ARUP

Please Note: This CEMP was prepared and submitted as part of planning application; ABP Ref. 306569-20 - i.e. for '*321 no. Build-to-Rent (BTR) residential units, ancillary residents' amenity facilities, commercial office space, retail space and café/restaurant accommodated in 5no. blocks ranging from 8 to 13 storeys over ancillary basement area, and all associated and ancillary conservation, landscaping and site development works.*'

This CEMP is being re-submitted in support of the application for the current proposed development

Ruirside Developments Limited

42A Parkgate Street

Construction and Environmental Management Plan (CEMP)

265381/EIAR/1

Issue | January 2020

Job number 265381

Ove Arup & Partners Ireland Ltd

Arup
50 Ringsend Road
Dublin 4
D04 T6X0
Ireland
www.arup.com

ARUP

Document verification

ARUP

Job title		42A Parkgate Street			**Job number** 265381
Document title		Construction and Environmental Management Plan (CEMP)			**File reference**
Document ref		265381/EIAR/1			
Revision	**Date**	**Filename**	Parkgate Street EIAR - Outline CEMPx.docx		
Draft 1	16 Oct 2019	**Description**	First draft		
			Prepared by	Checked by	Approved by
		Name			
		Signature			
Draft		**Filename**	Parkgate Street EIAR- CEMP Final		
		Description	Draft for legal review		
			Prepared by	Checked by	Approved by
		Name			
		Signature			
Issue	28 Jan 2020	**Filename**			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
				Issue Document verification with document	✓

Contents

1 Introduction

Ruirside Developments Ltd. intend to apply for permission to develop apartments, commercial office, retail and café/restaurant floorspace at the Hickey's site, 42A Parkgate Street, Dublin 8.

The proposed development is a mixed-use residential and commercial scheme comprising 'Build to Rent' residential units with associated residential amenities and facilities, commercial office and café/ restaurant floor space. The proposed development involves demolition and retention of a number of existing structures at the site, and construction of the mixed use residential and commercial scheme, which will include a 29-storey tower on the eastern corner of the site.

Arup has prepared this Construction Environmental Management Plan (CEMP) for the proposed development at the Hickey's site. The purpose of this CEMP is to provide a framework that outlines how Ruirside and any contractor appointed will manage and, where practicable, minimise negative environmental effects during the construction of the proposed development. Construction is considered to include all site preparation, enabling works, materials delivery, materials and waste removal, construction activities and associated engineering works.

This CEMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout construction. Compliance with this CEMP does not absolve the contractor or its sub-contractors from compliance with all legislation and bylaws relating to their construction activities.

This CEMP has been produced as part of the Environmental Impact Assessment Report (EIAR).

2 Overview

This CEMP provides a framework to:

- Provide an overview description of the construction strategy (Section 3)
- Outline an indicative programme for construction (Section 4);
- Describe the land-use requirements of the construction phase (Section 5);
- Outline the employment requirements, roles and responsibilities associated with the construction phase of the proposed development (Section 6 and Section 7);

- Outline all the measures which shall be implemented by the appointed contractor to ensure that no significant effects on the environment occur during the construction phase of the proposed development (Section 8 and Section 9).

It is intended that this CEMP would be expanded and updated by the contractor prior to the commencement of any construction activities on site.

Following appointment, the contractor will be required to develop more specific Method Statements and submit a more detailed (bespoke, contract-specific) CEMP that is cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed development. This CEMP should not be considered a detailed Construction Method Statement as it would be the responsibility of the contractor, appointed to undertake the individual works, in association with Ruirside Developments Ltd., to implement the mitigation measures described in the CEMP in more detail, by adopting appropriate procedures and in progressing this documentation prior to commencement of construction.

This CEMP outlines the range of potential types of construction methods, plant and equipment which may be used by any contractor appointed in order to enable their impacts to be assessed by the competent authority for the purposes of the environmental impact assessment and appropriate assessment prior to determining whether to grant planning permission.

3 Construction Strategy

As described in **Section 1**, the proposed development involves demolition of a number of existing structures at the site, and construction of the mixed-use scheme, which will include a 29-storey tower on the eastern corner of the site.

This section describes the key elements of the construction phase of the proposed development.

3.1 Phase 1- Enabling Works and Demolition

3.1.1 Preparation Works

A survey of the buildings and local surroundings will be carried out. This will identify the detail of the buildings' construction and all services on the site. Site investigation pits and boreholes will be excavated to establish the soil condition.

Movement, vibration, and dust monitors will be put in place.

Refer to **Section 4.1** below for further information on site preparation works.

3.1.2 Service Disconnections and Diversions

Utilities such as ESB, Gas, IT, and water will be disconnected, and the services terminated from entering the site. Disconnections will be phased corresponding to the proposed progress of demolition and construction works on site.

The existing sprinkler system within the Hickey's warehouse will be emptied with the water contained therein discharged to sewer at a controlled rate in agreement with Irish Water.

There are a number of above and under-ground fuel tanks located around the site. The tanks will be disconnected, and all associated pipework made defunct and stripped out during the demolition phase. Any fuel contained within the tanks and associated pipework will be emptied and disposed of appropriately.

The site is relatively free of services, with the services encountered within the site curtilage serving the buildings to be demolished. These services will be made defunct and stripped out during the demolition phase. Primary services and utilities are beneath the adjoining road network and not in direct proximity to the site.

Where the excavation strategy or temporary works require any temporary diversion of local services or utilities on the site perimeter, this would be undertaken with prior agreement of the relevant service provider.

The Contractor may seek agreement with Irish Water for a foul connection on Parkgate Street for the site compounds and welfare facilities. Alternatively, foul waste may be removed by tanker and disposed of off-site at an appropriately licensed facility.

3.1.3 Asbestos removal

An asbestos audit will be carried out on the buildings scheduled for demolition prior to demolition works. Any asbestos discovered will be removed by a Specialist Contractor in accordance with *Safety, Health, and Welfare at Work (Exposure to Asbestos) Regulations 2006/2013*[1], and disposed of by specialist contractors to an appropriately licensed facility. Traceable records of this activity, including the disposal licence, will be kept. Following the asbestos removal, a soft strip of the building will be carried out to remove wiring, ceiling tiles, electrical fittings, mechanical plant, fixtures, etc.

3.1.4 Erection of scaffolding along demolition perimeter

Scaffolding will be erected around each building to be demolished. This scaffolding will be clad in Monarflex to control dust, light debris, and light from the site.

[1] Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). Available: https://www.hsa.ie/eng/Legislation/New_Legislation/SI_291_2013.pdf Accessed: 29/10/19.

There will be consultation with neighbouring stakeholders to agree measures along the western boundary and near the eastern boundary, where there may be certain requirements, e.g. type of netting to be used in lieu of Monarflex for visual impact.

3.1.5 Demolition of the existing structures

A detailed demolition plan will be developed in due course by the appointed specialist demolition contractor which will take account of any particular requirements of the planning permission. Detailed proposals will depend on the expertise and plant available to the demolition specialists selected to undertake the demolition and will be set out in the Demolition Specification during the project delivery phase. It is envisaged that existing structures will be demolished in the reverse order from how they were constructed.

Following a soft strip of the building comprising removal of finishes, electrical fittings, wiring, mechanical plant, fixtures, fittings, etc., the structural frame will be demolished. All substructures and foundations will be grubbed up to an approximate depth of 1.8m below existing ground level. Underground tanks and other buried structures shall be removed in advance of piling mat construction.

3.1.6 Demolition waste generation

Demolition waste is expected to comprise of concrete, masonry, stone, metals and glass. These wastes will be segregated where possible for reuse or recycling in accordance with the relevant legislation and guidelines. In addition, it is likely that some plastics, cabling, and mixed non-hazardous demolition waste will also be generated.

3.1 Phase 2- Piling and Groundworks

3.1.1 Piling Mat

The piling mat will be formed at existing site levels and will comprise of a combination of imported granular material and site-won crushed concrete and rock material. The piling specialist shall clearly delineate the areas of pile mat constructed in the different sourced materials to enable appropriate removal in future.

Prior to construction of the pile mat, the formation shall be prepared, and a separation geotextile membrane installed. The pile mat material shall be appropriately compacted in layers in accordance with the Piling Specialist requirements.

3.1.2 Piling

The foundations are envisaged to be continuous flight auger (CFA) piles to Buildings B and C, and bored rock socketed piles to Building A. The piles shall support reinforced concrete pile caps and piled rafts under the stability cores.

It is anticipated that the respective piling rig shall install piles from a pile mat datum close to existing ground level. Arisings from the pile installation shall be appropriately disposed off-site to a licensed facility.

A temporary retention structure is required in the vicinity of the existing Protected Arch to facilitate the bulk excavation of the basement. This will comprise of either sheet piles or king-post construction and will be monitored for movement throughout the substructure works. The retention structure shall be removed upon achievement of the appropriate concrete strength in the ground floor slab construction.

Subsequent to the bulk excavation of the basement, the constructed piles in this area will be broken down to proposed foundation datum level using an excavator with hydraulic breaker attachment.

3.1.3 Groundworks

The outline Construction Waste Management Plan (CWMP) contains more detailed information regarding the minimising of stockpiling of excavated material on site. Excavated material generated by the construction works shall be appropriately assessed for possible re-use on site, where possible, through various accommodation works. Surplus material will be immediately removed from site. The groundworks external to the buildings will comprise installation of precast retaining walls along the existing River Liffey boundary to facilitate build-up of ground to proposed finished levels.

Refer to **Sections 6 and 7** for information on vehicle movements during the bulk excavation.

Refer to **Section 6** for information on stockpiling of site-won material.

3.1.4 Dewatering

Dewatering may be required for local excavations, such as pile cap or lift pit locations. Any local dewatering is to be discharged to the River Liffey by agreement with the Local Authority and will include necessary treatment as required, such as silt traps and settlement tanks. Alternatively, dewatering may be reinjected to the subsurface through a number of wells or injection points across the site. Similar treatment measures will be adopted prior to reinjection. Local dewatering is likely to be necessary for only a portion of the construction programme, approximately 20 weeks.

3.1.5 Surface Water Run-Off

Existing surface water drainage on the site discharges to the River Liffey. It is envisaged that one of the existing surface water discharge points shall be maintained for the duration of the works, subject to Local Authority agreement. All other existing surface water discharge points to the River Liffey shall be decommissioned.

Appropriate settlement tanks and silt traps shall be incorporated to capture any excess silt in the run-off. Refer to **Section 10.1.9** for further detail on surface water management measures.

The Contractor shall employ measures to ensure surface water run-off from Parkgate Street does not enter the site.

3.2 Phase 3- Main Construction Works

3.2.1 Substructure

The substructure generally consists of a reinforced concrete slab supported on reinforced concrete pile-caps. The stability core walls are supported on reinforced concrete piled raft foundations. The pile-caps and piled rafts for works at grade will be shuttered with formwork and the concrete cast. Upon removal of the formwork, the areas between the foundations will be built-up with site-won material.

In the basement area, the bulk dig datum will be the formation level of the foundations. This will mean the method of constructing the pile-caps and piled rafts in the basement will be similar to that at grade.

There will be an open dig to the basement area, with localised retention works at existing structures. The rising perimeter walls will be constructed with two-sided shutters, propped in position, and supported off the basement slab.

3.2.2 Superstructure

The superstructure of Building A is cast in-situ concrete. The stability core walls will be constructed by jump-formwork technique. Columns and slabs will be conventional reinforced concrete flat slab construction. The proposed external envelope comprises either prefabricated or precast panels, hence most of the fabrication will occur off-site at supplier premises.

The superstructures of Buildings B and C are in-situ concrete up to and including Level 1. Thereafter, the superstructure is precast concrete. The proposed façade comprises lightweight cold form steel sections to the inner leaf façade, with the external leaf constructed in masonry and supported from relieving angles and lintels. Scaffolding around the building exterior shall be necessary for construction of the masonry outer leaf and will remain in place until completion of the façade. Prefabricated balcony structures shall be lifted into position and fixed into cast-in connection points.

The precast elements are large components and require substantial vehicle movement on site for deliveries. Vehicles will be standard multi-axle flat back trucks delivering less than 40 tonnes each trip and typical for a building of this scale. There will be in-situ concrete work requiring regular deliveries of premixed concrete and formwork materials.

The construction works will require the use of tower cranes on site. The cranes will be required for the moving of building materials on site, such as formwork for concrete, reinforcement, precast concrete, steelwork, façade, plant, and general building materials. The use of mobile cranes may be adopted to assist in the installation of the façade and plant.

3.2.3 Existing Structures

The following structures are included in the Record of Protected Structures (RPS 6320) and are to be retained as part of the new development: riverside stone wall; turret at eastern end of site; square tower on the riverfront; and entrance stone arch on the Parkgate Street frontage. The River Liffey Building to the west of the River Liffey wall (not a protected structure) is also to be retained and adapted for re-use within the scheme.

