Appendix I

The Donore Project

Part 10 Application
Infrastructure Report

The Land Development Agency

STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report

18 November 2022

Delivering a better world

Quality information

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Table of Contents

Figures

Tables

1. Introduction

In accordance with Section 175 of the Planning and Development Act 2000 (as amended) The Land Development Agency, on behalf of Dublin City Council, gives notice of its intention to make an application for approval to An Bord Pleanála for a seven year permission in relation to a proposed residential development at this site located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8. The site is bound by Donore Avenue to the north-east, Margaret Kennedy Road to the north-west, The Coombe Women & Infants University Hospital to the west, the former Bailey Gibson factory buildings to the south-west, and the former Player Wills factory to the south-east. The development will consist of the construction of a residential scheme of 543 no. apartments on an overall site of 3.26 ha.

The proposed development is hereafter referred to as the 'Donore Project'. The site is owned by Dublin City Council (DCC).

Figure 1.1: Site Location

This report will detail the existing and proposed foul, surface water and watermain infrastructure for the site to the extent that would be reflective of a stage 1b design strategy.

It is noted that a new building is being constructed, at the time of writing, within The Coombe Women & Infants University Hospital car park (planning reference 4049/19) which includes proposals for surface water attenuation. This is discussed in more detail within the main body of this report.

1.1 Proposed Development

The current site is part of the overall Strategic Development & Regeneration Area (SDRA) 11. This site lies at the centre of the SDRA 11 lands and will be developed to provide 543 new homes.

The development (GFA of c. 53,227 sqm) contains the following mix of apartments: 225 No. 1 bedroom apartments (36 no. 1-person & 189 no. 2-person), 274 No. 2 bedroom apartments (including 52 No. 2 bed 3 person apartments and 222 No. 2 bed 4 person apartments), 44 No. 3 bedroom 5-person apartments, together with retail/café unit (168 sq.m.), mobility hub (52 sq.m.) and 952 sq.m. of community, artist workspace, arts and cultural space, including a creche, set out in 4 No. blocks.

The breakdown of each block will contain the following apartments:

- Block DCC1 comprises 111 No. apartments in a block of 6-7 storeys;
- Block DCC 3 comprises 247 No. apartments in a block of 6-15 storeys;
- Block DCC5 comprises 132 No. apartments in a block of 2-7 storeys;
- Block DCC6 comprises 53 No. apartments in a block of 7 storeys;

The proposed development will also provide for public open space of 3,408 sqm, communal amenity space of 4,417 sqm and an outdoor play space associated with the creche. Provision of private open space in the form of balconies or terraces is provided to all individual apartments.

The proposed development will provide 906 no. residential bicycle parking spaces which are located within secure bicycle stores. 5% of these are over-sized spaces which are for large bicycles, cargo bicycles and other non-standard bicycles. In addition, 138 spaces for visitors are distributed throughout the site.

A total of 79 no. car parking spaces are provided at undercroft level. Six of these are mobility impaired spaces (2 in each of DCC1, DCC3 & DCC5). 50% of standard spaces will be EV fitted. Up to 30 of the spaces will be reserved for car sharing (resident use only). A further 15 no. on-street spaces are proposed consisting of:

- 1 no. accessible bay (between DCC5 & DCC6)
- 1 no. short stay bay (between DCC5 & DCC6)
- 1 no. crèche set-down/ loading bay (between DCC5 & DCC6)
- 1 no. set-down / loading bay (northern side of DCC5)
- 1 no. set-down/loading bay (northern side of DCC 3)
- 10 no. short stay spaces (north-east of DCC1)

In addition, 4 no. motorcycle spaces are also to be provided.

Vehicular, pedestrian and cyclist access routes are provided from a new entrance to the north-west from Margaret Kennedy Road. Provision for further vehicular, pedestrian and cyclist access points have been made to facilitate connections to the planned residential schemes on the Bailey Gibson & Player Wills sites for which there are extant permissions (Ref. No.'s ABP-307221-20 & ABP-308917-20).

The development will also provide for all associated ancillary site development infrastructure including site clearance & demolition of boundary wall along Margaret Kennedy Road and playing pitch on eastern side of site and associated fencing/lighting, the construction of foundations, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, green roofs, hard and soft landscaping, play equipment, boundary walls, attenuation area and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

Refer to Figure 1.2 for the proposed site layout. The proposed development consists of the construction of 543 no. residential units, distributed over 4 no. proposed apartment blocks (DCC1, DCC3. DCC5 and DCC6). Table 1.1 summarises the current schedule of accommodation, per block.

Figure 1.2: Extract from drawing STG-MW-S1b-00-RF-DR-A-1100002 – Site Layout Plan Proposed

Table 1.1: Proposed Residential Units

Phase	Number of Proposed Units
DCC1	111
DCC3	247
DCC5	132
DCC6	53
Total	543

Source: <Metropolitan Workshop>

1.2 Proposed Levels

A topographical and utilities survey of subject site and immediate surroundings has been carried out by Murphy Geospatial. Refer to Appendix A for further information on existing levels. Finished floor levels (FFL) of 20.2 m are proposed for blocks DCC3, DCC5 and DCC6. These Blocks are proposed approximately 0.6-1.2 m above existing ground levels, in order to allow the site to be drained by gravity.

Block DCC1 is proposed to be split in terms of levels with FFLs of 19.1 m and 19.65 m, to match existing levels on Margaret Kennedy Road and to ensure Part M access requirements are met. The existing levels within the building's footprint range from 19 m to 19.4 m at the location of the proposed block DCC1. It is noted that the topography survey shows the site is elevated in comparison to the adjacent Margaret Kennedy Road, by approx. 0.5 m.

These proposed FFLs are also suitable to ensure sufficient depth is available to allow service connections from the building to the drainage networks. These proposed FFL's also meet the required freeboard (500 mm), between the

predicted flood water level (discussed in the CFRAM section of the Flood Risk Assessment (FRA) (STG-AEC-S1b-00-00-RE-C-0000002_Flood_Risk_Assessment) included with this application) and the FFL of the new buildings.

Refer to drawing STG-AEC-S1b-00-00-DR-C-0000601 for proposed Road & Finished Floor Levels.

1.3 Ground Investigation

AECOM have procured a geotechnical investigation for the site, which is appended to the Structural Engineer's report. A soakaway test was undertaken, which failed, indicating poor infiltration on the site. High groundwater levels (<1 mbgl) were found towards the west of the site.

Made ground deposits were encountered at ground level and below topsoil. The cohesive deposits below this are typically 'slightly sandy gravelly CLAY'.

2. Engagement with Stakeholders

2.1 Barrett Mahony Consulting Engineers

Various coordination meetings were held between the Design Team and Barrett Mahony (Civil Engineering consultant for future sites for development within the SDRA). Required diversions of assets were discussed in these meetings, connection locations to assets and other considerations.

2.2 Irish Water

A Pre-Connection Application was submitted to Irish Water on 9th February 2021 to establish the impacts of the new development on the existing water and wastewater network.

A Confirmation of Feasibility was received on 1st October 2021, included in Appendix B.

The Confirmation of Feasibility outlined no upgrade works should be required to facilitate a wastewater connection but stated that peak discharge must be restricted to 2 DWF (dry weather flow).

AECOM engaged with Irish Water regarding the restriction of peak discharge to 2DWF. It was explained that the Pre-Connection Application was submitted with an estimated 750 no. units. Given, the proposal is now for approx. 200 units less than this, it was agreed that it would not be required to limit the peak discharge to 2DWF and this requirement would be assessed at connection application stage.

Irish Water advised in the Confirmation of Feasibility that the development should be served with potable water by;

- a new 200 mm diameter watermain supplied from a 250 mm watermain within the Bailey Gibson site. The Bailey Gibson planning application included a 200 mm watermain and the design should therefore be revised. The Bailey Gibson site would be supplied from the watermain in South Circular Road, which would be required to be upgraded from 18" to 450/500 mm diameter (Irish Water later noted this upgrade was no longer required, as the main will be replaced with a new pipe as it's on Irish Water's Capital Investment Programme and the Developer is not required to wait for completion of the works. Refer to this correspondence in Appendix C), and;
- a 200 mm watermain connection to the proposed 200 mm watermain in the Player Wills site.

However, given these described connections to Irish Water infrastructure rely upon proposed infrastructure from future developments, new watermain connection locations are proposed to allow the Donore Project site to be served, independent of other proposed developments.

Irish Water confirmed during the design vetting process (Statement of Design Acceptance), that the proposed connections would be assessed at Connection Application stage. Refer to the Statement of Design Acceptance in Appendix D.

A diversion of a wastewater asset is required to allow construction of Block DCC1. The proposed diversion begins within The Coombe Women & Infants University Hospital car park and connects to the existing wastewater sewer in Margaret Kennedy Road. A Diversion Application was submitted to Irish Water on 24th August 2021. Irish Water issued a Diversion Confirmation of Feasibility (DIV21217) on 31st March 2022, refer to Appendix E.

Similarly, a diversion of a 100 mm watermain is required to allow construction of Block DCC1, the proposed diversion begins within The Coombe Women & Infants University Hospital car park and connects to the watermain in Donore Avenue albeit at a different location to where it currently connects. A Diversion Application was submitted to Irish Water on 30th June 2022 and Irish Water issued a Diversion Confirmation of Feasibility (DIV22181) on the 17th August 2022, included in Appendix F, for this portion of the diversion required. Refer to Section 6.1 for further details.

2.3 DCC Transportation, Roads & Drainage departments

Prior to the submission of the Section 247 (S247) meeting request, the DCC Transportation, Roads and Drainage departments were contacted to arrange a consultation meeting.

2.3.1 Meeting with DCC Drainage on 29th September 2021

A meeting was held with DCC's Drainage department on 29th September 2021 where the following was discussed:

- Attenuation calculations should be provided with the application,
- Diversion of pipes are to be included within the subject site's red line boundary,
- DCC requested additional CCTV is procured to define the catchment of the surface water network which is being diverted.

2.3.2 S247 Meeting - 7th October 2021

It was noted during this meeting that a Part 10 Application was the likely planning route and therefore the meeting was not strictly a 'Section 247'. Items such as building heights, tenure mix, parking ratios, Taking In Charge and sunlight & daylight analysis were discussed.

AECOM explained tree pits were removed from the proposal, as per advice received from DCC Parks.

3. Road Infrastructure

This chapter contains an outline of the conceptual philosophy and design criteria for the road infrastructure including pavement finishes, swept path analysis and areas to be taken in charge for future maintenance.

3.1 Road General Arrangement

It is proposed to use porous asphalt on car parking bays and set-down bays. Refer to drawing STG-AEC-S1b-00-00-DR-C-0000001 for road general arrangement including relevant dimensions and the AECOM landscape architect's drawings for pavement finishes. Note all finishes are generally in accordance with DCC Road Construction Standard guidelines.

3.2 Taking in Charge

A taking in charge drawing has been developed by Metropolitan Workshop Architects in conjunction with AECOM Civil Engineers and Landscape Architects to clarify which areas will be taken in charge by DCC Roads, DCC Parks, DCC Housing and by the Management Company to carry out future maintenance works.

It is proposed that DCC Roads takes in charge roads, footpaths and immediate streetscape. A Management Company would be responsible for maintaining apartment buildings, including roof terraces, courtyards and internal car parks and area outside of ground flood including cycle stands and defensible space for ground floor apartments. DCC Housing would take in charge social housing apartments.

Refer to the architect's (Metropolitan Workshop) drawing package for the taking in charge drawing.

4. Surface Water Drainage

4.1 Surface Water Criteria

This chapter contains an outline of the conceptual philosophy and design criteria for surface water in the Donore Project. It is AECOM's intention that the proposed surface water drainage system will be designed in accordance with the following documents:

- Greater Dublin Strategic Drainage Study (GDSDS)
- Greater Dublin Regional Code of Practice for Drainage Works (as per Policy SI4 of the Development Plan)
- Building Regulations Technical Guidance Document H: 2010 - Drainage and Water
- Department of the Environment, Heritage and Local Government 'Recommendations for Site Development Works'
- BS EN 752: Part 4: Drain and Sewer systems outside buildings: hydraulic design and environmental considerations
- CIRIA Document C753: 2015 – The SuDS Manual
- CIRIA C768:2017 – Guidance on the Construction of SuDS.

This section will outline the proposed surface water design intent that is reflective of a Stage 1b design and the proposals are indicative and to be verified by further design at the next stage. The surface water strategy has been developed in accordance with Policies SI22, SI25 and SI26 of the Dublin City Development Plan 2022-2028 and with reference to the guidance on Sustainable Drainage and Surface Water Management, Appendix 12 and Appendix 13 respectively. Elements of Surface Water Management are also discussed in the Flood Risk Assessment report (STG-AEC-S1b-00-00-RE-C-0000002).

4.2 Existing Surface Water Drainage

There are several existing surface water pipes present throughout the subject site and the DCC lands, as seen on the utility survey (refer to Appendix A) and the records (refer to Figure 4.1 below and Appendix G for full records).

