6 Construction

6.1 Introduction

6.1.1 This chapter is prepared by Quod, with input from the Applicant's contracting advisors Wates. It describes the key activities that will be undertaken during the construction process of the Proposed Development, including enabling, demolition and construction works. The chapter also provides an outline of the indicative programme for the construction phase.

6.1.2 Due to the outline nature of the planning application, the level of information on enabling, demolition and construction works is high level at this time and may be subject to modification following appointment of principal contractor(s). For this reason, the EIA is based on reasonable assumptions as set out in this chapter and the collective experience of the EIA team with based on similar scale projects.

6.1.3 Discussions regarding enabling and construction logistics, and site and environmental management will be undertaken with the CDC and other relevant statutory consultees before construction commencement.

6.1.4 Assessments of construction stage effects of the Proposed Development are provided in each technical chapter of this ES (i.e. Chapters 7 to 16 and Volume II: LVIA). Each technical chapter also assesses the cumulative effects of the Proposed Development in conjunction with construction of other schemes in the vicinity.

6.1.5 This chapter is supported by:

- Appendix 6.1: Outline Construction Environmental Management Plan (CEMP); and
- Appendix 6.2: Indicative Construction Plant and Equipment.

6.2 Programme and Phasing of Works

6.2.1 The indicative programme for construction of the Proposed Development is estimated to be approximately eight years. Subject to outline planning permission and subsequent consents and licences, the key stages of the indicative programme for construction are as follows:

- Work commencing on Site in 2025;
- First residential occupation at the Site in 2026;
- Peak of construction activity year in 2028; and
- Completion in 2033.

6.2.2 Construction of the Proposed Development is likely to take place continuously over the eight year period, albeit at different levels of intensity and in phases across the Site. Four construction phases are currently proposed. It is reasonable to assume a period of 2-3 years for each construction phase and that phases could overlap for a period of 1-2 years. It is anticipated that construction works would commence in the north west of the Site and would be completed progressively clockwise across the Site.

6.2.3 The phased nature of the construction work means that effects would be varied in their location and timing across the Site. Uncertainty in the spatial phasing, methods and duration of activities during the construction stage has been addressed in the assessments through reasonable worst-case assumptions which are set out in each technical chapter.

6.2.4 Construction of the Proposed Development will be influenced by the need to deliver social and community infrastructure (e.g. schools) as well as physical infrastructure (e.g. roads and public transport infrastructure) as residential and commercial/R&D uses are built out. These triggers will be defined in the Section 106 Agreement.

6.2.5 Further information on construction phasing and methods would be addressed during subsequent stages of planning consent and would be agreed with CDC.

6.3 Description of Works

6.3.1 The following sections provide a description of the key activities during the demolition and construction stage of the Proposed Development.

6.3.2 As the Development progresses, each construction phase will be self-contained with site perimeter demarcation / fencing. Infrastructure including main access roads will be constructed ahead of each parcel / development phase to ensure well-defined construction access is maintained.

6.3.3 The Applicant will explore the feasibility of a centralised temporary construction hub or consolidation centre to service the entire Development which would facilitate the efficient flow of materials through the supply chain, reducing waste and minimising disruption. Further environmental assessment may be undertaken should this type of facility be proposed and it is likely to generate new or different effects to those identified in the ES.

General Enabling Works

6.3.4 The key activities during this stage of each works would be as follows:

1. Archaeological / ground investigation, as required;
2. Diversion of Public Rights of Way/permissive paths;
3. Construction of site access and haul roads;
4. Demolition of some existing buildings on the Site;
5. Establishment of construction compounds, welfare areas and hoarding/safety fencing;
6. Vegetation clearance and establishment of protective measures (e.g. root protection zones, watercourse buffers, utility easements);
7. Translocation of protected species, if required, and ecological protection measures;
8. Earth works and soil preparation including excavation, grading and preparation of surfaces as well as the placement/compaction of fill; and
9. Utility diversions, upgrades and connections.

