

20 Summary of Mitigation Measures

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20.1 Introduction

This chapter was prepared Brock McClure Planning Consultants. This chapter provides a summary of mitigation measures proposed in Chapters 5 to 18. The appointed contractor will be required to adhere to the mitigation contained in the EIAR for the protection of the environment and to ensure sustainable development.

20.2 Mitigation Strategies

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes.

Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

20.3 Population and Human Health

Construction Stage

A bespoke and detailed Construction Management Plan (CMP) has been prepared by DBFL Engineering Consultants. The main purpose of a CMP is to provide a mechanism for implementation of the various mitigation measures which are described in chapter 20 of the EIAR. The purpose of this

report is to summarise the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the CMP on site.

All personnel will be required to understand and implement the requirements of the CMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.

Project supervisors for the construction phase will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013, and a Preliminary Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phases.

Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety

Operational Stage

The proposed development has been designed to avoid negative impacts on population and human health through:

1. The inclusion of a childcare facility within the proposed development;
2. Landscaping to mitigate against issues arising from microclimate conditions;
3. The inclusion of a comprehensive foul and surface water management system;
4. Energy efficient measures; and,
5. High quality finishes and materials.

Monitoring

Measures to avoid negative impacts on Population and Human Health are largely integrated in to the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.

1. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.
2. Monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process.

20.4 Biodiversity

Construction Stage

1. Disturbance of birds' nests and bats (if present)

Deliberate disturbance of a bird's nest is prohibited unless under licence from the National Parks and Wildlife Service (NPWS). If possible, site clearance works should proceed outside the nesting season, i.e. from September to February inclusive. If this is not possible, vegetation must first be inspected by a suitably qualified ecologist. If a nest is encountered then works must stop, until such time as nesting has ceased. Otherwise, a derogation licence must be sought from the NPWS to allow the destruction of the nest.

2. Japanese Knotweed/Three-cornered Garlic/Spanish Bluebell

The stand of Japanese Knotweed has already been cordoned off, labelled and all site workers have been informed of its presence. It has received a first treatment with herbicide by Invasive Plant Solutions (www.knotweed.ie). A management plan has been prepared in order to eradicate the plant and to ensure that site works do not result in its spread. This plan includes measures to control Three-cornered Garlic and Spanish Bluebell. Preliminary herbicide treatment took place during the growing season in 2019. The following measures are taken from the invasive species management plan:

Isolate infested areas and implement bio-security measures

- Carry out a test trenching programme to establish the extent of infested soils.
- Excavate knotweed-contaminated soils from the footprint of proposed works, as part of a bio-secure management programme, to ensure the safe, off-site, disposal of all Japanese Knotweed infested soil and I.A.P.S. plant material to a licenced land fill facility or to an overseas processing facility.
- Use a proprietary vertical root-barrier membrane system along vulnerable site boundaries, to protect the property from the potential re-introduction of viable Japanese Knotweed and other I.A.P.S. plant growth from adjoining properties.
- Develop a construction stage monitoring programme for inadvertent plant regrowth or spread, and future control using herbicide treatment or further physical remediation.

Full details are contained within the Construction Stage Invasive Species Management Plan prepared by Invasive Plant Solutions and which is included as part of the EIAR under separate cover.

Operational Stage

3. Japanese Knotweed

Japanese Knotweed can regenerate from small fragments and continued vigilance will be required for signs of regrowth. The following measure is taken from the invasive species management plan:

Implement a monitoring programme as an integral and mandatory part of the post development property management plan, to run for a period of at least 5 years following the completion of the development.

Monitoring

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

Construction Stage

Monitoring will be required during the construction phase to ensure that measures in the invasive species plan are fully implemented.

Operational Stage

Monitoring for Japanese Knotweed will be required to ensure it does not re-emerge. A schedule of monitoring has been included in the Japanese Knotweed management plan.

20.5 Land and Soils

Construction Stage

1. Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

Topsoil stockpiles will also be located so as not to necessitate double handling.

Surface water runoff from areas stripped of topsoil will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

On-site settlement ponds are to include geotextile liners and ripped inlets and outlets to prevent scour and erosion.

2. Excavation of Subsoil Layers

Excavation of existing subsoil layers has been minimised as the proposed basement level, ground floor levels and external pavement levels have been designed to follow the natural topography of the site.

Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

As noted in Section 7.3.1, Section 7.4 and Section 7.5.1.2 an area of the site adjacent to the neighbouring filling station (adjacent to the western boundary) has been impacted by hydrocarbons. It is proposed to remove subsoil impacted by hydrocarbons which are affected by the proposed development (refer to Table 7.3).

The Contractor is to provide a Method Statement (to be agreed prior to commencing any works on site) for works in the vicinity of areas impacted by hydrocarbons including but not limited to details of their proposed specialist sub-contractors, proposals for containment of contamination, proposal for removal of hydrocarbons from dewatered groundwater prior to discharge, co-ordination of contamination removal with other site works, proposed licenced waste receiving facility and compliance with relevant legislation including HSA publications and the Waste Management Act.

3. Imported Fill

As noted in section 7.5.1.3 above, importation of fill to site will be required.

No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

4. Construction Traffic

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

5. Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

When not possible to carry out such activities off site, refuelling and servicing of construction machinery will take place in a designated hardstand area which is remote from any surface water inlets.

6. Geological Environment

As noted in Section 7.9.1.2, the Contractor is to provide a Method Statement (to be agreed prior to commencing any works on site) for works in the vicinity of areas impacted by hydrocarbons including proposals for containment of contamination and removal of hydrocarbons from dewatered groundwater prior to discharge.

7. Risks to Human Health

- Contractor to prepare Method Statement, method statement to be agreed with PSDP.
- Contractor/PSCS to implement safe systems of construction including but not limited to
- battering the sides of trench excavations and installation of excavation shoring systems.
- Full precautions to be taken when working in vicinity of boundary structures for protection
- of same. Method and sequence of construction to be agreed with design team prior to commencement of work. Contractor's Temporary Works Designer to prepare Method Statement and Temporary Works Cert to ensure stability of excavations and adjacent structures.
- As noted in Section 7.9.1.2, The Contractor is to provide a Method Statement (to be agreed prior to commencing any works on site) for works in the vicinity of areas impacted by hydrocarbons including but not limited to details of their proposed specialist sub-contractors, proposals for containment of contamination, proposal for removal of hydrocarbons from dewatered groundwater prior to discharge, co-ordination of contamination removal with other site works, proposed licenced waste receiving facility and compliance with relevant legislation including HSA publications and the Waste Management Act.
- Contractor to obtain utility company network plans and arrange observation as required.
- Contractor to locate and record all services on site prior to commencement of excavations.
- Contractor to prepare and implement a Construction Traffic Management Plan that will be
- agreed with the Design Team and local authority and which will ensure the safety of the
- public during construction.
- Contractor must supervise vehicle movements to and from the site during construction in
- order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
- Public pedestrian routes to be established at site entrance as required.
- All personnel using machinery/plant to have undergone training on the use of said
- machinery/plant. Ongoing site supervision to be undertaken to ensure all use of
- machinery/plant is in accordance with the training undertaken.
- Contractor's employees to be provided with all required PPE in accordance with Safety,
- Health and Welfare at Work Act, 2005.

Operational Stage

On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment.

Monitoring

Construction Stage

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

Adherence to Outline Construction Management Plan Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.). Inspection of fuel / oil storage areas.

Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision vehicle wheel wash facilities. Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination) Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.

A dust management/monitoring programme should be implemented during the construction phase of the development. The quantities of material removed from site and their destination to be recorded (inert, contaminated non-hazardous and hazardous). Source of imported aggregates to be approved by the engineer prior to delivery to site

Operational Stage

No ongoing monitoring is proposed on completion of the construction phase.

20.6 Water

Construction Stage

The following measures are proposed during the construction phase to mitigate against risks to the surrounding hydrological environment.

1. A site-specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan.
2. Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
3. Weather conditions and typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimizing soil erosion.
4. In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals should be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
5. Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).
6. Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
7. The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

