22 SUMMARY OF MITIGATION, MONITORING AND RESIDUAL EFFECTS

22.1 Introduction

This chapter provides a summary of the proposed mitigation and monitoring measures as well as an overview of the residual likely significant effects associated with the proposed development (as identified in Chapters 6-20).

22.2 Summary of Mitigation Measures

A number of safeguard and management measures have been identified in order to mitigate negative environmental effects during construction and operation as described in detail in Chapters 6-20.

It should be noted that this generally excludes any inherent measures and elements that have been incorporated in the design as these design measures have been documented as part of Chapter 3. Further, any environmental management measures during construction that have been identified and are associated with construction activity and methodology are documented in the Construction Environmental Management Plan (CEMP) which is available in Appendix 4.1. The mitigation measures that have been established to minimise any likely significant negative effects arising from the proposed development on the surrounding environment are summarised in Sections 22.2.1- 22.2.2.

In the event that permission is granted for the proposed development and it is considered appropriate to condition the mitigation measures set out in this EIAR, we refer to the mitigation measures set out in Sections 22.2.1- 22.2.2 below and in Appendix 4.1 (where not expressly incorporated below).

22.3.1 Construction Phase

22.2.1.1 Transport

The following mitigation measures are proposed for the construction phase of the scheme:

Construction Environmental Management Plan and Construction Traffic Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared (see Appendix 4.1.). A Construction Traffic Management Plan (CTMP) has been included as a section within the CEMP. The contractor will develop a detailed 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.

22.2.1.2 Air Quality

The assessment of likely significant effects on air quality during the construction phase (contained in Chapter 7 – Air Quality Section 7.4.2) includes the implementation of 'standard mitigation', as stated in the TII guidance (*Transport Infrastructure Ireland (TII), (formerly the National Roads Authority (NRA)) (2011). Guidelines for the Treatment of Air Quality during the Planning and Construction of National Roads Schemes. TII, Dublin, Ireland)*.

The measures which will be implemented during the construction phase of the proposed development are:

- 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:

- 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.

As permitted under ABP-306569-20, 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 2006/2013[1], and disposed of by specialist contractors to an appropriately licensed facility. Traceable records of this activity, including the disposal licence, will be kept.

22.2.1.3 Climate

Carbon Emissions

The direct effects predicted in Section 8.4.2 of Chapter 8 'Climate' are considered slight, negative and long term. Accordingly, no mitigation measures are identified / proposed during the construction phase of the proposed development.

No significant indirect effects are predicted during the construction phase of development Accordingly, no mitigation measures are identified / proposed during the construction phase of the proposed development.

No significant cumulative impacts are predicted during the construction phase of development.

As such, no mitigation measures are identified / 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.

22.2.1.4 Noise and Vibration

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration*

[1] 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

Control on Construction and Open Sites Parts 1 and 2. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening;
- liaison with the public; and,
- monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. 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 in excess of 30m from noise sensitive receptors within the site constraints. The lifting of bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. 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 should 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.

- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should 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. General guidance in relation to piling is outlined in the following paragraphs.

Piling programmes should 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 should 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 should in turn have evaluated any practicable and more acceptable alternatives that would economically achieve, in the given ground conditions, equivalent structural results.

On typical piling sites the major sources of noise are essentially mobile and the noise received at any control points will therefore vary from day to day as work proceeds. The duration of piling works are typically of the order of 6 weeks which is relatively short in relation to the length of construction work as a whole, and the amount of time spent working near to noise sensitive areas can represent only a part of the piling period.

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.

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 should 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 should 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.

Project Programme

Where possible, 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.

22.2.1.5 Biodiversity

There are limited semi-natural habitats on the site. All of the on-site habitats will have been removed to ground level prior to the Tower development and the only considerations are with regard to the Aquatic environment of the River Liffey during the construction phase.

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 are summarised below.

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); and

- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004); and
- CIRIA (2015) Environmental Good Practice on Site C692 (4th Edition) (C762).

22.2.1.6 Archaeology and Cultural Heritage

Archaeological monitoring of site investigation works and archaeological test excavation have already taken place across the overall development site, including the proposed development area for Block A. No evidence was found for any pre-industrial archaeological remains. The ability to locate and identify Viking 'boulder clay or lacustrine' archaeology in deep test trenches in urban stratified sites is extremely limited and the excavation of further test trenches is unlikely to further define the pre-industrial archaeological potential of the site. In addition, the depths of the reclamation levels and the contaminated soils would present significant logistical and health and safety issues. For these reasons, archaeological monitoring is considered the appropriate mitigation.

Archaeological monitoring will take place of any works requiring ground disturbance / excavation, including site preparation works for the piling regime for Block A and any ground disturbance works associated with the propping / stabilisation of the historic turret and river wall, where these have not already taken place for the consented development (Planning Permission Ref. ABP-306569-20).

Should archaeological material be identified, the remains will be preserved by record through archaeological excavation. It should be noted that the significant ground contamination that exists within the site may restrict the manual excavation of some deposits based on health and safety concerns.

