



WEST CAMBRIDGE

OUTLINE PLANNING APPLICATION

CONSTRUCTION AND
ENVIRONMENTAL
MANAGEMENT PLAN

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	Name	Position	Signature	Date
Prepared by:	Robin Clarke	Principal Engineer		10.06.2016
Reviewed by:	Simon Tucker	Senior Associate		10.06.2016
Approved by:	Simon Darch	Equity Director		10.06.2016
For and on behalf of Peter Brett Associates LLP				

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1 Introduction

1.1 Background

- 1.1.1 On behalf of The University of Cambridge, Peter Brett Associates LLP (PBA) has prepared this Construction Environmental Management Plan (CEMP) to support the outline planning application for the masterplan for future development at the West Cambridge development site adjacent to Madingley Road, Cambridge.
- 1.1.2 This CEMP is the strategic environmental management plan for the construction of the West Cambridge development. More detailed plot specific CEMPs will be required for specific development phases. In addition, Construction Waste Management Plans (CWMPs) and Construction Traffic Management Plans (CTMPs) are to be prepared in parallel, dealing specifically with Construction Waste and Traffic, respectively. The preparation of these documents will be the responsibility of the Principal Contractor at each stage.

1.2 Purpose of this Document

- 1.2.1 This CEMP has been prepared to provide a framework that sets out the environmental issues and management procedures to be adopted during construction works on site. This is in order to control potential adverse impacts to the environment and the local community. This document will also ensure that the Principal Contractor(s) is fully aware of the environmental issues that could affect the contract.
- 1.2.2 This CEMP has been prepared on the basis of the environmental assessment work undertaken as part of the Environmental Impact Assessment (EIA) in relation to the proposed development.
- 1.2.3 This CEMP provides an overview plan for the whole of the West Cambridge site. However, it is likely that phase-specific CEMPs will be required should phases of the development be led by different Principal Contractors who may adopt different working practices. Preparation of such a plan will be the role of each Principal Contractor, working with sub-contractors. This can be secured through a condition as appropriate.
- 1.2.4 Therefore, the objectives of this CEMP are to:
- Minimise, or eliminate where practicable, the environmental effects of the construction of the development as proposed;
 - Document the environmental controls to be adopted during construction;
 - Enable agreement with the relevant approval authorities on measures to be adopted during construction; and
 - To provide a framework for contractors to manage construction impacts.
 - Promote a sustainable approach and strive for innovation in the environmental management of the site.

1.3 Structure of this CEMP

1.3.1 This CEMP covers a range of topics relating to identification and management of potential environment effects of construction. These topics are:

- Ecology and natural habitats;
- Protection of Historic Features
- Construction traffic;
- Waste and minerals management.
- Pollution control and water environment;
- Air quality and dust, and
- Noise and vibration.

1.3.2 Each of these topics is covered by individual **Chapters 4 to 14** that consider the general issues for construction, potential impacts, mitigation of these impacts and topic specific legal compliance.

1.3.3 **Chapter 3** discusses general site management issues that relate to good practice in environmental site management. This covers:

- Communications and training;
- Roles and responsibilities;
- Emergency and incident planning;
- Site logistics control and site management; and
- Monitoring and reporting.

1.4 Update of CEMP

1.4.1 As construction is likely to extend over a long period (see **Chapter 2**) it may mean that during this time there are changes in working practices, plant and equipment that should be used, and also new regulatory requirements may emerge. Therefore, the CEMP should be reviewed periodically through the life of the project to embrace new technologies methods and management practices. Review will help ensure that the CEMP can be renewed and updated as necessary, adapting to changes.

2 Proposed Development

- 2.1.1 The West Cambridge site covers a 66 hectare site on University land. Its site boundaries are Madingley Road to the north, Clerk Maxwell Road to the east, the Coton Footpath to the south and the M11 to the west.
- 2.1.2 Existing development on the site is based on the West Cambridge Masterplan, prepared in the mid-late 1990s. The outline planning application was granted in 1999 (application ref. C/97/0961/OP) and a review was approved in 2004. Together with the pre-existing development on the site, the 1999 masterplan envisaged just under 275,000m² of development on the 66 ha site, approximately 47% of which would be academic, 15% research institute and 22% commercial research. The remaining 16% would consist of shared facilities, sports and residential uses.
- 2.1.3 The academic development components of the 1999 masterplan have been delivered to the levels anticipated, as have the residential components. However, the delivery of commercial research and shared facilities on the site is well below the levels envisaged in the 1999 masterplan.
- 2.1.4 Pre-masterplan development occupies a significant part of West Cambridge site. This includes the Department of Veterinary Medicine on a large central part of the site. The southeast corner of the site is dominated by Cavendish Laboratories, in a complex of inter connected buildings and service yards dating from 1970s. The Whittle Laboratory is located in the northeast part of the site. The north-east corner accommodates commercial tenants Schlumberger and Aveva, and British Antarctic Survey, a research institute.

2.1 The Proposed Development

- 2.1.1 The revised 2015 West Cambridge Masterplan intensifies the usage of the site and provides up to 383,300m² of development comprising:
- Up to 370,000m² of academic floorspace (Class D1), commercial / research institute floorspace (Class B1b and sui generis research uses), of which not more than 170,000m² will be commercial floorspace
 - Up to 2,500m² nursery
 - Up to 1,000m² of A1-A5 uses
 - Up to 4,100m² floorspace for community facilities, and not less than 3,000m²
 - Up to 5,700m² of sui generis uses
 - Associated infrastructure including roads (including adaptations to Madingley Road), pedestrian, cycle and vehicle routes, parking, drainage, open spaces and earthworks
- 2.1.2 Delivery of the masterplan is divided into Phase 1 (2015-2020), Phase 2 (2020-2025) and Phase 3 (2025-2030). Development of the site on a phased programme will introduce new faculty and Research and Development buildings for the engineering and science disciplines, and related commercial research and development organisations onto the site. Some existing facilities will be replaced as part of the new masterplan.
- 2.1.3 The masterplan will provide a robust and flexible framework for the phased development of the West Cambridge site to allow for changes in need and aspirations of the University, which will be reflected in the way that the masterplan is implemented. In order to provide a degree of flexibility to allow some evolution of the proposals as the masterplan is implemented, the planning application is expected to be a hybrid application, seeking outline planning permission for built elements, with detail provided on highways access and associated

infrastructure. As individual plots/ parcels are brought forward, the detailed design will be considered at the Reserved Matters stage.

- 2.1.4 This CEMP is based on the illustrative masterplan for the site submitted as part of the planning application (Appendix A). Further information on the proposed development can be found within the Design & Access Statement and Design Code documents, submitted in support of the application
- 2.1.5 Due to the size of the proposed development and the phased approach to delivery, the works will likely be delivered by more than one Principal Contractor. Therefore, there will be the need to ensure that the interactions between phases of construction of land parcels are fully managed and significant cumulative effects avoided. Individual CEMP's will be developed by each Principal Contractor for their works.
- 2.1.6 The significant construction activities associated with the development include, but are not limited to:
- Site clearance, including stripping of topsoil and removal of vegetation;
 - Demolition of some existing buildings, car parks and hard landscaping areas;
 - Installation of a Combined Heat and Power facility and infrastructure for connection to the development plots;
 - Construction of a new sewer network, and other services in the existing road network within the development;
 - Provision of additional on-site water attenuation, comprising underground storage, and capacity increase of existing balancing ponds and the canal at the southern edge of the site;
 - Bulk earthworks operations to reuse construction arisings within the site, building up ground levels in some areas and providing landscaping bunds;
 - Processing of construction/demolition waste for reuse on site, such as using crushed concrete as fill material;
 - Construction of a new highway access to Madingley Road to the west of the Park & Ride site;
 - Extension of the existing on site road network;
 - Provision of new/enhanced cycle/pedestrian links within the site;
 - Additional lighting of roads and public areas on site;
 - Hard and soft landscaping across the site, and
 - Construction of buildings, car parks (including multi-storey), and associated services and landscaping.

