

5.0 CONSTRUCTION METHODOLOGY & PHASING

Introduction

- 5.1 This chapter describes the anticipated demolition and construction methodology and phasing of the Development. Consideration of likely significant effects on the environment that may arise during the demolition and construction phase, and any necessary mitigation measures, are provided within the respective technical chapters of this ES.
- 5.2 Planning for demolition and construction is necessarily broad at this stage and may be subject to modification. This chapter is based on reasonable assumptions and experience and allows assessment of the realistic “worst case” demolition and construction phase effects.

Anticipated Programme

- 5.3 Demolition of the existing buildings on site and construction of the Development is anticipated to commence at the beginning of 2018 subject to gaining planning permission, and span approximately six years. Overall, the construction process is expected to be completed by 2024. The commercial element of the Development will be built out in one phase and is anticipated to be complete in early 2019, the residential element will be built out in six phases and is anticipated to be completed in 2024. A phasing plan is shown in Figure 5.1. Table 5.1 and Table 5.2 show an indicative construction and phasing programme.

Table 5.1: Indicative Construction Programme

Activities	Duration (weeks)
Demolition works	36
Excavation / site levelling	3
Foundation works	10
Drainage works	10
Superstructure works	16
Fit-out and landscaping	18

Note the above periods overlap and are indicative dependant on the final construction programme.

Table 5.2 Construction Phasing

Phase	Number of Residential Units / other development	Anticipated Construction Start Year	Anticipated Completion Year
Commercial Element			
Phase 1	22,600 sqm (B1c/B2/B8) & Data Centre	2018	2019
Residential Element			
Phase 1	350 residential units	2018	2021
Phase 2	132 residential units	2018	2019

Phase	Number of Residential Units / other development	Anticipated Construction Start Year	Anticipated Completion Year
Phase 3	179 residential units	2018	2020
Phase 4	490 residential units	2021	2024
Phase 5	212 residential units	2023	2024
Phase 6	18 residential units	2023	2024

- 5.4 With the exception of the canteen building and the main factory building facade, all other buildings on Site will be demolished (see Figure 5.2). All asbestos related materials will be removed from the Site under the necessary controlled conditions, all plant and equipment will then be removed from Site. The existing buildings will be demolished, including the grubbing up of existing foundations, pads and basements. All demolished material will be crushed and screened on Site so the recycled stone materials can be re-used within the construction works on Site.
- 5.5 A proportionate building record will be undertaken in accordance with the relevant best practice guidance, prior to the demolition of the Nestlé Works (Lodge) (locally listed building). Further information is provided in Chapter 9 Built Heritage.

Outline Construction Methodology

Demotion and Construction Machinery

- 5.6 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 each key element of the construction process is set out in Table 5.3.

Table 5.3 Plant used during the Demolition and Construction Process

Type of Equipment	Required for Construction Phase
Tracked/wheeled 360 degree excavators	✓
Concrete Crushers	✓
Dumpers	✓
Mobile cranes	✓
Hand held tools including breakers (pneumatic and hydraulic)	✓
Power tools including percussion drills, cutting disks, pipe-threaders	✓
Piling equipment	✓
Wheel washing plant	✓
Scaffold	✓
Mobile access platforms	✓
Delivery trucks	✓
Skips / Skip trucks	✓
Forklift trucks	✓
Ready mix concrete wagons	✓
Concrete placing booms & pumps	✓
Road sweepers	✓

Enabling Works

5.7 Enabling works would comprise:

- Removal of asbestos from buildings;
- Arboricultural works – including the protection of trees/vegetation to be retained and removal of trees/vegetation where applicable;
- Ecological works, where required;
- Installation of any site hoarding and security fencing;
- Ground modelling works including topsoil stripping and stockpiling for later use;
- General clearance; and
- Installation of temporary surface water management measures.

5.8 Geo-Environmental investigations have been undertaken at the Site on a number of occasions between 2014 and 2016. The findings of these investigations have been used to determine the requirements for environmental remediation, which in summary comprise:

- Removal of asbestos containing materials from near-surface soils, and
- Removal of localised hotspots of soil impacted by petroleum hydrocarbons.

5.9 It is proposed that the majority of the remedial work be undertaken during development enabling works associated with the demolition of existing site structures, removal of old foundations and construction of new development platforms.

5.10 It is also proposed to implement a 'reactive strategy' to evaluate and if necessary remove from Site any ground contamination not revealed during the ground investigations that is discovered during the demolition and/or construction periods.

