6. Construction Methodology & Programme

Introduction

6.1 This chapter of the Environmental Statement (ES) describes the anticipated construction methodology and phasing of the Development. Consideration of the likely significant effects on the environment that may arise during the construction of the Development and any necessary mitigation measures are provided within Chapters 7 to 14 of this ES.

6.2 Given the outline nature of the Development, planning for construction is necessarily broad at this stage and will be subject to modification during detailed construction planning. A fully detailed method of the construction will be developed in accordance with relevant planning conditions attached to the outline planning permission.

Indicative Programme and Phasing

6.3 The construction programme associated with the Development is anticipated to span a circa 7 year period.

6.4 **Table 6.1** summarises the indicative programme.

Table 6.1: Indicative Construction Programme

Activity	Approximate Start Date	Approximate End Date
Phase 1 (Infrastructure and Enabling Works)	Mid 2015	Mid 2017
Phase 2 (Residential)	Mid 2016	Mid 2019
Phase 3 (Employment)	Mid 2017	Mid 2022
Development in full operation	Mid 2022	

6.5 Note – the above assumes that the residential and employment phases of the Development can take place in tandem; however the residential element of the scheme is likely to be started and completed earlier in the programme.

6.6 The ES has been based on the assumption that the Development will take approximately 7 years to complete, with it becoming fully operational in mid-2022. The construction programme impacts of the Development are particularly relevant to the assessment of traffic and transportation impacts (the TA and ES Chapter 9), Flood Risk and Drainage (Chapter 10), Dust and Air Quality Assessment (Chapter 12) and, Noise and Vibration Assessment (Chapter 13).

6.7 Prior to the start of construction of each phase of the Development, necessary works will be carried out to prepare the Site for construction. These works are likely to comprise of the following main activities:

- Surveys of any buildings to be demolished to identify the extent of hazardous materials such as Asbestos-Containing Materials (ACM) and then their removal under controlled conditions;
- Identification of all underground services serving and transiting the Site. Services to be retained will require demarcation and protection; those to be removed will require termination and isolation;
- Installation of Site hoardings and establishment of a demolition/construction Site;
- Demolition of existing buildings and other structures, including existing hardstanding areas as required;
- Site preparation ready for foundation works;
- Further Site assessment investigations and surveys to define ground conditions for construction (e.g. geotechnical properties, soil and groundwater quality, potential for contamination);
- Phased programme of archaeological evaluation (potentially including trenching) to fully define the archaeological resources across the Site;

6.8 Further details on the construction methodology are also set out in the following paragraphs of this Chapter.

Anticipated Construction Methodology

Construction Machinery

6.9 Consideration has been given to the types of plant that are likely to be used during the construction works. The plant and equipment likely to be associated with the construction process is set out below in **Table 6.2**.

Table 6.2: Construction Plant

Type of machine	
Tracked/wheeled 360 degree excavators	Yes
Excavator mounted hydraulic breakers	Yes
Excavator mounted hydraulic crushers	No
Dumpers	Yes
Concrete crushing plant	No
Mobile/Tower cranes	Yes
Eight-wheel trucks	Yes

Type of machine	
Air compressors	Yes
Diamond cutting tools	Yes
Hand held tools including breakers (pneumatic and hydraulic)	Yes
Power tools including percussion drills, cutting disks, Pipe-threaders	Yes
Wheel washing plant	Yes
Piling rigs	Yes
Scaffold	Yes
Poker vibrator	Yes
Mobile access platforms	Yes
Delivery truck	Yes
Skips/skip trucks	Yes
Forklift trucks	Yes
Hoists (Goods & Passenger)	Yes
Ready mix concrete wagons	Yes
Concrete placing booms & pumps	Yes
Road sweepers	Yes

Pre-Construction

6.10 Prior to construction commencing, a full review of the Development and all background information will be undertaken, including dialogue with relevant key stakeholders.

