

Chapter 5: Demolition and Construction

INTRODUCTION

- 5.1 This chapter of the Environmental Statement (ES) describes the principal activities relating to the enabling and demolition works across the site and the subsequent construction of the Proposed Development. For the purposes of this ES, enabling, demolition and construction works are referred to as the demolition and construction works, unless specified otherwise or with enabling works being specifically referred to if necessary.
- 5.2 Planning for demolition and construction is broad at this stage in the planning process and may be subject to modification during the detailed planning of these works. The information presented within this ES chapter is based on reasonable assumptions made by the Applicant and is suited to this stage of planning. It is anticipated that further detailed information on demolition, enabling works and construction logistics will be submitted to Woking Borough Council (WBC) pursuant to relevant planning conditions attached to the permission relating to the preparation of a Construction Environmental Management Plan (CEMP).
- 5.3 Subject to successful tender process, a Principal Contractor shall be appointed. The Principal Contractor will manage the demolition and construction works themselves. The selection process shall ensure they have sufficient experience of working on projects such as the Proposed Development, including projects which have involved consideration and management of complex issues such as working near to existing residential properties, busy main roads, transport networks and utilities infrastructure.
- 5.4 This chapter does not assess the magnitude of potential impacts, nor the scale and so significance of likely effects during the demolition and construction works, as this is addressed within individual technical assessments presented within **ES Volume 1 (Chapters 6 and 7)**. An outline of the environmental measures to be included in the CEMP, Construction Logistics Plan (CLP) and Site Waste Management Plan (SWMP) are included in **ES Volume 1, Chapter 10: Mitigation and Monitoring**. These measures have been considered within each technical assessment whether as standard control measures, or as mitigation, to enable the assessment of potential and residual demolition and construction effects within a particular technical assessment.
- 5.5 This chapter has been prepared by Trium, Tier Consult Ltd and Quartz Project Services (on behalf of the Applicant). **ES Volume 1, Chapter 4: The Proposed Development** includes a description of the Proposed Development, which should be referenced as appropriate.

PROGRAMME OF WORKS

- 5.6 Figure 5.1 presents an outline of the enabling works, demolition and construction programme for the redevelopment of the site and delivery of the Proposed Development. It is currently envisaged that the enabling works, demolition and construction will take approximately 3 years to complete.
- 5.7 Construction of the proposed David Lloyd Leisure Centre will commence in Quarter 1 of 2020 (year 1) and will likely be operational in Quarter 2 of 2021 (year 2). Construction of the residential element of the Proposed Development will commence in Quarter 2 of 2021 (year 2), and will likely become occupied in Quarter 4 of 2022 (year 3). The phasing of the David Lloyd Leisure Centre and residential properties will in part run concurrently as shown in Figure 5.1.
- 5.8 The demolition and construction works are expected to comprise of the following main stages
 - Enabling works and site establishment, including demolition of the existing building;
 - Excavation and piling;
 - Construction of the substructure;
 - Construction of the superstructure;
 - External envelope; and
 - Fit out and landscaping.
- 5.9 Operation of the David Lloyd Leisure Centre is expected in Quarter 3 of 2021 (year 2); however, construction of the residential properties will commence in Q2 of 2021 (year 2). As the superstructure and fit-out stages progress for each block of houses, first occupation of all residential blocks are scheduled for occupation following completion in Quarter 4 of year 3. First occupation of the residential properties is expected in Quarter 1 of year 4 (2023).

Figure 5.1 Summary Demolition and Construction Programme

| Demolition and Construction Programme | 2020 (Yr 1) | | | | 2021 (Yr 2) | | | | 2022 (Yr 3) | | | | 2023 (Yr 4) | | | | 2024 (Yr 5) | | | | 2025 (Yr 6) | | | |
|---------------------------------------|-------------|----|----|----|-------------|----|----|----|-------------|----|----|----|-------------|----|----|----|-------------|----|----|----|-------------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Vacate and Demolish | | | | | | | | | | | | | | | | | | | | | | | | |
| Existing Storage Building | | | | | | | | | | | | | | | | | | | | | | | | |
| Construction | | | | | | | | | | | | | | | | | | | | | | | | |
| David Lloyd Leisure Centre | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential Development | | | | | | | | | | | | | | | | | | | | | | | | |