The majority of the works to the River Liffey wall will be land based. However, some works from the River Liffey may be necessary, such as vegetation removal and pointing repair of mortar. The Contractor will obtain a Foreshore Licence for temporary scaffolding erection in the River Liffey to facilitate the works, should this be necessary, and the associated Stakeholder engagement shall include liaison with Inland Fisheries Ireland (IFI). The Foreshore Application will involve submission of a Method Statement for the works, which will be prepared with input from a suitably qualified Ecologist.

Entrance Stone Arch

The existing arch is a stonework arch structure. Refurbishment works will comprise stonework repair and pointing repair of mortar. In some instances, the stonework is delaminating at the surface and localised replacement will be necessary. All superfluous embedded metal work shall be removed, and the substrate made good with matching stonework and mortar.

Scaffolding shall be erected to all sides of the arch to facilitate refurbishment works.

Turret

The existing turret is a stonework structure. All vegetation growth will be removed. Refurbishment works will comprise local stonework repair and pointing repair of mortar. In some instances, the stonework will require local stitching with helical ties. All superfluous embedded metal work shall be removed, and the substrate made good with matching stonework and mortar. Some of the capping at parapet level may need replacement.

Square Tower

The existing tower structure comprises stonework construction at lower level and brickwork at upper level. All vegetation growth will be removed. Refurbishment works will comprise local structural fabric repair and pointing repair of mortar. In some instances, the structural fabric is delaminating at the surface and localised replacement will be necessary. All superfluous embedded metal work shall be removed, and the substrate made good with matching stonework and mortar.

The internal metal work to be retained shall be shot blasted in situ and a new protective paint finish applied. The existing timber roof structure shall be retained, subject to condition assessment, but new roof finishes shall be installed.

Riverside Stone Wall

The existing riverside stone wall comprises stonework above high-tide level, and colloidal concrete below. The foundations of the river wall are also comprised of stonework. There is a separate internal brick wall that constitutes part of the adjacent Warehouse structure to the north of the riverside stone wall; this separate wall being shorter than the riverside stone wall and stopping short of its eastern end.

The quay wall supports timber rafters from the edge of the roof of the adjacent warehouse building, which span from the adjacent internal Warehouse brick wall described above.

The existing riverside stone wall will be fully propped by temporary works, which will be removed upon installation of the permanent lateral restraint (after the Level 1 slab construction has been cast). The build-up in ground levels will result in new retaining structures installed at the north side of the riverside stone wall.

The proposed elevation of the wall comprises new opening modifications, which will be either broken-out or saw-cut. Some re-building of the openings will be necessary, and the openings will be redressed and strengthened as required with new structural framing to align with the final design features described in the Alternative Chapter of the EIAR which accompanies this planning application.

All vegetation growth on the River Liffey side will be removed. In some instances, the stonework will require local stitching with helical ties. All superfluous embedded metal work shall be removed, and the substrate made good with matching stonework and mortar. Some of the capping at parapet level may need replacement.

A new surface water discharge point for the development will be constructed in the wall. The proposed surface water management measures have been agreed with Dublin City Council (DCC) Drainage Division, with various SuDS measures incorporated to satisfy their drainage requirements for a minimum two-stage treatment train approach. The majority of the works to the wall will be land based.

Gabled Industrial Buildings on the River Front

The existing gabled industrial buildings on the River front are double height structure comprising a combination of stonework and brickwork walls. It is intended to retain the larger of the two gabled buildings and the River façade of the smaller gabled building In the larger gabled building there is a mezzanine floor at differing levels. The original mezzanine structure over part of the building consists of concrete floors supported by steel and cast iron beams. It appears that the remaining mezzanine was infilled with timber construction at a later date. The roof finishes are supported on timber sarking boards, which are supported by ironwork trusses. Window and door heads are generally supported by concrete lintels, but some comprise of steel or cast-iron beams.

Modifications to the existing structural fabric for larger openings have been formed by a combination of wrought iron and steelwork members, depending on the time of interventions.

The works to the larger gabled building will comprise the removal of the existing roof finishes, demolition of mezzanine structures, removal of most internal walls and removal of the existing ground bearing concrete floor slab. Any made ground below the slab will be removed and new fill material placed and compacted for supporting a new ground bearing concrete slab. New lightweight mezzanine structures comprising timber floor construction supported on steelwork will be installed. The existing ironwork roof trusses will be refurbished in-situ (shot blast and new paint protection applied), with new roof finishes also installed. There will be minor modifications to the structural fabric to form new openings and widen existing openings. Temporary pinning of the walls will be necessary for the installation of new supporting beams and padstones.

All vegetation growth to the exterior walls will be removed, in particular the gable wall facing the River Liffey. In some instances, the walls will require local stitching with helical ties. All superfluous embedded metal work shall be removed, and the substrate made good with matching stonework and mortar. Some of the capping at parapet level may need replacement.

The works to the gabled industrial buildings on the River front will provide an improved setting that opens the building up to both the river walk and the residential courtyard. The design will remove previous unsympathetic work to open the ground floor level to the residential community behind. These works are intended to provide an increase in natural light levels, to give a better connection to the River walk as a though route.

The Large Main Warehouse at the east of the Site

Most of the eastern half of the site is occupied by a large single storey warehouse. It is proposed to demolish this large warehouse including its curving north wall, which runs along Parkgate Street. However, the large cast-iron elements within the warehouse, including columns and beams, are to be removed for re-use as advised by the Conservative Specialist.

3.2.4 Parkgate Street Interfaces

Works along the south footpath on Parkgate Street will be carried out in phases. Refer to **Section 4.3.2.3** for proposed activities. The Contractor will obtain road closure licences on at least two occasions for the Works. The first will be at the start of Phase 3 to facilitate construction arrangements, and later licences will be necessary for minor reconfigurations of the south footpath on Parkgate Street.

Works associated with the surface water improvement works will take place on public property, including public roads and footpaths. The scheme will be installed by trench excavations. Approximately 20m of trenching will be open at any one time. Installation of pipework shall be carried out under traffic management at night, with all traffic lanes returned to traffic each morning. Manholes shall be constructed under traffic management at weekends.

Gullies and local pavement resurfacing works may be completed under lane restriction during daytime hours.

The duration of the proposed works will be approximately five weeks and will commence in Q4 2020. Excavated material will be removed off site to a registered waste facility. There will be no storage of chemicals on lands outside of the ownership boundary, and refuelling will take place at the Contractor's base compound.

4 Duration and Sequencing

It is envisaged that construction of the proposed development will take approximately 34 months. Phase 1 and phase 2 will run concurrently and are expected to take approximately 4 months. Phase 3 as the main construction works will take approximately 30 months. All construction works will be carried out during day time hours (Refer to **Section 6.6**).

The Main Contractor(s), once appointed, will ultimately be responsible for the sequencing and implementation of the works in a safe and secure manner, and in accordance with all statutory requirements and the mitigation measures proposed in the EIAR.

An indicative construction methodology is described in **Section 3**.

The main stages of construction will proceed in a general sequence as follows:

- Phase 1: Enabling Works and Demolition
- Phase 2: Piling and Groundworks
- Phase 3: Main Construction Works

There will be some overlap in phasing activities, as outlined in the sections below.

4.1 Phase 1: Enabling Works and Demolition

Phase 1 will take approximately 4 months. The following is a list of the main activities that are planned to be undertaken in the first phase.

4.1.1 Enabling Works Site Set Up

- Site set up for the enabling works contract, including construction compound and erection of secure site hoarding and fencing along Parkgate Street and the neighbouring premises;
- Implementation of Contractor's Health & Safety Plan for the enabling works and demolition contract;
- Identification and cut-off, as required, to existing services;

- Protection of existing site features to be retained (See Section 6.10 for further information); and
- Removal and disposal of asbestos, based on survey and site investigations, and in accordance with statutory requirements (See Chapter 17, Resource and Waste Management, for greater detail on construction and demolition waste).

4.1.2 Demolitions and Site Preparation

- Undertaking of condition surveys of existing buildings/structures that will be retained (see structures highlighted in blue in Figure 1);
- Erection of temporary structures for retention of existing structures around protected archway and quay wall;
- Erection of permanent works for retention of proposed fill to back of existing quay wall and to interface with existing River Building;
- Demolition of existing structures (see structures highlighted in red in Figure 1), with the exception of those to be incorporated in the development;
- Excavation and removal of all substructures and foundations to an approximate depth of 1.8m below existing ground level;
- Removal of all underground tanks and other buried structures in advance of piling mat construction;
- Maintenance of protection measures to existing site features to be retained;
- Removal of waste materials off-site in accordance with statutory permitting requirements and retention of selected material for re-use on site as fill; and
- Possible re-use of some demolition waste material (subject to suitability testing) to be crushed and graded on site for re-use in building sub-bases and landscaping.

The Contractor shall coordinate the Works with the Archaeologist.

4.2 Phase 2: Piling and Groundworks

The piling works undertaken in Phase 2 consist of the installation of all piles across the site. The works may also include the installation of temporary retention structures to facilitate bulk excavation. The works will run concurrently with Phase 1 and are expected to last 4 months.

4.2.1 Piling

The Piling Specialist will liaise with the separate Phase 1 and Phase 3 Contractors to:

- Develop the preferred sequencing of the works;
- Conduct condition surveys of sensitive boundary structures and existing buildings that will be retained;

- Co-ordinate the design and installation of the temporary works required to implement the Main Contractor's preferred sequence of works;
- Relocate construction compound and welfare facilities within the site boundary; and
- Agree on the optimum location for stockpiling of material for re-use on site.

The Piling Specialist will also undertake the following list of activities:

- Installation, and later removal, of pile working platform (possible re-use of site won material);
- Construction of permanent piles across the site;
- Conduction of working load pile tests on a number of production piles;
- Conduction of integrity testing of all piles;
- Installation and removal of temporary piles; and
- Breaking down of piles within basement area.

4.2.2 Groundworks

The following is a list of the main groundworks activities that are planned to be undertaken in this phase:

- Bulk excavation for basement;
- Removal of surplus excavated material for off-site disposal;
- Stockpiling of site-won material (to be stockpiled for a maximum of 6 months) and appropriate temporary covering (refer to Section 6.11 for further information); and
- Placement of site-won material in areas at grade for build-up in site levels and as backfill to basement substructure, if appropriate for re-use.

4.3 Phase 3: Main Construction Works

The Phase 3 construction works include the construction of the new buildings, the refurbishment of the existing structures, and the external site works. The works will take approximately 30 months. The footpath will remain open throughout the construction phase, with the exception of short road closure licences necessary to complete service tie-ins.

4.3.1 Site Set Up and Preparation

- Mobilisation and site set up for the main contract works, including the erection of the construction compound and secure site hoarding and fencing (note: possible retention and re-configuration of hoarding erected as part of Phase 1);
- Closure of the existing vehicular entrance and construction of a new site entrance between Building A and B for construction movements;

- Conduction of minor works along the south footpath on Parkgate Street, including:
  - Creation of a dished kerb at proposed vehicular entrance;
  - Relocation of the westbound bus stop and shelter;
  - Regrading of the bus stop kerb;
  - Relocation of recycling bins;
  - Creation of loading bay;
  - Relocation of Dublin Bikes Station No. 92; and
  - Creation of dropped kerbs for emergency access to the development, all subject to relevant permits and agreements.
- Improvement works for surface water along the south kerb on Parkgate Street, subject to Local Authority agreement, comprising:
  - Installation of new manholes constructed in Parkgate Street pavement;
  - Installation of new sections of surface water concrete pipework to connect new manholes and gullies;
  - Connection into existing surface water outfall;
  - Diversion of existing road gullies into new surface water sewer; and
  - Construction of new trapped blockwork road gullies and connection into new surface water sewer.
- Protection of existing site features to be retained, including Protected Structures (See **Section 6.10** for details);
- Condition surveys of existing buildings and boundary structures that will be retained; and
- Preparation of site area for the construction of the new buildings.

4.3.2 Construction of New Development

It is envisaged that a number of construction activities will progress concurrently at the start of Phase 3 works, including:

- Installation of temporary structures, including tower cranes, needling, and stability measures to existing structures;
- Construction of pile-caps and piled raft foundations in areas at grade;
- Installation of radon barrier/damp proof membrane/waterproof membrane, where appropriate;
- Construction of basement substructure, including retaining walls;
- Construction of all new site services;
- Connection to new foul drainage infrastructure;
- Connection to surface water drainage for discharge to River Liffey;

- Connection to new site services, including Gas, Electricity Supply Board, and Telecoms; and
- Construction of reinforced concrete ground floor slabs.

The rising superstructure is likely to be concrete frame but will comprise different construction methods across the different buildings, as explained below. The various buildings shall be constructed at a similar rate, apart from the Building A main stability core. The following is a list of the main activities that are planned to be undertaken in this phase.

