

Chapter 5: Demolition and Construction

INTRODUCTION

- 5.1 This chapter of the Environmental Statement (ES) describes the proposed programme of construction works and the key activities that will be undertaken prior to the completion and occupation of the Proposed Development
- 5.2 Planning for the enabling, demolition and construction of the development is broad at this stage of the planning process and may be subject to modification during the detailed planning of these works. The following construction programme, logistics and methodologies have been based on reasonable assumptions developed with the collective experience of the design and consultant team who have extensive experience on similar projects. This will be refined following consultation with the various project stakeholders and with the input of the selected Main Contractor.
- 5.3 This chapter of the ES has been prepared by Stace construction and property consultants in conjunction with Trium Environmental. Potential environmental effects identified within this chapter are discussed in more detail in each of the corresponding technical chapters of this ES (*Volume 1* and *Volume 2*).
- Programme of Works
- 5.4 The construction of the Proposed Development will be undertaken in several phases. The current expectation is that the construction works to the existing Broad Street Mall (hereafter referred as the 'Existing Mall') will take approximately 30 months, commencing in June 2020 and completion in December 2022.
- 5.5 The work phases of the development are identified as follows:
 - The phasing will be Building A to Building E in sequence (Figure 5.1). The completion dates are as follows:
 - Phase 1 Building A - Q4 Year 2;
 - Phase 1 Building B – Q1 Year 3;
 - Phase 1 Building C – Q1 Year 3; and
 - Phase 2 (Building E) – Q4 Year 3.

Figure 5.1 Proposed Construction Phasing Layout



- 5.6 Phase 1 constitutes the construction of Buildings A, B and C and it is intended that these blocks will be occupied in sequence. Phase 2 (Building E) will be carried out in sequence from Block C with occupation following that of Phase 1 (Buildings A, B and C).
- 5.7 The anticipated programme is presented in Figure 5.2 and summarised in Table 5.1.

Figure 5.2 Indicative Demolition and Construction Programme

Year		1				2				3			
Quarter		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1	Substructure												
	Site Establishment												
	Demolition												
	Piling and Basement Cores												
	Building A												
	Site Establishment												
	Superstructure												
	Building Envelope												
	Fit-Out												
	External Landscaping												
	Building B												
	Site Establishment												
	Superstructure												
	Building Envelope												
	Fit-Out												
	External Landscaping												
	Building C												
	Site Establishment												
	Superstructure												
	Building Envelope												
	Fit-Out												
	External Landscaping												
Phase 2 (Building E)	Site Establishment												
	Superstructure												
	Building Envelope												
	Fit-Out												
	External Landscaping												

Table 5.1 Indicative Demolition and Construction Programme

Construction Task / Activity	Duration (months)	Start Date (Quarter and Year)	Completion Date (Quarter and Year)
Phase 1			
Site Establishment	7	Q2 Year 1	Q1 Year 2
Demolition	1	Q2 Year 1	Q2 Year 1
Substructure	2	Q2 Year 1	Q3 Year 1
Superstructure	9	Q3 Year 1	Q2 Year 2
Building Envelope	12	Q4 Year 1	Q4 Year 2
Fit-out	12	Q1 Year 2	Q1 Year 3
External Landscaping	3	Q4 Year 2	Q1 Year 3
Phase 2			
Site Establishment	1	Q2 Year 2	Q2 Year 2
Superstructure	2	Q2 Year 2	Q4 Year 2
Building Envelope	4	Q4 Year 2	Q1 Year 3
Fit-out	8	Q1 Year 3	Q3 Year 3
External Landscaping	1	Q3 Year 3	Q4 Year 3

DESCRIPTION OF THE WORKS

Enabling Works

Pre-Commencement Surveys, Investigations, Consents/Licences

- 5.8 Prior to the demolition works, the enabling works and site set-up will involve utility diversions and the removal of any asbestos from the existing adjacent occupied buildings. Several surveys and investigations will need to be undertaken prior to the commencement of the works on site. The following pre-commencement surveys and investigations are envisaged:
- Condition survey of any adjoining party walls and boundary walls;
 - Structural surveys of existing buildings;
 - Asbestos survey of existing buildings;
 - Topographical survey to confirm existing site levels;
 - Utility surveys to determine the position of any assets; and
 - CCTV survey of the surface water and foul water drainage to confirm size and condition.
- 5.9 In addition, to the surveys and investigations identified above, various consents and licenses will be required taking into to the consideration the necessary consents and licences required to commence an onsite activity will be applied for giving appropriate notice periods. These may include:
- Connections to existing statutory services and main sewer; and
 - Licenses for discharge of water from the site into the public sewer, if required.

Utility Diversions / Removals

- 5.10 Detailed discussion and reviews will be undertaken with all statutory utility companies in advance of the works on the areas of the site that may have utility services, as indicated by utility company record drawings. Any required diversions will be implemented in advance of the construction works, in compliance with all statutory notifications and required provisions.

Site Establishment

- 5.11 Following site possession by the Main Contractor, activities will include the installation of hoardings, traffic management provisions, set up of site accommodation and the installation of protective measures to ensure the safety of neighbours, pedestrians and operatives.
- 5.12 Modifications to internal areas within the Existing Mall will be required during the construction works and these will be explained to the retail tenants and the Mall Centre Manager prior to implementation (refer section 'Neighbour and Public Relations' of this ES Chapter).
- 5.13 The live construction areas within the retail mall will be fully encapsulated and screened for the duration of the works, keeping the works fully segregated from the retained operating retail units and visitors to the Existing Mall.

Hoarding

- 5.14 The boundary of the Phase 1 works will be established and 2400mm high hoarding will be constructed around the works (see Figure 5.3). The hoarding will stay fixed in position until handover and the progressive occupation of Phase 1 (Buildings A, B and C) in sequence.
- 5.15 The subsequent construction of Phase 2 will also involve erection of hoarding prior to commencement of the works hoarding (2400 mm) will be constructed around the boundary of these works, and the hoarding will stay fixed in position until the handover and occupation.
- 5.16 The individual site areas will be hoarded and secured with acoustic Noise Reduction Hoarding panels.
- 5.17 Where scaffolding is erected monarflex sheeting will be erected around the perimeter of the area, providing screening and protection to site users. Podium Hoarding Plan can be seen in Figure 5.4.
- 5.18 The basement hoarding plan for Phase 2 can be found in **Annex A**.

