

BARRATT HOMES

**FELPHAM SITE 6,
FELPHAM,
BOGNOR REGIS, WEST SUSSEX**

**CONSTRUCTION
ENVIRONMENTAL
MANAGEMENT PLAN**

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

1.0 Introduction

The CEMP provides the management framework needed for the planning and implementation of construction activities in accordance with environmental commitments identified within the Environmental Statement and any requirements of planning conditions or Section 106 legal agreements. Its purpose is to reduce the risk of adverse impact of construction on sensitive environmental resources and to minimise disturbance to local residents.

The CEMP describes the checking, monitoring and audit processes that would be implemented to ensure works are being undertaken in accordance with these requirements, together with measures to ensure that appropriate corrective actions or mitigation measures are taken.

The CEMP forms part of the overall Project Management and as such, activities described would be integrated with other Quality, Sustainability and Health and Safety management processes.

The Project

A programme of works will identify and sequence activities that are needed in order to complete a required construction process. The programme would identify reference documentation, the approval required to complete that activity and the verification documentation to be produced as evidence of satisfactory completion.

The Programme

The programme would include the following sections:

- advanced works
- site clearance and fencing
- contractor's compound
- haul road construction
- topsoil strip
- earthworks
- viaduct construction
- drainage works
- building foundations
- superstructures to buildings
- building finishes and fit-out
- road and car park construction
- landscaping and planting

1.1 Risk Assessments

All activities undertaken on site would be subject to a Health and Safety assessment which will include environmental issues and those relating to habitats, protected species and issues arising from the requirements of the wildlife & Countryside Act. Risk assessments would be undertaken by trained staff following an approved procedure, including reference to –and taking guidance from Environment Agency Pollution Prevention Guidelines - which would:

- identify the significant environmental impacts that can be anticipated
- assess the risks from these impacts
- identify the control measures to be taken and re-calculate the risk
- report where an inappropriate level of residual risk is identified so that action can be taken through design changes, re-scheduling of work or alternative methods of working in order to reduce the risk to an acceptable level

The results of risk assessments, and their residual risks are only considered acceptable if: the severity of outcome is reduced to the lowest practical level; the number of risk exposures are minimised; all reasonably practical mitigating measures have been taken and the residual risk rating is reduced to a minimum.

The findings of the risk assessment and in particular the necessary controls would be explained to all operatives before the commencement of the relevant tasks using an agreed instruction format (inductions/tool box talks etc).

All activities would be subject to such assessment and the preparation of, and adherence to, the Method Statements as subsequently described. Of particular significance are the bridges over the Lidsey Rife and railway as these areas contain specific hazards relating to health, safety environment, water quality, habitat and potentially to protected species

1.2 Method Statements

Method statements would be completed on behalf of the Main Contractor or Subcontractor by trained engineers or other appropriate experienced personnel, in consultation with on-site environment staff and, where necessary, environmental specialists. Their production would include a review of the environmental risks and commitments and health and safety risk assessment, so that appropriate control measures are developed and included within the construction process.

Method statements would be reviewed by Construction/Site Manager, and where necessary by the OHS&E Advisor. Method statements would contain as a minimum:

- location of the activity and access/egress arrangements
- work to be undertaken and methods of construction
- plant and materials to be used
- labour and supervision requirements
- health, safety and environmental considerations
- any permit or consent requirements

1.3 Site Environmental Standards

These would be agreed with the Project Team and would detail the minimum measures that should be achieved for general operations that would fall outside the risk assessment/method statement procedure designed to cover the majority of construction activities. They would cover issues such as storage of materials, management of waste, water pollution, noise and vibration, and water pollution control. The standards would be printed on A3, placed in the induction folder and used within the site induction process.

2.0 Control of Construction Processes

2.1 Training, Awareness and Competence

The raising of environmental awareness is viewed as a crucial element in the appreciation and implementation of the CEMP. As a consequence, all staff would undergo environmental awareness training, by way of the pre-start induction process.

Training for all personnel identified in the Company training plan would be completed before commencement of the associated construction activities. Line managers and supervisors would ensure that all personnel engaged in activities that may have an impact on the environment are competent to carry out their duties or, where necessary, arrange for suitable training to be undertaken.

