

The West Midlands Rail Freight Interchange Order 201X  
ES - Vol 1 - Chapter 5: Demolition and Construction  
Regulation 5(2)(a)  
Ramboll - July 2018

# 5 DEMOLITION AND CONSTRUCTION

## Introduction

- 5.1 Impacts arising during the demolition and construction processes are temporary, generally short-term and intermittent. Nevertheless, they can be sources of potentially significant effects on environmental receptors and residential amenity. This chapter of the ES provides a description of the demolition and construction works for the purposes of identifying the potential environmental impacts and likely significant environmental effects of the Proposed Development which are considered in chapters 6-16.
- 5.2 In accordance with the EIA Regulations, this chapter sets out the demolition and construction works of the Proposed Development and the key activities that would be undertaken during the works. This chapter also describes the management controls that would be implemented to avoid, minimise and mitigate potential environmental impacts.
- 5.3 Although detailed demolition and construction method statements and specifications have not yet been prepared and contractors not yet appointed, it is possible to establish the potential broad environmental impacts associated with the proposed works based on standard practice and utilising the experience of the Applicant and project team on similar projects. An Outline Demolition and Construction Environmental Management Plan (ODCEMP) has been produced for the Proposed Development and is included within Technical Appendix 2.3 of this ES. The ODCEMP has been used as to establish the minimum environmental controls that will be put in place during demolition and construction for the purposes of assessment. The key components of the ODCEMP relevant to the assessment in this ES are summarised within this chapter.
- 5.4 The ODCEMP would form the basis for detailed demolition and construction environmental management plans (DCEMP) to be implemented during each phase of demolition and construction works. The detailed DCEMPs, which will be produced post consent, will be prepared in accordance with the ODCEMP, standard best practice and regulatory requirements and will include sub-plans such as a Site Waste Management Plan (SWMP), a Materials Management Plan (MMP), a Soil Resource Plan (SRP) and Dust Management Plan (DMP). The detailed DCEMPs will include any necessary mitigation identified throughout the EIA process in order to reduce or eliminate environmental impacts.
- 5.5 It is not proposed that a single DCEMP would be produced, instead that a DCEMP would be prepared for each phase of development to reflect Site conditions and guidance applicable at the specific time.
- 5.6 A Demolition and Construction Traffic Management Plan (DCTMP) has been produced for the Proposed Development and is included as an appendix to the Transport Assessment (TA) (Technical Appendix 15.1). The DCTMP has been used as to establish the minimum construction traffic controls.
- 5.7 Once the principal contractor has been appointed there will be opportunity for them to review and adjust the DCTMP in agreement with the local authorities.
- 5.8 It is important to note that this chapter does not assess the magnitude of potential impacts, nor the significance of likely effects during the demolition and construction works, as this is addressed within individual technical assessments within ES (Chapters 6 - 16).

## Scope and Programme of Works

- 5.9 The Proposed Development comprises the demolition of existing structures and the construction of an SRFI (including warehousing), ancillary buildings and infrastructure, as described in detail in Chapter 4 of this ES.

- 5.10 A detailed development programme has not yet been prepared. To enable assessment of likely environmental effects within this ES, an indicative, but feasible, programme has been developed by the Applicant based on a number of assumptions. These assumptions have been informed by an understanding of current and future projected market conditions, logistical arrangements, technical considerations and professional experience, all of which are considered to be reliable.
- 5.11 The indicative development programme is outlined in Chapter 4: Description of the Proposed Development.

## Description of Works

### Background

- 5.12 Presented below is a description of the demolition and construction works at the level of detail necessary to facilitate assessment of demolition and construction effects in this ES, alongside the information presented in the ODCEMP. Given the early stage in design and planning of the Proposed Development, many elements of the construction process are not yet fixed; the below however is considered to provide parameters for assessment and to represent a reasonable worst case in terms of environmental effects.
- 5.13 Following approval of the DCO, discussions will be held with South Staffordshire District Council (SSDC) and other relevant statutory consultees, such as Staffordshire County Council, Highways England and the Environment Agency. These discussions will include Site logistics, management, access and egress and hoarding arrangements.
- 5.14 Prior to work starting on-site, the phase-specific DCEMP and all associated sub-plans would be produced and agreed with SSDC. These would include roles and responsibilities, details on the control measures and actions to be taken to minimise the potential environmental impacts of the Proposed Development (the roles, responsibilities, control measures and actions which need to be defined are as identified in the ODCEMP). Monitoring, record-keeping and auditing requirements will also be addressed in each DCEMP.
- 5.15 There are also a number of technical approvals that will be required for the Proposed Development from third parties. These will all be addressed individually during the detailed design of the Proposed Development using analysis and site investigation targeted to investigate and mitigate effects on these assets.
- 5.16 A key aspect of the successful management of the Proposed Development would be the maintenance of good relations with the Site neighbours and the general public. The Applicant would consider other developments that may proceed at the same time and ensure close liaison with the other parties to co-ordinate and minimise potential impacts from the demolition and construction works.