- Building A main stability core to be slip-form or jump-form construction, meaning the core will be constructed for the full building height in advance of the rest of the superstructure;
- Building A superstructure to be cast-in situ reinforced concrete columns up to first floor. There shall be a thickened slab structure at Level 1 where columns shall change in profile and comprise either precast concrete or in situ reinforced concrete structural form for the remaining building height. The floor slabs shall be flat slab construction, which requires formwork and temporary propping, to roof level;
- Buildings B and C superstructure to be cast-in situ reinforced concrete columns and flat slab construction up to Level 2, which requires formwork and temporary propping;
- Buildings B and C superstructure to be precast concrete from Level 2 to roof, consisting of precast load-bearing stability and non-stability walls supporting precast floor panels with in situ concrete topping. Associated temporary propping to be provided as necessary;
- Installation of temporary works in area between Building A and Building B to maintain construction traffic movements during construction of superstructure overhead;
- Installation of precast construction stair flights and landings, with associated temporary propping as necessary;
- Installation of prefabricated bathroom ensuite pod units;
- Completion of external envelope to Buildings B and C once the concrete frame is near completion and the groundworks is clear. The façade comprises masonry construction with associated relieving angle and lintel supports to the external leaf. Scaffolding around the building exterior to be provided and to remain in place until completion of the façade;
- Completion of external envelope to Building A. The façade comprises either stone faced precast concrete panels or individual fixed stone, and erection will start once groundworks is clear;
- Installation of prefabricated balconies to fixing points cast into the concrete frame to Buildings B and C;
- Completion of reinforced concrete balconies to Building A, which shall comprise Special Finish to the soffit and include a drip check;

- External envelope insulation and detail to ensure air tightness in accordance with the Building Regulations;
- Installation of building services;
- Internal fit out, including partition walls, doors, joinery, and fire rated enclosures as required;
- Toilet and sanitary facilities installation, including disabled/accessible provision in accordance with the Building Regulations;
- Internal finishes (floors, walls, and ceilings) to various areas; and
- Fitted furniture installation.

Other site related works not listed above include:

- Provision of permanent lateral restraint to existing stonework wall along River Liffey upon completion of Level 1 of Building A, and removal of temporary retention structure;
- Construction of appropriate sub-base to non-trafficable and trafficable areas;
- Refurbishment and strengthening to existing structures retained on site;
- New substructure and internal superstructure to existing River Building at west end of river wall;
- Removal of vegetation, pointing repair to localised sections of stonework, and construction of a surface water outfall point to the existing quay wall; and
- Landscaping works, beginning at Building A and progressing westward.

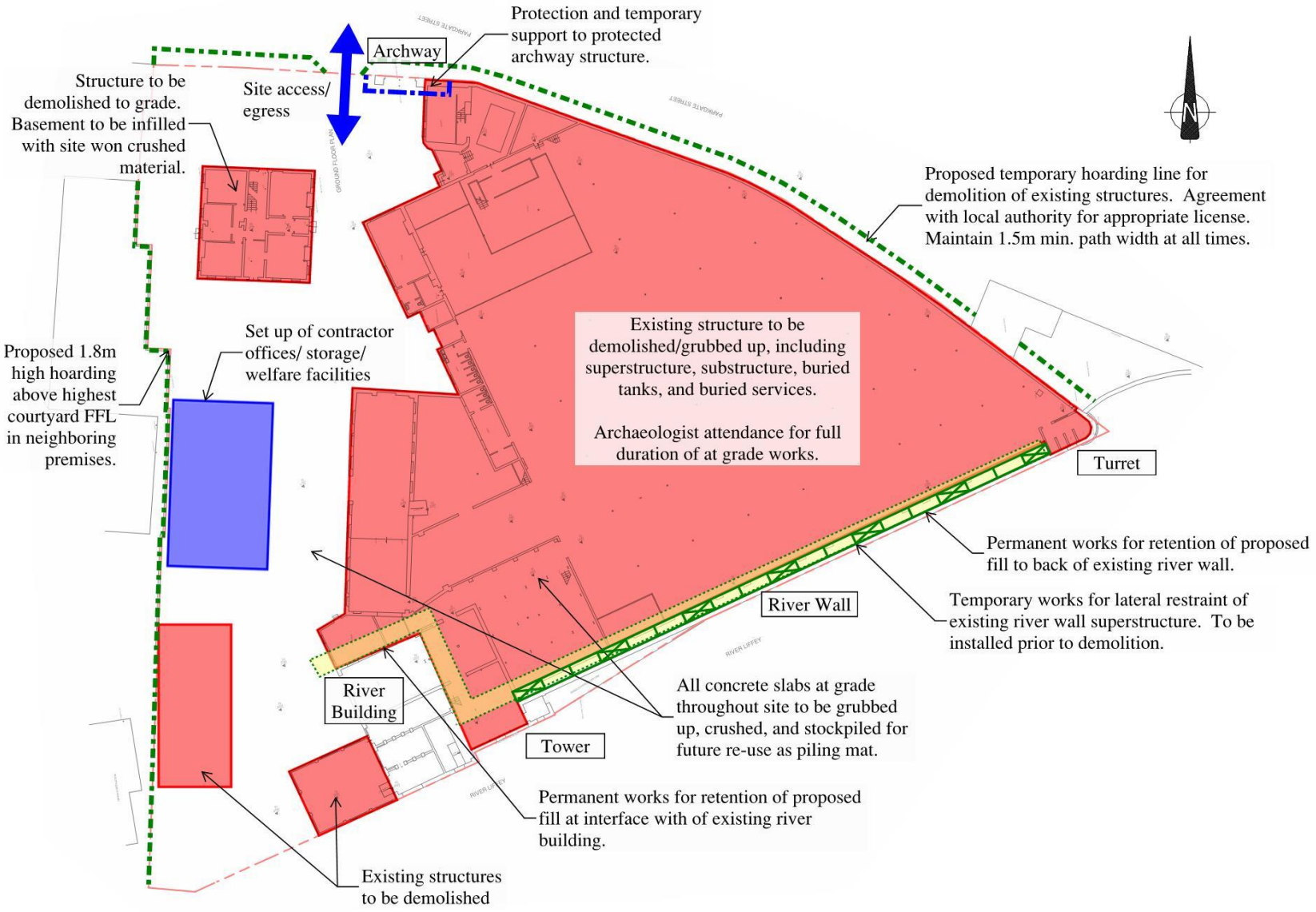

Figure 1: Overall sequencing of Works (1 of 6)

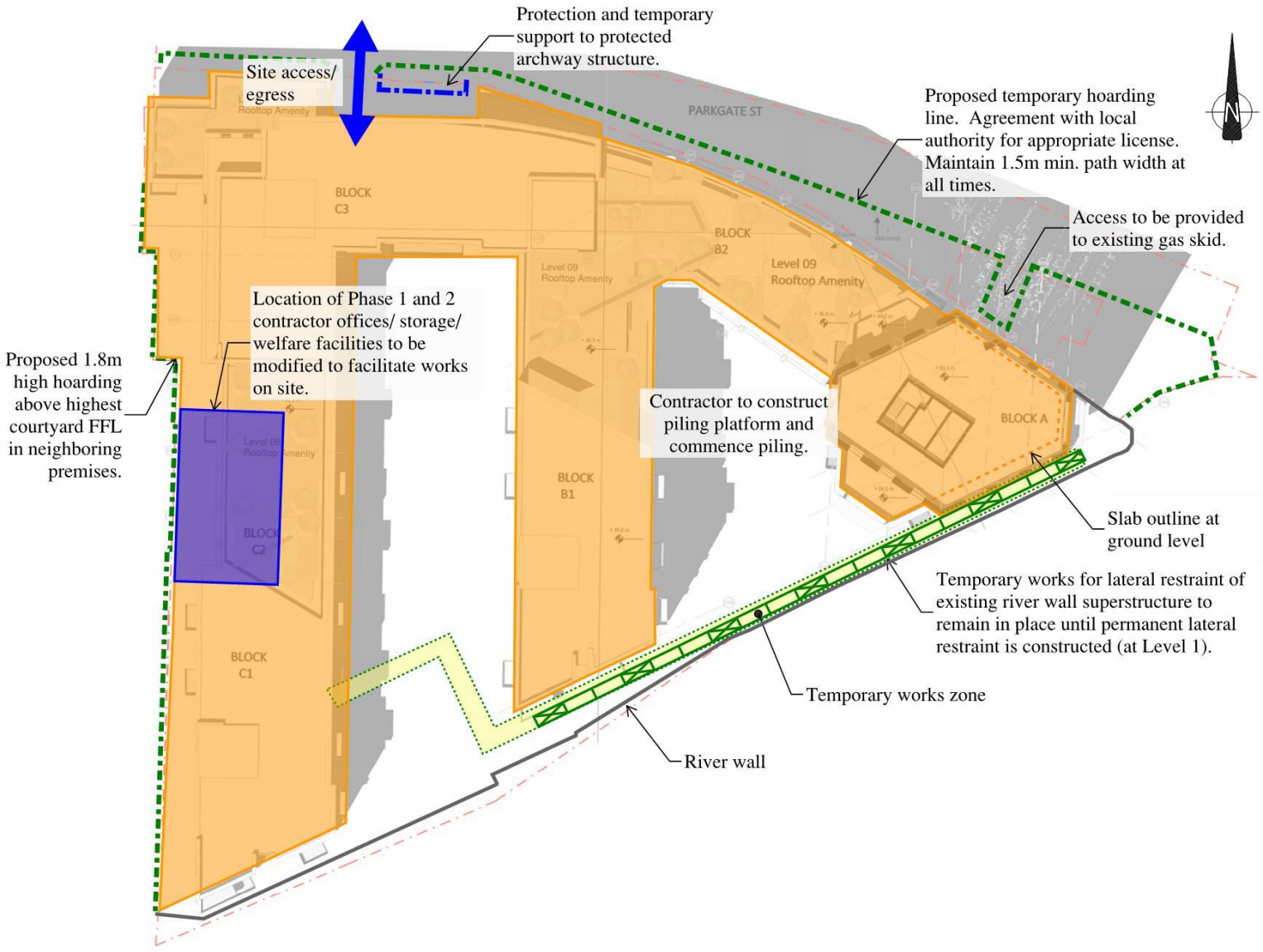

Figure 2: Overall sequencing of Works (2 of 6)

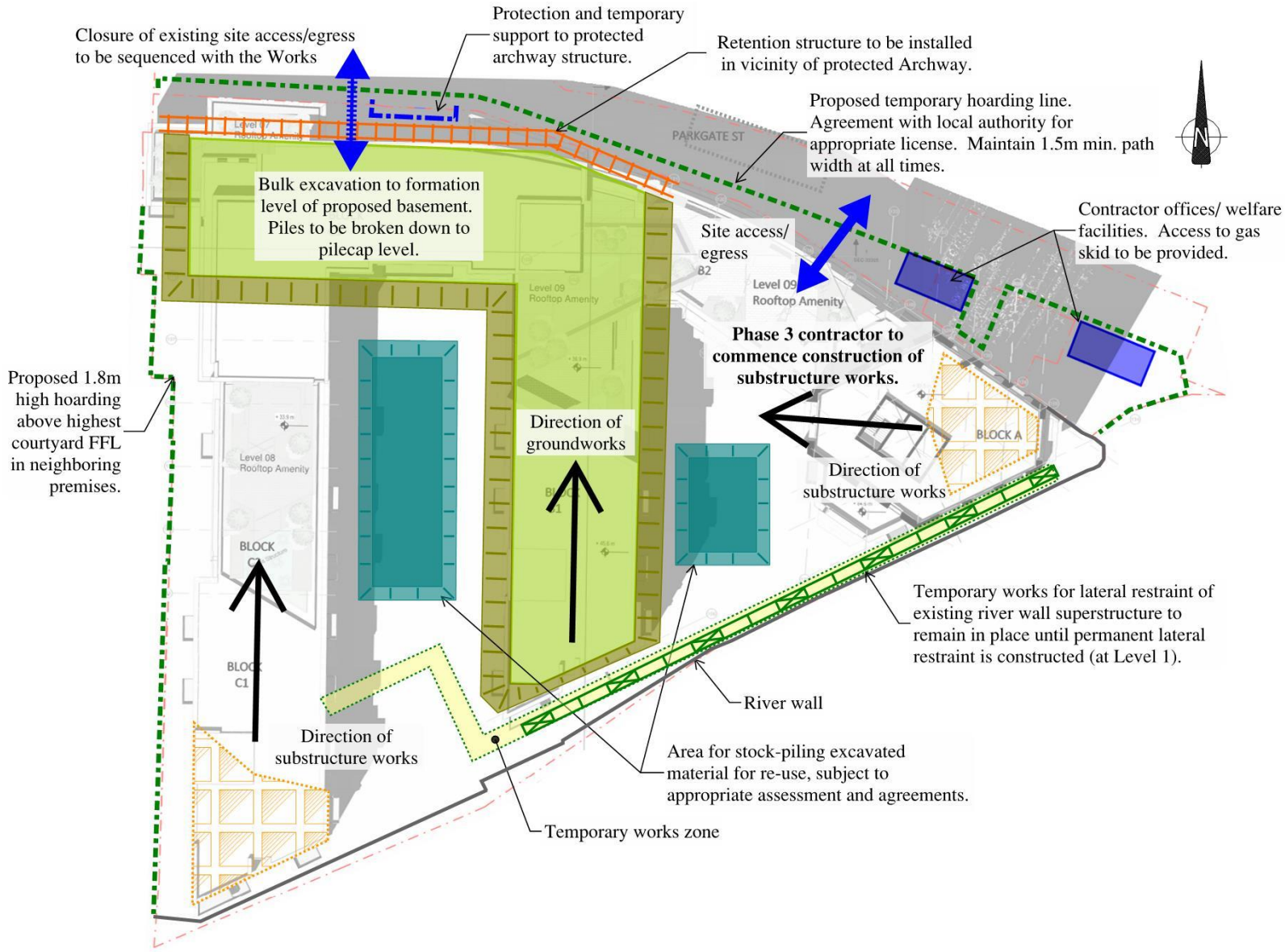

Figure 3 Overall sequencing of Works (3 of 6)