Cumulative

Archaeological Heritage:

An archaeological strategy for the consented development site (including the proposed development area) (Planning Permission Ref. ABP-306569-20) has been drawn up for consultation with the City Archaeologist and the National Monuments Service (DHLGH). The proposed strategy seeks to employ preservation by record and to archaeologically excavate the industrial remains that will be exposed as a result of the basement design for the development. It provides for the recording and for the removal of archaeological material acceptable to the planning authority as detailed in the Archaeological Assessment Report (O'Donovan 2020). This includes the following elements:`

- Archaeological excavation to be carried out within the basement / undercroft footprint of the development (part of Block B and C);
- Archaeological monitoring to be carried out on the remainder of the site where any sub-surface works associated with the ground floor foundations of the development requires reduction. This will involve having the ground-breaking element of the development works monitored by an archaeologist. Should archaeological material be identified, further archaeological excavation shall proceed;
- Prior to the demolition of existing historic buildings on site, a full photographic and descriptive record of the upstanding remains in relation to the Phoenix Iron Works (c. 1800-1878) and Kingsbridge Woollen Factory (1880-1890) will take place in order to add to the archaeological record of the sub-surface industrial remains;

The strategy acknowledges that significant ground contamination with heavy metals etc. exists on the site and that this may restrict the manual excavation of some deposits based on health and safety concerns. The presence of these contaminated deposits has led to a development design leaving these fills in situ which has a consequent reduction in the area requiring archaeological excavation.

22.2.1.7 Architectural Heritage

It is noted that Condition 23 of the An Bord Pleanála grant under ABP 306569-20 sets out requirements in relation to how works to historic structures on the wider 42A Parkgate Street site should be carried out and in relation to how historic structures, features and fabric should be protected during any works.

22.2.1.8 Landscape and Visual Impact Assessment

No mitigation measures have been proposed with respect to landscape and visual effects from the construction of the proposed development.

22.2.1.9 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:

- 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.

Mitigation during the construction phase will also include implementing best practice during earthworks operations to avoid sediments draining to the River Liffey, in accordance with:

- o ICE (2015) Earthworks, A Guide (2nd Edition) ; and
- o TII (2013) Specification for Road Works Series 600 - Earthworks.

In addition to the above, construction phase mitigation measures for the proposed development are described in a detailed Construction Environmental Management Plan (CEMP) which is contained in Appendix 4.1. The CEMP will be implemented by the Contractor for the duration of the construction phase. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

The CEMP for the proposed development will be formulated in consideration of standard best practice and will align with the guidance set out in the following documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001) ; and
- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004) ; and
- CIRIA (2015) Environmental Good Practice on Site C692 (4th Edition) (C762) .
- The CEMP will comprise all of the construction mitigation measures, which are set out in this EIAR, and any additional measures which are required by the conditions attached to the An Bord Pleanála decision.

22.2.1.10 Lands and Soils

General

A Construction Environmental Management Plan (CEMP) is contained in Appendix 4.1.

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;
- 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
- A contingency plan for pollution emergencies will also be developed by the contractor prior to the commencement of the works and regularly updated during construction. This contingency plan will identify the actions to be taken in the event of a pollution incident in accordance with the CIRIA guidance37 which requires the following to be addressed:
    - 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 Wicklow County 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 agreed on 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.

22.2.1.11 Hydrogeology

Existing Waterbodies

A Construction Environmental Management Plan (CEMP) is contained in Appendix 4.1

Examples of measures to be implemented 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.

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, as recommended in the guidance above, that will be implemented to minimise the risk of spills and contamination of soils and waters, include:

- 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.

22.2.1.12 Material Assets - Waste Management

A project specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared in line with the requirements of the requirements of the guidance document "*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*" issued by the DoEHLG " and is included as Appendix 17.1. 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 construction phase 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 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.

There will also be soil, stone, gravel and clay excavated to facilitate site preparation for construction and foundation excavations. However, the majority of excavation will occur under the consented application ABP Ref. 306569-20 and excavations for this proposed development will be minimal. 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 to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that 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 shall 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 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). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

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 and the Litter Pollution Act 1997, 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.

22.2.1.13 Population and Human Health

It should be noted that mitigation measures relating to those factors under which population and human health effects might occur have been addressed elsewhere in this EIAR, under the relevant environmental factors. Other than the mitigation measures outlined in Chapters 6-20, no further mitigation measures have been proposed with respect to population and human health. However, those relevant to this assessment are restated in Section 18.5.1.1 and 18.5.1.2 of Chapter 18 – Population and Human Health for completeness.

In order to mitigate potential temporary community disturbance during construction, a Construction Environmental Management Plan (CEMP) has been prepared and is included in Appendix 4.1. Further, 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 offset during the construction phase through the implementation of standard mitigation as stated in the Transport Infrastructure Ireland (TII) guidance and employee awareness. In addition, the following measures will be implemented for the proposed development:

- A c. 1.8m hoarding will be provided around the site works to minimise the dispersion of dust from the working areas and to reduce construction noise;
- 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.

