

Chapter 5: Demolition and Construction

INTRODUCTION

- 5.1** This chapter of the ES describes the proposed programme of demolition and construction works, specifically the key activities that will be undertaken prior to the completion and operation of the Proposed Development. This chapter of the ES provides a description of the demolition and construction works for the purposes of identifying and assessing the potential demolition and construction related environmental impacts and resultant environmental effects of the Proposed Development. The assessment of these impacts and effects is reported within each technical topic chapter of this ES (**ES Volume 1, Chapters 6-15** and **ES Volume 2**).
- 5.2** Planning for construction is broad at this stage in the planning process and may be subject to modification during the detailed planning of these works, particularly following appointment of a contractor and throughout preparation of various management plans including a Demolition Method Statement (DMS) and Construction Method Statements (CMS). The information presented within this ES chapter is therefore based on reasonable assumptions made by the Applicant and the wider planning and design teams, specifically for projects which have involved consideration and management of complex issues such as working near to existing commercial and residential property, to busy main roads, water courses and in proximity to underground constraints and surface utilities and other infrastructure. The information presented within this ES chapter is therefore suited to this stage of planning. It is also considered robust for the purposes of the Environmental Impact Assessment (EIA) in defining a reasonable worst-case scenario for the purposes of assessment and any non-material changes to the timings of works and sequence of plot delivery is not considered likely to affect the findings and conclusions of the technical assessments. Any future material changes to the timings of works and sequence of plot delivery has the potential to affect the conclusions of the technical assessments undertaken in this ES, and as such updated assessment may be required.
- 5.3** Various environmental management controls will form the basis of a Construction Environmental Management Plan (CEMP) that will be implemented over the duration of construction works. It is anticipated that multiple CEMPs will be prepared for the Proposed Development. An Outline CEMP is presented in **ES Volume 3, Appendix: Demolition and Construction – Annex 1** which provides a framework for the future CEMP(s), the detail of which would be confirmed at a subsequent planning stage as indicated above. Demolition and construction related management, mitigation and monitoring measures on a topic-by-topic basis are described within the relevant technical chapters of this ES, as well as summarised in **ES Volume 1, Chapter 18: Environmental Mitigation and Monitoring Schedule**. The CEMP(s) will define, amongst other things, the hours of operation, dust control measures and vehicle emission control. In addition to the environmental management measures and procedures (such as noise control and dust suppression (etc.)), consideration shall also be given to construction materials quantities and best practice environmental standards for construction sites.
- 5.4** In addition to the Outline CEMP, other supporting management plans have been drafted and submitted in support of the Planning Application, as set out as relevant within **ES Volume 1, Chapter 18: Mitigation and Monitoring Schedule**.
- 5.5** It is anticipated that the implementation of the CEMP(s) as well as required management plans as relevant (e.g. Dust Management Plan) will be secured through appropriately worded planning conditions. The Outline CEMP and this ES chapter are based on established good management principles. It is intended that the detailed CEMP(s) (and other plans, as relevant) will be 'live working' documents, and that the Principal Contractor's appointed representative will update the documents according with any amended construction environmental management measures as the scheme progresses.
- 5.6** In addition, the site will be registered with the UK's Considerate Constructors Scheme.
- Anticipated Works and Programme**
- Summary of Anticipated Works**
- 5.7** The anticipated works comprise a phased residential and commercial development and associated demolition and infrastructure and public realm improvements. Phase 1 includes a new stadium and commercial complex (Plots 1 and 2) plus commercial and residential development; Phase 2 comprises residential led development towards the river frontage.(refer to **Figure 5.1** for the indicative phasing plan and **Figure 5.2** for the Proposed Development plots). The works are summarised as:
- Phase 1 – Plots 1-8, 15-19 and associated improvements to infrastructure and open space;
 - Phase 2 – Plots 9-14 and further associated open space; and
 - Public realm works to be delivered within each plot as relevant.

Programme of Works

- 5.8** The current expectation is that the demolition and construction works would take approximately 96 months (8 years) over 9 calendar years.
- 5.9** **Table 5.1** and **Figure 5.3** show the indicative demolition and construction programme. The programme has been defined solely for the purposes of the EIA specifically, the assessment of the likely significant effects of the Proposed Development over the build programme and on completion and operation and for no other purposes.
- 5.10** The indicative programme has been produced by an experienced construction manager and is representative of a programme that is reasonable and achievable. The programme presents the likely sequence of activities and is based on reasonable assumptions in terms of the sequencing of works and site logistics. If the construction programme does not commence or end by the period specified in this ES Chapter, and instead commences or ends at a later date, the timings for when environmental effects are realised will adjust to reflect any programme adjustment. **Figure 5.4** through to **Figure 5.11** illustrates the sequence of construction identified on the programme of works.

Table 5.1 Indicative Construction Timetable

Construction Task / Activity	Duration	Start Date (Quarter and Year)	Completion Date (Quarter and Year)
Phase 1: Site Establishment/ Demolition	15 months	Q4 Year 1	Q4 Year 2
Phase 1: Infrastructure - Highways	12 months	Q4 Year 1	Q4 Year 2
Phase 1: Plots 1&2	22 months	Q4 Year 2	Q3 Year 4
Phase 1: Plot 19	24 months	Q1 Year 2	Q4 Year 3
Phase 1: Plot 18	28 months	Q3 Year 2	Q4 Year 4
Phase 1: Plot 17	29 months	Q4 Year 2	Q2 Year 5
Phase 1: Plot16	29 months	Q1 Year 3	Q3 Year 5
Phase 1: Plot 15	28 months	Q2 Year 3	Q3 Year 5
Phase 1: Plot 3	20 months	Q3 Year 3	Q1 Year 5
Phase 1: Plot 4	26 months	Q3 Year 3	Q3 Year 5
Phase 1: Plot 5	27 months	Q4 Year 3	Q4 Year 5
Phase 1: Plot 6	18 months	Q1 Year 4	Q2 Year 5
Phase 1: Plot 7	20 months	Q1 Year 4	Q4 Year 5
Phase 1: Plot 8	20 months	Q2 Year 4	Q4 Year 5
Phase 2: Site Establishment/ Demolition	6 months	Q1 Year 6	Q2 Year 6
Phase 1: Infrastructure - Highways	6 months	Q1 Year 6	Q3 Year 6
Phase 2: Plot 14	27 months	Q2 Year 6	Q2 Year 8
Phase 2: Plot 9	26 months	Q3 Year 6	Q3 Year 8
Phase 2: Plot 13	24 months	Q4 Year 6	Q4 Year 8
Phase 2: Plot 10	25 months	Q1 Year 7	Q1 Year 9
Phase 2: Plot 12	34 months	Q4 Year 6	Q3 Year 9
Phase 2: Plot 11	27 months	Q2 Year 7	Q3 Year 9
Public Realm, Landscape and Green space improvements	Completed in respective plots to suit building completions		

Figure 5.1 Proposed Development Indicative Phasing¹

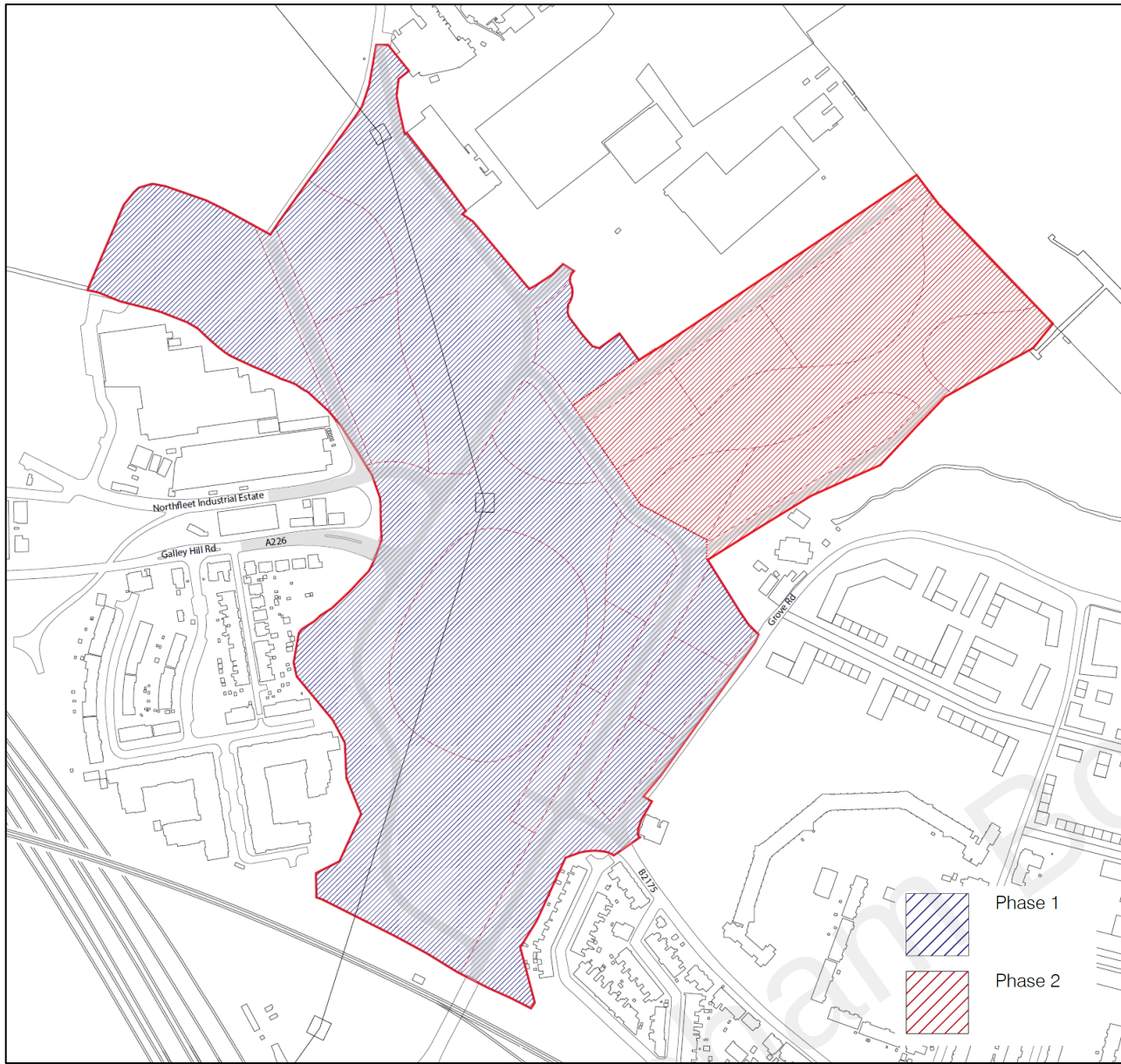


Figure 5.2 Proposed Development Plot Boundaries²



¹ Parameter Plan – Indicative Phasing (Drawing Reference: NFH-UNS-MAST-DR-1016).

