

Site health handbook

Second edition

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CIRIA *sharing knowledge ■ building best practice*

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Site health and safety is not a nice to have option, it is a right for all engaged in construction. It is about education, empowerment and leadership, not process or policing. Without all involved sharing the belief we should and can have safe sites, hazardous behaviours will emerge that history tells us results in needless deaths and injuries.

This easy-to-use reference guide gives an overview for all who may be working on-site, to prepare you for working safely, and provides advice on what to do when you come across commonly encountered health hazards.



The information will also assist designers to appreciate the site hazards which they need (under CDM2007) to identify, eliminate where possible and then reduce the level of residual risk.

Everyone on site should find it helpful and useful. It also takes account of recent changes in health and safety legislation, for example The Control of Vibration at Work Regulations 2005, and

emphasises the need for all those involved in construction to identify, assess and manage risks.

I am pleased that CIRIA has produced this revised handbook for the benefit of all those in the construction industry. I commend it to your use.

Keith Clarke
Chairman of the Health and Safety Committee
of the Construction Industry Council

Site health handbook (second edition)

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Bob Blackman	Transport & General Workers Union
Richard Boland	Health and Safety Executive
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Summary

This *Site health handbook* provides practical advice for operatives, supervisors and managers working in construction as well as designers who are making decisions about construction.

The guide identifies how to recognise risk and minimise the impact of construction sites and operations on your health and that of your colleagues. The guide is intended to be a reference and a training aid.

The guide has four sections:

- **Section 1:** Introduction to site health
- **Section 2:** Site health: the basics
- **Section 3:** Health issues at work
- **Section 4:** Further help and information.

The *Site health handbook* is presented as a companion guide to *C669 Site safety handbook* (CIRIA, 2008).

When planning the control of health risks, the decision process for identifying the most appropriate control should be fairly formal. The list below gives the accepted hierarchy of control for protecting health and safety:

- Eliminate** – remove the substance or activity that is high risk (or substitute it with a less hazardous substance or activity)
- Reduce** – change the degree of risk from the substance or the activity
- Inform** – develop safe working procedures and provide effective training for handling the level of risk
- Control** – keep levels of the hazardous substance or activity as low as possible and maintain these levels. Provide personal protective equipment (PPE) only as a last resort.

The appropriate control is usually a combination of engineering, technical, procedural and behavioural controls.



Remember: PPE is **not** the first line of defence for good health.

The target audience

Who should read this guide?

This guide provides practical advice for all people engaged or working in construction, including those with a responsibility or interest in the management of their workers' health.

The task of preventing or minimising the risks to health at site level demands high standards of health awareness and education. This guide provides practical information about health hazards and identifies how individuals can avoid or minimise risks to their health.

It is primarily aimed at:

- workers
- supervisors
- line managers.

Additionally, there is also a need to improve the health culture within the industry. To help achieve this objective, this guide should be brought to the attention of construction professionals including:

- construction planners within contractors' main offices
- contractors and principal contractors
- project managers/directors
- designers (including quantity surveyors, specifiers and buyers)
- local authority staff
- construction managers
- CDM co-ordinators
- regulators
- construction clients.

This guide covers health issues for construction workers and others who may be affected by construction work. The hazards that they may come into contact with during construction work are explained.

Statistics and pictures are used to show the short- and long-term effects to health and how ill-health can impact on individuals and their families.

The **principal objectives** of the guide are to:

- **set out** why it is important to understand the hazards and how they can be avoided or the level of risk reduced
- **educate and inform** workers, their supervisors and managers about the health risks associated with common construction activities
- **provide guidance** that can help reduce or avoid the risks to workers' health associated with hazardous materials and conditions
- **summarise** the basic health requirements at a site level so that workers and their supervisors are aware of their duty to ensure that a healthy working environment is maintained throughout the construction process
- **advise** that construction projects, irrespective of location, size or nature, offer potential risks to the health of site workers, and that site inductions about workplace hazards – before starting work – are essential
- **raise awareness** of the issues that affect good health. The induction process also helps workers understand the impact their work can have on current and long-term health
- **improve** the long-term health prospects for construction workers and other people in the industry.

