6 Construction

6.1 Introduction

6.1.1 This chapter describes the construction process including the enabling and construction works and the key activities that will be undertaken prior to completion and occupation of the Development. It also provides an outline of the indicative programme of the construction works and phasing.

6.1.2 Quod has prepared this chapter in conjunction with the Applicant and the project management, design and consultant team. It should be noted that this is a descriptive chapter. The information in this chapter is general at this time and may be subject to modification following appointment of a 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 design and consultant team with similar projects.

6.1.3 Assessments of construction impacts of the Development are provided in each technical chapter of this ES (i.e. Chapters 7 to 11 and ES Volume II). In addition, each technical chapter assesses the cumulative impacts of construction of the Development in conjunction with other schemes in the vicinity.

6.2 Programme of Works

6.2.1 The indicative delivery programme for the Development is estimated to be approximately 1.5 years. Subject to planning permission, construction is anticipated to commence in Q1 2022 and be complete by Q2 2023.

6.2.2 Construction of the Development is likely to take place continuously over the 1.5 year period, albeit at different levels of intensity. Spatial phasing and timing would depend on commercial factors. For the purposes of the EIA, a worst-case assumption was taken that the Development will be constructed over a single phase, wherein different types of construction works would take place concurrently across the Site. This overlap of activities can result in a greater impact magnitude and intensity of effect and, in turn, give rise to a greater significance of effect experienced by a sensitive receptor.

6.2.3 Therefore, this approach to the assessment of construction phase effects represents a worst-case assessment scenario when compared to a longer construction programme. Should the Development be constructed in separate phases and/or over a longer programme, the construction assessment as reported within this ES would therefore remain robust for decision making.

6.3 Description of Works

6.3.1 The following section provides an overview of the anticipated enabling and construction strategy for the Development.

Enabling Works, Infrastructure and Services

6.3.2 The following works are likely to form the basis of the enabling works, infrastructure and services stage, where relevant:

- Drainage / utilities investigations would be undertaken, as required;
- Hoarding or safety fencing would be erected around the boundary of construction areas. Root Protection Zones will be identified and measures such as fencing will be put in place to protect sensitive features (e.g. trees and other vegetation to be retained) in accordance with BS 5837, Trees in Relation to Design, Demolition and Construction[1]. An Arboricultural Impact Assessment (including Tree Protection Plan and Method Statement) is provided within Appendix 8.2 of the ES;
- Enabling works to utilities and any further infrastructure and services required by the Development would be carried out. This may include, but is not limited to, capping-off or removal of redundant utilities and boreholes, new supplies, diversions and connections for electrical, telecommunications, gas, potable water, foul water and surface water drainage infrastructure (including SuDS), as agreed with the statutory authorities; and
- To achieve the required Site levels there would be some general civil engineering groundwork activities including excavation, grading and preparation of surfaces as well as the placement/compaction of fill. During engineering groundwork activities for the Site, the removal of topsoil and vegetation will be undertaken.

Construction

6.3.3 Construction would commence on building structures following the completion of enabling works, and would follow the main stages of standard construction activities outlined below:

- **Foundations –** The specific type of foundations would depend on the design of the building and would be determined at the detailed design stage, however it is likely that pad foundations will be used.;
- **Sub-structure –** Some drainage and service runs will also be required to be buried or placed beneath the yards and other external areas;
- **Structure –** It is anticipated that a steel frame construction would be used. Buildings would be erected from the foundations and ground bearing slab using tower/mobile cranes or mobile platforms as appropriate;
- **Facade and Fit Out –** Once each building structure is sufficiently progressed the wall and roof cladding would be installed, floor slab, interior fit out and installation of mechanical, electrical and plumbing systems would then commence;
- **Roads, Carparking and Yards –** Involves the construction of the road surface (known as the ‘pavement’) over an earthwork foundation (known as the ‘formation layer’) over the area allocated for the SLR, internal road network, carparking or yard areas. The installation of kerbing and paved areas concerning footways, road restraint systems (e.g. vehicle and pedestrian safety barriers), road markings (e.g. white lining) and road signs would also be undertaken during construction of the pavement and formation layer; and,
- **External Works and Landscaping –** Areas of landscaping and open space would be prepared to establish the green spaces within the Site. This would include soil preparation, mound construction, tree and vegetation planting, seeding and the sustainable drainage systems.