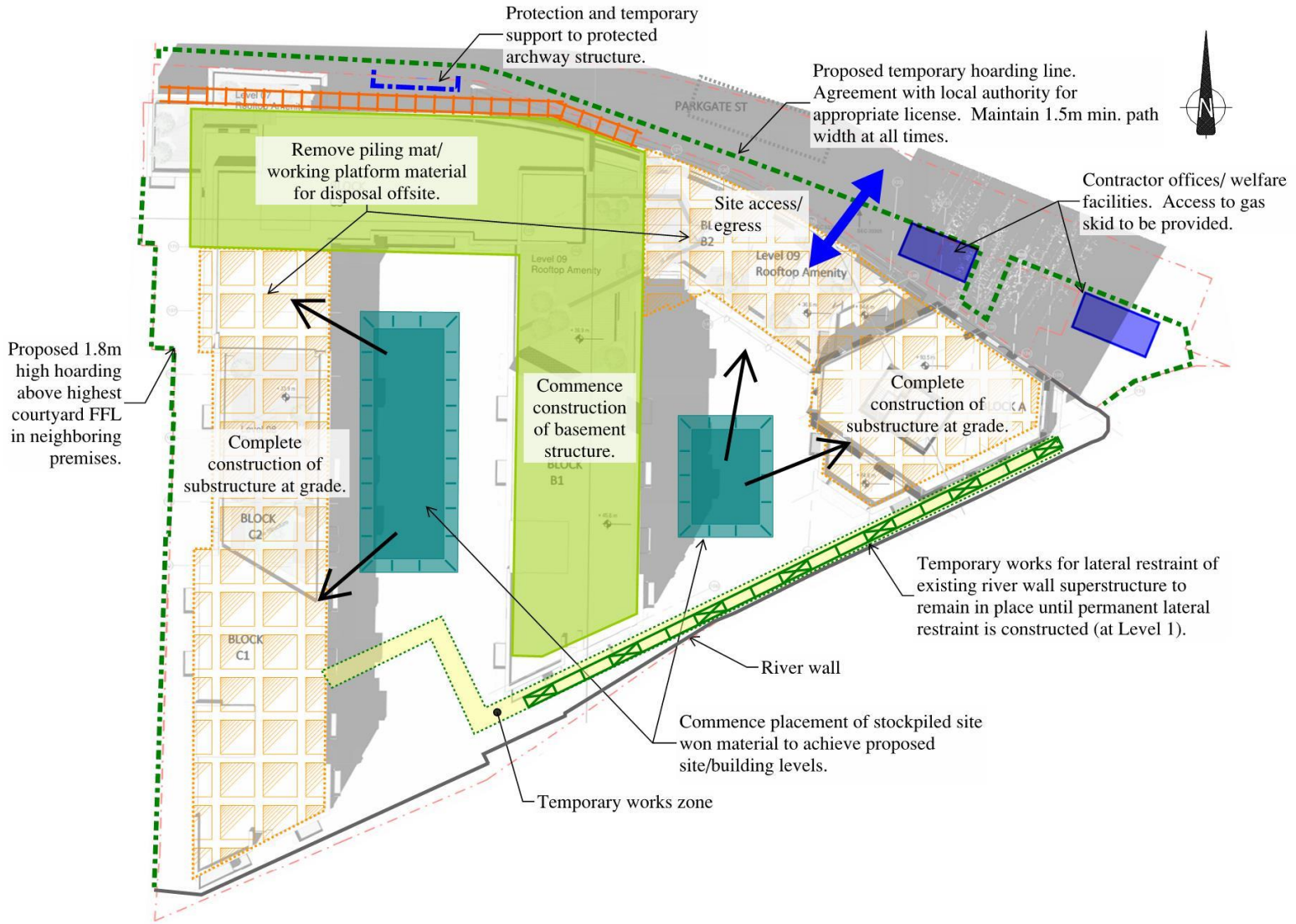

Figure 4 Overall sequencing of Works (4 of 6)

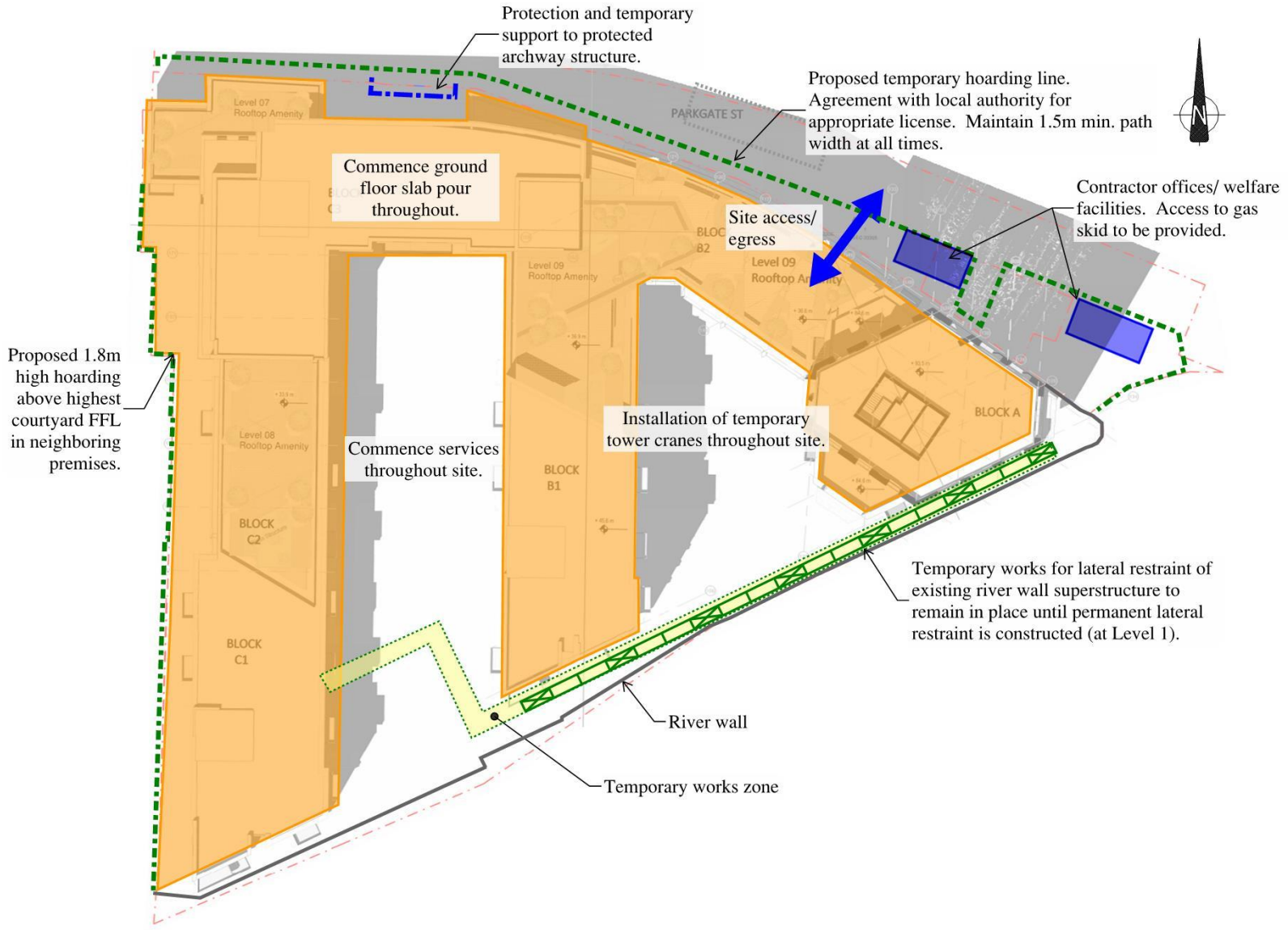

Figure 5 Overall sequencing of Works (5 of 6)

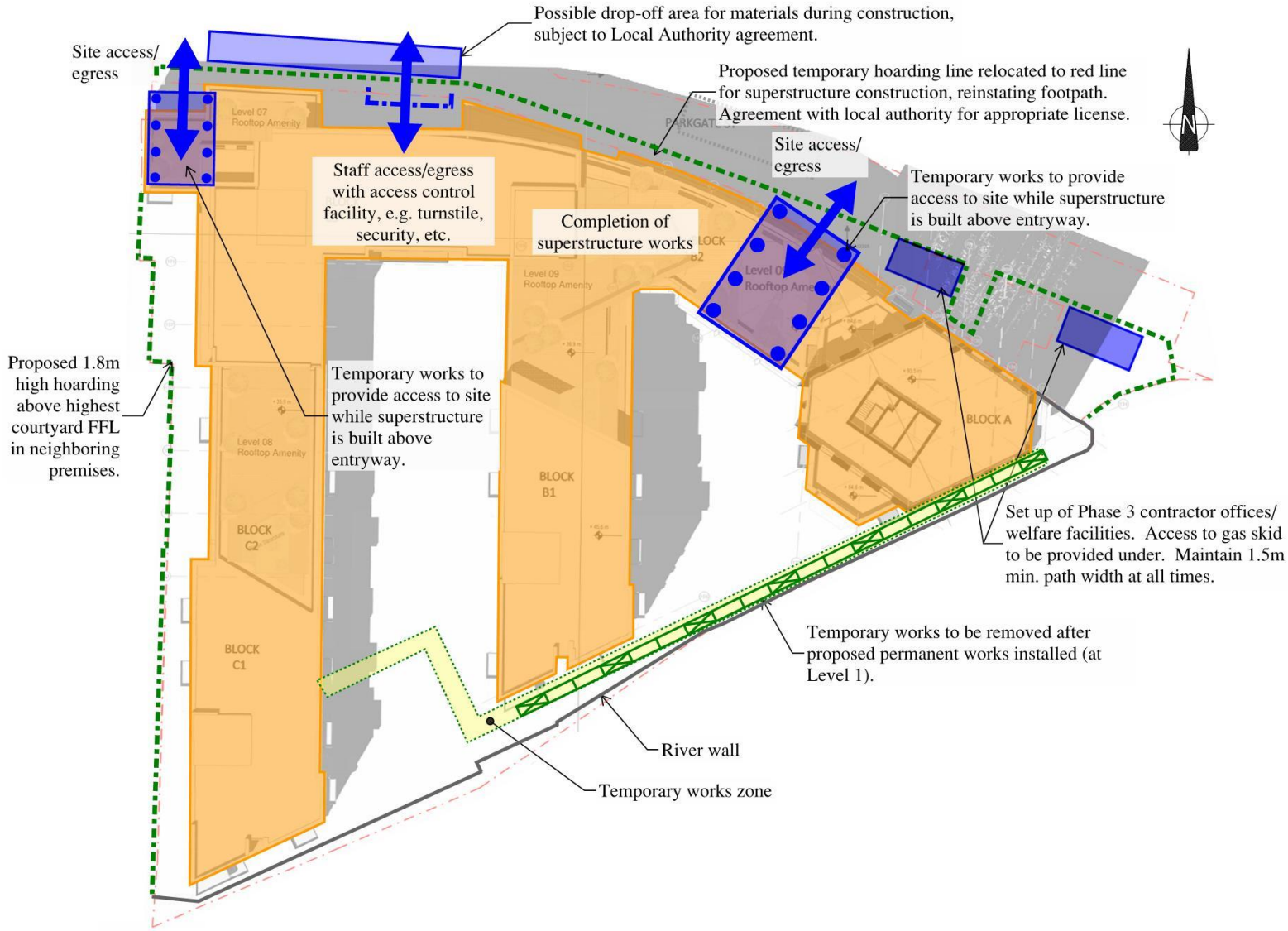

Figure 6 Overall sequencing of Works (6 of 6)

5 Land-Use Requirements

The site of the proposed development is owned by the developer, Ruirside Developments Limited. No acquisition of land will be required during the construction phase of the proposed development. The development area will also include the portion of landscaped area east of the existing ESB substation on Parkgate Street, and an area of footpath and pavement along Parkgate Street. All areas outside the site ownership boundary but within the red line boundary are owned or controlled by Dublin City Council.