² Parameter Plan – Plots Plan (Drawing Reference: NFH-UNS-MAST-DR-1004).

Figure 5.3 Indicative Demolition and Construction Programme

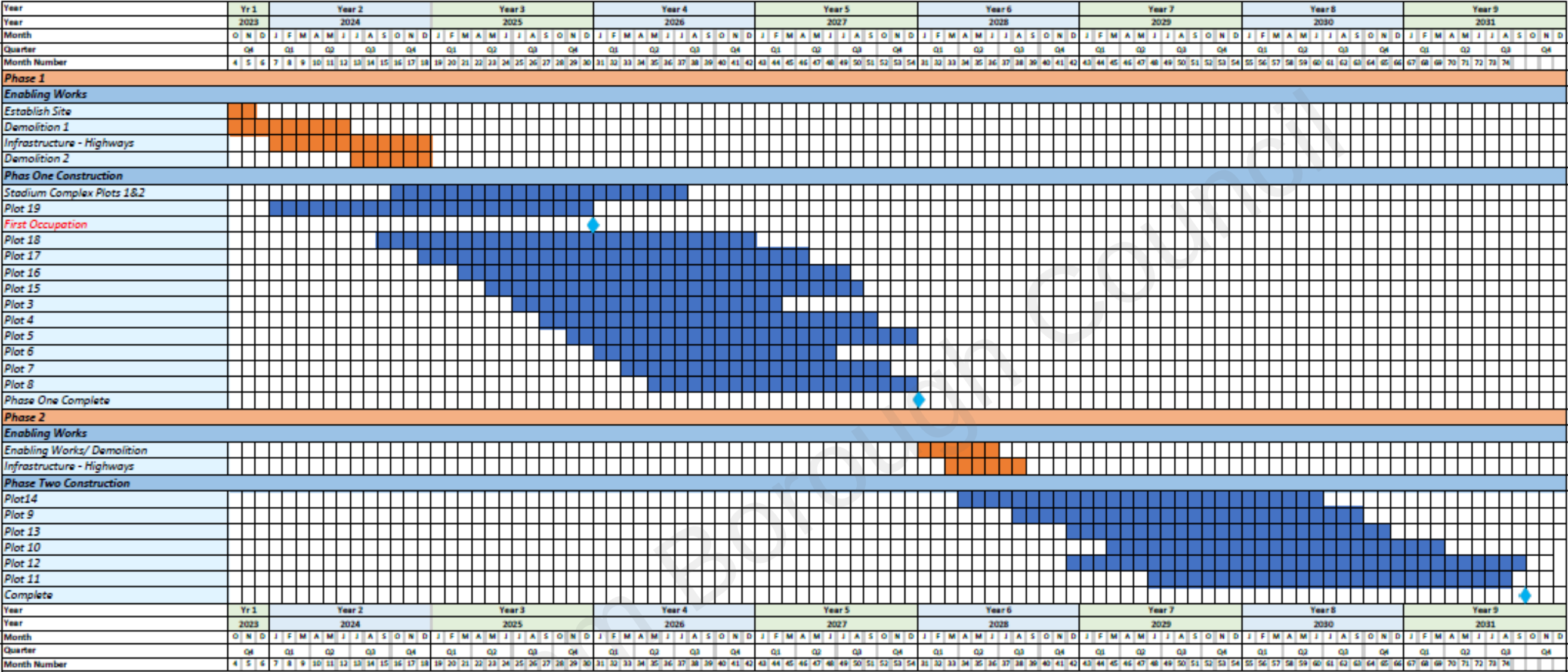


Figure 5.4 Year 1