3 Construction Management & Methodology

3.1 Introduction

- 3.1.1 This chapter provides an overview of proposed site management procedures.
- 3.1.2 Key legal and guidance references are provided for information purposes only. The lists are not exhaustive but are considered to be current at the time of writing.

3.2 Roles & Responsibilities

The Client

- 3.2.1 Overall responsibility for the CEMP and ensuring legislative compliance lies with the client. The client should make sure that all contractors engaged in a particular phase have an obligation to comply with good environmental practice for construction including preparation and implementation of the detailed CEMP.

The Principal Contractor

- 3.2.2 It is possible that a Principal Contractor will be appointed for each area or phase of the development.
- 3.2.3 The Principal Contractor will be charged with responsibility for management and co-ordination of CEMP preparation and implementation.
- 3.2.4 It will be the responsibility of each Principal Contractor to ensure that all of their staff, sub-contractors, delivery drivers and plan operators are aware of the CEMP. This is so that everyone understands the aims of the CEMP and recognises their personal responsibility in its implementation, protection of the environment and legislative compliance.
- 3.2.5 The Principal Contractor will have responsibility for ensuring documentation and update of the CEMP and details of specific permits etc. Documentation, recording and monitoring of the CEMP will be essential and updated on a regular basis and verified at the end of the project.
- 3.2.6 Key applicable legislation, at the time of writing, is referenced in this CEMP. It is the contractor's responsibility to ensure they are in compliance with all relevant and current legislation applicable at the time of the works.
- 3.2.7 For each phase of works an **Environmental Manager** should be identified by the Principal Contractor to co-ordinate environmental activities during construction. This will include:
- Making sure that a detailed CEMP is prepared;
 - Ensuring appropriate environmental training and advice is provided to contractors;
 - Monitoring construction activities and compliance; and
 - Acting as point of contact between constructors and other stakeholders.
- 3.2.8 Personnel to ensure proper waste management and specialists in specific environmental measures will also need to be part of the delivery team on an 'as needed' basis.

Sub-contractors

- 3.2.9 Sub-contractors are responsible for compliance with the CEMP enshrined by the Principal Contractor and for adoption of good practice in construction.

3.3 Communications and Training

Overview

- 3.3.1 The Principal Contractor will need to set up a series of communication protocols as part of their CEMP to ensure that during site work they maintain an appropriate profile and quality project image to existing occupiers of the site and neighbours by use of effective communications and good public relations.
- 3.3.2 The communication protocols will also need to ensure appropriate relations between contractors to each area, the client, any adjacent construction works; and with occupants of properties near construction sites, including the current occupiers and the local community, particularly relating to the development access arrangements.
- 3.3.3 Where there is change of construction personnel between infrastructure delivery and construction stages, appropriate liaison and handover must take place.

Local Community and Third Party Liaison

- 3.3.4 The Client should appoint a Project Manager who, working with the Environmental Manager, will act as a central point of contact between Cambridge City Council (CCC), the Principal Contractor, the local community and other third parties. This officer will have the responsibility of keeping the local community informed and be a point of contact with them. They should also have the responsibility of responding to complaints or emergencies.
- 3.3.5 To minimise disruption to occupiers of existing facilities on the site and nearby residents, all those potentially affected should be contacted. This will particularly be the case for the construction works which will be the nearest part of the development to a significant number of homes. Residents should be advised of the nature of the work, hours of works, timetable of works and phasing.
- 3.3.6 Letter drops should be used to inform local stakeholders in advance of works and in particular where any particularly disruptive activities are scheduled to take place. Letter drops should also give contact details for the Project Manager and a contact telephone number should be displayed around the site boundaries.
- 3.3.7 The Project Manager should also consider the requirement for meetings to be set up with the local resident and employer representatives. This could include a 'Construction Practice Liaison Group' being established, comprising the developers, CCC and local representatives.
- 3.3.8 As part of the general communications protocol, the Project Manager should liaise with nearby residents and businesses. This should give a point of contact for complaints and queries. A 24 hour number should be provided for urgent contact.
- 3.3.9 The Principal Contractor, as part of their own communications procedure, will need to ensure all site generated enquiries and/or complaints are effectively logged, communicated to the Project Manager and put into action as appropriate.

Training

- 3.3.10 Environmental training is essential to implement the CEMP, protect the environment and minimise impacts during construction activities. It is also necessary to ensure compliance with environmental legislation. The Site Induction for construction personnel will include minimising environmental effects, waste management and responding to emergencies. Toolbox talks, as certain activities take place or areas of high risk, are an effective means of focussed communication to the site staff.

Project Communications and Reporting

- 3.3.11 The Principal Contractor will need to set up procedures for communicating and reporting to the Project Manager on all matters relating to the environment. This may include the use of key performance indicators.
- 3.3.12 The Principal Contractor is responsible for environmental management during construction works. The CEMP is the key operating document.

3.4 Consents and Licences

- 3.4.1 The Principal Contractor will be responsible for all consultations regarding construction issues and for any consents, permissions or licences necessary for the construction works that are not already in place by the Client. For example, land drainage consent and waste licenses.
- 3.4.2 A register of consents etc. must be kept, to include all applied for and secured, details of expiry dates, conditions and commitments that must be adhered to and all related correspondence. The Principal Contractor should ensure that this is kept up-to-date.

3.5 Emergency Planning & Incident Control Procedures

Legislation and Guidance

- Construction (Design and Management) Regulations 2015;
- Control of Pollution Act, 1974;
- Control of Substances Hazardous to Health Regulations 2002;
- Environmental Protection Act 1990;
- Health and Safety at Work etc. 1974; and
- HSE – Codes of Practice and Guidance Notes.

General

- 3.5.1 The Principal Contractor will develop and implement an incident control procedure as part of the detailed CEMP. This is to avoid the release of pollutants (for example oil and fuels) into the environment and to protect health and safety of those on-site. Emergency procedures are also to be prepared by the Principal Contractor.

Environmental Pollution Incident Recognition

- 3.5.2 To ensure awareness of these procedures the Principal Contractor will undertake safety, health and environmental induction training courses to highlight the key potential environmental pollution issues to all project personnel. Briefing topics will include:

- Uncontrolled discharge/spillage of polluting substances such as chemicals, oil, concrete etc. into controlled waters;
- Uncontrolled discharge/spillage of polluting substances such as chemicals, oil, concrete etc. into sewers;
- Uncontrolled discharge of contaminated surface water run-off such as oil, chemical, suspended solids contamination into controlled waters;
- Release of smoke (e.g. fire) into the atmosphere;
- General ecological, archaeological and environmental awareness; and
- Spillage of solid waste into sensitive areas and risks of windblown litter and debris.

Emergency Planning

3.5.3 The Principal Contractor will need to set up and manage systems, procedures and equipment for emergency planning which will include the following:

- Provision of adequate spillage containment materials to stop and contain pollution, for example the use of available earth where stockpiles are strategically placed in environmentally vulnerable areas;
- Provision of a site drainage plan identifying and colour coding surface water drainage separate to foul sewer drainage - this will assist in the siting of storage containment areas and associated protection measures;
- Emergency bunding/control packs to be available at key locations in the event of a pollution incident;
- Liaison with the appropriate representatives from the Environment Agency, CCC and essential local emergency services to discuss in particular, emergency pollution control plans and emergency communications strategy; and
- Appointment of a site 'emergency pollution control response team' to respond to pollution incidents.

Incident Control and Reporting

3.5.4 Incident control procedures will be developed by the Principal Contractor in liaison with the Environment Agency, CCC and essential emergency services. The control procedure in outline will include:

- Immediate containment of pollution at source;
- Reporting incident immediately to site management team;
- Raising the alarm to the emergency pollution control response team;
- Summoning emergency services where appropriate;
- Safe disposal of pollution waste; and
- Notifying the local Environment Agency Regional Office.

3.5.5 All environmental incidents shall be recorded by the Principal Contractor and reported to the client as soon as practicable and if appropriate reported to the Environment Agency. The Principal Contractor will complete an environmental incident report as part of the procedure.