22.2.1.14 Material Assets – Utilities and Telecommunications

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.

As outlined in Section 19.5.1 of Chapter 19 – Material Assets, 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. To mitigate this effect, the proposed development includes provision for a new hop site, as illustrated in Figure 22.1 below.

This has been assessed for visual impact, in Chapter 13, Landscape and Visual Impact Assessment.

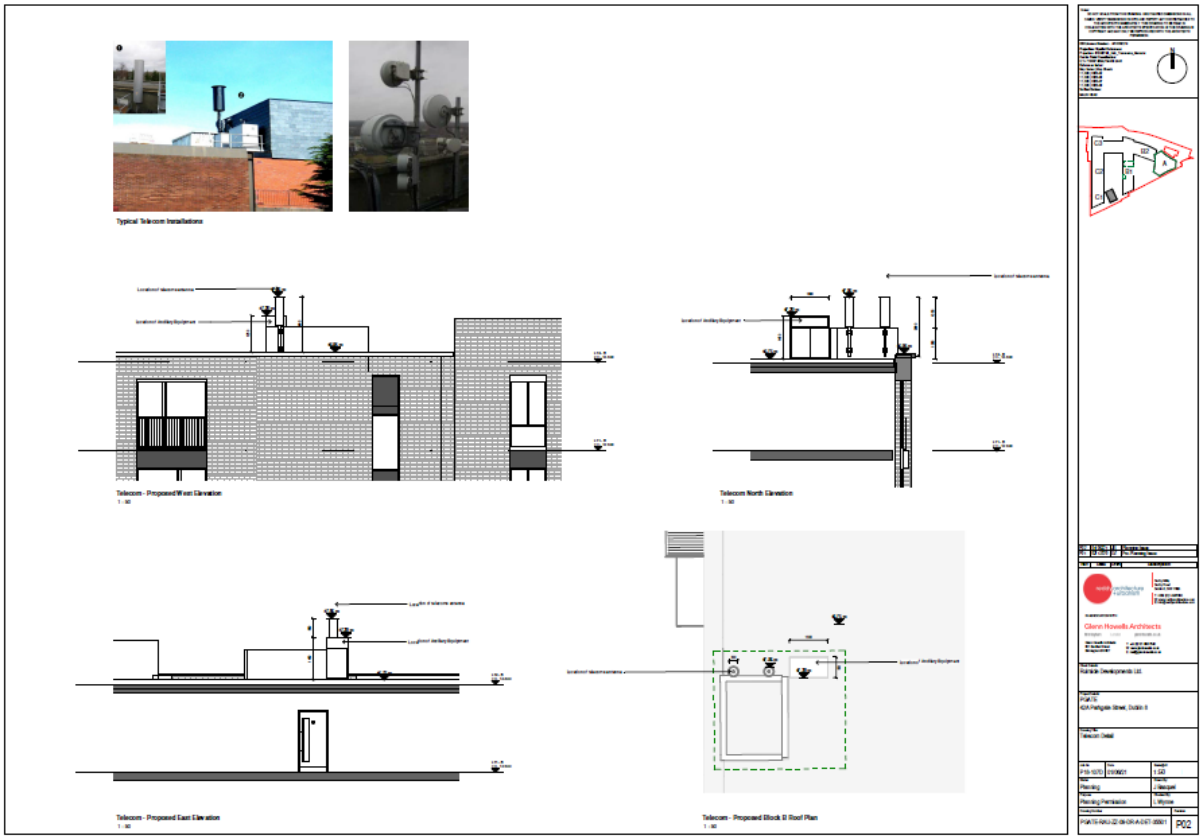

Figure 22.1 Proposed Mitigation for Telecommunications

22.2.1.15 Major Accidents and Disasters

As previously discussed, temporary design measures such as lateral steel restraints will be provided to the existing stone wall along the river during construction, until such time as permanent restraints are installed, bracing it against Block A in the manner consented under ABP-306569-20.

The construction phase of the proposed development will also be carried out in accordance with best practise construction measures outlined in the Construction Environmental Management Plan (CEMP) which is included in Appendix 4.1.

Refer to Chapter 4, Construction Strategy for further information.

22.3.2 Operational Phase

22.2.1.16 Transport

The development will have a pro-active Mobility Management Plan (MMP) that will include measures to further encourage sustainable transport trips. A Framework MMP has been included in the Transport Statement, which is submitted as part of the planning application documentation.

22.2.1.17 Air Quality

As there are no significant effects on air quality predicted during the operational phase of the proposed development, no mitigation measures are proposed.

22.2.1.18 Climate

Carbon Emissions

As the proposed development complies with the NZEB criteria for new developments, no mitigation measures are proposed during the operation phase of the proposed development.

Wind

As outlined in Section 8.4.3, the analysis undertaken identified that the proposed development was determined to not introduce any adverse wind effects.