6.11 From this review an outline method statement for the construction phase(s) of the Development will be produced and will form the basis of the on-going discussions with the various parties. This will be incorporated into the Construction Environmental Management Plan (CEMP). A pre-commencement safety risk register will be produced which will identify the high risk activities of the construction process. This will include:

- Interface with neighbours;
- Noise and dust;
- Public protection;
- Substructure works;
- Frame construction;
- Lifting operations;
- External cladding; and
- Building Services works.

Enabling Works

6.12 Initial site preparation works will comprise site clearance including the making good of previously developed parts of the Site. For the Site more generally, preparation works will also include the removal of topsoil and other vegetation as the vast majority of the Site is free of built development. This will be followed by an earth moving exercise to achieve required levels. Compaction of the engineered fill to create the final formation level will be carried out in layers using appropriate compaction plant. If contamination is found which requires remediation, this will be carried out as part of the enabling works using methods and controls agreed and supervised by the Environment Agency and Staffordshire Moorlands District Council.

6.13 Any removed soil will seek to be reused elsewhere on or adjacent to the Site for landscaping and/or land profiling purposes.

6.14 Waste will be managed in line with the principles of the Waste Hierarchy and the developer's policies and procedures. Building materials will be reused where appropriate in line with sustainable building practice. Materials that cannot be reused will be transported off site for (preferably) reuse /recycling or (if not) disposal, acknowledging the Duty of Care provisions.

6.15 Necessary drainage works will be carried out in all phases of the development. Across the Site as a whole, this will involve implementing a range of sustainable urban drainage measures (SUDS), comprising a combination of pipes, swales/ditches and balancing ponds, in preparation to receive surface water runoff. Please refer to Chapter 10: Water Resources, Drainage and Flood Risk, the Flood Risk Assessment (FRA) at ES Volume 2 **Appendix 10.1**.

6.16 Drainage works will utilise wheeled or tracked excavators to form trenches into which drainage pipes are placed. The pipes themselves will be surrounded by either gravel or dry mix concrete dependent on their location, which will be placed in the trench using small dump trucks.

Highways

6.17 Internal roads will be built as part of each phase. As an initial item of enabling works, an access road will be provided to the new employment area, which is required to run through part of the existing Blythe Business Park. A number of off-site highways works will also be required to enable the satisfactory delivery of the Development. The specific details of the proposed phasing strategy for highways works will be discussed and agreed with the relevant highway authority prior to construction and pursuant to relevant planning conditions or planning obligations.

Foundations

6.18 Foundations are expected to include a mix of piled foundations, traditional foundations and suspended slabs. Foundation design will be finalised on completion of the ground investigations. Spoil arisings will be sampled for potential contaminants and Waste Acceptance Criteria (WAC) testing and will be classified for re-use or removal off-site, in accordance with a Materials Management Plan.

6.19 A construction working platform will be created to facilitate easy access around the Site. This will be formed from a mix of recycled material and imported stone fill tipped on-site

from large wagons, distributed with dump trucks, levelled with wheeled excavators and compacted with vibrating rollers.

6.20 Foundations will be formed using concrete, placed either by pumping or directly from the concrete wagon.

Superstructure

6.21 The superstructure will commence following the sufficient progression of the substructures. Traditional brick construction techniques will be applied to the proposed residential properties. For employment buildings, it is anticipated that a mixture of concrete frame and steel frame construction will be used for the superstructure. This will be erected from the piled foundations using tower cranes or mobile cranes as appropriate. Floor slabs will be of either reinforced or pre-stressed concrete. Precast floor beams will be an option.

Demolition Works

6.22 Given the nature of the Site, it is anticipated that there will only be minimal works required in terms of the demolition of existing buildings on the Site. The precise quantity of material that the demolition will generate is difficult to calculate at this stage but that generated from demolished buildings and existing hardstanding areas will be relatively small. To enable the worst case effects to be assessed with respect to traffic, air quality and noise during the demolition and construction phase, it is assumed that all demolition material will be transported off-site for re-use, recycling and/or disposal. This is reflected in the assumptions relating to the number of vehicles anticipated to access and egress the Site.