3.6 Site Logistics Control and Site Planning

Construction Site Logistics

3.6.1 Schedules and plans to be prepared by the Principal Contractor will show an overview of the logistics plan for the construction. It will follow the general principles that are outlined below unless otherwise agreed with CCC or other relevant organisations, such as the Environment Agency. Topics covered should include:

- Site working hours;
- Site layout (e.g. principal access/egress points, routing plans, site security);
- Site offices and welfare facilities;
- Site access routes (construction traffic management);
- Site demarcation and access control;
- Lighting arrangements;
- Delivery areas; and
- Storage and lay-down.

Welfare Facilities

3.6.2 In accordance with the *Construction (Design and Management) Regulations 2015*, and HSE guidance, welfare facilities will need to be provided on site. Given the scale and range of development there may be several contractors on site at any given time. It is likely that each contractor will have their own accommodation site set ups. Each temporary site should include site offices and site welfare facilities. These should include canteens, toilets and washrooms with hot water; drying/changing rooms; first aid post, as appropriate.

Lighting Control

3.6.3 The requirement for works after sunset will need to be considered, especially in the winter. Should there need to be some night-time work, such as the delivery of abnormal loads, or critical timing of construction, the use of temporary lighting will be required. There is the potential for adverse impacts including light spill, glare and light trespass.

3.6.4 Lighting will need to comply with the Environment Protection Act 1990 and the Clean Neighbourhoods and Environment Act 2005. Therefore, mitigation of impacts may be necessary and could include careful positioning, directing and anti-glare control. Details of controls should be specified by the Principal Contractor.

Operating hours

3.6.5 Where the site is close to residential or university/business premises, and heavy plant, noisy equipment or operations and deliveries are likely to occur CCC are to be consulted on permissible hours of work. It is anticipated that such works are unlikely to be permitted outside the following hours:

- Monday-Friday 7.30-18.00
- Saturday 8.00-13.00
- Sundays/Bank Holidays – no noisy activity.

3.6.6 In areas where sensitive receptors may be affected, such as homes, or research buildings with sensitive monitoring equipment, further restrictions on working hours may be required.

General Types of Plant and Equipment

- 3.6.7 At this stage it is not possible to set out in precise detail the types and numbers of plant and equipment items that will be utilised on site during the construction period. However, 'control principles' have been set out in respect to the planning and management of plant and equipment items which contractors will bring onto site. In addition, the 'general' types of plant and equipment which will be utilised on site have also been identified.

Control Principles

- 3.6.8 The Principal Contractor will be required to complete a 'Register of Plant & Equipment and Statutory Certification' within their Health & Safety 'Method Statement' prior to works commencing on site.
- 3.6.9 All key static plant and equipment (e.g. hoists, power distribution units, diesel storage tanks etc.) will be clearly identified on site logistics drawings.
- 3.6.10 The process allows an inventory of on-site plant and equipment to be kept to, ensure they are maintained in accordance with statutory test/examination/inspection requirements, and that specific operator training requirements are addressed. This list also assists by providing a useful cross-reference for noise level predictions and assessments of plant and machinery in respect to ensuring that excessive noise levels are identified and suitable control measures implemented to minimise those noise levels.

3.7 Monitoring & Reporting

- 3.7.1 Checks will be undertaken on the effectiveness of the CEMP. Should deficiencies be identified, the CEMP will be updated to ensure the document continues to fulfil its objectives. This will include a review of current legislation, standards, plant, processes, etc. Revised copies of the CEMP will be available to CCC as appropriate.
- 3.7.2 In addition, consideration will be given to regular environmental audits of the construction works to ensure compliance with the CEMP. The scope of the audits should include:
- Waste Management & Duty of Care;
 - Noise & Vibration;
 - Dust;
 - Construction traffic;
 - Fuel storage;
 - Pollution;
 - Community Liaison; and
 - Ecology.
- 3.7.3 All audits undertaken should be documented in an Audit Report. Where non-conformances with the CEMP are identified these will be recorded on a Non-Conformance Report, this should include:
- Details of who and what is being audited;
 - Details of the non-conformance;
 - Corrective action required; and
 - Review of corrective action dated and signed.

- 3.7.4 The report allows subsequent audits to monitor the performance of the corrective action and then sign off the corrective action request once it has been successfully implemented. All completed Non-Conformance Reports will be held on site in a designated file.

4 Ecology and Natural Habitats

4.1 Introduction

- 4.1.1 This chapter sets out the specific measures that can be put in place during the construction of the development to help mitigate adverse effects of construction activities.
- 4.1.2 Implementation of the CEMP related to the protection of water quality and air quality will also be vital in protecting ecology. For instance, through protecting aquatic habitats and nearby designated sites dependent on a good air and water quality.
- 4.1.3 Key ecological features at the site identified through a suite of ecological surveys includes:
- A number of habitats of high ecological value including herb-rich semi-improved grassland, wet ditches and streams, mature hedgerows and areas of mature broadleaved woodland;
 - A number of outlier and subsidiary badger setts within the site and the whole site provides a foraging habitats for badgers using the setts;
 - Presence of dormouse habitat in a number of locations;
 - Bats have been found to be using the site;
 - Supporting a significant amount of reptile habitat as well as foraging areas for Great Crested Newt, mainly on field margins and woodland edge and areas of unmanaged grassland.

4.2 Potential impacts

- 4.2.1 The Environmental Statement has identified the potential effects of the scheme as well as the requirements for mitigation.
- 4.2.2 The only risk of impact from construction on ecology and natural habitats considered to be significant is the potential loss of the 3 mature oaks (063, 064 and 065) within the building zone.
- 4.2.3 Other identified impacts considered to have a minor adverse effect are:
- Possible dust deposition from construction process on surrounding habitats;
 - The short term loss of areas of aquatic and marginal planting in the reworked green corridor, comprising the West Cambridge Canal, the Swales and ponds, and in Coton Brook;
 - Possible contamination of surface waters from site run-off;
 - Direct disturbance of habitats, including trees and hedges from construction activities, particularly in the areas comprising the Coton Path Hedgerow County Wildlife Site and the East of M11 City Wildlife Site through construction activities; and,
 - Direct or indirect to species (Bats, Badgers, Birds) and their breeding or foraging habitats.
- 4.2.4 Surveys indicate populations of Great Crested Newts present in Adams Road Sanctuary City Wildlife Site, Madingley Road Park and Ride and the Birds Sanctuary, Conduit Head City Wildlife Site. It is considered unlikely that newts will be within the development site, but a low risk remains and the Principal Contractor shall exercise vigilance.

4.3 Mitigation

- 4.3.1 Mitigation of impacts on the ecology and natural habitats on site will be necessary during construction phases. This section outlines general good practice mitigation for the whole site and detailed mitigation for specific species that have been identified on site. Measures will need to be incorporated into the detailed CEMPs on protection of features, with maps and plans demonstrating how works should proceed. The mitigation only covers construction activities, with details of restoration etc. included in the Environmental Statement.
- 4.3.2 A full ecological mitigation strategy for the site has been submitted with the planning application and should be referred to in detailing specific measures in the detailed CEMPs.
- 4.3.3 As the proposed development is anticipated to be phased over 15 years, it should be recognised that there are difficulties in accurately predicting the effects of the later stages of development. For example, a species that is common and has no legal protection at this time may decline in numbers and become protected by law before construction of the later stages of development. For this reason, further surveys and Ecological Impact Assessments may be required when reserved matters applications are made over the lifetime of the Proposed Development.
- 4.3.4 Natural England and the CCC ecologist will be consulted prior to submission of the reserved matters applications to determine what if any new or further surveys need to be undertaken to support future reserved matters applications.

Habitats

- 4.3.5 A protective exclusion buffer will be established around the Coton Path Hedgerow CWS and remaining extent of the Scrub East of M11 CiWS and clearly marked with netlon fencing or equivalent for the duration of construction works in the vicinity of the CWS.
- 4.3.6 A management plan will be produced and implemented to maintain the condition of the Coton Path Hedgerow CWS and Scrub East of M11 CiWS.
- 4.3.7 Replacement aquatic and marginal planting within the surface water bodies re-profiled to increase drainage capacity will be of equivalent or better habitat value than existing.
- 4.3.8 The new profile and plan of the waterbodies (D3, D4 and D5) and ponds (P2, P3 and P5), which will be reengineered to increase drainage capacity, will maximise ecological value by providing a variety of physical habitats. Hard engineering structures along the banks of these surface water bodies will be minimised with preference given to softer natural banks planted with species to maximise ecological value.
- 4.3.9 Advice will be sought from ecologists for landscape and re-engineering designs of ditches and ponds will be re-profiled as part of the surface water drainage design to ensure these waterbodies maximise the ecological opportunities.

