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Environmental good practice on site

(Second edition)

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*sharing knowledge
building best practice*

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Environmental good practice on site (Second edition)

This second edition of the *Environmental good practice on site* handbook (C650), updates the previous version (C502, 1999), which resulted from CIRIA research project 559. This update has been undertaken in collaboration with a Project Steering Group of industry practitioners and was funded by the CIRIA Core Programme and the Environment Agency. See Acknowledgements (Appendices 6 and 7).

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Construction activities will always have an impact on the surrounding environment and neighbours. Good environmental practice enables these impacts to be managed positively. Impacts take many forms, for example effects on surrounding flora and fauna, watercourses, noise or pollution. Clients, their professional advisers, contractors and the whole construction supply chain, all have responsibilities for environmental management.

This handbook provides practical guidance about managing construction on site to control environmental impacts, and is relevant to all concerned with the construction process. The handbook has four sections:

1 Benefits and obligations

Outlining the benefits of good practice and the environmental obligations under which a site operates in terms of both the legislation and the contract conditions.

2 General site management issues

Providing general guidance on good site practice to provide the framework for managing environmental impacts.

3 Environmental issues

Providing guidance on how to manage impacts for each environmental issue and how to recognise and deal with any problems that may arise.

4 Construction processes

Identifying the environmental issues that need to be considered when carrying out a particular construction process.

This handbook is intended as a user-friendly guide, reference and training aid, replacing CIRIA publication C502, *Environmental good practice on site*. It is accompanied by a pocket-sized book containing a series of on-site checklists (C651) *Environmental good practice – pocket book*, and tool box talks (on CD), which contain key advice for all site personnel.

The accompanying CD includes further reference material.

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The target audience

This handbook provides guidance on environmental good practice for each construction stage and is aimed primarily at site personnel including sub-contractors. People involved in the early stages of a project's development, including designers and planners, can influence the ability of the site personnel to meet their obligations.

Primary audience	Secondary audience
<ul style="list-style-type: none">● site managers● site engineers● site foremen and site supervisors● project managers● contract supervisors/resident engineers● site environmental coordinator	<ul style="list-style-type: none">● client organisations● estimators● quantity surveyors● company directors● designers● construction planners.

The nature of environmental legislation is changing and this in itself, together with changes in good practice, makes this handbook relevant for all levels of construction experience.

How to use this handbook

This handbook is intended to be used on site following the completion of site investigation that may have involved Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). The findings from these assessments should be referred to, as the issues they highlight could impact on the progress of a project.

This publication is written for a wide range of construction personnel. **Section 1** presents the benefits of reading this handbook and the reasons for adopting good environmental practice on site.

Good environmental practice starts with planning for good site management. **Section 2** explains how the overall establishment and management of the site can form the basis of environmental good practice. Therefore those with management responsibility, from the beginning of the set-up of the site through to project completion and demobilisation, should read this section.

If you want to know about a particular environmental issue (eg noise or archaeology), then turn to **Section 3** for guidance. If you need to know what environmental issues to consider for a particular construction process (eg piling), then turn to that process in **Section 4**.

Use this handbook with the toolbox talks (on the accompanying CD) by concentrating on the issue or construction activity most relevant to the work taking place at that time.

Throughout the handbook symbols alongside the text help identify the type of information presented. These symbols and their explanations are shown below.



Plan ahead



Case study



Key guidance



Checklist



Legal/court case

Coverage of this handbook

This handbook updates CIRIA publication C502, *Environmental good practice on site*. It addresses environmental issues once a project has reached the construction stage. For each of the key topics it describes the issues and how to avoid or overcome them. To facilitate good environmental practice on site, this handbook explains how to establish a suitable management framework for the site, and how to set up central site facilities such as vehicle refuelling stations and materials storage locations.