Figure 5.3 Phase 1 Basement Hoarding Plan

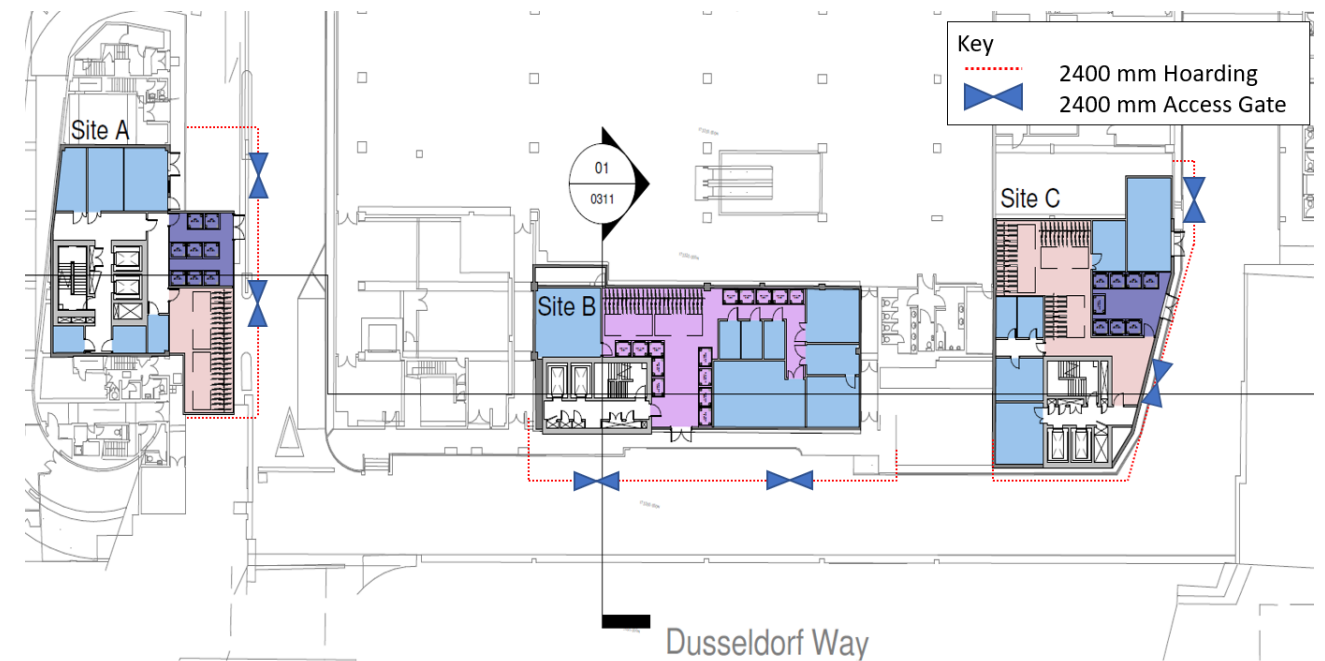
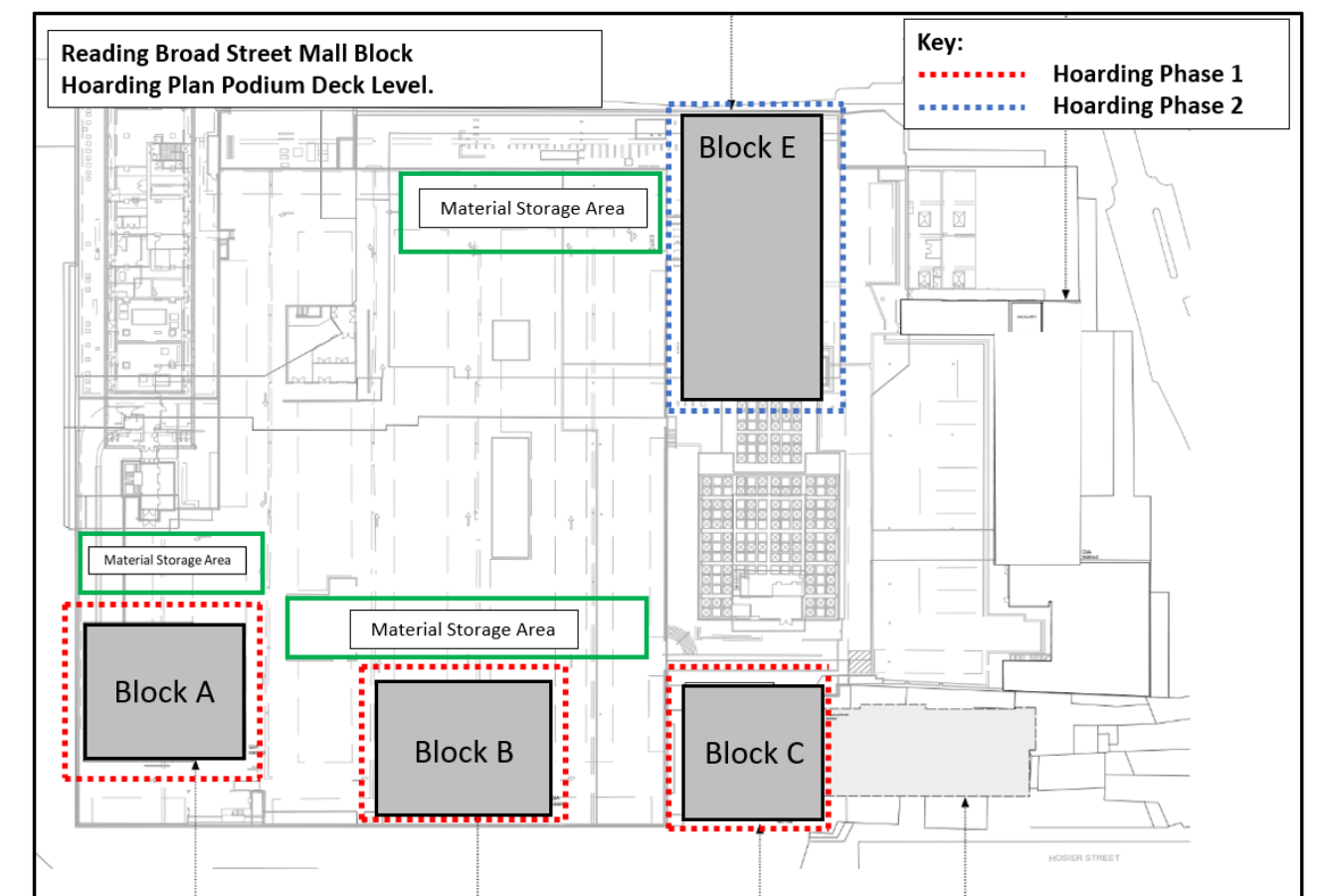


Figure 5.4 Podium Hoarding Plan



- 5.19 Safe site access and walking routes will be established and maintained for the duration of the works to segregate vehicles and pedestrians. This will be achieved by the installation of a separate fixed barrier. Designated pedestrian routes for construction personnel will also be established within the construction access routes on Hosier Street and Dusseldorf Way (Figure 5.5).

- 5.20 There will also be a designated protected walkway to the neighbouring Hexagon Theatre and Arts Venue from Hosier Street, maintaining this access route to the Hexagon for the duration of the Phase 1 construction works.

Figure 5.5 Site Establishment and Logistics Layout Plan



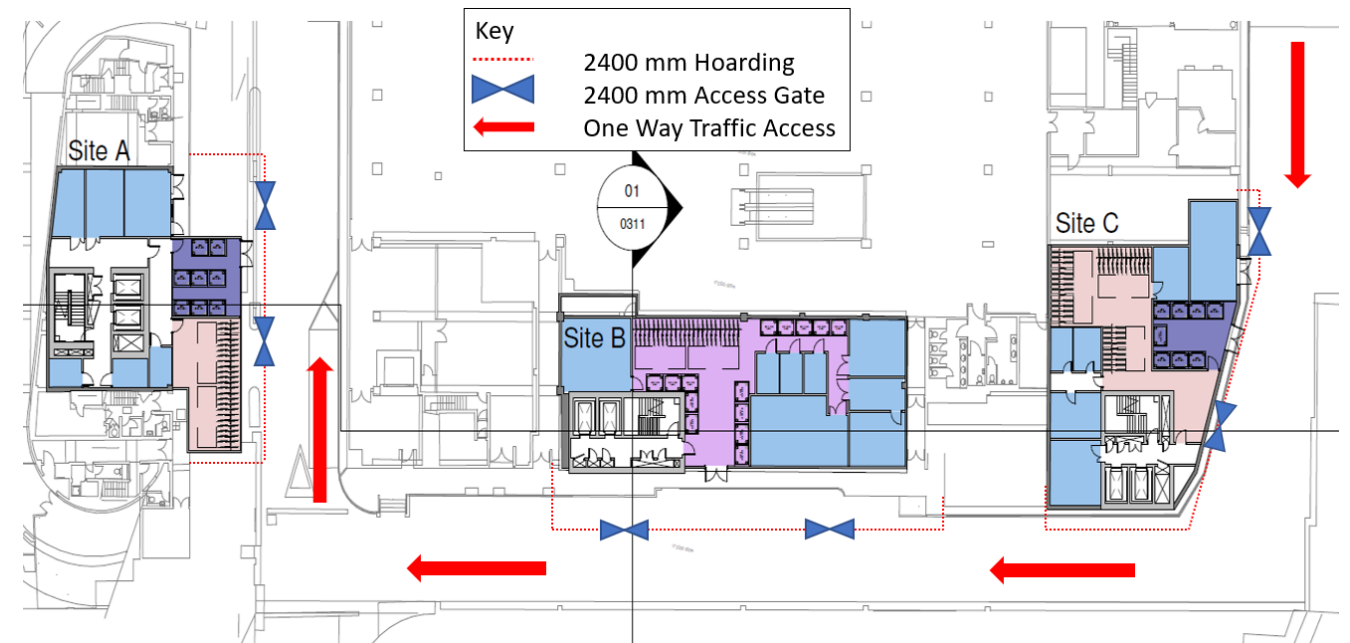
Site Office and Welfare Facilities

- 5.21 Site welfare facilities will be established at an agreed position with the RBC prior to the commencement of works. These facilities will include a canteen, drying rooms, toilets and office facilities. The site office and welfare facilities will be strategically located in a position that is appropriate to serve all Phases, and it is anticipated the site office will remain in the same location throughout the works. Where there is the opportunity, vacant units within the Existing Mall will be used for site office facilities.

Demolition

- 5.22 Demolition will be required within the Existing Mall to provide sufficient space for the central lift and stair cores serving the proposed development. Demolition of small areas of the basement within the Broad Street Mall will be necessary to create sufficient space for the cores for the towers which will be built through the podium deck. The foundation piles and piling caps will be present in the basement of the shopping centre, below the existing slab level.
- 5.23 There will also be internal demolition within a small number of the retail units to facilitate the new build (See the Basement Logistics Plan for each Buildings A, B and C). The demolition will be by hand, given that the sections of the retail units to be removed will be demountable partitions & walls. These materials will be loaded into skips for transfer off site.
- 5.24 The areas for demolition are detailed on the Basement Logistics Plan (Figure 5.6 and **Annex B**). The works required will be regularly reviewed with the retail mall owners and management company to ensure that all works are clearly identified with procedures agreed to ensure that the health and safety of all personnel (i.e. visitors, retail workers etc.) using the existing mall is maintained.