The site is currently occupied by Hickeys fabric company and has been since the 1970s. As part of a leasing agreement, Hickeys will vacate the site in December 2019. These lands are in the ownership of Ruirside Developments Limited, so no change in land ownership is required.

The works to take place outside the site boundary (but within the red line planning boundary), for which the necessary licences and consents shall be obtained, include:

- Minor works along the south footpath on Parkgate Street;
- Surface water improvement works along the south kerb on Parkgate Street;
- Foul drainage connection on Parkgate Street;
- Vegetation removal, pointing repair of existing stonework, and the construction of a surface water discharge point to the River Wall; and
- Set up of site offices on the south footway on Parkgate Street, adjacent to the existing ESB Substation.

5.1 Construction Compound

The construction compound will be located on site within the planning boundary for the duration of the project. On-site accommodation will consist of:

- Adequate materials drop-off and storage area;
- Set down areas for trucks;
- Site offices; and
- Staff welfare facilities (i.e. toilets etc.).

As construction progresses, it will be necessary to move the location of the construction compound within the site. **Error! Reference source not found.**Figures 1 to 6 indicate the location of the construction compound in the context of the proposed development site.

The construction compound will be engineered with appropriate services and will be hoarded or fenced off for security purposes. The compound will be used as the primary location for the storage of materials, plant, and equipment, site offices (which may be two to three stories in height), and worker welfare facilities.

An access control facility will be provided to restrict compound access to site personnel and authorised visitors only.

Materials to be stored on site will be stored in a safe manner and will minimise the risk of any negative environmental effects and will be managed on a 'just-in-time' basis. All fuel storage areas will be bunded in the compound and will be clearly marked. Fuel will be transported from the offsite compound to the plant and equipment, on the Parkgate Street worksite, in mobile units based on need. A dedicated fuel filling point will be set up on site with all plant brought to this point for filling.

Temporary toilets and wash facilities will be provided for construction workers. These facilities may require periodic waste pumping and waste offsite haulage, which will be carried out by an authorised sanitary waste contractor. Alternatively, the Contractor may utilise an existing foul drainage connection for site welfare facilities, subject to license agreement with Irish Water.

Appropriate lighting will be provided as necessary at the construction compound. All lighting will be installed to minimise light spillage from the site and will be temporary, i.e. confined to use during construction only. The Contractor may utilise existing electrical ducting at the boundary, with connection to be agreed with ESB Networks.

No car parking is envisaged to be provided within the site. Staff and visitors to the site will be encouraged to utilise non-vehicular means. Otherwise, there is on-street Pay & Display public parking in the environs of the site.

6 Site Management

6.1 Good Housekeeping

The Contractor will employ a "good housekeeping" policy at all times. This will include, but not necessarily be limited to, the following requirements:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage, welfare facilities etc;
- Maintain all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) will be provided at the boundaries of the working areas;

- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Excavated material generated during construction will be reused on site as far as practicable and surplus materials/soil shall be recovered or disposed of to a suitably authorised waste facility site;
- Effective prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests will be implemented. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence;
- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Open fires will be prohibited at all times;
- The use of less intrusive noise alarms which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access;
- All loading and unloading of vehicles will take place off the public highway wherever this is practicable; and
- Material handling and/or stockpiling of materials, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

6.2 Site Management and Security

A construction management team will be established for the duration of the construction phase. The team will manage the construction of the works including monitoring the contractor's performance to ensure that the proposed construction phase mitigation measures are implemented, and that construction effects and nuisance are minimised.

The primary function of site security will be to ensure that no unauthorised entry to site occurs. There will be hoarding around the construction areas to minimise the risk of vandalism and unauthorised access.

6.3 Site Hoarding

The Demolition and Enabling Works Contractor will establish a site boundary with the provision of appropriate signage, construction of hoarding, and welfare facilities, site office, and establishment of appropriate access and egress.

The site hoarding (or fencing where appropriate) will be established around the work area before any significant construction activity commences and will be 1.8m in height.

Construction site hoarding is used to provide a secure site boundary to what can be a dangerous environment for people who have not received the proper training and are unfamiliar with construction operations. Site hoarding also performs an important function in relation to minimising some of the potential environmental impacts associated with construction, namely:

- Noise;
- Visual impact; and
- Dust.

The Contractor will be required to ensure at all times a clear demarcation with a safe and secure enclosure between areas in use as public facilities and areas of the construction site. Where possible, hoarding and fencing will be retained and re-configured from the Phase 1 works, and re-used for subsequent work phases.

The extent of compound and facilities required by the Contractor will vary throughout the duration of the works. The Contractor will likely require a small-scale compound and facilities located within the site compound. It is proposed that the hoarding line will incorporate part of the footpath during the works along Parkgate Street, where the appropriate licences will be obtained from the Local Authority in advance of the works.

The footpath will be closed for short periods to facilitate service connections, where minor diversion for pedestrians shall be provided along the carriageway of the road immediately adjacent to the footpath, closing off one lane of traffic to westbound vehicles.

Controlled access points to the site, in the form of gates or doors, will be kept locked for any time that these areas are not monitored (e.g. outside working hours).

The hoarding will be well maintained and painted and may contain graphics portraying project information.

6.4 Lighting

- Site lighting would typically be provided by tower mounted 1000W metal halide floodlights. The floodlights would be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed so as not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor to cause distraction or confusion to passing motorists, river users or navigation lights for air or water traffic.

6.5 Hours of Working

Normal working hours during the construction phase will typically be as follows:

Start	Finish	
0700	1800	Monday to Friday
0800	1400	Saturday

However, it may be necessary, in exceptional circumstances, to work outside of these hours at night and at weekends during certain activities and stages of the development. These will be agreed in advance with DCC and advertised in advance to relevant stakeholders.

6.6 Employment

The construction workforce numbers will vary depending on the construction stage of the project. However, it is anticipated that at the peak of construction there will be an average construction workforce of approximately 600-700 people employed on site.

6.7 Construction Health and Safety

The appointed Contractor will be required to ensure all Health & Safety requirements are agreed with Ruirside.

All construction staff and operatives will be inducted into the security, health and safety and logistic requirements on site prior to commencing work.

All contractors will be required to progress their works with reasonable skill, care and diligence and to proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, all other persons accessing the subject site and interacting stakeholders.

Contractors will have to implement all mitigation measures relevant to construction activity described in the EIAR. Contractors will also have to ensure that, as a minimum, all aspects of their works and project facilities comply with legislation, good industry practice and all necessary consents.

Particular cognisance will be taken by the contractor to managing the use of machinery in a public environment.

The requirements of the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations, 2006 and other relevant Irish and EU safety legislation will be complied with at all times.

As required by the Regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages through to completion of the construction and maintenance phases. This plan will be reviewed and updated as required, as the development progresses.

In accordance with the Regulations, a "Project Supervisor Construction Stage" will be appointed as appropriate. The Project Supervisor Construction Stage will assemble the Safety File as the project progresses.

Further, any requirements of the Irish Aviation Authority (IAA) with regards to lighting, crane operation etc. will be fully complied with.

6.8 Emergency Response Provision

The Contractor will maintain an emergency response action plan which will cover all foreseeable risks, i.e. fire, spill, flood, etc. The response plan will be developed in accordance with the site emergency plan. Appropriate site personnel will be trained as first aiders and fire marshals. In addition, appropriate staff will be trained in environmental issues and spill response procedures.

Equipment and vehicles will be locked, have keys removed and be stored securely in the works area.

6.9 Protection of Sensitive Structures

The Contractor will carry out condition surveys of all neighbouring structures and Protected Structures on the site and will erect protective hoarding to the existing Arch on Parkgate Street and the Turret at the eastern corner of the site. Temporary works will be put in place to protect sensitive structures, and a cordoned off zone of influence will be maintained at all times, in particular to the River Wall, Arch, Turret, and Tower. The Contractor(s) of subsequent construction phases will keep all protection measures in good order for the duration of the works.

The Contractor's Demolition and Construction Management Plan shall include a section on the Luas interface, dealing with and mitigating the specific risks to Luas infrastructure and operational services. All works shall be carried out in strict accordance with *Code of Practice for Works on, Near or Adjacent to the Luas Light Rail System* which is available to download from https://luas.ie/work-safety-permits.html. The Demolition and Construction Management Plan shall demonstrate compliance with the code of engineering practice, and particularly:

- Working safely in the vicinity of the Overhead Conducting System danger zone and the general Luas corridor;

- Demonstrating settlement and vibration remains within the limits set in the code of practice;
- Ensuring the Demolition and Construction Traffic Management Plan does not impact Luas operations, and;
- Compliance with the requirements of the Transdev (Luas operators) permit system for works in the area.

6.10 Waste Management

The handling and storage of construction wastes arising will be conducted in full compliance with the recommended guidelines.

6.10.1 Excavated Materials

Excavated materials as part of the construction works will generally consist of:

- Service yard and ground floor slab (i.e. asphalt and concrete);
- Topsoil and soil;
- Made ground; and
- Underground structures of various materials.

It is estimated that c. 14,400 m³ of bulk excavation will result from the works, including c. 220 m³ of excavation outside the ownership boundary for the proposed surface water improvement works. It is estimated that c. 6,100 m³ of fill material will be required, assuming some re-use of excavated materials will be allowed.

6.10.2 Demolition Materials

Materials will arise from the demolition and refurbishment of structures on the site. These will include concrete, steel, timber, and other materials that typically arise from the demolition of structures.

Any stockpiles of demolition material shall be temporarily stored on impermeable surfaces and covered using tarpaulin to avoid any contaminated run off entering the surface water system. Any stockpiles of excavated material will be covered using tarpaulin. Silt traps shall be placed in gullies to capture any excess silt in the run-off. All silos shall be bunded appropriately. Construction activities will have regard to CIRIA Good Practice Guidelines (C543 – Control of Water Pollution from Construction Sites).

The Main Contractor(s) will be required to establish and implement a detailed Construction and Demolition Waste Management Plan as part of their Quality Assurance System.

6.10.3 Construction Materials Requirements

The proposed development will have a requirement for imported materials, primarily concrete, and steel for the new proposed construction.

It is estimated that the following approximate quantities of the main construction materials will be imported during the construction works:

- Concrete In-Situ (superstructure only)– 15,100 m^3;
- Concrete Precast (superstructure and landscape paving)- 51,700m^3
- Concrete (Substructure only)- 5,100m^3
- Reinforcing Steel – 4,700 tonnes;
- Façade Glazing – 11,500 m^2;
- Solid Façade – 13,100 m^2; and
- Brickwork – 6,200 m^2.

6.10.4 Construction and Demolition Waste Management Plan

Resource and waste generation during construction will be mitigated and managed where possible. In this regard, Contractors will be required to produce a Construction and Demolition Waste Management Plan (CDWMP) for DCC approval prior to commencing any works on site. The CDWMP will address waste generation and arrangements made for prevention, reuse, recycling disposal and collection of recyclables and wastes.

The CDWMP which accompanies this planning application was prepared in line with the DoEHLG Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects.

The following is an indicative list of the contents of a CDWMP:

- Description of the Project;
- Wastes Arising Including Proposals for Minimisation/Reuse/Recycling;
- Procedures for prevention, reuse and recycling of wastes
- Estimated Cost of Waste Management;
- Roles including Training and Responsibilities for C&D Waste;
- Procedures for education of workforce and plan dissemination programme
- Record Keeping Procedures;
- Waste Collectors, Recycling and Disposal Sites Including Copies of Relevant Permits or Licences; and
- Waste auditing protocols.

Using the information identified in this section the Contractor will be required to develop, implement and maintain the CDWMP for the construction phase of the proposed development. The Construction and Demolition Waste Management planning application.

Plan can be found in **Appendix 17.1** of the EIAR which accompanies this

6.11 Water Management

Site drainage will be provided to collect surface runoff prior to discharge to the local drainage network – all in accordance with the necessary Dublin City Council approval.

7 Construction Traffic Management Plan

7.1 Site Access

It is anticipated that, subject to the grant of planning permission, construction will commence in Q4 2020.

The site is currently accessed from Parkgate Street via an existing vehicular entrance. For the duration of the Phase 1 and 2 works, all construction traffic will enter and leave the site using this existing entrance. A temporary lay-by may be required for truck set down for management of deliveries to site.

Phase 3 will require closure of the existing vehicular entrance and construction of a new site entrance between Building A and B for access and egress construction movements. This will require the relocation of the Dublin Bike Station No. 92.

Pedestrian Access

During certain stages of construction, it may be necessary to close part of the footpath along Parkgate Street. If this were to occur, a minor diversion for pedestrians would be provided along the carriageway of the road immediately adjacent to the footpath, closing off one lane of traffic to westbound vehicles. There are two vehicle lanes in the westbound direction, so no detours would be required for vehicles. All details of this Construction Traffic Management Plan will be agreed with Dublin City Council and An Garda Síochána in advance of the works.