## Enabling and Demolition Works

### Enabling Works

#### *Pre-Commencement Surveys and Works*

- 5.17 Prior to commencement of construction or demolition works on Site surveys would be undertaken as identified and required by this ES and the ODCEMP and Framework Ecological Management Plan (FEMMP), including the following (where applicable):
- Archaeological surveys;
  - Building Recording surveys for built heritage prior to demolition;

- Ecological surveys; and
  - Geotechnical and geo-environmental site investigation.
- 5.18 These surveys are detailed further within the ODCEMP and FEMMP (Technical Appendices 2.3 and 10.4 respectively).
- 5.19 Enabling works would comprise the following:
- In the event that unexpected ground contamination is recorded, appropriate remedial measures would be developed for the Site (secured as a DCO Requirement);
  - Undertaking any necessary measures identified during the pre-commencement ecology and archaeological surveys;
  - Removal of vegetation in accordance with the Parameter Plans;
  - Removal of all loose rubble and debris; and
  - Preparation of a Pre-Tender Health and Safety Plan and Construction Tender Document.

#### *Site Offices/Welfare Facilities, Construction compound and laydown, and General Site Access*

- 5.20 Prior to demolition perimeter site hoarding / fencing and access/egress gates would be erected and maintained throughout the duration of the works around the perimeter of the relevant construction area. This would segregate the general public from works and help to contain the work within the Site boundary. Heights and specification of hoarding/fencing would be modified locally in order to mitigate visual and noise impacts where appropriate.
- 5.21 Construction compounds, including welfare facilities and offices for construction staff would be constructed on-site during the enabling works and initial set up of each construction phase. The precise location construction compounds has not been determined at this stage, but it is envisaged that they would be located away from sensitive receptors. There may be more than one construction compound in use at the Site at any one time, due in part to the phased approach and the size of the Site, but also to facilitate construction of the new crossing over the canal which may require compounds on both sides.

#### *Tower Crane Locations*

- 5.22 The process of constructing steel framed industrial buildings, like those proposed at the Site, is such that large footprint areas are erected in a relatively short time. Lifting equipment is therefore usually mobile craneage with erection crews operating mobile elevated working platforms (MEWPs). During cladding operations, it is not unusual for mobile tower cranes to be employed for the lifting of roofing sheets; this operation is usually undertaken within a few days or weeks.

#### *Temporary Works*

- 5.23 Some temporary works would be necessary during the course of the Proposed Development works, in order to protect the public and environment, and ensure the structural integrity of the works as they progress. These would include the following:
- Installation of a temporary surface water drainage system to control storm water runoff and silt during construction;
  - Establishment of perimeter fencing;
  - Construction of temporary haul roads;
  - Local pumping of groundwater to reduce its level in the vicinity of excavations, for the purposes of groundwork stability and human safety;
  - Stockpiling of site won materials; and
  - Site establishment including siting of temporary cabins and welfare facilities.

#### **Demolition Works**

- 5.24 The majority of the Site is previously undeveloped arable farmland and woodland plantation; therefore, demolition arisings from infrastructure would be minimal.

- 5.25 Areas of hardstanding and concrete surfaced areas are limited across the Site to the buildings and features outlined below. These are to be grubbed up and the materials separated and stockpiled for re-use on-site or recycling.
- 5.26 Materials would be crushed, graded and stockpiled with 100% targeted for on-site re-use.
- 5.27 All recovered materials will be subject to material classification testing to confirm their suitability before being crushed and size graded for re-use in the wider development.
- 5.28 It is proposed that a number of buildings, and their associated infrastructure, are to be demolished as part of the development. Figure 4.4 identifies the structures which would be removed as part of the Proposed Development. These properties are described in more detail in Chapter 4: Description of the Proposed Development.
- 5.29 Detailed survey information for the existing structures, which might allow quantification of demolition arisings, is not available at this stage but structures have been identified based on their general construction type and estimated area.
- 5.30 Footprints of structures proposed for demolition are approximately:
- 1,800 sq m – residential properties;
  - 310 sq m – masonry outbuildings;
  - 3,450 sq m – steel framed agricultural and commercial buildings; and
  - 8,500 sq m – existing roadways.