6.23 Any hazardous demolition waste arising (e.g. asbestos) will be managed and removed by authorised specialists only. If demolition material is suitable for re-use, this will need to be managed under a Materials Management Plan.

External Works and Landscaping

6.24 New car parking areas, roads, and most hardstanding areas within the Development will normally be constructed in bituminous macadam or concrete block. Macadam will entail the use of large items of plant to pour and level the finished surfaces.

6.25 Preparation for new/enhanced landscaping and open space, including the placing topsoil, will be carried out using large and small excavators and dump trucks to transport materials. Planting will be carried out manually with the plants being transported to their locations either directly from the rear of the delivery vehicles or on pallets by adapted excavating machines.

6.26 Please refer to the Landscape and Visual Impact Assessment ES Chapter 7 and the separate Design and Access Statement for further details on landscaping works.

Proposed Alterations to Incoming Services

6.27 Statutory services will be brought into the Site as and when the programme dictates although the trenching works will be carried out alongside the substructure work. Some redirection of existing utility services across the Site will be required as part of the Development. In terms of utility infrastructure within the area, this will likely be insufficient to service the Development. Therefore it is anticipated that either new main

service routes will be provided to the Development or the existing infrastructures will need upgrading to enable the Development to be serviced.

6.28 Where possible the trenches will be left open so that the pipes and cables can be placed in directly. Where this is not possible, a series of ducts and draw pits will be installed to facilitate the introduction of the services at a later date. Generally this only applies to small pipes and cables and is not a suitable method for large and heavy installations.

Construction Traffic

6.29 The vast majority of construction traffic movements will be generated from Site operatives' cars and light vans, having a minimal effect on the surrounding highway network, which will be temporary in nature. Most construction machinery, including forklift(s) and cranes, will be delivered to the Site during the early stages of the build programme and will remain on-site for most of its duration.

6.30 Due to the outline nature of the Development, and the length and complexity of the anticipated construction programme (such as the potential for the construction of certain phases to overlap), it is difficult to define precisely the volumes of traffic that would be generated during the construction phase. Reasonable assumptions in relation to construction traffic have been considered in the preparation of the Transport Assessment and the associated Traffic and Transportation ES Chapter 8.

Construction Traffic Access and Off-Site Construction Routing

6.31 All construction traffic will enter and exit the site via Sandon Road. No turning of HGVs should be allowed outside of designated turning areas. A Construction Traffic Management Plan will be prepared to set out details on off-site construction routing.

6.32 Provision will be made, wherever possible, to ensure that vehicle unloading can be carried out on-site rather than on the adjacent roads. Should this become problematic during certain phases or elements of the construction process, such arrangement will be reviewed with appropriate authorities nearer the time.

6.33 The ingress and egress of construction traffic will be carefully located to minimise impact on surrounding highway and local road users. Access and egress for construction vehicles will vary according to the particular stage of construction as discussed above.

6.34 All construction traffic entering and leaving the Site will be closely controlled. Vehicles making deliveries to the Site or removing spoil or other material will travel via designated routes.

Construction Impacts

6.35 Detailed assessments of the likely significant effects on the environment that could result from the demolition and construction works are considered within Chapters 7 to 14 inclusive. However, a brief summary (without mitigation in place) is presented below.

Noise

- Increased road noise levels from vehicles; and
- Increased noise levels from plant during general construction works.

Vibration

- Increased vibration levels from vehicles; and
- Increased vibration levels from plant during general construction works.

Dust/Local Air Quality

- Generation of windblown dust nuisance from ground surfaces, stockpiles, vehicles, workforces and cutting and grinding of materials; and
- Generation of exhaust emissions from lorries and plant delivering and removing materials including dust and particulates which have the potential to impact upon local air quality.

Waste/Sustainability

- Waste generation and its appropriate disposal.
- Waste will be managed in accordance with a Site Waste Management Plan (SWMP) produced and submitted to LDC prior to work starting on Site (a draft SWMP is submitted as a standalone document as part of this application). The SWMP will ensure that the requirements of relevant legislation are met.