Great Crested Newts

- 4.3.10 To minimise the risk of harm and disturbance to great crested newts, a Precautionary Method of Working (PMW) will be produced and implemented during the construction phase for all works within 500m of the ponds within Madingley Road Park and Ride, Adams Road Sanctuary CiWS and Birds Sanctuary, Conduit Head CiWS. This will include measures such as hand-searching of potential refuges within working areas, supervised clearance of suitable habitat, and provision of toolbox talks to workers.

- 4.3.11 Mitigation measures specified in the water environment assessment (Chapter 13) will also mitigate any water quality impacts to great crested newt breeding ponds in Adams Road Sanctuary CWS which is connected to the site via the Coton Brook (D5).

Badgers

- 4.3.12 A survey of the existing artificial badger sett will be undertaken prior to any construction works within the vicinity of the sett to check for any further expansion and levels of activity.
- 4.3.13 A 50m exclusion buffer zone around the artificial badger sett will be maintained and marked with netlon fencing or equivalent for the duration of construction works that occur in the vicinity of the sett. No works activities will proceed within the buffer without further consultation with Natural England and the Cambridge City Council ecologist first to agree additional protection measures. This may include the submission of an application for a Natural England licence to interfere or prevent damage to the sett.
- 4.3.14 Green corridor links to the existing hedgerows and surrounding countryside from the artificial badger sett will be maintained and protected throughout construction.

Birds

- 4.3.15 Vegetation and building clearance will be undertaken outside of the bird nesting season if possible or under appropriate supervision. The core bird nesting season is March to August inclusive, although some species have been recorded nesting during all months of the year and so care will be taken at all times. All vegetation and structures will be checked by a suitably trained and qualified ecologist prior to clearance to ensure no nesting birds are present. If active birds' nests are found, all works that could damage the nests will cease until the eggs have hatched and the young have fledged.
- 4.3.16 Approximately 25 bird boxes suitable for House Martins and 5 bird boxes suitable for Swallows will be installed in areas close to the Department for Veterinary Medicine buildings and sports centre to replace the loss of, or disturbance to, existing nesting sites identified in the surveys.

Bats

- 4.3.17 Update surveys will be required for buildings and trees a season before any proposed demolition and vegetation clearance during the construction phase. Currently an application to Natural England for a protected species licence will be required for the demolition of building W27. Mitigation will be required in the form of a bat box suitable for pipistrelle bats (such as a Schwegler bat box) to be installed on buildings or trees within approximately 50m of the existing building W27 to replace the loss of the confirmed transitional roost at this location.
- 4.3.18 Lighting schemes during construction and operation will be undertaken in accordance with wildlife and lighting guidance which advises:
- Minimisation of the spread of light spill;
 - Lowering the height of lighting columns;
 - Abstaining from lighting areas such as the M11 scrub, Coton footpath hedgerow and West Cambridge lake, effectively creating dark corridors and areas in which bats can still forage and commute around the Site;
 - Limiting the times lights are on to provide dark periods, if practical, especially during the peak summer months of June, July and August;
 - Using narrow spectrum light sources;

- Using light sources that emit minimal ultra-violet light;
- Using lights that peak higher than 550nm; and
- Avoiding white and blue wavelengths of the light spectrum.

Invasive species

- 4.3.19 Prior to any construction works, checks will be undertaken by a suitably qualified botanist to ensure that new invasive species have not colonised the Site in the intervening period.
- 4.3.20 All existing invasive plant species and any new invasive plant species found will be treated and removed from the Site by a specialist contractor before any construction works that could result in their disturbance and subsequent spread are undertaken.

5 Protection of Historic Features

5.1 Introduction

- 5.1.1 This chapter sets out the specific measures that can be put in place during the construction of the development to help mitigate adverse effects of construction activities.
- 5.1.2 The archaeology assessment undertaken as part of the EIA and summarised in the ES considered the effects of all excavations associated with the proposed development on any buried archaeological assets. Only construction phase effects were assessed as there will be no further effects to archaeology once the proposed development is operational.
- 5.1.3 The installation of new service lines and contractor's roads and compounds, in undisturbed areas could affect the archaeology, especially designated site areas prior to their excavation. In areas otherwise deemed sensitive, routes will either be trench evaluated or have watching brief monitoring undertaken during their construction (to be agreed by the Council's Historic Environment Team).
- 5.1.4 Small-scale or minimal areas of disturbance will be monitored for archaeological features or significant artefacts via watching briefs and limited excavation. This monitoring will be contingent upon the scale and location of any construction related activity, e.g. installation of new and extension to existing services.
- 5.1.5 The built heritage assessment considered the effects of the proposed development on the setting of heritage assets during both the construction phase and the operational phase. All heritage assets within a 500m radius of the site were considered in addition to any specific built heritage assets specifically identified by the relevant authorities.

5.2 Potential Impacts

Archaeology

- 5.2.1 The Proposed Development will have an adverse effect on buried archaeological remains within the Site. However, the Proposed Development does not conflict with national or local policy regarding the safeguarding of heritage assets. Adverse effects will all be felt during construction, no additional effects will occur during operation. Post-construction there will be minimal to negligible effects upon the archaeological assets which are not considered significant.

Built Heritage

- 5.2.2 The Proposed Development will have a moderate impact on the following assets, leading to a permanent moderate adverse effect in each case:
- White House (1126037) Grade II listed building;
 - Conduit Head Road Conservation Area; and
 - West Cambridge Conservation Area.

5.3 Mitigation

Archaeology

- 5.3.1 Following the 2015 field evaluation for the Proposed Development a number of areas will require further fieldwork. These areas are discussed below.

- 5.3.2 As confirmed by the 2011 Whittle Laboratory excavations (Slater 2011), the north western side of the Vicar's Farm Roman settlement extends into the eastern portion of that facility's grounds. This will require excavation over approximately 3,375m². Of this, excluding the 2011-area, approximately 2,100m² lie exterior to that building's footprint and will require full excavation prior to the Laboratory's demolition; occurring within the footprint-area, the remaining portion (approximately 1,275m²) will require more summary investigation concurrent with the Laboratory's demolition.
- 5.3.3 A limited degree of Iron Age occupation evidence was found during the course of the 2001 Nano-Fabrication Building Site investigations. The settlement is likely to have extended across at least part of the area of the Cavendish Laboratory complex, but where it was unfeasible to cut any trial trenches during the 2015 evaluation programme. Accordingly, upon vacating the Laboratory buildings (but prior to their demolition), a limited trenching programme will be conducted within the grounds; should further evidence of early settlement be recovered, then an appropriate excavation programme will occur in conjunction with the demolition works.
- 5.3.4 Site 1 (beside the Schlumberger building) has already been excavated having therefore already effectively been mitigated (see ES), it is only the area of Site 2 (the paddocks west of the Veterinary School) that will require full open-area excavation when development proceeds there. The further investigation of the Site 3 (the paddocks east of the Veterinary School) field system and trackway – aside from its incidental exposure in Site 2 – can, within Field 1, be limited to the area of new major building footprints and any further areas that will be disturbed through excavation, augmented by additional trenching.
- 5.3.5 Nano-Fabrication Building Site - A limited degree of Iron Age occupation evidence was found during the course of the 2001 investigations. The settlement is likely to have extended across at least part of the area of the Cavendish Laboratory complex, but where it was unfeasible to cut any trial trenches during the 2015 evaluation programme. Accordingly, upon vacating the Laboratory buildings (but prior to their demolition), a limited trenching programme will be conducted within the grounds; should further evidence of early settlement be recovered, then an appropriate excavation programme will occur in conjunction with the demolition works.