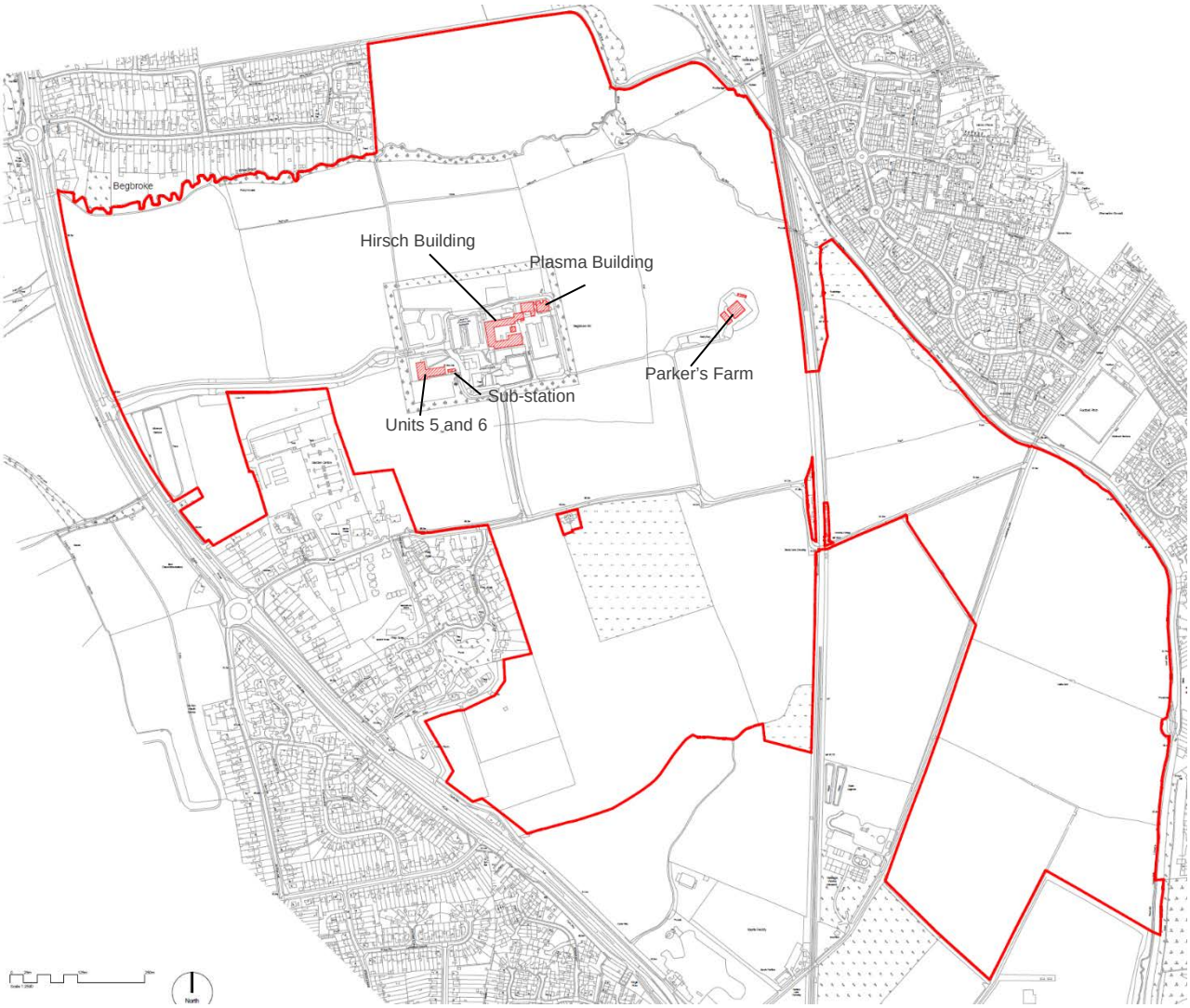
Demolition

6.3.5 A small number of buildings within the Site may potentially be demolished as part of the Proposed Development, as shown on Figure 6.1. These include three farm buildings in the north east of the Site, known as 'Parkers Farm'. Additionally, up to four buildings with Begbroke Science Park (BSP) could be demolished, comprising the Hirsch Building, Plasma building, Units 5 and 6, and a sub-station. No demolition audit has been undertaken at this stage of the project. However, based on the worst-case assumption that all buildings shown on Figure 6.1 would be demolished, it has been estimated that up to 1,896 tonnes of material may result from demolition activities.

6.3.6 It is expected that a demolition method statement will be provided to CDC for approval prior to the works taking place which will provide detailed methodology on how the works will be completed. The method statement will also set out the safeguards that would be in place to protect human health and the environment. Appropriate pre-demolition surveys for asbestos containing materials and other hazardous materials would be undertaken by appropriately licenced contractors to determine safe working practices. Any hazardous waste arisings from demolition would be disposed of safely in accordance with waste legislation in force at the time. Other materials would be retained on Site for re-use during construction subject to their suitability.