Traffic

- Traffic congestion caused by Site traffic and an increase in heavy goods vehicle (HGV) movements;
- Traffic disruptions from abnormal or hazardous loads; and
- Transfer of mud and material from vehicles onto the public highway creating pollution hazards.

Storage of fuels and construction materials

- Accidental spills and discharges to drains which may create pollution hazards.

Pedestrian access to Site and surroundings

- Temporary disruptions to pedestrian access and routes within the locality of the Site.

Hazardous materials and contaminated land

- Exposure of the workforce to hazardous materials and ground contamination (however, based on existing desk-based investigations, exposure to ground contamination is anticipated to be low).

Water Quality

- Water demand for construction activities and domestic use by the contractor (however, this is anticipated to be low);
- Generation of domestic foul effluent by contractors; and
- Increase in run-off due to creation of impermeable areas for contractor's site facilities.

Controls to Protect the Environment

6.36 The environmental controls (or mitigation measures) to eliminate, reduce or offset likely significant adverse environmental effects during the construction phase (as identified above) are identified below. It is anticipated that these controls will be secured by appropriate planning condition or obligation:

- Preparation of a Construction Environmental Management Plan (CEMP) which clearly sets out the methods of managing environmental issues for all involved with the construction works, including supply chain management;
- Requirement to comply with the CEMP included as part of the contract conditions for each element of the work. All contractors tendering for work will be required to demonstrate that their proposals can comply with the content of the CEMP and any conditions or obligations secured through the planning permission;
- In respect of necessary departures from the above, procedures for prior notification to the Council and affected parties will be established;
- Establishing a dedicated point of contact and assigning responsibility to deal with construction related issues if they arise. This will be a named representative from the construction team;
- Production of a regular newsletter to be circulated to the surrounding neighbours and authorities; and
- Regular dialogue with the Council and the local community.

Construction Environmental Management Plan

6.37 The preparation of a CEMP is an established method of managing environmental impacts resulting from construction works.

6.38 The CEMP will be submitted to the Council (and other relevant bodies) prior to the commencement of the works. Compliance with the CEMP is anticipated to be secured by appropriate planning conditions or obligations, and the obligations contained within it passed onto the main contractors as 'Employer's Requirements' within the contract for the works.

6.39 The structure of the CEMP will include the following:

- A table (logical framework) showing the objectives, expected results, activities (mitigation/optimisation measures), and responsibilities for the implementation of those activities;
- The broad plan of the phasing of the work and its context within the whole project;
- Inclusion of baseline levels for noise, vibration and dust and monitoring protocols;
- Setting of 'Threshold' and Action Levels' for noise, vibration and dust to warn of activities that may require particular care and control;

- Details of prohibited or restricted operations (location, hours etc.);
- Institutional arrangements for its implementation and for environmental monitoring: responsibilities, role of the environmental authorities, participation of stakeholders;
- Suggestions for contracts (environmental clauses and standards) and contracting modalities;
- A monitoring and supervision plan (including appropriate indicators, frequency of monitoring, means to gather and analyse the data, reporting system);
- A response plan in case of accidents or unexpected results from the environmental monitoring;
- Reference to ground conditions and remedial measures and/or mitigation associated with ground contamination if necessary;
- Contact during normal working hours and emergency details outside working hours;
- Provision for reporting, public liaison, and prior notification of particular construction related activities;
- The mechanism for the public to register complaints and the procedures for responding to such complaints;
- The details of proposed routes for heavy goods vehicles travelling to and from the Site; and
- Reference to management of material resources and waste (see further details in Waste Management section below).

6.40 Footways and carriageways will be kept tidy and in a safe condition, hoardings, safety barriers, lights and other features will be maintained in a safe and tidy condition. The Site is to be kept clean and in good order at all times with surplus materials and rubbish controlled within the Site and not allowed to spill over into the surroundings.