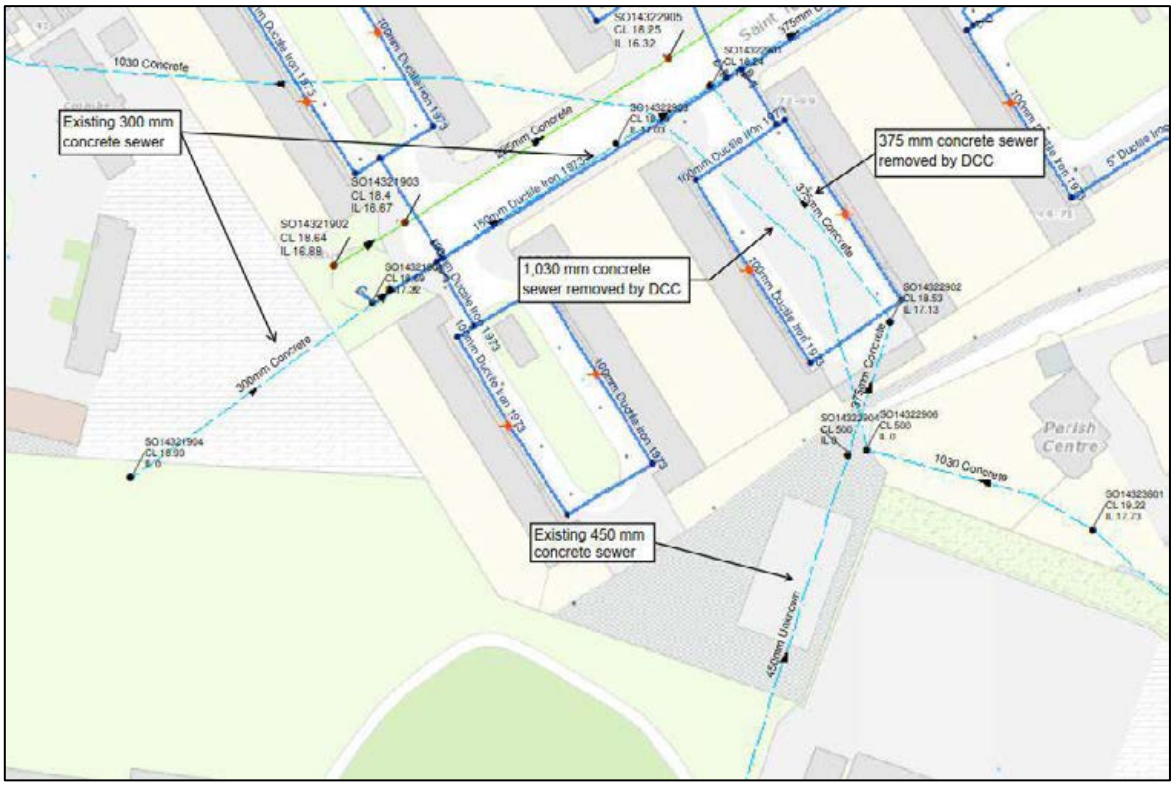


Figure 4.1: Surface Water sewers recorded within the Donore Project Site

Further investigations were undertaken to further determine the extent of the surface water lines via;

- discussions with the Contractor and Design Engineer for The Coombe Women & Infants University Hospital,
- and a CCTV Survey to determine the upstream extent of the 300 mm coming from the Bailey Gibson site which was unknown. This survey confirmed there are connections from the existing Bailey Gibson warehouse draining to this line. Refer to Appendix H for the CCTV survey report.

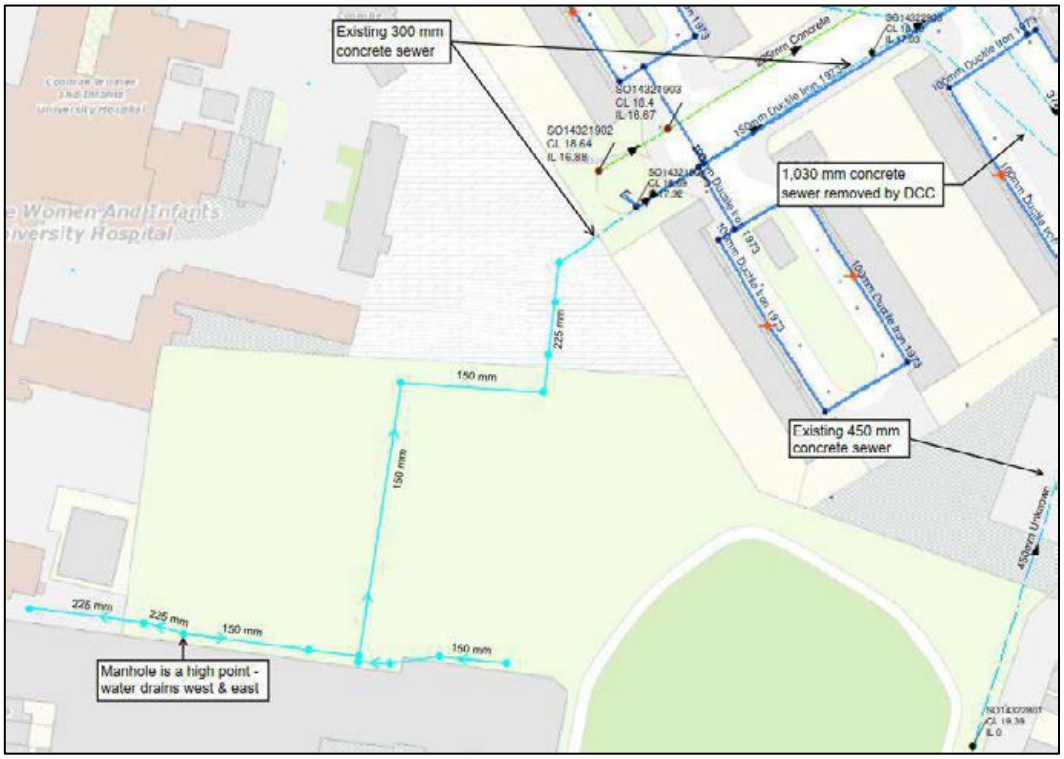


Figure 4.2: Existing surface water network following investigations

1. A portion of the Bailey Gibson warehouse drains to a 150 mm surface water line within the Donore Project site, and drains north towards The Coombe Women & Infants University Hospital car park and then joins a 300 mm sewer which drains east, which enters the Donore Project site from The Coombe Women & Infants University Hospital lands, traverses the location of the proposed DCC1 Block and continues along the site of the former St. Teresa's Gardens flats (the line upsizes to a 375 mm sewer in this area), before discharging to a 1 m stormwater culvert in Donore Avenue.
2. A 450 mm concrete sewer running parallel to the west of the Player Wills warehouse (which drains north), reduces in size to a 375 mm pipe and previously connected to the 375 mm pipe described in the bullet point above, via a 60 m run of pipe as shown in records (refer to Appendix G). This 60 m run of 375 mm pipe was removed by DCC in 2019 during demolition of St. Teresa's Gardens flats, meaning the 450 mm pipe does not join this network which discharges to the culvert in Donore Avenue. The 450 mm was not diverted to another outfall location and DCC previously noted that there was no indication of flooding as result of the lack of a downstream connection.
3. A 1,030 mm surface water concrete culvert which is shown on the records to drain from Donore Avenue, northwest across the SDRA site, entering The Coombe Women & Infants University Hospital lands. The sewer is noted to be obsolete and removed in the area where the St. Teresa's Gardens flats once existed. Northwest beyond this area, within The Coombe Women & Infants University Hospital lands, the sewer remains as a live asset. The portion of culvert within the St. Teresa's Church grounds acts as storage, permanently filled with water. The inflow to this 'storage' is from an overflow from Donore Avenue 700 mm above its invert. The outflow from this 'storage' is a 225 mm pipe which connects into the 450 mm sewer described in the bullet point above, which does not have an outfall location and DCC had noted there is no indication of flooding issues at this location. It is not proposed to divert this overflow, as the potential volume from the Donore

Avenue culvert which overflows to this storage culvert could be too large to be catered for in the attenuation tank. It is proposed to retain the existing scenario for this 1,030 mm culvert.

The utility survey carried out by Murphy Geospatial, shows that there are foul connections south of The Coombe Women & Infants University Hospital car park which discharge from the site compound into the separate 300 mm surface water sewer. It has been confirmed from The Coombe Women & Infants University Hospital's contractor that foul connections from the site compound do not drain to this network, despite what the utility survey shows, refer to Figure 4.3.

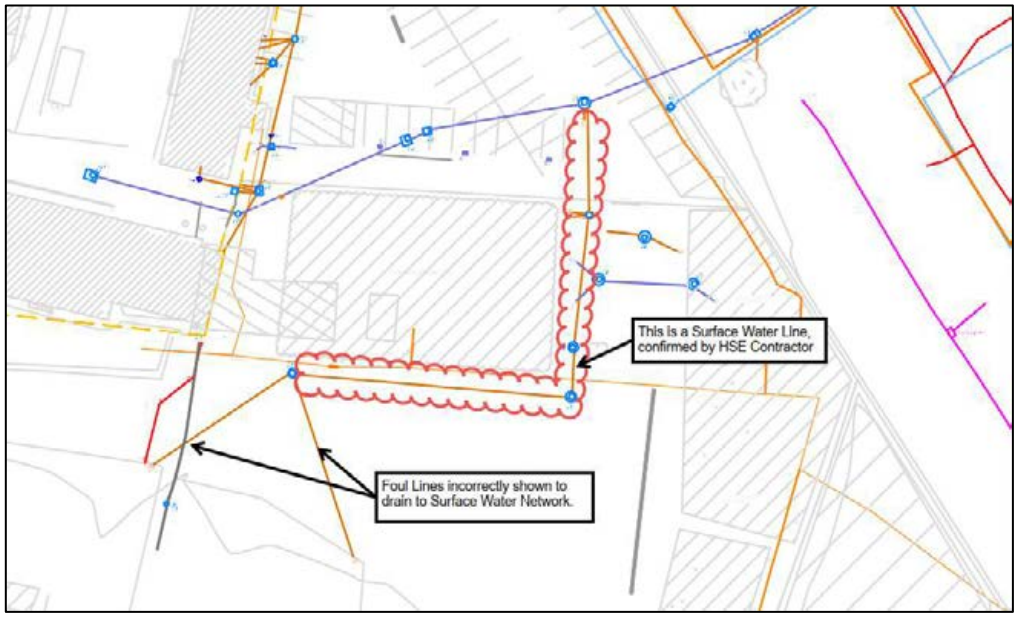


Figure 4.3: Corrections to Utility Survey, confirmed by HSE Contractor

4.3 Proposed Surface Water Drainage Diversions

As can be seen from Figure 4.2 and drawing STG-AEC-S1b-00-00-DR-C-0000500_DrainageLayoutOverall, there are existing surface water sewers traversing locations of proposed buildings. Therefore, these sewers are required to be diverted.

Diversion 1

Diversion of Existing Catchment (Bailey Gibson Factory):

The 150 mm sewer which traverses the proposed DCC5 Block, drains a portion of runoff from the existing Bailey Gibson warehouse. It is proposed to divert this portion of catchment into the proposed network, meaning this runoff will be attenuated. The attenuation tank proposed for the development is designed to also account for future developments within this SDRA, which includes this portion of catchment described. Refer to Section 4.4 for further details on the proposed attenuation strategy.

Diversion of Surface Water Pipe (The Coombe Women & Infants University Hospital car park – Donore Avenue):

A diversion is also required for the 300 mm surface water sewer which traverses the location of the proposed DCC1 Block. The proposed route of this diversion is; altering the route to flow north within The Coombe Women & Infants University Hospital car park (parallel to the DCC1 Block) before turning east below the existing boundary wall, into the proposed surface water pipe which enters Margaret Kennedy (MK) Road for 10m, before running under the proposed footpath, crossing the proposed road and then running adjacent to Margaret Kennedy (MK) Road (between MK Road and the proposed tank) and ultimately discharging to the same location in Donore Avenue, unattenuated, as before. Refer to the AECOM drainage drawings STG-AEC-S1b-00-00-DR-C-0000500 - 0000502.

Diversion 1 – Construction Process

The initial portion of the diversion is within The Coombe Women & Infants University Hospital car park. To allow the surface water diversion to be completed, a foul diversion must be completed first. The existing foul water line (the grey 'FW' line shown in Figure 4.4) will remain live until the diversion shown in red has been constructed as far as the Margaret Kennedy Road. The surface water line shown in blue would clash with the exiting foul line shown in grey, which couldn't be avoided due to levels constraints. Therefore, the surface water line can only be

completed when the wastewater diversion has taken place, and the existing foul line decommissioned and removed.

Diversion 2

It is proposed to divert the flow from the 450 mm line, which runs along the boundary of the Player Wills factory site and previously had its downstream connection removed leaving the sewer in a dead end, as discussed in Section 4.2, Point 2. The flow will be diverted into the proposed drainage network and attenuated, a catchment analysis was undertaken and incorporated into the attenuation calculations, along with the future developments within this SDRA. A total of 2 no. spur have been provided in the design of this diversion to facilitate connection to the network from the future developments.