6.3.7 For the purposes of the standalone Site Waste Management Plan (SWMP) prepared for this application, a worst case scenario has been assumed whereby all buildings will be demolished.

Figure 6.1: Indicative Demolition Plan



Remediation

6.3.8 Land within the historical landfill and within c. 3m of its extent will be remediated. A Remediation Strategy has been prepared and is provided at Appendix 15.2: Remediation Strategy and Verification Plan of this ES.

6.3.9 Subject to regulatory (and NHBC) agreement), it is considered that the following mitigation is required to ensure the former landfill site on Sandy Lane is suitable for use for the proposed end use as a public park:

- The installation of a 450mm engineered cover, comprising a bonded geogrid break layer (to deter burrowing animals), subsoil beneath a topsoil thickness of between 150mm and 300mm, extending across the landfill, and outside the landfill boundary by a minimum of 3.00m (to allow embedment). No buildings are proposed in the landfill area and therefore no gas protection measures are required.
- Import of subsoil/topsoil in line with a Materials Management Plan.

6.3.10 To assist with land forming, the landfill is likely to be compacted using a High Energy Impact Compactor, utilising specialist compaction equipment fitted with Surface Covering Dynamic

Compaction Control or similar to provide a continuous measurement of the ground response.

6.3.11 A detailed Remediation Strategy will be submitted for approval by CDC and the Environment Agency once a Contractor has been appointed at either Tier 2 or Tier 3 stages. If processing of Made Ground is required, an appropriate Environmental Permit will also be required under the Environmental Permitting (England and Wales) Regulations 2016.

Construction

6.3.12 An indicative list of large plant and equipment that are likely to be used at various stages of construction are shown in Appendix 6.2.

Buildings

6.3.13 Construction activities for buildings and other structures will commence in each phase following appropriate enabling works. The method of construction will be dependent on the nature of the buildings and detailed design, however general principles based on standard construction methods are set out below:

1. **Foundations / Sub-structure –** The specific type of foundations will depend on the design of the building and will be determined at detailed design stage. Given that the majority of buildings are proposed as low-rise units and no basements are proposed, it is likely that strip foundations will be used to create a continuous, linear strip of shallow foundation. If buildings require piles, e.g. office/R&D units in the extension to the BSP, it is likely that either Continued Flight Auger (CFA) or 'mini' piles would be used. A piling mat – a platform providing a stable base on which piling rigs can move around the site and operate – will be prepared for the rig, following which piled foundations to support each building will be installed. Some drainage and service runs will also be required to be buried or placed beneath the ground floor slabs.
2. **Superstructure –** It is expected that scaffolding will be used to progress construction vertically up each of the building's superstructure (assuming standard construction methods). Once construction on the building elements reach the second floor that material hoists, tower and/or mobile cranes will be used to move materials to the various levels. The siting and heights of cranes will be discussed and agreed through consultation with Oxford Airport. Mobile cranes would be lowered in height in low visibility days.
3. **Façade and Fit Out –** The façade of the buildings will be progressively installed/constructed. Upon completion of each floor's façade, interior fit out and installation of mechanical, electrical and plumbing systems will commence.
4. **External Works and Landscaping –** Due to the phasing requirements of the Proposed Development, parcels of landscaping, sports pitches and other amenity space will be completed as phased handovers are provided for occupation.

Roads and Bridges

6.3.14 Internal roads will be constructed in accordance with standard industry guidance and to the specifications defined by the Development Brief.

6.3.15 The detailed design and construction of structures over the watercourses, such as the internal bridges over the Rowel Brook in the north of the Site would be subject to approval

by the Environment Agency where they pass over Main Rivers and the Lead Local Flood Authority where they pass over Ordinary Watercourses. Consultation will be carried out with the Canals and Rivers Trust (CRT) as appropriate on the works which affect Oxford Canal. Works would be undertaken in line with good practice guidance including:

- SEPA good practice guide: River Crossings[1]; and
- Guidance on Pollution Prevention (GPP) 5: Works and Maintenance in or near water and GPP 6: Working at construction and demolition sites[2].

6.3.16 Land will be safeguarded to deliver the Begbroke Hill bridge over Sandy Lane (by Network Rail) and Stratfield Bridge in the south east of the Site. These will be subject to separate planning applications.

6.4 Construction Phasing

6.4.1 Construction phasing is not defined in the planning application to allow flexibility in delivery of the Proposed Development. Indicative construction phasing has been defined by the Applicant's construction advisor, with development likely to be broadly developed over four phases.