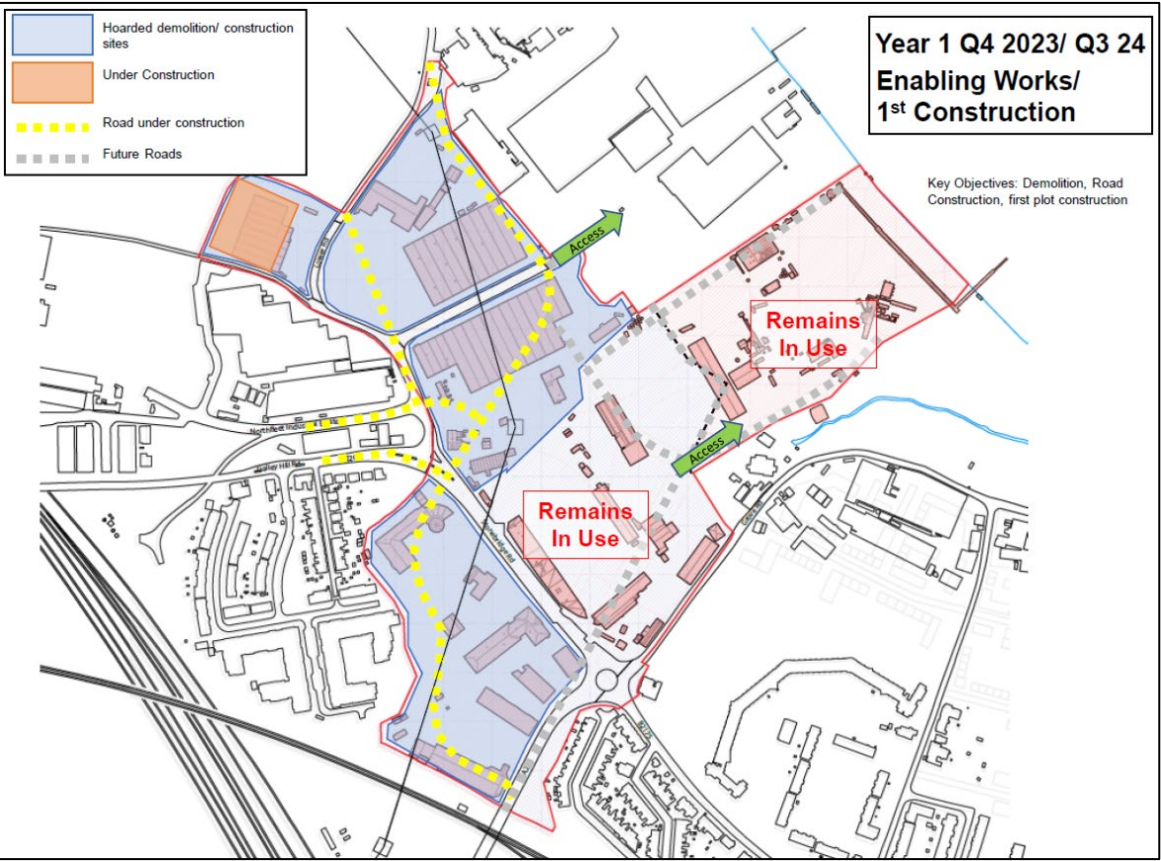


Figure 5.5 Year 2

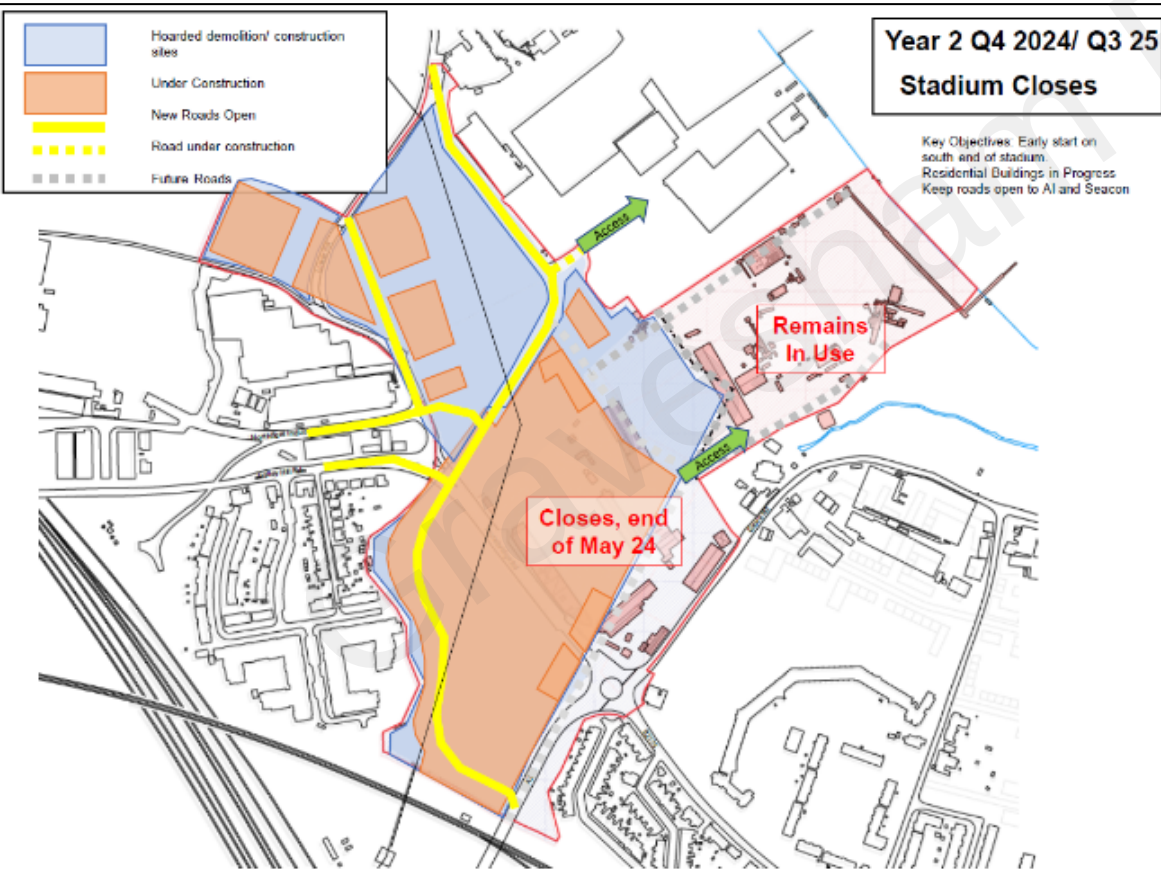


Figure 5.6 Year 3

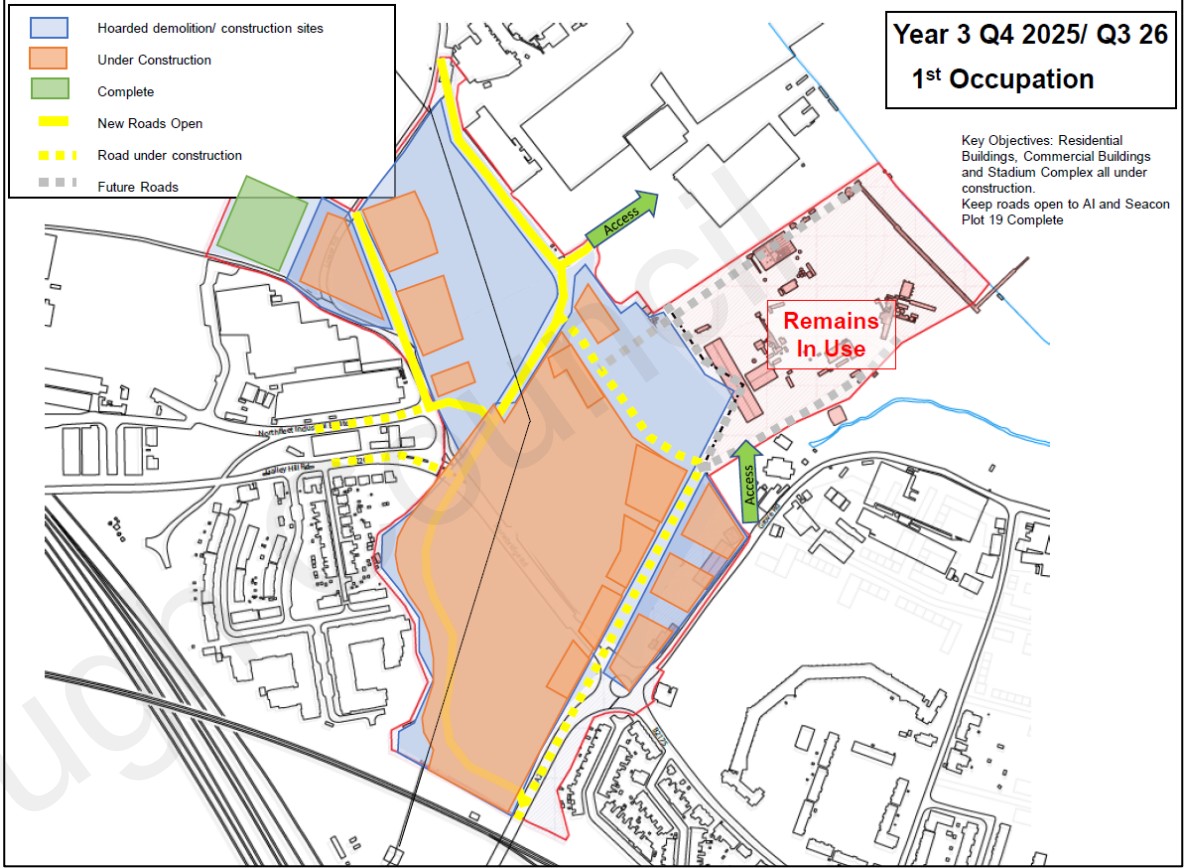


Figure 5.7 Year 4

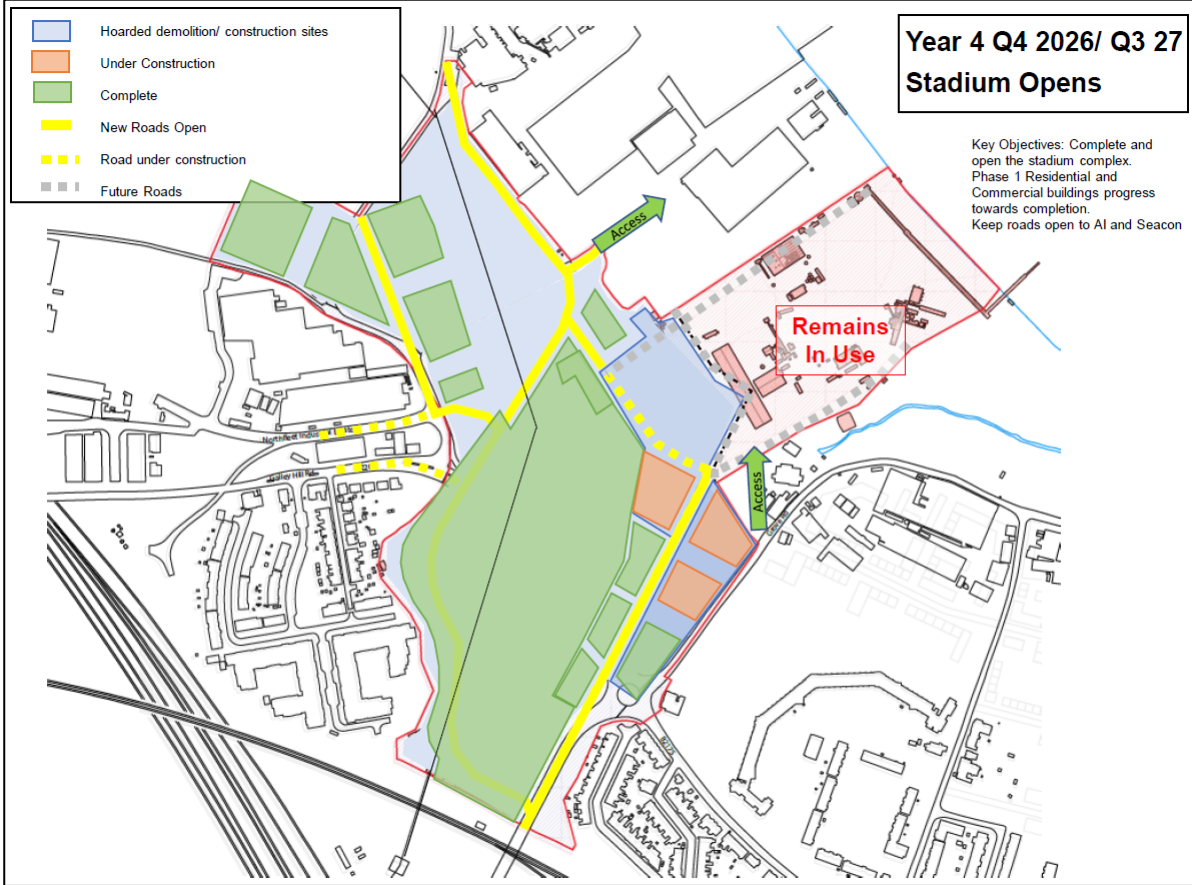


Figure 5.8 Year 5