6.4 Materials and Waste

Excavation and Groundwork Activities

6.4.1 It is anticipated that some site-won earthworks material will require off-site disposal. However, wherever possible, site-won materials would be re-used to create mounds around the Site periphery. Re-use of such materials would be dependent on it meeting relevant geotechnical specification requirements and being inert.

Construction Waste and Materials

6.4.2 A Sustainability Statement has been provided in support of the planning application which confirms that the Development will target a BREEAM 'Very Good' rating, capable of 'Excellent'. In seeking to achieve this target, the Development will seek to incorporate construction methods that apply the use of pre-fabricated units to minimise energy use and waste arisings.

Waste and Materials Management

6.4.3 Waste produced during all construction activities on-site will be subject to the 'Duty of Care' under the Environmental Protection Act 1990[2]. It will be the joint responsibility between the Principal Contractor and the Applicant to ensure that waste produced on-site is transported and disposed of in accordance with legislation. The quantities of materials and volume of waste is outline in the Sustainability Statement, submitted with the planning application.

6.4.4 The relevant 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. All relevant contractors will be required to operate in accordance with a Construction Environmental Management Plan (CEMP) (to be secured via a planning condition) 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"* through such measures as:

- 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;
- 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);
- Segregation of waste at source where practical;

- Skips to 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;
- Burning of wastes or unwanted materials will not be permitted on-site; and,
- Any waste arisings from the Site will be transported and disposed of in accordance with relevant legislation.

6.4.5 The project will seek to maximise the reuse of suitable soils on-site, where possible, in order to minimise waste disposal.

6.4.6 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.

6.5 Construction Methods

Plant and Equipment

6.5.1 An indicative list of large plant and equipment that are likely to be used at various stages of construction are shown in Table 6.1.

Table 6.1: Plant and Equipment

Equipment / Plant	Enabling Works, Infrastructure and Services	Foundations, Sub-structures and Structures	Facades and Fit-Out	Roads, parking and Yards	External Works and Landscaping
360^0 Excavator	✔	✔		✔	✔
Tower / Mobile Crane	✔	✔	✔		
Breaker		✔			
Compressor & Air Tools	✔	✔	✔	✔	✔
Drills / Cutters	✔	✔	✔	✔	✔
Compacter / Roller	✔			✔	✔
Piling Rigs	✗	✗			
Concrete Pumps	✔	✔		✔	✔
Generators	✔	✔	✔	✔	✔
Concrete Vibration Equipment	✔	✔		✔	✔
Scaffolding	✔	✔	✔		
Fork Lift Truck	✔	✔	✔		

Equipment / Plant	Enabling Works, Infrastructure and Services	Foundations, Sub-structures and Structures	Facades and Fit-Out	Roads, parking and Yards	External Works and Landscaping
Goods / Passenger Hoist		✔	✔		
Scissor Lifts / Cherry Pickers		✔	✔		
Mechanical Road Sweeper	✔	✔	✔	✔	✔
Floodlights	✔	✔	✔	✔	✔
Hydraulic benders and cutters	✔	✔	✔	✔	
Lorries and Vans	✔	✔	✔	✔	✔
Ready mix concrete trucks	✔	✔		✔	

Hours of Work

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

6.5.3 No continuous 24-hour activities are envisaged for works and any work on Sundays or Bank Holidays will be subject to reasonable notice. Any change to working hours will be agreed in advance with CDC.

6.5.4 Approval from CDC would be required for works that need to be undertaken outside of these hours. Typically, works that may need to be undertaken out of hours would be for the delivery and removal of abnormal loads, for which the principal contractor would be expected to make the necessary road closure applications to OCC, if required.

6.5.5 The following enabling activities are expected to be permitted to take place within the period before and after normal working hours as outlined above:

- Arrival and departure of workforce on-site;
- Deliveries and unloading;
- Check and examinations of plant and machinery (including test running) and the carrying out of essential repairs / maintenance to plant and machinery;

- Site inspections and safety checks; and
- Site clean-up.

6.5.6 These hours will be strictly adhered to unless or in the event of:

- An emergency demands continuation of works on the grounds of safety;
- Minor internal works are being carried out within the confines of the building envelope; or
- Completion of an operation that would otherwise cause greater interference with the environment /general public if left unfinished.