8. The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
9. The following measures are proposed during the construction phase to mitigate against risks to human health.
10. Contractor to prepare Method Statement, method statement to be agreed with PSDP.
11. Contractor/PSCS to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of excavation shoring systems.
12. Full precautions to be taken when working in vicinity of boundary structures for protection of same. Method and sequence of construction to be agreed with design team prior to commencement of work. Contractor's Temporary Works Designer to prepare Method Statement and Temporary Works Cert to ensure stability of excavations and adjacent structures.
13. As noted in Chapter 7 Land and Soils (Section 7.9.1.2), the Contractor is to provide a Method Statement (to be agreed prior to commencing any works on site) for works in the vicinity of areas impacted by hydrocarbons including but not limited to details of their proposed specialist sub-contractors, proposals for containment of contamination, proposal for removal of hydrocarbons from dewatered groundwater prior to discharge, co-ordination of contamination removal with other site works, proposed licenced waste receiving facility and compliance with relevant legislation including HSA publications and the Waste Management Act.
14. Contractor to obtain utility company network plans and arrange observation as required.
15. Contractor to locate and record all services on site prior to commencement of excavations.
16. Contractor to prepare and implement a Construction Traffic Management Plan that will be agreed with the Design Team and local authority and which will ensure the safety of the public during construction.
17. Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
18. Public pedestrian routes to be established at site entrance as required.
19. All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.
20. Contractor's employees to be provided with all required PPE in accordance with Safety, Health and Welfare at Work Act, 2005.

Operational Stage

Following the Site Specific Flood Risk Assessment, it has been determined that the proposed development is located in Flood Zone C as defined by the Guidelines i.e. proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GSDSDS). Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with below ground attenuation storage.

The following methodologies are being implemented as part of a SuDS surface water treatment train approach:

1. Surface water runoff from the site's street network are directed to tree pits via conventional road gullies (with high level overflow to the piped surface water network) while surface water runoff from on street parking areas will be captured by permeable paving.
2. Surface water runoff from the roofs of houses along the eastern boundary will be routed to the proposed surface water pipe network via bio-swale filter drains (infiltration trenches) located in their rear gardens (providing an additional element of attenuation and treatment).

3. Surface water runoff from apartment roofs will be captured by green roofs (sedum blanket) prior to being routed to the piped surface water drainage network. While a drainage reservoir (drainage board) is to be provided on the podium slab over basement.
4. Attenuation of the 30 and 100 year return period storms
5. Installation of a Hydrobrake (limiting surface water discharge from the site to 4.2 l/sec/ha)
6. Surface water discharge will also pass via a fuel / oil separator (sized in accordance with permitted discharge from the site)

A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, Hydrobrake and full retention fuel / oil separator noted above.

No specific mitigation measures are proposed in relation to foul drainage however, all new foul drainage lines will be pressure tested and be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

No specific mitigation measures are proposed in relation to water supply, however, water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.

The potential impact of climate change has been allowed for as follows;

- Pluvial flood risk - attenuation storage design allows for a 10% increase in rainfall intensities.
- Pluvial flood risk - drainage system design allows for a 10% increase in flows, as recommended by the GSDSDS.
- Provision of min. freeboard (500mm) from 1% AEP as required by GSDSDS (mitigation against impact of climate change).

Monitoring

Construction Stage

1. Proposed monitoring during the construction phase in relation to the water and hydrogeological environment are as follows:
2. Adherence to Outline Construction Management Plan
3. Inspection of fuel / oil storage areas.
4. Monitoring cleanliness of adjacent road network, implementation of dust suppression and vehicle wheel wash facilities.
5. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)
6. Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content)

Operational Stage

During the operational phase an inspection and maintenance contract is to be implemented in relation to the proposed Class 1 full retention fuel / oil separators.

20.7 Noise & Vibration

Construction Phase

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 Control on Construction and Open Sites Parts 1 and 2. Predictions indicate that significant construction noise impacts are expected to occur when work is ongoing at boundary locations adjacent to noise sensitive locations, hence the contractor will ensure that all best practice noise and vibration control

methods will be used. In this regard, various mitigation measures can be considered and applied during the construction of the proposed development, such as:

1. limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
2. establishing channels of communication between the contractor/developer, Local Authority and residents;
3. appointing a site representative responsible for matters relating to noise and vibration;
4. monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
5. all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These may include:

1. selection of plant with low inherent potential for generation of noise and/ or vibration;
2. erection of barriers as necessary around noisy processes and items such as generators heavy mechanical plant or high duty compressors;
3. placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

Operational Phase

1. Inward Noise Impact

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 9.7 will be provided with glazing and ventilation that achieves the minimum sound insulation performance as set out in Table 9.12 and Table 9.13. Other facades in the development have no minimum requirement for sound insulation.