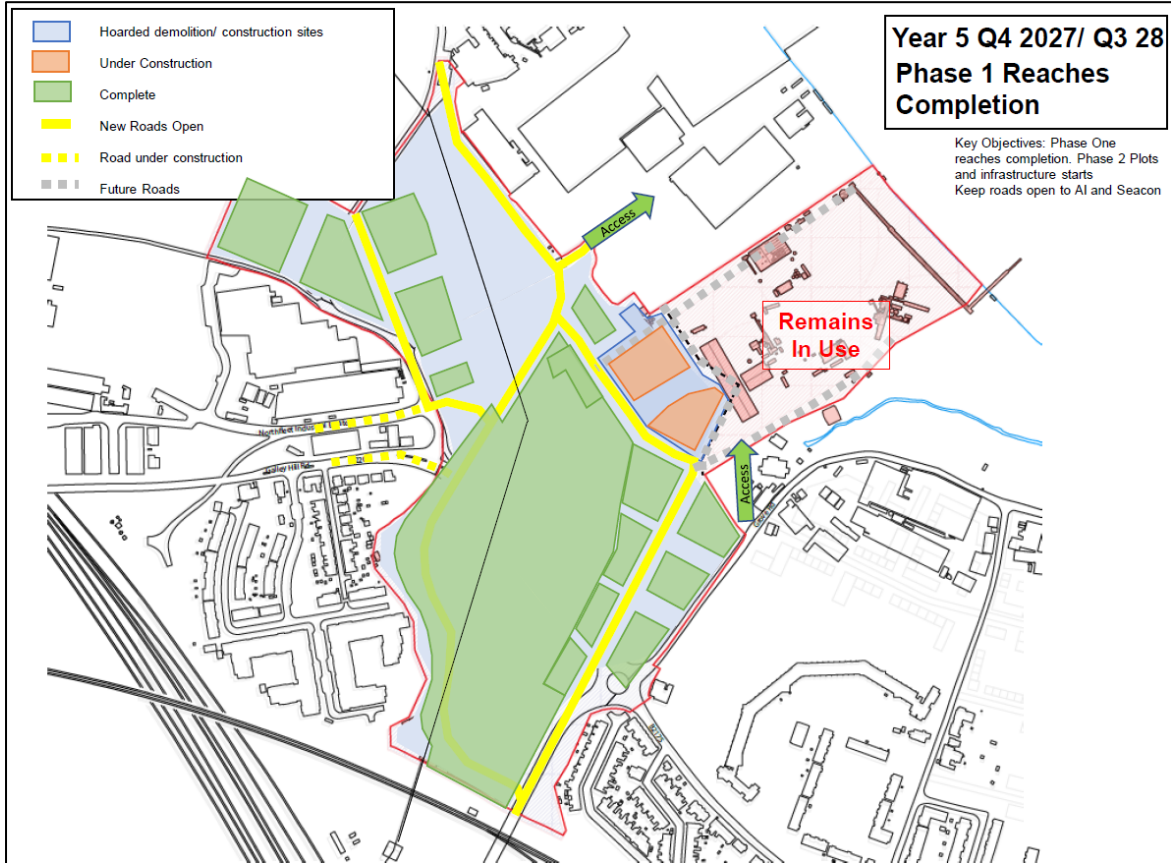


Figure 5.10 Year 7

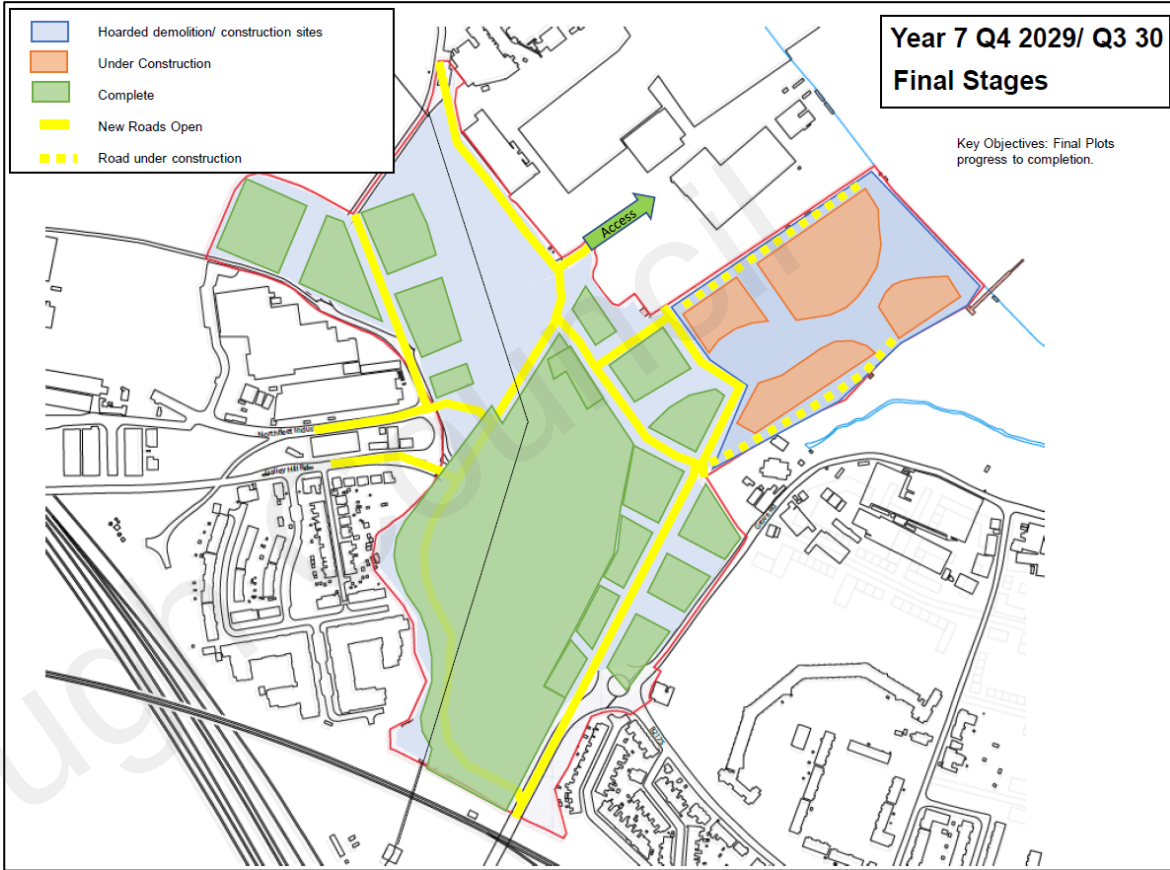


Figure 5.9 Year 6

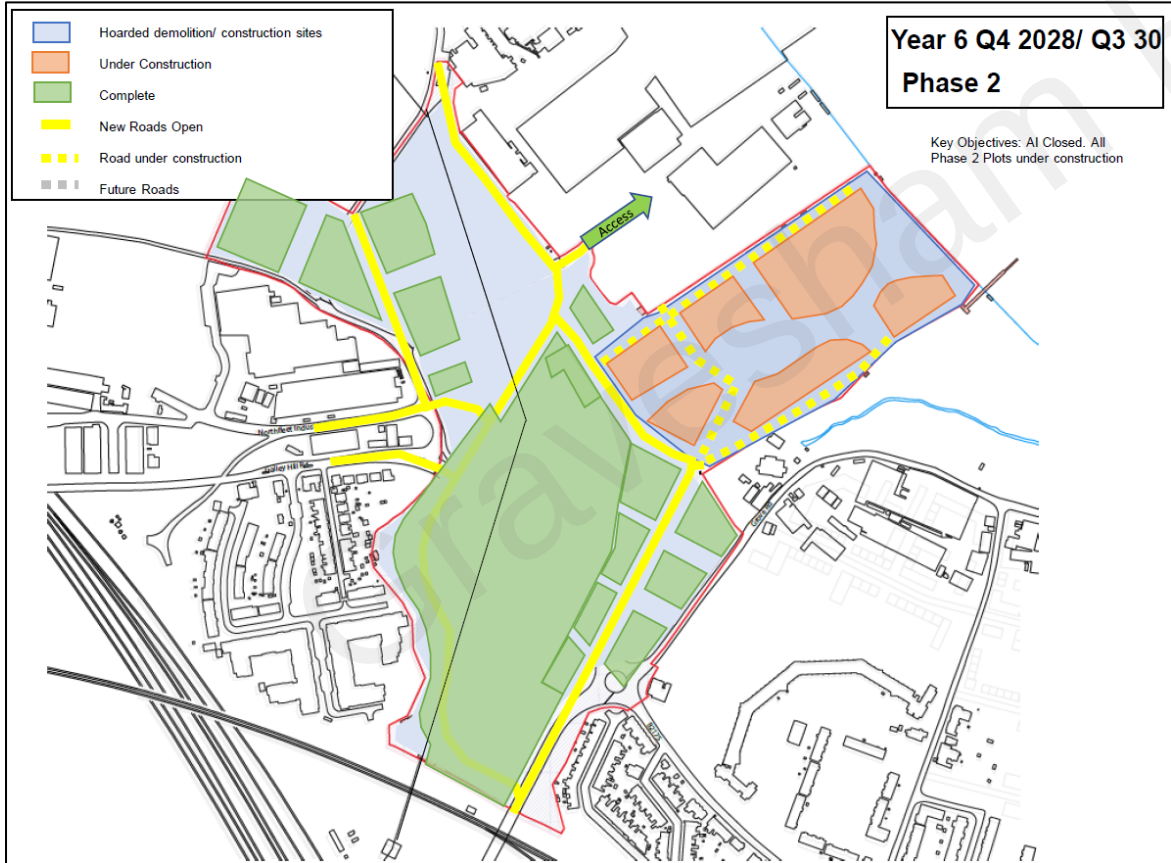
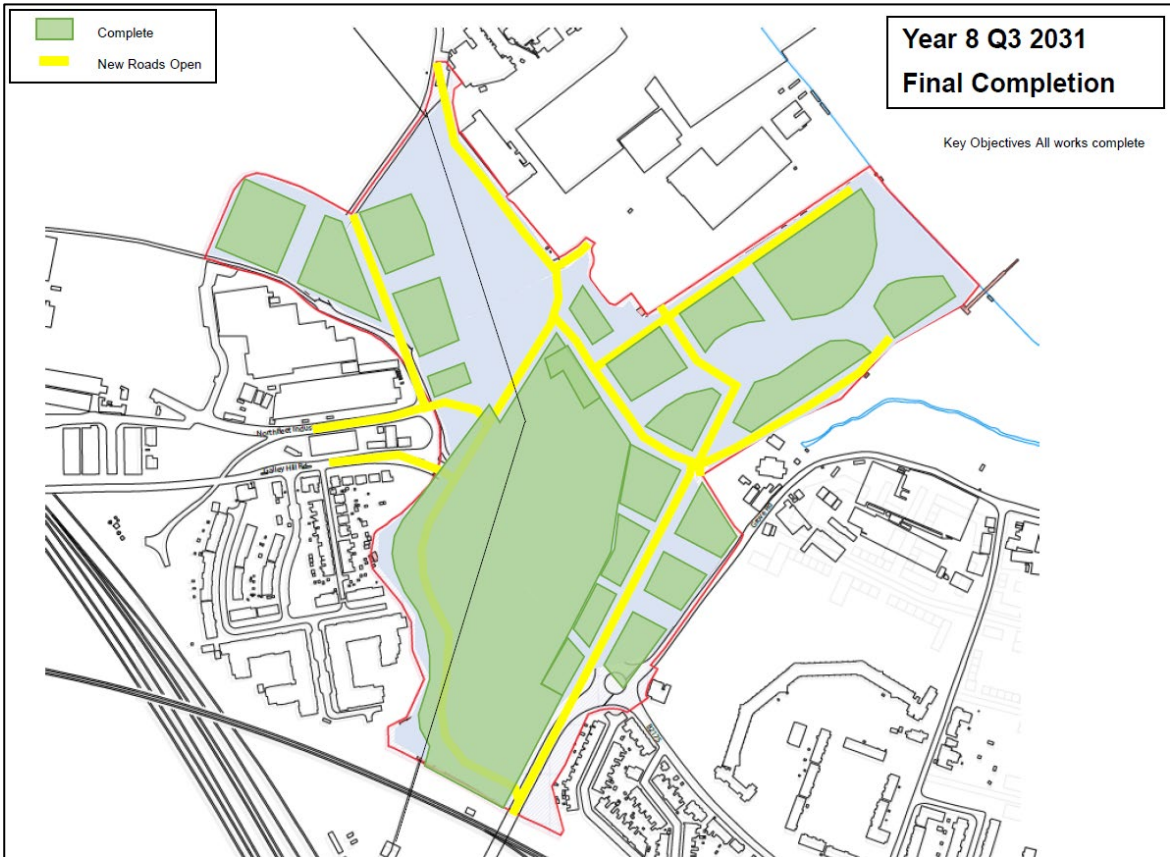