The reader should be clear about the limitations in the scope of the handbook. In particular:

- it is not a health and safety manual
- it must not replace contact with regulators
- although it gives an overview of legislation, detailed guidance should be sought from the company's environmental representative (or external specialists) if it is required
- in all instances, when dealing with the issues covered, do not take action beyond your expertise. If in doubt, seek specialist advice
- it does not deal with environmental issues that should be covered during the planning and design of the project.

The guidance is generally relevant for all types of contract conditions, eg traditional, design and build, design-build-finance-operate (DBFO) and build-operate-transfer (BOT).

However, the site manager should be aware that, on some types of contract, the contractor carries the risk of cost or programme delays caused by unexpected events or finds. If in doubt seek advice from your quantity surveyor or contracts manager.

Relationship to other CIRIA guidance

CIRIA has produced three key publications that establish the environmental issues to be addressed at all stages of construction:

- *A clients' guide to greener construction* (SP120)
- *Environmental handbook for building and civil and engineering projects: design and specification* (SP97)
- *Environmental handbook for building and civil and engineering projects: Vol. 2 construction phase* (SP98).

These key publications outline the issues, principles and legislation that should be adopted to improve environmental performance in the construction industry. Details of other CIRIA publications of particular relevance can be found in Appendix 4.

- Abatement notices** A local authority has powers, under the **Environmental Protection Act 1990**, to serve an Abatement Notice where it is satisfied that a statutory nuisance exists.
- Abstraction** The removal of water from groundwaters or surface waters, either temporarily or permanently. Licences are required from the Environment Agency in England and Wales. No licence required in Scotland though this is likely to change under the requirement of the **Water Services and Water Environment (Scotland) Act 2003**.
- Asbestos** Environmental legislation looks to control pollution arising from manufacturing industry, demolition works, asbestos waste disposal and transportation of asbestos.
- Biodiversity** The entire variety of life on earth; this means species, genetic variations within species, and the communities, habitats and ecosystems and habitats within which they occur.
- Brownfield site** As opposed to a “greenfield” site, a brownfield site is a generic term for land used previously for an industrial or commercial purpose, being available for redevelopment towards new industrial, commercial or residential use. The level of remediation or clean-up necessary may vary hugely.
- Consent (discharge)** A statutory document issued by the Environment Agency under Schedule 10 of the **Water Resources Act 1991** or the Scottish Environment Protection Agency under the **Control of Pollution Act 1974** to indicate any limits and conditions on the discharge of an effluent to controlled water. Contact EHSNI for equivalent legislation for Northern Ireland.
- Controlled waters** Virtually all natural waters in the UK. This includes surface water (rivers, streams, lakes, reservoirs, ditches, ponds), including those temporarily dry, and groundwater (aquifers), as well as coastal waters up to three miles out. It is an offence to pollute such waters. Responsibility for policing controlled waters is placed with the regulators.

Glossary

Contaminated land	Land which contains substances likely to represent a hazard to human beings, animals or the environment.
Discharge consents (Water)	Any intended discharge to or abstraction of water from “controlled waters” will require prior permission from the environmental regulator over granting of a consent. Any intended discharge to foul sewer will require negotiation with the relevant water company for a consent.
Dust	Airborne solid matter up to about 2 mm in size. Along with noise and odour, dust is probably the most common form of “nuisance”.
Duty of care for waste	Legally set by Section 34 of the Environmental Protection Act 1990 . This imposes a duty on everyone in the waste management chain, ie anyone who imports, carries, produces, keeps, treats, or disposes of waste or acts as a broker.
Ecology	All living things, such as trees, flowering plants, insects, birds and mammals, and their habitats.
Enforcement notices	Issued under the Water Resources Act 1991 by the Environment Agency or Control of Pollution Act 1974 (as amended) by SEPA, if the discharge consent holder is contravening the conditions of the consent. Contact EHSNI for equivalent legislation for Northern Ireland.
Environmental impact	The total effect of any operation on the environment.
Environmental indicator	A measure, which can be used to assess the present state of the environment by looking at trends over time.
European Waste Catalogue	Lists various types of waste, eg Cat. 17 00 00 – Construction and Demolition Waste
Forest Stewardship Council	Based in Mexico, the organisation sets out international standards for the responsible management of forests in accordance with ecological, social and economic criteria.