- Demolition
- Construction
- Expected Residential Occupation**
- Expected Operation of the David Lloyd Leisure Centre**

- 5.10** The works for the residential element and the David Lloyd Leisure Centre will largely be undertaken concurrently. However, the intention is that the Proposed Development becomes progressively operational. The proposed David Lloyd Leisure Centre is expected to be operational first, whilst the residential units undergo substructure works, superstructure works and fit-out. Thereafter, the residential blocks will become progressively occupied, whilst the subsequent blocks undergo fit-out and have landscaping / public realm works completed.
- 5.11** Whilst the outline programme reflects a continuous construction period of 3 years, there will be some points across the programme where there will be reduced construction activities ongoing; for example, year 1 (2020) which will primarily involve infrastructure and David Lloyd Leisure Centre works only, and year 3 (2022) in which there will only be substructure, superstructure, fit-out and landscaping / public realm works associated with the residential blocks of houses being undertaken. There will also be a point in time where there is a peak in construction activity due to multiple works occurring across the David Lloyd Leisure Centre and residential blocks during year 2 (2021).

Interfaces

- 5.12** The main interfaces are as described below:

- Residential: There will be no direct interfaces relevant to the Proposed Development, apart from the existing school and athletics club (located to the north of the site) which are to remain in operation during the entire demolition and construction programme. There will be no direct interface with these facilities, other than the shared use of the site access and egress route, and the public highway. Within close proximity of the site (namely to the south of the site), there are residential houses, together with a retail (garden centre). There will be no direct interface with the residential properties other than shared use of the public highway.
- David Lloyd Leisure Centre: There will be no direct interfaces relevant to the Proposed Development, apart from the existing school and athletics club (located to the north of the site) which are to remain in operation during construction. There is no direct interface with these facilities other than shared use of the site access and egress route, and the public highway.
- Public Transport: Whilst the adjacent public highway is serviced by local bus routes and the nearest train station is located approximately 2.5km to the north-east of the site, there will be no direct interfaces with the local transport infrastructure.
- Statutory Services: Services distribute adjacent to the site, on the A320 Egley Road, which will require a new transformer to serve the site. Current feeds will be cut back during site clearance (as required) and builders supplies provided. A single substation will likely be required for the site, up to a maximum of 1MVA. This will be discussed and agreed with WBC.

Pre-Commencement Surveys, Investigations, Consents, Licenses

- 5.13** Several surveys and investigations will need to be undertaken prior to the commencement of works on-site. In addition, various consents and licences will need to be granted. The following pre-commencement surveys and investigations are envisaged:
- Asbestos surveys;
 - Clearance of vegetation supervised by a suitably qualified ecologist;
 - Condition survey of any adjoining party walls, boundary walls, and public highway;
 - Structural surveys (pre-demolition appraisal) of existing construction;
 - Utility surveys to determine the position of any assets;
 - Buried services ground penetration survey to determine existing services routes and validate the above utility survey information;
 - CCTV survey of the surface water and the foul water drainage to confirm size and condition;
 - Condition survey of perimeter roads; and
 - Archaeological watching brief for all substructure works.

- 5.14** All necessary consents and licences required to commence an onsite activity will be obtained ahead of the works commencing and giving the appropriate notice period. These will include:
- Communication with various parties regarding the use of cranes (particularly oversailing rights), as the site is located adjacent to public and private third-party land. Construction activities that have the potential to have a direct impact on the land under public and private ownership will be agreed with owners, including (but not limited to): hoarding positions, temporary footpath diversions, connections / diversions of any private drainage or utilities, and temporary unloading on the roads. The Applicant and Principal Contractor shall develop a good working relationship with WBC and the community through the planning stages; this relationship shall be maintained;
 - Connections to existing statutory services and main sewers;
 - Licences for discharge of water from the site into the public sewer, if required;
 - Party Wall Act notices and agreements, if required;
 - Approval of a CEMP, including any specific agreements relating to the control and monitoring of construction logistics and aspects such as demolition and construction noise.
 - Section 80 Demolition Notice application to the Local Authority Building Control. Triggered following Planning consent with the Works being undertaken under a Section 81 Counter Notice.