Built Heritage

- 5.3.6 The greatest sensitivity from a built heritage perspective is along the northern and north eastern boundary of the Site which adjoins the Conduit Head Road and West Cambridge Conservation Areas and forms the setting to numerous listed buildings. The eastern boundary is also relatively sensitive due to the presence of listed buildings on Wilberforce Road and the West Cambridge Conservation Area although some screening is offered by intervening development and mature planting.
- 5.3.7 A considered design response in the north and east of the Site, particularly in those buildings closest to the Site boundary, will help to minimise heritage impacts in these sensitive locations. This design response will incorporate the following measures:
- Reduction in the scale and bulk of buildings in these locations;
 - Effective screening of rooftop accretions such as plant;
 - Facades facing the Site boundary must have a high quality architectural treatment including softening materials such as timber cladding; and,
 - Façade accretions, such as plant and storage structures will be minimised and will not located within views of the West Cambridge Conservation Area, Conduit Road Conservation Area, or associated listed buildings, to ensure that building lines are kept as clean as possible.
- 5.3.8 In addition maintaining and strengthening boundary planting with coniferous shrubs and trees will be undertaken to screen the Proposed Development in views from heritage assets to the north and north east of the Site.

6 Site Set-up

- 6.1.1 The construction will entail the use of several concurrent contractors, each working under separate contracts. The site is to be organised in order, as far as practical, to keep the contractors separate from each other and within their respective designated zones of operation. The client will be responsible for identifying compound areas for the contractor's use within the overall site.
- 6.1.2 The site is partially occupied by existing facilities and is open to the public. The Principal Contractor(s) will ensure that work areas, compounds and material storage areas are secured to prevent access, particularly outside working hours.
- 6.1.3 Large volumes of earthworks materials will be generated during the works, and in order to minimise the number of vehicle movements off site to transfer this waste the client will seek to re-use as much of this material as practical within the development site. Areas for the reuse of earthworks materials will be identified prior to commencement of construction, including an assessment of the volume of storage available. The contractor will be expected to utilise these areas and identify the savings in vehicle movements within the CWMP.

7 Off-site Traffic Movements and Routing

7.1 Management of traffic movements

7.1.1 Off-site traffic movements and routing will be examined fully within the detailed CEMP. This will ensure that construction and servicing of the site can be carried out efficiently, minimising negative impacts upon the local highway network, residents and commercial occupiers within and surrounding the site, and the environment. The document will consider:

- i) Design;
- ii) On-site logistics;
- iii) Access Strategy;
- iv) Procurement strategy;
- v) Operational Efficiency;
- vi) Delivery Practice;
- vii) Demand Smoothing;
- viii) Managing Construction Traffic;
- ix) Pedestrian Routing;
- x) Targets and Monitoring;
- xi) Waste Management

7.1.2 The detailed CEMP will be supported by a Construction Travel Plan.

7.1.3 Sustainability practices during the construction phase are to be maximised by consideration of the following:

- demonstration that construction materials can be delivered, and waste removed, in a co-ordinated, safe, efficient and environmentally-friendly way;
- identification that deliveries that could be reduced, re-timed or even consolidated, particularly during peak periods;
- measures to help cut congestion on local roads and ease pressure on the environment;
- improvement to the reliability of deliveries to the site; and,
- reduction in freight operators' fuel costs.

7.1.4 Traffic considerations will also be addressed within the procurement strategy of contractors, including:

- a commitment to safer, more efficient and more environmentally friendly distribution by contracting operators registered with a best practice scheme;
- a strategy for the contractors sourcing items locally where possible, or from the same supplier, to reduce the number of deliveries required;

- a review of the traffic routes, and any required alterations to the network to be set out.

- 7.1.5 The construction will entail the movement of vehicles to and from the site delivering the required materials. Materials such as granular fill, concrete, timber, structural steel, masonry and glazing and cladding together with all finishing items, will be delivered to site as and when required.
- 7.1.6 All major deliveries of materials will be phased to avoid congestion at the site entrance from Madingley Road. Queueing of delivery vehicles on Madingley Road, outside the site entrance, will be managed through co-ordination between all contractors on site, to prevent activities with significant heavy vehicle trip generation (such as concrete foundation casting, carriageway construction etc) occurring simultaneously.

7.2 Construction Routing Strategy

- 7.2.1 Contractors' deliveries (and staff) will be restricted through their respective construction contracts so that they are not permitted to route along sensitive roads. The CEMP will also identify approaches that can be used to improve the efficiency of the logistics management for the development. It also considers ways to link with and/or exploit construction activity and practices taking place on other parts of Cambridge. These measures would reduce the Site traffic, and the number of movements removing the generated waste.
- 7.2.2 A Construction Routing Strategy will be defined within the detailed CEMP, specifying:
- The routes to be used for heavy vehicle construction movements – assumed to be from the M11 Junction 13 and Madingley Road;
 - Identify routes along which heavy vehicle construction may not pass – assumed to include Madingley Road to the east of Clark Maxwell Road;
 - The movement of workers into the Proposed Development - all construction sites within the Development will have comprehensive Construction Travel Plans, detailing how their workforce will travel to the Site.
 - The cycle and pedestrian access routes during construction, to ensure that construction related vehicles do not impact upon these users.
- 7.2.3 Traffic signs will be erected on key approach roads to indicate that construction traffic is not permitted on protected routes.
- 7.2.4 Estimates of numbers and frequency of materials deliveries have been made, these inform the reported assessment of the Construction impact.
- 7.2.5 Construction operatives will drive to the site via permitted access routes either by private car, or by vans; and will enter the site through the security gate at the entrance. Once on site, operatives' cars will be parked in designated areas and will not be allowed onto the main construction site; no parking will be permitted in the vicinity of the site outside its perimeter. Car sharing and shuttle bus services will be promoted from key settlements / local accommodation.
- 7.2.6 As well as implementing measures to increase the efficiency of the logistics operation and minimising the impact of the construction operation, the University will;
- require all construction contractors be members of the Construction Logistics and Cycle Safety initiative (CLOCS); and
 - seek that all construction vehicles are fitted with cycle safety equipment.

8 On-site Vehicle Routing

- 8.1.1 The principal routes across West Cambridge to be used by site traffic during the works will be agreed and presented within the detailed CEMP. These routes will be enforced and managed. Other circulatory routes will be used in order to allow construction access to local areas of the site as necessary.
- 8.1.2 All routes will be selected, wherever possible, to reflect areas of current occupation. Clearly, this approach serves to manage the impact on sensitive areas.
- 8.1.3 In order to keep the individual sites for the main buildings to minimum practical size, storage of materials and working areas will be managed. Compensatory office space, storage and sufficient car parking will be allocated to each contractor in the main car park. All facilities will be kept within the main site boundary and subject to access controls at the security gate. Security is likely to be manned by representatives of each major contractor or a joint representative.
- 8.1.4 Allocation of spaces within the main construction car park will be decided once the car park layout and detailed contractual arrangements have been finalised. It is envisaged that a car park permit system will be set up and administered by the contractors.
- 8.1.5 The contractors will be expected to provide controlled transport for the workforce from the facilities in the car park to the various construction zones.

9 Roads Cleaning and De-icing

- 9.1.1 A wheel cleaning facility is to be provided by the Principal Contractor to prevent mud and other detritus being transferred to the highway network from the site. This will comprise either a buried steel trough containing water through which all heavy materials delivery vehicles will be expected to pass before leaving the site or, alternatively, a steel tank with wheel sprays.
- 9.1.2 Road sweepers will be used to keep the hard surface roads clean both on-site and on adjacent public highways.
- 9.1.3 In the event of heavy snowfall or freezing conditions during the construction programme on-site roads will be cleared using appropriate equipment. The uncontrolled use of de-icing salts will be avoided, and de-icing will be operated at controlled speeds to mitigate salt being spread beyond trafficked areas.