Façade	Octave Band Centre Frequency (Hz)						R _w
	125	250	500	1k	2k	4k	
RED	30	30	39	44	48	51	42
ORANGE	30	29	32	41	46	49	39
GREEN	27	26	33	39	39	47	37

Table 9.12: Sound Insulation Performance Requirements for Glazing, SRI (dB)

Façade	Octave Band Centre Frequency (Hz)						D _{ne, w}
	125	250	500	1k	2k	4k	
RED	31	33	42	43	39	44	42
ORANGE	35	34	33	38	49	49	39
GREEN	33	34	33	42	29	32	34

Table 9.13: Sound Insulation Performance Requirements for Ventilation, SRI (dB)

The overall R_w and $D_{ne,w}$ outlined above 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.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Monitoring

Construction Phase

The contractor will be required to ensure construction activities operate within the noise limits set out within this assessment. The contractor will be required to undertake regular noise monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

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

Operational Phase

Noise or vibration monitoring is not required once the development is operational.

20.8 Air Quality and Climate

Construction Phase

Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 10.3.

1. The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues;
2. The development of a documented system for managing site practices with regard to dust control;
3. The development of a means by which the performance of the dust management plan can be monitored and assessed;
4. The specification of effective measures to deal with any complaints received.

At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Climate

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, based on the short-term nature and relatively small scale of the works, the impact on climate will be imperceptible.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are minimised. In particular;

1. the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
2. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

Operational Phase

No additional mitigation measures are required during the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.

Monitoring

Construction Phase

Monitoring of construction dust deposition at nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure the mitigation measures are providing adequate dust minimisation. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The applicable limit value is the TA Luft limit value of 350 mg/(m²*day) for a monitoring period of between 28 - 32 days.

Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

20.9 Wind and Microclimate

Construction Phase

1. During the construction phase, it will be recommended to have the site surrounded by large panels up to 3m high. This will prevent any dust being blown from the site on to the neighbouring locations. This could be of concern especially on the N11 if not contained.

Operational Phase

1. Additional mitigation features are unlikely to be required in the operational phase of the development.

Monitoring

Construction Phase

Monitoring measures are not recommended as long as the wind panels are implemented around the periphery of the development boundary.

Operational Phase

Monitoring measures are not recommended for the operational phase of the development.

20.10 Landscape and Visual Impact Assessment

Construction Phase

The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase. The provision of site hoarding along the property boundaries will substantially address many potential effects of construction operations during the delivery stage. Construction cranes and of course, the emerging buildings will become visible from neighbouring properties and also from a number of more distant vantage points as the development proceeds. The cranes and site facilities are generally viewed as a temporary and unavoidable feature of construction, particularly in urban settings. Mitigation measures proposed during the construction stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. The Preliminary Construction Management Plan for the project (prepared by DBFL) included with this submission, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This is a working document which is refined and added to as the project proceeds.

Operational Phase

The designed scheme seeks to harmonise and integrate the development within the existing landscape and the broader urban environment whilst adhering to national planning policy which seeks the densification and the provision of increased height on appropriate urban sites. The design rationale and detail employed, seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass (eg. the taller built elements are located along the Stillorgan Road which is itself of larger scale and the proposed buildings closer to existing residential properties are lower in height);
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings, balconies and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines;
- Use of appropriate materials;
- The provision of significant additional communal and public space with pedestrian and cycle linkage with the Stillorgan Road and Cornelscourt village;
- The inclusion of a considered relationship between the buildings and the adjacent newly created communal space which includes semi-private buffering where appropriate between external and internal living areas at ‘ground’ level;
- The provision of communal/public uses within the development, in order to facilitate public access and permeability and to assist in activating public spaces.

Monitoring

The success of the proposed development is dependent on the proposals being properly executed as approved. Detailed agreement on finishes and materials to be employed needs to be ensured through the provision of, and on-going adherence to, reference samples provided on site for the duration of the construction works and defects period. The proposed soft landscape works will need to be maintained and managed especially over the initial period after planting, in order to ensure their successful establishment and the intended integration of the development into its existing context.

