

ECI Environmental Guidance for Construction Sites



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ECI Environmental Guidance for Construction Sites

INTRODUCTION

This document provides basic guidance and advice for the project and construction management team to help consider the environmental impact of projects through the planning, design and construction phases. It focuses on construction projects being delivered in the EU, with advice and references taken from multiple sources, and is applicable to all construction, demolition, and excavation sites.

Construction activities can have a major impact on the environment and currently within the European Community there is a wide variance of performance. This guidance does not seek to provide detail regarding the local regulatory requirements for each EU country but points to the fundamental elements of good environmental practice, management and control of construction sites wherever they may be in the EU.

The team should familiarise themselves with the local environmental legislation and regulation (see Appendix 1 for links to European Environmental Agency websites).

Each section provides simple checklists to help consider environmental issues on construction sites. References are provided to detailed guidance from other sources.

ENVIRONMENTAL PLANNING

Environmental best practice on construction sites can bring many benefits such as:

- Environmental benefits:
 - improved air quality
 - better protection of controlled waters
 - less damage to wildlife

- Social benefits
 - better local infrastructure
 - less noise and nuisance

- Economic benefits
 - reduced infrastructure operating costs
 - fewer delays
 - better use of resources

Effective planning is essential to minimise the environmental impact of construction and the team should consider the following before the start of the project:

Environmental Pre-Project Planning Checklist

- ✓ Identify the local environmental legislation requirements
- ✓ Identify the environmental requirements in the project brief
- ✓ Consult with the environmental regulator to identify issues
- ✓ Commence an environmental risk register
- ✓ Prepare an Environmental Impact Assessment (EIA)

What is an Environmental Impact Assessment?

Planning applications for developments within EU countries must meet national\local environmental requirements before approval is granted and planning\environmental agencies will

use evidence to assess the potential environmental risks associated with a development. A new development may require an Environmental Impact Assessment (EIA). An EIA will identify the environmental impacts of the whole lifecycle of the project before construction works begin, and propose appropriate measures to address these impacts. The EIA may also have implications for construction. You must expect to receive an EIA and manage the controls specified to eliminate or mitigate the environmental impact of the construction.

If you haven't seen it – ask for it

Construction Considerations at the Planning Stage

During the planning stage the construction team should be involved in the following activities to ensure that construction issues impacting on the environment are considered.

Environmental Management Planning Checklist

- ✓ Develop the environmental risk register
- ✓ Talk with designers to determine how construction environmental risks can be eliminated or mitigated at the design stage
- ✓ Understand the residual environmental risks that must be managed during the construction phase
- ✓ Define site roles and responsibilities
- ✓ Define communication and reporting routes
- ✓ Determine emergency procedures for when things go wrong on site
- ✓ Determine how to monitor environmental performance on site
- ✓ Determine how to communicate the above through site induction
- ✓ Prepare an Environmental Management Plan

What is an Environmental Management Plan (EMP)?

An Environmental Management Plan (EMP) is the site specific document used to manage the environmental issues associated with the project site, as a constant reference during construction and updated as the construction develops.

A typical EMP will include:

- ✓ Policy
- ✓ Targets and objectives
- ✓ Site organisation
- ✓ Roles and responsibilities
- ✓ Environmental risks
- ✓ Controls and arrangements.
- ✓ Emergency procedures
- ✓ Site induction and training requirements
- ✓ Audit and inspections requirements
- ✓ Review meeting requirements
- ✓ Reporting arrangements

The Environmental Regulator

Early involvement, and maintenance of a good relationship, with the local environmental regulator is essential and the following items should be considered:

Keeping the Environmental Regulator Happy

- ✓ Show the regulator the EMP for the construction site detailing how you intend to manage the environmental impacts
- ✓ Invite the regulator to site to review the plan and the on-site implementation
- ✓ Display the regulators' contact details and emergency contact number on site
- ✓ Ensure that site operatives know the key elements within the EMP
- ✓ Ensure site operatives know the correct procedures for reporting environmental incidents
- ✓ Always notify the environmental regulator of any reportable incidents