Diversion 3 (Future Diversion)

It is not proposed under this application to divert/remove the overflow from Donore Avenue into the 1,030 mm culvert 'storage', this is instead proposed under a separate application for development within the SDRA. This application proposed to retain the current scenario regarding the overflow and 'storage'. It is noted however the diversion of the 450 mm line described above does reduce the flow to this dead end, thus allowing more 'storage'. The future application to divert / remove the overflow from Donore Avenue into the 1030mm culvert storage will be a standalone upgrade and does not impact this application.

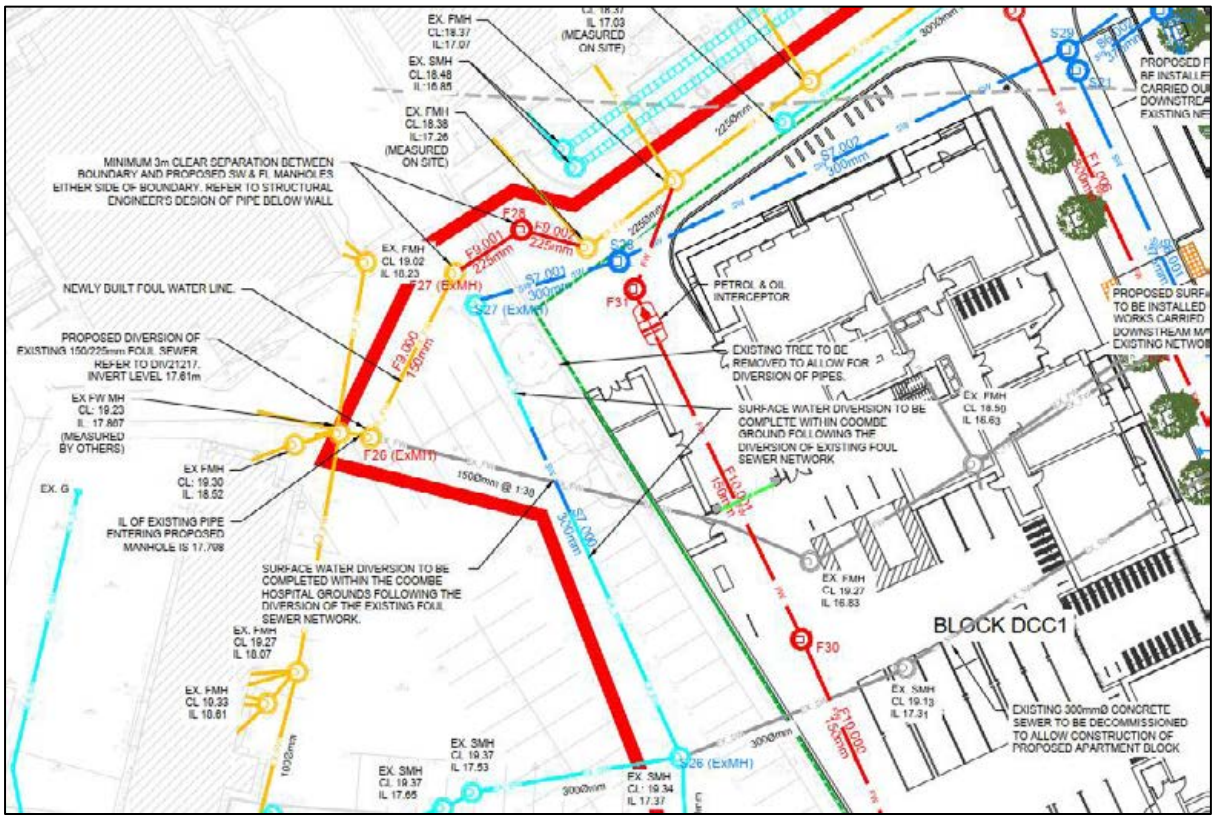


Figure 4.4: Proposed Wastewater & Surface Water Diversions

4.4 Proposed Surface Water Drainage Strategy

A surface water drainage strategy has been prepared to ensure runoff leaving the site is of a good water quality and is restricted to an appropriate flow rate, as discussed below. It is proposed to discharge the surface water from the site to a separate 1.2 m diameter surface water sewer in Donore Avenue.

The proposed site's Net Developable Area is approx. 2.05 ha, with an additional catchment of 0.12 ha (2.17 ha total) which will be diverted from the 450 mm sewer, into the proposed network. Ignoring future developments, the associated outflow rate is calculated as follows;

In accordance with the IH124 method, the greenfield runoff for existing undeveloped sites measuring less than 50 ha can be estimated using the following formula:

$Qbar_{rural}$ (in m^3 /s) = 0.00108 x (0.01 x AREA)$^{0.89}$ x SAAR$^{1.17}$ x SPR$^{2.17}$

where:

- $Qbar_{rural}$ is the mean annual flood flow from a catchment for a 50 ha site,
- AREA is the area of the catchment in ha,
- SAAR is the standard average annual rainfall for the period 1981-2010 Annual Average Rainfall Grid produced by Met Éireann,
- SPR is Standard Percentage Runoff coefficient for the SOIL category.

Rainfall data for the site was sourced from an Annual Average Rainfall (AAR) Grid (1981-2010) produced by Met Éireann. The rainfall data for the Irish Grid Coordinates closest to the site indicates a SAAR value of 721mm is appropriate.

Based on the site investigation referenced above, low permeability clays are present at the subject site. On this basis, it is appropriate to use a SOIL Type 4 for the calculations.

Therefore, $Qbar_{rural}$ for a 50ha site has been calculated as follows:

$Qbar_{rural}$ (for a 50ha site) = 0.00108 x (0.01 x 50)$^{0.89}$ x 721$^{1.17}$ x 0.45$^{2.17}$

$Qbar_{rural}$ (for a 50ha site) = 0.22738 m^3 /s

= 227.385 l/s

Interpolating linearly, this corresponds with a Qbar figure of 9.87 l/s, for the drained area of 2.17 ha.

A drainage model has been developed for the site, with the following rainfall data; M5-60 equal to 16.4 mm and a ratio, R, of 0.277 and a 20% allowance for climate change.

An attenuation tank is proposed to store the runoff which is excess of the greenfield runoff rate. The attenuation tank has been incorporated into the design in accordance with the civil engineer for future developments within the SDRA (as it also considers and can account for runoff from future development within the SDRA), who propose a concrete tank with a total volume of 2000 m^3. However, it is noted that the form of construction is to be agreed with DCC prior to commencement. (The allowable outflow from the attenuation tank when considering the future development is 22.3 l/s).

Percentage Impermeable Areas (PIMP) have been used to capture the effect of SuDS measures on runoff rates, for different areas of the site (roads which drain to SuDS measures, intensive green roofs (provided on amenity roof terraces and podiums), extensive green roofs, and impermeable areas), in the drainage model which are further discussed in Section 4.5.

For details of surface water drainage layouts, please refer to AECOM Drawing no. STG-AEC-S1b-00-00-DR-C-0000501 – 0000504. For the surface water drainage model results and longsections, refer to Appendix I. All proposed surface water manholes and gully chambers are to be blockwork, in accordance with DCC requirements.

4.5 SuDS Strategy

The SuDS features included are as follows:

- Extensive Green Roof;
- Intensive Green Roof (provided on amenity roof terraces and podiums);
- Permeable Paving on Roof Terrace;
- Swales;
- Tree pits;
- Porous asphalt;
- Bio-Retention / Rain Gardens;

The SuDS measures provide interception and treatment volume on site. Please refer to Appendix J for a drainage maintenance inspection checklist, maintenance should be carried out on the drainage network every 6 months or after large rainfall events.

Table 4.1: SuDS Measures Proposed by Surface Type

Surface Type	Proposed SuDS Measures
Roofs	Extensive Green Roofs
Amenity roof terraces and podiums	Intensive Green Roofs and Permeable Paving
Roads	Tree Pits, Porous Asphalt at parking/loading bays and Swales
Hardstanding Paths	Swales/Land Drains and Rain Garden/Bio-Retention

Percentage Impermeable Areas (PIMP) were used in the drainage model in order to account for the impact of SuDS on reducing the amount of runoff. Refer to Table 4.2 for the PIMP values adopted for the different surface types.

Table 4.2: Percentage Impermeable Areas per Surface Type

Surface Type	PIMP (%)	SuDS Measures
Impermeable areas (stair overruns etc)	100	Conservatively assumed as impermeable, however preference is to drain to surrounding green roof or SuDS measures to achieve some interception & treatment
Extensive Green Roofs	92	92% for areas roofs with extensive green roof (minimum 80 mm substrate)
Roof Terraces	90	Intensive Green Roof & Permeable Roof Paving
Podiums	60	Intensive Green Roof & Permeable Roof Paving
Roads & Footpaths	80	Tree Pits, Porous Asphalt at parking/loading bays, Swales and Rain Garden/Bio-Retention

Refer to the SuDS layout and SuDS details in drawings STG-AEC-S1b-00-00-DR-C-0000505 – 00000506.

4.6 Compliance with Greater Dublin Strategic Drainage Study

Site investigations found infiltration is not present on the site. Therefore, in areas where interception (no runoff from the site for rainfall depths of 5 mm – GDSDS) requirements are not achievable, treatment of runoff is satisfied in accordance with the GDSDS. The criteria for surface water is summarised in Section 6.3.4 and Table 6.3 of the GDSDS.

Table 4.3: Compliance with GDSDS Table 6.3 criteria

Criteria	Sub-criterion	Return Period (Years)	Design Objective	Design Proposals
Criterion 1 River Water Quality Protection	1.1	<1	Interception storage of at least 5mm, and preferably 10mm, of rainfall where runoff to the receiving water can be prevented.	SuDS measures such as green roof, permeable paving, bioretention, swales, tree pits and porous asphalt have been proposed, where possible, to allow interception storage, through evapotranspiration. This criterion has not been satisfied and therefore treatment volume shall be provided as per sub-criterion 1.2.
	1.2	<1	Where initial runoff from at least 5mm of rainfall cannot be intercepted, treatment of runoff (treatment volume) is required. Retention pond (if used) to have minimum pool	Treatment volume will be provided through the proposed green roof, permeable paving, bioretention, swales, tree pits and porous asphalt, at or close to the source. See treatment volume calculations in Appendix K.

			volume equivalent to 15mm rainfall.	
Criterion 2 River Regime Protection	2.1	1	Discharge rate equal to 1 year greenfield site peak runoff rate or 2 l/s/ha, whichever is the greater. Site critical duration storm to be used to assess attenuation storage volume.	Runoff from the site will be restricted to a maximum of 9.8 l/s. This is based on a contributing area of 2.17 ha and a soil class of 4 (as site investigation found cohesive deposits to be clay). However, the 1 year peak runoff event will be further restricted due to the Hydrobrake's head/discharge relationship, as described further below. It is noted that while the outflow will be set to the Qbar Rate, the outflow is also a function of head. The maximum flow rate is achieved only at the maximum head of water in the attenuation tank (and momentarily just before the vortex starts to form), while for less head of water in the tank (as in the case of the 1 year return period event) the discharge rate is a function of the head-discharge relationship of the Hydro-Brake (flow control) device. This ensures that an appropriate/reasonable discharge flow rate is achieved for each return period event. Refer to Appendix I for surface water network calculations.
	2.2	100	Discharge rate equal to 1 in 100 year greenfield site peak runoff rate. Site critical duration storm to be used to assess attenuation storage volume.	The overall discharge rate proposed for the site is 9.8 l/s, which is achieved for the 100 Year Return Period Events.
Criterion 3 Level of Service (flooding) for the site	3.1	30	No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.	It is proposed that the Critical Duration Storm 100 Year Return Period event is fully contained within the attenuation tanks. No flooding occurs in the model on site for any event up to the 100 Year event + 20% climate change.
	3.2	100	No internal property flooding. Planned flood routing and temporary flood storage accommodated on site for short high intensity storms. Site critical duration events.	It is proposed that the Critical Duration Storm 100 Year Return Period event is fully contained within the drainage network. No flooding occurs on site for any event up to the 100 Year event + 20% climate change. Site levels have been proposed to ensure that in the highly unlikely event that ponding occurs, it will be situated away from the building access points. Runoff is directed towards SuDS features where possible.
	3.3	100	No internal property flooding. Floor levels at least 500 mm above maximum river level and adjacent on-site storage retention.	No flooding occurs on site for any event up to the 100 Year event + 20% climate change. It is also noted that the attenuation tank has minimum 460 mm cover, and the top of tank level is 17.77 (the top water level is lower than this in the model results) and neighbouring properties are minimum estimated at 18.19 m floor level (based on the closest level available from the topographical survey which is 3.5 m in front of the property, a 1:50 slope is assumed).