20.11 Material Assets - Traffic and Transport

Construction Stage

The Construction Management Plan will be prepared as part of the planning application with an associated Construction Traffic Management Plan (CTMP) which will incorporate a range of integrated control measures and associated management activities with the objective of minimising the construction activities associated with the development. The following initiatives will be implemented to avoid, minimise and/or mitigate against the anticipated construction period impacts:

1. During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads;
2. Appropriate on-site parking and compound area will be provided to prevent overflow onto the local network;
3. It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential;
4. Delivery vehicles to and from the site will be spread across the course of the working day, therefore, the number of HGVs travelling during the peak hours will be relatively low;
5. Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by Dún Laoghaire – Rathdown County Council will be adhered to;
6. Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed and implemented in accordance with the Department of Transport's Traffic Signs Manual "*Chapter 8 Temporary Traffic Measures and Signs for Roadworks*" and "*Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition*" (2010); and
7. Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway.
8. Material storage zone will be established in the compound area and will include material recycling areas and facilities;
9. 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
10. Dedicated construction haul routes will be identified and agreed with Dún Laoghaire – Rathdown County Council prior to commencement of activities on-site; and
11. On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

Operational Stage

1. A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed residential development at the subject site could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The identified measures and associated timescale for their implementation are summarised below.
2. *Management* – A Mobility Management (MMP) will be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor to be implemented upon occupation of the site. The MMP will ultimately seek to encourage sustainable travel practices for all journeys to and from the proposed development. The active management of this BTR development will ensure an increased provision of sustainable transport alternatives for the development’s residents. This is aided by the low car parking provision and the generous cycle parking provision at the proposed development.
3. *Car Parking Management Strategy* - A management regime will be implemented by the development’s management company to control access to the 278 no. on-site car parking spaces thereby actively managing the availability of on-site car parking for residents. This provision equates to a car parking ratio of approximately 0.6 car parking spaces per residential unit. The signing of a rental agreement for one of the proposed residential apartments will NOT include access to a designated on-site parking space. All potential residents (prior to signing rental agreement) will be notified that the proposed scheme is a ‘low car allocation’ development with no access (or guarantee thereof) to either (i) the limited on-site residents car parking provision or (ii) apply to Dún Laoghaire County Council for a residents parking permit (to park on-street in one of the neighbouring streets). Nevertheless, all residents of the proposed residential scheme will have the opportunity to apply to the on-site management company for both a (i) residents car parking permit (updated weekly, fortnightly, monthly, quarterly or annually) and subsequently access to a dedicated (assigned) on-site basement car parking space or (ii) a visitor’s car parking permit for a short period of time. A charge will be applied to obtain a permit with the objective of covering the associated management costs and discouraging long term usage of the car parking space.
4. *Infrastructure* – Infrastructure measures identified to reduce reliance of private vehicles include the provision of ample secure cycle parking on site and ensuring a design which promotes permeability for pedestrians and cyclists to, through and from the development. The level of parking provision for the development will also act as a powerful mobility management measure, ensuring against an overprovision of parking and a resultant over reliance on the private vehicle.
5. *Car Sharing* – The provision of 11 no. dedicated car share (GoCar) spaces in the basement parking facility for the sole use of the scheme’s residents. The availability of these on-site provide a viable alternative to residents owning private vehicles whilst still having access to a car when required.

Monitoring

Construction Stage

During the construction stage, the following monitoring exercises are proposed:

1. Compliance with construction vehicle routing practices;
2. Compliance with construction vehicle parking practices;
3. Internal and external road conditions; and
4. Timing of construction activities.

Operational Stage

As part of the MMP process, bi-annual post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

20.12 Material Assets – Utilities

Construction Phase

1. Contractor to prepare Method Statement, method statement to be agreed with PSDP.
2. Contractor to locate and record all services on site prior to commencement of excavations.
3. A GPR utility survey (and slit trench investigation as required) will be carried out along the Old Bray Road in advance of commencing road works to confirm the location of the power, gas and telecommunication infrastructure.
4. Connections to the existing power, gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
5. Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.
6. Contractor to obtain utility company network plans and arrange observation as required.
7. Contractor/PSCS to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of trench shoring systems.
8. Contractor to prepare and implement a Construction Traffic Management Plan that will be agreed with the Design Team and local authority and which will ensure the safety of the public during construction.
9. Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
10. Public pedestrian routes to be established at site entrance as required.
11. Contractor to prepare Method Statement for works in confined spaces, method statement to be agreed with PSDP. Contractor to comply with HAS Code of Practice for Working in Confined Spaces.
12. All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.

Operational Phase

1. On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure.

Monitoring

Construction Phase

No specific monitoring is proposed in relation to electrical, gas and telecommunications infrastructure.