All construction professionals should discharge their duties under the Management Regulations and CDM2007 by working together to reduce health problems in construction by improved design, planning and site management.

Coverage of this guide

Readers should be clear about the scope and limitations of this guide and in particular that:

- it identifies risk and gives guidance, but detailed advice may need to be found from other sources
- the guide should not replace meetings and discussions with regulatory and medical authorities and other key interested parties
- the guide only summarises legislation. For more detail you should contact your company's medical or legal advisors and regulators such as the HSE
- in all instances when dealing with the issues covered, do not take action beyond your knowledge and ability. If in doubt, seek specialist advice.

This book is intended to be used as a reference and a training manual.

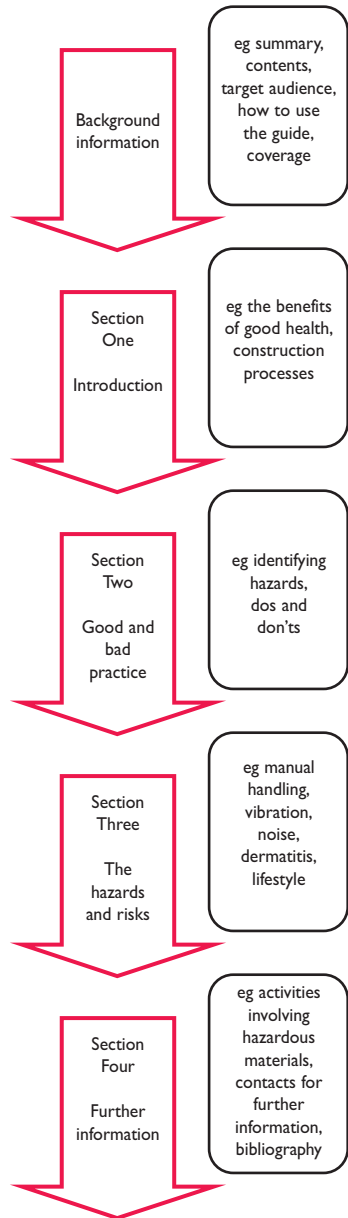
The guide is split into four main sections:

Section 1 introduces the benefits of good health practice and why it should always be adopted. It examines the most common construction processes and identifies the materials that can affect your health.

Section 2 gives you some straightforward tips on what you should do before you start on site and what you should do as soon as you start a new job. This section also discusses the basics of how to identify hazards and how to take action to eliminate or avoid them, or reduce the risks arising from them.

Section 3 describes the health hazards that can affect your body when working on a construction site, eg manual handling, vibration, exposure. Descriptions are given explaining when you are at risk, why you are at risk and what you can do about it.

Section 4 is about construction activities involving hazardous materials, and includes an annotated bibliography. It also contains a list of useful organisations to contact if you have been affected by ill-health or need further information.



How to use this guide

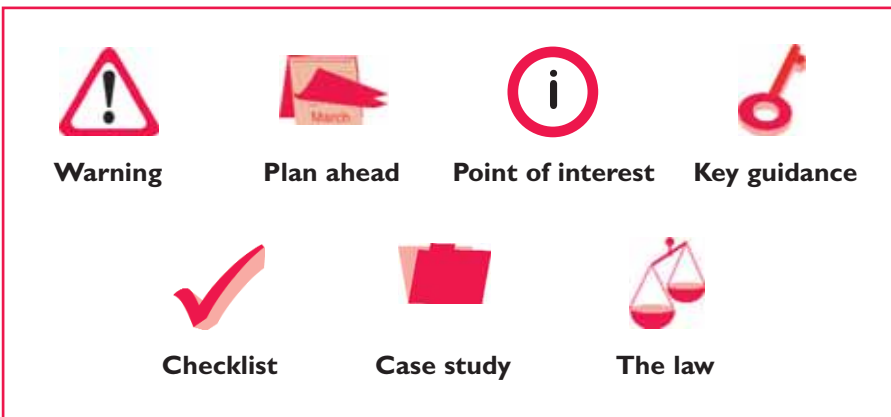
The guide should be used as part of an integrated health management strategy that includes:

- setting targets for health improvement
- implementing risk assessments and control measures
- tool box talks
- informing, instructing and training
- applying effective surveillance
- improving understanding
- monitoring performance.