#### *Domestic and Agricultural Buildings*

- 5.31 The steel framed agricultural and commercial buildings generally comprise a steel frame over which sheet materials are fixed, typically either corrugated steel or asbestos cement across a mass concrete slab. This type of construction lends itself to deconstruction whereby the sheet materials will be removed and the steel frame will be dismantled, both for re-use or recycling. Ground floor slabs will be grubbed up and the arisings stockpiled for re-use. The quality and value of the components will be assessed and, where feasible, the structures will be deconstructed to allow salvage of the materials. Alternatively, the buildings will be emptied and collapsed before materials are separated and stored for re-use or disposal.
- 5.32 Domestic buildings on Site are predominantly of traditional masonry construction with timber roof trusses and tile or slate roofs. Some of the existing buildings/structures on Site will be subject to Building Recording prior to demolition (Heath Farm and Woodside Farm). Materials will be re-used on Site where possible or transported off-site for re-use or recycling. The entranceways to demolished properties which connect to the public highway will be removed and 'made good', creating continuity of kerb lines or edge conditions across the previous frontages.

#### *Infrastructure/Existing roadways*

- 5.33 Existing roadways across the Site, including the existing public highway at Gravelly Way, have been measured from the topographical survey to be approximately 8,500 sq m, they vary in their construction and include macadam, concrete and compacted granular material. These are to be grubbed up and the materials separated and stockpiled for re-use or recycling.
- 5.34 All recovered materials will be subject to material classification testing to confirm their suitability before being crushed and size graded for re-use in the wider development, where possible.

#### *Bridges*

- 5.35 As shown on the Development Zone Parameter Plan (Document 2.5), it is proposed to remove two redundant pipe bridges and a road crossing which linked SI Group to land east of the Staffordshire and Worcestershire Canal.
- 5.36 The road crossing is of composite concrete construction, supported on reinforced concrete walls and abutments with macadam surfacing. Removal of the bridge from the sensitive canal

corridor will include careful removal of any surfacing from the structural deck and breaking out of the in-situ concrete element. The bridge beams can then be craned away for re-cycling.

- 5.37 The two redundant steel pipe bridges are located on the eastern edge of the SI Group land, crossing the Staffordshire and Worcestershire Canal, previously associated with the off-site chemical works. These structures would be systematically dismantled and the recovered steel recycled as scrap metal. Foundations and abutments would be removed and recovered for recycling or crushed and re-used on-site.
- 5.38 It is anticipated that the majority of the materials recovered will be stockpiled to be crushed. Metals (parapets, reinforcing and studs etc) will be salvaged for re-use where appropriate or recycled as scrap.

**Figure 5.1: Redundant Bridge, Staffordshire and Worcestershire Canal**



## Earthworks

- 5.39 The Proposed Development includes an extensive earthworks scheme, the development of which will continue post-DCO approval for the detailed design. For the purposes of the ES, a cut and fill model and volumes balance have been generated based on the topographical survey for the Site; information obtained from the quarry operator; and using the illustrative masterplan. The model has been developed to target a 1:1 cut/fill balance so as to reduce import/export of material from Site. The cut/fill model takes into account the perimeter bunding and surface water drainage swales, as well as the need to create level development plots.