Figure 5.11 Year 8



DESCRIPTION OF WORKS

Site Establishment and Demolition Strategy

- 5.11** The principal function of site establishment is to prepare the site area to allow demolition and construction to start whilst maintaining existing facilities and amenities. Site establishment and demolition will be undertaken in phases to suit the construction sequence. These works will include, but will not be limited to:
- The early focus of site establishment and demolition will be to prepare sites for the highways works to realign the A226 to its proposed route. Demolition will therefore commence within Plot 2 at the site's southern boundary;
 - The remainder of the plots will be secured once vacated, and close boarded timber hoardings will be erected to the entire perimeter, with access gates for demolition and construction traffic in key locations;
 - Live services to the plots will be identified and terminated as required, with services to live buildings maintained or reconnected;
 - Local alterations to utility supplies will be undertaken to allow temporary builders connections and to prepare for future permanent installations;
 - Associated highway works to facilitate construction access will be undertaken;
 - The first residential plots to be progressed will be at the western extent of the site – Plots 19 and 18; and
 - Realignment of the A226 will be programmed to allow coordinated closure of the existing Stonebridge Road and the existing football stadium in Year 2.
- 5.12** It is anticipated that a number of surveys and investigations will need to be undertaken prior to the commencement of works across the site, as identified below. It should be noted that it is likely that some of the surveys and investigations will need to be undertaken once the construction plots are fully established to facilitate ease of access to the site for exploratory purposes. The following surveys and investigations are envisaged:
- Condition survey of boundary walls and fences;
 - Condition survey of roads and pavements;
 - Condition survey of adjoining buildings;
 - Full topographic survey;
 - Drainage survey, including establishing invert levels of any site discharge points;
 - Detailed survey of the Ebbsfleet river culvert within the site;
 - Existing utilities tracing;
 - CCTV drain surveys;
 - Party Wall surveys;
 - Relevant ecological surveys (overwintering birds and black redstart – see **ES Volume 1, Chapter 14: Ecology and Biodiversity**);
 - Geotechnical and environmental surveys and remediation;
 - Unexploded ordnance; and
 - Asbestos surveys of the buildings to be demolished (after full vacant possession).
- 5.13** All statutory and Local Planning Authority (LPA) consents and licences required to commence any on site activity will also be obtained ahead of the works commencing and give the appropriate notice period. These will include but not necessarily be limited to:
- Notices for works on the highway in accordance with the Highways Act 1980 and Road Traffic Act 1998;
 - Hoarding, scaffold and crane licences for works on the perimeter boundary;

- Construction Phase Plan under Construction Design and Management (CDM) Regulations;
- Health and Safety Executive (HSE) F10 Notification;
- Demolition Method Statements (DMS) and Risk Assessments;
- Construction Method Statement (CMS) and Risk Assessments;
- Section 80 (Demolition Notice) Application;
- Section 61 (Noise Control) Application;
- Liaison with the National Grid (NG) and development of safety protocols under Technical Guidance Note TGN 287: Third-party guidance for working near National Grid Electricity Transmission equipment;
- Construction notices;
- Connections to existing statutory services and main sewers;
- Licence for discharge of water from the site into the public sewer;
- Party wall act notices and agreements; and
- Approval of relevant demolition and construction related environmental management plans and other supporting documents).

Site Establishment & Welfare Facilities

- 5.14** Construction site areas will be made safe and secure prior to works commencing and the general public will be separated from the works, with the use of solid and well maintained, 2.4m high hoardings. Secure access points with wheel cleaning facilities will be established at all site access and egress locations. Pedestrian access points for operatives will generally be located close to the main vehicular access gates with separate pedestrian gates and footpaths provided. Public access to neighbouring buildings will be safeguarded and will be entirely separate from construction areas.
- 5.15** Site offices and associated welfare facilities for the workforce may initially be established in existing buildings prior to their demolition (subject to suitability and to planning permission). As works proceed, appropriate facilities will be established within each plot. Contractors' offices and welfare facilities will be established in temporary cabins as works progress. The locations will be identified in advance and agreed with the LPA as part of the detailed construction and demolition logistics programming and approval of the DMS, CMS and CEMP(s). It is anticipated that further information and details on this will be submitted, pursuant to planning conditions in relation to construction and demolition management.
- 5.16** Perimeter demolition scaffolding with Monarflex sheeting will be designed to ensure that safe access for both pedestrians and vehicles accessing the retained neighbouring buildings and surrounding streets.
- 5.17** Safety Protocols in accordance with TGN 287 and NG agreements will be implemented. These are likely to include barriered safety zones for tall plant at ground level, no go zones adjacent to pylons and nonconducting goalposts on site roads.

Demolition

- 5.18** The majority of existing buildings are industrial sheds constructed of steel frames and metal cladding. They will be demolished by "High Reach" machines as described below. The site includes extensive hardstandings of concrete or bituminous road materials.
- 5.19** The first areas of demolition will focus on both the Plot 2 highways area and Plot 19 residential construction areas. Building plots will be secured, hoarded and prepared for demolition by high reach methods.
- 5.20** A "Soft Strip" will entail the removal of all internal furnishings, windows and plant, and will include the safe removal of asbestos within the existing buildings by a specialist contractor. Advanced building surveys will be carried out as part of the pre-demolition process following vacant possession of each building, including a full Refurbishment & Demolition (R&D) survey of materials containing asbestos. Waste arising from the soft strip will be separated on site into recyclable waste streams for processing off site.
- 5.21** The High Reach method of demolition entails demolishing in a step like manner working through the structural bays on each floor using excavators fitted with long reach arms. Arisings on the floors will be scraped off periodically to keep the weight on the slabs to a minimum. Independent scaffolding and Monarflex will be used

on key elevations and water hoses fed up through the machine arm assists dust suppression. Arisings on the ground will be processed for crushing using standard height machines.

- 5.22** The buildings will primarily be dismantled using a combination of machine mounted pulverisers, crushers and shears. Water dousing will be carried out using recycled water where possible, to control dust. Noise levels will be controlled using best practice controls and management including the provision of screening where required. It is anticipated that the concrete materials recovered from the demolition process will be crushed, graded and stockpiled on site, and then ultimately reused on site where practical. In the event of contaminated material being identified, the contaminated material will be segregated and removed from site to a suitable landfill.
- 5.23** In the event that any hazardous loads are required for transportation than all packaging and containment will be provided in line with the Vehicle Certification Agencies Dangerous Goods Office procedures and requirements for UK roads. Vehicles will be loaded on site with the responsibility for the safe transit of the good that of the haulier or client under the European Agreement concerning International Carriage of Dangerous Goods by Road.

5.24 Figure 5.12 illustrates the Demolition Plan which supports the planning application.

Figure 5.12 Demolition Plan³



³ Demolition Plan (Drawing Reference: NFH-UNS-MAST-DR-1002).