Excavation and Sub-Structure Works

5.11 Excavation work, preparation of ground works and installation of foundations would take place at this stage. It is anticipated that piled / vibro compaction foundations will only be necessary in some localised areas of the commercial element of the Development. For the residential element of the Development, it is anticipated that piled foundations will be necessary in the majority areas.

5.12 Sub-structure works may involve:

- Localised re-grading within the Site to create level development platforms for the structures;
- Installation of piled foundations and associated pile caps and ground beams;
- Excavation for foundations to allow installation of any below ground services; and
- Installation of ground slabs (ground bearing or suspended slab) and supporting beams.

5.13 Block B will also include works to provide a partial basement carpark (providing 135 spaces).

Drainage works

5.14 Temporary drainage infrastructure will be installed by the main development contractor to manage and regulate surface water run-off during the construction period.

5.15 All site works will be undertaken in accordance with CIRIA (2001) Control of Water Pollution from Construction Sitesⁱ which promotes environmental good practice for control of water pollution arising from construction activities.

5.16 Construction vehicles will be properly maintained to reduce the risk of hydrocarbon contamination and will only be active when required. Construction materials will be stored, handled and managed with due regard to the sensitivity of the local water environment and thus the risk of accidental spillage or release will be minimised.

5.17 In accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001ⁱⁱ, any tanks storing more than 200 litres of oil will have secondary bunding. Bunding will be specified having a minimum capacity of "not less than 110% of the container's storage capacity or, if there is more than one container within the system, of not less than 110% of the largest container's storage capacity or 25% of their aggregate storage capacity, whichever is the greater." Any above ground storage tanks will be located on a designated area of hardstanding. No underground storage tanks will be used during the construction period. Storage of liquids such as degreasers, solvents, lubricants and paints will be in segregated, banded enclosures.

5.18 The construction drainage system will be designed and managed to comply with BS6031 "The British Standard Code of Practice for Earthworks"ⁱⁱⁱ, which details methods that should be considered for the general control of drainage on construction sites. Further advice is contained within the Geotechnical Design, General Rules (BS EN 1997)^{iv} which should be read in conjunction with Basis of Structural Design (BE EN 1990)^v.

5.19 The following control measures will also be incorporated into the Construction Environmental Management Plan (CEMP):

- Temporary surface water management system, for example oil interceptors, holding tanks to remove suspended sediment before discharge etc;
- Equipment maintenance;
- Wheel washing;
- Covering stockpiles; and
- Storage of substances in accordance with applicable legislation

5.20 Further information on the CEMP is provided below.

Construction of Superstructure

5.21 This stage will involve the construction of the main building structure and would include the pouring of concrete, the installation of steel frames, brick facade walls, reinforced masonry and the external building fabric.

Fit Out

5.22 Fit out of the Development will involve the installation of block work party walls, dry lining to internal walls, internal walls, domestic mechanical and electrical installations with fitted kitchens and bathrooms, as well as the construction and fitting out of the office areas of the industrial units.

Landscaping

5.23 Landscaping works will involve some ground modelling works and the establishment of green spaces within the Site including soil preparation, tree and vegetation planting, seeding, construction of footpaths/cycle routes. The ground modelling works will be undertaken concurrently with the site preparation and substructure works outlined above.

Material and Resource Use

5.24 This section describes the materials and other resources required for construction of the Development.

- 5.25 The primary construction materials to be used will include concrete, steel columns and beams, brickwork & blockwork, aluminium, glass and timber. Where possible materials and resources used during the construction of the Development will be sourced from the local area. Furthermore, a proportion of timber will be purchased from sustainable forest sources. In terms of material selection, 'A' rated materials from the Building Research Establishment's Green Guide to Specification will be preferred, where possible.
- 5.26 The construction of the Development is likely to require the following:
- 29,022m³ of concrete; and
 - 58,044m² brickwork.

Construction Phase Vehicle Movements

- 5.27 Construction vehicle movements will be managed to minimise the impact on the local road network. Table 5.4 provides an indicative level of construction traffic trip generation associated with the demolition and construction phase of the Development.

Table 5.4: Demolition & Construction Traffic

Vehicle Type	Average Trips Per Day
HGV	15-20
Cars and Light Goods	35-40

- 5.28 The HGV movements would be dispersed across the working day outside of the AM and PM peak periods. The arrival and departure of light vehicles would be concentrated during the morning and evening periods, but would be less than the predicted levels of traffic during the operational phase of the Development.