- 5.40 The earthworks model assumes that earthworks for the whole Site (all phases), would be undertaken within a single phase. In reality it is recognised that the majority of earthworks for development platforms and some landscaping would be undertaken per construction phase, except for Site wide infrastructure such as the drainage network/roads. In order to meet a cut/fill balance across the whole Site it will therefore be necessary to undertake some degree of stockpiling of earth/soils on Site, for instance, so that an excess on an earlier phase can be retained and used in later phases. In line with the requirements of the ODCEMP, all stockpiling and soil storage and management at the Site will be undertaken in accordance with the DEFRA 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'<sup>1</sup>. In order to minimise the need for long term stockpiling between phases, creation of the perimeter landscape bunding will be brought forward wherever possible so as to utilise excess material and accelerate mitigation for local residents.
- 5.41 The maximum cut and fill depths measured from existing ground level have been measured as 5m cut and 7.5m fill based on current cut/fill drawings. However, these extremes relate to relatively discrete areas such as balancing ponds and berms/earth bunds, and in the vicinity of the watercourse at the north-west of the Site, rather than being representative of wider areas of the Site. In general, where levels are not constrained by rail or road infrastructure, the plateau levels for each of the potential plots can be designed to provide a cut/fill balance to minimise hauling and stockpiling during construction.
- 5.42 Construction of the perimeter landscaping bunds as part of the embedded mitigation for the Proposed Development (see Chapter 4: Proposed Development), would, where practicable, take place early on in the construction programme, or within each construction phase, so as to provide mitigation for visual and noise effects during construction. Generally, the landscape bunding would be constructed per construction phase, although as outlined above this may be brought forward in some areas where there is an excess of material from the earthworks.
- 5.43 The majority of the existing Site, excepting the quarry workings and railway cutting, is relatively flat and will require minimal cut/fill to achieve the Proposed Development platforms. The main area of cut/fill are described as follows:
- Area of cut associated with the rail terminal in the west of the Site, owing to the level of the existing railway cutting at approximately 2-3m below ground level;
  - Areas of cut to approximately 4-5m below ground level associated with balancing ponds and swales for the surface water drainage system, located towards the centre of the Site close to Gravelly Way;
  - 1-3m cut associated with the development plateaux for the proposed buildings situated adjacent to Calf Heath Wood;
  - Up to 7.5m fill above existing ground level associated with the earth bunds along the northern and western Site boundaries; and
  - 1-3m fill associated with the former Calf Heath quarry.
- 5.44 As Calf Heath Quarry is still active the volume of cut/fill in this area will change but it is anticipated that any cut/fill model developed in future iterations will be based on the same principles as described above.
- 5.45 Within the quarry areas where variable made ground was recorded, and where significant new volumes of clay and silt quarry waste are anticipated, there are volumes of silt and clay materials with geotechnical properties considered to be of low suitability for conventional foundations. Specialised treatments of these materials may be necessary, such as dewatering, excavation and re-compaction, and stabilisation with lime/cement additives.
- 5.46 Bulk earthworks construction techniques will involve the use of heavy plant machinery including, but not limited to:
- CAT Dozers

<sup>1</sup> Department for Environment, Food and Rural Affairs (2009). Construction Code of Practice for the Sustainable Management of Soil on Construction Sites. Available online @ <https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites> Last viewed December 2016.

- 360° Excavators
- 180° Excavators
- Articulated Dump Trucks
- Screener/Crusher
- Telescopic Handlers
- Forward Tipping Dumpers
- Self-Propelled Rollers / Ride on Rollers / Towable Rollers
- Water Bowsers
- Bunded Fuel Bowsers
- Agricultural Tractors
- Hopper/Mixer/Rotavator/Spreader (stabilisation equipment)
- Silo Tankers

## Ground Conditions, Substructure Works and Geotechnical Engineering

- 5.47 Ground investigations were carried out to ascertain geotechnical and geo-environmental conditions at the Site by Waldeck and Ramboll respectively (see Chapter 11 of this ES for more information on Ground Conditions), indicate that the use of traditional mass concrete (pad and strip) foundations is a viable option over the majority of the virgin ground on the Site, where Till, Glaciofluvial Deposits and Sandstone formations were found. Excavations within these areas are anticipated to be diggable and side slopes stable above the groundwater table. Where significant depths of fill are required, the engineered earth placement solution will be designed to provide suitable bearing capacity and settlement characteristics for traditional pads.
- 5.48 Floor slabs within the proposed structures are anticipated to be to be ground bearing, with the geotechnical information identifying the magnitude of settlement likely to occur to be low and within tolerance limits for the proposed structure. However, further investigation is required once cut/fill levels have been fully established to confirm this. Any further intrusive investigation would include an archaeological watching brief in areas of potential interest (refer to Chapter 8: Archaeology (below ground heritage)).
- 5.49 The presence of the contamination and ongoing remediation works in the south-west of the Site has been taken into account in the Site layout, and development plots, infrastructure or temporary works in this area will not lead to disturbance to the remediation works and the ground in this area during construction (refer to Chapter 11 Ground Conditions).
- 5.50 Foundations for the majority of buildings are anticipated therefore to be of reinforced concrete construction. This would be poured in situ, and the concrete mixed at an on-site batching plant to minimise HGV movements during concrete pours. Foundation slabs may be completed before or after the steel frame building structures are completed. In the latter scenario, the ground would be reinforced/stabilised to permit plant movement prior to completion of the foundation slab.
- 5.51 Based on the geotechnical information described in more detail in Chapter 11 Ground Conditions and in the Waldeck Geotechnical Report (Technical Appendix 11.6); and the foundation solutions outlined above, piling is not expected to be required for the majority of the Proposed Development, including the warehouse units and the majority of the rail and rail terminal works, although it may be used for proposed bridges at the Site (see below).
- 5.52 Bridge abutments, as detailed under Civils Works below, are proposed to be constructed using piled foundations.