Infrastructure Services

- 5.25** A strategy of new and temporary provision of utilities and sewers will be agreed as the design is further developed, notably for electrical substations where phased provision of new substations will be planned, ensuring existing services are maintained.
- 5.26** Various utilities and services exist on the site. To eliminate the risks associated with live services, existing services will be identified and terminated prior to demolition commencing. Temporary services will be installed in advance of these terminations as necessary. All new cables and services will be clearly marked, located and identified. Safe working protocols for crane management will be adopted as required when working close to the existing pylons and overhead cables in accordance with TGN 287.
- 5.27** Safety Protocols in accordance with TGN 287 and National Grid 400kVA supply specific 'protection and safety' methodology conditions will be implemented. These are likely to include barriered safety zones for tall plant at ground level, no go zones adjacent to pylons and nonconducting goalposts on site roads.
- 5.28** The Proposed Development will include the provision of an appropriate flood defence on-site which meets the Thames Estuary 2100 (TE2100) standards. The design and provision of this flood defence on-site will be agreed with the necessary authorities and statutory consultees.
- 5.29** Furthermore, a detailed culvert survey will be undertaken at reserved matters stage (controlled by a suitably worded planning condition). An indicative resolution with regards to the on-site culvert has also been proposed which includes the diversion of the Ebbsfleet river culvert beneath the eastern extent of the site along a road within the development. The realignment details would be confirmed following a detailed survey of the culvert to understand its depth, width and conditions and this would stipulate any realignment route. This approach would provide a betterment when compared to the existing scenario as there will be opportunities to widen the culvert, increasing its capacity thereby reducing flood risk. This approach would also ensure that there is a suitable 8m easement predominantly free of built development to allow for access and maintenance. Opportunities for de-culverting and partial decelerating will also be considered following the culvert survey that will be undertaken at reserved matters stage.

Highways Works

- 5.30** The Proposed Development includes the realignment of the junction of the A226 (Stonebridge Road) into an underpass below the podium of the new stadium complex. The highways alterations will commence early in Phase 1. The new road and underpass are proposed to open in Year 2 to allow closure of the existing route and development of the new stadium.
- 5.31** The alignment of the A226 represents the key element of highways works. New roads serving Phase 1 and Phase 2 of the Proposed Development will be constructed to suit the overall sequence, ensuring access remains available to adjacent businesses and properties. Road junction connections will be managed in phased operations to ensure continuity of traffic flows.

Earthworks, Piling and Foundations

- 5.32** The proposed buildings are founded at ground level. New piled foundations will be required to support the new construction. Design is at an early stage and remains subject to further site investigations. Continuous Flight Auger (CFA), or other augured solutions will be favoured but sizes and depths remain subject to ground investigations and future design development. For the purposes of assessment, a maximum depth of piling up to 30m below ground level (bgl) is assumed.

Substructure Construction Methodology

- 5.33** When demolition works are complete at each plot, a piling platform will be constructed using compacted crushed demolition arisings that will have been stockpiled for this purpose. Pile probing for below ground obstructions will be undertaken prior to forming the piling platform.
- 5.34** Piling will be undertaken from a piling platform at the existing ground level. Excavation for below ground drainage, ground beams and pile caps will follow piling operations. Basement (if applicable) and ground level slabs will then be cast.
- 5.35** Multiple piling rigs are likely to be on site in the early stages of each phase. Piling will be serviced by small crawler cranes and 360° excavators. Concrete will be delivered by ready mix trucks and placed directly from the vehicle's placement chute where possible.

- 5.36** Fixed tower cranes, needed for building each superstructure, will be erected during the piling works and will be used to service the remaining substructure construction. Cranes will generally be positioned within the footprint of each of the taller buildings. Low rise structure will be constructed using smaller mobile cranes.

Superstructure

- 5.37** The superstructures to the residential buildings are likely to be reinforced concrete (RC) framed with ribbon columns and flat slab floors. The concrete cores may be constructed ahead of the main frame by slip-forming or jump-forming. Consideration will be given in the detailed construction planning to utilising prefabricated elements, such as columns and staircases. Balconies will need to be carefully considered as the final detailing can dictate method and sequencing of the superstructure frames. It is envisaged that the final balconies design will allow a 'clip-on' approach, fixed to the external cladding.
- 5.38** Commercial buildings and the stadium complex will likely include elements of pre-cast concrete and steel frames, with plank or composite RC floors.
- 5.39** Fixed tower cranes will be used to assist with construction of the superstructures in a conventional manner on a floor by floor basis. Concrete will be placed by concrete pumps and placing booms.
- 5.40** Access and edge protection will be incorporated in the design of the falsework system which could include climbing screens to contain construction operations for the taller buildings.
- 5.41** The lifting equipment (e.g. mobile cranes, tower cranes, other lifting equipment such as elevated working platforms or forklifts etc) that will be required throughout the construction works is yet to be determined in detail. However, as part of the DMS and CMS, a lifting strategy will be developed and prepared in accordance with the detailed design and statutory obligations. The LPA will be consulted throughout preparation of the lifting strategy to ensure an appropriate proposal is put forward for consent. All necessary permits and licenses (e.g. permits and over sailing licenses (where applicable) for tower cranes) will be secured, and risk assessments and safe working instructions prepared and approved, ready for implementation by the contractor prior to the use of this type of equipment on site.

Envelope / Cladding

- 5.42** The new cladding will be a mixture of components for which specific methodologies will be developed once the design has been further developed. For the purposes of construction planning at this stage, it has been assumed that the inner skin of the perimeter walls to residential blocks would ideally be a Metsec, or similar SFS (Steel Framing System) which will allow earliest creation of a watertight environment for fit out works to commence.
- 5.43** For the lower rise buildings traditional scaffolding would be erected as concrete frames near completion for the construction of SFS, windows and membranes; followed by hand laid brickwork, or rendered rainscreen panels. For the taller buildings mast climber platforms may be used for access rather than scaffolding.
- 5.44** Cladding of commercial buildings and the stadium complex may include metal and glass curtain walling which will include prefabricated panels and elements to assist construction.
- 5.45** Materials will be transported vertically by platform hoists and tower cranes. Mortar would be delivered as dry ready mix and stored on site in silos for daily preparation and use.
- 5.46** The final operations for tower cranes will be to deliver roof materials, plant and equipment, after which they will be dismantled and removed. External hoists will remain in position throughout the envelope construction and to move fit out materials. Hoists will remain in position until permanent lifts are operational.

Fit-Out and External Works

- 5.47** Finishes and services fit out will commence once a level of temporary or permanent water tightness has been achieved, working from the lower floors upwards. The fit-out works will comprise the complete installation of finishes and services to the residential units, common areas and cores. The timing of fitting out of Commercial buildings will be subject to tenancy agreements.
- 5.48** As each building nears completion the construction site area will be reduced, and the local hard and soft landscaping areas released. Finally, the temporary site facilities and hoardings will be cleared, and the final landscaping completed for the public realm.

Temporary Road Closures over the Demolition and Construction Period.

- 5.49** Whilst construction planning is at an early stage it is recognised that there will be permanent and temporary closures and alterations to roads and footpaths to facilitate the works and public realm improvements. No designated cycle ways are currently anticipated to be affected. In addition to the realignment of the A266 the following roads and footpaths are likely to be affected and may be the subject of future Temporary Traffic Regulation Orders and/ or Hoarding & Scaffold Licence Applications within the Construction & Demolition areas indicated in **Figure 5.4** to **Figure 5.11**:

- Phase 1. Temporary Closures, hoardings and scaffolds potentially required to:
 - Manor Way/ Lower Road Junction;
 - Lower Road;
 - Northfleet Industrial Estate Road and Junctions;
 - A226/ Lower Road Junction;
 - Seacon Entrance road;
 - B2175 Stonebridge Road; and
 - Grove Road.
- Phase 2. Temporary Closures, hoardings and scaffolds potentially required to Grove Road/ Junctions to new roads within the development.

GENERAL EMBEDDED CONSTRUCTION RELATED MITIGATION

- 5.50** For the purposes of the technical assessments provided as part of this ES, the following construction related mitigation measures are taken as 'embedded' and so factored into the technical assessments to define the potential for likely significant effects. All other construction related mitigation that has been identified as being required to reduce the scale and so significance of residual effects or render residual effects insignificant is 'additional mitigation' and is presented in **ES Volume 1, Chapter 16: Environmental Mitigation and Monitoring Schedule**:

- Use of 2.4m high solid timber construction hoardings;
- Implementation of wheel cleaning facilities at all site access and egress locations;
- Use of Continuous Flight Auger piling techniques; and
- Re-use and re-cycling of demolition materials.

- 5.51** Additionally, this also includes measures set out within the:

- The Control of Pollution Act (COPA) 1974⁴ with particular reference to part III;
- The Environmental Protection Act 1990⁵;
- The Control of Noise at Work Regulations 2005⁶; and
- The Health and Safety at Work Act 1974⁷.

ESTIMATED DEMOLITION QUANTITIES

- 5.52** **Table 5.2** provides an estimate of the quantities of material likely to be generated as a result of the demolition works.

⁴ UK Government, The Control of Pollution Act 1974
⁵ UK Government, Environmental Protection Act 1990

⁶ UK Government, Control of Noise at Work Regulations 2005
⁷ UK Government, Health and Safety at Work etc. Act 1974

Table 5.2 Demolition Quantities

Demolition Material	Demolition Quantities (Tonnes)
Crushed Concrete	40,700
Structural Steel	1,270
Mixed Metals	3,400
Mixed Hard Waste	1,500
Masonry	500
Asphalt/ Blacktop	2,070
Bituminous Felt	350
Glass	330
Plasterboard/ Plaster	475
Ceilings/ Insulation	780
Carpets/ Flooring	50
Cables	110
Timber	950
Plastics	140
Asbestos	30
Total	52,655

- 5.53 It is anticipated that the concrete materials recovered from the demolition process will be crushed, graded and stockpiled on site, and then ultimately reused on site. In the event of contaminated material being identified, the contaminated material will be segregated and removed from site to a suitable landfill.
- 5.54 It is currently estimated that most of the crushed concrete (approximately 35,000 tonnes) could be used on site in the construction of the piling platforms, subject to satisfactory quality.

ESTIMATED CONSTRUCTION QUANTITIES

- 5.55 Table 5.3 presents estimated key construction materials associated with the Proposed Development.