6.4.2 Initially construction site access will only be available from the A44 via Begbroke Hill. It is expected that the Proposed Development would be build out from west to east with an element of clockwise construction phasing, moving north around the Begbroke Science Park to then complete properties in the southern extent of the Site. Subject to future viability calculations, it is envisaged that circa 500 new residential dwellings would be constructed during Phase 1 along with the first primary school and some initial non-residential uses. Circa another 500 residential dwellings would be constructed during Phase 2 alongside a further extension of the BSP, 250 residential dwellings in Phase 3 and the remainder in Phase 4. The timing of delivery of the secondary school and other primary school will be subject to further discussion with CDC and OCC.

6.4.3 The strategic infrastructure will be built in four phases, with full details to be confirmed during detailed design. The green arteries would likely be developed during Phase 1, with Rowel Brook Park (north of Rowel Brook) during Phase 2 and Central Park coming forward at a later stage. The Central Park location is likely to be the location of a centralised construction compound.

6.5 Construction Environmental Management

6.5.1 Various environmental management controls will form the basis of Construction Environmental Management Plans (CEMPs) (or equivalent) that will be implemented over the duration of enabling, demolition and construction activities. The Applicant has committed to implementing CEMPs during enabling, demolition and construction activities. An Outline CEMP is provided in Appendix 6.1. It is expected that detailed CEMP(s) will be developed in line with the Outline CEMP for the Proposed Development and would be subject to approval by CDC prior to works commencing.

6.5.2 The detailed CEMP(s) will set out the responsibilities and requirements with regard to legal and regulatory compliance and the implementation of Environmental Management Systems and mitigation measures which will be in place during the construction phase (including

enabling, demolition and construction works. The detailed CEMP(s) will also set out procedures and plans for the avoidance, minimisation and mitigation of potential environmental impacts as a result of the construction phase of works in accordance with the mitigation hierarchy. The detailed CEMP(s) will include a framework of measures, targets and monitoring strategies for the environmental management of the project's construction phase.

6.5.3 The Outline CEMP standards and measures would form part of Employers' Requirements and therefore part of each Contractors' contract documents. Each Contractor would be responsible for implementing the requirements of the Outline CEMP through the development of a detailed CEMP(s), depending on the nature of the contract(s).

6.5.4 Detailed CEMP(s) would be developed prior to construction but only when sufficient detail on the construction method is available. The CEMP(s) will detail the practical execution of the construction works that demonstrates compliance with the measures and controls of the CEMP(s) and other requirements. The CEMP(s) would also provide details of the general site layout and operations, working hours, site lighting, security, emergency planning and response, fire prevention and control, utility works and worker access and welfare. The Outline CEMP includes the environmental mitigation measures required during the construction stage. These would be reviewed once further details of construction are known to ensure that they are sufficient to meet the commitments made throughout the assessments. A commitment will be made to periodically review the CEMP(s) and undertake regular environmental audits of its implementation during construction of the Development.

6.5.5 The Outline CEMP includes information on the following:

- Regulatory Framework and Relevant Planning Conditions
- Site Location and Project Description;
- Site layout and operations;
- Construction programme;
- Roles & Responsibilities;
- Information for Contractors & Visitors;
- Sustainability Strategy and Commitments;
- Ecology (including designated sites);
- Air quality;
- Heritage;
- Construction waste and materials;
- Water and energy consumption;
- Pollution prevention & hazardous materials storage;
- Soil, geology and contamination;
- Construction lighting;
- Noise and vibration;
- Housekeeping and security;

- Incident response;
- Internal Communication and Training;
- External Communication; and
- Environmental Monitoring, Audit and Reporting.

Hours of Work

6.5.6 The prescribed hours of work would be agreed with CDC. It is anticipated that the core working hours for the Development will be as follows:

- 08:00 – 18:00 hours weekdays;
- 08:00 – 13:00 hours Saturday; and
- No working on Sundays or Bank Holidays.

6.5.7 Contractor(s) will have a period of 30 minutes before and at the end of the working shift outside the timings stated above to start up and close-down the works activities. Approval from CDC and/or the relevant statutory authorities will be required for any works that need to be undertaken outside of these hours and it is expected that CDC may vary these hours where the works are in close proximity to sensitive uses.