## Superstructure Works

- 5.53 The warehouse buildings are described in full in Chapter 4: Description of the Proposed Development. The structures are to be multi-span steel portal frames.
- 5.54 The structures are to be enveloped in lightweight cladding and are to have office areas totalling around 5% of the overall footprint incorporated into the structure, typically attached to the front or side elevation. Where possible and appropriate to do so, the cladding and framework components would be manufactured off-site for assembly on Site. Construction of this type of structure is typically rapid once the initial groundworks are complete.

## Civils Works

- 5.55 To provide appropriate loading capacity and durability, external HGV yards and the rail container terminals are proposed to be constructed of reinforced concrete. Where lighter duty loading will be realised, for car parks and staff accesses, macadam and block paved surfacing will be used. All will be placed on compacted granular sub-base material.
- 5.56 The proposed access roads through the Site are to be constructed to meet appropriate standards. These will be asphalt surfaced upon a granular sub-base layer, edged with precast concrete kerbs.
- 5.57 Four bridges are proposed as part of the Proposed Development to carry the new link road across the proposed terminal arrival/departure rail line, the existing WCML, the proposed new access to the existing SI Group facility and over the Staffordshire and Worcestershire Canal and tow path. The bridges will be constructed to required standards and it is envisaged that these will be integral bridges of composite construction.
- 5.58 Abutments for the bridges will require piled foundations to support the appropriate highway loading with the walls themselves formed from reinforced concrete.
- 5.59 Further details on the new bridge across the Staffordshire and Worcestershire Canal are provided in Chapter 4: Proposed Development. It is anticipated that the main components of the bridge deck will be prefabricated and can be positioned (from the road) with minimal footprint or disruption to the canal. The canal and towpath may need to be closed temporarily for safety reasons during installation of the bridge deck and other major components. The duration of any closures will be minimised and agreed in advance with the Canal and River Trust. There will be some degree of works within the towpath /banks of the canal during works to construct and clad the bridge abutments. It is expected that pedestrian and canal boat access will be maintained during these works.
- 5.60 The rail terminal itself will have a finished surface of reinforced concrete, placed over compacted granular sub base material, with inset rails in the siding area.

## Highway Improvement Works

- 5.61 Where applicable, the proposed highway infrastructure improvements on the roads serving the Site will commence during the first phase of construction. The works are summarised under the following headings. All works and temporary traffic measures would be planned and agreed with SCC and/or Highways England in advance of construction.

### A449 Access

- 5.62 This new junction will facilitate access to and from the new adopted link road to the A449 next to the existing Gravelly Way junction. The works will involve construction of a new four-arm roundabout in line with the existing A449 dual carriageway. It is anticipated that these works would be constructed in two halves split between the south and northbound carriageways, allowing traffic to continue to use the A449. It would likely be necessary to close a lane in each direction and use contraflows to divert traffic to the opposite carriageway during construction of each half of the roundabout. Access to Gravelly way would be maintained throughout although may be either restricted to access to/from the Southbound carriageway only or controlled by temporary traffic lights to permit access from the northbound

carriageway. It is likely that access to Crateford Lane would be closed during the works with a temporary diversion for access to properties along this road. There are no proposals to undertake widespread resurfacing of the existing road surfaces.

