. It is quite likely that drylining, and in particular fire protection work, may take place either alongside or below structural work in the same building.

Such practices may meet the objective of accelerated completion, often with partial handover of completed zones of a building. However, there is an attendant risk of injury to operatives from falling components or debris. This warrants careful consideration in the pre-contract health and safety plan, and may show that savings created by accelerated completion are offset by additional costs of temporary protective measures.

Steel framing is a quick and dry form of construction for partitions and ceilings

Strategic approaches

Minimising risks through design

Design, cost considerations and detailed specification all have a bearing on health and safety matters. The following examples discuss how a strategic approach to design can influence health and safety.

Plastering and drylining

Wet plastering achieves high quality, smooth surfaces with the advantages of a continuous, homogeneous finish. It requires a number of labour intensive site activities, including opening and mixing bagged powder material. The cutting and sanding of board material also produces dust.

A key strategic issue for design teams is the position of electrical cables and other services. These can either be housed in specially designed recesses, surface mounted in profiled trunking, situated behind drylining board, or within chases cut in the wall.

Cutting chases through masonry or plaster is discouraged as this produces dust which can often exceed exposure limits, both for those undertaking the operation and others in the vicinity. Gypsum wallboard drylining can eliminate the need for chases in the backing masonry, which with the full use of modular board sizes will minimise board cutting and reduce the generation of dust. (For other considerations for services within drylining voids see the section on Maintenance.)

Assembly

Lightweight framing systems, predominantly utilising metal components, promote speed of assembly with relative ease of handling. They can be exploited to their full potential in the lining of masonry, free standing partitions, suspended ceilings and even complete steel framed buildings. Prefabrication may extend to complete moulded forms using glass reinforced gypsum where, for instance, complete bulkheads may be preformed off site obviating the need for often strenuous in-situ forming with fibrous plaster.

Off site prefabrication frees working areas from material clutter where assemblies need only to be bought onto site when required for final fixing. This reduces storage on or around the site working area and generally permits components to be assembled under the more controlled conditions of specialist fabricators - all of which helps to reduce potential site hazards.

The most suitable strategic approach will depend on the type and scale of plasterwork being specified.

Designers Checklist

Management Issues
- Unusual design aspects
- Choice of competent contractors

Handling
- Manual or mechanical

Restrictive working
- Precautions when working at height
- Ventilation of confined spaces
- Manipulation of components

Parallel working
- Fast track construction

Plastering and
- Avoidance of cutting chases
- Accommodation of services

Assembly
- Opportunity for off site prefabrication
- Lightweight steel framing

Maintenance
- Openings for services

Maintenance

Since gypsum products are essentially used for homogeneous lining or facing of building elements, designs should ensure that strategically placed openings are incorporated to give safe access to services concealed within lining voids.

The safe siting of service runs and outlets should also be considered where protection is likely to be lessened in lightweight constructions, particularly when future service alterations are likely.

Electrical cables, for instance, may run freely within the void of a slender stud partition, serving socket outlets or switch points sited on either or both sides of the partition. In any subsequent alteration work, precautions should be taken when drilling through one side of the partition to avoid accidental and potentially dangerous rupture of any outlet connection on the opposite side of the partition. Reducing this potential hazard at the design stage may include the staggering of opposing outlet positions or the inclusion of protective back plates within the depth of slender partitions.

Specification

The design team should set out their strategic approach to health and safety matters within the health and safety plan on each project. This will help to ensure that alternative specifications may be rejected if they are likely to compromise safety.

References

Health and Safety Executive Publications and other useful guidance:

- Managing Construction for Health & Safety. Construction (Design and Management) Regulations 1994. Approved Code of Practice L54. HSE 1995. (ISBN 0 7176 0792 5) This document also includes the text of the Regulations.
- Control of Substances Hazardous to Health Regulations (COSHH) 1994. Approved Code of Practice. HMSO (ISBN 0 7176 0427 6)
- Designing for Health and Safety in Construction. HMSO, 1995. (ISBN 0 7176 0807 7)
- CDM – How the Regulations Affect You. HSE, 1995, Free leaflet.
- Dust and Noise in the Construction Process - Information for Designers. HSE CRR73, 1995 (ISBN 0 7176 0768 2)
- Getting to grips with manual handling. HSE IND(G)143L. (ISBN 0 7176 0622 8)
- Construction (Design & Management) Regulations: A BEC Guide. Building Employers Confederation 1995. (ISBN 1 8526 3023 X).
- VIDEO: A Safer Bet - An Introduction to the Principles of the CDM Regulations 1994. Construction Industry Council 1995. (ISBN 1 8986 7104 4).
- Manufacturers Literature - British Gypsum, Gypsum Industries, Knauf and Lafarge Plasterboard.

Health and Safety references for the Republic of Ireland:

- Safety, Health and Welfare At Work (Construction) Regulations, 1995, Statutory Instrument No 138 of 1995.
- Safety, Health and Welfare At Work (General Application) Regulations, 1993, Statutory Instrument No 44 of 1993.
- Safety, Health and Welfare At Work (Carcinogens) Regulations, 1993, Statutory Instrument No 80 of 1993.
- Safety, Health and Welfare At Work (Chemical Agents) Regulations, 1994, Statutory Instrument No 445 of 1994.
- A Short Guide to Health and Safety Law, Health and Safety Authority, March 1993.

The Gypsum Products Development Association (GPDA) comprises a permanent Secretariat and member companies, in the UK and the Republic of Ireland, all engaged in the manufacture of gypsum products. The primary function of the GPDA is to develop and encourage the understanding of gypsum-based building products and systems and to pioneer new applications for these products.

It also has an ongoing commitment to advise on matters of environmental impact, energy conservation and health and safety, wherever gypsum based products are used. The members promote the use of systems which maximise the conservation of energy and give a high priority to waste reduction and recycling initiatives.

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