Figure 5.6 Buildings A to C Basement Logistics Plan



Substructure Works

- 5.25 Excavation and substructure works will be undertaken in the following order:

- Breaking out the existing concrete slab and formation excavation will be undertaken in preparation for piling operations;
- Piling will be undertaken via the Continuous Flight Auger (CFA) piling method, which is the quietest form of piling and is a cast in-situ process. Piling will be undertaken into and through the ground. Pile sleeves will be used where necessary to prevent collapse through any weak strata;
- The Piles will be progressively installed following the pile coring. The piles installed will include support for the tower cranes;
- Following the piling works, the installation of pile caps will be undertaken; and
- All substructure reinforced concrete works will be progressively installed following the installation of pile caps. This will include the lift pits, any sumps, pumps and reduced level plant rooms.

- 5.26 The Proposed Development does not propose the creation of any additional basement floorspace. However, some excavation may be required for reduced level areas such as plant rooms and lift pits in connection with the residential tower requirements. This will be undertaken through a combination of core drilling and mechanical breakers, to construct the basement structures through the existing concrete basement floor.

- 5.27 Where ground water is encountered during any piling operations within the basement to construct the foundations for the tower cores and tower crane bases, dewatering will be undertaken, pumping will be carried out using silently operated pumps. Ground water sediment/settlement tanks will be utilized with all necessary environmental controls implemented. Further details regarding measures to avoid or mitigate environmental impacts is presented within **ES Volume 1: Chapter 13 – Mitigation and Monitoring**.

Superstructure

- 5.28 The frame to Buildings A, B and C will be constructed in reinforced concrete, cantilevered from the central vertical access core. The tower cranes will be utilised to hoist all components into place. Where practical, prefabricated elements (i.e. such as stairs) will be delivered to site to: minimise on site labour required to erect the cladding; ease logistics; reduce number of vehicle trips; and to optimise/reduce the programme period.

- 5.29 The sequence of operations will be as follows:

- Complete the tower core structure;
- Install the structural floor components;

- Erect the lightweight steel framing systems (SFS) structural external frame; and
 - Fix the cementitious board to the SFS frame.
- 5.30 The frame to Building E will be lightweight framing supported from the existing Podium deck, to reduce loading onto the existing structures below. Light weight framing systems lend themselves well to off-site prefabrication which will be utilised as much as possible.
- 5.31 It is proposed to utilise the area of the amenity deck for the storage of materials once these have been off loaded by the Crane from ground floor level (see Figure 5.7).
- 5.32 There will be a Luffing Jib Tower Crane used for Phase 1 (Buildings A, B and C), with the cranes located in the Internal Lift Shaft for each block. Mobile cranes will be used for Phase 2 (Building E). See Figure 5.7 below, indicating the locations of the tower cranes and the crane radius.
- 5.33 The temporary use of tower cranes for the demolition and construction works would not exceed a height of 60m above ordnance datum (AOD) and would not infringe any safeguarding obstacle limitation surface. Fixed red aeronautical obstacle lighting to the jibs of the tower cranes will be provided.
- 5.34 Crane arcs for the cranes will be controlled to prevent oversail of the public realm (see Figure 5.7), highways and neighbouring properties.

Figure 5.7 Proposed Tower Crane Location and Radius



Building Envelope

- 5.35 The building facades for the new buildings will constitute cladding panels. It is envisaged that off-site manufacture of these panels will be utilised as far as reasonably practical with feasibility studies undertaken to test the benefits to programme of lifting in complete floor height units as the frame progresses. The use of off-site manufacture reduces the construction period for the erection of the external envelope and in turn reduced the period of crane time required to erect the structural envelope.

- 5.36 Access mast climbers (or where necessary at higher set back levels scaffolding platforms) will be erected to facilitate installation of the external cladding panels. Access for all subsequent finishing required to the external envelope for all buildings will be by mast climbers/scaffold.

- 5.37 The SFS internal structural framework and windows to all elevations of Buildings A, B and C will be installed from inside of the Tower Blocks. Installation of windows for Building E will also be from inside.

Fit-Out

- 5.38 As the new build structure progresses vertically, the installation of SFS mild steel internal sections of the external cavity wall can also proceed. This will be followed by the installation of the Ventilation flat duct and soil and vent pipes.
- 5.39 In tandem to the SFS installation and once the building is water tight, the installation of internal partitions can commence with the plasterboard fix on to one side of the internal partitions, sections of the first fix mechanical and electrical (M+E) pipework and electrical wiring can be installed,
- 5.40 Following the completion of the dry lining, second fix, decorating and finishing can follow to programme.
- 5.41 As many elements as possible of the internal fit out will be manufactured off site and can include as an example, bathroom pods and kitchen components, in order to minimise on-site labour, ease logistics, reduce number of vehicle trips and optimise programme.
- 5.42 Temporary lighting and power systems will be installed at all levels where works are in progress.
- 5.43 Vertical transportation of personnel and materials during construction will be either by crane (see Figure 5.7) or a number of material and passenger hoists. On-site storage space will be restricted and will utilise the amenity deck for storage if provided by crane, alternatively delivery by hoist will adopt a 'just in time' delivery strategy (see section 'Traffic Management – Preferred Traffic Routes to the site' of this ES Chapter for further details).
- 5.44 The installation of mast climbers will commence when the core has been completed and overhead protection can be provided to those operatives working below. The internal lifts will be used for "preferential" construction use as required.

External / Landscaping

- 5.45 Landscaping works at deck level (Phase 1) will commence on completion of the construction of access and storage at podium deck level to facilitate these works. Landscaping will be fully completed and handed over by construction phase, the order dependent upon the occupation strategy agreed with the Applicant.
- 5.46 Landscaping works are likely to comprise the installation of walkways and paving, tree pits and raised beds, prior to planting.

MATERIALS QUANTITIES

Demolition

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

Table 5.2 Estimated Demolition Quantities.

Demolition Material Type	Estimated Demolition Quantities (m³)
Concrete (Total)	30
General (Ground Bearing Slab)	40

Excavation

- 5.48 It is estimated that there will be approximately 20m³ of material excavated from the pile arisings associated with each block in Phase 1, totalling 60m³. No excavated material is anticipated from Building E.

Construction

5.49 Estimates of material quantities for key construction components are provided in Table 5.3.

Table 5.3 Estimated Construction Material Quantities.

Materials	Phase 1			Phase 2
	Building A	Building B	Building C	Building E
Arisings & Concrete in Piles (m³)	20	20	20	N/A
Concrete to foundations and substructures (m³)	60	60	60	N/A
Concrete in Superstructures (m³)	2500	2000	1750	50
Substructure Rebar (tonnes)	10	10	10	6
Superstructure rebar (tonnes)	200	170	150	N/A
Façade Cladding (incl. Brick) and Glazing (m³)	1760	1440	1200	400
Roof finishes (m²)	400	400	400	400
Blockwork Walls (m²)	40	40	40	40
Internal Walls (m²)	40,000	32,000	28,000	20,000
Ceilings (m²)	8800	7200	6000	3000
Wall Finishes (m²)	40,000	32,000	28,000	20,000
Floor Finishes (m²)	8800	7200	6000	400
Hard and Soft Landscaping (m²)	200	200	200	N/A

Construction Waste Generation

5.50 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 data¹. The BRE Benchmark data identifies the average tonnes of construction waste per 100m² of floor area (GEA) for commercial (i.e. office, retail) projects as 19.8m³ per 100m².

5.51 Based on this information, the Proposed Development is likely to generate approximately 21,800m³ construction waste, which equates to a total of approximately 26,000 tonnes when applying standard construction factors²

5.52 100% recycling of inert waste from demolition and construction is targeted. Excavation spoil/material will be 100% reused off site unless contamination is identified, in which case the preferred course of action will be treatment and re-use. Deep landfill or incineration will be utilised as a last resort if necessary.

5.53 Further consideration of the management of waste is discussed within section '*Environmental Management and Monitoring – Waste Management*' of this ES Chapter.

PLANT AND EQUIPMENT

5.54 Consideration has been given to the types of plant that are likely to be used during the demolition and excavation, construction of substructure, superstructure and fit out works. The plant and equipment associated with these work stages is set out in Table 5.4 below.

Table 5.4 Plant and Equipment Schedule – Substructure & Main Structure.