Cycle Facilities

Cycle parking spaces will be provided on site for construction staff and in addition lockers will be provided to provide necessary storage for cyclist's personal belongings. There are also several Dublin Bikes stations in the vicinity of the site near Heuston Station.

As part of the proposed development it will be necessary to permanently re-locate Dublin Bikes Station No. 92 on Parkgate due to the provision of a loading bay in the current location of the station. It is likely that the relocation will occur early in the construction phase. The new location for the Dublin Bikes Station will be confirmed by DCC.

Public Transport

It is not envisaged that there will be any impact on public transport infrastructure or services during the construction of this development.

Car parking

No car parking is being provided on site for staff as the location of the proposed development is in the centre of Dublin and can be easily accessed by public transport, walking and cycling. If staff drive, they will have to park in the wider area such as Phoenix Park, Royal Hospital Kilmainham, or the various city centre car parks. However, the majority of these trips will likely occur before 7:00 and thus will not impact the network during the peak period of traffic volume.

7.1.1 Removal of Materials from Site

Demolition of existing buildings and bulk excavation arisings will be the most intensive period for removal of materials off site. Removal of materials off site will be managed effectively to ensure that there will be no queuing of trucks on the public roadways around the site. All trucks will have a built-in tarpaulin that will cover the excavated material as it is being hauled off site, and wheel wash facilities will be provided at all site egress points.

7.1.2 Deliveries to Site

Deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required on site. Works requiring multiple vehicle deliveries to site, such as concrete pours, will be planned to ensure there will be no queuing on the public roadways around the site.

7.2 Construction Traffic Trip Generation

The level of construction traffic directly associated with the construction of the proposed development will vary over the course of the construction project. The construction works will generate traffic during the following phases:

- Phase 1 – Enabling Works and Demolition;
- Phase 2 – Piling and Groundworks; and
- Phase 3 – Main Construction Works

The following section presents the projected volume of traffic generated during the peak period of construction activity.

It is expected that the most onerous phase of construction activity is during Phases 1 and 2 which may potentially run concurrently over a period of 4 months. For the purposes of this assessment and its robustness, it has been assumed that the entirety of the construction works for these phases will occur over a period of 2 months. This means an assumption of the same volume of trips but distributed by a shorter time period, thus resulting in more trips per day or hour.

Removal of Excavated and Demolished Material: The largest number of HGV movements will be associated with the excavation and demolition stage. It has been robustly assumed that approximately 14,500m^3 of bulk excavation material and approximately 2,250m^3 of demolition waste (based on estimate of 2,695 tonnes, at 1.2T/m^3) will require removal from the site, and this is assumed to occur over a 2-month period. It is unlikely that demolition and excavation will happen at the same time. However, for robustness, this assessment assumes that they will occur at the same time.

On the basis of a 10m^3 truck capacity, approximately 28 trucks per day are needed over the 2-month period. This equates to less than 2.5 trucks per hour on average. During peak construction periods this number could potentially double to 5 trucks per hour.

Imported Fill Material: It has been robustly assumed that 6,500m^3 of fill material will be imported to the site, and again, it is assumed that this will occur over a 2-month period.

On the basis of a 10m^3 truck capacity, approximately 11 trucks per day are needed over the 2-month period. This equates to less than one truck per hour on average. During peak construction periods this number could double to 2 trucks per hour.

Total Construction Traffic Generation: The total traffic generation for construction activities based on the assumptions set out above is presented in Table 1 below. Note these are 2-way movements (i.e. one truck = two movements).

Table 1: Traffic Generated During the Construction Period

Construction Aspect	2-Way Trips in Peak Hour
Removal of Excavated Material	10
Imported Fill Material	4
Total	14

A total of 14 two-way trips in a peak construction hour will not have any significant impact on the local traffic network.

7.3 Construction Traffic Distribution

It is anticipated that all construction vehicles accessing and egressing the site will do so from a construction access point on Parkgate Street. Construction traffic travelling to and from the site will do so via the Conyngham Road, South Circular Road, and Con Colbert Road/Chapelizod Bypass from where they will access the M50 and the national road network. This will keep trucks to an established HGV route, minimising their impact on residential areas.. The CTMP will be agreed with Dublin City council and An Garda Síochána in advance of the works.

Figure 7 shows the designated construction traffic route to/from the site.

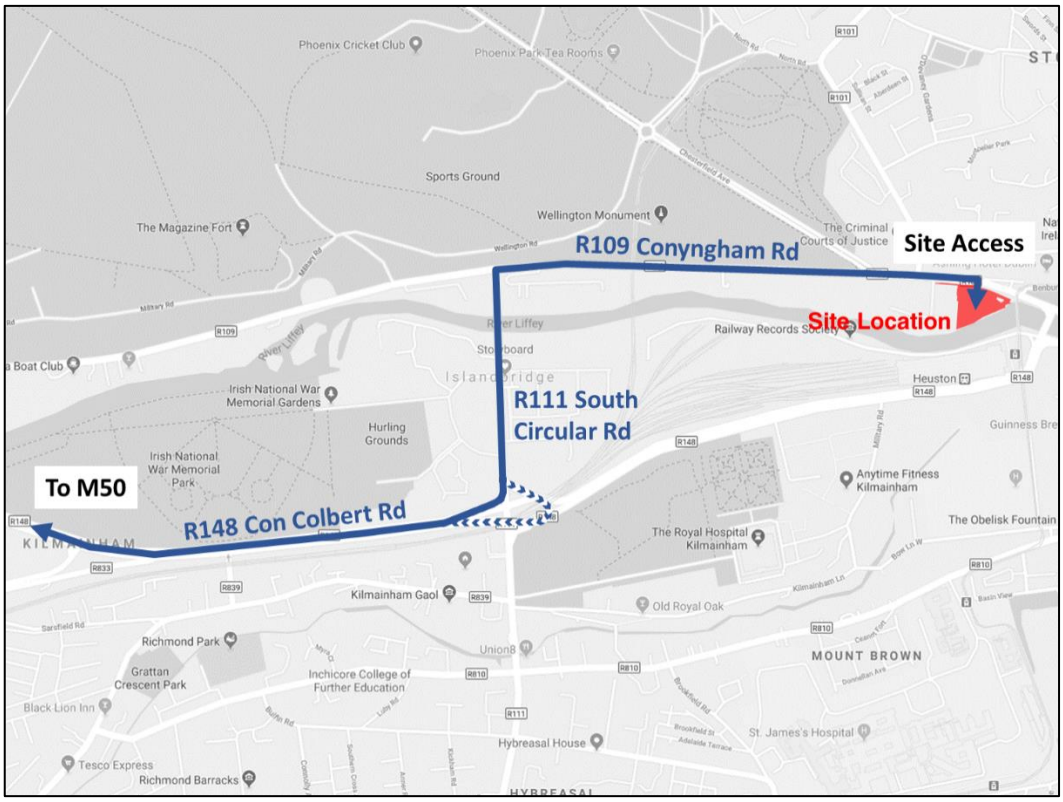

Figure 7 Designated Construction Traffic Route

7.4 Construction Stage Traffic Impact Mitigation

7.4.1 Construction Vehicle Movements

Construction vehicle movements will be minimised through:

- Consolidation of delivery loads to/from the site and management of large deliveries on site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- Assessment of 'cut' material generated by the construction works for possible re-use on site through various accommodation works. This will reduce the amount of material for removal offsite.
- Provision of adequate storage space on site;
- Development of a strategy to minimise construction material quantities as much as possible; and
- Minimisation of construction staff vehicle movements by offering Travel to Work Scheme benefits to encourage car sharing and public transport use.

7.4.2 Mobility Management Measures

A framework Mobility Management Plan (MMP) has been included with the planning application documentation, as part of the Transport Statement.

The Contractor will be required to introduce a MMP for its workforce to encourage access to the site by means other than private car.

The following section identifies some of the measures the Contractor will provide as part of the MMP. The MMP will be agreed with Dublin City Council prior to works beginning on site.

There is good connectivity between the site and public transport links.

There are buses within walking distance including Parkgate Street, Heuston Station, and St. John's Road West. The Luas Red-Line stop at Heuston Station is also within walking distance. The Contractor will issue an information leaflet to all staff as part of their induction on site highlighting the location of the various public transport services in the vicinity of the construction site.

Cycle parking spaces will be provided on the site for construction staff. In addition, lockers will be provided to allow cyclists store their cycling clothes. There are several Dublin Bike stations in the vicinity, on Parkgate Street and near Heuston Station.

Car sharing among the construction staff should be encouraged, especially from areas where construction staff may be clustered. The Contractor will aim to organise shifts in accordance with staff origins, thereby enabling higher levels of car sharing. Such a measure offers a significant opportunity to reduce the proportion of construction staff driving to the wider site area and will minimise the potential traffic impact on the road network surrounding this facility.

To oversee and implement the Mobility Management Plan for the construction works, the following mechanisms will be put in place:

- The appointment of a Mobility Manager to implement the Plan; and
- The establishment of a group to oversee the implementation and ongoing implementation of the Plan.

7.4.3 Temporary Traffic Management

Despite the limited impact on traffic capacity, the construction activities may require temporary modifications to the existing road network, particularly on Parkgate Street adjacent to the site.

The exact nature of the modifications and the time periods over which they will be in place will be a matter for the Construction Management Plan to be submitted by the appointed Contractor to Dublin City Council for agreement prior to commencement of works.

As part of the temporary traffic management, it may be necessary to interrupt the pedestrian footpath on the southern side of Parkgate Street to facilitate construction activities such as piling works along the northern boundary of the site. If this were to occur, a minor diversion for pedestrians would be provided along the carriageway of the road immediately adjacent to the footpath, closing off one lane of traffic to westbound vehicles. There are two vehicle lanes in the westbound direction, so no detours would be required for vehicles.

The Contractor will liaise with DCC and Dublin Bus to ensure the impact is adequately mitigated during construction.

8 Environmental Management Framework

8.1 Overview

The contract(s) awarded for the proposed development will include a requirement for the contractor to comply with relevant documentation including the EIAR, planning (and other statutory consent) conditions received, this CEMP and subsequent further development of this CEMP.

As part of the environmental management framework contractors will need to comply with all relevant environmental legislation and take account of published standards, accepted industry practice, national guidelines and codes of practice appropriate to the proposed development. Due regard should be given to the guidance and advice given by ISO14001 standard[2] and Construction Industry Research and Information Association (CIRIA) guidance[3,4,5].

The contractor will be required to develop and implement an Environmental Management System (EMS) that follows the principles of ISO14001. Further, the contractor's EMS should include an environmental policy, operational, monitoring and auditing procedures to ensure compliance with all environmental requirements and to monitor compliance with environmental legislation and the environmental management provisions outlined in the relevant documentation.

8.2 Roles and Responsibilities

8.2.1 Employer

Ruirside Developments Limited ('Ruirside') will be the employer responsible for ensuring that competent parties are appointed to undertake construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

8.2.2 Employers Representative

Ruirside and/or the Employers Representative (ER) appointed by Ruirside will be responsible for monitoring compliance with the CEMP. The ER may be required to appoint temporary or permanent specialists with appropriate skills and experience as required to implement on site procedures and monitor construction on behalf of Ruirside, i.e. competent experts in noise, vibration, dust, waste etc.

[2] ISO (2015) ISO 14001:2015 Environmental management systems -- Requirements with guidance for use
[3] CIRIA (2015) Environmental Good Practice on Site C692 (fourth edition) (C762)
[4] CIRIA (2015) Coastal and marine environmental site guide (second edition) (C744)
[5] CIRIA (2002) Brownfield development sites: ground-related risks for buildings (X263)

8.2.3 The Contractor

The contractor(s) appointed will be responsible for the organisation, direction and execution of environmental related activities during the detailed design and construction of the proposed development. The contractor is required to undertake all activities in accordance with the relevant environmental requirements including the consent documentation and other regulatory and contractual requirements.

8.2.4 Site Manager

A Site Manager will be appointed by the contractor to oversee the day-to-day management of working areas within the site and ensure that effective, safe, planned construction activities are delivered on an ongoing basis to the highest standards. The Site Manager will be a suitably qualified, competent and experienced professional that will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation.

9 Environmental Management Procedures

9.1 Monitoring, Inspections and Audits

For the duration of the contract(s), the environmental performance of the contractor will be monitored through site inspections and audits. The programme for monitoring, inspections and audits shall be specified in the contract and it is likely to be a combination of internal inspections and independent external audits that may be either random or routine.

Records of all inspections carried out should be recorded on standard forms and all actions should be closed out in a reasonable time. The CEMP will be developed further by the appointed Contractor(s) to include further details of inspection procedures.

10 Environmental Management

The contractor will be required to comply with any conditions imposed as part of the granted planning approval including any environmental commitments i.e. mitigation and monitoring measures set out in the EIAR.