Glossary

Global warming	The projected consequences of the greenhouse effect arising out of man's industrial practices, use of transport and domestic lifestyle. There is growing evidence that this is a reality and not just a cyclic natural effect.
Greenhouse gases	Natural and man-made gases which influence the greenhouse effect. Including carbon dioxide, methane, ozone and chlorofluorocarbons.
Greywater	The capture and reuse of lightly contaminated water for a second purpose eg water from wash handbasins used to flush toilets.
Groundwater	Water beneath the ground's surface.
Groundwater protection zones	Identifies the proximity of land to a groundwater source.
Heritage bodies	These have a general duty to conserve our heritage, to carry out scheduling of historic remains, and to undertake research. They comprise English Heritage, Cadw, Historic Scotland, and the Environment and Heritage Service Northern Ireland.
Landfill tax	Introduced in October 1996, as a tax payable to HM Customs & Excise by the operator, on all active waste materials going to landfill. Rising by £3 per tonne per year the tax is currently £18 per tonne (from April 2005) for active waste, Inert wastes are now not subject to the tax. There are certain defined exemptions.
Local Biodiversity Action Plan	An LBAP is used by local authorities and others to identify environmental objectives and targets. Aimed at ensuring sustainable development in relation to processes such as planning, the LBAP helps conserve and save valuable habitats as well as plant or animal species. LBAPs link to a National Biodiversity Plan set by government.
Local planning authorities	Based within local councils, the LPA is responsible for local planning issues including control of building works and development of land, protection of hedgerows and trees, and listed buildings.

Glossary

Mitigation	Refers to the environmental impact of scheme's development or operation and the actions, which may be taken to reduce or ameliorate such impacts.
Nature conservancy bodies	Countryside Council for Wales, English Nature (Natural England from October 2006), Environment and Heritage Service Northern Ireland, and Scottish Natural Heritage that have regional responsibility for promoting the conservation of wildlife and natural features in the UK.
Noise	Often explained as being a sound that is not desired. Sound is a wave motion carried by air particles between the source and the receiver, usually the ear.
Noise abatement zones	Local authorities have the power to set up a noise abatement zone as an area-based approach for controlling commercial and industrial noise
Polluter pays principle	Not defined in law, but which requires those who cause pollution or environmental damage, to pay the costs of preventing, reducing, or remediating any pollution or damage.
Pollution	The introduction of a substance that has the potential to cause harm to the environment or any other living organisms supported by the environment. Pollutants include silty water, oils, chemicals, litter and mud.
Prescribed processes	Any activities carried out on premises or by means of mobile plant (eg concrete crusher) capable of causing pollution to the environment. Nearly always require a local authority (SEPA in Scotland) licence.
Recycling	Collecting and separating materials from waste and processing them to produce useable products
Reduction of waste	Waste reduction has two components: <ul style="list-style-type: none">● reducing the amount of waste produced● reducing the hazard of the waste produced.
Remediation notice(s)	Having identified any contaminated land within its area, the environmental regulator or the local authority may serve on an "appropriate person" such a notice, specifying what needs to be done and the timescale for it to be done.