2.2 Supervision of Construction Activities

All construction and installation activities including those carried out by subcontractors and suppliers would be supervised, or regularly checked through the completion of site inspections by Construction/Site Managers and OHS&E Advisor within his site visits, to ensure that requirements identified in risk assessments or method statements have been implemented. The frequency and extent of this supervision would vary according to the degree of competence displayed by the workforce and the level of risk of the activity and to the environment.

2.3 Inspection of Other Operational Impacts

Appointed representatives would carry out weekly inspections of their respective construction areas, to verify that housekeeping or supporting controls are being implemented effectively. These inspections would utilise the site environmental standards as the minimum standards that should be achieved, with necessary actions being recorded and raised at regular progress meetings. Subsequent inspections would

commence with a review of all outstanding actions from previous reports to verify that they have been completed.

2.4 Inspections of Environmental Aspects

Environmental deliverables required by the CEMP would be subject to regular independent inspections by either the Barratt, Southampton Site Manager or OHS&E Advisor. These inspections would be used to confirm that:

- Construction works are progressing in accordance with the agreed method statements'
- Agreed protection or mitigation measures are in place, prior to or during the implementation of construction activities
- Construction works have been completed in accordance with the design and commitments made during the statutory process

2.5 Environmental Monitoring

Monitoring of noise, vibration, dust and water quality would be carried out in accordance with the specialist environmental procedures and environmental commitments included within the CEMP, the method statements and site waste management plan (SWMP.)

2.6 Control of Non-conformance

Non-conforming products or processes would initiate a Non-Conformance Report, which would identify the nature of the problem, the proposed corrective action, action taken to prevent recurrence of the problem and verification that the agreed actions have been carried out. (This will be recorded in the Barratt Southampton ISO 14001 records).

2.7 Communication and Co-ordination

Internal Communications

Internal project communications would be via three processes:

- monthly team meetings
- a monthly Project OHS&E Review
- a six monthly sustainability audit by the Barratt, Southampton ISO 14001 internal auditor

2.8 Weekly Team Meetings

Weekly meetings chaired by the Construction Manager would be held by the construction teams to review performance and co-ordinate short-term planning of forthcoming activities. The management team would use these meetings to report on the findings of their inspections together with any systematic or recurring issues. Actions from these meetings would be recorded via minutes and reviewed by Senior Managers, Directors and OHS&E advisors.

2.9 Monthly Project Environmental Review

Environmental issues would be primarily discussed at a monthly Project review, chaired by the Construction Manager and attended by the OHS&E advisor, relevant subcontractors representatives and, when necessary, specialists and representatives from statutory consultees. The Project review would:

- consider past performance from inspections, audit reports and monitoring data
- plan actions required to mitigate forthcoming risks
- disseminate best practice

2.10 Communications and Consideration with the Public

The construction process can be very disruptive to those living in close proximity to the development site.

Barratt Southampton aim to act with consideration as to the impacts we have on the local community during this process.

Barratt Southampton participate in the considerate constructors' scheme which takes into consideration the following:

1. Considering the needs of the local community during the construction process
2. Minimising noise during the construction process
3. Keeping the site clean and in good order at all times
4. Maintaining a channel of communication with neighbours via letter drops and signage as a minimum
5. Maintaining a safe and respectful standard of behaviour and eradicating derogatory behaviour and language
6. Considering the safety to the general public and site personnel at all times

3.0 Environmental Control Measures

The following control measures have been developed from the mitigation proposals described in the Environmental Statement and would be developed in more details with the contractor once appointed, to best reflect the actual methods of working and programming of construction activities. Construction teams would also use the control measures as a guidance whilst completing risk assessments and method statements which would in turn provide the appropriate mechanism for implementation on site.

3.1 Archaeology

Mitigation Measures

In addition to the mitigation measures and environmental benefits included in the Scheme design, a comprehensive Archaeological Mitigation and Monitoring Strategy has been prepared in consultation with the local planning authority by an Archaeological consultant.

The Mitigation Strategy has been designed to ensure that archaeological remains in affected areas are fully investigated and recorded prior to construction, and includes the following mitigation measures:

- preservation *in situ*
- archaeological evaluation of areas of direct impact
- recording of existing facilities
- earthwork survey and recording
- strip, map and excavate of all direct impacts
- archaeological watching brief during site clearance/demolition, construction of non-intrusive Scheme elements, drainage and service runs

A separate Written Scheme of Investigation (WSI) would be prepared in respect of each of these mitigation measures, for approval by the local planning authority. These WSI's would form the basis of monitoring of the design and implementation of the archaeological mitigation measures.