The Level 28 rooftop amenity space in Block A is generally deemed suitable for short/long term sitting activity, provided a balustrade/wind screening is provided, with a minimum height of 2 metres required.

Daylight and Sunlight

The design development has ensured that there are no significant effects associated with sunlight and daylight. As a result, no mitigation measures are proposed during the operation phase of the proposed development.

22.2.1.19 Noise and Vibration

Mechanical Plant Noise

As part of the detailed design of the development, plant items with appropriate noise ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

The assessment outlined earlier in this Chapter has specified cumulative plant noise limits at the nearest noise sensitive properties that must be achieved in order to ensure the impact is acceptable. To achieve these noise limits consideration will be given, at the detailed design stage, to a variety of mitigation measures and forms of noise control techniques. Some example of these measures are as follows:

- Reduced/quiet modes;
- duct mounted attenuators on the atmosphere side of air moving plant;
- splitter attenuators or acoustic louvres providing free ventilation to internal plant areas;
- solid barriers screening any external plant; and
- anti-vibration mounts on reciprocating plant.

In addition to the above, it is proposed that the following practices are adopted to minimise potential noise disturbance for neighbours.

- All mechanical plant items e.g. motors, pumps etc. shall be regularly maintained to ensure that excessive noise generated any worn or rattling components is minimised; and
- Any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from site do not exceed the noise limits outlined in this document.

Noise associated Customer Use of Retail and Food & Beverage Facilities

Ground floor retail and cafés spaces are proposed within the development. The following 'good practice' measures are advised for the site:

- doors between indoor and outdoor dining/smoking areas should be kept closed in order to minimise the noise transfer from internal sources to the outside;
- a "Respect your Neighbours" campaign should be initiated within all outdoor and smoking areas, including signage indicating that it is a residential area and noise levels should be kept to a minimum;
- brief and train all staff on the requirement to keep noise levels to a minimum and to actively discourage raised voices, rowdy behaviour, singing etc.;
- ensure that patrons do not gather in other outdoor areas of any retail tenant where noise would impact on the resident nearby;
- implement a specific policy to deal with all noise complaints, including but not limited to:
    - assign a single member of staff as the "Noise Liaison";
    - log all complaints;
    - acknowledge all complaints;
    - follow up all complaints promptly

Inward Noise Impact - Acoustic Design Statement Part 2

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.

In this instance the facades highlighted in Figure 22.2 will be provided with glazing and ventilation that achieves the minimum sound insulation performance as set out in Table 22.1 and Table 22.2.

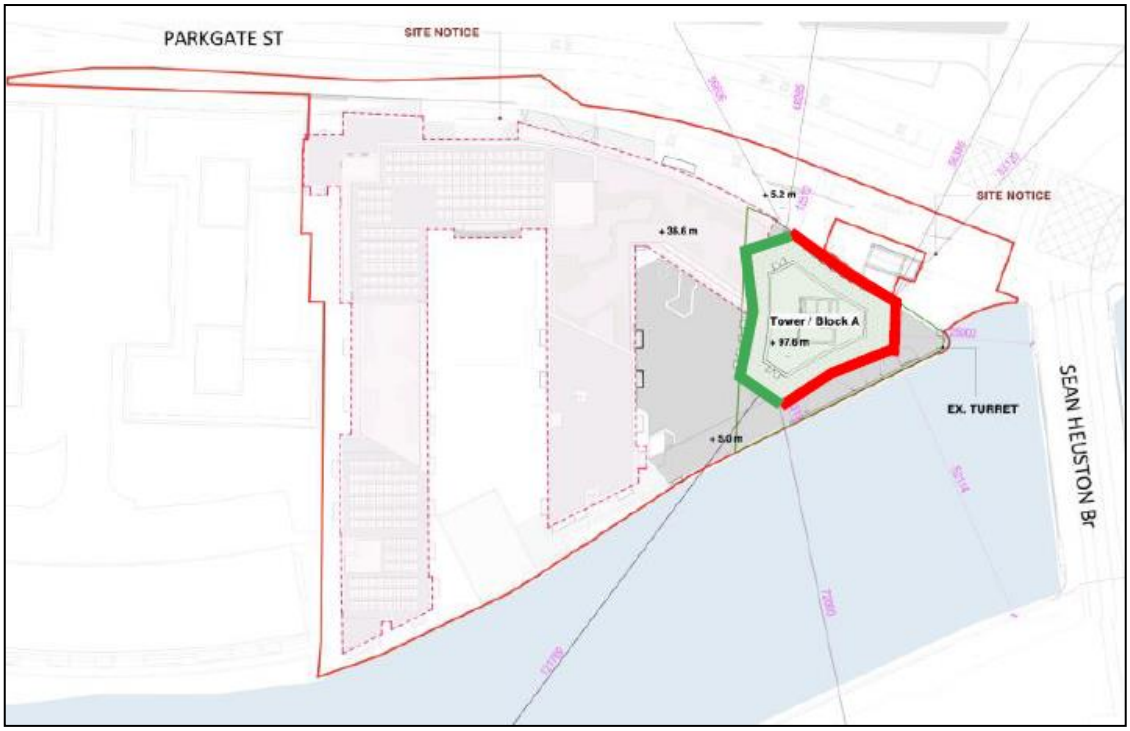

Figure 22.2: Façade Specification

Façade	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1000	2000	4000	
Red	27	24	34	39	42	49	37
Green	17	21	30	38	36	35	33

Table 22.1: Sound Insulation Performance Requirements for Glazing, SRI (dB)

The overall R_w and $D_{ne,w}$ outlined in this section are provided for information purposes only. The over-riding requirement is the Octave Band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Tables 9.12 and 9.13 or greater.