6.6 Construction Traffic

Construction Vehicle Movements

6.6.1 During construction, all vehicles will access and egress the Site via Middleton Stoney Road through the Axis J9 development.

6.6.2 The estimated numbers of enabling and construction-related vehicle journeys, including HGV movements, have been projected for the busiest periods during the enabling works and construction programme to allow for an assessment of the 'worst case' scenario; thereby making the assessment as robust as possible. A full assessment of the construction vehicle movements on the surrounding road network is presented within ES Chapter 8: Transport and Access.

6.6.3 Based upon construction experience of similar schemes, it is considered that during the main construction phases, on an average daily basis there would be a total of 20 two-way HGV movements.

6.6.4 While there would be peaks in activity where vehicle movements would be more concentrated, typically to peak hours, efforts will be taken to minimise the number of movements during these periods. See Section 6.8 for further details on environmental management and mitigation measures, which includes information on Construction Traffic Management Plan(s) (CTMP).

6.6.5 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. Local traffic management measures for Site access will be agreed with OCC prior to construction commencing.

6.6.6 An assessment of the impact of construction vehicle movements on receptors is presented within Chapter 8: Transport and within Appendix 8.1: Transport Assessment.

6.7 Potential Environmental Effects

6.7.1 All construction sites have the potential to cause temporary nuisance and disruption to sensitive receptors situated within the Site or in the surrounding area. Table 6.2 provides a summary of potential effects which could arise in the absence of mitigation measures.

Table 6.2: Summary of Potential Construction Effects

Topic	Potential Effects
Socio-economics	Temporary increase in construction-related employment and jobs. Increased local expenditure as a result of the Development construction workforce in the surrounding area.
Transport and Access	Temporary traffic disruptions due to road closures and diversions, if required. Traffic disruption caused by Site vehicles and an increase in HGV movements. Transfer of mud and materials from vehicles onto the public highway. Disruption to pedestrian / cycle access and routes within the locality of the Site.
Air Quality	Temporary generation of windblown dust from cleared surfaces, stockpiles, vehicles, work areas. Generation of exhaust emissions from construction vehicles and plant. Temporary release of odorous compounds during Site remediation works, if required.
Noise and Vibration	Temporary increased road noise and vibration generated from construction vehicles, plant and machinery required for construction of the Development.
Biodiversity	Loss of arable habitat and associated loss of foraging and breeding habitat for birds. Protection of habitats to be retained.
Landscape and Visual	Temporary visual intrusion of construction, with respect to hoarding/ machinery / plant / site offices / lighting etc., to nearby residents and occupiers of commercial and industrial properties in the Axis J9 development.
Water Resources	Accidental spills and discharges from the storage of fuels, construction materials, plant and machinery to groundwaters and/or drains.
Ground Conditions and Soil	Accidental spills and discharges from the storage of fuels, construction materials, plant and machinery contaminating surface soils.

6.8 Environmental Management and Mitigation Measures

Construction Environmental Management Plans

6.8.1 The Applicant has committed to implementing a CEMP during enabling and construction activities. The CEMP will set out the strategy, standards, control measures and monitoring procedures that will be implemented to manage and mitigate any adverse environmental effects of the construction process.

6.8.2 The mitigation measures within the technical chapters (i.e. Chapter 7 to 11 and ES Volume II) will be included within the CEMP, where applicable. These will be reviewed at the detailed enabling works and construction planning stage(s) to ensure that the mitigation measures and management controls and/or procedures adopted are sufficient to meet the commitments made throughout the assessments.

6.8.3 The CEMP will refer to industry standards, good practice and guidance, such as the Guidance for Pollution Prevention (GPPs) notes (i.e. GPP13: Vehicle Washing and Cleaning[3]; and GPP22: Dealing with Spills[4]) and will remain a live document to ensure that

it is specific to the works and processes that are to be employed during construction site activities. The CEMP will include details on roles and responsibilities, control measures and activities to be undertaken to minimise environmental effects, as well as monitoring and record-keeping requirements. It also provides a framework for engaging with local businesses including adjacent commercial occupiers within the Axis J9 development, residents and communities and their representatives throughout the construction period.

6.8.4 The 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 CEMP. The CEMP will be subject to approval by CDC and their preparation and implementation could be secured through an appropriate planning condition.