Monitoring Measures

The design and implementation of the archaeological mitigation measures would be monitored by the local planning authority.

A Project Archaeologist approved by the local planning authority has been appointed to oversee the design and implementation of all aspects of the archaeological mitigation programme. The Project Archaeologist would be responsible for liaison with the design and construction teams, the archaeological field team, and the archaeological monitors.

Control measures

In addition to the specific requirements of the Mitigation Strategy and individual WSI's, the following Control Measures would be applied throughout the detailed design and construction of the Scheme:

- the use of construction plant of appropriate size, fitted with toothless excavator buckets where appropriate, together with the adoption of working methods designed to minimise the risk of accidental damage to archaeological remains and restriction of machine movement to defined working areas

Target Performance Measures

Compliance with the mitigation and control measures would be monitored using the following Target Performance Measures:

- site monitoring to sign off completed areas (issue of Completion Statements by Project Archaeologist)
- site monitoring to ensure works are completed according to the requirements of the Archaeology Management Plan, the Archaeological Mitigation and Monitoring Strategy and individual WSI's (Project Archaeologist in liaison with archaeological monitors)
- Weekly progress reporting to track the implementation of the mitigation requirements (Project Archaeologist in liaison with design and construction teams and archaeological field team)
- Archaeology has been recorded to a sufficient standard to meet the aims and objectives of the Archaeological Mitigation and Monitoring Strategy and individual WSI's (issue of Archaeology Certificate by Project Archaeologist)

4.0 Noise and Vibration

Monitoring would be undertaken to ensure that noise and vibration levels at nearby properties or other sensitive sites are kept to a minimum.

Strict controls on the sequencing of works and providing noise protection would be developed on an activity-by-activity basis. This would include:

- mobile plant would be turned off when not in use
- mortar silos to reduce operating noise
- All plant & equipment effectively silenced
- Screen enclosures will be used in sensitive areas
- All works will be in accordance with CoP 5228

Working hours would be restricted to the hours indicated below:

Normal Working Hours

0800 – 1800 Monday to Friday

0800 – 1300 Saturday

With occasional working on Sundays and Bank Holidays (essential or traffic related works only).

Solid site hoardings and any permanent noise barriers would be constructed as early as practical in the construction programme.

The quietest possible plant that can reasonably practicably be obtained would be used for each construction task. Percussive plant would be avoided where alternative non-percussive plant is available for a given task.

Cutting operations or other noisy tasks would be minimised through off-site fabrication wherever practicable.

5.0 Geology and Soils

Removal of Contaminated Ground

No contaminated ground was identified during the geotechnical investigations. Should small pockets of contamination be encountered during the works, the material would either be capped and left in-situ (where soil porosity is low enough not to present a risk of migration of contaminants) or disposed of to a licensed waste facility under strict controls to be agreed with the Environment Agency and the local authority.

Loss and/or Destruction of Agricultural Soils

The majority of existing topsoil would remain on site. Topsoil from one area of the proposed development may be transferred for use elsewhere on site subject to meeting the soils criteria demanded by the long term proposals to revert to landscape instead of arable base agriculture. Destruction of soils would be avoided by strictly controlled temporary storage area to ensure that the soil remains adequately oxygenated and that the micro-biological structure is maintained.

Swales and retention ponds would provide a degree of compensation recharge where car parking and roads replace existing soils with hard cover; however this would be managed to ensure pollutants are prevented from contaminating groundwater.

5.1 Water Quality, Drainage and Hydrology

Construction phase operations would be carried out in accordance with guidance contained within the Health and Safety Plan, Method Statements, Environment Agency Pollution Prevention Guideline publications and Waste management Plan and would consider the following.

- General Guide to the Prevention of Pollution.
- Above Ground Oil Storage Tanks.
Use and Design of Oil Separators in Surface Water Drainage Systems.
- Works in, near or liable to affect Watercourse.
- Working at Construction and Demolition Sites.
- High Pressure Water and Steam Cleaners.
- Control of Spillages.
- Pollution Incident Response Planning.
 - there would be no pumping to controlled waters without a Discharge Consent obtained from the Environment Agency
 - there would be no pumping into surface water drains without the permission of the Environment Agency
 - there would be no pumping into the foul sewer without the permission of the water company
 - in order to prevent water pollution resulting from worker-generated sewage effluents, portable toilets (for initial site set up works only) and good quality temporary toilet facilities would be provided for construction worker use