#### A5 Access

- 5.63 The proposed A5 access has been designed so that it is positioned offline from the existing A5. This will allow construction of the new four-arm roundabout with minimal construction disruption to traffic on the existing A5.
- 5.64 There may be a need to reduce the width of the A5 temporarily to facilitate construction of the intersections between the new junction and the existing road. Given the width of the A5 at this location, it is anticipated that this can be achieved whilst maintain two-way traffic.
- 5.65 It is anticipated that the existing road surface of the section of A5 taken offline will be planed and removed, and the land restored as part of the landscaping proposals once the new junction is operational.

#### Vicarage Road Access

- 5.66 The proposed Vicarage Road access has been designed so that it is positioned offline from the existing road. This will allow construction of the new three-arm roundabout with minimal construction disruption to traffic on the existing road.
- 5.67 There may be a need temporarily reduce Vicarage Road to a single lane controlled by temporary traffic lights whilst the intersection of the new junction with the existing road alignment is constructed.

#### Footways/Cycleways/Signage

- 5.68 Footway and cycleway improvements, and signage and traffic light changes on roads surrounding the Proposed Development would be implemented with minimal interference with road traffic.

### Concrete Batching and Washout

- 5.69 Given the scale of the Proposed Development is proposed that concrete batching is undertaken on Site so as to reduce transport of raw materials and reduce waste.
- 5.70 Concrete batching and crushing activities are subject to regulatory control and permitting in accordance with the Pollution Prevention and Control (England and Wales) Regulations 2000, and the Environmental Permitting (England and Wales) Regulations 2010. Operation of the plant will be subject to permitting by the Local Authority and subject to stringent environmental controls.
- 5.71 The concrete batching plant would be located within the perimeter of the Site and positioned centrally to ensure ease of access for bulk material deliveries, to minimise haul distances within the Site, and to maximise distance from residential receptors.
- 5.72 The concrete batching plant will be located away from existing and proposed surface water features and situated on hardstanding with a dedicated temporary surface water drainage system to prevent runoff of concrete fines into surface waters, vegetation and soils.
- 5.73 There will be a dedicated concrete washout facility for the washing and disposal of waste concrete and concrete slurry. All arisings from this process will be captured in skips or containers and tankered off site for licensed disposal.
- 5.74 The precise location of the concrete batching plant and washout areas will be agreed with SSDC prior to commencement of construction. The concrete batching plant and washout facilities may need to be relocated during construction due to phasing. The same principles established above will apply.

### Utilities and Service Installation

- 5.75 Existing Western Power Distribution (WPD) electrical infrastructure is established throughout the Site. 132KV and 33kv overhead lines traverse the Site, with a 33KV substation located on the Southern boundary. It is intended that the existing substation is retained as it provides potential capacity crucial for the initial phases of the Proposed Development.
- 5.76 The Proposed Development would include the repositioning and under-grounding of the existing electricity overhead lines within the Site. This would comprise the replacement and under-grounding the existing overhead line which consists of 8 pylons that currently cross the Site, plus the removal and replacement of two pole mounted substations and under-grounding of the existing circuits currently fed by 34 wood poles within the Site. Two new termination towers will require construction (in the north and south of the Site) at the point existing overhead lines will be under-grounded. These new termination towers will be located in close proximity to existing pylons.
- 5.77 All the overhead line circuits will be replaced by underground cables which would be installed within the proposed path of the highways infrastructure. These works would be undertaken in stages, predominately before each phase of construction works, to minimise any constraints on warehouse buildings being developed. This would be undertaken with approval from the relevant utilities operator.
- 5.78 Existing gas and water infrastructure has been noted at positions within the Site.
- 5.79 Minor mains infrastructure and services have been identified, with the intention to develop diversions for each infrastructure.
- 5.80 Existing telecommunication infrastructure relay masts have been noted at two positions within the Site. Detailed assessment with asset owners and infrastructure operators is ongoing to understand the extent of services associated with each mast position, to determine the potential requirements / process to relocate assets from existing positions.

### Construction and Contracting Strategy

- 5.81 The appointed principal contractor(s) (the 'Contractor') would be responsible for a number of sub-contractors (piling, concrete, cladding etc.) and ultimately for environmental management during the construction process.