Description of Works

Enabling Works and Site Establishment

Hoarding

- 5.15** The boundary the construction works will be established and the minimum of 2.4m high, solid perimeter hoarding will be erected around the site, along the planning application boundary line. The hoarding will remain fixed in position until handover and operation / occupation of each element. Safe site access routes onto the A320 Egley Road will be established.

Site Office and Welfare Facility

- 5.16** A welfare office will be established prior to the commencement of works, which will include a canteen and office facility. It will be located in a position that will be appropriate to the demolition, construction and handover of the Proposed Development. As far as reasonably practicable, it is envisaged that the office will stay in the same location throughout construction.
- 5.17** Safe walking routes will be established as required, at all times, vehicles and pedestrians will be separated from the site with a fixed barrier.

Utility Diversions / Removals

- 5.18** All existing services to the site will be stripped back as redundant and significant new supplies will be brought to the site. Water and existing electrical services will be cut back, capped or enhanced for builders' supplies.
- 5.19** The existing communications provision on the site (e.g. for mobile data etc.) will require re-positioning during the works to maintain the services; the Applicant will organise this with the utility provider.

Demolition and Enabling Works

- 5.20** Prior to commencement of demolition works, the area of works will be encapsulated with 2.4m high, solid perimeter hoarding.
- 5.21** All hazardous materials (such as fluorescent tubes, fridges and air conditioning units) will be identified and removed, and any live services will be terminated, before the soft stripping of the existing building on-site and subsequent removal of internal debris commences.
- 5.22** The demolition of the existing building on-site will be undertaken on a controlled top down approach, with the structure being dismantled, materials suitably sorted on site for recycling, and then removed to suitable licensed waste receivers.

5.23 Following the demolition of the main structure / building in question, the initial site strip will entail the removal of a combination of tarmac and concrete hardstanding, with some sporadic areas of paving together with soft landscaping¹.

Excavation, Substructure & Infrastructure Works

5.24 Excavation and substructure works will be undertaken in the order set out below.

Residential Excavation and Substructure

5.25 Following the soft strip, excavations will be undertaken and concrete strip foundations will be constructed, in preparation to receive the masonry superstructure.

David Lloyd Leisure Centre Excavation and Substructure

5.26 Following the soft strip, excavations will be undertaken and reinforced concrete pad foundations will be constructed, in preparation to receive the steel superstructure portal frame. Reinforced concrete ground floor slabs (including those for the proposed swimming pool) will be primarily laid to earth upon insulation and damp proof membrane. The proposed external courts will be of a specialist design, with a shallow construction depth.

Infrastructure

5.27 The drainage and services installations that will serve the site will be installed as an enabling works package, immediately following site clearance. This will ensure that sufficient access facilities, drainage and power supplies can be provided to the Contractor in constructing the Proposed Development. Roads and hard standing areas will be brought up to base course level, to accommodate vehicles and crane requirements. Upon substantial completion of the David Lloyd Leisure Centre and the residential blocks, the surface finishes will be applied.

Construction Works

Residential Crane Strategy, Superstructure and Building Envelope

5.28 Buildings will be served using mobile cranes and hoists, subject to their reach and over-sailing provision. Cranes to be used will be Demag AC-40 or Kobelco RK250-7 or similar and will stand at a maximum height of 45m above existing ground level, with an operating jib length of 44m.

5.29 The structure of the residential blocks will be constructed using load bearing masonry, with ground floors being formed of ground bearing in situ concrete or suspended precast concrete units, with upper floor being of suspended timber construction.

5.30 The external wall envelope will predominantly be masonry (brickwork) clad, with aluminium powder coated-multiple glazed window units and doors, timber effect cladding features and load bearing masonry walls, insulation and plasterboard internal finish. This will be constructed off of scaffolding.

5.31 Roof finishes will be pitched tiled finishes, on traditional timber truss frames and will be insulated. Proprietary preformed aluminium powder coated canopies will be installed at entrance locations.

David Lloyd Leisure Centre Crane Strategy, Superstructure and Building Envelope

5.32 The David Lloyd Leisure Centre will be erected using mobile cranes, ranging between 20 and 40 tonnes in capacity. These will be situated around the perimeter of the building footprint and the fabricated steel will be sourced directly from flat-bed vehicles entering the site at strategic times. No steel will be stored on-site, other than in exceptional circumstances. Typical types of crane that will be used are a Demag AC-40 Mobile Crane or similar.