Item of Plan	Demolition (Phase 1 only)	Substructure and Basement Cores	Super-Structure	Envelope, Roof, Shell and Core	Fit Out and External Work)
Breaker/Cutter	✓	✗	✗	✗	✗
Mini skid-steer loader	✓	✗	✗	✗	✗
Mobile floodlights	✓	✓	✓	✓	✓

¹ 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]

Item of Plan	Demolition (Phase 1 only)	Substructure and Basement Cores	Super-Structure	Envelope, Roof, Shell and Core	Fit Out and External Work)
Tower Cranes (Phase 1 only)	✓	✓	✓	✗	✗
Passenger/goods hoists	✓	✓	✓	✓	✓
Tipper lorries	✓	✗	✗	✗	✗
Mobile cranes (Phase 2 only)	✗	✗	✗	✓	✓
Mobile access equipment	✓	✓	✓	✓	✓
CFA piling rig	✗	✓	✗	✗	✗
Wheel wash	✓	✗	✗	✗	✗
Lorry mounted concrete pump	✗	✓	✓	✓	✓
Concrete vibrator	✗	✓	✓	✓	✓
Fork lift	✓	✓	✓	✓	✓

HOURS OF WORK

5.55 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.

5.56 To maintain the above working hours, the Main Contractor may require at certain times a period of up to one hour before and after normal working hours to start and close 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 carried outside of these core hours in agreement with RBC and other relevant parties.

TRAFFIC MANAGEMENT

Preferred Traffic Routes

5.57 The preferred transport routes to and from the site during the construction period for deliveries of materials to the site and for the removal of wastes will be agreed with the RBC prior to commencement of construction works (see Figure 5.8).

5.58 As the site is located adjacent to A329, it is considered that this would be the preferred route to be used by construction lorries travelling to and from the site. The A329 allows access to strategic arterial roads, such as the M4, and therefore avoid local residential roads.

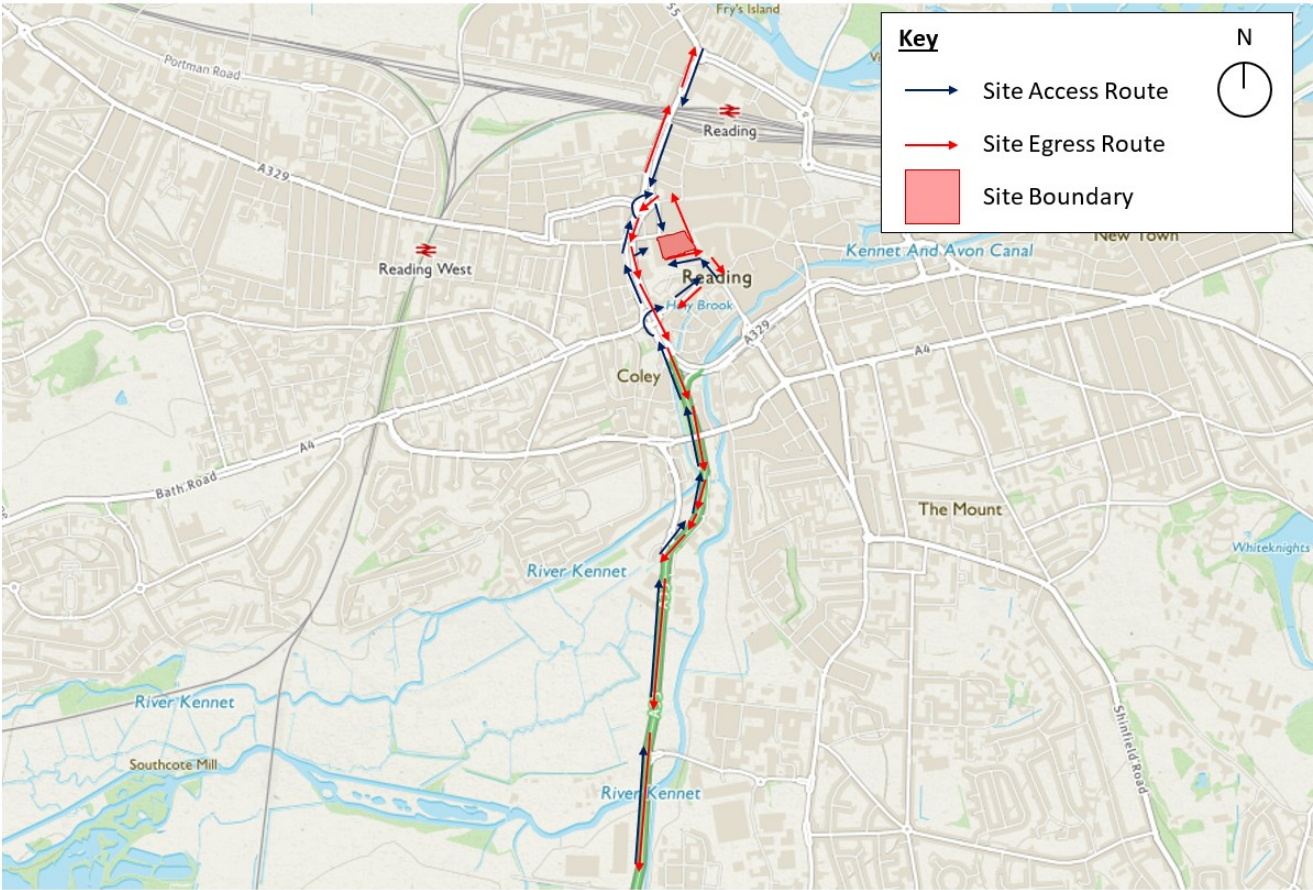
5.59 Access and egress to Phase 1 will be via the A392 then into Castle Street and into St Marys Butts.

5.60 Access and egress to Phase 2 will be via the A392 then into Friar Street then into Cheapside and onto Oxford Street.

5.61 RBC will be consulted prior to the commencement of construction works regarding the provision of direction signage on the surrounding road network to avoid vehicles using inappropriate routes to reach the site.

² Waste and Resources Action Plan (WRAP); Accessed Online 20.03.2018 [URL: <http://www.wrap.org.uk/sites/files/wrap/Reporting%20Guidance.pdf>]

Figure 5.8 Access and Egress Traffic Routes – Wider Context



Site Access / Egress

- 5.62 All construction vehicles will approach the site travelling northwards along St Mary's Butt. To leave the site, vehicles will exit onto St Mary's Butt, travel north along St Mary's Butt joining West Street before turning west onto Friar Street and subsequently re-joining the A329 which allows access to strategic arterial roads such as the M4. This will allow vehicles to avoid local residential roads.
- 5.63 All construction routes will be agreed with RBC ahead of any construction activities and the agreed routes will be incorporated into the Construction Management Plan.
- 5.64 Phase 1 and 2 will access the site via the A329, then travelling east along Castle Street, then north up St Mary's Butts and finally west along Hosier Street for Phase 1. An outline of the proposed site access and egress arrangement is presented within Figure 5.9
- 5.65 Phase 2 will be accessed along the A329, east along Friar Street, south on Cheapside and east along Oxford Road. Whilst Basement Access (Phase 1) will be accessed off the A329 (Figure 5.10).
- 5.66 The site entrances will have specific Health and Safety signage. Additional signage will be provided for pedestrians / visitors and vehicles to ensure they are segregated and use the correct gates. The required Considerate Constructors boards will also be displayed with the emergency contact information.
- 5.67 No car parking will be available on site for construction staff as the assumption is that staff members will access the site via public transport.