6.8.5 The CEMP will comprise, but not be limited to, the following elements to minimise the environmental effects of the Development's construction on the surrounding area:

- Construction Method Statement;
- Construction Traffic Management Plan (CTMP);
- Neighbour and public relations;
- Management of trade contractors;
- Noise and vibration;
- Air quality;
- Waste management;
- Ground conditions and soil;
- Protection of water resources; and
- Ecology.

Construction Method Statement

6.8.6 A Construction Method Statement ('CMS') would be provided together with a CEMP. The CMS will outline the different activities and procedures to be undertaken in order to complete the various construction works. The CMS will include the following main items:

- A detailed construction programme for works, highlighting the various stages and their context within the project, including a full schedule of materials and manpower resources, as well as plant and equipment schedules;
- Detailed site layout arrangements (including requirements for temporary works), plans for storage, accommodation, vehicular parking areas, delivery and Site access and egress;
- Prohibited or restricted operations (locations, hours, etc.);
- Details of operations that are likely to result in disturbance, with an indication of the expected duration of each activity with key dates, including a procedure for prior notification of the CDC and relevant statutory and non-statutory (including neighbours) parties so that local arrangements can be agreed;
- Provisions for affected parties to register complaints and the procedures for responding to complaints; and,

- Provisions for reporting to the Applicant and CDC, if required.

Construction Traffic Management Plan

6.8.7 A Construction Traffic Management Plan (CTMP) will be prepared to control traffic during the temporary period of construction, which is expected to be secured by planning condition.

6.8.8 The CTMP will ensure that a strategy for planning of the construction access routes will be implemented to take into account current legislation, police, fire authority and Health and Safety Executive guidance, local authority transport schemes and neighbourhood lorry restrictions.

6.8.9 The CTMP would enable and manage all types of HGVs to and from the Site during construction. This would improve the safety and reliability of deliveries to the Site, reducing congestion and minimise the environmental effects. No road closures are anticipated as part of the construction works.

6.8.10 Directional signage will be implemented to ensure that construction traffic utilises designated routes to minimise the effect on the surrounding road network. Locations for temporary signage for the approved route will be discussed with the OCC Highway Officers.

6.8.11 HGV movements will be restricted as far as reasonably possible to avoid peak traffic flow periods (i.e. from 08h00-09h00 and 17h00-18h00). All construction traffic entering and leaving the Site will be closely controlled and during delivery times traffic marshals will be positioned, as necessary, at the egress/ingress point to control and record entry and exit movements. No construction traffic will turn right onto Middleton Stoney Road, or left onto Howes Lane when leaving the Site. It is expected that all construction traffic will be routed via the M40 and B4030 Vendee Drive.

6.8.12 The CTMP(s) will be reviewed and updated in line with the final construction programme and is expected to include details of the following:

- Temporary traffic control measures, if required;
- Timing controls (e.g. limiting peak period vehicle movements);
- Temporary and permanent access arrangements for personnel/vehicles;
- Traffic management procedures for waste disposal vehicles;
- Personnel and vehicle segregation;
- Safety measures to protect the public/Public Rights of Way;
- Equipment (e.g. road cones, temporary fencing and signage);
- Provision to ensure that vehicles can be loaded and unloaded off the public highway where possible;
- Measures to encourage the site labour force to use public transport to travel to and from the Site;
- Housekeeping measures (e.g. HGV wheel washing prior to vehicles leaving the Site, use of road sweepers); and,
- Consultation and liaison process with neighbouring businesses, construction sites and other stakeholders.

Neighbour and Public Relations

6.8.13 A key aspect of the successful management of the project will be the maintenance of good relations with Site neighbours and the general public. The Applicant will require the principal contractor to be the first line of response to resolve issues of concern or complaints. Reasonable steps will be taken to engage with local residents during the Development. Site boards outlining information on the project and forthcoming works will be erected at the entrance to the Site. Site contact numbers will be displayed as appropriate along with the complaints procedure.

References

[2] Her Majesty's Stationary Office (1990). *The Environmental Protection Act 1990*.

[3] Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2017). *Guidance for Pollution Prevention: Vehicle Washing and Cleaning PPG13.*

[4] Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2018). *Guidance for Pollution Prevention: Dealing with Spills.*