	3.4	100	No flooding of adjacent urban areas. Overland flooding managed within the development.	No flooding occurs on site for any event up to the 100 Year event + 20% climate change. Gullies are proposed at low points of the site and flows are directed towards SuDS/softscape where possible. Road levels contain multiple low points, so in the case of exceedance events, a large portion of runoff will be retained within the site. Refer to AECOM drawing no. 60639703-ACM-00-00-DR-CE-10-0550 for the overland flood routing.
Criterion 4 River Flood Protection (Criterion 4.1, or 4.2 or 4.3 to be applied)	4.1	100	"Long-term" floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only. 100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff.	This sub-criterion is not applied. Only one of the three sub-criteria is required to be applied.
	4.2	100	Infiltration storage provided equal in volume to "long term" storage. Usually designed to operate for all events. 100year, 6 hour duration storm to be used for assessment of the additional volume of runoff.	This sub-criterion is not applied. Only one of the three sub-criteria is required to be applied.
	4.3	100	Maximum discharge rate of Qbar or 2 l/s/ha, whichever is the greater, for all attenuation storage where separate "long term" storage cannot be provided.	A simulation for the surface water network was undertaken to ensure that all runoff from the site will be limited to 9.8 l/s. The drainage network provides sufficient capacity within the site to ensure that no flooding occurs for the critical duration storm of the 1 in 100 year event plus 20% climate change allowance.

Flood Risk is further discussed in the Flood Risk Assessment report (STG-AEC-S1b-00-00-RE-C-0000002).

4.7 Interception & Treatment Volumes

As per the GDSDS Volume 2, Interception is required at source (where practicable) as no run-off should be discharged to the receiving watercourse for rainfall depths of 5 mm. The benefits of interception are that the runoff characteristics will be more closely reflecting the existing greenfield runoff behaviour and the pollutants discharged with the small rainfall events could be retained within the system and naturally treated. The requirement is to provide a minimum volume of interception storage equalling 5 mm of runoff over 80% of all impermeable surfaces.

The GDSDS also requires that a "treatment volume" is to be provided to prevent any pollutants or sediments discharging into river systems, additionally a 'treatment train' stormwater runoff management system is required.

The treatment volume required is based on treatment 15 mm of rainfall depth from 80% of the runoff from impermeable areas.

Extensive green roofs are proposed at roof level and coverage is maximised, while allowing for mechanical plant. By maximising coverage, interception and treatment will be maximised, reducing the amount of runoff entering the drainage network.

Intensive green roof buildups are provided on amenity roof terraces and podiums, to intercept and treat runoff from these amenity spaces. The hardstanding on roof terraces and podiums is permeable paving, also allowing interception and treatment.

Hardstanding areas and roadways are proposed to drain to swales, tree pits and raingardens/bio-retention, allowing opportunity for runoff to be intercepted via evapotranspiration and the remainder to be treated as it filters through the substrate before entering the drainage network.

The SuDS design is being progressed, however the tables available in Appendix K give an indication of what coverage is required to provide sufficient interception & treatment.

5. Wastewater Drainage

5.1 Existing Wastewater Drainage

There is an existing 225 mm combined sewer which drains east, collecting the wastewater flow from The Coombe Women & Infants University Hospital (west of the site) and flowing eastwards, connecting to the existing 1,020 mm combined sewer running along Donore avenue. Please refer to Figure 5.1 for the extract of the Irish Water records map showing the identified foul sewers.

Refer to Appendix G for the full map of the Irish Water existing records drawing.

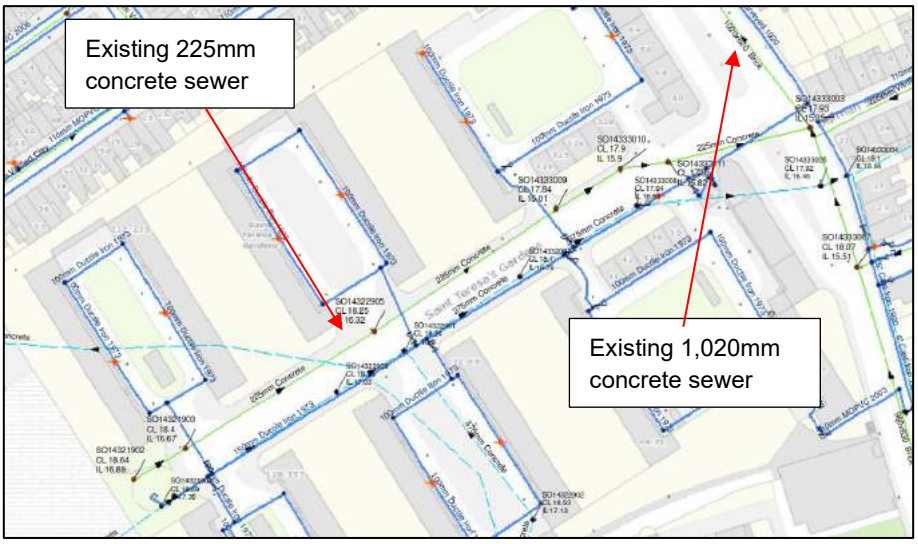


Figure 5.1: Existing Irish Water Foul Water Records

5.2 Proposed Wastewater Drainage Diversion

Its proposed to divert the existing foul sewer within The Coombe Women & Infants University Hospital grounds into the 225 mm foul sewer recently constructed by DCC along Margaret Kennedy Road.

As described in Section 4.3, the existing foul water line (grey 'FW' line) will remain live until the full diversion, shown in red in Figure 4.4, has been constructed as far as Margaret Kennedy Road. Manhole F29, was constructed as part of The Coombe Women & Infants University Hospital works (Diversion 1 - Phase 1), however the foul wastewater still flows southeast in the existing foul line (grey 'FW' line), until Diversion 1 - Phase 2 is completed and the manhole benching at F29 is altered so the wastewater flows northeast as per the diversion route.

Irish Water issued a Diversion Confirmation of Feasibility (DIV21217) on 31st March 2022, refer to Appendix D.

5.3 Proposed Wastewater Network

AECOM submitted a Pre-Connection Enquiry Form to Irish Water on the 9th February 2021 in order to establish the feasibility of connecting to the existing network. The customer reference number is CDS21000854. To allow for changes to the Schedule of Accommodation, AECOM assumed a conservative estimate of 750 no. units at the time of submitting the pre-connection enquiry to Irish Water.

A Confirmation of Feasibility was issued on the 1st October 2021 (refer to Appendix B), which states the peak discharge from the development must be limited to 2DWF (dry weather flow) using a throttle or pump.

AECOM engaged with Irish Water regarding the restriction of peak discharge to 2DWF. It was explained that the Pre-Connection Application was submitted with an estimated 750 no. units. Given, the proposal is now for approx. 200 units less than this, it was agreed that it would not be required to limit the peak discharge.

The proposed development now consists of 543 no. residential units, the associated wastewater discharge of the development is estimated in Table 5.1.

Under-croft car parks have the potential to discharge runoff which is highly concentrated of hydrocarbons as the car parks wouldn't receive rainfall directly, but instead receive minimal runoff from what is brought in from wet vehicles. It is therefore required by DCC that surface water discharges to the wastewater network.

Irish Water have issued the Statement of Design Acceptance for the submitted design proposal, refer to this Statement in Appendix D.

Table 5.1: Estimated Wastewater Discharge

Use	Proposed (units or sqm.)	Associated Population	Foul Discharge (l/s)	Peak Flow (l/s)
Residential	543 units	1466	2.80	8.40
Creche	664 m^2	150	0.31	1.38
Retail units	348 m^2	20	0.04	0.18

Notes:

1. Domestic calculations based on a national average of 2.7 persons/house (Irish Water Code of Practice)
2. Domestic calculations based on foul loading 165 l/p/d as per Irish Water Requirements
3. Domestic peak factor equals to 3 as per Irish Water requirements (population between 0 - 750)
4. Creche/commercial loading based on table 3 of "Wastewater Treatment Manual" by EPA.
5. Creche/commercial peak factor equals to 4.5 as per Irish Water requirements (area between 0 - 5.5ha).

The proposed foul water layout will be designed in accordance with the Irish Water Code of Practice and Standard Details for the Wastewater Infrastructure. Refer to Appendix L for wastewater drainage model results and longsections.

For details of the proposed foul water drainage layout and diversion proposal, refer to AECOM Drawings no. STG-AEC-S1b-00-00-DR-C-0000501 – 0000504.

6. Watermain Infrastructure

6.1 Existing Watermain Infrastructure

There is an existing 6” watermain located along Donore Avenue as identified by the Irish Water Record drawings.

As shown on drawing STG-AEC-S1b-00-00-DR-C-0002701_WatermainLayout, it is proposed to connect the site at two locations, to a 200 mm (estimated from the utility survey) to the south and to a 6” watermain to the east, in Donore Avenue.

Irish Water have issued the Statement of Design Acceptance for the submitted design proposal, refer to this Statement in Appendix D. As part of these design discussions, Irish Water noted that the connection locations shown would be assessed at connection application stage, given different connection points are proposed to what is set out in the CoF. Refer to Section 2.2 for further detail.

The connection to Donore Avenue is also a diversion of an existing 100 mm watermain which traverses the site, from The Coombe Women & Infants University Hospital to Donore Avenue. Irish Water issued a Diversion Confirmation of Feasibility (DIV22181) on the 17th August 2022, included in Appendix F, for this portion of the diversion required.

DIV21315 has been issued for other sites within the SDRA, which shows a portion of the required diversion. Irish Water have advised two separate Diversion Confirmation of Feasibilities can’t be issued for the same site. Therefore, this diversion is referenced on drawing STG-AEC-S1b-00-00-DR-C-0002701_WatermainLayout.

6.2 Proposed Watermain Infrastructure

The Irish Water Code of Practice for the Water Infrastructure provide a guide for sizing of watermains based on the number of properties (refer to Table 6.1).

Table 6.1: Extract from the Irish Water Code of Practice for Water Infrastructure, Section 3.7

Table: Typical Main Size for Multiple Properties

Number of Dwellings	Typical Pipe Outside Diameter (Polyethylene Pipes)	Nominal Bore (Other materials)
1 to 5**	Up to 63mm	Up to 50mm*
5 to 40**	90mm	80mm
40 to 100	110/125mm	100mm
100 to 300	160/180mm	150mm
300 to 700	225mm	200mm

Block DCC1 (111 no. units) will connect to the proposed 150 mm watermain.

Block DCC3 (247 no. units) is proposed to be supplied by a service connection from the proposed 200 mm watermain.

Block DCC5 (132 no. units) and block DCC6 (53 no. units) are both proposed to connect to a proposed 150 mm watermain as part of the proposed development.

Separate service connections are proposed for the 1No. creche and 3No. café/retail units located at ground floor level.

The proposed development consists of 543 no. residential units, the associated water demand of the development is estimated in Table 6.2 below.

Table 6.2: Estimated Water Demand

Use	Proposed (units or sqm.)	Associated Population	Average Water Demand (l/s)	Peak Demand (l/s)
Residential	543 units	1466	2.55	15.91
Creche	664 m^2	150	0.11	0.69
Retail units	348 m^2	20	0.01	0.109

Notes:

1. Domestic calculations based on a national average of 2.7 persons/house (Irish Water Code of Practice)
2. Domestic calculations based on per-capita consumption of 150 l/p/d, as per Irish Water requirements
3. Day/week peak demand as 1.25 times the average daily domestic demand, as per Irish Water requirements
4. Peak demand as 5 times the average day/peak week demand, for sizing of the pipe network, as per Irish Water requirements
5. Associated commercial population 1 for 17 m^2 based on a food superstore in 'Employment Densities Guide' published by Drivers Jonas Deloitte.