The following performance requirements apply to all ventilation paths from outside the building. This can be achieved by passive acoustic wall or window vents or via mechanical ventilation systems.

Façade	Octave Band Centre Frequency (Hz)						$D_{n,e,w}$
	125	250	500	1000	2000	4000	
Red	35	34	33	38	49	44	39
Green	34	27	37	35	34	34	36

Table 22.2: Sound Insulation Performance Requirements for Ventilation, $D_{n,e,w}$(dB)

Taking into account the height of Block A1, a check of incident noise levels as the building increases with height has been done. At a height of approx. 32m incident noise levels decrease to a level where standard glazing is sufficient to ensure the required internal noise levels. Therefore, glazing to facades of Block A from 8th Floor upwards are designated under the 'green' category described above.

22.2.1.20 Biodiversity

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage.

22.2.1.21 Archaeology and Cultural Heritage

The history of the site is significant for the cultural heritage of the immediate area and of Dublin City in general and this is recognised in the Dublin City Industrial Heritage Record. It is important that the changes to the cultural landscape as a result of the proposed and consented developments do not erase this history. The historic industrial fabric on the site is a tangible and integral part of this history, but one that is not well understood by, or visible to, the public.

The site has not been publicly accessible and its history and importance are little known, both to the local community and to Dubliners in general. As the proposed development will include public open spaces, this offers an opportunity for the proposed development to remedy this and to make a cultural contribution to the area. The provision of information panels, placed in the communal lobby or public square of the development, could assist in the recognition and preservation of the history of the site. These could incorporate both the story of the industrial heritage of the site – providing context for the historic elements that will be retained – as well as the results of any new archaeological findings that may emerge from the archaeological testing and resolution on the site.

22.2.1.22 Architectural Heritage

The subject application proposes the development of site designated as a Strategic Development and Regeneration Area under the *Dublin City Development Plan 2016-2022*, in order to accommodate medium and high density residential development. In these circumstances, during the construction or operational phases scope for mitigation measures is limited. No mitigation measures are proposed.

22.2.1.23 Landscape and 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* in order to accommodate medium and high density residential. In these circumstances, during the construction or operational phases scope for mitigation measures is limited. No mitigation measures are proposed.

22.2.1.24 Water

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage.

22.2.1.25 Lands and Soils

No mitigation has been proposed with respect to effects from operation of the proposed development in relation to soils and geology.

There are no residual issues relating to soils and geology. No specific operational phase mitigation measures relating to soils and geology are required.

22.2.1.26 Hydrogeology

No mitigation measures are considered necessary for the operational phase of the proposed development as no significant effects are predicted.

22.2.1.27 Material Assets - Waste Management

A project specific Operational Waste Management Plan (OWMP) has been prepared and is included as Appendix 17.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the operational development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and abiding by the Dublin City Council waste bye-laws.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from 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, the EMR Waste Management Plan (2015 - 2021) and the DCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

22.2.1.28 Population and Human Health

The external plant items will be designed so that emissions will be within the noise criteria set for day and night-time periods at any noise sensitive locations. Notwithstanding this, noise control techniques will also be employed during operation in order to reduce the level of operational noise generation, and subsequent human health effects (Refer to Chapter 9 Noise and Vibration).

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage.

A project specific Operational Waste Management Plan (OWMP) has been prepared and is included as Appendix 17.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the Eastern and Midlands Region (EMR) Waste Management Plan 2015 – 2021 and abiding by the Dublin City Council waste bye-laws. In addition, a number of waste mitigation measures will be employed (refer to Chapter 17, Material Assets – Waste Management).

22.2.1.29 Material Assets – Utilities and Telecommunications

Due to the measures already incorporated in the design, i.e. SuDS, no mitigation measures will be necessary during the operational phase.

22.2.1.30 Major Accidents and Disasters

No mitigation measures are proposed specific to reducing the risk of major accident/disaster during operation.

22.3 Summary of Monitoring Measures

A range of monitoring measures has been identified to demonstrate that the proposed development conforms to the predictions made as part of this EIAR. This monitoring will take place after consent is granted and provide assurance that aspects of the proposed development are functioning as intended and thus not generating significant effects. Monitoring has been identified to occur after consent is granted in order to provide assurance that aspects of the proposed development are functioning as intended (and thus not generating significant effects) as described in detail in Chapters 6 – 20. Where appropriate, remedial actions have also been identified.