Construction Traffic Access and Management

- 5.29 Construction Traffic access for the residential element of the Development will be via the existing access on Nestles Avenue. The commercial element will take access of North Hyde Gardens. Construction vehicles will access the site using the main arterial roads, most notably the A312 and the A437, as far as possible to minimise the impacts on the local road network. All traffic will be encouraged to avoid Hayes town centre. Measures will be put in place to ensure the existing historic gates and railings are protected from any potential damage from construction vehicles.

- 5.30 If abnormal or oversized loads are required to deliver materials to the Site, notice will be given to LBH, depending on the routing, and also the Police, the Fire Brigade, and other emergency services, sufficiently in advance of the required closure or diversion dates. Should any hazardous materials arise during the course of the works, these materials will be transported to a licensed disposal site using permitted routes as identified in the Construction Traffic Management Plan.
- 5.31 All vehicle unloading will take place within the Site and will not affect public highways or adjacent occupiers.
- 5.32 All management of construction traffic and access will be carried out in accordance with a Construction Management Plan (CMP) as set out below:
- Planning and managing both vehicle and pedestrian routes;
 - The elimination of reversing, where possible;
 - Safe driving and working practices;
 - Protection to the public;
 - Adequate visibility splays and sight lines;
 - Provision of signs and barriers; and
 - Adequate parking for off-loading storage areas.

Controls to Protect the Environment

- 5.33 The environmental controls (or mitigation measures) to eliminate, reduce or offset likely significant adverse effects on the environment during the construction phase (as identified above) are identified below. It is anticipated that these controls will be secured by appropriately worded planning conditions or obligations:
- Preparation of a CMP, including the CTMP, 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 LBH, as appropriate, 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 newsletter to be circulated to the surrounding neighbours and authorities; and
- Regular dialogue with LBH and the local community.

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

5.35 The CEMP will be submitted to LBH (and other statutory authorities) prior to the commencement of the works. Compliance with the CEMP will be to be secured by planning condition. The structure of the CEMP will include the following:

- A table showing the objectives, activities (mitigation/optimisation measures), and responsibilities for the implementation of those activities;
- The broad plan of the work programme including working hours and delivery times;
- 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;
- 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; and
- The details of proposed routes for HGVs travelling to and from the Site.

Site Offices & Welfare Accommodation

5.36 Specific offices and accommodation for construction staff will be required and located on-site.

Hours of Work

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

- Monday to Friday, 8am to 6pm;
- Saturday, 8am to 1pm; and
- Sunday and Bank Holidays, no noisy activities on-site.

- 5.38 Night-time working will be restricted to exceptional circumstances, and work internally with buildings. By arrangement, there may be some out of hours construction deliveries made to the Site.
- 5.39 Specific offices and accommodation for construction staff will be required and located on site.

Management of Construction Works

- 5.40 All contractors will be required to complete a method statement and risk assessment and obtain a works permit from the Applicant prior to commencement on Site.

Response to Complaints

- 5.41 Any complaints will be logged on-site and, where necessary, reported to the relevant individual within LBH, as appropriate, (and vice versa) as soon as practicable.

Prior Notice

- 5.42 In the event of unusual activities or events, these will be notified to LBH, as appropriate, and relevant property owners or occupiers in advance. The relevant activities will be agreed with LBH, as appropriate, once the detailed programme of construction is defined. This will include:
- Necessary night-time, weekend or evening working (outside core areas) of a type which may affect properties; and
 - Road or footpath closures/diversions and movements of wide loads (unlikely to be required).
- 5.43 The community will be kept informed during the construction phase through press adverts, LBH, and through direct notification to Parish Councils as appropriate. Letter drops to nearby residents will also be undertaken in advance of work commencing.

References

ⁱ CIRIA C532 (2001) Control of Water Pollution from Construction Sites Guidance for consultants and contractors

ⁱⁱ The Control of Pollution (Oil Storage) (England) Regulations 2001, Statutory Instrument 2001 No. 2954

ⁱⁱⁱ British Standards Institution (December 2009) BS6031:2009 Code of Practice for Earthworks

^{iv} British Standards Institution (December 2004) BS EN 1997-1:2004 Eurocode 7. Geotechnical Design. General Rules.

^v British Standards Institution (2002) BS EN 1990: 2002 Basis of Structural Design