Glossary

Section 60 notice	Issued under the Control of Pollution Act 1974 to control noise pollution and nuisance. If issued the conditions must be complied with until revoked or successfully appealed against
Section 61 consent	Issued under the Control of Pollution Act 1974 to permit noise on site.
Sewage provider	Regional water utility company or Scottish Water responsible as the drainage authority for removal and treatment of foul water/sewage. Overseen by EHSNI in Northern Ireland.
Statutory consultees	Organisations that must be consulted at the planning stage of projects. These organisations include regulators, heritage bodies and nature conservation bodies
Sustainable development	“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (from the Bruntland Report).
Sustainable timber	Wood that is obtained from a sustainably managed forest.
Transfer note	Required under the Environmental Protection (Duty of Care) Regulations as a legal document describing the transfer of controlled/directive waste between dutyholders.
Transfer station	Facility where waste is transferred from collection vehicles to larger vehicles or onto rail or river for onward transport for disposal.
Waste	Any substance or object that the holder discards, intends to discard, or is required to discard. <ul style="list-style-type: none">● controlled waste – household, commercial and industrial waste● directive waste – material that the holder discards● difficult waste – includes liquids and sludges● inert waste – eg clean bricks, blocks, concrete● non-hazardous waste – a Landfill Tax classification● hazardous waste – hazardous or dangerous to life.

Glossary

Waste hierarchy

- eliminate
- reduce
- reuse
- recycle
- recover
- disposal (landfill only as last resort).

Waste minimisation/ resource efficiency

The reduction of waste at source by understanding and changing processes to minimise its production. It includes the substitution of less environmentally harmful materials in the production process.

Water protection zones

The Secretary of State for the Environment has the power to declare a Water Protection Zone, to protect specific controlled waters. Declaration of a zone may prevent or severely restrict any activities placing the zone at risk.

Wildlife corridor

A linear habitat, or range of habitats in which species can survive, and along which they can move to other wildlife areas. Examples include rivers and streams, hedges and shelterbelts, field and road margins.

Acronyms and abbreviations

ACE	Association of Consulting Engineers
AONB	Area of Outstanding Natural Beauty
ASSI	Area of Special Scientific Interest (in Northern Ireland)
BPM	Best Practicable Means
BPN	Building Preservation Notice
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method.
BS	British Standard
Cadw	Welsh Historic Monuments
CCTV	Closed Circuit Television
CCW	Countryside Council for Wales
CECA	Civil Engineering Contractors Association
CEEQUAL	Civil Engineering Environmental Quality Assessment and Award Scheme
CLR	Contaminated Land Report
COPA	Control of Pollution Act
COSHH	The Control of Substances Hazardous to Health (Regulations 1994)
CWS	County Wildlife Sites
DARD	Department of Agriculture and Rural Development (Northern Ireland)
dB	Decibel
Defra	Department of Environment Food and Rural Affairs
DTI	Department of Trade and Industry
EHNSI	Environment and Heritage Service Northern Ireland
EIA	Environmental Impact Assessment
EMAS	Eco-management and Audit Scheme
EMP	Environmental Management Plan
EMS	Environmental Management System
EnCams	Environmental Campaigns
EPA	Environmental Protection Act 1990
EWG	European Waste Catalogue
FOD	Foreign Object Damage
FSC	Forest Stewardship Council
HSE	Health & Safety Executive

Acronyms and abbreviations

ICE	Institution of Civil Engineers
IFA	Institute of Field Archaeologists
ISO	International Standards Organisation.
LAPC	Local Air Pollution Control
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
MCERTS	Monitoring Certification Scheme
MDF	Medium Density Fibreboard
NNR	National Nature Reserve
NRSWA	New Roads and Streets Works Act 1991
PEFC	Programme for Endorsement of Forest Certification
PFA	Pulverised Fly Ash
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
RAMSAR	Wetlands of international importance
RIGS	Regionally Important Geological Sites
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SEMP	Site Environmental Management Plan
SEPA	Scottish Environment Protection Agency
SINC's	Sites of Importance for Nature Conservation
SMC	Scheduled Monument Consent
SNCI	Sites of Nature Conservation Interest
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
SWMP	Site Waste Management Plan
TMP	Traffic Management Plan
TPO	Tree Preservation Order
UKAS	United Kingdom Accreditation Service
WAC	Waste Acceptance Criteria
WEEE	Waste Electrical and Electronic Equipment
WEWS	Water Environment and Water Services (Scotland) Act 2003
WRAP	Waste and Resources Action Programme
WWF	World Wildlife Fund

Benefits and obligations

Construction sites are often criticised for the impacts that they have on the surrounding environment and residents. These impacts include; effects on flora and fauna, excess noise and water, air and ground pollution. Good environmental practice on site to manage these impacts must be a high priority.