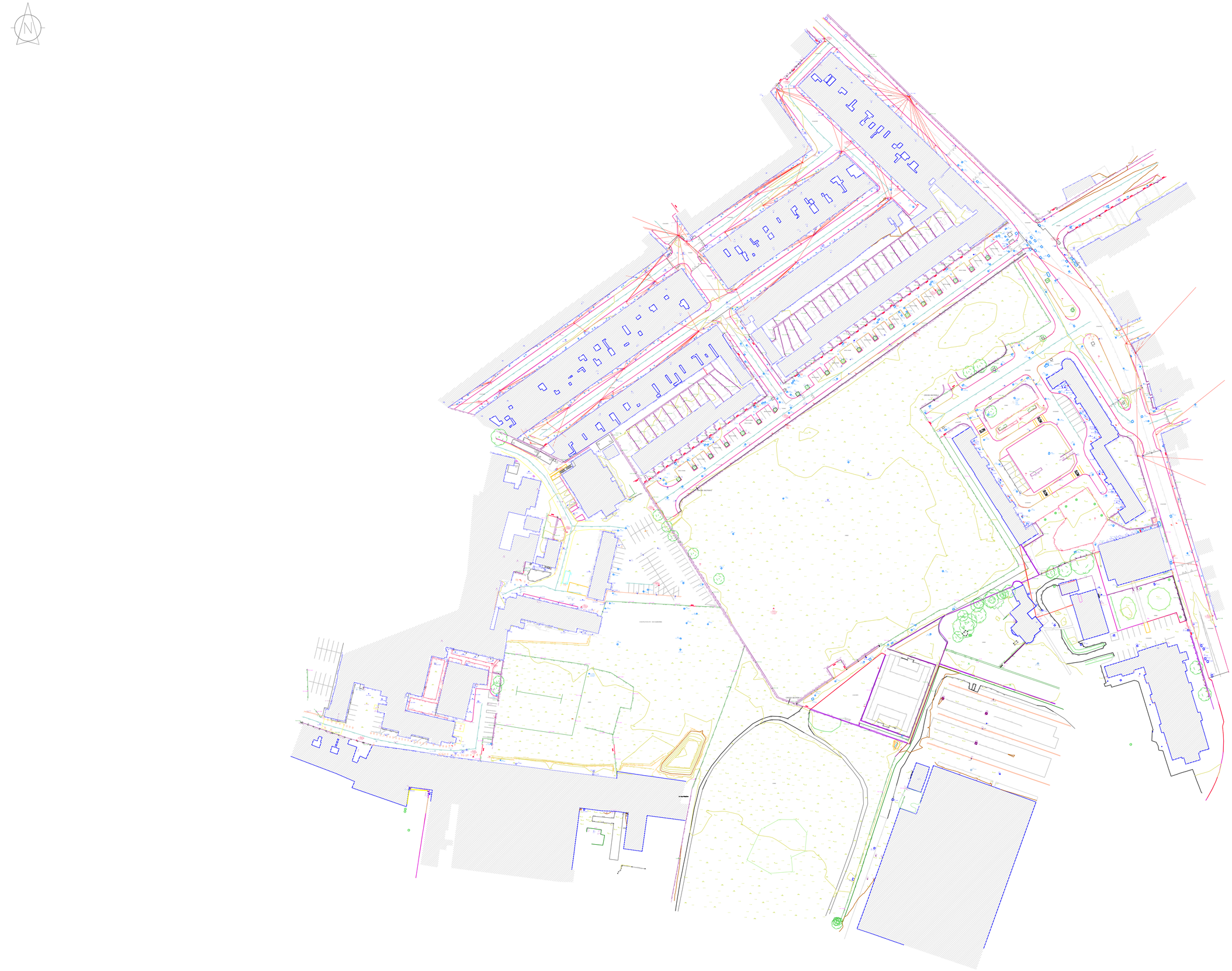
The watermain and drainage layouts have been designed to allow planting where possible. Proposed planting should be designed in accordance with Irish Water standard details STD-WW-06A and STD-W-12A (wastewater and watermain respectively).

The following Irish Water requirements provided constraints to the positioning of the watermain;

- the watermain shall be positioned in the footpath where possible,
- keeping a distance of 3 m from the building (for a 150 mm diameter watermain),
- hydrants must be positioned a minimum of 6 m from buildings,
- off-line hydrants must be a maximum of 3 m from the watermain, and
- hydrants must be located to allow fire tender access to dry riser locations.

The proposed watermain network is designed in accordance with the Irish Water Code of Practice and Standard Details for Water Infrastructure. Irish Water have issued the Statement of Design Acceptance for the submitted design proposal, refer to this Statement in Appendix D.

Appendix A – Topographical & Utility Surveys



LEGEND

Street furniture & Services

- Over Head Wires (LUAS) - Pylon ESB
- Flowerbed
- Pipe
- Lift
- Barrier
- Pump
- Trial Pit
- Bus/Tram Shelter
- Postbox
- Valve - General
- Water Valve
- Gas Valve
- Sluice Valve
- Air Valve
- Stop Cock
- C P Post
- Marker Post
- Traffic light
- Parking Meter
- Plane Aerial Mark
- Smart Card Validator
- Unknown Valve
- Road Sign
- Bus Stop
- Bollard
- Beacon
- Coalhole Cover
- Bore Hole
- Electricity Pole
- Telegraph pole
- OCS Pole
- CCTV Camera Pole
- Lamp Post
- Foul Manhole
- Surface Water MH
- Manholes
- Air Conditioning Vents
- Services Inspection Cover
- Traffic Inspection Cover
- Cable TV Inspection Cover
- ESAT Inspection Cover
- NTL Inspection Cover
- Eircom Inspection Cover
- Rodding Eye
- Phone Box
- Bench Seat
- Kiosk
- Gully
- Waste Bin
- Hydrant
- Fire Hydrant
- ESB Box
- ESB Inspection Cover
- Traffic Control Box
- LUAS Technical Cubicle
- Ticket Vending Machine
- Water Meter Cover
- Telecom Inspection Cover
- Monument / Toilets
- Tank Storage
- Basement: MH, Cover & Pipe
- Dished Aerial Mark
- Stay for pole
- Pipe Protection
- Washout

Natural Features

- Surface Change
- Land Drain
- Bottom of Slope
- Top of Slope
- Ditch
- Water Edge / Lake / Pond
- Hedge / Trees Drip Line / Vegetation
- Tree Coniferous
- Water Level
- Crown Level
- Invert level
- Bed Level
- Spotheight
- Tree Deciduous

Golf

- Fair Way
- Green
- Tee Box

Other

- Survey Station
- Photo point
- Top of Tree

Built Features

Roads & Road Markings

- Building
- Edge of Road
- Kerb Bottom
- Kerb Top
- Bridge Abutment
- Bridge Deck
- Bridge Parapet
- Building Façade
- Footpath / Platform Train & Tram
- Damp Proof Course / Verge
- Bridge Pier / Wall & Gate Pillar / LUAS Trackbed
- Cycleway / Private Landing Area
- Fence
- Gate
- Road Centreline
- Top of Wall
- Hoarding
- Property Line
- Road Scar
- Top of Fence
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- Apex Height
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North

Site Location

Map Sheet Layout:

Surveyed by :	MC	Date: 25.04.2021	Datum : Malin Head
Drawn by :	MC	Date: 20.05.2021	Grid System:
Checked by :	PK	Date: 21.05.2021	Irish National Grid ☐ ITM ■

Revisions

No.	Date	Description
0	21.05.2021	First Drawing
1	08.07.2021	Missing features and Spot Levels added.

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Topographic surveys, Measured Building Surveys, Setting-Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping, Pipeline Surveys, Services Location, Ground Penetrating Radar, Laser Scanning, Rectified Photography

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Email: info@murphygs.ie

Client :	AECOM
Project :	Topo & GPR St Theresa's Gardens
Date : 21.05.2021	Scale : NTS
Description :	Topographical Survey
Drawing Number :	MGL39995_T_ITM_Rev1-00

LEGEND

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- Over Head Wires (LUAS) - Pylon ESB
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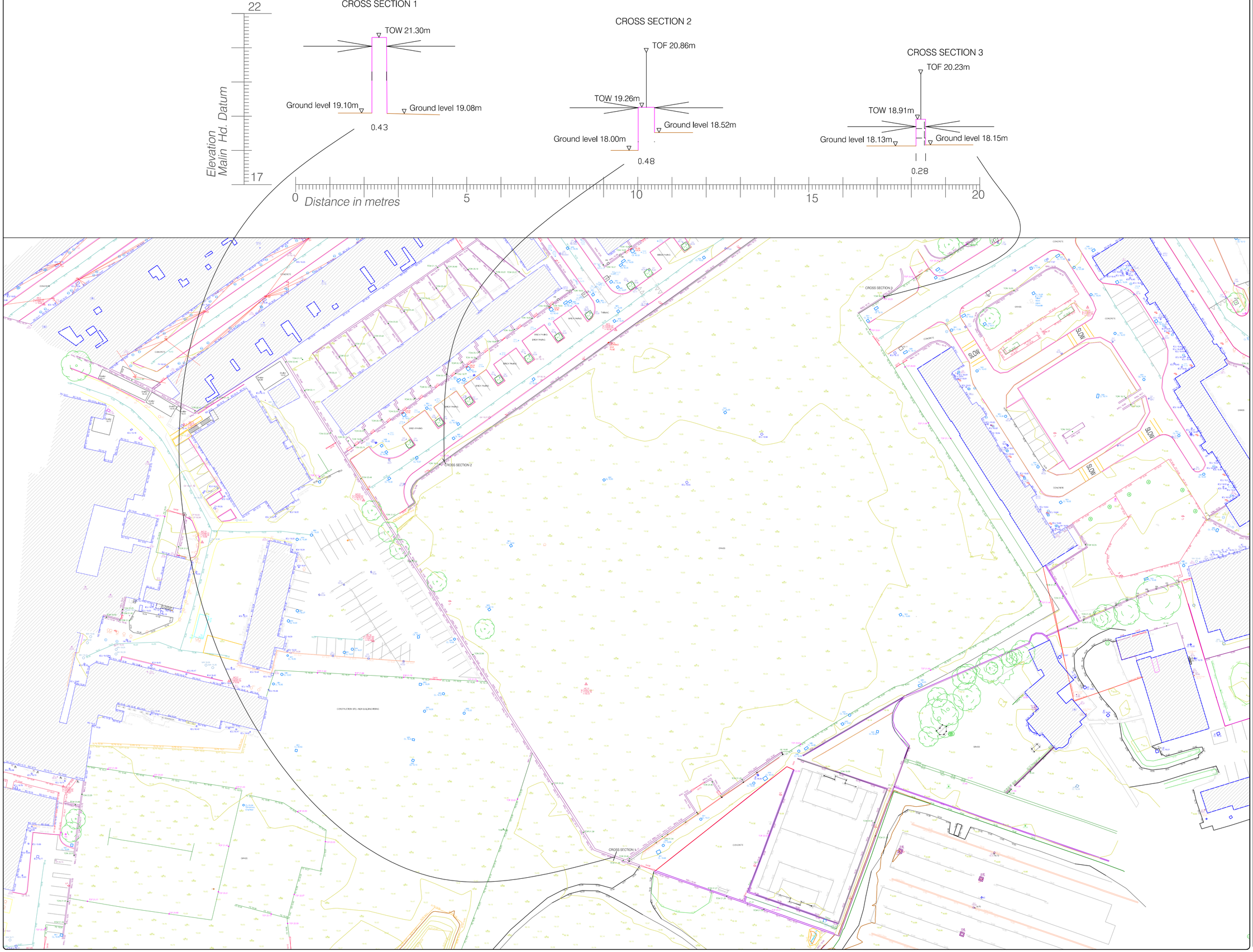

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Drawn by : MC	Date: 20.05.2021	Grid System:	
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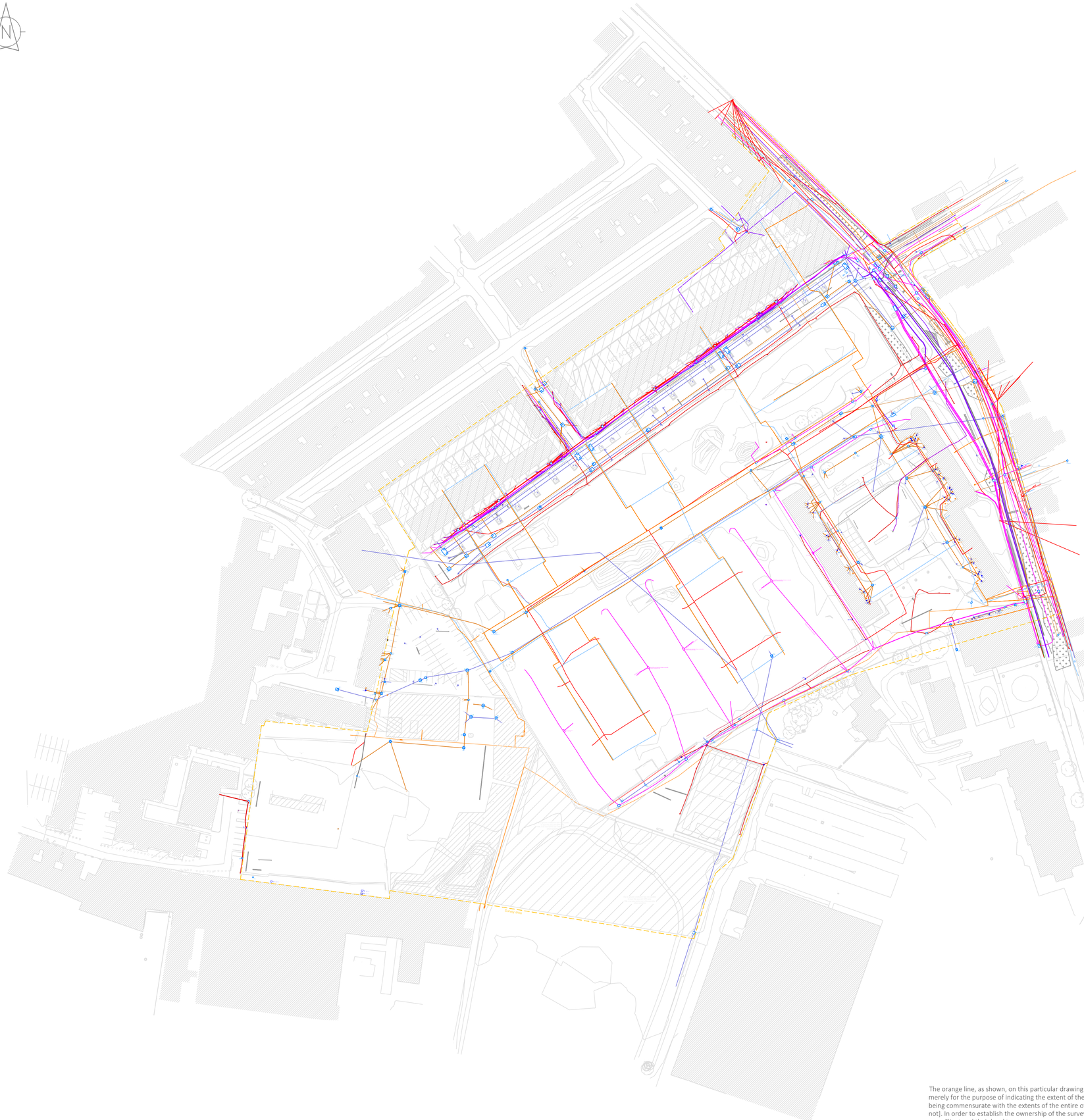
Global House
Kilcullen Business Campus
Kilcullen Co. Kildare, Ireland
Phone: (+353) 045 484040
Fax: (+353) 045 484004
Email: info@murphygs.ie