Table 5.3 Estimates of Key Construction Quantities

Materials Delivered	Quantities
Concrete in Piles	59,000m³
Concrete to foundations and substructures	49,000m³
Concrete in Superstructures	108,000m³
Substructure Rebar	9,800T
Superstructure rebar	15,800T
Structural Steel	3,600T
Façade Cladding and Glazing	250,000m²
Roof finishes	64,000m²
Blockwork Walls	328,100m²
Internal Walls	340,000m²
Ceilings	270,000m²
Wall Finishes	684,000m²
Floor Finishes	62,000m²
Hard and Soft Landscaping	225,000m²

- 5.56 A Procurement Strategy in accordance with the Green Guide to Specification⁸ will be adopted.

⁸ BRE, (2009); The Green Guide to Specification, Fourth Edition.)

CONSTRUCTION WASTE

Excavated Material

- 5.57 Arisings from excavations of foundations and groundworks are estimated to be in the order of 23,500m³. All arisings will be re-used as fill on site where possible or removed from site to other suitable projects (subject to satisfactory testing of condition).

Waste

- 5.58 Construction waste volumes have been estimated using Building Research Establishment (BRE) Waste Benchmarking data, which outlines likely construction waste arisings in tonnes for new build construction projects, based on real-life data. The BRE Benchmark data identified the average volume of construction waste per 100m² of floor area (Gross External Area – ‘GEA’) for residential projects is 18.1 m³/100m² or 17.4 m³/100m² for commercial projects. Alternative benchmarks are also provided of 16.8 and 7.0 Tonnes/100m² respectively.
- 5.59 Based on this information, the Proposed Development is likely to generate approximately 93,281m³ construction waste, or approximately 77,980 tonnes over the whole development. Construction waste will be separated into recyclable waste streams before removal from site for disposal.
- 5.60 A Site Waste Management Plan (SWMP) (or equivalent) will be developed to demonstrate how the waste will be minimised and managed. The SWMP will include a number of measures to forecast the predicted excavation, demolition, and construction waste arisings, set out ways to minimise and manage this waste and outline waste minimisation and management measures and performance targets for the construction phase.
- 5.61 Contractors will be required to investigate opportunities to minimise and reduce waste generation, such 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;
 - 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. Concrete may be taken off-site for crushing and re-use;
 - Segregation of waste at source where practical;
 - Re-use and recycling of materials off-site 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).
 - Should hazardous or contaminated materials be identified, works in the area will temporarily stop, and the materials will be removed and disposed of in line with relevant legislation and guidance e.g. The Control of Asbestos at Work Regulation 2012 and Control of Substances Hazardous to Health Regulations (COSHH) 2002; and
 - The setting of waste reduction targets and waste re-use / recycling targets prior to commencing works on-site and monitoring of such targets throughout the duration of the demolition and construction works.
- 5.62 In order to reduce potential health risks throughout the demolition and construction phase, the following waste management measures will be implemented on-site:
- Damping down of surfaces during spells of dry weather and brushing/water spraying of heavily used hard surfaces/access points across the site as required;
 - Off-site prefabrication, where practical, including the use of prefabricated structural elements, cladding units, toilets, mechanical and electrical risers and packaged plant rooms;
 - Burning of waste or unwanted materials will not be permitted on-site;

- All hazardous materials including chemicals, cleaning agents, solvents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas;
- All demolition and construction workers will be required to use full Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) whilst performing activities on-site;
- Any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s;
- Materials requiring removal from the site will be achieved using licensed carriers and records will be kept detailing where waste will be transferred to; and
- Pre-assembly and pre-fabrication of construction materials will be prioritised wherever practicable to minimise on-site generation of waste and packaging and reduce the number of delivery and collection vehicles to and from the site.

SITE ACCESS AND EGRESS

Access and Egress

- 5.63** The main site access gate locations will vary as the phases develop as shown in **Figure 5.4** to **Figure 5.11**. Construction traffic access will mostly be from the A206/ A226.

Main Access Routes

- 5.64** From the south, vehicles will access the Site from the A2, joining the A2260 Ebbsfleet Gateway and A226 London Road. From the north and east, vehicles will leave the M25/ A282 on to the A2 or A206 Crossways Boulevard.
- 5.65** **Figure 5.13** identifies this construction vehicle routing.
- 5.66** As the demolition and construction programme progresses, construction haul roads within the site boundary will be relocated around the site to serve efficiently the parts of the sites “under construction” and to minimise disturbance to existing surrounding sensitive receptors.
- 5.67** Secure access points with wheel cleaning facilities will be established at each site when excavation and groundworks are taking place. Pedestrian access points for construction workers will generally be located close to the main vehicular access gates with separate pedestrian gates and footpaths provided.
- 5.68** To minimise the likelihood of congestion during the demolition and construction period, strict monitoring and control of vehicles entering and egressing the sites will be implemented. Construction deliveries will be carefully planned with delivery times agreed with each contractor using a booking system. Delivery schedules will be produced in order to look at the profiles of up and coming deliveries, and to regulate deliveries and eliminate bottle necks.
- 5.69** Specific time slots will be allocated to the sub-contractors and suppliers for the use of cranes and hoists, to ensure that the main plant will be utilised efficiently, and that deliveries are not queued.
- 5.70** Construction traffic will be managed appropriately, including the avoidance of any sensitive site boundaries, via the implementation of a Construction Traffic Management Plan (CTMP).

Road Vehicle Numbers

- 5.71** The anticipated number of demolition and construction vehicles serving the site has been reviewed over the duration of the demolition and construction programme. **Figure 5.14** identifies the anticipated average number of vehicles per month over the duration of the demolition and construction programme. **Figure 5.14** shows that the anticipated average monthly number of vehicles is expected to peak during month 30 of the construction period (anticipated to be Q2 2026 based on the indicative programme). This equates to an average peak of 107 HGVs per day, or 214 vehicle movements. This corresponds with the most intensive demolition and construction activity occurring on-site, associated with the construction of Phase 1 Plots 1, 2, 3, 4, 5, 6, 7, 8, 15, 16, 17 and 18. However, as a reasonable conservative estimate for the purposes of assessment, the peak daily movements could be up to 20% higher than that for some periods of works during this phase, resulting an approximate total of 128 HGV movements per day (an additional 21 HGVs per day above the average peak).

- 5.72** With regards to Phase 2 of the Proposed Development, **Figure 5.14** shows that the anticipated average monthly number of vehicles during Phase 2 of the Proposed Development is expected to peak during months 71 and 72 of the construction period (anticipated to be Q3 2029 based on the indicative programme). This equates to an average peak of 72 HGVs per day, or 144 vehicle movements. This corresponds with peak Phase 2 construction activity, associated with the construction of Plots 9, 10, 11, 12, 13, and 14. However, as noted above, peak daily movements could be up to 20% higher than that for some periods of works during this phase, resulting an approximate total of 86 HGV movements per day (an additional 14 HGVs per day above the average peak).

Figure 5.13 Construction Vehicle Routing (Preferred)