Figure 5.9 Phase 1 and 2 Access and Egress Routes and Layout – Site Context

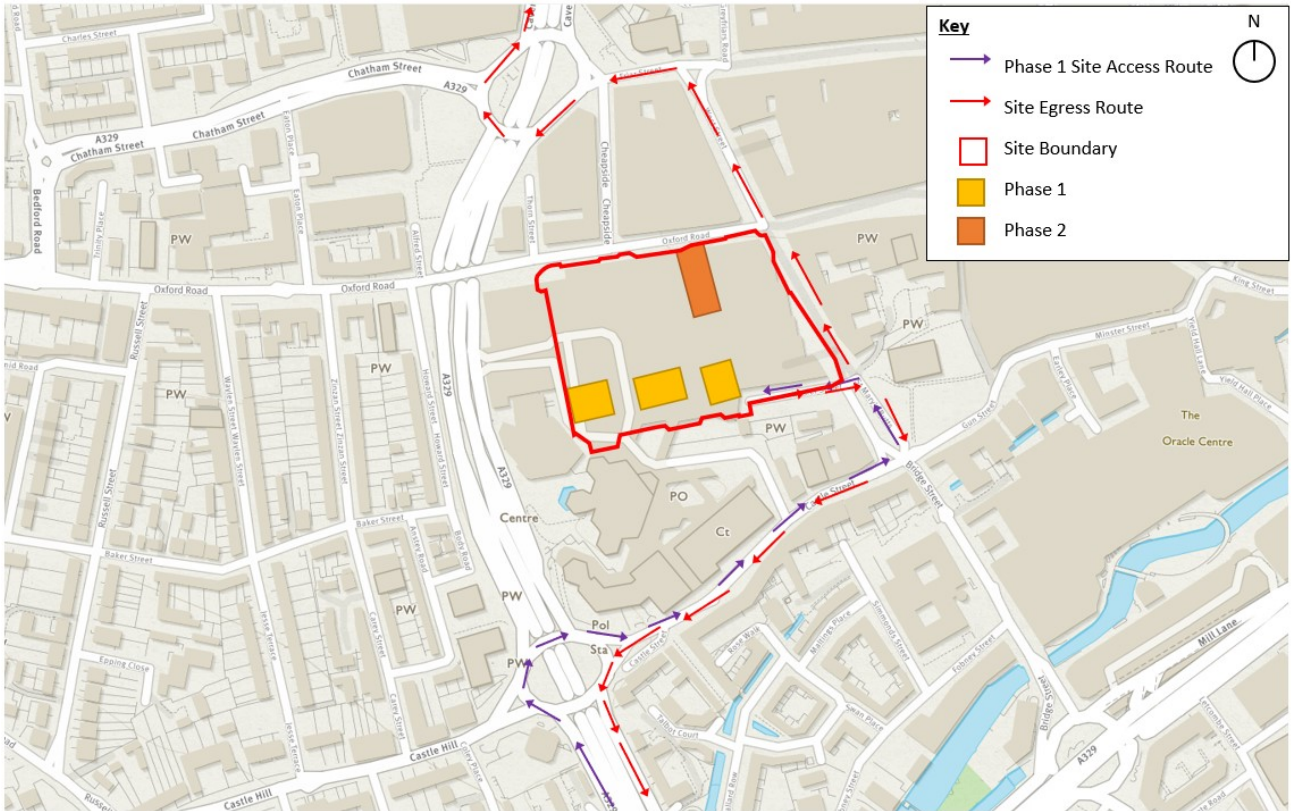
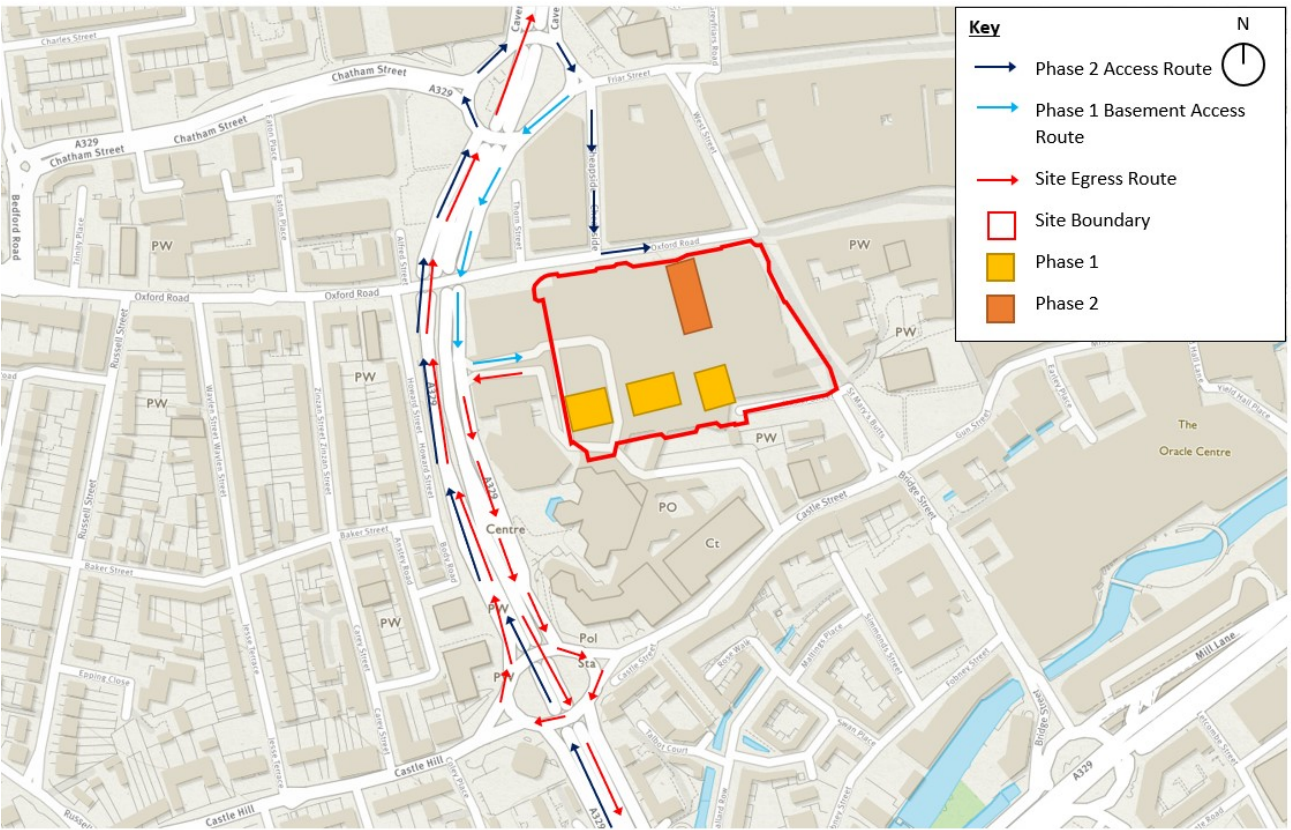


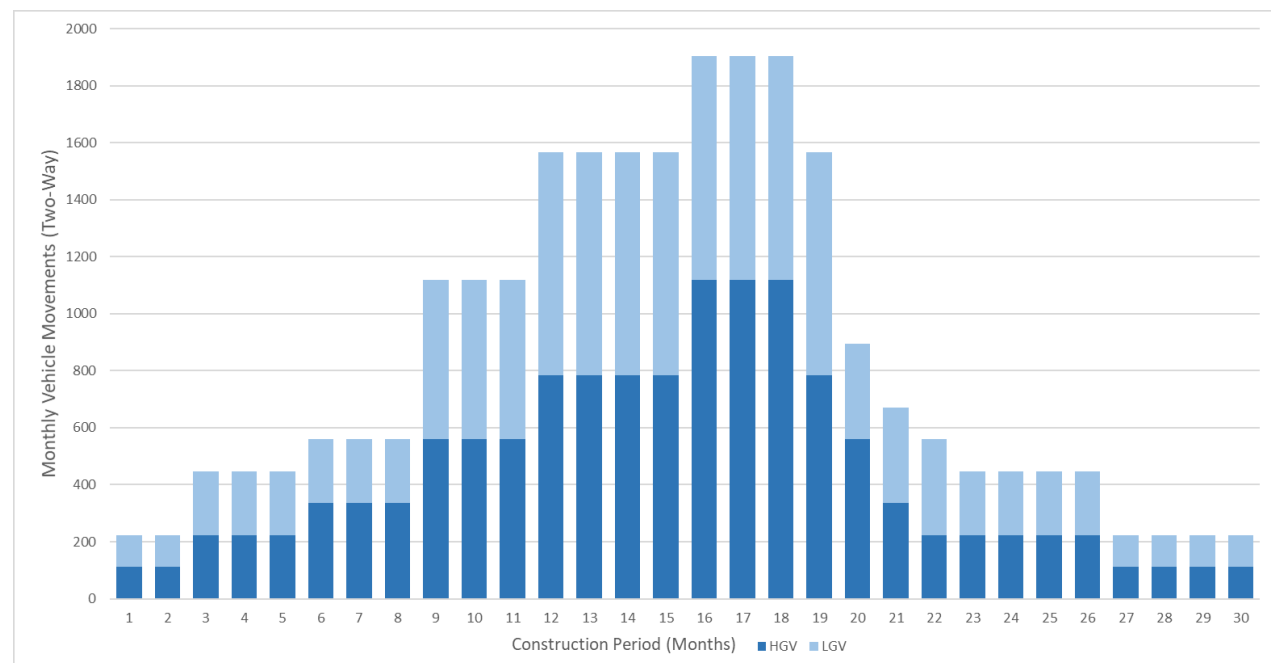
Figure 5.10 Phase 3 and Basement Access and Egress Routes and Layout – Site Context



Vehicle Numbers

- 5.68** The estimates of demolition and construction material quantities, together with the outline demolition and construction programme, have been used to estimate the number of vehicle movements for the works programme.
- 5.69** Data relating to vehicle movements are presented in Figure 5.11 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).
- 5.70** The peak vehicle movements are anticipated to occur during months 16 to 18, associated with the building envelope and fit out of Phase 1, superstructure and superstructure of Phase 2. The peak vehicle movements are equivalent to 4 HGV movements per hour (2 in, 2 out), 40 vehicle movements per day and this equates to a monthly peak of 1120 HGV vehicle movements associated with the main construction works
- 5.71** There is also a high number of vehicle movements anticipated for months 12 to 15 (associated with superstructure, building envelope and fit out of Phase 1, and superstructure of Phase 2) and month 19 (associated with building envelope, fit out and external landscaping of Phase 1, building envelope and superstructure and building envelope of Phase 2).