Other considerations during the planning phase are:

Wider Environmental Planning Issues

- ✓ Develop relationships with other stakeholders and keep them informed i.e. the local community
- ✓ Consider employing local construction labour to reduce the environmental impact of travel to and from site and to encourage sustainable local jobs
- ✓ Consider green transport policy for construction labour to reduce environmental impact i.e. promote car sharing, bus employees to site, etc.
- ✓ Consider environmental management issues when selecting and appointing suppliers and subcontractors

ENVIRONMENTAL DESIGN

The design of a development can have a significant impact on the environment both in terms of its impact during the construction phase and its whole life impact. This is a broad subject generally outside the scope of this guide. Notwithstanding, some considerations, particularly linked to construction, include:

Environmental Design Checklist

- ✓ Specify construction materials with recycled content from a recovered source e.g. recycled steel
- ✓ Consider lean and modular designs, select standard component sizes, and design for deconstruction and recycling/recovery
- ✓ Include packaging and unused materials recovery by the supply chain in specifications and contract terms
- ✓ Avoid excessive packaging requirements
- ✓ Ensure efficient site planning and materials storage to minimise waste from damage or loss
- ✓ Plan to segregate and store waste for effective recovery.
- ✓ Consider refurbishment rather than new build to reduce waste and energy usage.
- ✓ Consider just in time delivery of materials.
- ✓ Consider bespoke size materials to avoid cut off waste.
- ✓ Consider prefabrication off site to ensure greater control over fabrication generating less waste, noise and dust.
- ✓ The reuse or recovery of demolition waste
- ✓ Carry out pre-demolition and pre-refurbishment audits to identify materials that could be recovered.

Example - The recovery of bricks from the demolition of an old building to be reused for the new development.

This approach would not only recover materials for reuse thus saving the energy required, pollution impact, and climate change impact to produce new materials but will also result in a new development which is sympathetic to its heritage and its surroundings.

All design phase assessment information must be passed on to the site team to ensure effective management and control during the construction phase.

CONSTRUCTION SITE MANAGEMENT

Site Layout

Careful planning and layout of the construction site will help to eliminate and minimise environmental impacts and some of the significant issues to consider are as follows:

Good Site Layout Checklist

- ✓ Provision of waste management facilities including local job face facilities and a central waste storage area
- ✓ Consideration of car parking, site accommodation and welfare facilities to minimise impact
- ✓ Ensure good site security is established to minimise vandalism and theft
- ✓ Consider local surroundings and understand key pollution risks i.e. local controlled waters (streams, rivers and ground water), wildlife habitats, etc.
- ✓ Establish drainage requirements on site and clearly label drains
- ✓ Provide bunded fuel, chemical and oil storage
- ✓ Designate controlled concrete wash out areas
- ✓ Designate controlled wheel wash areas
- ✓ Design traffic management and temporary roads to minimise impact
- ✓ Provide materials laydown and storage to minimise the impact of deliveries, double handling and ensure storage of materials is close to the job site.
- ✓ Ensure the provision of emergency procedures and spill kits

Construction Site Management Considerations

With due consideration to risks and controls identified in the Environmental Management Plan, the project/site manager should consider the following checklist of items to minimise the environmental impact of the construction activities:

Good Construction Site Management Issues Checklist

- ✓ Manage materials and materials storage
- ✓ Manage site traffic
- ✓ Ensure good housekeeping
- ✓ Establish good site security
- ✓ Manage the refuelling of vehicles and plant
- ✓ Manage the delivery and storage of fuels, oils and chemicals
- ✓ Establish and manage traffic routes
- ✓ Ensure good maintenance of plant, equipment and vehicles
- ✓ Establish waste management
- ✓ Prevent ground contamination
- ✓ Identify and manage wildlife habitats and biodiversity
- ✓ Manage noise and vibration
- ✓ Manage light pollution
- ✓ Consider dust as a pollution
- ✓ Establish Emergency and Spill Procedures

Example hints and tips for some of the above issues are provided as follows:

Hints and Tips - Materials Storage and Management

- ✓ Reduce storage requirements by ordering the right quantities of materials for delivery at the time for use.
- ✓ Follow the suppliers' instructions for storage and handling.
- ✓ Provide easy access to frequently used items.
- ✓ Securely store valuable materials out of sight.
- ✓ Reduce the use of hazardous materials and replace where possible with non-hazardous materials.
- ✓ Use more recycled materials.
- ✓ Design the storage area to contain spills.
- ✓ Provide suitable offloading areas and equipment.
- ✓ Arrange for packaging materials to assist with effective storage.
- ✓ Avoid busy delivery times e.g. rush hour.
- ✓ Take special care with potentially polluting materials.
- ✓ Ensure stock rotation for perishable materials like cement.

Hints and Tips - Emergency Procedures for Leaks and Spills

- ✓ Ensure emergency procedures are in place for foreseeable leaks, spills and loss of containment.
- ✓ Train site personnel in emergency procedures.
- ✓ Provide the equipment to manage leaks and spills.

Hints and Tips - Good Housekeeping

- ✓ Segregate waste streams and manage at the work face.
- ✓ Keep the site tidy and clean - a tidy site is a safe site.
- ✓ Ensure that no wind-blown litter or debris leaves site.
- ✓ Manage material and plant storage areas.
- ✓ Keep hoardings tidy – repair and repaint as required.
- ✓ Frequently clean wheel washing facilities.
- ✓ Keep traffic routes clean and clear of debris.
- ✓ Damp down dry roads to keep the dust down.
- ✓ Keep roads free from mud.
- ✓ Ensure the site is secure

Hints and Tips – Delivery\Storage of Fuels, Oils & Chemicals

Special care should be taken when receiving deliveries of, and storing, chemicals, fuels, oils, etc. on site.

- ✓ Supervise deliveries at all times
- ✓ Check storage tank levels to prevent overfilling
- ✓ Clearly label all storage tanks\containers.
- ✓ Design and construct storage tanks\containers to be fit for purpose and locate on firm foundations.
- ✓ Locate storage tanks\containers in bunds.
- ✓ Ensure emergency procedures are in place.
- ✓ Clearly identify loading and offloading areas.
- ✓ Protect drains from accidental spillage
- ✓ Install catch pits\interceptors at delivery points.
- ✓ Ensure spill kits are available for emergencies.
- ✓ Always follow local legislation for storage of fuels and oils.
- ✓ Regularly check valves, hoses and pipes for leaks.
- ✓ Store drums so that they can all be inspected for leaks.

For further information specific to the country of the construction please refer to the links to European Environmental Agencies in Appendix 1.

ADDITIONAL BACKGROUND INFORMATION

Pollution Prevention

The following hierarchy of control should apply for pollution caused as a consequence of construction activities:

Prevention – Prevent environmental harm in the first place rather than having to remediate or make good environmental problems once they have occurred.

***Example** – Prevent the pollution associated with the transport of backfill material to the construction site by reusing spoil excavated from the site.*

Monitoring – Where pollution cannot be prevented it must be managed within controlled environmental limits or limit values.

***Example** – Monitor CO2 emissions from diesel plant providing temporary power on the construction site to ensure that environmental limits are not exceeded*

‘End of Pipe’ Solutions – Where environmental limits are exceeded, then ‘end of pipe’ solutions are required to protect the environment.

***Example** – Establish Water treatment for contaminated liquid waste prior to discharge into controlled waters.*

It must be noted that these solutions are usually expensive and it is much more cost effective and efficient to prevent the contaminated liquid waste being generated in the first place.

Taking simple steps to prevent pollution incidents during the construction process will save you money and protect the environment.

Pollution incidents occur every day as a result of spills, accidents, negligence or vandalism. Pollutants can put human health at risk and destroy wildlife habitats.

In law, the polluter pays principle means that you will have to pay to put right any damage to the environment. This can be avoided with careful planning and following good practice on-site.