Environmental Monitoring, Audit and Reporting

6.5.8 The CEMP(s) will be live documents that would be subject to updating and refinement by the contractor as required in response to the changing needs of the works during construction. The CEMP(s) will include details of those responsible for the effective implementation of the plan and will also set out the procedures to be implemented to monitor compliance with the plan during construction.

Considerate Constructors' Scheme

6.5.9 The Site will be registered with the 'Considerate Constructors Scheme' (CCS)[3]. The CCS ensures that contractors carry out their operations in a safe and considerate manner with due regard to passing pedestrians, road users and surrounding properties.

Community Liaison and Liaison with Other Developments

6.5.10 The Principal Contractor will commit to appointing a Public Liaison Officer, who will be the first line of response to resolve issues of concern or complaints. Reasonable steps would be taken to engage with other nearby development sites (including PR sites) that are likely to proceed on similar timescales and local residents during the demolition and construction works.

6.5.11 Occupiers of neighbouring properties will be informed in advance of works taking place that may give rise to disturbance in order to develop plans and respond to complaints. Site boards outlining information on the construction activities will be erected at the entrance to the Site. Site contact numbers will be displayed as appropriate, along with the complaint's procedure.

6.5.12 Careful monitoring of complaints received will be carried out, including recording details of the location of the affected party, time of the disturbance and nature.

6.6 Waste and Materials Management

6.6.1 It is not possible to accurately quantify the amount of materials arising from the demolition, excavation and groundwork activities for the Development at this stage. However, based on BRE benchmarking, it is anticipated that approximately 75,900 tonnes of waste could result from construction works. The standalone SWMP outlines estimated construction waste quantities and potential for reuse. It includes ambitions to source resources sustainably, with 20% of materials from circular sourcing. Waste going to landfill will be avoided, and the Applicant will aim to reuse 80% of construction materials. Together these measures would help reduce construction waste by almost 4,000 tonnes.

6.6.2 The Framework Energy and Sustainability Strategy states that the Applicant will:

- Ensure zero waste in construction;
- Set up a material reuse and exchange hub for construction materials;
- Responsibly source 100% of key construction materials; and
- Aspire for 30% of construction materials from reused or recycled sources.

6.6.3 The ground levels of the Proposed Development have been designed to achieve a balance of cut and fill across the Site. Initial calculations have projected an estimated excess cut of 51,000 tonnes and excess fill requirement of 63,000 tonnes. A detailed cut and fill assessment will be undertaken at the detailed design stage once further details of the ground levels are known.

6.6.4 Where practicable, materials arising will be retained and re-used by implementing many of the industry standard practices (see paragraph 6.6.6 below). Typical construction sites are achieving material recovery rates of above 90%[4]. Re-use of the material will be dependent on it meeting relevant specification requirements, i.e. being inert and not contaminated. A Materials Management Plan (MMP) will be implemented through the CEMP(s) to coordinate reuse of material reduces deliveries to the Site and the amount of waste for disposal.

6.6.5 Waste produced during all construction activities on-site will be subject to the 'Duty of Care' under the Environmental Protection Act 1990[5]. It will be the joint responsibility between the Principal Contractor and the Applicant to ensure that waste produced on-site is disposed of in accordance with legislation.

6.6.6 All relevant contractors will be required to operate in accordance with the Outline CEMP (Appendix 6.1), SWMP and MMP and will be required to investigate opportunities to minimise and reduce waste generation in line with the Government aim of *"Work towards eliminating all avoidable waste by 2050"* by:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- Use of standard size components in design detailing to eliminate risk at source where possible to do so;

- Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping;
- Segregation of waste at source where practical;
- Re-use and recycling of materials off-site, where feasible, and where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing);
- Skips will be colour coded and signposted to reduce risk of cross contamination and covered to prevent dust and debris blowing around the Site, these will be cleared on a regular basis; and
- Burning of wastes or unwanted materials will not be permitted on-site.

6.6.7 Contractors will be required to carry out works in a way that, as far as is reasonably practicable, minimises the amount of waste to be disposed of by landfill. Any waste arisings from the Site will be transported and disposed of in accordance with relevant legislation in force at the time.

6.6.8 The project will seek to maximise the reuse of suitable soils on-site, where possible, in order to minimise waste disposal. Intrusive site investigation work will be undertaken to identify any significant areas of contamination. It is likely that the intrusive site investigation work will comprise soil chemical testing to further characterise soil material for disposal, including Waste Acceptance Criteria (WAC) analysis.