#### Hours of Work

- 5.82 Standard working hours for the Proposed Development will be:
- Monday to Friday: 07.00 to 19.00; and
  - Saturday: 07.00 to 13.00.
- 5.83 No works will take place outside of the hours stated above, unless by agreement with the SSDC or in emergency situations. Noise limits for out-of-hours work will be agreed with SSDC prior to this work commencing. Light nuisance during out of hours working will be minimised through the use of task-orientated, directional lighting.
- 5.84 As specific mitigation for bats (see Chapter 10: Ecology and Nature Conservation for further details), construction activity that creates noise, vibration or emits light within 30 m of known roosts will cease at sunset between the period March to September inclusive when bats are active to avoid delaying the emergence of locally roosting bats. Construction activity within 30m will not commence again until after sunrise to ensure that impacts to bats returning to local roosts does not occur. Construction phase lighting will be designed, installed and maintained to minimise effects on bats outside development plots through avoiding light spill on adjacent habitat. Lighting will only be used when necessary for construction operations or for safety reasons and should be directed within the plot, with no upward directed light and suitable cowls as necessary. Further details in relation to construction lighting and bats are provided in the FEMMP. Construction phase noise will be controlled through the ODCEMP such

that effects beyond the Site boundary are minimised. Appropriate measures may include temporary noise barriers (for instance, where development plots adjoin sensitive habitats such as the canal or woodland areas).

## Health and Safety

- 5.85 All works on-site would be undertaken in accordance with the provisions of the Construction (Design and Management) (CDM) Regulations 2015<sup>2</sup>. A Principal Designer would be appointed by the principal contractor and would work with the project team to ensure compliance with these Regulations.
- 5.86 All method statements would incorporate regulatory safety matters and a Health and Safety File would be maintained on-site for inspection by the Health Safety Executive and others as appropriate.

## Access Management

- 5.87 SCC and Highways England will be notified prior to commencement of the construction works on Site. Further details are included in the DCTMP which accompanies the Transport Assessment (Technical Appendix 5.1).

## Community Engagement and Consultation

- 5.88 The Applicant would engage with and inform the local community and local stakeholders of particular construction tasks and indicative timelines across the individual construction phases and would ensure that both parties were fully involved in any such dialogue.

## Materials Management

### Selection

- 5.89 Construction materials would be selected following the Building Research Establishment (BRE) 'Green Guide to Specification'. These include:
- Minimising embodied energy content (the energy used in manufacture);
  - Using recyclable materials where they have high embodied energy; and
  - Maximising the recycled content of the material, ease of maintenance, appropriate sourcing of materials and totally excluding deleterious and hazardous materials.
- 5.90 Key materials required for the Proposed Development are envisaged to include those indicated in Table 5.1.

Materials	Materials Required For
Concrete	Foundations, substructure, superstructure, cores, stairs and shear walls
Steelwork	Foundations, superstructures, minor structural elements
Brick/Blockwork/Stonework	External Envelope, External and Internal walls
Cladding	External Envelope
Glass	External Envelope (windows)

Materials	Materials Required For
Partitioning (gypsum board)	Internal walls

## Storage and Handling

- 5.91 The 'sustainability' of raw materials would be considered during the procurement process. All construction materials would be appropriately stored on-site to minimise damage by vehicles, vandals, weather or theft.
- 5.92 Where possible, prefabricated elements would be lifted directly into position from delivery vehicles. This would assist in reducing on-site storage and labour requirements and construction noise levels, thereby reducing potential nuisance to the surrounding receptors.

## Waste

- 5.93 Construction waste figures for the Proposed Development have been estimated based on the BRE SmartWaste Tool and the resultant numbers used as part of the transport assessment to account for construction waste movements. The SmartWaste method applies average construction waste figures per unit area for the type of development. In this case, the BRE estimated waste volume of 14 m<sup>3</sup> per 100 m<sup>2</sup> of development floor space equivalent to the closest available development type (office) is used. Based on the gross floor area of approximately 731,000 m<sup>2</sup> for the Proposed Development, this results in a total waste volume of approximately 102,652 m<sup>3</sup>. Resultant estimates for each waste stream are presented below for the Proposed Development. These are considered to represent a reasonable worst case for assessment.