Figure 5.11 Estimated Number of Vehicle Movements per Month (two-way)



Construction Logistics Management

Closures and Diversions

- 5.72** The use of St Marys Butt by construction vehicles to access the site may cause disruption and delays as vehicles wait to enter the site, temporarily increasing traffic flows and using road-space.
- 5.73** Short-term closures of Hosier Street, St Marys Butt and Oxford Road may also be required to establish and remove tower cranes and to deliver large items of building plant. The requirement for short-term road closures will be discussed and agreed with RBC prior to the commencement of works requiring the road closure in question.

Loading / Unloading

- 5.74** A segregated area for the safe loading and unloading of road vehicles will be implemented on site and traffic marshals will direct vehicles on to and off site.
- 5.75** Loading and unloading of materials and equipment will occur within the site boundary as far as practicable, thereby minimising congestion on the adjacent highway network.

Existing Multi Storey Car Park

- 5.76** The existing multi-storey car park will remain operational throughout the construction of the development with the minimum number of parking bays suspended to facilitate the safe implementation of the works. The live

construction areas within the car park will be fully encapsulated and screened for the duration of the demolition and construction works, keeping the works fully segregated from the car park. No construction loads will be allowed to traverse the car park.

Reading Bus Network

- 5.77** There are several bus terminals and bus stops on the roads surrounding the site. Detailed discussions with the bus operators will be required to review the access required for construction vehicles who are expected to require temporary use of these terminal and bus stop areas.
- 5.78** Formal permissions will be obtained from the Local Authority in conjunction with the Highways Department, the local Police Traffic division and the bus companies prior to any construction operations as part of the planning of these construction works. However, should temporary closure or relocation of these taxi ranks be required formal permissions will be obtained from RBC following consultation with the relevant stakeholders prior to the commencement of works as required. Closures or road restrictions are anticipated for St Marys Butts and Oxford Road.
- 5.79** All statutory public transport companies will be consulted as part of the preparation of the Construction Logistics Plan (CLP), to ensure all precautions and provisions for the safe implementation of the construction works are identified, and procedures listed to maintain a safe environment for the public and construction employees.

Taxi Ranks

- 5.80** There are two taxi ranks located adjacent the site:
- On the north side of Oxford Road, located to the north of the site; and
 - On the east side of St. Mary's Butts, located to the east of the site.
- 5.81** Under the current construction logistic proposals, the taxi ranks are unlikely to be affected. Should temporary closure or relocation of these taxi ranks be required formal permissions will be obtained from RBC prior to the commencement of works as required. Closures or road restrictions are anticipated as being a requirement in Oxford Road.

Site Management

- 5.82** The restrictive nature of the surrounding infrastructure will demand careful planning and control of deliveries to avoid congestion. A Construction Logistics and Interface Manager will be prepared to manage all deliveries and ensure the coordinated flow of vehicles to and from the site. Deliveries will be managed by a system of timed / booked deliveries, which will be implemented and controlled by the Construction Logistics and Interface Manager. This will ensure that access and adjoining roads do not become congested. The intent with all deliveries is to unload them from within the site boundary (see section 'Loading / Unloading').
- 5.83** To ensure the timely management of deliveries to the site, the following key considerations will be enforced:
- No stopping or parking on the adjoining roads to the site. Strict control to prevent temporary parking on kerbsides near the site will also be enforced;
 - All deliveries are to be made during the stipulated site working hours. All deliveries must be booked in advance (i.e. at least a week) with the Construction Logistics and Interface Manager. Unscheduled deliveries will not be accepted; and
 - The size of and type of delivery vehicles will be stipulated where necessary to suit the construction process and access available.
- 5.84** To further minimise the likelihood of congestion, strict monitoring and control of all vehicles entering and exiting the site will be maintained, including the adoption of the following measures (where appropriate):
- Consolidation of deliveries wherever possible; and
 - A system of 'just in time' deliveries.
- 5.85** The opportunity to mitigate further the potential for congestion by delivery vehicles by providing parking off-site will be explored when detailed planning for the construction works and logistics is undertaken. The possibility of identifying a holding area will be investigated along the traffic routes. This would allow vehicles to be held until the time they are required on-site. Should delivery vehicles be managed by parking on-site, the details will be outlined within the CEMP and approved prior to works commencing.

- 5.86** The Construction Logistics and Interface Manager will be assisted by trained banks-men and entrance security personnel to ensure vehicles arriving and leaving the site are coordinated with the works on site.

ENVIRONMENTAL MANAGEMENT AND MONITORING

- 5.87** *ES Volume 1: Chapter 13 - 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 significance of any likely environmental effects.

- 5.88** The environmental management and mitigation measures will form the basis of the Construction Environmental Management Plan (CEMP) that will be implemented during the works. The CEMP will likely comprise a number of supporting management plans / documents, for example a Construction Logistics Plan (CLP). It is anticipated that the preparation and implementation of these plans will be secured through appropriately worded planning conditions. An outline of the CEMP is presented below.

Construction Environmental Management Plan

- 5.89** The Applicant will develop and implement an CEMP through which mitigation and compliance with the RBC Procedures and 'The Control of Dust and Emissions During Construction and Demolition SPG'³ will be managed. The CEMP will also refer to industry standards, best practice and guidance, such as the 'Considerate Constructors Scheme'⁴. The CEMP will include roles and responsibilities, details of control measures and activities to be undertaken to minimise environmental effects, and monitoring and record-keeping requirements.

- 5.90** The CEMP will be periodically reviewed, and regular environmental audits of its implementation will be undertaken during the construction phase.

- 5.91** The CEMP will include (and not limited to) the following matters listed below to minimise the environmental effects during the period of construction of the Proposed Development:

- Construction Method Statement (CMS);
- Considerate Constructors Scheme;
- Neighbour and public relations;
- Management of effects from noise, vibration and air quality;
- Waste management;
- Ground conditions;
- Protection of water resources; and
- Energy and water usage.

Construction Method Statement

- 5.92** Sitting within the CEMP, the CMS will outline the different activities and procedures to be undertaken to complete the various construction works.

- 5.93** The CMS will include the following elements:

- The construction programme;
- A programme of the construction 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;
- Details (including plans) of enabling works, including provision of temporary services, utility diversions, and re-alignment / replacement of hoarding;
- Detailed site layout and access arrangements, including plans for storage, site office set-up, vehicular movements, site access and egress (see earlier comments within section 'Traffic Management' of this ES Chapter);

- Details of the transport routes for HGVs (see earlier comments within section 'Traffic Management' of this ES Chapter);
- Prohibited or restricted operations (i.e. locations, site working hours, etc.);
- Details of operations that are likely to result in disturbance, with an indication of the expected duration of each phase with key dates, including a procedure for prior notification of the RBC and relevant statutory and non-statutory consultees (including neighbours) so that local arrangements can be agreed in advance;
- A procedure to ensure communication is maintained with the Reading Borough Council and the local community to provide information on any operations likely to cause disturbance (e.g. through meetings and newsletters);
- Provision for affected parties to register complaints and the procedures for responding to complaints; and
- Considerate Constructors Scheme and RBC Management Measures

- 5.94** The site will be registered with the 'Considerate Constructors Scheme'. This scheme ensures that contractors carry out their operations in a safe and considerate manner with due regard to passing pedestrians and road users.

- 5.95** The Principal Contractor will aim to exceed the minimum requirements of the Considerate Constructors Scheme.

- 5.96** In addition to the standard banner and information board erected as part of the Considerate Constructors Scheme, an additional information board will be displayed on the external hoarding around the site to enable it to be read by the general public. The additional board will contain project specific information relating to the progress of the Proposed Development. This will be periodically updated to include any changes to the site layout and access routes.

- 5.97** During the planning process the RBC will be consulted regarding the construction process and they will be able to raise any issues or queries they have regarding the construction plans put in place.

- 5.98** In addition to the standard banner and information board erected as part of the Considerate Constructors Scheme, an additional information board will be displayed on the external hoarding around the site to enable it to be read by the public. The additional board will contain project specific information relating to the progress of the Proposed Development. This will be periodically updated to include any changes to the site layout and access routes.

Neighbour and Public Relations

Existing Retail Tenants

- 5.99** A key aspect of the successful management of the project will be the maintenance of good relations with key Retail Tenants Centre management. Prior to the start of any construction works, all Retail Tenants will be consulted to ensure that there is no disruption to their stores' deliveries; and no interruption to the public access of their retail units. There will also be regular monthly stakeholder review meetings at which the tenants will be requested to raise any concerns they have during the construction works.