This guide is closely related to its sister document CIRIA C669 *Site safety handbook*.

Throughout the text, important information has been highlighted with the use of bullet points and text boxes. The book has also been illustrated with the use of photographs. However, please note that these are for illustration only and do not always show complete examples of best practice.

Throughout this guide, the symbols below have been used to help identify the types of information being provided and to simplify its use:



Term	Definition
Anthrax	An acute infectious disease of farm animals caused by bacteria and which can be transmitted to humans by contact with animal hair, hides or excrement.
Asbestos	A group of naturally occurring minerals used in building materials etc.
Asbestosis	A chronic lung disease caused by exposure to asbestos.
Aspergillosis	A group of lung conditions caused by fungus.
Asthma	A narrowing of the airways making it difficult to breathe.
Carcinogen	A substance that causes cancer.
CE mark	The CE mark is given to products (such as PPE) that should be of a suitable standard so as to be safe for the people using them.
Cirrhosis	Liver disease usually caused by drinking excessive amounts of alcohol.
Cold stress	The term used to describe the lowering of your body temperature due to long periods of time in a cold environment.
Conjunctivitis	Inflammation of the eye, making it red and swollen, and producing pus. Caused by bacteria or viruses, allergy, or physical or chemical irritation.
Dermatitis	Inflammatory condition of the skin that is caused by outside agents. It is caused by contacts with irritants such as acids, alkalis, solvents and detergents.
Decompression illness	Complaint caused by breathing compressed air of between 0.25 bar and 3.5 bar above normal pressure. It can occur during air range diving (inland, offshore, inshore) mixed gas diving (mostly offshore) or when using compressed air in tunnelling.

Glossary

Term	Definition
Fibrosis	A health problem caused by breathing in silica dust for long periods. Fibrosis is a hardening of the lung tissue, making it hard to breathe.
HAV	Hand-arm vibration. vibration that reaches your hands when you are working with hand-held power tools or machinery.
HAVS	Hand-arm vibration syndrome. The injuries caused by HAV. These can include VWF (vibration white finger), damage to your nerves, muscles, bones and joints as well as your blood circulation.
Heat stress	The overheating of your body due to working in a hot environment for a long time.
Hepatitis	Inflammation of the liver caused by viruses, toxic substances, or immunological abnormalities.
Iris	The coloured part of your eye.
Jaundice	From skin-borne infections. Yellowing of the skin or whites of the eyes, indicating excess bilirubin (a bile pigment) in the blood.
Leptospirosis	Also known as Weil's disease. An infectious disease, caused by bacteria from the urine of rats, cattle, foxes, rodents and other wild animals – rats and cattles being the most common form of transmission in the UK. The disease begins with a fever and may affect the liver (causing jaundice) or brain (causing meningitis). It can also affect the kidneys.
Manual handling	Using your body strength to lift, lower, push, carry, pull, move, hold, or restrain equipment, products or tools.
Mesothelioma	A tumour, usually of part of the lungs, associated with exposure to asbestos.

Term	Definition
MSDs	Musculoskeletal disorders. Injuries to the muscles, joints and tendons of the body, incurred through overuse.
Mycosis	Any disease caused by fungus.
Noise-induced hearing loss	Damage to your ears from equipment at work, eg loud drilling.
PPE	Personal Protective Equipment. It includes safety glasses and hearing protection.
Pneumoconiosis	Lung diseases from inhaling dust over time.
Psittacosis	An infection that birds carry. It can be passed on to humans through contact with faeces, feathers or inhaling cage dust.
RPE	Respiratory protective equipment (a type of PPE)
RSI	Repetitive strain injury. Injuries to the muscles, tendons and joints of the body, caused by a movement being repeated.
Silica	Silica occurs as a natural part of many materials used in the construction industry. It may be present in sand, sandstone and granite, clay, shale and slate, chalk, limestone and other rock.
Silicosis	This is a disease caused by breathing in silica dust. The dust causes scarring of the lung tissue, which leads to breathing difficulties.
Tetanus	An acute infectious disease that affects the nervous system, caused by bacteria entering the body through broken skin. All site staff must be vaccinated against tetanus as it can be fatal if a person is unprotected.
Ultraviolet light/radiation	Invisible short-wave length radiation. Sunlight contains UV rays that are responsible for both suntan and – on overexposure – sunburn.