A summary of the mitigation and monitoring measures for each aspect of the proposed development are set out in Chapter 22 of the EIAR which accompanies this planning application.

As stated previously, the CEMP will be developed by the appointed contractor and updated with regard to the environmental commitments including all mitigation as set out in the EIAR which accompanies this planning application. These mitigation measures are also included in this CEMP for each environmental factor. See below for a list of the environmental factors considered in this CEMP and the corresponding EIAR chapter.

- Traffic and Transport – EIAR Ch 6
- Air Quality – EIAR Ch 7
- Climate – EIAR Ch 8
- Noise and Vibration – EIAR Ch 9
- Biodiversity – EIAR Ch 10
- Archaeology – EIAR Ch 11
- Architectural Heritage – EIAR Ch 12
- Landscape and Visual – EIAR Ch 13
- Water – EIAR Ch 14
- Land and Soils – EIAR Ch 15
- Hydrogeology – EIAR Ch 16
- Resource and Waste Management – EIAR Ch 17
- Population & Human Health – EIAR Ch 18
- Material Assets – EIAR Ch 19
- Major Accidents and Disasters – EIAR Ch 20

Potential environmental effects during construction will be mitigated or reduced where possible. This section summarises all those construction related mitigation and monitoring measures that must be implemented by the appointed contractor during the construction phase of the proposed development, in accordance with the EIAR for the proposed development.

10.1 Mitigation Measures

10.1.1 Traffic & Transport

A Construction Traffic Management Plan has been included as Section 7 of this CEMP. The contractor will develop this CEMP and Construction Traffic Management Plan (CTMP) in order to implement the requirements of the CEMP prepared as part of this application. This will be developed by the appointed contractor in advance of the works and will be agreed with Dublin City Council and An Garda Síochána.

10.1.2 Air Quality

The assessment of likely significant effects during construction includes for the implementation of 'standard mitigation', as stated in the TII guidance[6]. The measures which are appropriate to the proposed development and which will be implemented include:

- Spraying of exposed earthwork activities and site haul roads during dry weather;
- Provision of wheel washes at exit points;
- Covering of stockpiles;
- Control of vehicle speeds, speed restrictions and vehicle access; and
- Sweeping of hard surface roads.

In addition, the following measures will be implemented for during the construction phase of the proposed development:

- Facades of buildings will be covered and sprayed with water while being demolished;
- A c. 1.8m hoarding will be provided around the site works to minimise the dispersion of dust from the working areas;
- Any generators will be located away from sensitive receptors in so far as practicable; and
- Stockpiles will be located as far as possible from sensitive receptors and covered and/or dampened during dry weather.

Employee awareness is also an important way that dust may be controlled on any site. Staff training and the management of operations will ensure that all dust suppression methods are implemented and continuously inspected.

During the construction phase of the proposed development it is possible that disturbance of ACMs on site could cause asbestos fibres to be released into the ambient environment. An asbestos audit will be carried out on the buildings scheduled for demolition prior to demolition works. Any asbestos discovered will be removed by a Specialist Contractor in accordance with Safety, Health, and Welfare at Work (exposure to Asbestos) Regulations 2006/20137, and disposed of by specialist contractors to an appropriately licensed facility. Traceable records of this activity, including the disposal licence, will be kept.

[6] TII, 2011. Guideline for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. Available at: *https://www.tii.ie/technical-services/environment/planning/Guidelines-for-the-Treatment-of-Air-Quality-during-the-Planning-and-Construction-of-National-Road-Schemes.pdf*

[7] Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). Available at: *https://www.hsa.ie/eng/Legislation/New_Legislation/SI_291_2013.pdf*

10.1.3 Climate

Carbon emissions

Due to the nature of effects predicted, no mitigation measures are proposed during the construction phase of the proposed development.

Wind

As no significant impacts are predicted during the construction phase, no mitigation measures are proposed.

Daylight and Sunlight

As no significant impacts are predicted during the construction phase, no mitigation measures are proposed.

10.1.4 Noise & Vibration

Noise

The impact assessment conducted for the construction activity during the construction phase has highlighted that the predicted construction noise levels are above the adopted criteria at distances of 20m or less, and that a negative impact on nearby receivers will occur.

The following mitigation measures will be implemented during construction activities in order to reduce the noise and vibration impact to nearby noise sensitive areas. The contractor will provide proactive community relations and will notify the public and vibration sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.

With regard to potential mitigation measures during construction activities, the standard planning condition typically issued by Dublin City Council states:

"*During the construction and demolition phases, the proposal development shall comply with British Standard 5228 "Noise Control on Construction and open sites Part 1. Code of practice for basic information and procedures for noise control*."

BS5228 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- control of noise sources;
- screening;
- hours of work, and;
- liaison with the public.

Thus, the following noise mitigation will be adhered to during construction:

Selection of Quiet Plant

The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be considered:

- Site compounds will be located away from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas will be restricted to normal working hours.
- Mobile plant should be switched off when not in use and not left idling.
- For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover.
- For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Piling

Piling is the construction activity which is most likely to cause disturbance. Mitigation in relation to piling is outlined in the following paragraphs.

Piling programmes will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. If piling works are in progress on a site at the same time as other works of construction or demolition that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

During consultation the planner, developer, architect and engineer, as well as the local authority, should be made aware of the proposed method of working of the piling contractor. The piling contractor will in turn have evaluated any practicable and more acceptable alternatives that would economically achieve, in the given ground conditions, equivalent structural results.

Noise reduction will be achieved by enclosing the driving system in an acoustic shroud.

Screening by barriers and hoardings is less effective than total enclosure but can be a useful adjunct to other noise control measures. For maximum benefit, screens should be close either to the source of noise (as with stationary plant) or to the listener. Removal of a direct line of sight between source and listener can be advantageous both physically and psychologically. In certain types of piling works there will be ancillary mechanical plant and equipment that may be stationary, in which case, care should be taken in location, having due regard also for access routes. When appropriate, screens or enclosures will be provided for such equipment.

Contributions to the total site noise can also be anticipated from mobile ancillary equipment, such as handling cranes, dumpers, front end loaders etc. These machines may only have to work intermittently, and when safety permits, their engines will be switched off (or during short breaks from duty reduced to idling speed) when not in use.

Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m2 to provide adequate sound insulation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Monitoring

Construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation/ piling or other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

Vibration

Any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in *BS 7385-2 (1993).* [8]

10.1.5 Biodiversity

Terrestrial Environment

Mammals

The buildings on site present roosting potential to bats. However, none were recorded in two separate surveys at the appropriate time of the year. There are no proposed mitigation measures for bats with regard to the demolition of buildings.

There will be no direct lighting of the river during the construction period. All arc or flood lighting will be directed into the site and away from the river to reduce potential effects on commuting otters and bats during night time hours.

Birds

There are no specific measures required for birds during construction.

Aquatic Environment

Surface Water

Surface water from the proposed development will discharge to the River Liffey. A foreshore consent will be sought for this discharge. Mitigation measures relating to the protection of surface water quality and status are described in **Chapter 14**, Water and Hydrology and are summarised below.

[8] BS 7385-2:1993 *Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration.*

"The employment of good construction management practices will minimise the risk of pollution of soil, surface water and groundwater. The following site-specific measures will be implemented for the proposed development which will include:

- *Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding;*
- *Run-off will be controlled to minimise the water effects in outfall areas;*
- *All concrete mixing and batching activities will be located in areas away from watercourses and drains; and*
- *Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site.*

In order to prevent the accidental release of hazardous materials (fuels, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the proposed development. The contractor's sanitary facilities will discharge into the existing combined sewer on Parkgate Street or as otherwise agreed with Dublin City Council."

Construction management measures including specific measures to prevent pollution of the River Liffey have also been incorporated into the CEMP, see **Appendix 4.1,** which will ensure that there are no likely effects on the River Liffey from surface water runoff.

The CEMP has been formulated in consideration of standard best practice and, as expanded on by the contractor, will align with the guidance set out in the following documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001)[9]; and
- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004)[10]; and
- CIRIA (2015) Environmental Good Practice on Site C692 (4th Edition) (C762)[11].

[9] CIRIA, 2001. Guidance Document C532 Control of Water Pollution from Construction Site: https://www.ciria.org [Accessed October 2018]
[10] CIRIA, 2004. Guidance Document C624 Development and Floor Risk – guidance for the construction industry: https://www.ciria.org [Accessed October 2018
[11] CIRIA, 2015. Environmental Good Practice on Site C692 (4th Edition): https://www.ciria.org [Accessed October 2018]

10.1.6 Archaeology

All archaeological and cultural heritage issues will be resolved during the pre-construction phase, or in advance of the main construction stage, during the site clearance / ground reduction / demolition stage.

10.1.7 Architectural Heritage

As is detailed above, repair and refurbishment works are proposed in the case of all the protected structures on the site and the retained historic structures. No other mitigation measures have been proposed with respect to effects from the construction of the proposed development.

10.1.8 Landscape & Visual

The subject application proposes the development of site designated as a Strategic Development and Regeneration Area under the *Dublin City Development Plan 2016-2022*, which was the subject of major re-development in order to accommodate medium and high density residential development in recent years. In these circumstances, during the construction or operational phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

10.1.9 Water

The employment of good construction management practices will minimise the risk of pollution of soil, surface water and groundwater. The following site-specific measures will be implemented for the proposed development which will include:

- Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding; and
- Run-off will be controlled to minimise the water effects in outfall areas; and
- All concrete mixing and batching activities will be located in areas away from watercourses and drains; and
- Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site.

In order to prevent the accidental release of hazardous materials (fuels, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the proposed development. The contractor's sanitary facilities will discharge into the existing combined sewer on Parkgate Street or as otherwise agreed with Dublin City Council.

These mitigation measures will be in accordance with:

- *ICE (2015) Earthworks, A Guide (2nd Edition)*[13]*; and*
- *TII (2013) Specification for Road Works Series 600 - Earthworks.*[14]

This CEMP will be developed and implemented by the Contractor for the duration of the construction phase, in accordance with the guidance set out in the following documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001)[15]; and
- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004)[16]; and
- CIRIA (2015. All personnel working on the site will be trained in the implementation of the procedures.
- Environmental Good Practice on Site C692 (4th Edition) (C762)[17].

10.1.10 Land & Soils

General

Precautionary measures will be taken to contain any areas within the planning boundary at risk of contaminated run-off.

- Potential pollutants shall be adequately secured against vandalism and will be provided with proper containment according to the relevant codes of practice. Any spillages will be immediately contained, and contaminated soil shall be removed from the proposed development and properly disposed of in an appropriately licensed facility;
- Dust generation shall be kept to a minimum through the wetting down of haul roads as required and other dust suppression measures;
- Any stockpiles of earthworks and site clearance material shall be stored on impermeable surfaces and covered with appropriate materials;
- Silt traps shall be placed in gullies to capture any excess silt in the run-off from working areas;

[13] Institute of Civil Engineers ICE, 2015. Earthworks, A Guide (2nd Edition) https://www.icevirtuallibrary.com/isbn/9780727741851 [Accessed October 2018]
[14] Transport Infrastructure Ireland, 2013. Specification for Road Works Series 600 – Earthworks (including Erratum No. 1, dated June 2013) http://www.tiipublications.ie/library/CC-SPW-00600-03.pdf [Accessed October 2018]
[15] CIRIA, 2001. Guidance Document C532 Control of Water Pollution from Construction Site: https://www.ciria.org [Accessed October 2018]
[16] CIRIA, 2004. Guidance Document C624 Development and Floor Risk – guidance for the construction industry: https://www.ciria.org [Accessed October 2018
[17] CIRIA, 2015. Environmental Good Practice on Site C692 (4th Edition): https://www.ciria.org [Accessed October 2018]

- Soil and water pollution will be minimised by the implementation of good housekeeping (daily site clean-ups, use of disposal bins, etc.) and the proper use, storage and disposal of these substances and their containers as well as good construction practices; and

This CEMP includes good housekeeping and emergency response measures to be implemented during the construction phase of the project, including actions for dealing with any potential pollution incidents, in accordance with the following measures which are detailed in CIRIA Guidance 37:

- Containment measures;
- Emergency discharge routes;
- List of appropriate equipment and clean-up materials;
- Maintenance schedule for equipment;
- Details of trained staff, location and provision for 24-hour cover;
- Details of staff responsibilities;
- Notification procedures to inform the EPA or Environmental Department of the Dublin City Council;
- Audit and review schedule;
- Telephone numbers of statutory water consultees; and
- List of specialist pollution clean-up companies and their telephone numbers.

Compression of Substrata

- Excavations shall be kept to a minimum, using shoring or trench boxes where appropriate. For more extensive excavations, a temporary works designer shall be appointed to design excavation support measures in accordance with all relevant guidelines and standards.