Client :	AECOM
Project :	Topo & GPR St Theresa's Gardens
Date : 21.05.2021	Scale : 1:50@A1
Description :	Typical wall sections
Drawing Number :	MGL39995_T_ITM_Rev1-02



LEGEND
Underground Utilities

- WM — Water Main
- FW — Fire Water
- PW — Process Water
- SW — Storm Water Drainage
- FS — Foul Sewer
- CS — Combined Sewer
- Manhole Chamber
- Eir — Eircom
- Vir — NTL/Virgin
- Enet — ENET/OCEAN
- BT — BT/ESAT
- Colt — Colt
- Aurora — Aurora
- Bend / Weld
- Oxy — Oxygen Pipe
- WELD — Weld Point
- Gas — Gas
- Hydro — Hydrogen Pipe
- Oil — Oil Pipe
- Mag — Magnet
- Ad — Adshel
- Traf — Traffic
- Heat — Heating Pipe
- Elec — Electrical
- PL — Public Lighting
- GPR Anomaly
- Unk Duct — Unknown Cable Duct
- Unk — Unknown Empty Duct
- Nitrogen — Nitrogen Pipe
- Unk Ser — Unidentified Service
- UR — Unidentified Radio Signal
- UP — Unidentified Power Signal
- Photo point
- Reinforced Concrete (GPR)
- Possible Slab (GPR)
- Other observations - see description (GPR)
- (DP0.45) — Depth from ground level to Top of Pipe/GPR Target (m)
- (D150 PE) — Pipe/Duct diameter (mm) and material
- S/L Signal Lost
- T/L Trace Lost
- N/S No Signal
- Exp Exposed
- Off Off-site
- UTT Unable to trace
- UTS Unable to sonde
- Blck Blocked
- CD Closed Duct
- FO Fibre Optic
- Unk Unknown
- Ab Abandoned
- (Ass) Assumed
- (Records) Utility taken from records
- CC Concrete
- VC Vitrified Clay
- BR Brick
- CI Cast Iron
- DI Ductile Iron
- ST Steel
- Poss./Prob. Possible/Probable
- AC Asbestos Concrete
- PE Polyethylene
- S1 — Survey Station

The orange line, as shown, on this particular drawing and bounding the entire of the utility survey area is merely for the purpose of indicating the extent of the area that was surveyed. It must not be taken as being commensurate with the extents of the entire of the plot of ground that the Client may own [or not]. In order to establish the ownership of the survey area Murphy Geospatial do advise consulting with your Client and their legal team.

Murphy Geospatial Ltd. Disclaimer

The survey aims to map all existing utilities and sub surface structures and provide information with respect to pipe size, material type and drainage connectivity. However GPR surveying is limited by the following guidelines and it may not be possible to accurately survey, define and locate all services and sub surface features.

- Locational accuracy is determined by referring to the manufacturers guidelines for the detectors used.
- Existing record information showing underground services is often incomplete and unknown accuracy; therefore it should be regarded only as an indication.
- In ideal conditions these spatial accuracies for the underground utilities are +/- 5% for the RD4000 and +/- 10% of depth for the GPR to 2.5m deep. However, variations within the subsurface may alter this estimated accuracy.
- Although all reasonable steps have been taken to locate all features, there is no guarantee that all will be shown on the drawing as some above ground features may have obstructed the survey.
- GPR surveying operates best within high resistivity material. Clay overburden can impair GPR surveying.
- Due to the attenuation of the radar signal with depth, resolution is restricted, hence making identification of anomalies difficult with increasing depth.
- The depth penetration and quality of the data depends on the ground conditions on the site. Poor data may be a result of areas with high conductivity. Also, high reflective materials close to the surface i.e. rebar may hide deeper anomalies.
- It is not always possible to trace the entire length of each underground service.
- It is always our intention to use the Utility providers' details, if supplied prior to survey commencement as a guide for location purposes. However, should we not be able to locate those guided services we shall not be held responsible for the accuracy, or otherwise, of the location of that service, as issued by the utility provider and therefore shown "Taken from Records" on the drawing and we are not liable for any loss that may arise due to the lack of accuracy in the guided information.
- Unless otherwise stated, all services and sub surface structures shown on Murphy Geospatial Limited plan drawings have been surveyed using approved detectors and the connections between manholes, if not traced, are assumed to run straight.
- Plan accuracies of the order of + or - 150mm may be achieved but this figure will depend on the depth of the service below ground level. Where similar services run on close proximity, separation may be impossible. Successful tracing of non metallic pipes may be limited.
- Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate.
- Services which have been untraceable are shown from Records where possible.
- DP represents distance from the surface level to the top of the service/ radar.

No allowance has been made within our quotation, unless otherwise stated, for the location and mapping of undeclared services. Failure to detect or fully map any declared service will be recorded within the notes accompanying our final drawings.
Where technically possible, depth indications will be given. These should be used for guidance only and wherever critical accuracy is required these should be confirmed by the Client by undertaking trial excavations or similar. Bends, lateral service connections, or the close proximity of other services and local magnetic, atmospheric or ground conditions, could in certain situations influence the accuracy of the plan and depth indication facility. Depths will not be provided unless we are reasonably confident of their validity.
Where Murphy Geospatial Limited issues a CAD drawn utility service plan, this should be read in conjunction with all available public utility records etc. As part of our exhaustive Quality Control procedures, Murphy Geospatial Limited Endeavour to add relevant Public Utility record information onto the final issue drawing. An allowance should be made for the width of services, particularly where these are laid in bands or are of significant size etc. For clarification or appropriate easement bands, we would recommend that direct contact is made with the Asset Owner or Statutory Undertaker.
We exclude the following, except where otherwise specified and possible to do so;

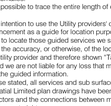
- All private service connections, (including water or gas fittings where no through flow of applied signal is possible.
- Pot ended or disconnected cables or terminated short lengths of pipe.
- Internal building services
- Fibre optic cables (except where laid with a standard communications cable or built in tracer wire or similar conductor system) or can be clearly located using ground penetrating radar.
- Small diameter cables less than 17mm diameter, or pipes less than 38mm diameter.
- Above ground services unless specifically requested.
- Lifting manhole covers which require longer than 10 minute effort using standard heavy duty lifting apparatus.
- Services positioned directly below other pipes or cables etc (i.e. masking signal) - intrusive verification options available on request.
- Deep non metallic pipes, ducts or culverts (unless probing or Pipe Track 3d is specified as part of the fully invasive survey option).
- Passing through detective pipework (displaced joints etc) or acute bends between access points.

Please note that our Quotation does not allow for location of individual service feeds to properties unless reasonable to do so, as access would be required into each property to apply direct connections to inlet points and this would significantly increase the scope of work, survey cost and also cause possible disruption to occupants.
All work carried out by Murphy Geospatial Limited (MGL) conforms to the guidelines set out by The Survey Association (TSA).

North

Site Location

Map Sheet Layout:



Surveyed by:	MG	Date: May 2021	Datum: Malin Head
Drawn by:	AB, DS	Date: 27.09.2021	Grid System:
Checked by:	DS	Date: 27.09.2021	Irish National Grid ☐ ITM ☒

Revisions

No.	Date	Description
0	09.07.2021	First Drawing
1	27.07.2021	Revision 1
2	20.08.2021	Revision 2
3	27.09.2021	Revision 3

Murphy GEOSPATIAL

Topographic surveys, Measured Building Surveys, Setting-Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping, Pipeline Surveys, Services Location, Ground Penetrating Radar, Laser Scanning, Rectified Photography

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Client :	AECOM
Project :	St. Teresa's Gardens
Date : 27.09.2021	**Scale :** NTS@A1
Description :	Utility Survey
Drawing Number :	**MGS39995_U_Rev3**

Appendix B – Irish Water Confirmation of Feasibility

AECOM / Neil Byrne

4th Floor Adelphi Plaza
Upper George St, Dun Laoghaire
Co. Dublin
A96T927

1 October 2021

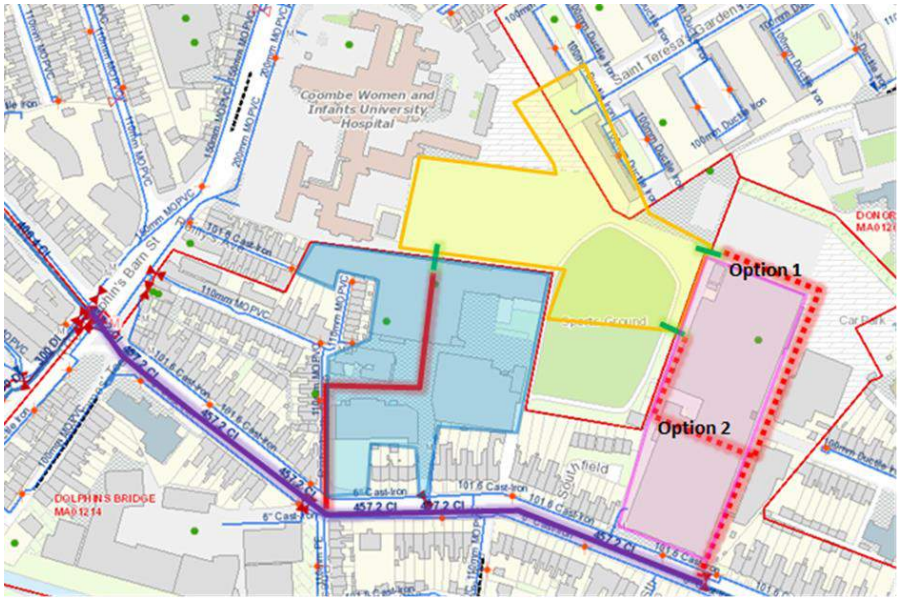
Re: CDS21000854 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 750 units at St Teresa's Gardens, Donore Avenue, Dublin 8, Dublin

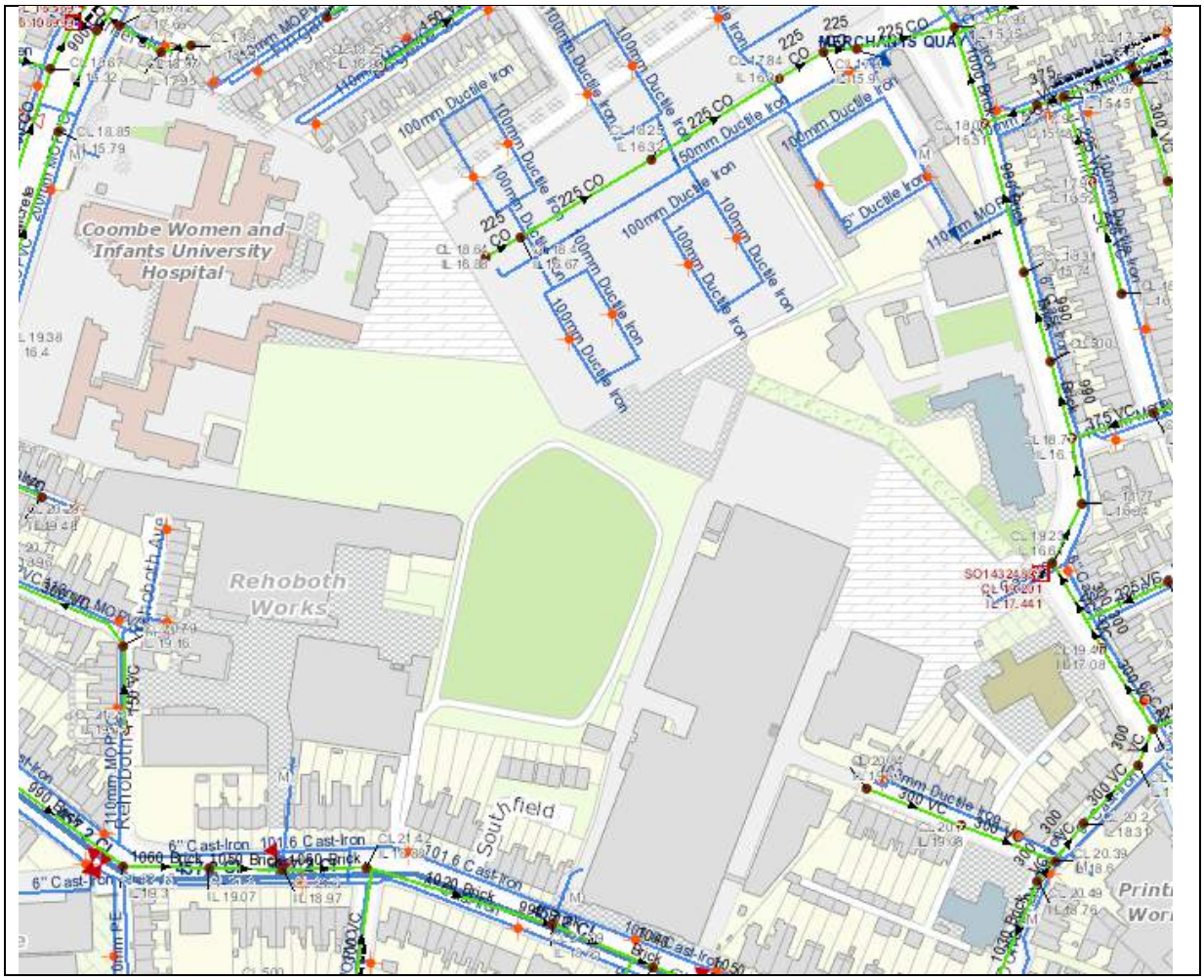
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at St Teresa's Gardens, Donore Avenue, Dublin 8, Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible Subject to upgrades
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	The proposed connections are via adjacent developments (Bailey Gibson W) w ' G R p m A A relevant core water infrastructure within the Area have to be completed, of adequate capacity and integrity, connected to the Irish Water networks and in operation prior the connection. Connection main (with installed DMA meter and telemetry) should be 200mm ID pipe connected to the new 250mm ID pipe within Bailey Gibson Site. Secondary connection main should be 200mm ID pipe with control valve, set to closed during normal operations.