5.33 The David Lloyd Leisure Centre (incorporating both the swimming pool and sports hall areas) will primarily be formed using hot rolled steel members (portal frame), cut and fabricated off-site, and fitted together using bolted connections (as site welding will not be permitted).

5.34 Suspended floors and seated areas will be formed using a combination of precast concrete steps and profiled metal permanent formwork, all supported by hot rolled steelwork. Concrete placed into the formers will be reinforced using mesh sheeting.

5.35 Roof and walls to the centre of the building will be finished by adopting either a composite insulated cladding panel or a built up system using insulation sandwiched between an external and internal profiled steel sheet,

with glazed walling systems to circulation areas. All cladding will be supported by light weight cold rolled steel members, designed to span between the primary hot rolled frames.

General

5.36 As the façade progresses, scaffolding will be erected which will service the progressive fit out.

5.37 Scaffolding will remain erected up to the façade until all final works to the building fabric are complete and the structure is weathertight.

5.38 Once the major façade works are completed for each building, the associated scaffolding will be removed.

Fit Out

5.39 A new water ring main will be installed to service all the buildings individually and any associated firefighting equipment. Each house will be served independently with dedicated supplies from the new water ring main and the new mains connection will service the proposed David Lloyd the Leisure Centre. Additionally, surface water and foul drainage connections will be made to the local sewers.

5.40 Power will be provided to the residential blocks via the installation of Air Source Heat Pumps (ASHPs) and the David Lloyd Leisure Centre will have a new gas connection to enable the functionality of its boilers and combined heat and power plant.

5.41 Once the proposed buildings are watertight, fit out will commence. The fit-out of the Proposed Development will be undertaken residential block by block, with handovers to the occupying residents upon completion. Safe walking and access routes will be in place at all times.

5.42 The typical sequence of fit out works will comprise the following:

- Construction of party walls;
- Fireproof and soundproof screed;
- Construction of internal walls;
- Installation of:
 - Mechanical and electrical services;
 - Installation of kitchens and bathrooms;
 - Flooring and doors;
 - Decorations;
- Implementation of air tightness and noise test;
- Construction of corridors and communal areas;
- Testing and commissioning of services;
- Quality inspection and snagging;
- Provision of warranties and user manuals; and
- Handover.

Landscaping / Public Realm

5.43 The areas of landscaping across the site will comprise of:

- Trees, shrub beds and grass areas; and
- Walkways and paving along with associated tree pits.

5.44 These aspects will be implemented based on the proposed site clearance, demolition and construction sequencing:

- Planting, hard landscaping and car park associated with the David Lloyd Leisure Centre (including trees, shrub and grass planting); and

¹ Where required, the pruning of trees will be carefully planned and undertaken in accordance with BS 3998: 2010 Recommendation for Tree Works.

- Planting and hard landscaping associated with the residential blocks (including trees, shrub and grass planting).

Demolition Volumes And Construction Materials Quantities

Demolition

5.45 Table 5.1 provides an estimate of the quantities of material likely to be generated as a result of the demolition of the existing buildings and associated structures on-site.

Table 5.1 Estimated Demolition Quantities

| Material Type | Quantities |
|----------------|---------------------|
| Steel | 50t |
| Concrete | 200m ³ |
| Hard Surfacing | 1,450m ² |
| Excavation | 8,000m ³ |

Excavation

- 5.46 It is estimated that there will be approximately 8,000m³ of material excavated in association with the site strip, infrastructure and foundation excavations.
- 5.47 The excavated material is anticipated to primarily comprise of natural sand and gravel deposits, with very little made ground anticipated.