6.6.9 Hazardous waste will be kept separately from other wastes and in appropriate containers and Duty of Care will be ensured for the transfer and removal of all site wastes. Further details are provided in the Outline CEMP (Appendix 6.1) and standalone SWMP.

6.7 Construction Traffic

Construction Routing, Access and Vehicle Movements

6.7.1 During construction, vehicles will principally access and egress the Site via the A44 and Begbroke Hill. It is proposed that construction access will be via this access route for initial phases of development, with the expectation that the latter phases will have site access via a second temporary access point off the A44, off an existing farm access to the south that will be upgraded, or via 3rd party land to the south of the Site, as shown in Figure 6.2. This will allow separation between occupied properties and ongoing construction works in other areas of the Site to minimise adverse noise and air quality impacts. It will also allow the establishment of a main contractor compound and welfare and separate access for construction workers.

Figure 6.2: Proposed Construction Accesses

6.7.2 There will be no other access from construction vehicles from Sandy Lane or from the east via Kidlington, which would be enforced via the existing 3 tonne weight limit at the Oxford Canal bridge on Yarnton Road.

6.7.3 Numbers of construction-related vehicle journeys, including Heavy Goods Vehicle (HGV) movements, have been estimated for the busiest 'peak' periods during the construction stage of the Proposed Development. This has been calculated based on volumes of construction waste material, together with imported materials.

6.7.4 At peak construction, it is estimated that the construction stage will produce approximately 370 two-way HGV trips and 2,100 two-way worker movements per day on average. Further details on construction traffic movements and an assessment of the associated effects is provided within Chapter 9: Transport and Access.

6.7.5 All HGVs would be required to access the construction site from the A44. HGVs arriving from the south would be required to access the Site via the Begbroke Hill signal controlled junction as there would be no right turn facility at the temporary southern construction access.

6.7.6 All HGVs arriving from the north would either turn left into the Begbroke Hill access or left into the temporary southern construction access, depending on their delivery booking instructions.

6.7.7 All HGVs exiting the site and travelling north would be required to exit via the Begbroke Hill access and turn right out onto the A44 northbound carriageway as there would be no right turn facility out of the temporary southern construction access.

Construction Transport and Management

6.7.8 The construction site layout will be phased to reflect the sequence of works from site preparation to groundworks and piling onto superstructure. The Site will, as far as reasonably practicable, operate a one-way system.

6.7.9 On-site parking for construction workers will be restricted to a reasonable minimum. This will only be made available to those construction personnel who need to carry heavy equipment or materials to the Site. The labour force will be encouraged to use public transport.

6.7.10 The Principal Contractor and sub-contractors will ensure a commitment to careful management of deliveries and collections by scheduling them in a manner that consciously avoids, where possible, the most congested times of the day.

6.7.11 Typically, works that may need to be undertaken out of agreed hours would be for the delivery and removal of abnormal loads, for which the Principal Contractor will be expected to make the necessary road closure applications to CDC if required.

6.7.12 Signage will be employed to identify access routes and to inform motorists that the local roads are accommodating construction traffic.

6.7.13 A Framework Construction Traffic Management Plan (CTMP) accompanies the ES (see Appendix 9.3). This will inform the preparation of detailed CTMP(s) that will be prepared prior to construction works commencing once a contractor has been appointed. Routing of the construction traffic will be agreed with CDC to outline the most appropriate routes for the Site traffic with the aim of minimising disruption. This would improve the safety and reliability of deliveries to the Site, reducing congestion and minimise the environmental effects.

6.7.14 The Framework CTMP sets out that all HGVs would be required to access the Site from the A44, either into Begbroke Hill or a temporary construction access in the south of the Site. There will be no construction access from the east via Kidlington or via Sandy Lane. Aside the permanent closure of Sandy Lane, it is not currently anticipated that there will need to be any temporary road closures within the local area surrounding the Site as a result of the construction works. However, this will be reviewed with the principal contractor to ensure that disruption any required temporary road closures (e.g. for deliveries of abnormal loads) are kept to a minimum. PRoWs will be maintained open and, where a temporary closure is required, an appropriate diversion will be provided

References

[1] https://www.sepa.org.uk/media/151036/wat-sg-25.pdf
[2] https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/
[3] Considerate Constructors Scheme. Available at: https://www.ccscheme.org.uk/
[4] HSMO, (March 2019). UK Statistics on Waste. Available online: https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#recovery-rate-from-non-hazardous-construction-and-demolition-cd-waste
[5] Her Majesty's Stationary Office (1990). *The Environmental Protection Act 1990*.