	A 1 ” I m R b p 450/500mm ID main (seen below in purple) 
Wastewater Connection	The Customer is to limit the peak discharge to 2DWF. This can be done with either a throttle or a pump. The Customer will need to provide a documentation regarding how the flows will be managed prior to a connection application. The proposed connection is via adjacent development (Player Willis Site) w ’ G R p m A A wastewater infrastructure within the Area have to be completed, of adequate capacity and integrity, connected to the Irish Water networks and in operation prior the connection.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

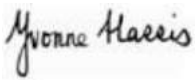
General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.

3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Marina Byrne from the design team via email mzbyrne@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Appendix C – Irish Water Correspondence

Magee, Dara

From: Marina Zivanovic Byrne <mzbyrne@water.ie>
Sent: 04 February 2022 15:49
To: Budal, Thamara
Subject: [EXTERNAL] RE: CDS21000854 St Teresa's Gardens, Donore Avenue, Dublin 8

Hi Thamara,

My apologies for the late response.
The upgrade is no longer required for the connection.
The 18'' CI trunk main will be replaced with a new pipe by Irish Water as the project is now on IW CIP list and the Developer is not required to wait for completion of the works.

Kind Regards,

Marina

From: Budal, Thamara <thamara.budal@aecom.com>
Sent: Tuesday 14 December 2021 13:45
To: Marina Zivanovic Byrne <mzbyrne@water.ie>
Subject: RE: CDS21000854 St Teresa's Gardens, Donore Avenue, Dublin 8

Hi Marina

Hope you are doing well.

I just have a quick query in relation to the COF attached. It is said there is an upgrade required on the existing watermain on South Circular road from 18" to 450/500mm. However, 18" = 457.2mm so I understand this is already 450 (internal)/500(external) diameter unless I am not reading this correctly.

Could you please clarify? We just want to ensure the client has all the necessary information related to the upgrades.

Appendix D – Irish Water Statement of Design Acceptance

Neil Byrne
4th Floor Adelphi Plaza
Upper George Street
Dun Laoghaire
Co. Dublin A96T927

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

8 July 2022

Re: Design Submission for St Teresa's Gardens, Donore Avenue, Dublin 8, Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS21000854

Dear Neil Byrne,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Dario Alvarez
Email: dalvarez@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

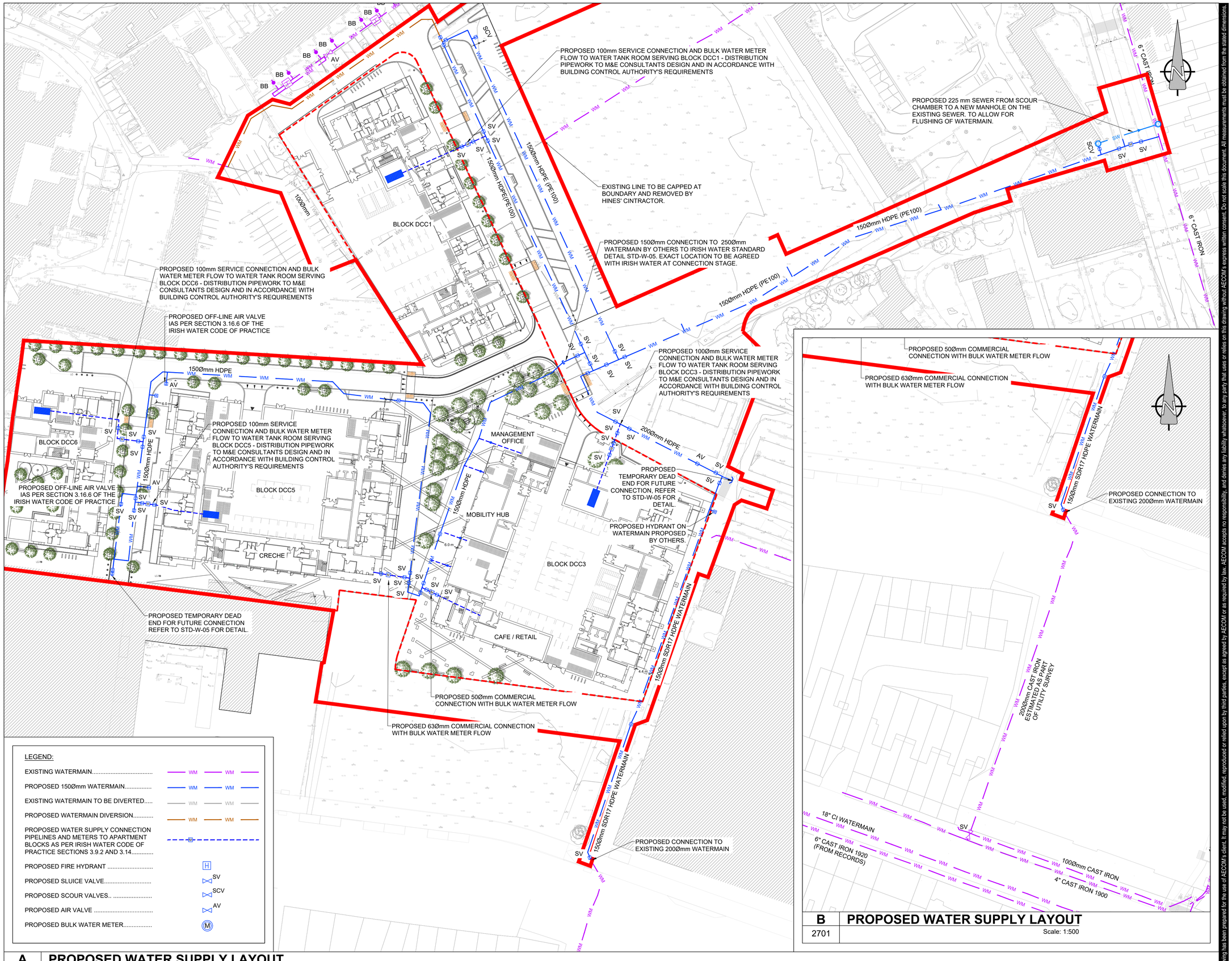
Document Title & Revision

- [STG-AEC-S1b-00-00-DR-C-0002700_WatermainLayout]
- [STG-AEC-S1b-00-00-DR-C-0000500_DrainageLayoutOverallPlan]
- [STG-AEC-S1b-00-00-DR-C-0000501 to DR-C-0000504 _DrainageLayoutSheet 1 to 4]

Standard Details/Code of Practice Exemption: N/A

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.



A	PROPOSED WATER SUPPLY LAYOUT
2701	Scale: 1:500

B	PROPOSED WATER SUPPLY LAYOUT
2701	Scale: 1:500

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 696-6220
www.aecom.com

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. DO NOT SCALE. ALL MEASUREMENTS AND CO-ORDINATES TO BE CHECKED ON SITE.
6. CONTRACTOR TO REQUEST EXISTING RECORD DRAWINGS PRIOR TO COMMENCEMENT OF WORKS.
7. REFER TO IRISH WATER STANDARD DETAILS STD-W-12A AND STD-WW-08A FOR GUIDANCE ON PLANTING IN PROXIMITY TO WATERMAIN SERVICES.
8. THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
9. THE DEVELOPMENT SHALL HAVE A BULK WATER METER (EXACT LOCATION TO BE AGREED WITH IRISH WATER) IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE SECTION 3.15.4.
10. ALL PROPOSED WATERMAIN PIPEWORK TO BE HDPE WITH MINIMUM PE80 RATING IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
11. THE MINIMUM PIPE DIAMETER PROPOSED IS 100mm.
12. ALL WATERMAINS WILL HAVE A MINIMUM COVER OF 900mm. ALL SERVICE PIPES CONNECTING PROPERTIES WILL HAVE MINIMUM COVER OF 750mm.
13. HYDRANTS SHALL BE DOUBLE FLANGED DRILLED TO PN16 AND SHALL COMPLY WITH BS EN 14339, IS EN 1074 PART 6 AND 135 750. REFER TO IRISH WATER CODE OF PRACTICE FOR WATER INFRASTRUCTURE SECTION 3.16.5.
14. SLUICE VALVES HAVE BEEN PROVIDED SO THAT INDIVIDUAL SECTIONS CAN BE ISOLATED & WILL COMPLY TO BS 5163. THE DEPTH OF THE SLUICE VALVE SPINDLE CAP BELOW FINISHED GROUND WILL NOT EXCEED 300mm.
15. ALL WATERMAIN DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
16. HYDRANTS LOCATION & THE HYDRANT TYPE IS TO BE DETERMINED IN ACCORDANCE WITH DUBLIN CITY COUNCIL, IRISH WATER & THE CHIEF FIRE OFFICER'S REQUIREMENTS.
17. PROPOSED TREES WITHIN LANDSCAPED AREA TO BE PROVIDED WITH ROOT PROTECTION SYSTEM WITH NA APPROXIMATE DEPTH OF 1m.

AECOM
DRAFT

ISSUE/REVISION

B	30/06/2022	SODA & DRAFT ISSUE
A	01/06/2022	ISSUED FOR INFORMATION
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60648061

SHEET TITLE

PROPOSED WATER SUPPLY LAYOUT

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0002701

LEGEND:

- PROPOSED SURFACE WATER..... SW
- PROPOSED FOUL WATER..... FW
- EXISTING FOUL WATER..... EX_FW
- EXISTING COMBINED SEWER..... EXST_CS
- EXISTING SURFACE WATER..... EX_SW
- EXISTING FOUL WATER TO BE DECOMMISSIONED..... EX_FW
- EXISTING SURFACE WATER TO BE DECOMMISSIONED..... EX_SW
- DRAINAGE LINE REMOVED BY DCC..... EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY.....
- PROPOSED ATTENUATION TANK.....
- PROPOSED ACO DRAIN AND RECESSED COVERS.....
- PROPOSED PETROL & OIL INTERCEPTOR.....
- PROPOSED LAND DRAIN.....
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....

DRAWING 0501

DRAWING 0502

COOMBE/PUBLIC OWNERSHIP IS SEPARATED BY BOUNDAY WALL

EXISTING LINES TO BE CAPPED. HINES' CONTRACTOR TO REMOVE LINES AS PART OF PITCH CONSTRUCTION

EXISTING SURFACE WATER LINE NEWLY BUILT TO ALLOW DIVERSION OF EXISTING SURFACE WATER NETWORK FROM COOMBE HOSPITAL WHICH WILL BE MADE LIVE FOLLOWING DIVERSION OF PUBLIC NETWORK INTO PROPOSED NETWORK (THIS LINE WILL ONLY SERVE THE COOMBE CATCHMENT)

EXISTING SURFACE WATER SEWER STILL SERVING THE COOMBE HOSPITAL. WHEN CONSTRUCTION OF THE DONORE PROJECT STARTS, FLOW WILL BE DIVERTED INTO THE NEWLY BUILT SURFACE WATER NETWORK

SURFACE WATER LINE SERVING THE UNDERCROFT LEVEL OF BLOCK DCC1 ONLY

PROPOSED 225 mm SEWER FROM SCOUR CHAMBER TO A NEW MANHOLE ON THE EXISTING SEWER. TO ALLOW FOR FLUSHING OF WATERMAIN.