22.3.3 Construction Phase

22.3.1.1 Transport

Since there are no significant effects anticipated, no monitoring has been proposed with respect to effects from construction or operational traffic associated with the proposed development.

22.3.1.2 Air Quality

Dust monitoring will be undertaken at a range of nearest sensitive receptors during the construction phases. The TA Luft dust deposition limit values of 350 mg/m2/day (averaged over one year) will be applied as a 30-day average.

22.3.1.3 Climate

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

22.3.1.4 Noise and 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 criterion.

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

22.3.1.5 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.

22.3.1.6 Archaeology and Cultural Heritage

Archaeological monitoring of site investigation works and archaeological test excavation have already taken place across the overall development site, including the proposed development area for Block A. No evidence was found for any pre-industrial archaeological remains. The ability to locate and identify Viking 'boulder clay or lacustrine' archaeology in deep test trenches in urban stratified sites is extremely limited and the excavation of further test trenches is unlikely to further define the pre-industrial archaeological potential of the site. In addition, the depths of the reclamation levels and the

contaminated soils would present significant logistical and health and safety issues. For these reasons, archaeological monitoring is considered the appropriate mitigation.

Archaeological monitoring will take place of any works requiring ground disturbance / excavation, including site preparation works for the piling regime for Block A and any ground disturbance works associated with the propping / stabilisation of the historic turret and river wall, where these have not already taken place for the consented development (Planning Permission Ref. ABP-306569-20).

Should archaeological material be identified, the remains will be preserved by record through archaeological excavation. It should be noted that the significant ground contamination that exists within the site may restrict the manual excavation of some deposits based on health and safety concerns.

22.3.1.7 Architectural Heritage

No monitoring has been proposed with respect to effects on architectural heritage from of the proposed development. It is noted that Condition 23 of the An Bord Pleanála grant under ABP 306569-20 sets out requirements in relation to how works to historic structures on the wider 42A Parkgate Street site should be carried out and in relation to how historic structures, features and fabric should be protected during any works.

22.3.1.8 Landscape and Visual

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

22.3.1.9 Water

Surface water/Hydrological regime and Water Quality

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.

22.3.1.10 Lands and 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.

22.3.1.11 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.

22.3.1.12 Resources and Waste Management

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

The management of waste during the operational phase should be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste contractor(s).

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the construction phase where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The C&D WMP specifies the need for a waste manager to be 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 identify trends. The data should be maintained to advise on future projects.

22.3.1.13 Population and Human Health

It should be noted that monitoring measures relating to those factors under which population and human health effects might occur have been addressed elsewhere in this EIAR, under the relevant environmental factors. Other than the monitoring measures outlined in Chapters 6-20, no further monitoring measures have been proposed with respect to population and human health. However, those relevant to this assessment are restated in Section 18.5.2.1 and 18.5.2.2 of Chapter 18 – Population and Human Health for completeness.

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.

22.3.1.14 Material Assets – Utilities and Telecommunications

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.

22.3.1.15 Major Accidents and Disasters

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

22.3.4 Operational Phase

22.3.1.16 Transport

Since there are no significant effects anticipated, no monitoring has been proposed with respect to effects from construction or operational traffic associated with the proposed development.

22.3.1.17 Air Quality

As no significant effects are predicted to occur during the operation of the proposed development, no monitoring measures are required.

22.3.1.18 Climate

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

22.3.1.19 Noise and Vibration

Ground floor retail and cafés spaces are proposed within the development. The following 'good practice' measures are advised for the site:

- doors between indoor and outdoor dining/smoking areas should be kept closed in order to minimise the noise transfer from internal sources to the outside;
- a "Respect your Neighbours" campaign should be initiated within all outdoor and smoking areas, including signage indicating that it is a residential area and noise levels should be kept to a minimum;
- brief and train all staff on the requirement to keep noise levels to a minimum and to actively discourage raised voices, rowdy behaviour, singing etc.;
- ensure that patrons do not gather in other outdoor areas of any retail tenant where noise would impact on the resident nearby;
- implement a specific policy to deal with all noise complaints, including but not limited to:
    - assign a single member of staff as the "Noise Liaison";
    - log all complaints;
    - acknowledge all complaints;
    - follow up all complaints promptly

22.3.1.20 Biodiversity

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

22.3.1.21 Archaeology and Cultural Heritage

There will be no requirement for monitoring post-construction.

22.3.1.22 Architectural Heritage

No monitoring has been proposed with respect to effects on architectural heritage during the operational stage of the proposed development.

22.3.1.23 Landscape and Visual

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

22.3.1.24 Water

There are no monitoring activities required during the operation phase of the proposed development.

22.3.1.25 Lands and Soils

No monitoring is specified as no impacts were identified for the operational phase of the works.

22.3.1.26 Hydrogeology

No monitoring is proposed during operation of the proposed development.