Construction

5.48 Estimates of material quantities for key construction components are provided in Table 5.2.

Table 5.2 Estimated Construction Material Quantities

| Component of Proposed Development | Residential Blocks | | David Lloyd Leisure Centre | |
|---|----------------------|-------|----------------------------|-------|
| | Quantities | Loads | Quantities | Loads |
| Concrete to Foundations and Substructures | 250m ³ | 40 | 2,500m ³ | 345 |
| Concrete in Superstructures | 250no. | 10 | 1,800m ³ | 240 |
| Steel | - | - | 550t | 30 |
| Reinforcement | 225t | 30 | 300t | 15 |
| Façade Cladding | - | - | 1,500m ² | 15 |
| Roof Finished | 9,675m ² | 130 | 3,650m ² | 50 |
| Blockwork Walls | 13,000m ² | 10 | 100 m ² | 10 |
| Internal Walls | 2,000m ² | 15 | 3,000m ² | 20 |
| Ceilings | 500 m ² | 10 | 6,500m ² | 10 |
| Wall Finishes | 800 m ² | 10 | 4,000m ² | 10 |
| Floor Finishes | 2,500m ² | 10 | 6,000m ² | 10 |
| Hard Landscaping | 4,500m ² | 60 | 16,220m ² | 210 |
| Construction Waste | 550m ³ | 75 | 500m ³ | 65 |

Construction Waste Generation

5.49 Construction waste volumes have been estimated using Building Research Establishment (BRE) Waste Benchmarking data², 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 tonnes of construction waste

per 100m² of floor area, for residential projects, to be 18.1m³ per 100m², and for leisure projects 14.4m³ per 100m².

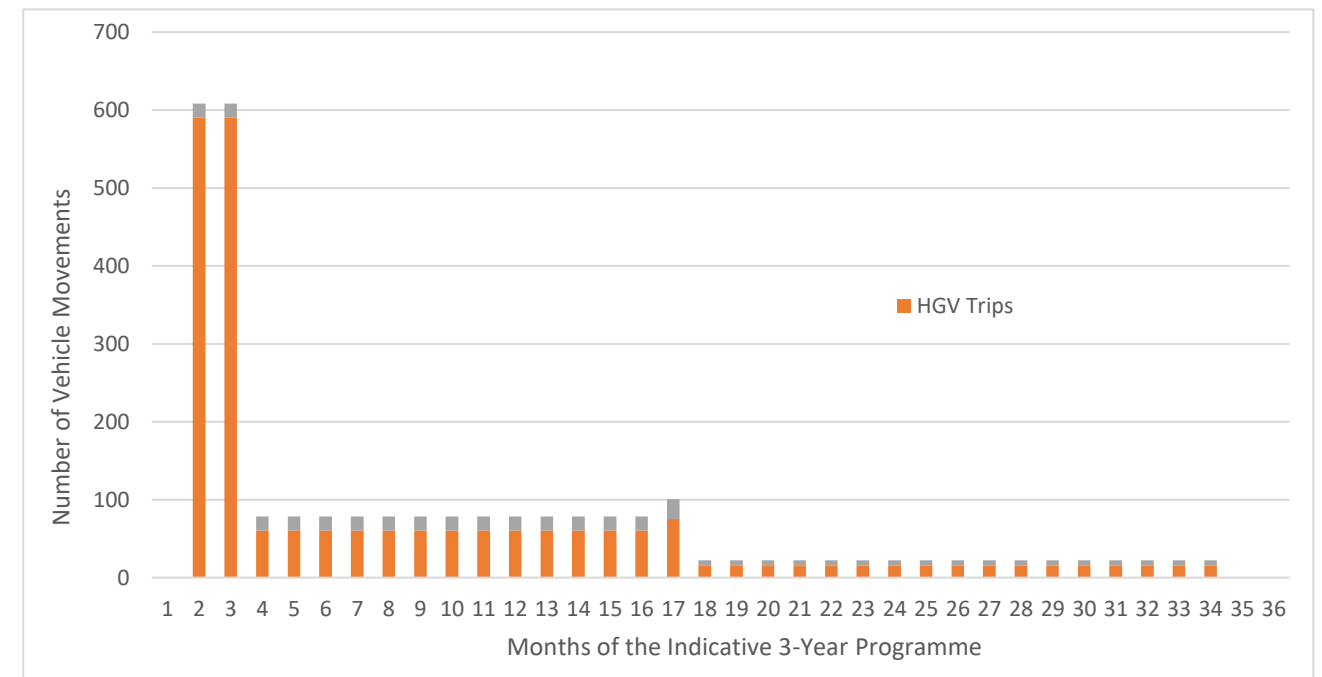
5.50 Based on this information and a total proposed floorspace of approximately 6,700m² Gross External Area (GEA) for the residential, and 5,800m² GEA for the leisure centre, the Proposed Development is likely to generate approximately 10,500m³ construction waste, which equates to a total of approximately 9,135 tonnes when applying standing construction factors.