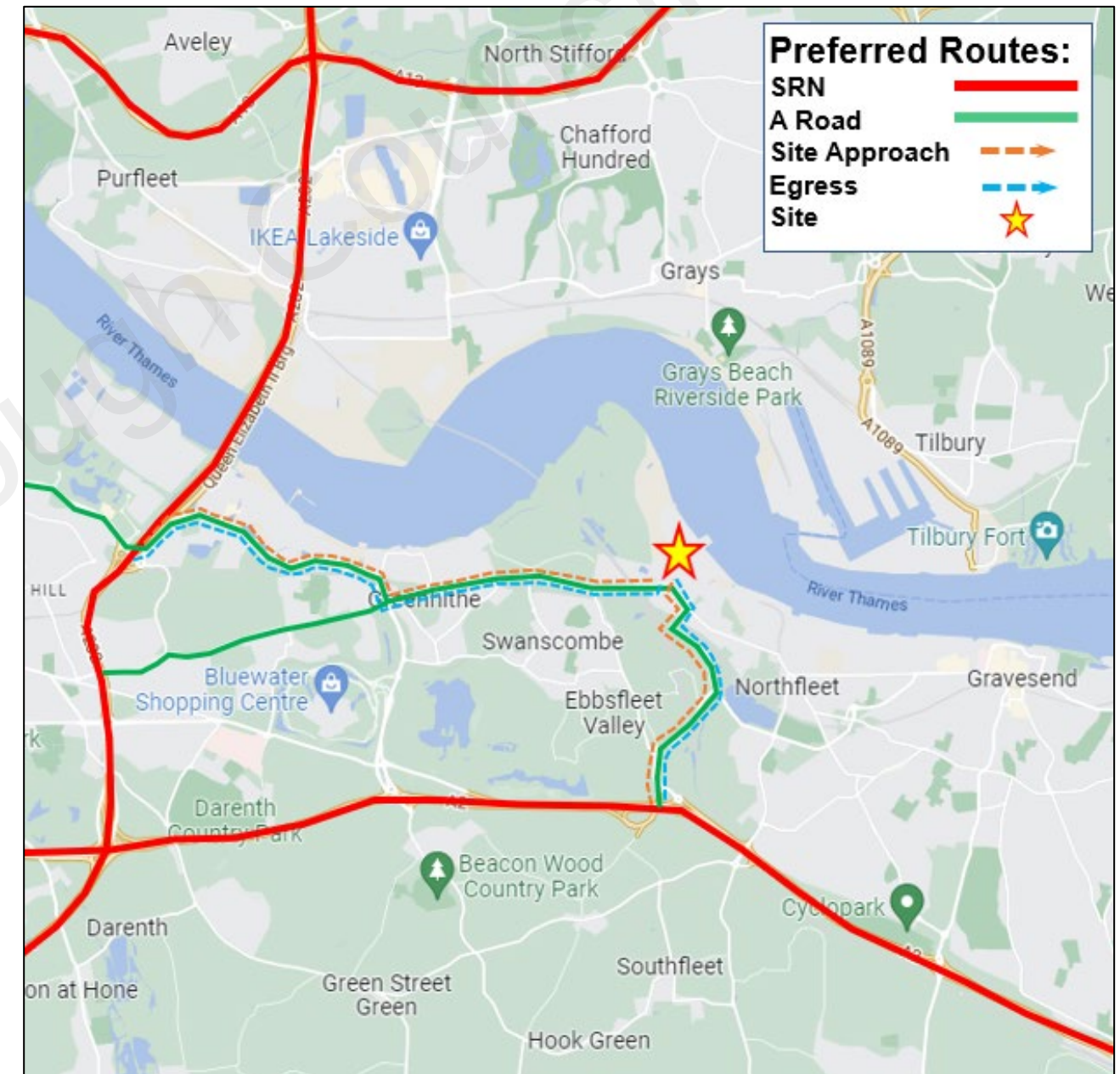
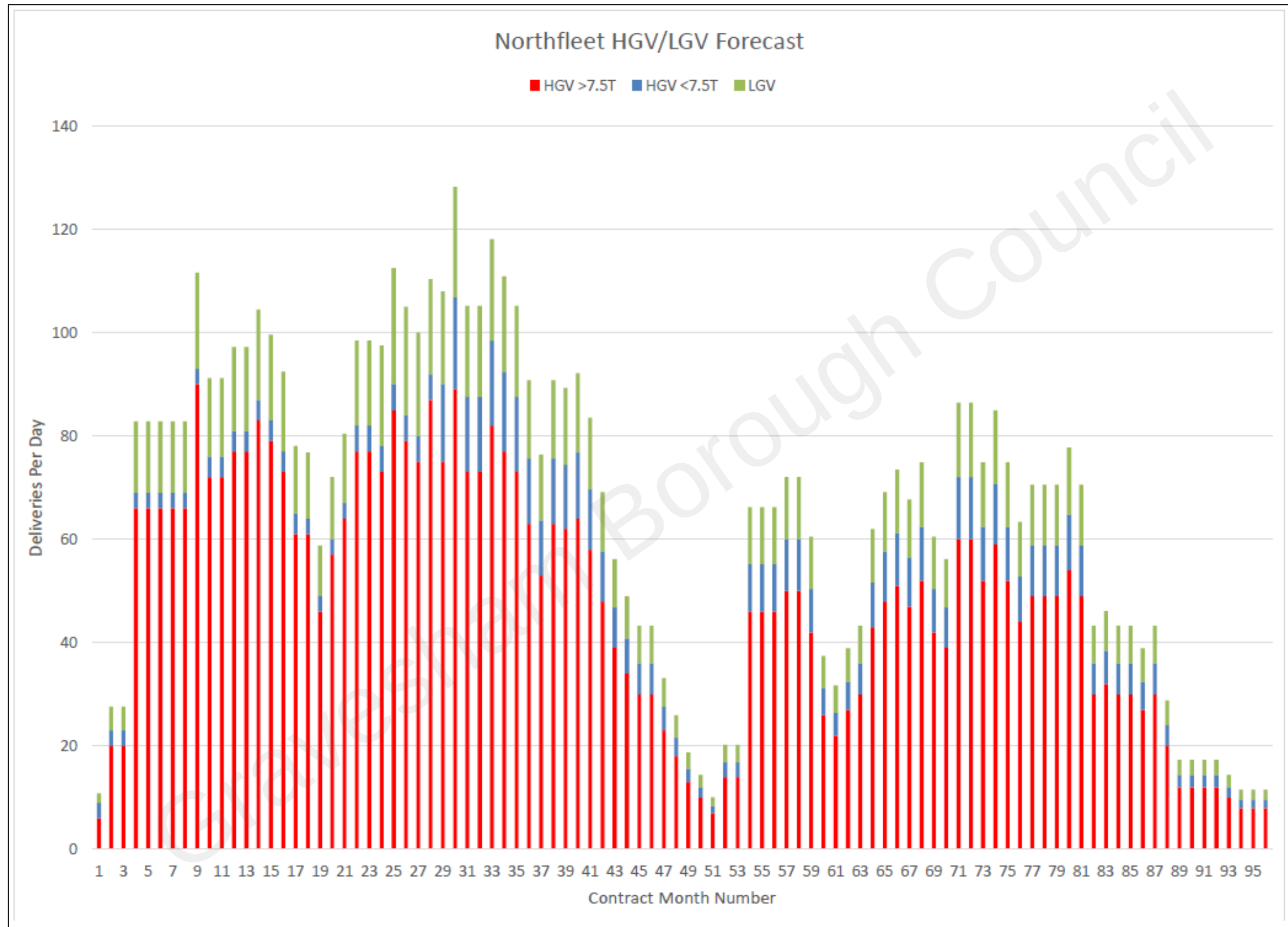


Figure 5.14 Construction Vehicle Forecast (HGV and LGV) – Average Vehicles Per Day



PLANT AND EQUIPMENT

5.73 Consideration has been given to the types of plant that are likely to be used during the enabling, demolition and construction works. The plant and equipment associated with the enabling and demolition works, and construction process is set out in **Table 5.4**

Table 5.4 Plant and Equipment Associated with the Proposed Development

Plant	Demolition Works	Highways	Substructure	Superstructure	Fit Out	Landscaping
Bulldozers		✓	✓			✓
Dumpers/ Spoil Trucks	✓	✓	✓	✓		
Crawler & Mobile Cranes	✓	✓	✓	✓		
Tower Cranes			✓	✓	✓	
Platform Hoists	✓		✓	✓	✓	
Cutters, drills and small tools	✓	✓	✓	✓	✓	✓
Crushers	✓	✓	✓			
360° excavators	✓	✓	✓			✓
Floodlights	✓	✓	✓	✓	✓	✓
Forklift truck	✓	✓	✓	✓	✓	✓
Generators	✓	✓	✓	✓		
Compressors	✓	✓	✓	✓		
Hydraulic benders and cutters		✓	✓	✓	✓	
HGVs/lorries/vans	✓	✓	✓	✓	✓	✓
Piling rigs			✓			
Scaffolding and mobile hydraulic access platforms	✓	✓	✓	✓	✓	✓
Ready-mix concrete lorry		✓	✓	✓	✓	✓
Concrete pump			✓	✓		
Mortar batching plant				✓	✓	
Water Pump	✓	✓	✓	✓		✓
Temporary Supports	✓	✓	✓	✓		
Power Tools	✓	✓	✓	✓	✓	✓
Hand Tools	✓	✓	✓	✓	✓	✓

HOURS OF WORKS

5.74 The anticipated core working hours for construction will be as follows:

- 08:00 – 18:00 hours on weekdays;
- 08:00 – 13:00 hours on Saturdays; and
- No working on Sundays, Bank or Public Holidays, unless otherwise agreed with the LPA.

5.75 In order to maintain the above core working hours, the Principal Contractor may require at certain times a period of up to one hour before and after core working hours to start and close down activities (this will not include works that are likely to exceed any pre agreed maximum construction works noise levels). Specialist construction operations and deliveries may also be required to be carried outside these core hours in agreement with the LPA and other relevant parties.

Community Liaison

5.76 In advance of the works commencing on site, a public briefing / information session for the local community on the works that will be undertaken will be held at a local venue. These drop-in briefing / information sessions will be held periodically (particularly in advance of key milestones in the construction programme) over the duration of the 96-month construction period and will provide an opportunity not only for the contractor and the Applicant to disseminate information but also for local residents, businesses and stakeholders to ask questions of the contractor and the Applicant and raise any particular concerns. The public briefings / information sessions will be publicised via a variety of channels and be open on specified days so those with differing commitments can attend.

5.77 In advance of and during the construction works, the contractor / Applicant will maintain a number of other methods to communicate with the local community to keep them informed of progress on the scheme and enable concerns to be voiced and listened to. These methods will also be used as appropriate to inform local residents and neighbours of any emergency work required on site. These methods will likely include newsletters, drop in sessions, updates via a dedicated website and email address, a dedicated hotline and text alerts for targeted communications (including in the event of emergency works).

Complaints Procedure

5.78 A staffed hotline will be available 24/7. This will provide local residents with the ability to communicate directly with the appropriate personnel allowing escalation procedures to be instigated, ensuring all enquiries are handled promptly.

5.79 The hotline will allow any complaints to be logged and fully investigated, and responded to quickly, advising what action has been taken. If necessary, complaints will be reported to the relevant department of the LPA. The hotline will be operational 24/7, so will be available during normal operational hours and outside of normal working hours. The requirements for the hotline will be set out within the CEMP.

MITIGATION AND MONITORING CONTROLS

5.80 ES Volume 1, Chapter 18: Environmental Mitigation and Monitoring Schedule presents the environmental management and mitigation measures that the Applicant is committed to implementing throughout the demolition and construction works to, either eliminate, or reduce the significance of any likely environmental effects.

5.81 The Outline CEMP (**ES Volume 3, Appendix: Demolition and Construction – Annex 1**) aims to provide an overarching and strategic framework for the management of environmental effects and the implementation of measures prior to, and during, the construction phase of the Proposed Development. It is based on established good management principles. It includes the following information:

- Information pertaining to data management, roles and responsibilities, structure, mitigation and monitoring, auditing, and non-compliance and corrective actions;
- Information pertaining to staff training, health and safety, community liaison;
- Information relating to the Site and the Proposed Development;
- Outline of the construction works, timing and duration;
- Schedule of Environmental Legislation; and
- Environmental management measures, addressing (but not limited to) the following elements:
 - Transport;
 - Noise and Vibration;
 - Air Quality;
 - Waste;
 - Water Resources, Flood Risk, Drainage and Ground Conditions;
 - Ecology; and
 - Surface Water Management.