The potential for impacts to occur as a result of storage of materials would be minimised by the following measures:

- storage compounds (for the storage of construction materials or temporary stockpiling of excavated soils) would be located away from surface watercourses and drains
- drums and barrels would be stored in a designated bunded safe area within the compound
- all drums and barrels would be fitted with flow control taps
- all drums and barrels would be properly labelled

The potential for impacts to occur as a result of works over or adjacent to watercourses would be minimised by the following measures:

- the placing of any wet concrete in or close to any watercourse would be controlled to minimise the risk of leakage of wet cement into the watercourse

- the washing of any concrete mixing plant or ready mix lorries would be carried out so as to prevent effluent from cleaning being allowed to flow into any watercourse or drain
- haul roads on the site and approaches to the watercourse (or drains leading to a watercourse) would be regularly cleaned to prevent the build up of mud
- before any discharge of water is made from the site, adequate provisions would be made to ensure that it is not polluting, for example by incorporating silt settlement techniques. Techniques may include settlement lagoons, use of straw bales for silt trapping

areas of bare soil would be kept to a practical minimum to reduce silty runoff

The potential for impacts to occur as a result of disturbance of silt would be minimised by the following measures:

- all pumped drainage from the construction works including areas for temporary storage of construction materials or excavated soils, would be passed through silt settlement treatment prior to discharge to surface watercourses or drains; silt settlement treatments may, for example, include straw bales, grassland soak away, silt settlement lagoons
- all pumping operations would be carried out on a 'permit to pump' basis and all pumps would have a permit to pump tag
- all roads and hardstandings would be kept clean and tidy to prevent the build up of oil and dirt that may be washed into a watercourse or drain during heavy rainfall (including regular sweeps with mechanical sweeper)
- the use of water sprays to reduce dust or wash down construction areas would be carefully regulated to avoid washing substantial quantities of silt etc, into surface water drains. Where large quantities of gravel, mud or other such material required cleaning, the area would be swept prior to any subsequent hosing down

The potential for impacts occur as a result of contamination of water by wet cement or concrete would be minimised by the following measures:

- manholes and catchpits would be covered to prevent concrete/cement ingress
- concreting at watercourse culvert sites would be closely supervised to prevent concrete contamination of the watercourses
- the washing of any concrete mixing plant or ready mix lorries would be carried out so as to prevent effluent from cleaning from being allowed to flow into any watercourse or drain

The potential for impacts to occur as a result of contamination of water by oil or other liquids would be minimised by the following measures:

- storage compounds for fuels, oils or other liquid chemicals would be sited away from surface water drains. They would have an impermeable base and bund with a capacity of 110% and would not drain directly in to the surface water drains
- small plant such as pumps would be equipped with drip trays
- drums and barrels would be stored in a designated bunded safe area within the site compound
 - all drums and barrels would be fitted with flow control taps
- all drums and barrel would be properly labelled

The potential for impacts to occur as a result of contamination from accidental spillages would be minimised by the following measures:

- emergency response procedures would be established to deal with instances of leakages or spillages of potentially contaminating substances
- spill kits would be located on sites near to stored chemicals and within the works compounds
- staff would be trained in the use of spill kits

In addition, the following measures would be implemented to minimise potential impacts on ground water during earthworks:

- prior to pumping from excavations permits to operate pumps would be issued to the pump operator, indicating the point of discharge and all other necessary control procedures
- subsoil would be exposed for a minimum length of time after topsoil strip. Cut-off trenches, where necessary, would be excavated to prevent excessive surface water run-off into watercourses. Cut-off trenches would discharge into sediment lagoons, with discharge to watercourses subject to the prior consent of the Environment Agency
- topsoil/vegetation along watercourses would be retained to aid attenuation and sediment infiltration

Any risk of contamination of groundwater resulting from piling would be controlled through adequate casing of the piles, selection of suitable concrete mixes with short curing periods and localised control of the groundwater level should this prove necessary.

Consents would be required from the Environment Agency under the Water Resources Act 1991 for temporary discharges or construction

works affecting controlled watercourses. Applications for consents would be made to the Environment Agency in accordance with these requirements and works would be undertaken in accordance with any conditions imposed.