Operational Phase

No specific monitoring is proposed in relation to electrical, gas and telecommunications infrastructure.

20.13 Material Assets - Waste Management

The Construction and Operational Waste Management Plans have been designed to ensure that the construction and operational phases of the proposed development will be managed to reduce the generation of unsegregated wastes, to maximise the potential for recycling, recovery and re-use and to demonstrate how the development will operate in a sustainable manner in terms of waste management and contribute to the achievement of the Regions compliance with the waste reduction targets specified in *The Eastern-Midlands Region Waste Management Plan 2015-2021* (and any subsequent future revisions).

The general principles and key aspects of the Construction and Operational Waste Management Plans are detailed as follows:

1. Construction Waste and By-Product Management Plan

The Construction Waste and By-Product Management Plan prepared by Byrne Environmental (included with the SHD application) specifically addresses the following points:

Waste materials generated by construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication - *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*.

- Analysis of waste arisings / material surpluses
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase.
- Methods proposed for Prevention, Reuse and Recycling
- Waste Handling Procedures
- Waste Storage Procedures
- Waste Disposal Procedures
- Record Keeping
- Waste Auditing

Waste minimisation and prevention shall be the primary responsibilities of the Construction Project Manager who shall ensure the following:

Materials will be ordered on an "as needed" basis to prevent over supply

Materials shall be correctly stored and handled to minimise the generation of damaged materials

Materials shall be ordered in appropriate sequence to minimise materials stored on site

Sub contractors will be responsible for similarly managing their wastes

2. Programme of Waste Management for Construction Works

The Construction Project Manager as part of regular site inspection audits shall determine the effectiveness of the waste management plan and will assist the project manager in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

3. Construction Waste Disposal Management

From the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site Construction Project Manager to ensure all staff are informed by means of

clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Construction Project Manager to ensure that a written record of all quantities and natures of wastes exported off-site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Construction Project Manager or his/her delegate that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)

Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)

Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.

Prior to the commencement of the Construction Project Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Construction Project Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the EPA's *Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* document dated 1st June 2015 to ensure that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

4. On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

Reduction in the requirement for virgin aggregate materials from quarries

Reduction in energy required to extract, process and transport virgin aggregates

Reduced HGV movements associated with the delivery of imported aggregates to the site

Reduced noise levels associated with reduced HGV movements

Reduction in the amount of landfill space required to accept C&D waste

Reduction in the volume of soils to be exported off-site

5. Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips

Waste oils / containers shall be placed in dedicated mobile bunds units.

Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers.

Spill kits with instructions shall be located in the waste storage compound.

6. Soils

The subject development site is currently greenfield and undeveloped with no evidence of historic dumping. A soil sampling and analysis survey was conducted in March 2019 by Ground Investigations Ireland and identified an area to the southwest of the site that contains hydrocarbon contaminated soils. This area shall be excavated and soils shall be exported off-site as a hazardous waste to a suitably licenced waste acceptance facility. All other soils at the site were classified as non-hazardous.

Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site.

Excess soils shall be exported to an appropriately waste permitted/licenced facility.

The construction project manager shall inform Dun Laoghaire Rathdown County Council of the volume of excess soils generated and the permitted / licenced waste facility they shall be exported to.

Excess soils shall be removed off-site throughout the duration of the construction phase. Prior to being removed off-site the excess soils shall be characterised as being inert, non-hazardous or hazardous in accordance with *Landfill Directive (2003/33/EC)*. The classification of the soils shall be established by WAC testing which shall occur throughout the construction phase.

Excavated excess soils that are required to be exported off-site shall be tested to determine their classification as hazardous or non-hazardous in accordance with *EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Non-Hazardous soils may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011*. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that that a declaration of a material as a by-product is notified to the EPA.

7. Contaminated Soils

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the *2002 Landfill Directive (2003/33/EC)* for contamination, and pending the results of laboratory WAC testing, will be excavated.

8. Record Keeping

It is the responsibility of the Construction Project Manager or his/her delegate that a written record of all quantities and natures of all wastes reused / recycled and exported off-site and Article 27 declarations during the project are maintained in a Waste File at the Project office.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description
- Volume of waste collected
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number
- Destination of waste load including Waste Permit / Licence number of facility
- Description of how waste at facility shall be treated : disposal / recovery / export
- Article 27 declarations
- The waste records shall be issued to DLR County Council as required / requested.

9. Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis by an independent waste management consultant to determine compliance with the Construction Waste and By-Product Management Plan.

10. Operational Phase Waste Management Plan

An Operational Phase Waste Management Plan (OWMP) has been prepared as a stand-alone report to accompany this planning application. The OWMP has been prepared to demonstrate how the required infrastructure shall be incorporated into the design and operational management of the development to ensure that domestic wastes will be managed and monitored with the objective of maximizing the quantity of waste segregated at source and maximizing the volume of clean recyclable materials generated by the residents of the development.

The Goal of the OWMP is to achieve a compliance with *The Eastern-Midlands Region Waste Management Plan*

2015-2021 which defines the following Waste Targets:

1% reduction per annum in the quantity of household waste generated per capita over the period of the plan.

Achieve a recycling rate of 50% of managed municipal waste by 2020.

Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill.

The Operational Waste Management Plan has been prepared with regard to the strategy, policy and objectives of the *Dun Laoghaire Rathdown County Development Plan 2016 – 2022*.

Key Aspects of the OWMP to achieve Waste Targets:

- All residential units shall be provided with information on the segregation of waste at source and how to reduce the generation of waste by the Facilities Management Company.
- All waste handling and storage activities shall occur in the dedicated communal apartment waste storage areas.
- The development's Facility Management Company shall appoint a dedicated Waste Services Manager to ensure that waste is correctly and efficiently managed throughout the development.

The Operational Phase of the Waste Management Plan is defined by the following stages of waste management for both the residential and commercial aspects of the development:

Stage 1 Occupier Source Segregation

Stage 2 Occupier Deposit and Storage

Stage 3 Bulk Storage and On-Site Management

Stage 4 On-site treatment and Off-Site Removal

Stage 5 End Destination of wastes

The OWMP has been prepared with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of storage, collection, segregation for recycling and recovery for residential building.

The apartments which will include a 3 - bin waste segregation at source system together with the communal waste storage areas have been designed with regard to *Section's 4.8 and 4.9 Refuse Storage of The Department of Housing, Planning and Local Government – Sustainable Urban Housing : Design Standards for New Apartments – Guidelines for Planning Authorities. 2018.*

The proposed residential development shall be designed and managed to provide residents with the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling domestic waste fractions.

The **Objective** of the OWMP is to maximise the quantity of waste recycled by residents by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information services to the residents of the development.

The **Goal** of this Waste Management Plan is to achieve a residential recycling rate of 50% of managed municipal waste by 2020 (and future targets in subsequent Regional Waste Management Plans).

All apartments and houses will have a 3-bin system (non-recyclable, organic and recyclable) in each kitchen to encourage residents to segregate waste at source.

Apartment residents will be provided with waste recycling and waste disposal information by the development's Facility Management Company who will be responsible for providing clean, safe and mobility impaired accessible communal waste storage areas for the apartment blocks.

House residents shall engage private waste collection contractors who provide a 3-bin waste collection service.

The Facility Management Company shall maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling. They shall also provide an annual bulky waste and WEEE collection service for all residents.

The development shall be designed to provide adequate domestic waste storage areas for each apartment blocks. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development. Communal waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct disposal and recycling of waste is available for residents.

Monitoring

Construction Phase

The Contractor shall maintain a record of all quantities and natures of all wastes reused / recycled and exported off-site and Article 27 declarations during the construction phase of the project.

Operational Phase

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in *The Eastern-Midlands Region Waste Management Plan 2015-2021*.

20.14 Archaeological, Architectural and Cultural Heritage

The site has been subject to desktop survey, geophysical survey and test trenching with no archaeological features or material identified. Furthermore, topsoil stripping of the site should be monitored by a suitably qualified archaeologist and if any archaeological features are identified then an appropriate area will be cordoned off from surrounding construction activity. The Department of Culture, Heritage and the Gaeltacht (DCHG) and National Museum of Ireland (NMI) will be notified and an appropriate mitigation strategy will be agreed, i.e. preservation in situ or full archaeological excavation under licence.

Monitoring

Any potential archaeological excavation that may result from the implementation of mitigation measures can only be undertaken upon receipt of a licence issued by the Department of Culture, Heritage and the Gaeltacht in consultation with the National Museum of Ireland. Conditions of awarding of an excavation licence include the production of a Preliminary Report within four weeks

and a Final Report within twelve months of the completion of the excavation. The production of these reports ensures compliance with the proposed mitigation measures. If the monitoring of the topsoil stripping is undertaken without a licence then it is standard practice to issue a report of such an exercise to the DCHG.