10 Waste and Materials Management

10.1 Introduction

- 10.1.1 The Waste Strategy, submitted as part of the outline planning application, sets the waste management principles and aspirations for the development.
- 10.1.2 Detailed Waste Management and Minimisation Plan/s (DWMMP) will be produced once the detail of the scheme is finalised. Once developed, the DWMMP should be incorporated/ referenced within the detailed CEMP. The Principal Contractor will be responsible for developing and implementing the DWMMP during the construction phase of the proposed development. This will ensure
 - building materials are managed efficiently;
 - waste is disposed of legally and fly tipping is reduced; and
 - materials, reuse, recovery and recycling are maximised.
- 10.1.3 The RECAP Design Standards Checklist and Design Guide will be considered and included within the DWMMP.
- 10.1.4 The waste hierarchy (Figure 10.1) is a conceptual model used to encourage the management and reduction of waste materials and is a principle embedded in European and UK legislation. The waste hierarchy seeks to ensure the most sustainable approach to a waste material is taken which will be different for any given waste product/material. The DWMMP will detail how the concepts of the waste hierarchy will be applied during the construction phase.

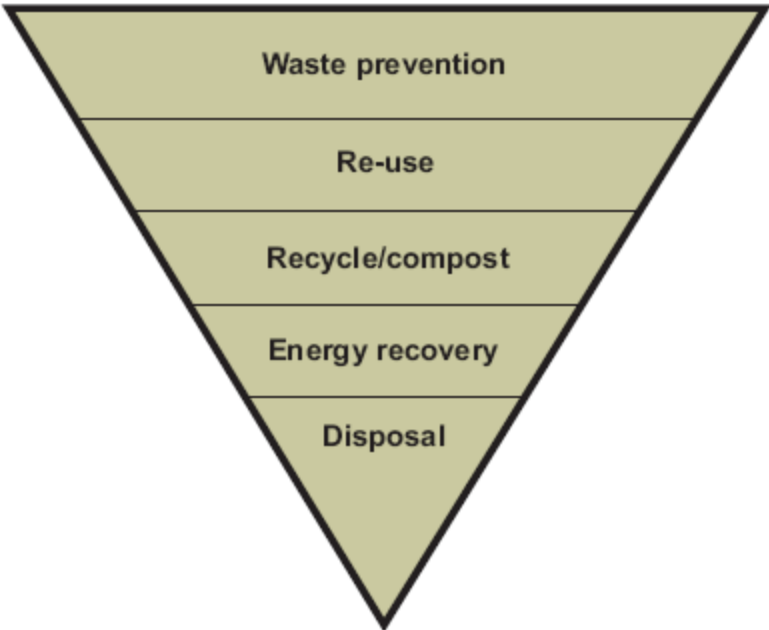


Figure 10.1: Waste Hierarchy

10.1.5 In addition, the DWMMP for the demolition and construction phase will include:

- Dedicated area(s) within the site should be allocated for the segregation and storage of all demolition and construction waste streams as far as practicable.
- Onsite waste segregation and storage areas, and associated facilities such as skips and containers, for the purposes of demolition and construction waste, should be clearly labelled and secured as appropriate.
- Detailed plans and processes for waste segregation, storage and collection should be presented.
- The strategy for the procurement and delivery of materials during the construction phase should be presented. This should ensure material usage is optimised and waste quantities are minimised. The Principal Contractor will evaluate the use of materials required throughout the construction process and identify where there is the potential for returning unused materials to the supplier under a buy-back scheme, as may be necessary.
- Waste transfer company(ies) should be appointed as necessary in order to collect and remove any waste which needs to be transferred to an offsite waste management facility. The DWMMS should sets out appropriate procedures for the collection and movement of waste.

11 Water Environment

11.1 Introduction

- 11.1.1 Environment Agency mapping on the Catchment Data Explorer indicates that the majority of the Site lies within the Bin Brook catchment, a tributary of the River Cam. It is designated as a heavily modified waterbody (HMWB) and the Anglian River Basin Management Plan² states that the reason for its designation is 'urbanisation'. An artificial land drain, known as the Coton Brook runs along the southern boundary of the Site and ultimately discharges into the Bin Brook to the east of the Site downstream of Grange Road.
- 11.1.2 The Catchment Data Explorer indicates that the north-western area of the Site, in the vicinity of the British Antarctic Survey buildings, drains to the north, through the North West Cambridge development and adjacent to the Madingley Road Park & Ride. This was indicated as Wash Pit Brook in the Scoping Report. The Wash Pit Brook is shown as a tributary of the Cottenham Lode in the 2009 Anglian RBMP. However the configuration of waterbodies has changed in advance of the publication of the 2015 RBMP and it is now identified as a tributary of the Old West River.
- 11.1.3 The upper reaches of the Coton Brook lie entirely within the Site and consist of a series of heavily modified ephemeral and permanent ponds which ultimately discharge into the drain. The source of the Coton Brook is an outfall, receiving road drainage. It has a shallow, uniformly wide channel cross-section. Upstream of the road is a single building, a vacant lot and more distant the M11 which is aligned north-south. The channel is ephemeral and was dry during the Site visit.
- 11.1.4 The site is predominantly developed with an extensive system of water services infrastructure constructed following the previously consented masterplan. Connection points have been provided to currently undeveloped plots.
- 11.1.5 Within the Site there is a west to east ridge that falls in elevation eastwards from 19.70m above ordnance datum (AOD) to 14.70m AOD, broadly through the upper third of the Site. This essentially splits the Site into two catchments, with approximately one third of the Site area draining northwards towards Washpit Brook and the remainder draining south east towards Coton Brook.
- 11.1.6 Existing surface water attenuation and storage for the Site is provided using a combination of methods including geo-cellular storage, ponds and a large attenuation lake and canal (Reaches 2 and 3 of the surface watercourses) from which flows are discharged to the downstream reaches of the Coton Brook at restricted rates.
- 11.1.7 The southern part of the Site discharges to a foul sewer located under the Coton footpath, which gravitates eastwards to the sewer network in Wilberforce Road. Initial investigations suggest that there may be limited capacity to discharge increased flows to the foul sewer under the Coton footpath. The northern areas of the Site drain to the public sewer in Madingley Road, which has capacity to accept increased flows. The overall capacity to receive development flows is currently being assessed by Anglian Water Developer Services.
- 11.1.8 The Environment Agency's flood maps indicate that the Site is in flood zone 1, an area designated as having a low probability of flooding from fluvial sources. The Site is assessed as having a probability of fluvial flooding of less than 0.1% (i.e. less than 1 in 1000 years) and has no history of flooding.

11.2 Potential Impacts

11.2.1 The principal risks during the construction period will likely be the potential for silt pollution due to areas of exposed earthworks and the potential for contamination due to leaks and spills associated with plant, machinery and materials.

11.2.2 Potential pollutants to the water bodies are:

- Silt;
- Cement and concrete;
- Oils and fuels;
- Waste materials;
- Effluent / waste for welfare facilities.

11.3 Mitigation

Accidental Pollution Control

11.3.1 Construction will be managed in accordance with the Environment Agency's Pollution Prevention Guidance and other relevant standards and guidance to ensure that best practice is adopted for all site works. More detailed proposals on how to manage construction risks related to water will need to be drawn up by the Principal Contractor(s) to be agreed with CCC. The following measures will be implemented on site avoid accidental water pollution:

- The construction works would be managed so as to comply with the necessary standards and consents as identified by the EA and the local planning authority, and secured through planning condition;
- Any construction water runoff from the site would require the filtering out of suspended solids before reintroduction to the water system;
- Runoff areas would be identified and water drainage in those areas would be actively managed;
- Water bodies would be monitored regularly to ensure the quality and quantity remains unaffected;
- Areas where contamination may occur would be provided with suitable pollution protection. Storage areas and vehicle refuelling/maintenance areas would be protected by an impervious base, while impermeable bunds of an adequate capacity would be provided around tanks containing potential pollutants;
- Potentially hazardous materials should not be stored in areas at known risk of flooding;
- Construction plant would have drip trays and undergo regular maintenance checks;
- Pollution control packs would be positioned within vulnerable areas to allow immediate reaction to any pollution incident;
- A toolbox briefing about the importance of the water supply, water bodies and use of pollution control packs would be disseminated to all site staff;
- All fuel and chemical storage would be away (twenty metres minimum) from all watercourses, all oil and fuel storage will be undertaken in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 and Environment Agency Pollution Prevention Guidelines;
- The contractors would be required to use closed circuit wheel and chassis washing facilities located at all site boundary access and egress points;

- Particular care would be taken when working with concrete as it is highly alkaline and can cause serious pollution to controlled waters;
- In the event of a water quality incident the EA would be notified as necessary;
- The potential for flooding would be monitored via the EA's flood warning programme; and
- Should the potential for a flood event be identified all potential pollutants would be moved to a safe area and it would be ensured that the river channels are free from obstruction.