Loss of Overburden

- All excavated material will, where possible, be reused as construction fill. The appointed contractor will ensure acceptability of the material for reuse for the proposed development with appropriate handling, processing and segregation of the material. This material would have to be shown to be suitable for such use and subject to appropriate control and testing according to the Earthworks Specification(s);
- These excavated soil materials will be stockpiled using an appropriate method to minimise the impacts of weathering. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff; and
- Any surplus suitable material excavated that is not required elsewhere for the proposed development, shall be used for other projects where possible, subject to appropriate approvals/notifications.

Earthworks Haulage

- Earthworks haulage will be along agreed predetermined routes along existing national, regional and local routes. Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to an acceptable condition. Where practicable, compaction of any soil or subsoil which is to remain in situ will be avoided; and
- Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe runoff and prevent ponding and flooding. Runoff will be controlled through erosion and sediment control structures appropriate to minimise the possible impacts.

Impact on surrounding ground:

- Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations; and
- Ground settlements will be controlled through the selection of a foundation type and construction methods which are suitable for the particular ground conditions.

10.1.11 Hydrogeology

Pollution from Construction Activities

The employment of good construction management practices will minimise the risk of pollution of soil, storm water run-off, adjacent watercourses and groundwater. The construction management of the site will take account of the recommendations of the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams et al., 2001) to minimise as far as possible the risk of soil, groundwater and surface water contamination.

Measures that will be implemented to minimise the risk of spills and contamination of soils and waters, will include:

- Where feasible all excavated spoil will be treated to remove excess fluid prior to stockpiling and transportation;
- Where feasible transfer of excess soil materials from stockpile areas off-site will be undertaken during dry periods;
- Stockpile and transfer of excess soil material will be restricted to specified and impermeable areas that are isolated from the surrounding environment;
- Wheel washes will be provided at site entrances to clean vehicles prior to exiting the work site;
- All staff will be trained and follow vehicle cleaning procedures. Details of these procedures will be posted in all work sites for easy reference; and

- The implementation of the above measures will ensure that the risk of pollution of groundwater and nearby water bodies resulting from the construction activities will be minimised.
- Training of site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures;
- Careful consideration will be given to the location of any fuel storage facilities. These will be designed in accordance with guidelines produced by CIRIA, and will be fully bunded;
- All vehicles and plant will be regularly inspected for fuel, oil and hydraulic fluid leaks. Suitable equipment to deal with spills will be maintained on site;
- Ensure that all areas where liquids are stored, or cleaning is carried out are in designated impermeable areas that are isolated from the surrounding area e.g. by a roll-over bund, raised kerb, ramps or stepped access;
- Minimise the use of cleaning chemicals; and
- Use trigger-operated spray guns, with automatic water-supply cut-off.

10.1.12 Resource & Waste Management

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG and is included as **Appendix 17.1** to the EIAR which accompanies this application. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the proposed development. Prior to commencement, the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to the C&D WMP to DCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to ‘design out waste’;
- On-site segregation of waste materials will be carried out where practical to increase opportunities for off-site reuse, recycling and recovery – the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and

- Timber.

- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials will be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with *Article 27 of the EC (Waste Directive) Regulations (2011)* [18]. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996, as amended*, associated Regulations, the *Litter Pollution Act 1997* [19] and the *EMR Waste Management Plan (2015-2021).* It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

10.1.13 Population & Human Health

A Site Manager will be appointed to ensure the proper running of the site, and the minimisation of community disturbance and the implementation of "good housekeeping" policy at all times. Potential effects on air quality, and consequently human health, will be mitigated during the construction phase and full account will be taken of the Transport Infrastructure Ireland (TII) guidance and the development of employee awareness. Measures that will be implemented for the proposed development will include:

[18] EC (2011) Article 27 of the EC (Waste Directive) Regulations
[19] Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended

- A c. 1.8m hoarding will be provided around the site works to minimise the dispersion of dust from the working areas;
- Any generators will be located away from sensitive receptors in so far as practicable;
- Stockpiles will be located as far as possible from sensitive receptors and covered and/or dampened during dry weather.

Where asbestos is uncovered on site during construction, the ACM will be double-bagged and removed from the site by a competent contractor and disposed of in accordance with the relevant procedures and legislation.

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, strict construction noise limits and noise monitoring during the construction phase will ensure any potential human health effects from noise are controlled to within the adopted criteria.

In order to offset any potential effects on water, and consequently human health, earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding. Good housekeeping (site clean-ups, use of disposal bins, etc.) will be enforced by the contractor on the site to mitigate against the risk of spillages.

The potential risk of river wall collapse during construction will be mitigated by standard best practice construction measures, and lateral steel restraints will be provided to the existing stonework along the river, throughout construction.

Should any utility/service diversions or disturbances be required, these will only be carried out in agreement with the relevant service providers, and with notice to the affected public.

10.1.14 Material Assets

The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and that all services and utilities are maintained, unless this has been agreed in advance with the relevant service provider and local authority.

All works in the vicinity of utilities apparatus will be carried out in ongoing consultation with the relevant utility company and/or local authority and will be in compliance with any requirements or guidelines they may have.

Where new services are required, the Contractor will apply to the relevant utility company for a connection permit where appropriate and will adhere to their requirements.

The proposed development is likely to give rise to a minor adverse effect on transmission links, once developed.

During the construction phase of the proposed development, Vodafone and Three will re-align the identified microwave links to new hop sites.

In the unlikely event that the proposed development continues to impact on existing or new microwave channels, Ruirside Developments Ltd. is committed to assisting in mitigating the issues as illustrated in Figure 8 below.

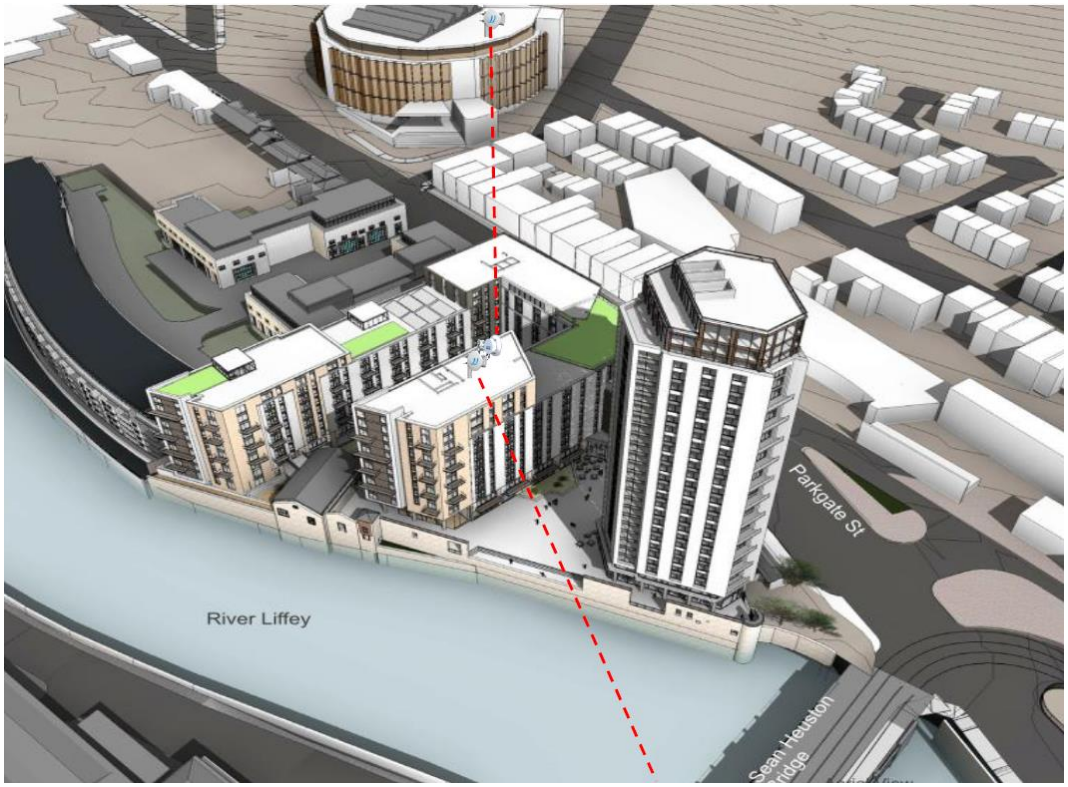

Figure 8 Potential Mitigation

10.1.15 Major Accidents & Disasters

As previously discussed, the construction phase of the proposed development will be carried out in compliance with best practice construction measures.

Lateral steel restraints will be provided to the existing stonework along the river, throughout construction, to avoid risk of collapse. Asbestos will be removed from site and disposed of prior to construction/ demolition in accordance with statutory requirements.

10.2 Monitoring Measures

10.2.1 Traffic & Transportation

No monitoring has been proposed with respect to effects from construction traffic associated with the proposed development.

10.2.2 Air Quality

Dust monitoring will be undertaken at a range of nearest sensitive receptors during the demolition and construction phases. The TA Luft dust deposition limit values of 350 mg/m^2/day (averaged over one year) will be applied as a 30-day average

10.2.3 Climate

As no significant impact is predicted to occur during the construction phase of the proposed development, no monitoring measures are required.

10.2.4 Noise & Vibration

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criteria. Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

Vibration monitoring will be implemented during construction activities to ensure that vibration levels are in accordance with criteria set out in Section 9.2.7.2. Monitoring will be more rigorous in the proximity of any protected structures; including more frequent monitoring and additional monitoring points. Monitoring points will be located on the face of the structures and centred every 1m.

10.2.5 Biodiversity

During the construction phase when and if dewatering of excavations is required, the Contractor will be responsible for monitoring the suspended solids content of the adjacent River Liffey water. The discharge of treated surface water from construction activities will be monitored to ensure that the discharged treated water will be in accordance to the Dublin City Council Discharge Licence if required.

The settlement tank and silt bag will be monitored by a Site Environmental Manager who will direct the control of settlement and whether a silt bag needs to be changed.

10.2.6 Archaeology

No construction phase monitoring measures are proposed with respect to archaeology.

10.2.7 Architectural Heritage

No monitoring has been proposed with respect to effects from construction of the proposed development.

10.2.8 Landscape & Visual

No monitoring has been proposed with respect to visual effects from of the proposed development.

10.2.9 Water

Hydrology, Water Quality and Drainage

Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development to ensure existing surface water runoff is draining from the site and is not exposed to any contaminants.

Wastewater

The contractor will be required to ensure that the sanitary facilities for the site personnel are maintained and effluent storage is regularly emptied and disposed of.

Water Supply

The contractor will be required to ensure that the water supply to the site is maintained and free of contaminants.

Flood Risk

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

10.2.10 Land & Soils

Excavations in made ground will be monitored by an appropriately qualified person to ensure that any contaminated material is identified, segregated and disposed of appropriately. Any identified hotspots shall be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure that the hotspot does not cross-contaminate clean soils elsewhere.

Any excavation shall be monitored during earthworks to ensure the stability of side slopes and to ensure that the soils excavated for disposal are consistent with the descriptions and classifications according to the waste acceptance criteria testing carried out as part of the site investigations.

Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations. Monitoring will be more rigorous in the proximity of any protected structures. This will include more frequent monitoring and additional monitoring points. Monitoring points will be located on the face of the structures and centred every 1m. Horizontal, vertical and rotational displacement in all directions will be monitored.

Movement monitoring shall be carried out during any activities which may result in ground movements or movements of any nearby structures.

10.2.11 Hydrogeology

In relation to soils contamination a suitably experienced environmental consultant will be required to oversee the excavation works for the proposed development so that potential contamination can be segregated, classified and suitably disposed.

The works will be monitored by a Resident Engineer.

Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development to ensure the groundwater resource is not impacted by the proposed development.

10.2.12 Resource & Waste Management

The management of waste during the construction phase will be monitored by the site manager to ensure compliance with relevant local authority requirements and effective implementation of the C&D WMP including maintenance of waste documentation.

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. The C&D WMP specifies the need for a waste manager to appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and the identification of trends. The data will be maintained to advise on future projects.

10.2.13 Population & Human Health

Dust monitoring will be undertaken at a range of nearest sensitive receptors during the demolition and construction phases. The TA Luft dust deposition limit values of 350 mg/m^2/day (averaged over one year) will be applied as a 30-day average.

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criteria. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development to ensure existing surface water runoff is draining from the site and is not exposed to any contaminants. The contractor will be required to ensure that the sanitary facilities for the site personnel are maintained and effluent storage is regularly emptied and disposed of. The contractor will be required to ensure that the water supply to the site is maintained and free of contaminants.

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

The management of waste during the construction phase will be monitored by the site manager to ensure compliance with relevant local authority requirements and effective implementation of the Construction & Demolition Waste Management Plan including maintenance of waste documentation.

10.2.14 Material Assets

Construction phase mitigation measures have been proposed to ensure that significant negative effects on material assets will be avoided, prevented or reduced during the construction of the proposed development. As such, no monitoring measures are proposed during the construction phase.

10.2.15 Major Accidents & Disasters

No monitoring is proposed specific to reducing the risk of major accidents/disasters during construction.