20.15 Daylight Sunlight

Construction Stage

This is not relevant to daylight/sunlight analysis as the analysis is carried out on the potential final design.

Operational Stage

Additional mitigation features are unlikely to be required in the operational phase of the development when considering daylight and sunlight.

Monitoring

Construction Phase

It is not recommended to monitor daylight/sunlight during construction. The analysis conducted within this report is done so based on the potential final design.

Operational Phase

It is not a requirement as long as there is no change to the proposed design or the glazing specification.

20.16 Risks of Major Accidents & Disasters

Construction Stage

The following mitigation measures are proposed within the Construction Management Plan, which reduce the risks of major accidents and disasters and risks to human health.

Measures to Minimise Nuisance Dust Emissions

The following dust suppression practices are to be implemented during the construction phase:

- The Contractor shall prepare a dust minimisation plan which shall be communicated to all site staff
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly (on any un-surfaced site road, this will be 20 kph and on hard surfaced roads as site management dictates)
- Vehicles delivering material with dust potential (soil, aggregates etc.) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust
- Public roads outside the site will be inspected on a daily basis for cleanliness and cleaned as necessary
- Debris, sediment, grit etc. captured by road sweeping vehicles is to be disposed off-site at a licensed facility
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate prior to entering onto public roads

- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions

Monitoring of dust deposition levels (via the Bergerhoff method) shall take place at a number of locations at the site boundary of the proposed development to ensure that dust nuisance is not occurring at nearby sensitive receptors. This monitoring aims to ensure that the dust mitigation measures outlined above remain effective.

Site Control Measures

Stripping of Topsoil

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains
- Topsoil stockpiles will also be located so as not to necessitate double handling

Excavation of Subsoil Layers

- The duration that subsoil layers are exposed to the effects of weather will be minimized
- Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of drainage trench excavations)
- Stockpiles of excavated subsoil material will be protected for the duration of the works, stockpiles of subsoil material will be located separately from topsoil stockpiles

Weather Conditions

- Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimizing soil erosion

Dust Control

- Dust suppression practices are to be implemented during stripping of topsoil layers and excavation of subsoil layers as outlined in Section 9 of this Preliminary Construction Management Plan

Area Impacted by Hydrocarbons Adjacent to Filling Station

An area of the site adjacent to the neighbouring filling station (adjacent to the western boundary) has been impacted by hydrocarbons. Investigation within the hydrocarbon impacted area confirms that the reduction in degree of impact moving downgradient and away from the filling station suggests that the impact is related to the filling station.

Two locations have been identified where these materials should be excavated and removed from site in the event of residential development (see Figure 4.1). These materials should be classified as and disposed of as hazardous. All subsoil impacted by hydrocarbons which are affected by the proposed development is to be removed.

The natural subsoils outside the impacted area have been assessed and are suitable for removal to a suitably licenced inert facility.

Also refer to EIAR Chapter 7 Lands and Soils.

The Contractor is to provide a Method Statement (to be agreed prior to commencing any works on site) for works in the vicinity of areas impacted by hydrocarbons including but not limited to details of:

- Their proposed specialist sub-contractors
- Proposals for containment of contamination,
- Proposal for removal of hydrocarbons from dewatered groundwater prior to discharge
- Co-ordination of contamination removal with other site works
- Proposed licenced waste receiving facility
- Compliance with relevant legislation including HSA publications and the Waste Management Act.

Operational Stage

None required.

Flood Risk

Proposed mitigation measures to address residual flood risks are summarized below;

M1. Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.

M2. In the event of storms exceeding the 1% AEP design capacity of the attenuation system, possible overland flow routing towards open space areas located to the north of Willow Grove should not to be blocked. At this location the site's boundaries should be permeable to facilitate flood routing onto adjacent public spaces.

It is considered that the flood risk mitigation measures if implemented are sufficient to provide a suitable level of protection to the proposed development. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur.

Should extreme pluvial flooding occur that is in excess of the development's attenuation capacity (i.e. greater than 1%AEP), then overland flow routes directed towards open space areas and adjacent public roads are provided in order to protect the residence which are proposed at lower floor levels.