11.3.2 Appropriate practical techniques for managing pollution risk during construction include the following:

- Restrictions on the extent of vegetation removal in advance of earthworks.
- Construction of cut-off drains and grips to intercept surface water flows which will then divert flows to settlement ponds.
- Silt fences, bunds and grips at the top of watercourse embankments.
- Settlement ponds or tanks to remove suspended solids (regularly maintained).
- Oil booms and/or oil separators to remove fuel/oil contamination.
- Grassland infiltration where appropriate.
- Secondary fuel/oil booms and baffles installed on existing watercourses where appropriate.

11.3.3 One of the key requirements will be the provision of settlement lagoons at the downstream end of the work area but upstream of the receiving watercourses. In some areas it may be possible to construct the proposed sustainable drainage (SuDS) attenuation basins to serve as settlement ponds during the works period, and thereafter brought into condition to serve as attenuation for the development.

11.3.4 Construction of the proposed development is planned to take place in phases over a 15-year period. Within each phase area, the strategic drainage infrastructure for any affected sub-catchment will need to be installed or part-installed such that the development runoff will be managed in accordance with the proposed SuDS strategy.

12 Air Quality Impacts

12.1 Introduction

- 12.1.1 The construction works will be carried out in such a way that emission of air-borne pollutants including dust and odours are minimised and managed by best practicable means. This is so as not to cause a statutory nuisance or loss of amenity to the local community, as well as potential health effects related to particulate matter and to not exceed air quality objectives.
- 12.1.2 The contractors will be responsible for ensuring that all relevant legislative requirements for health and safety of workers and for the protection of the environment are complied with.
- 12.1.3 The ES identifies that the principle source of likely air quality impacts associated with the development relate to dust generated and elevated PM during construction.

12.2 Potential Impacts

12.2.1 Dust is defined in BS 6069 Characterisation of Air Quality as particles with a diameter between 1 to 75 microns (μm). The main impact from dust is the annoyance caused by the soiling of surfaces. However, the smaller fraction overlaps with the definition of PM_{10} , particulate matter less than $10\mu\text{m}$, which can enter the lungs and cause health effects. Where dust is allowed to escape from contaminated soil it can also spread contaminants. The following activities have the potential to cause emissions of dust:

- Demolition of existing structures;
- Site preparation including delivery of construction material, erection of fences and barriers;
- Earthworks including digging foundations and landscaping;
- Materials handling such as storage of material in stockpiles and spillage;
- Movement of construction traffic including haulage, vehicles and plant movements;
- Construction and fabrication of buildings; and
- Disposal of waste materials off-site.

12.2.2 Typically the main cause of unmitigated dust generation on construction sites is from demolition and vehicles using unpaved haul roads, and off-site from the suspension of dust from mud deposited on local roads by construction traffic. The main determinants of unmitigated dust annoyance are the weather and the distance to the nearest receptor.

12.2.3 Based on the Institute of Air Quality Management (IAQM, 2014) criteria, the risk of dust emissions is considered to be high. The study area is considered to be of medium sensitivity, due to the presence of residential properties as the site is built out. According to the IAQM 2014 'medium' mitigation control measures are required during construction to manage risks and achieve a low risk.

12.3 Management of impacts

- 12.3.1 The mitigation measures proposed should reduce potential impacts to low risk, and construction dust will infrequently affect sensitive receptors.
- 12.3.2 The following standard mitigation measures from the IAQM 2014 guidance are recommended:

Communication

- Develop and implement a stakeholder communications plan.
- Display the name and contact details of persons accountable on fencing around individual construction parcels where they can easily be seen by local residents.
- Display the head or regional office information on the site boundaries of construction parcels.

Management

- Develop and implement a dust management plan.
- Record all dust and air quality complaints, identify causes and take measures to reduce emissions.
- Record exceptional incidents and action taken to resolve the situation.
- Carry out regular site inspections to monitor compliance with the dust management plan and record results.
- Increase site inspection frequency during prolonged dry or windy conditions and when activities with high dust potential are being undertaken.
- Agree dust monitoring locations with the local authority and instigate monitoring 3 months in advance of works commencing in the area.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around dusty activities at least as high as any stockpile on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site run off of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove potentially dusty materials from site as soon as possible.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary.
- Avoid the use of diesel or petrol powered generators where possible.
- Produce a Construction Logistics/Delivery Plan to manage the delivery of goods and materials.
- Only use cutting, grinding and sawing equipment with dust suppression equipment.
- Ensure an adequate supply of water on site for dust suppressant.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use water sprays on such equipment where appropriate.
- Ensure equipment is readily available on site to clean up spillages of dry materials.
- No on-site bonfires and burning of waste materials on site.

Demolition

- Incorporate soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure water suppression is used during demolition operation.
- Avoid explosive blasting, using appropriate manual and mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless required for a particular process.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored silos with suitable emissions control systems.

Earthworks

- Re-vegetate earthworks and exposed areas /soil stockpiles to stabilise surfaces as soon as practicable.
- Only remove the cover in small areas during work and not all at once.

Trackout

- Use water assisted dust sweepers on the site access, internal roads and local highway.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving the site are covered to prevent escape of materials.
- Record inspection of on-site haul routes and any subsequent action, repairing as soon as reasonably practicable.
- Install hard surfaced haul routes which are regularly damped down.
- Install a wheel wash with a hard-surfaced road to the site exit where site layout permits.
- The site access gate to be located at least 10m from receptors where possible.

13 Noise and Vibration

13.1 Introduction

13.1.1 Where the works are close to residential properties and occupied buildings within the site, there is the potential for disturbance from noise and vibration. Given the nature of the site as a centre for academic and commercial research and development, some of the occupiers are likely to be using equipment and instrumentation which is sensitive to noise and vibration.

13.2 Impacts

13.2.1 Key construction activities expected to create disturbance include:

- Demolition activities;
- Compaction plant;
- Piling activities;
- Processing of construction waste materials e.g. crushers, screeding; and
- Construction traffic.

13.3 Mitigation

13.3.1 Further assessment of construction noise mitigation will be undertaken when a Principal Contractor(s) is appointed for each stage/plot and detailed method statements and the construction programme are available.

13.3.2 The following mitigation measures, as detailed in the ES, will be applied to minimise the noise breakout from the construction activities affecting noise sensitive receptors:

- Breaking out of concrete structures should be undertaken, where possible, using low noise effect methods including bursting and splitting rather than percussive breaking;
- Detailed programming of works to make maximum use of existing barriers to noise;
- Retention of the outer walls of structures for as long as possible before demolition is necessary;
- Careful selection of demolition/construction methods and plant to be used;
- Switching off of plant and vehicle engines when not in use;
- Restriction of drop heights onto lorries;
- Regular maintenance and servicing of vehicles, equipment and plant;
- Appropriate handling and storage of materials;
- Appropriate operational hours (to be agreed with the local authority);
- Enforcement of restricted working hours for excessively noisy activities;
- Implementation of an appropriate traffic management strategy;

- Use of temporary acoustic barriers where appropriate and other noise containment measures such as screens, sheeting and acoustic hoardings at the construction site boundary to minimise noise breakout and reduce noise levels at the potentially affected receptors.

13.3.3 In addition to the above, all reasonable steps would be taken to keep the local community (including the existing commercial and university occupants as well as nearby residential inhabitants) informed of proposed demolition and construction operations. Measures for community liaison would be dealt with by a dedicated Community Liaison Officer to co-ordinate the dissemination of information (for example, by means of a regular newsletter) and to program those operations at time that would minimise the potential for disturbance.