- 5.100** Modifications to internal areas within the existing Broad Street Mall will be required during the construction works and these will be explained to the retail tenants and the Mall Centre Manager prior to implementation. These modifications will be identified as part of the internal Construction Logistics sequencing.

General Public

- 5.101** The contractor will endeavour to communicate with adjoining neighbours within the vicinity of the site and the public who may be affected by the works, and wherever possible give notice of forthcoming activities on site, particularly those that may have an impact on the aforementioned stakeholders.

- 5.102** Engagement with the community could be achieved by:

- Facilitating regular community group meetings;

³ Greater London Authority (2014); The Control of Dust and Emissions during Demolition and Construction SPG

⁴ Considerate Contractors Scheme (1997); Considerate Contractors Scheme. Accessed at: <https://www.ccscheme.org.uk/ccs-ltd/what-is-the-ccs2/>

- Providing specific notices, emails and warning letters regarding ad hoc construction activities, for example, wide loads to be delivered out of hours;
- Providing quarterly newsletters on progress and forthcoming activities; and
- Engaging with local schools or youth groups to promote joint activities for education on Health and Safety and also site-based learning activities and / or career advice.

5.103 In order to ensure that any comments or feedback from the public and neighbours are captured and effectively responded to, a complaints register will be implemented. The register will be held at the site office. All complaints will be recorded for action in the register. Complaints will be responded to in writing within prescribed timescales outlined in the CEMP (unless alternatively agreed in writing) and following the appropriate action to mitigate against the causes of the complaint

Waste Management

5.104 A key objective during the period of demolition and construction works will be to reduce the amount of waste generated and exported from site. This approach complies with the waste hierarchy of the Waste Management Plan for England (2013) whereby the intention is first to minimise, then to treat at source or compact and, finally, to dispose of off-site as necessary.

5.105 All contractors will be required to investigate opportunities to either avoid, minimise and reduce waste generation by means of appropriate measures either involving material selection or management of handling materials. Full details of the measures proposed are presented within **ES Volume 1: Chapter 13 - Mitigation and Monitoring**.

5.106 If waste can be re-used at the site, exemption or permit forms will be obtained from the Environment Agency in advance for re use as required.

5.107 The disposal of waste or other materials removed from the site will be in accordance with the requirements of all relevant legislation, including:

- The Environmental Permitting (England and Wales) Regulations 2016⁵;
- The Waste (England and Wales) Regulations 2011 (as amended)⁶;
- Clean Neighbourhoods and Environment Act 2005⁷; and,
- Contractors would be encouraged to adopt the principals of the Site Waste Management Plans Regulations 2008 (repealed)⁸ as good working practice.

5.108 The potential risks associated with waste disposal would be adequately managed through industry recognised standards and best practice measures (full details of the measures proposed are presented within **ES Volume 1: Chapter 13 - Mitigation and Monitoring**).

5.109 The detailed CEMP prepared by the Principal Contractor prior to the commencement of works will describe the measures required contain the measures and to manage and disposal of the waste. The CEMP, in terms of waste management, will contain:

- Classification of all wastes;
- Performance measures and target setting against estimated waste forecasts;
- Measures to minimise waste generation;
- Opportunities for reuse and recycling;
- Provision for the segregation of waste streams on site that are clearly labelled;
- Recording of proposed carriers and licenses for disposal sites;
- An audit trail encompassing waste disposal activities and waste consignment notes;
- Measures to avoid fly tipping by others on land being used for construction;
- Measures to provide adequate training and awareness through toolbox talks; and

- Consider alternative means of removing waste other than by road.

Site Health & Safety

5.110 The Principal Contractor will carry out their duties in accordance with the Construction Design Management Regulations (CDM). They will ensure that all site personnel have the correct training and qualifications, every site visitor will have a site induction. There will be a programme of toolbox talks for site operatives and the construction works will be tidy and be well maintained with all safety measures in place. Appropriate Personal Protective Equipment (PPE) will be worn by all operatives always when on the construction site.

Water Usage

5.111 Where existing pipes are likely to be disrupted by construction works, new potable water supply pipes will be installed.

5.112 Processes during the construction phases that require large volumes of water supply include mixing (especially relating to concrete), water for washing down and potable water for sanitary facilities for the construction workforce.

5.113 It is expected that the water supply to the construction site during the demolition and construction works will be provided from the existing Thames Water sources via an application to use an existing water supply for building purposes.

5.114 The CEMP will outline the appropriate strategy for the sustainable management of water use across the site. The CEMP will require relevant contractors during the period of works to investigate opportunities to sustainably manage the use of water. Full details of the measures for the management of water consumption on-site are presented within **ES Volume 1: Chapter 13 - Mitigation and Monitoring**.

Energy Usage

5.115 All relevant contractors will be required to investigate opportunities to minimise and reduce the use of energy to avoid any likely significant adverse effects associated with excessive energy consumption and resulting greenhouse gas emissions.

5.116 Measures to minimise energy usage are presented within **ES Volume 1: Chapter 13 - Mitigation and Monitoring**.

Monitoring, Inspection and Auditing

5.117 The CEMP will define responsibilities and procedures for the management of the potential impacts on the environment arising during the demolition, enabling and construction. A monitoring programme of the environmental effects of demolition and construction will be implemented to agreed RBC requirements. This programme will:

- Evaluate the effectiveness of environmental mitigation, and identify environmental problems and appropriate responses at an early stage;
- Ensure that the works are carried out in accordance with the provisions of the CEMP; and
- Identify and implement any environmental improvements that would contribute to the overall environmental performance of the Proposed Development.

5.118 To ensure that the contractors are adhering to the CEMP, the Applicant will require that site inspections and more formal audits would be undertaken, and a checklist pro-forma would be used, which would cover the environmental issues addressed in the CEMP.

5.119 Where a problem is identified, corrective action will be identified and implemented in conjunction with the Site Manager and Principal Contractor.

5.120 It is envisaged that there will be a requirement for regular reporting of monitoring and auditing to RBC, and RBC would be asked to review implementation of the protective measures as necessary during demolition and construction and would have direct access to the monitoring representative to ensure that any non-compliances with the requirements of the CEMP are speedily rectified.

⁵ Statutory Instruments 2016 No. 1154; The Environmental Permitting (England and Wales) Regulations 2016

⁶ Environmental Protection, England and Wales, 2014. The Waste (England and Wales) (Amendment) Regulations 2014

⁷ HMSO, 2005. Clean Neighbourhoods and Environment Act

⁸ DEFRA, 2008. The Site Waste Management Plans Regulations, repealed

Emergency Response and Environmental Incidences

- 5.121** Protocols to be implemented on-site in instances of emergencies and environmental incidences will be set out within the CEMP for approval by RBC.
- 5.122** Before construction works commence on-site, emergency procedures and fire exit routes from the site would be identified within the fire safety plan. Throughout the course of the construction works, these would be regularly inspected and maintained. The fire safety plan would be updated regularly as construction works progress, particularly as areas are progressively completed, and as the means of escape from the evolving buildings change. Fire alarm points and extinguishers would be situated at each floor of the buildings at the stair cores and within main corridors.
- 5.123** Site management, operatives and any visitors to the site would undergo an induction to ensure they are briefed on what actions to take in case of an emergency and in case of an environmental incident.

General Site Management

- 5.124** Hoardings with an acceptable visual outlook will be erected around and within the site (see section 'Site Establishment and Enabling Works') to provide a clear and secure demarcation between operational activities and other areas with an acceptable visual outlook. The hoarding will be used to provide information regarding the Proposed Development and the progress of the construction works. Attention will be paid to locations supporting high volumes of pedestrian movement, demolition and construction routes, access gates and security arrangements.
- 5.125** A 'clean site' policy will be maintained to keep the site clean and tidy internally, and contractors and their subcontractors will be expected to maintain this policy. For example, materials will be stored with care, spills will be cleaned up immediately and various dust mitigation measures will be put in place and managed through the CEMP. Measures to maintain the Site and avoid or reduce impacts on the surrounding area are presented within **ES Volume 1: Chapter 13 - Mitigation and Monitoring**.
- 5.126** Staff facilities would be kept clean and maintained in good working order. Waste would be collected regularly, with food waste removed from site daily. Smoking areas would be provided as necessary. They will be located away from sensitive boundaries and neighbouring residences and businesses.
- 5.127** Any damage incurred to the public realm and highway will be repaired in conjunction with RBC and Highways Agency requirements. A street sweeper will also be employed as and when required during the demolition, piling and excavation periods to ensure the surrounding the streets remain clean during the works.

