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9 Water and Hydrology

9.1 Introduction

This section of the EIAR has been prepared by Kevin O'Mahony BA, BAI, C.Eng, MIEI, MIStructE, Chartered Engineer with over 25 years' experience in the industry of CORA Consulting Engineers to address the issues of water following the EPA guidance documents, "Advice notes on current practice (in the preparation of Environmental Impact Statements)" and, "Guidelines in the information to be contained in Environmental Impact Statements."

A separate Water Services and Flood Risk Assessment (FRA) Report was carried out by CORA Consulting Engineers. The FRA report accompanies this planning application under separate cover.

9.2 Proposed Development

The proposal consists of the demolition of existing buildings and redeveloping it for 495 Build to Rent residential units, which are proposed to be split into 4 no. proposed blocks (Blocks A1, A2 each with two 10 storey elements, and Blocks B & C ranging from 3no. to 7no. storeys and associated residential services and facilities, as well as courtyard spaces. In addition, the scheme includes for a service building comprising of a crèche (300 sq. m), café (34 sq. m) and gym (412 sq. m), as well as streets, public realm amenity and green open space.

The details of acceptable methods of surface water discharge were discussed with Dublin City Council and are based upon requirements for improving water quality indirectly entering watercourses.

The surface water drainage design has been carried out in accordance with Sustainable Urban Drainage Systems and more particularly United Kingdom CIRIA Document 'Sustainable Urban Drainage System' - Design Manual for Scotland and Northern Ireland (CIRIA C521) and in accordance with the recommendations of the Greater Dublin Strategic Drainage Study, as required by Dublin City Council

All surface water drainage works will be constructed in accordance with the recommendations of the CIRIA Document 'Sustainable Urban Drainage System' - Design Manual for Scotland and Northern Ireland (CIRIA C521).

9.3 Methodology

9.3.1 Surface water drainage

The existing topography of the subject site was obtained by carrying out a topographical survey.

Part of the surface water drainage works includes the re-profiling of the South Bank of the Santry River and discussions have been held with all stakeholders including the OPW, the Inland Fisheries Ireland and Dublin City Council.

9.3.2 Water Supply

The existing record drawings for the water supply network for the area surrounding the subject site were obtained from Dublin City Council/ Irish Water.

The water demand produced by the subject development was calculated using Irish Water Code of Practice for Water Infrastructure.

A pre-connection enquiry was submitted to Irish Water with Confirmation of Feasibility Letter returned from Irish Water.

The impact of the water demand on the water supply network has therefore been assessed by Irish Water.

9.4 Baseline Environment

9.4.1 Surface Water

The site is located within the catchment of the Santry River which passes through the site from east to west.

The development area is currently 85% hardstanding. Surface water from the development lands currently drain directly attenuated and untreated to the Santry River which enters the Irish Sea at the James Larkin Road approximately 2.5km to the East of the site.

9.4.2 Flood Risk

Flood risks have been identified as being unlikely in the Water Services and Flood Risk Assessment Report.

9.4.3 Site Investigation

Detailed site investigations have been carried out with reports contained in Chapter 7. It was noted that ground water table is low.

9.5 Difficulties Encountered

The exact location of the existing services infrastructure is reliant upon both the public records obtained, which are indicative, and the results of the topographical surveys at ground level only to locate manhole and access covers. This information gives a good indication of the approximate location of the various water features however, their exact location remains unknown.

The existing waste water and water flow rates from the redundant site have been estimated using Irish Water Codes of Practice as no data was available given that the site has been unoccupied for almost 2 decades.

9.6 Impact Assessment

It is envisaged that the proposed development will result in improvements to the water quality and hydrology of the site.

9.6.1 Do Nothing Scenario

The site is zoned for residential use that is designed to facilitate increased availability of residential use in a largely residential area. In the 'Do Nothing' scenario, the derelict industrial site would likely remain idle; resulting in surface water run-off directly to water courses and with the decaying factory buildings likely to impact increasingly negative over time.

9.6.2 Demolition and Construction Phase

During the construction of the new foul drainage systems there is the potential for surface water to be discharged to the existing public foul sewer system due to pipes and manholes being left open.