6.0 Air Quality and Emissions

Particular care would be required to maintain dust emissions at a practicable minimum when working in the vicinity of residential properties and environmentally sensitive areas. Best practice mitigation would be required during dry conditions. Dust reduction measures would include:

- careful management of earth stockpiles
- sheeting of vehicles transporting materials to and from the site
limiting the speed of general vehicles within the site to 20mph
- surfacing of the haul roads as soon as possible in the programme
- haul roads to be regularly cleansed
- provision of wheel washing facilities at access points into local roads (to prevent mud from getting on the public highways)
- visual monitoring would be carried out at sensitive locations on a daily basis

By using effective dust mitigation techniques, including good site planning, the potential for dust emissions to arise at a construction site and impact surrounding receptors can be minimised.

The potential for dust to arise during the ground breaking, earth moving and excavation stage of the construction is highly weather dependent. If carried out in dry weather, increased water spraying may be required to ensure the surface material remains damp. In wet weather greater attention would be paid to vehicle cleaning to ensure significant quantities of mud are not trafficked onto local roads, which once dry can become a significant source of dust.

Throughout the construction period, care would be taken to ensure the adequate control of dust from vehicles delivering and removing materials to and from the site. Drop heights, when loading and unloading materials, would be minimised. All dusty loads would be sheeted appropriately. Dried mud and dust carried onto roads by lorries and other machinery can be a significant source of dust. The Site Manager would ensure that the hard surfacing of heavily used areas and adjacent public roadways are regularly cleaned.

Once the actual building of the development commences there is less potential for significant emissions of dust from the site, although emissions may still arise from the storage of dusty materials. Generally storage compounds would be screened, both for security and to prevent wind whipping. In addition, there are certain construction activities that are inherently dusty and would require additional controls eg stone or brick cutting. Such activities may require local screening or the activities may be limited to certain areas or time periods in order to limit impacts.

Specific measures to prevent dust would include the following practices:

- the provision of easily cleaned hard standings for vehicles (to include the areas close to the site access)
- the regular cleaning by brushing and water spraying of heavily used hard surfaced area
- the provision of wheel washing facilities or high pressure hose to ensure all vehicles leaving the site are in a satisfactory state of cleanliness
- dusty materials stockpiles and dusty activities such as stone cutting and grinding to be sited away from the site boundary and/or effectively screened where practicable

7.0 Agriculture

Land

Mitigation of the loss of best and most versatile land is best achieved by limiting the extent of the development to the smallest size possible, consistent with operational requirements, and by retaining the maximum area of land in continuing agricultural use.

Soil

Soils handled in connection with the areas proposed for pre-construction activity such as archaeology investigation and construction be stripped under appropriate conditions to avoid damage to the topsoil and upper sub-soil and would be replaced across the site. Such a use of the soil resource would comply with the concept of sustainable use of soil.

8.0 Waste Management

Detailed proposals would be drawn up for dealing with waste arising from the construction of the project within a **site waste management plan**.

These would include:

- storing and reusing earthwork materials and general arisings to negate the export or import of inert materials
- reduction of site generated waste through waste minimisation, segregation and recycling initiatives
- identification, storage and management of potentially contaminated materials
- appropriate methods of waste disposal linked to a robust waste disposal audit trail

all topsoil and subsoil would be handled and stored carefully to minimise the potential for damage to the soil structure. A detailed method statement would be produced clearly identifying correct stripping, soil handling, storage, placement and programming requirements to avoid compaction and moving the material in unsuitable weather conditions

- where possible, construction arisings would be reused within the site as structural or non-structural fill
- where practicable, all concrete and redundant road pavements would be transported to a dedicated crushing and recycling facility for re-use on the project or within the local area
- detailed procedures and guidance would be developed and implemented through the construction process to minimise the import of non-sustainable raw materials and for identifying opportunities for re-using or recycling waste
- site office wastes would be collected in separate containers to maximise the opportunities for recycling, this would include can, bottle and paper banks

9.0 Light Pollution

Consideration will be given to the subject of light pollution during the construction process with developments.

Although it is essential to maintain a safe standard of lighting for operational and security purposes, the effects of the lighting should be given consideration when positioning lighting.

The following criteria should be followed when erecting safety and/or security lighting:

- is the lighting necessary?
- could security be achieved in other ways?
- will the light affect others?
- do the lights need to be on at all times?

Barratt, Southampton (A Trading name of BDW Trading, Ltd)
Tollbar House
Tollbar Way
Hedge End
Southampton
SO30 2UH