The UK Environment Agency have produced a step-by-step guide “Working at Construction and Demolition Sites: PPG6 – Pollution Prevention Guidelines” on how to plan your activities on-site to prevent pollution incidents. PPG6 can be found at the following link:

[www.environment-agency.gov.uk/static/documents/Business/EA-PPG6 -
_03_2012_Final.pdf](http://www.environment-agency.gov.uk/static/documents/Business/EA-PPG6_-_03_2012_Final.pdf)

Water Pollution Prevention

Consideration needs to be given on site to drainage and preventing water pollution. Two types of drains will be required on site - foul drains and surface water drains.

Foul water can be connected into an existing foul drainage system but will need prior agreement with the water company. Alternatively foul water can be collected in tanks and shipped off site by tanker. Care needs to be taken when transferring foul water from the tank to the tanker to prevent spillage.

Surface water is normally clean and surface water drainage normally leads directly to local rivers and streams or soak away. Problems arise when contaminants are washed down clean water drains.

If you are going to make a discharge to surface water (for example to a river, stream, estuary or the sea), or to groundwater (including via an infiltration system), you will usually need to apply for a permit or an exemption before construction begins. Due to limited water supplies, you will also need to follow our guidance for water abstraction.

Further detailed information from a UK perspective is available as follows:

Managing groundwater:

www.environment-agency.gov.uk/business/topics/water/110593.aspx

Managing concrete wash water:

[www.environment-](http://www.environment-agency.gov.uk/static/documents/Business/MWRP_RPS_107_Concrete_washwaters_-_June_2011.pdf)

[agency.gov.uk/static/documents/Business/MWRP_RPS_107_Concrete_washwaters_-_June_2011.pdf](http://www.environment-agency.gov.uk/static/documents/Business/MWRP_RPS_107_Concrete_washwaters_-_June_2011.pdf)

Waste Prevention

The following hierarchy of control should apply for waste caused as a consequence of construction activities:

Eliminate – Where possible eliminate all waste

Example – Arrange for components and materials to be delivered to site at exactly the right size to eliminate on site processing and the generation of waste materials.

Reduce – Where waste cannot be eliminated then take measures to reduce the amount of waste

Example – Encourage suppliers to reduce the amount of packaging used when transporting materials.

Reuse – Where possible reuse waste

Example – Spoil excavated from ground works should be reused on site rather than sent to landfill..

Recycle – Where waste cannot be reused it should be recycled for use by others

Example – Provide segregated waste skips on site to allow the sorting of waste into separate waste streams.

Recover – If waste cannot be recycled in its current form then recover the waste for use elsewhere

Example –The components from waste electrical equipment can be recovered for use in new electrical products.

Disposal – Disposal of waste, generally to landfill or incineration, is expensive and harmful to the environment and should only be used as a last resort.

Construction Waste Facts & Figures

- Construction waste accounts for between 2% and 3% of construction project costs.
- The UK construction industry is responsible for 32% of landfill waste
- Around 420 million tonnes of materials are used by the UK construction industry each year, and approximately 120 tonnes becomes waste.
- The production and transportation of construction materials are estimated to use 6% of UK energy.
- Between 1999 and 2008 the proportion of construction and demolition waste recycled by crushers and screeners has increased from 35 per cent to 61 per cent.

Good site management and well managed waste handling reduces serious impacts on the environment, makes good business sense, reduces costs and enhances community relations.

The Waste Resources Action Programme (WRAP) has produced a series of tools, templates and guidance to help manage waste and encourage efficiency on construction sites:

Further detailed information from a UK perspective is available as follows:

WRAP and guidance on how to manage your waste:

www.wrap.org.uk/category/sector/construction

Ideas on how to reduce, recycle, and reuse construction waste:

www.nsc.org.uk/docs/general/002fGuidanceonwaste.pdf

www.eastsussex.gov.uk/nr/rdonlyres/b3345bd0-d7b3-41d3-a4aa-fb925ec52faa/0/finalversioneastsussexcdwasteadvicenote.pdf

Site Waste Management Plans (SWMPs)

A SWMP sets out how resources will be managed and waste controlled at all stages during a construction project and covers:

- Who will be responsible for waste management?
- What types of waste and in what quantities will be generated?
- How the waste will be managed – will it be reduced, reused or recycled?
- Which contractors will be used to ensure the waste is correctly recycled or disposed of responsibly and legally.
- How the quantity of waste generated by the project will be measured.