Archaeology

- 5.128** An Archaeological Historic Environment Assessment (HEA) has been produced for the site in order to understand the buried heritage value of the site and to identify archaeological constraints on the future development of the site and for the formulation of a mitigation strategy if required.
- 5.129** The HEA is presented within **ES Volume 3 - Technical Appendices - EIA Scoping**⁹.
- 5.130** On the basis that the HEA has defined the potential for remains of limited heritage significance only, the development of the site is unlikely to generate any significant archaeological (buried heritage assets) related effects. Furthermore, the previous development on site (Broad Street Mall and the associated basement) is anticipated to have removed or heavily disturbed all archaeological remains within its footprint.
- 5.131** Taking into account the existing knowledge of the site and surrounding area and the potential for removal of archaeological remains within the building footprints, it is concluded within the HEA that a programme of archaeological works is proposed to be undertaken to enable any archaeological remains to be identified, assessed and recorded, with the details to be agreed in advance before works commence on-site and the observations and works to be carried out during the sub-structure works on site. The exact scope and extent of the programme of archaeological works would be agreed with the local authority's archaeological advisor, prepared under the terms of a standard archaeological planning condition(s) set out under the grant of planning consent. Any archaeological work would need to be undertaken in accordance with a Written Scheme of Investigation (WSI) and the mitigation would require an appropriate level, evaluation (if required) and reporting. The mitigation proposed is also presented within **ES Volume 1, Chapter 13 - Mitigation and Monitoring**.

⁹ The amendments culminating in the description of the Proposed Development presented in this ES (Nov 2019) have been reviewed in light of the assessment and conclusions presented in the HEA. It is considered the Proposed Development described in this ES does not change the conclusions presented in the HEA.

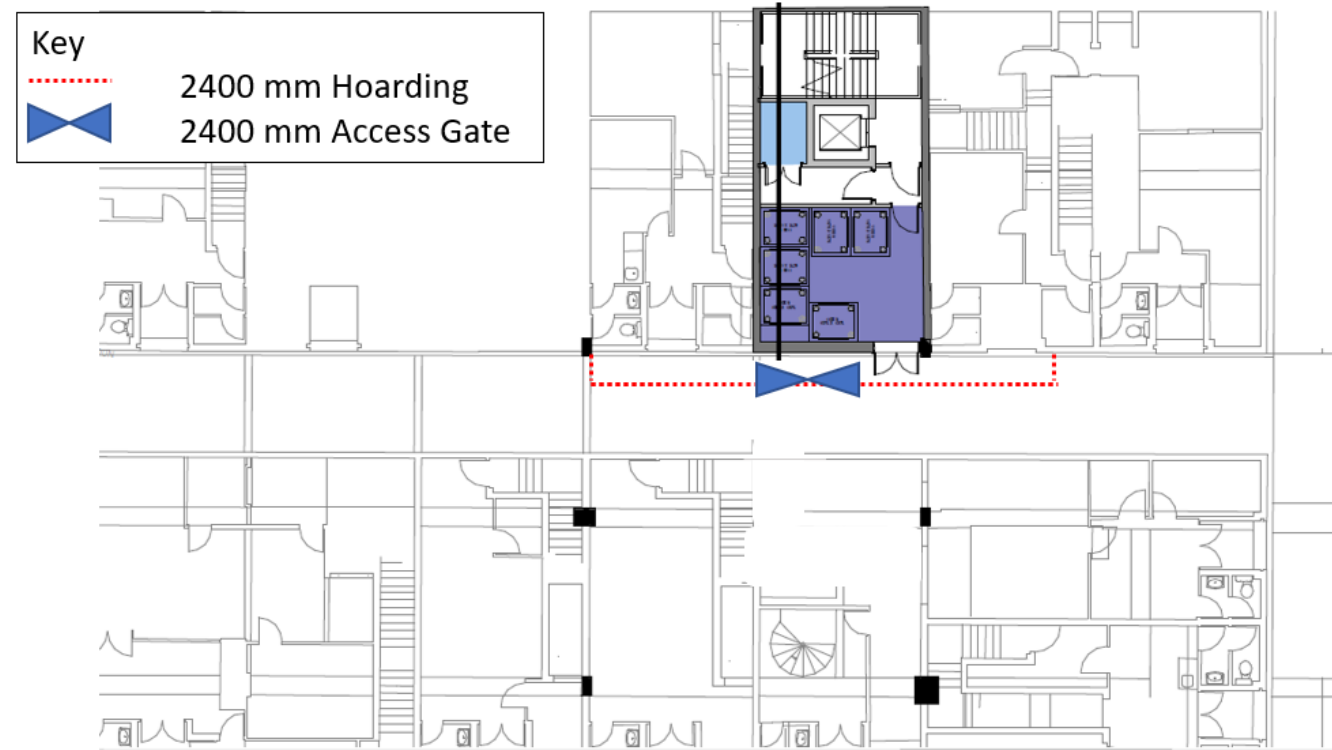
Ground Conditions and Contamination

- 5.132** A Geotechnical and Geo-Environmental Desk Study (Phase 1) has been produced for the site, with the aim of understanding from the available information (desk based study) the site conditions in relation to geotechnical and geo-environmental conditions, including UXO. The objective is to provide a preliminary risk assessment for the site, outlining the potential risks from a geotechnical and geo-environmental basis and identify mitigation and further work requirements.
- 5.133** The Phase 1 Environmental Desktop Study is presented within **ES Volume 3 - Technical Appendices - EIA Scoping**¹⁰.
- 5.134** Overall, the Phase 1 desk study concludes that in the absence of any information to the contrary (i.e. site investigation), the general risk of contamination of receptors (i.e. demolition and construction workers, future on-site users) and resources (i.e. groundwater) is considered to be very low and can be further controlled by adopting appropriate control / protective measures. The site is designated as having a low risk for Unexploded Ordnance (UXO). A geotechnical ground investigation is recommended, to assess the risk of instability due to soluble rock, any ground strengthening works which may be required will be developed once the findings of the intrusive ground investigation are made available. The mitigation proposed is also presented within **ES Volume 1, Chapter 13 - Mitigation and Monitoring**.

¹⁰ The amendments culminating in the description of the Proposed Development presented in this ES (Nov 2019) have been reviewed in light of the assessment and conclusions presented in the Phase 1 Environmental Desktop Study. It is considered the Proposed Development described in this ES does not change the conclusions presented in the Phase 1 Environmental Desktop Study.

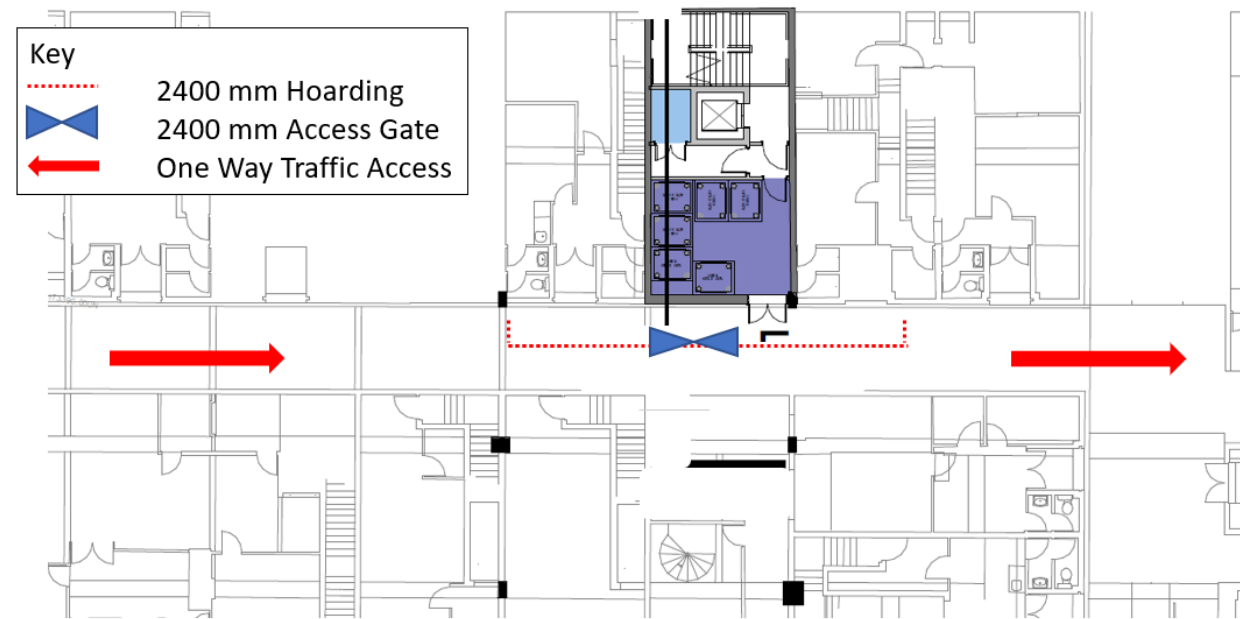
ANNEX A

Basement Site Hoarding Plan Building E



ANNEX B

Basement Logistics Plan Building E



Site Logistics Plan Building E