There is risk of pollution of groundwater / watercourses by accidental spillage of foul effluent when making connections to live sewers.

Pollution of groundwater / watercourses / soils by accidental spillage of oils / diesel from temporary storage areas, or where maintaining construction equipment, can occur.

There is a minor risk of traffic disruption during construction works when connecting the existing foul sewer to the proposed foul sewer network although works to the existing truck sewer are wholly within private property.

There is a risk of damage to existing services when excavating for the new foul sewer network.

The development will require the excavation of considerable quantities of soil (estimated as 94,500m³ with 62,500m³ of material moved off site) and some hardstanding areas. These activities may result in the potential contamination of the surface water with soil particles when discharging to the existing watercourses.

The initial runoff from newly laid bitumen surfaces will contain some soluble extracts from the bitumen binder. These extracts will mostly consist of phenolic and hydrocarbon substances in low concentrations (circa 10 to 50 µg/l). The quantities will not adversely affect the water quality due to dilution effects.

There is potential for silt to be washed into the Santry River when the site is stripped, during river bank re-profiling works, and setting of the linear park.

There is a risk of cementitious material being washed into the Santry River during construction of crossings and the development more generally.

There is a risk during construction works for oil spills from construction plant/operations to pollute the proposed surface water network.

9.6.3 Operational Phase

Wash down in the basement areas shall be directed to foul drainage; Petrol Interceptors will intercept oils from car parking areas. Periodic inspection & maintenance shall be required for the Petrol Interceptors.

A worst case scenario from the proposed development would be if the receiving sewers were to surcharge and inundate the basements with foul sewage. This worst case scenario would be mitigated by providing anti-flooding devices on the outlets to the sewer network plus relative levels ensure that this risk is minimal. Pumps will be provided in the basements to cater for oil spillages, wash-down & snow melt, and would also relieve accidental discharge of foul sewage to a basement area in the unlikely event of an anti-flooding device failing.

There may be the possibility of leakage from foul sewers and drains within the development and along the route of the outfall sewers. Any foul water leakage would result in contamination of ground waters in the area.

There may be the possibility of surface water ingress into the foul water drainage system due to poor workmanship which would increase the load on the existing sewers and pumping station. However, all pipes will be tested and surveyed prior to allowing foul effluent to discharge through the pipes.

A worst case scenario is that for a very intense storm, minimal flooding may occur within the site while volumes drain down.

There is a potential impact for the discharge of contaminants from hardstanding and impermeable areas within the development to the Santry River. These would include particulates, oil, etc. The quality of runoff from the site would be dependent on the time of year, weather, particulate deposition from the atmosphere and any gritting or salting carried out by the Local Authority. The time of year has a major bearing on the quality of storm water run-off - in particular the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc. are washed away.

9.6.4 Risks to Human Health

Infrastructure will be constructed in line with the current recommendations for the improved treatment of water quality on the site. There is no likely significant risk to human health resulting from the construction or operation of the proposed development.

9.6.5 Cumulative Impacts

Taking account of the overall environment prior to the development of the Chivers Site to date, the current environment in the broader area, the current buildings & infrastructure, the development proposed under the current application and potential future developments on the subject site in the context of the current County Development Plan and the proposed design life & life cycle for the current proposals the potential cumulative impacts may be considered to be Moderate and Long-term impacts. That is, any impact which may occur would be consistent with existing and emerging trends, and the proposed development will have a design life of fifty years.

9.6.6 Impact on Climate

There is likely to be a slight increase in air pollution and carbon dioxide emissions due to the development. However, any such threat is considered negligible in terms of adversely impacting the climate due to the high quality and energy efficiency of the development proposed.

9.7 Mitigation

9.7.1 Design Mitigation

Surface water treatment has been designed to significantly improve the quality of the site run-off to water courses or to ground. Storm water run-off shall pass through at least 2 stages of treatment with over 90% of rainfall events passing through soakaway systems into the receiving ground.

The form of the development is such that groundwater shall be unaffected.