For detailed information on Site Waste Management Plans use the following links:

www.environment-

agency.gov.uk/netregs/businesses/construction/62359.aspx

www.constructingexcellence.org.uk/pdf/document/sitewastemanagement.pdf

Sustainable Construction

Sustainable construction is about the better management of resources, reusing waste materials where possible, and reducing your carbon footprint. It includes how developments impact on and provide for the surrounding infrastructure and natural environment as well as the fabric of buildings.

Sustainable Good Practice Construction

- ✓ Reduce construction, demolition and excavation waste to landfill
- ✓ Reduce carbon emissions from construction processes and associated transport
- ✓ Ensure construction products are responsibly sourced
- ✓ Consider the local sourcing of materials and labour
- ✓ Reduce water and energy usage during the construction process
- ✓ If possible, consider installing the permanent power supplies at the start of construction to reduce the effort and cost of installing and then removing temporary supplies
- ✓ Carry out biodiversity surveys and following up with necessary actions

An example of Sustainable Construction is to use Sustainable Urban Drainage Systems (SuDS) which is a technique that manages surface water and groundwater sustainably and effectively.

For more information on Sustainable Construction including SuDS technology visit the UK Environment Agency website on the following link:

www.environment-agency.gov.uk/business/sectors/136252.aspx

Wildlife and Conservation

Before construction works commence you need to know how to protect plants and animals, what plants and animals are classed as protective species, and how to prevent contamination from, and dispose of, invasive species.

General protection of trees, hedgerows, plants and animal habitats can be managed as follows:

Wildlife and Conservation Checklist

- ✓ Keep vehicles and equipment away from them
- ✓ Fence off protected areas
- ✓ Do not store construction materials, chemicals, fuels, cement, etc. near them
- ✓ Do not damage roots, bark, or branches
- ✓ Protect exposed roots
- ✓ Do not disturb animal habitats or birds' nests
- ✓ Consider the seasonal changes to habitats
- ✓ Consider on site processes that can effect plant and animal habitats and biodiversity e.g. dewatering

You may consider how you can create or enhance habitats and biodiversity as part of the construction project.

Consideration also needs to be given to protected species. European Protected Species (EPS) are protected under EC Directive 92/43/EEC implemented in the UK by the Conservation of Habitats and Species Regulations 2010.

Common examples of protected species in Europe include:

Animals – Horseshoe Bats, Common Otter, Dormouse, Fisher’s Estuarine Moth, Great Crested Newt (or warty), Large Blue Butterfly, Lesser Whirlpool Rams Horn Snail, Natterjack Toad, Pool Frog, Sand Lizard, Smooth Snake, Sturgeon, and Wild Cat.

Plants – Creeping Marshwort, Early Gentian, Fen Orchid, Floating-leaved water Plantain, Killarney Fern, Lady’s Slipper, Shore Dock, Slender Naiad, Yellow Marsh Saxifrage.

For detailed information on managing protected species use the following links:

www.businessandbiodiversity.org/construction.html

www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/faq.aspx

You may also need to check with local authorities whether any trees on site have preservation or protection orders.

Preventing contamination from, and disposal of, invasive species must also be considered. There are several hundred species of invasive weeds in the Europe. Japanese knotweed, giant hogweed and Himalayan balsam are extremely common and are the species that you are most likely to come across on a development or construction site.

You must not plant or encourage the spread of either Japanese knotweed or giant hogweed. This can include:

- Moving contaminated soil from one place to another
- Incorrectly handling and transporting contaminated material and plant cuttings.