6.41 As far as is possible the Site operations will be carried out in such a way as to minimise the effects of noise and dust emissions from the Site. All plant and equipment will be fitted with suitable noise suppression facilities in accordance with the manufacturer's recommendations. The main contractor will also ensure that any artificial lighting of the Site and its perimeter is sufficient to ensure the safety of Site users. In addition artificial lighting will be located and orientated so that it does not cause intrusion to nearby residential property or distract passing motorists or railway users.

Health and Safety

6.42 Health and Safety is an integral part of the planning process for each project. Implementation of the Principal Contractor's comprehensive Health and Safety System

and Procedures will ensure every facet of the construction process is planned, managed, and monitored. This will also ensure compliance with statutory obligations.

6.43 Designers and contractors engaged on the project must be competent and adequately resourced. This will be achieved by;

- Completion of prequalification health and safety questionnaires;
- Interviews, to ascertain compliance with their legal duties;
- Review of existing Health and Safety Policies and procedures; and
- Review of their Health and Safety performance and site visits.

6.44 The Principal Contractor will produce a detailed construction programme based on the current information and the pre-tender plan. The plan will set out the arrangements for managing and monitoring the project. Sub or trade contractors engaged by the Principal Contractor to carry out works on the project will be issued with this Health and Safety Plan so that they can integrate the project management philosophy into their Health and Safety Plans. The project team will implement the plan assisted by the Principal Contractor's own Health and Safety Advisors.

6.45 All persons on the project will be encouraged to express their views and concerns about Health and Safety. This will be achieved by the formulation of various routes. These include;

- Project Health and Safety committees;
- Safety representatives from each contractor;
- Toolbox talks including a feedback process; and
- Discussion and briefing on method statements and risk assessments.

6.46 An 'open door' policy will be employed whereby any individuals can discuss Health and Safety issues with any member of the project team. Site notice boards, Tool Box Talks and posters are used to convey environmental, health and safety information to persons on the project.

6.47 Entry onto the construction Site will be restricted to authorised people only. Before entry, all persons will be required to undertake an induction dealing with site specific construction activities, site hazards, site rules, enforcement and nonconformity procedures, welfare facilities, first aid facilities, emergency procedures etc. Following induction all persons will be issued with an induction booklet along with an induction swipe card. Automatic turnstiles will prevent unauthorised and un-inducted persons progressing beyond the security point.

Hours of Work

6.48 Working hours on the Site will be agreed with the Council through the CEMP. However, it is likely that the standard hours of work will be adhered to. These are:

- Monday to Friday, 7.30am to 6pm;
- Saturday, 8am to 1pm; and

6.49 All work outside these hours will be subject to prior agreement of, and/or reasonable notice to the Council. By arrangement, there may be some out of hour's construction deliveries made to the Site.

Neighbourhood Liaison

6.50 It is important to recognise the importance of the neighbourhood liaison role in ensuring the smooth running of site activities and their relation to the local residents and general public's welfare.

6.51 This represents a key function through which the co-ordination of site activities, the needs of the neighbours and requirements of the statutory authorities are effectively communicated and dealt with. In this way all stakeholders are consulted and informed.

6.52 During the execution of the works, the Principal Contractor will be tasked with ensuring all works are carried out safely and in such a way it will not inconvenience pedestrians or other road users and with a positive consideration to the needs of the local residents, site personnel and visitors as well as the general public.

Management of Sub-Contractors

6.53 Where individual contracts are required (for example for waste removal) these will incorporate relevant requirements in respect of environmental controls, based largely on the standard of 'good working practice' as outlined in the CEMP as well as statutory requirements.

6.54 Potential sub-contractors will also be required to demonstrate how they will achieve the provisions of the CEMP, how targets will be met and how potential effects will be minimised.

6.55 Contractors will be required to comply with all provisions of relevant legislation including:

- The Control of Pollution Act, 1974, Part IV;
- The Health and Safety at Work Act, 1974;
- The Clean Air Act, 1993; and
- The Environmental Protection Act, 1990.

6.56 All trade contractors' method statements will be required to address the specific issues that may have a disruptive effect on the local community identified in the CEMP, including:

- Noise;
- Local air quality and dust emissions;
- Parking;
- Deliveries;
- Waste management; and
- Operatives' behaviour.