Glossary

Term	Definition
Weil's disease	See <i>Leptospirosis</i> .
VWF	Vibration white finger. An ailment caused by the use of hand tools and equipment which transmit vibration to the hand and arm. VWF causes the fingers to become numb and to begin turning white.
WBV	Whole-body vibration. An ailment (usually back pain) caused by machinery vibration passing through the buttocks or the feet.
Work-related back pain	An injury to your back caused by an activity that you do in your job, eg lifting heavy objects.
Work-related stress	Work-related stress is the reaction people have to excessive pressure or other types of demand placed on them at work.
WRULD	Work-related upper limb disorder. Injuries to the muscles, tendons and joints of the body, caused by an activity that you do in your job, eg painting ceilings, which can make your shoulders ache.

Introduction to site health I

This section introduces the benefits of good health practice and why it should always be adopted. It also examines the most common construction processes and identifies the materials that can affect your health.

Why do you need this book?

- ill-health can have a major impact on your life and the lives others
- ill-health problems are often invisible and develop slowly or later in life
- prevention and proper action does make a difference
- the cost of ill-health to you is increasing, in terms of reduced quality of life and lost earnings
- the cost to your employer is increasing, in terms of increased sickness absence and a less healthy workforce



Health is a state of complete **physical, mental, and social well-being**, not merely the absence of disease or frailty.

- ill-health is a major problem for construction operatives as it can affect their ability to work and have an impact on their whole life
- ill-health continues to kill and maim large numbers of construction operatives



Ill health should be taken **seriously**. It can be much more serious than an accident as it may be progressive.

- very often there is a delay between exposure to hazardous materials and activities, and the onset of health problems.

I Introduction to site health

During recent years the construction industry has concentrated on site safety. However, it is important that everyone working in construction also understands the many health hazards that can also be part of work on a construction site but have more insidious and far-reaching effects.

Why bother about site health?



Some interesting facts about occupational health:

- ill-health in UK construction results in an estimated 4 million days off work each year
- each year there are innumerable cases of musculoskeletal disorders at work
- more than 200 incidences of vibration white finger are reported each year
- the incidence rates for hearing loss, spine/back disorders, musculoskeletal disorders, asbestosis, mesothelioma and dermatitis are significantly higher in construction than in any other industry
- it is estimated that asbestos-related diseases kill at least 600 people in construction each year, with this figure expected to continue to rise
- cement is believed to cause up to about half of all cases of occupational dermatitis in the UK.

Take action to avoid being the next statistic

What is occupational health management?

- the management of health at work



The main aim of occupational health management is to **prevent ill-health** (rather than to cure it).

- employers and managers have a responsibility to manage health risks



The law says **employers must consider the health risks** that all their operatives are exposed to (including sub-contracted workers) and help reduce the health risks they face at work and that designers **must design out health risks** inherent in the design choices they make.

- good personal health management, working together with your employer, discussing the way you work, developing joint responsibilities and improving co-operation will all result in positive benefits to your health and the health of others.



Others can advise you or may even be held responsible if they don't act on your behalf but **only you** can minimise the effect on you of poor health management.

I Introduction to site health

What you can do

- communicate your concerns
- describe the risks as you see them
- make a positive contribution to the debate
- help to redesign the tasks that affect your health and the health of others.



What are the health issues at work?



To minimise the impact of work on your health and the health of others, you must:

- 1 Raise your concerns with your supervisor.
- 2 Check with your GP when you suspect you may have symptoms.
- 3 Do not wait for increased damage to be certain of your symptoms before going to your GP.

Section 3 explains the specific health hazards faced by construction workers. The principal health issues are split into three separate groups:

- 1 Biological and chemical.
- 2 Physical.
- 3 Psychological.

Biological and chemical health issues



Exposure to many substances used in the construction industry can result in a variety of health problems. These can include dermatitis (skin rashes), breathlessness and burns. There are also long-term effects which can prevent you from continuing work, for example, allergic asthma and skin problems. Some can also contribute to fatal illnesses, including nasal, stomach and lung cancer.