9.7.2 Demolition and Construction Phase

Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from fuel, oil and other hazardous materials (paints, cleaning agents, herbicides, fertilisers, etc.). Suitable bunded areas will be installed for oil all storage tanks with a minimum 110% storage volume. Designated fuel filling points will be put in place at secure locations, remote from the Santry River with appropriate oil and Petrol Interceptors to provide protection from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.

All plant will be maintained in a designated maintenance area.

A traffic management plan will be prepared by the main contractor and implemented to minimise disruption to the existing road network.

Realignment of existing drains and provision of new drains is proposed in excess of 10m from the Santry River. Where services cross the existing stream alignment, trenchless construction shall be adopted.

All excavated materials shall be sorted and separated on site to suitable stockpiles. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil-bearing-runoff and mixing of materials.

If encountered, contaminated soils should be excavated and disposed off site in accordance with the Waste Management Acts 1998-2006 & associated regulations, and guidance provided in the NRA's Guidelines for the Management of Waste from National Road Construction Projects (National Roads Authority 2008).

9.7.3 Operational Phase

All foul drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to ground water on the site.

The use of Petrol Interceptors will reduce the amount of silt and grits present in the basement wash down discharged to the foul water network, as well as any contaminating pollutants, such as hydrocarbons, oils and grease.

All foul water from the basement areas, including wash down, shall outflow via retention tanks with 24h storage capacity to allow for smoothing of flow.

Otherwise, no other mitigation measures are deemed to be necessary after completion of the development, other than normal maintenance of the foul sewer system.

9.8 Residual Impact

9.8.1 Construction Phase

Residual impacts on during the construction phase is considered to be temporary and occasional in nature and not significant, where service is unavoidably disrupted to facilitate the construction phase.

9.8.2 Operational Phase

Residual impacts on water and hydrology during the operational phase given the new infrastructure is considered to be permanent with a constant occurrence, positive and beneficial to all the end users.

9.9 Monitoring

Water quality monitoring will be carried out on the Santry River during the construction stage of the project (typically on a weekly basis). Water samples will be collected upstream and downstream of the proposed development works. These samples will be submitted to Dublin City Council. Any deterioration in water quality will be immediately addressed.

All drainage assets shall be part of, and subject to, an ongoing inspection & maintenance schedule. Infiltration of ground water and exfiltration of sewage shall be included in such measures.

Water mains shall be metered for usage including unaccounted for use which may include leaks.

Paving – roads and paths – and other areas of hardstanding shall be part of, and subject to, an ongoing inspection & maintenance schedule.

Landscaped areas shall be part of, and subject to, ongoing inspections as required & maintenance schedule. It is noted that the vegetative cover contributes to both erosion protection and surface water treatment. Inspections shall also identify any invasive species and initiate appropriate action. See also Chapter 5 – Biodiversity (Flora and Fauna).

The channel of the Santry River shall be part of, and subject to ongoing inspections as required & maintenance schedule. The water conveyance capacity of the channel shall be maintained to prevent the occurrence of either upstream or downstream flooding. Inspections shall also address the habitat quality, including identification any invasive species, and initiate appropriate actions. See also Chapter 10 – Biodiversity.

9.10 References & Sources

- Irish Water Code of Practice for Wastewater Infrastructure
- Irish Water Code of Practice for Water Infrastructure
- Guidelines on the information to be contained in Environmental Impact Statements, EPA, 2002
- Advice notes on current practice (in the preparation of Environmental Impact Statements), EPA, 2003
- Greater Dublin strategic drainage study, DLRCoCo et al, 2005

- Dún Laoghaire Rathdown County Development Plan 2016 – 2022, DLRCoCo, 2016
- Sustainable urban drainage systems – Design manual for Scotland and Northern Ireland, Publication C521, CIRIA, 2000
- Development and flood risk – guidance for the construction industry, Publication C624, CIRIA, 2004
- Control of water pollution from linear construction projects – Technical guidance, Publication C648, CIRIA, 2006
- The SUDS manual, Publication C697, CIRIA, 2007
- Flood estimation for small catchments, Report No.124, IH, 1994