Management of Material Resources and Waste

6.57 Waste will be generated during all stages of the construction programme. However, this will be carefully managed and cleared to prevent nuisances such as litter, dust, odour and pests, and to maintain a "clean" working and site environment, for the benefit of all parties. Major sources of waste within the construction process are anticipated to include:

- Surplus soils from the construction;
- Packaging – plastics, pallets, expanded foams etc;
- Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage etc; and
- Liquid wastes, other than surface water run-off and foul drainage, such as waste oils and chemicals.

6.58 During the construction phase, requirements for the management of waste will be communicated to all contractors and sub-contractors to ensure that waste is managed in accordance with the waste hierarchy and relevant statutory controls. These measures will be controlled through the CEMP in consultation with the relevant authorities.

6.59 Where practical and suitable, surplus soil materials will be sought to be reused elsewhere on site. Careful consideration will be given to cut and fill volumes across the Site to seek to minimise the waste quantities produced from engineering operations.

Construction Material Quantities

Identification and Classification of Waste

6.60 A Site Waste Management Plan (SWMP) will be produced for the project in accordance with the requirements of the Site Waste Management Plan Regulations 2008 and will form part of the CEMP requirements.

Segregation and Storage of Waste

6.61 Procedures for the segregation and storage of waste will be detailed in the CEMP. This will include the use of colour-coded skips to facilitate segregation for re-use and recycling; inspection of containers to ensure they are fit for purpose; and the use of plastic sheeting to prevent leaching from waste soils and aggregates. There will not be any mixing of hazardous and non-hazardous wastes.

Waste Transfer and Duty of Care Requirements

6.62 For waste removed from the Site, notification by the Contractor/Construction Manager for approval (via consultation with the authorities) will take place. Loads will only be deposited at authorised waste treatment and disposal sites. Deposition will be in accordance with the requirements of the Environment Agency and all relevant legislation.

6.63 Any person removing waste from the Site will hold a current waste carrier's licence and all waste shall be received at an authorised waste treatment or disposal facility. The nominated person(s) with responsibility for waste will ensure that all relevant authorisations are in place prior to off-site removal. No burning of construction waste will be undertaken on the Site.

6.64 In addition, removal of any inert or non-hazardous waste from the Site will be accompanied by a Waste Transfer Note (WTN), signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Environmental Protection (Duty of Care) Regulations 1991 (as amended). This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).

6.65 To prove the correct depositing of waste material and to prevent the occurrence of fly-tipping, removal of any hazardous waste from the Site will be accompanied by a Hazardous Waste Consignment Note (HWCN), signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Hazardous Waste Regulations (England and Wales) Regulations 2005. This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).

6.66 Where it is identified that at least 200kg of hazardous waste will be generated in any twelve month period, the Site will be registered with the Environment Agency and a hazardous waste premises notification code obtained.

Site Drainage and Effects on Water Resources

6.67 The assessment of potential effects of the Proposed Development on water resources is presented in Chapter 9 Water Resources and Drainage. The contractor should ensure that any water which may have come into contact with any contaminated materials during construction will be disposed of in accordance with the Water Resources Act (1991) and other legislation, and to the satisfaction of the Environment Agency. In addition, any risk will be reduced as far as practicable by adopting good management practices and relevant measures described in the Environment Agency's Pollution Prevention Guidelines.

6.68 All liquids and solids of a potentially hazardous nature (for example diesel fuel, oils, and solvents) will be stored on surfaced areas, with double walled tanks, to the satisfaction of the Environment Agency.

Summary

6.69 This chapter has outlined the anticipated construction methodology and programme for the Development. A Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP) for the Development will be produced prior to the start of on-site works and will include all commitments to environmental protection; compliance with relevant planning conditions; detail on control measures and activities to minimise environmental impact; monitoring and record keeping requirements; point of contact details for dealing with any environmental enquiries; and a commitment to periodic review.