22.3.1.27 Material Assets - Waste Management

During the operational phase, waste generation volumes should be monitored against the predicted additional waste volumes outlined in Table 17.2 of Chapter 17 – Material Assets -Waste Management. There may be opportunities to reduce the number of bins, waste collections and equipment required in the WSAs where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

22.3.1.28 Population and Human Health

The management of waste during the operational phase will be monitored by the site manager to ensure effective implementation of the OWMP by the building management company and the nominated waste contractor(s).

Waste generation volumes will be monitored against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the Waste Storage Areas (WSAs) where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

22.3.1.29 Material Assets – Utilities and Telecommunications

As no significant, negative operational effects of the proposed development on material assets are identified, no operational monitoring measures have been proposed.

22.3.1.30 Major Accidents and Disasters

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

22.4 Residual Significant Effects

This EIAR has been prepared by competent experts in accordance with Article 1(2)(g) of the EIA Directive to identify the likely significant effects associated with the proposed development in accordance with the relevant legislation and guidance. A range of likely significant effects have been avoided or reduced through the implementation of mitigation measures and monitoring, therefore leading to the residual effects as outlined below.

22.3.5 Construction Phase

22.4.1.1 Transport

Since no significant traffic effect is predicted to arise from either the construction or operational stages, there are no residual effects anticipated. Cumulative effects have also been considered.

22.4.1.2 Air Quality

With the implementation of the mitigation measures outlined in Section 7.5 of Chapter 7 – Air Quality, no significant residual negative effects on air quality are envisaged during the construction or operation of the proposed development.

22.4.1.3 Climate

No significant residual impacts are predicted on climate during the construction or operational phase of the proposed development.

22.4.1.4 Noise and Vibration

Noise

During the construction phase of the development there is the potential for significant impacts on nearby noise sensitive properties due to noise emissions from certain site activities, in the absence of mitigation. The application of binding noise limits, hours of operation, along with the implementation of appropriate noise control measures, will ensure that noise impact at NSLs at distances up to 40m from construction works will have a ***negative***, ***slight to moderate*** and ***short-term*** impact on the surrounding environment.

At distances of 80m and greater from the works, the predicted construction noise levels are below the construction noise criteria and therefore the expected residual impact will be ***negative, slight*** and ***short-term.***

Considering the busy, urban location of the site and the low number of construction vehicles coming to and from the development during the various construction phases, in comparison to the existing traffic, it is expected that construction traffic associated with the development will be ***negative***, ***not significant*** and ***short-term***.

Vibration

Due to the distances between sensitive locations and anticipated major works and considering the low vibration levels predicted in the vicinity of piling rigs, etc., it is expected that the vibration impact will be ***negative***, ***not significant*** and ***short-term***. In order to minimise any vibration, good practice measures have been presented in Section 9.6 of Chapter 9 – Noise and Vibration.

22.4.1.5 Biodiversity

Given the employment of mitigation measures for the proposed control of surface water emission, there is no potential for residual effects for biodiversity, arising from the proposed development, during construction.

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage. Give the employment of these measures for the proposed control of surface water emission, there is no potential for residual effects from the proposed development during operation.

22.4.1.6 Archaeology and Cultural Heritage

No residual effects during construction phase were identified during the course of the assessment on archaeological or cultural heritage. Should any archaeological remains be uncovered, they will be fully resolved prior to the main construction stage (as detailed in Section 11.5.1 of Chapter 11 – Archaeology and Cultural Heritage).

22.4.1.7 Architectural Heritage

As no mitigation measures in addition to those provided for by Condition 23 of the An Bord Pleanála grant under ABP 306569-20 are now proposed, the residual effects of the proposed development on architectural heritage will be as described under Sections 12.5 and 12.6 of Chapter 12 – Architectural Heritage Impact Assessment. Cumulative effects have also been considered.

22.4.1.8 Landscape and Visual Impact Assessment

As no mitigation measures are now proposed, the residual visual effects of the proposed development on the built environment will be as described under Section 13.5 of Chapter 13 – Landscape and Visual Impact Assessment. Cumulative effects have also been considered.

22.4.1.9 Water

Surface water/Hydrological regime and Water Quality

With the implementation of mitigation measures described in Section 14.5.1 of Chapter 14 - Water there will be no significant residual effect on hydrology, drainage characteristics of the site or water quality during construction.

Wastewater

There are no significant residual effects expected in relation to wastewater arising from the construction phase of the proposed development.

Water Supply

There are no significant residual effects expected in relation to water supply arising from the construction phase of the proposed development.

Flood Risk

There will be no significant residual effect on flood risk caused by the construction of the proposed development.

22.4.1.10 Land and Soils

Before the implementation of any mitigation measures, all but one effect was noted to have an imperceptible effect. The only feature which was identified to have a moderate to slight effect related to the excavation and management of contaminated soils on the site.