The Control of Substances Hazardous to Health Regulations (COSHH) were devised to ensure that employers consider those hazardous products their employees are using and where necessary implement suitable control measures to eliminate or reduce exposure.



Start by assuming all materials have a hazardous content.



The Chemical (Hazard, Information and Packaging Supply) Regulations (CHIPs) require suppliers to provide safe use labelling and information with and about chemical products.

Be aware that the COSHH issues for initial use/installation/application may be very different from the issues later, when materials are rubbed down, burnt etc.

I Introduction to site health

Physical health issues



*The effects of some physical hazards are often less evident in the short-term and may only become apparent after a number of years have passed. Being aware of the conditions you work in and the result these may have on your health is your first line of defence. **You are your own health and safety officer.***

Work in construction can expose you to most of the currently recognised physical hazards:



- the most common construction health problems such as back pain are triggered by handling, lifting and carrying
- there is also a wide range of skin problems
- noise and vibration are also common health hazards
- heat exposure is not generally a problem in the UK, but work in confined spaces (for example tunnelling work) can be both hot and humid
- radiation is widely used in on-site radiography and in laser equipment. Ultraviolet radiation is not only present naturally, but is produced by electric arc welding
- dust and fumes can be a serious issue in construction and can be hazardous to your lungs, affecting your breathing.

Psychological health issues



Emotional stress is the main problem when discussing psychological ill-health in construction. It can affect us all in one form or another. Awareness raising and positive action can help reduce stress levels in the workplace.

Stress is the reaction people have to excessive pressure or other types of demand placed on them. Pressure in itself is not necessarily bad and many people thrive on it. It is when pressure is experienced as excessive by an individual that ill-health can result.

By the employer and the employee working together, problems regarding stress can be resolved.



You are your own health and safety officer. You are responsible for your body, and if you don't look after it will not last you into your old age.

I Introduction to site health

Materials found on-site and their health implications

If you are in contact with any of the hazardous substances listed below, and you do not take adequate precautions, it is likely that damage to your health will occur.



You can protect your health by having a pre-planned and disciplined approach.

Table I.1 *Materials found on site and their health implications*

Materials and substances and where they are used	Health issues arising from using these materials
Asbestos, eg insulation board, ceiling tiles and pipe lagging	Pneumoconiosis, asbestosis, mesothelioma, lung cancer
Carcinogenic materials, eg asbestos, mineral oils, lubricants, and PCBs (found in electrics)	Cancer, mesothelioma
Corrosive materials, eg concrete, brick, acid and wood dust	Cancer of the nasal tract, chemical burns
Skin sensitisers, irritants, eg bitumen, acids, alkalis and cement	Dermatitis
Contaminated land and materials, eg old buildings, redundant gas works, contaminated soils	Anthrax, tetanus, aspergillosis, psittacosis, poisoning, mycosis
Respiratory irritants, eg adhesives, bitumen, solvents	Asthma
Sewage and contaminated water	Leptospirosis (Weil's disease), hepatitis, viral infections

Table I.1 *Materials found on site and their health implications (continued)*

Silica-based products, eg granite kerbs, masonry, blockwork, fine aggregates	Silicosis
Lead, arsenic, solvents and PCBs found in redundant electrical apparatus	Systemic poisoning
Compressed air in sewers and tunnels	Decompression illness
Direct sunlight, eg when working outside, especially in unshaded areas such as on highways and when doing roofing work	Sunburn, skin cancer
Environments with limited lighting, eg tunnelling	Vision problems
Hot environments, eg when roofing and using hot materials	Heat exhaustion, heat cramps, heat rash, heat stroke
Ionizing radiation, eg welding	Radiation sickness, cancer and eye injuries
Lifting, carrying or moving heavy tools or materials	Work-related back pain and upper limb disorders
Noisy environments	Noise-induced hearing loss
Vibratory tools and equipment	A family of vibration-induced health problems including: <ul style="list-style-type: none"> – vibration white finger – hand-arm vibration syndrome – whole-body vibration syndrome – noise health issues.