Japanese Knotweed – The UK Environment Agency has produced “The Knotweed Code of Practice – Managing Japanese Knotweed on Development Sites” which can be found at the following link:

www.environment-agency.gov.uk/static/documents/Leisure/Knotweed_CoP.pdf

If you need to work on land contaminated with invasive weeds, you can find information on how to identify, handle and control the weeds at the following link:

www.businesslink.gov.uk/bdotg/action/layer?topicId=1086726920

APPENDIX 1 EUROPEAN ENVIRONMENT AGENCY LINKS

EEA	EEA European Environment Agency www.eea.europa.eu/
Albania	Agency of Environment and Forestry AEF www.moe.gov.al
Austria	Environment Agency Austria www.umweltbundesamt.at
Belgium	The Flemish Environment Agency (VMM) www.vmm.be
Croatia	Croatian Environment Agency www.azo.hr
Cyprus	Environment Service Ministry of Agriculture, Natural Resources and Environment Republic of Cyprus www.moa.gov.cy
Czech Republic	Czech Environmental Information Agency (CENIA) www.cenia.cz
Denmark	Danish Environmental Protection Agency www.mst.dk
Estonia	Estonian Environment Information Centre (EEIC) www.keskkonnainfo.ee
Finland	Environment Institute – SYKE www.environment.fi/syke
Germany	Federal Environment Agency www.umweltbundesamt.de

Greece	Greece National Centre for Environment and Sustainable Development http://epanet.ew.eea.europa.eu/european_epas/countries/gr
Hungary	Ministry for the Environment www.kvvm.hu
Iceland	Environment Agency of Iceland www.ust.is
Ireland	Environmental Protection Agency (EPA) www.epa.ie
Italy	Italian National Institute for Environmental Protection and Research (ISPRA) http://epanet.ew.eea.europa.eu/european_epas/countries/it
Latvia	Latvian Environment, Geology and Meteorology Agency (LEGMA) www.meteo.lv
Lithuania	Environmental Protection Agency (EPA) http://gamta.lt
Malta	Malta Environment and Planning Authority (MEPA) www.mepa.gov.mt/
Netherlands	Netherlands Environmental Assessment Agency (PBL) www.pbl.nl
Northern Ireland	Northern Ireland Environment Agency www.doeni.gov.uk/niea
Norway	Norwegian Climate and Pollution Agency (KLIF) www.klif.no

Poland	Chief Inspectorate of Environmental Protection www.gios.gov.pl
Romania	National Environmental Protection Agency (NEPA) www.anpm.ro
Scotland	Scottish Environment Protection Agency (SEPA) www.sepa.org.uk
Serbia	Serbian Environmental Protection Agency (SEPA) www.sepa.gov.rs
Slovakia	Slovak Environmental Agency (SEA) www.sazp.sk/
Slovenia	Environmental Agency of the Republic of Slovenia www.arso.gov.si
Spain	Ministry of the Environment and Rural and Marine Affairs www.magrama.gob.es
Sweden	Swedish Environmental Protection Agency www.swedishepa.se
Switzerland	The Federal Office for the Environment (FOEN) www.environment-switzerland.ch
United Kingdom	Environment Agency of England and Wales www.environment-agency.gov.uk

REFERENCES AND USEFUL INFORMATION SOURCES

CIRIA C651 – ‘Environmental Good Practice – Pocket Book’
www.ciria.org/service/Web_Site/AM/ContentManagerNet/ContentDisplay.aspx?Section=Web_Site&ContentID=8983

CIRIA C692 ‘Environmental Good Practice on Site’
www.ciria.org/service/Web_Site/AM/ContentManagerNet/ContentDisplay.aspx?Section=Web_Site&ContentID=18822

European Commission – Environmental Impact Assessment
<http://ec.europa.eu/environment/eia/eia-support.htm>

European Union – Sustainable Construction
<http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/sustainable-construction/>

Construction Industry Research & Information Association (CIRIA) - www.ciria.org/

NetRegs - www.netregs.gov.uk/

Natural England - www.naturalengland.org.uk/

WRAP waste prevention - www.wrap.org.uk/

European Construction Institute – SHE Task Force
www.eci-online.org/taskforces/she/she-taskforce/

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