With the implementation of the proposed mitigation measures outlined in Section 15.5.1 of Chapter 15 – Land and Soils and monitoring during construction, the effect of the proposed development on land and soils is considered to be of negligible magnitude and imperceptible significance during construction and operation. Table 15.7 of Chapter 15 – Land and Soils summarises the residual effects.

No residual effects of significance on land and soils were identified.

22.4.1.11 Hydrogeology

Table 16.5 of Chapter 15 - Hydrogeology summarises the residual effects.

No residual effects of significance on hydrogeology during construction were identified.

22.4.1.12 Material Assets - Waste Management

The implementation of the mitigation measures outlined in Section 17.6 of Chapter 17 – Material Assets – Waste Management will ensure that the high rate of reuse, recovery and recycling is achieved at the development during the construction phase as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

A carefully planned approach to waste management as set out in Section 17.6 of Chapter 17 – Material Assets – Waste Management and adherence to the C&D WMP during the construction phase will ensure that the effect on the environment will be **short-term, imperceptible** and **neutral.**

22.4.1.13 Population and Human Health

The proposed development is likely to give rise to a permanent, positive effect on the population, through the provision of residential, commercial and amenity opportunities in a prime city centre location.

Following the implementation of the mitigation measures outlined in Section 18.5.1 of Chapter 18 – Population and Human Health, and elsewhere in this EIAR, no significant negative effects on human health are identified in respect of the proposed development.

22.4.1.14 Material Assets – Utilities and Telecommunications

Following implementation of mitigation measures outlined in Section 19.5.1 of Chapter 19 – Material Assets – Utilities and Telecommunications, the residual impact on utility services is considered to be imperceptible.

22.4.1.15 Major Accidents and Disasters

The risk of a major accident and/or disaster during the construction phase of the proposed development is considered low.

22.3.6 Operational Phase

22.4.1.16 Traffic and Transport

Since no significant traffic effect is predicted to arise from either the construction or operational stages, there are no residual effects anticipated.

22.4.1.17 Air Quality

With the implementation of the mitigation measures outlined in Section 7.5 of Chapter 7 – Air Quality, no significant residual negative effects on air quality are envisaged during the construction or operation of the proposed development.

22.4.1.18 Climate

No significant residual impacts are predicted on climate during the construction or operational phase of the proposed development.

22.4.1.19 Noise and Vibration

Noise

Noise levels associated with mechanical plant will be designed to be within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be a ***neutral, imperceptible, long term*** impact.

Vibration

There is no source of vibration associated with the operational phase of the proposed development.

22.4.1.20 Biodiversity

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage.

Given the employment of these measures for the proposed control of surface water emission, there is no potential for residual effects from the proposed development during operation.

22.4.1.21 Archaeology and Cultural Heritage

No residual effects were identified during operation phase.

22.4.1.22 Architectural Heritage Impact Assessment

As no mitigation measures are now proposed, the residual effects of the proposed development on architectural heritage will be as described under Sections 12.5 and 12.6 of Chapter 12 – Architectural Heritage Impact Assessment.

22.4.1.23 Landscape and Visual Impact Assessment

As no mitigation measures are now proposed, the residual visual effects of the proposed development on the built environment will be as described under Section 13.5 of Chapter 13 – Landscape and Visual Impact Assessment.

22.4.1.24 Water

Surface water/Hydrological regime and Water Quality

As the proposed development is predicted to have an overall neutral long-term impact on water and hydrology within the study area there no mitigation measures required and as such there will be no significant residual effect on hydrology, drainage characteristics of the site or water quality during operation.

Wastewater

There is no significant impact expected to the public sewer as a result of the proposed development. Any increase in discharge will be compensated by a reduction in the expected surface water runoff into the combined sewers from the proposed development.

Water Supply

The development will result in additional demands on the public water network however the instillation of low flow devices will minimise the impact of the proposed development on the existing water supply network.

Flood Risk

There will be no significant residual effect on flood risk caused by the operation of the proposed development.

22.4.1.25 Land and Soils

No residual effects were identified during operational phase.

22.4.1.26 Hydrogeology

No residual effects during operations are expected during operational phase.

22.4.1.27 Resources and Waste Management

During the operational phase, a structured approach to waste management as set out in Section 17.6 of Chapter 17 – Material Assets – Waste Management will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long-term, imperceptible and neutral.

22.4.1.28 Population and Human Health

The proposed development is likely to give rise to a permanent, positive effect on the population, through the provision of residential, commercial and amenity opportunities in a prime city centre location.

Following the implementation of the mitigation measures outlined in Section 18.5.1 of Chapter 18 – Population and Human Health, and elsewhere in this EIAR, no significant negative residual effects on human health are identified in respect of the proposed development.

22.4.1.29 Material Assets – Utilities and Telecommunications

Following implementation of mitigation measures outlined in Section 19.5.1 of Chapter 19 – Material Assets – Utilities and Telecommunications, the residual impact on utility services is considered to be imperceptible.

22.4.1.30 Major Accidents and Disasters

The risk of a major accident and/or disaster occurring during the operational phase of the proposed development is considered medium.