13.3.4 Within the detailed CEMP, further controls may be required to ensure vibration sensitive equipment or experiments in the existing buildings are protected from damage or malfunction.

14 Consideration for Others and the Environment

14.1 Hours of Work on Site

14.1.1 These are to be agreed with CCC prior to commencement of construction, taking account of the sensitivity of the existing site uses and nearby residents to noise.

14.1.2 It is anticipated that works are unlikely to be permitted outside the following hours:

- Monday-Friday 7.30-18.00
- Saturday 8.00-13.00
- Sundays/Bank Holidays – no noisy activity.

14.1.3 In areas where sensitive receptors may be affected, such as homes, or research buildings with sensitive monitoring equipment, further restrictions on working hours may be required.

14.1.4 Variable site hours, dependent on the location and nuisance value of proposed activities may be considered.

14.2 Consideration for Others

14.2.1 Contractors appointed to construct the works will be expected to follow the principles of the Considerate Contractor Scheme. The objectives of such schemes are to foster communication and good relations with the neighbourhood and to seek to ensure that construction work is undertaken without making life unpleasant for those who live and work nearby. The appointed contractor will be expected to follow a voluntary code of professional conduct, demonstrating minimum standards for practices that affect the environment around construction sites, including:

- Considerate - consideration for residents, workers, pedestrians, visitors, neighbouring occupiers, businesses and highway users at times and in a manner that will minimise disturbance. Special attention is to be shown to the needs of those who have difficulties with sight, hearing or mobility, those in wheelchairs, or pushing prams and pushchairs.
- Quiet - Noise from works, machinery, workers, radios, music, vehicles and all other sources is to be kept to a minimum. There are to be no works that are audible at the nearest residential boundary outside permitted hours of work, unless prior agreement has been reached with the Council.
- Clean - Footways, carriageways, public areas adjacent to the site, as well as all visible aspects of site activities such as hoardings, scaffolding and warning lights, are to be kept clean and in good order. Dust and smoke are to be kept to a minimum. Mud and spillage are to be cleaned off pavements, roads and public areas immediately.
- Responsible - The contractor is to ensure that all employees, agents, sub-contractors, suppliers, drivers and others working on or near the project or activity maintain all aspects of the Code of Good Practice.
- Tidy - Pride in the condition and appearance of the project or activity, adjacent highways and public areas is to be shown in every way, including the tidiness of temporary structures, materials, machinery and the constant removal of litter and rubbish.
- Safe - Projects, activities and vehicle movements are to be carried out with utmost care for safety of passers-by, adjacent neighbours and for workers. All plant and machinery items are to be maintained in safe working order and the safety of structures is to be checked frequently.
- Accountable - A contact board is to be clearly displayed by the project or activity giving names and telephone numbers of staff who can be contacted promptly and take immediate action in response to issues raised by residents, businesses, others.

14.3 Monitoring, Review and Complaints

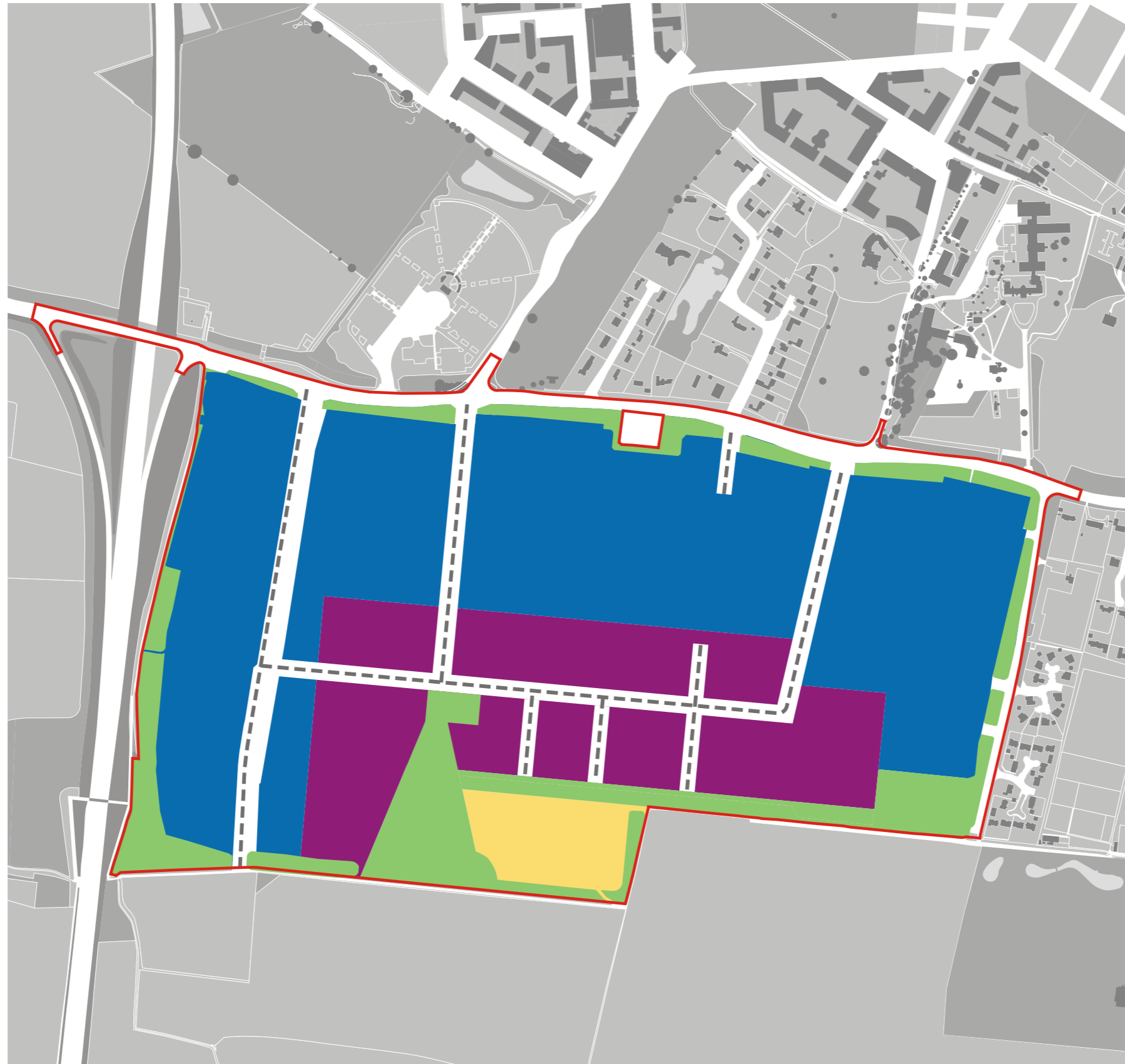
14.3.1 The detailed CEMP will present a comprehensive method for monitoring, review and complaints. This will include:

- A contact board with a complaints number will be advertised at the site entrance.
- A programme of monitoring and review will be implemented to generate information by which the success of all aspects of the CEMP can be evaluated against its objectives.
- Monitoring and review of construction activity to the site will be the responsibility of the principal contractor.
- This process will provide the opportunity for construction operations and procedures on the site to be reviewed and new management measures to be implemented to achieve the objectives.

14.3.2 Monitoring will be documented and available to the client and to CCC on request.

14.3.3 As part of the ongoing process for ensuring that impacts due to construction activities are minimised, ongoing engagement will be undertaken with neighbours and stakeholders.

Appendix A Masterplan



KEY

Contextual Information:
 - - - Existing street
 Existing open land

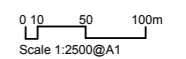
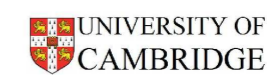
For Approval:
 Application site boundary
 Academic & Commercial Mix: D1, B1b, sui generis
 Mixed Use Zone: A1-A5, B1b, D1
 Community Uses: D1, D2

All information other than that identified as being for approval is shown for contextual purposes only.

West Cambridge

WC/OPA/PAR/03 - Land Use Parameter Plan

February 2016



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