Increasingly efforts are being made within the construction industry to implement environmental improvements:

- clients are requesting evidence of environmental credentials from contractors before awarding contracts
- contractors are assisting their suppliers and sub-contractors to manage and improve the environmental performance of their own operations
- top level commitment is demonstrated by environmental policies
- many construction companies have an environmental management system (EMS) and report on environmental and sustainability issues
- on-site personnel are implementing many environmental initiatives.

Action is still needed to improve environmental performance as the construction industry causes more water pollution incidents than any other industry. There are many incentives for improving performance, which include:

- enhanced environmental conditions resulting from good practice
- effective risk management to avoid the cost implications of failing to meet environmental obligations, regulations and legislation
- resource efficiency to maximise achievable cost savings
- demonstrating benefits of good environmental performance to interested parties including clients, regulators and the public.

I.1 The benefits of good practice

I.1 The benefits of good practice

“Sustainability” and “sustainable development” are terms defined differently by different people. The original definition (and the one still most widely used), was made in the Bruntland Report *Our common future* (World Commission on Environment and Development, 1987), which defined it as:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

In March 2005 the UK Government introduced its new strategy for sustainable development; *Securing the future – delivering UK sustainable development strategy*. The strategy contains five principles with an explicit focus on environmental limits. Further details on the strategy are available at: www.sustainable-development.gov.uk

Environmental benefits

- reduced damage to the surrounding air, water resources, land and to fauna and flora from potentially damaging activities
- reduced demand for resources through better material selection, procurement and management, less wastage and greater use of recycled, reclaimed and sustainably sourced materials.

Social benefits

- reduced nuisance to neighbours by liaising with the local community before and during the project to keep them informed about works that could affect them.

Economic benefits

- improved opportunities to tender through demonstration of sound environmental performance and effective risk management
- less money wasted on fines for non-compliance with legislation and associated costs of clean-up, legal fees and management time
- fewer delays to the project by fully characterising the site before works start, reducing costs incurred by delayed surveys
- less money lost through wasted resources that need to be disposed of to landfill

Environmental obligations 1.2

- improved environmental profile by establishing good relationships with environmental regulators and the local authority.

Benefits are felt at both a corporate and a project level. So what do they mean to the individual?

- the site manager can demonstrate improved margins
- the site engineer's workload can be reduced by fewer conflicts
- reduced risk of complaints
- reduced bad/negative press locally
- avoidance of delays.

1.2 Environmental obligations

There are a number of controls that ensure good practice is followed, and have both legislative and contractual origins and include:

Contract conditions

These address any conditions imposed through the planning system and commitments made to the local communities, and may include provisions made after an environmental assessment. Non-compliance will be penalised through the contract.

National legislation

It is enforced primarily by the environmental regulators to protect both the natural environment and residents surrounding sites. Key legislation includes the **Environmental Protection Act 1990** and the **Water Resources Act 1991**.

Other legislation is in place to protect specific features of the environment; with sites being designated and protected by virtue of their ecological, archaeological, geological or geomorphological importance.

Court convictions can lead to unlimited fines for a company and/or imprisonment or community service for the person (individual and/or appropriate director) or company responsible, if it is found that suitable training, procedures or equipment were not being provided.

I.2 Environmental obligations

Local control

Local authorities can impose a number of requirements through the powers given to them by national legislation including noise and air controls. Planning legislation at both a local and national level is the main control on construction development covering many aspects including scale and traffic.

Corporate control

Many contractors have corporate environmental policies and an EMS which employees are required to follow. There may be a specific site environmental management plan (SEMP) for a project that stipulates controls to minimise