Material Type	Estimated Waste Volume (m <sup>3</sup> )	Estimated Waste (tonnes)	Destination
Hard material (Waste concrete, aggregates, ceramics, bricks, blocks and stone)	32750.32	40610.4	Crush and grade for re-use on Site as granular sub-base/fill material
Timber	24562.74	8351.33	Remove from Site for recycling or shred for landscaping on Site
Plastics	15351.71	3377.38	Remove from Site for recycling
Cast formless	9211.03	3684.41	Remove from Site for recycling
Gypsum material	6140.69	2026.43	Remove from Site for safe disposal
Metals	6140.69	2579.09	Salvage for re-use or recycle as scrap off site
Paper / card	4093.79	859.7	Remove from Site for recycling

<sup>2</sup>Secretary of State (2015) Construction (Design and Management) Regulations. London: HMSO.

**Table 5.2: Estimated Construction Waste Volumes**

Material Type	Estimated Waste Volume (m <sup>3</sup> )	Estimated Waste (tonnes)	Destination
Bio-organic (Vegetation arisings)	3070.34	1565.87	Shred vegetation and/or compost on site for landscaping
Soil	1023.45	1279.31	Incorporate with cut/fill strategy. Retain on site
Chemicals / paint	307.03	175.01	Remove from Site for safe
<b>Total</b>	<b>102,651.79</b>	<b>64,508.93</b>	

- 5.94 The majority (approximately two thirds) of the waste outlined above would be from hard material<sup>3</sup>, which would be re-used on Site, likely crushed material to be used as granular sub-base and inert fill material. Soils and organic materials from vegetation clearance would also be re-used on Site.
- 5.95 Of those materials to be exported from Site, timber, used for pallets, concrete shuttering and other general construction applications, would constitute the highest at over 8000 tonnes.
- 5.96 The scale of the development is such that a strategy for managing waste can be implemented to maximise re-use on site. Hard materials represent 63% of waste which would include concrete and ceramics that would be readily recyclable as suitable granular material. The extent of soft landscaping on site facilitates effective re-use of soils and organic materials within soft landscaping.
- 5.97 The waste movements outlined above are included in the estimated construction phase traffic movements associated with the Proposed Development as outlined in the Transport Assessment (Technical Appendix 15.1). These traffic movements have been included in the assessment of environmental effects in the ES, especially in Noise and Vibration (Chapter 13) and Air Quality (Chapter 7) assessments.

## Construction Plant

### Typical Construction Plant and Machinery

- 5.98 The types of plant and machinery that would be likely to be used on-site for construction works are listed in Table 5.3.

**Table 5.3: Likely Plant and Machinery**

Plant	Site Enabling Works	Demolition	Bulk Earthworks and Remediation	Roads and Landscaping	Substructure	Superstructure	Fit-out
Bulldozers/Scrapers/Graders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Compaction plant	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<sup>3</sup> Category used in the BRE Smartwaste Tool to describe all hard, generally inert materials such as waste concrete, bricks, blocks, ceramics, stone and aggregates.

**Table 5.3: Likely Plant and Machinery**

	Site Enabling Works	Demolition	Bulk Earthworks and Remediation	Roads and Landscaping	Substructure	Superstructure	Fit-out
Plant							
Cranes and hoists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cutters, drills and small tools	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crushers		<input type="checkbox"/>	<input type="checkbox"/>				
360° excavators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Floodlights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fork lift truck		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic benders and cutters		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
HGVs/lorries/vans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piling rigs*	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
Scaffolding and mobile hydraulic access platforms	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Ready-mix concrete lorry	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Concrete pump					<input type="checkbox"/>	<input type="checkbox"/>	
Mortar/Concrete batching plant				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water pump	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Temporary supports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

\*Piling for bridge foundations only (precast concrete driven piles)

## Environmental Management Controls and Mitigation

- 5.99 An Outline Demolition and Construction Environmental Management Plan (ODCEMP) has been produced for the Proposed Development to outline general environmental management and agreed embedded mitigation measures to be undertaken during construction.
- 5.100 The ODCEMP is included as Technical Appendix 2.3 of this ES and has been used in the assessment of demolition and construction effects for each of the technical chapters presented in this ES.
- 5.101 Further measures relating specifically to ecology and nature conservation are detailed within a FEMMP for the Proposed Development (Technical Appendix 10.4).

## Decommissioning of the Proposed Development

- 5.102 The Proposed Development is expected to be operational indefinitely, as long as it is viable and fit for purpose.
- 5.103 In the long term, it may be re-developed or adapted on a piecemeal basis as operator requirements change and new occupiers move to the site. Any such piecemeal redevelopments would be expected to be undertaken in accordance with current and future legislation and guidance and would be subject to separate planning applications and planning requirements and conditions.