Vehicle Movements

5.51 The estimates of demolition and excavation volumes and construction material quantities together with the outline demolition and construction programme have been used to estimate the number of vehicle movements associated with the 3-year demolition and construction works programme.

5.52 Figure 5.2 presents the data relating to vehicle movements, in terms of the estimated number of movements per month (movements are 2-way, meaning one vehicle in and one out is equal to 2 movements).

Figure 5.2 Estimated Number of Two-Way Vehicle Movements (HGVs and LGVs) per Month



5.53 The peak vehicle movements are anticipated to occur during months 4 to 5, associated with the demolition of the existing building on-site and the construction of the David Lloyd Leisure Centre.

Site Access and Egress

5.54 There will be one site access and Egress point for vehicles onto the A320 Egley Road, located to the north-east of the site. This access and egress point will remain in place for the duration of the demolition and construction works.

Plant And Equipment

5.55 Consideration has been given to the types of plant that are likely to be used during the demolition, excavation and substructure, construction and superstructure and fit-out works. The plant and equipment associated with these work stages is set out in Table 5.3 to Table 5.7.

5.56 The temporary use of cranes for the demolition / construction works would not exceed a height of 45m above ground level and would not infringe any safeguarding obstacle limitation surface. If necessary, fixed red aeronautical obstacle lighting to the jibs of the cranes will be provided.

² Building Research Establishment, (2012); BRE Waste Benchmark Data by Project Type. Accessed Online 20.03.2018 [URL: http://www.smartwaste.co.uk/filelibrary/benchmarks%20data/Waste_Benchmarks_for_new_build_projects_by_project_type_31_May_2012.pdf]

Table 5.4 Plant and Equipment Schedule – Demolition

| Equipment | Example Model | Power Rating | Equipment Size |
|------------------------|-----------------|--------------|----------------|
| Tracked Excavator | Komatsu PC600-8 | 323kW | 58t |
| Articulated Dump Truck | Volvo A25G | 235kW | 25t |

Table 5.5 Plant and Equipment Schedule – Substructure / Excavation

| Equipment | Example Model | Power Rating | Equipment Size |
|------------------------|---------------------|--------------|----------------|
| Tracked Excavator | Komatsu PC600-8 | 323kW | 58t |
| Tipper Truck | GVW Muckaway Tipper | 250kW | 32t |
| Mobile Crane | Demag AC-40 | 300kW | 40t |
| Articulated Dump Truck | Volvo A25G | 235kW | 25t |
| Flatbed Lorry | MAN TGS 26.440 | 350kW | 26t |

Table 5.6 Plant and Equipment Schedule – Superstructure

| Equipment | Example Model | Power Rating | Equipment Size |
|------------------------|---------------------|--------------|-----------------|
| Mobile Crane | Demag AC-40 | 300kW | 40t |
| Mobile Crane | RK250-7 | 209kW | 20t |
| Mast Climbers | Alba EDC-1700/2000 | 25kW | 1700kg |
| Flatbed Lorry | MAN TGS 26.440 | 350kW | 26t |
| Concrete Wagons | Liebherr HTM 805 | 250kW | 8m ³ |
| Articulated Dump Truck | Volvo A25G | 235kW | 25t |
| Tipper Truck | GVW Muckaway Tipper | 250kW | 32t |

Table 5.7 Plant and Equipment Schedule – Fit Out

| Equipment | Example Model | Power Rating | Equipment Size |
|------------------|-------------------|--------------|----------------|
| Hand/Power Tools | Various | 110kW | - |
| Forklift Trucks | LPG TFG 540s-S50s | 59kW | 4-5,000kg |
| Skip Trucks | DAF LF 290 | 150kW | 18t |

Hours Of Work

5.57 The anticipated core working hours for demolition and construction works are:

- 08:00 – 18:00 hours on weekdays;
- 08:00 – 13:00 hours on Saturdays; and
- No working on Sundays, Bank or Public Holidays.

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

Environmental Management And Monitoring

5.59 *ES Volume 1, Chapter 10: Mitigation and Monitoring* 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 significant of any likely environmental effects.