AS PER THE EXISTING ARRANGEMENT, NO OUTFLOW TO A NETWORK IS PROPOSED FROM THE 1030 CULVERT, WHICH ACTS AS STORAGE. HOWEVER, THE 450mm SEWER WHICH ORIGINATES IN THE SOUTH CIRCULAR ROAD IS DIVERTED INTO THE PROPOSED DEVELOPMENTS NETWORK.

PROPOSED MANHOLE FOR MAINTENANCE OF EXISTING LINE.

EXISTING SURFACE WATER MANHOLE IS A HIGH POINT IN BOTH THE NETWORK TO THE WEST (COOMBE GROUNDS) AND EAST (MASTERPLAN SITE)

PROPOSED TEMPORARY DIVERSION OF 150Ømm EXISTING SURFACE WATER LINE (ATTENUATION IS DESIGNED FOR THE MASTERPLAN SITE)

SILT TRAP TO BE PROVIDED ON MANHOLE. EXISTING LINE IS NOTED TO BE TRANSPORTING SILT DOWNSTREAM.

DRAWING 0503

DRAWING 0504

PROPOSED NEW MANHOLE OVER EXISTING SURFACE WATER LINE TO ALLOW DIVERSION AND CONSTRUCTION OF THE PROPOSED BLOCK

NOTE:
BLUE BOUNDARY LINE TO DIFFERENTIATE BETWEEN TOPOGRAPHICAL INFORMATION PROVIDED TO AECOM BY 'LAND DEVELOPMENT AGENCY' (INSIDE) AND 'HINES' (OUTSIDE).

A	PROPOSED DRAINAGE LAYOUT
0500	SCALE: 1:750

SEE: INSET B

B	PROPOSED DRAINAGE LAYOUT
0500	SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 696-6220
www.aecom.com

NOTES

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2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. DO NOT SCALE, ALL MEASUREMENTS AND COORDINATES TO BE CHECKED ON SITE.
6. THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
7. MANHOLE COVERS IN PUBLICLY ACCESSIBLE AREAS SHALL BE HEAVY DUTY CAST IRON OR HEAVY DUTY CAST IRON, CLASS D400, DOUBLE SEALED AND LOCKABLE TYPE COMPLYING WITH BS EN 124:2015.
8. GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
9. EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
10. SURFACE WATER & FOUL PIPES LESS THAN 1.2m BELOW THE ROAD SURFACE OR LESS THAN 0.9m IN NON-TRAFFICKED FOOTPATHS AND LANDSCAPE AREAS (WITH AN ABSOLUTE MINIMUM DEPTH OF COVER ABOVE THE EXTERNAL CROWN OF THE PIPE Ø 750mm) SHALL BE PROTECTED FROM DAMAGE BY PROVIDING MINIMUM 150mm THICK CONCRETE C16/20 HAUNCH IN ACCORDANCE WITH IS EN 12620.
11. ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
12. CCTV SURVEY TO BE CONDUCTED PRIOR TO COMMENCEMENT OF ANY WORKS TO DETERMINE THE CONDITION AND VERIFY LEVELS OF THE EXISTING FOUL AND SURFACE WATER PIPES/MANHOLES TO BE REPORTED AND CORRECTED.
13. ALL SURFACE WATER DRAINAGE DETAILS TO BE IN ACCORDANCE WITH THE GREATER DUBLIN STRATEGIC DRAINAGE STUDY AND THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR THE DRAINAGE WORKS.
14. ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
15. ALL PROPOSED FOUL SEWER LAYOUT SHALL BE BUILT IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE AND STANDARD DETAILS STD-WW-02 & STD-WW-03.

AECOM
DRAFT

ISSUE/REVISION

I/R	DATE	DESCRIPTION
F	01.07.2022	DRAFT PLANNING ISSUE
E	21.06.2022	ISSUE FOR SODA TO IW
D	10/06/2022	ISSUED FOR DCC DISCUSSION
C	01/06/2022	ISSUED FOR DCC DISCUSSION
B	06/05/2022	ISSUED FOR DCC DISCUSSION
A	28/04/2022	ISSUED FOR DCC DISCUSSION

PROJECT NUMBER

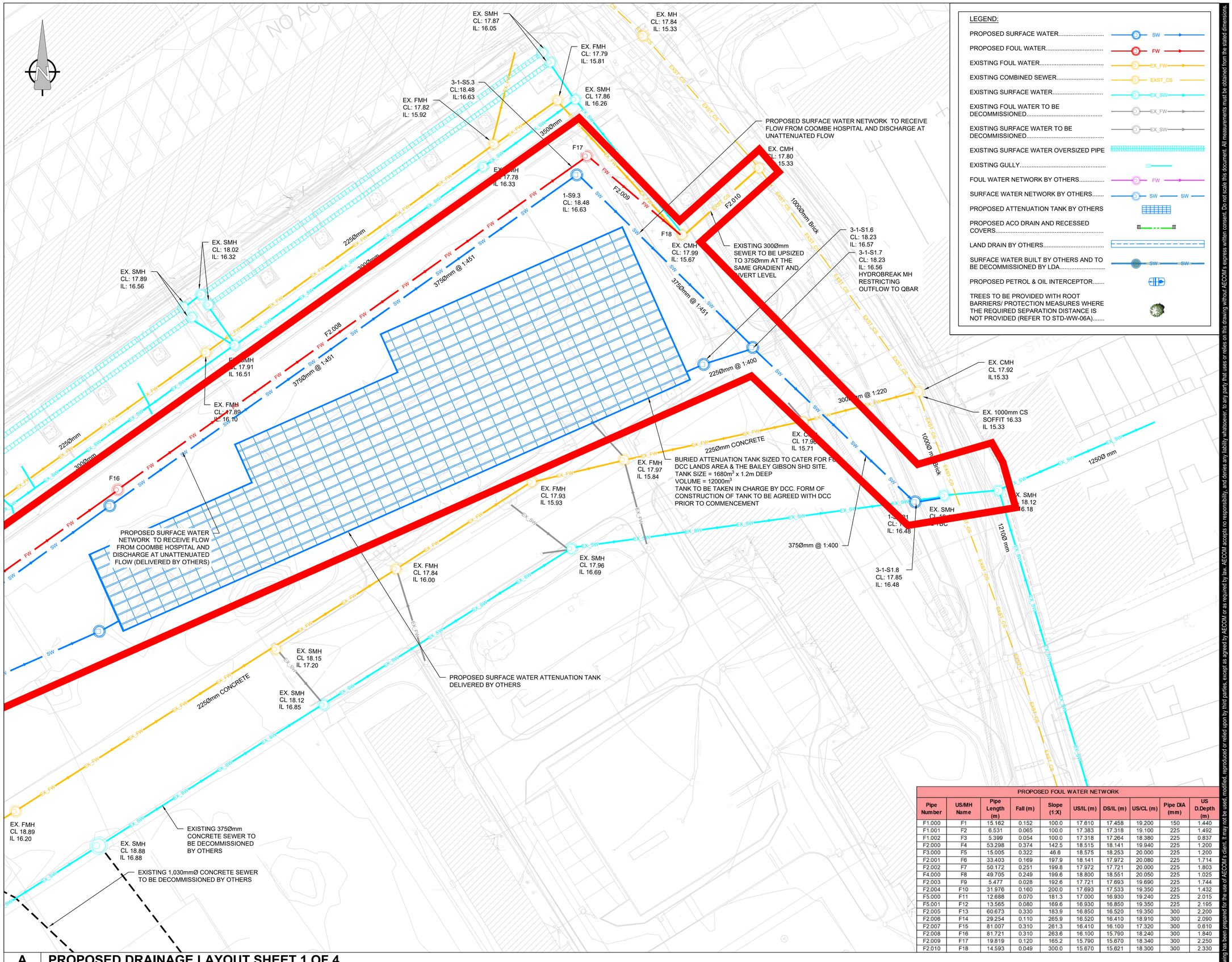
60648061

SHEET TITLE

PROPOSED DRAINAGE LAYOUT

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000500



LEGEND:

- PROPOSED SURFACE WATER
- PROPOSED FOUL WATER
- EXISTING FOUL WATER
- EXISTING COMBINED SEWER
- EXISTING SURFACE WATER
- EXISTING FOUL WATER TO BE DECOMMISSIONED
- EXISTING SURFACE WATER TO BE DECOMMISSIONED
- EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY
- FOUL WATER NETWORK BY OTHERS
- SURFACE WATER NETWORK BY OTHERS
- PROPOSED ATTENUATION TANK BY OTHERS
- PROPOSED ACO DRAIN AND RECESSED COVERS
- LAND DRAIN BY OTHERS
- SURFACE WATER BUILT BY OTHERS AND TO BE DECOMMISSIONED BY LDA
- PROPOSED PETROL & OIL INTERCEPTOR
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A)

PROPOSED FOUL WATER NETWORK

Pipe Number	US/MH Name	Pipe Length (m)	Fall (m)	Slope (1:X)	US/IL (m)	DS/IL (m)	US/CL (m)	Pipe DIA (mm)	US D.Depth (m)
F1.000	F1	15.162	0.152	100.0	17.610	17.458	19.200	150	1.440
F1.001	F2	6.531	0.065	100.0	17.383	17.318	19.100	225	1.492
F1.002	F3	5.399	0.054	100.0	17.318	17.264	18.380	225	0.837
F2.000	F4	53.298	0.374	142.5	18.515	18.141	19.940	225	1.200
F3.000	F5	15.005	0.322	46.6	18.575	18.253	20.000	225	1.200
F2.001	F6	33.403	0.169	197.9	18.141	17.972	20.080	225	1.714
F2.002	F7	50.172	0.251	199.8	17.972	17.721	20.000	225	1.803
F4.000	F8	49.705	0.249	199.6	18.800	18.551	20.050	225	1.025
F2.003	F9	5.477	0.028	192.6	17.721	17.693	19.690	225	1.744
F2.004	F10	31.976	0.160	200.0	17.693	17.533	19.350	225	1.432
F5.000	F11	12.688	0.070	181.3	17.000	16.930	19.240	225	2.015
F5.001	F12	13.565	0.080	169.6	16.930	16.850	19.350	225	2.195
F2.005	F13	60.673	0.330	183.9	16.850	16.520	19.350	300	2.200
F2.006	F14	29.254	0.110	265.9	16.520	16.410	18.910	300	2.090
F2.007	F15	81.007	0.310	261.3	16.410	16.100	17.320	300	0.610
F2.008	F16	81.721	0.310	263.6	16.100	15.790	18.240	300	1.840
F2.009	F17	19.819	0.120	165.2	15.790	15.670	18.340	300	2.250
F2.010	F18	14.593	0.049	300.0	15.670	15.621	18.300	300	2.330

A PROPOSED DRAINAGE LAYOUT SHEET 1 OF 4

0501

SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT,
DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

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6. THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
7. MANHOLE COVERS IN PUBLICLY ACCESSIBLE AREAS SHALL BE HEAVY DUTY CAST IRON OR HEAVY DUTY CAST IRON, CLASS D400, DOUBLE SEALED AND LOCKABLE TYPE COMPLYING WITH BS EN 124:2015.
8. GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
9. EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
10. SURFACE WATER & FOUL PIPES LESS THAN 1.2m BELOW THE ROAD SURFACE OR LESS THAN 0.9m IN NON-TRAFFICKED FOOTPATHS AND LANDSCAPE AREAS (WITH AN ABSOLUTE MINIMUM DEPTH OF COVER ABOVE THE EXTERNAL CROWN OF THE PIPE Ø 750mm) SHALL BE PROTECTED FROM DAMAGE BY PROVIDING MINIMUM 150mm THICK CONCRETE C16/20 HAUNCH IN ACCORDANCE WITH IS EN 12620.
11. ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
12. CCTV SURVEY TO BE CONDUCTED PRIOR TO COMMENCEMENT OF ANY WORKS TO DETERMINE THE CONDITION AND VERIFY LEVELS OF THE EXISTING FOUL AND SURFACE WATER PIPES/MANHOLES TO BE REPORTED AND CORRECTED.
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AECOM
DRAFT

ISSUE/REVISION

I/R	DATE	DESCRIPTION
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C	21.06.2022	ISSUE FOR SODA TO IW
B	10.06.2022	ISSUED FOR DCC DISCUSSION
A	02.06.2022	ISSUED FOR DCC DISCUSSION

PROJECT NUMBER

60648061

SHEET TITLE

PROPOSED DRAINAGE LAYOUT
SHEET 1 OF 4

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000501

ISO A1 594mm x 841mm
Project Management Initials: Drawn by: KM Checked: MI Approved: LS
Last saved by: PHIL.GRUNDY(2022-06-30) Last Plotted: 2022-06-30
Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IED\BL2\LEGACY\IED\BL2FP0011\DATA\DCS\PROJECTS\BP\60648061_LDA_STG_TERESAS\900_CAD_GIS\904_CE\01_WIP\02_SHEETS\STAGE 1B - STANDALONE APPLICATION\STG-AEC-S1B-00-00-DR-C-0000500 - 0502_DRAINAGELAYOUT.DWG
Printed on ___% Post-Consumer Recycled Content Paper

LEGEND:

- PROPOSED SURFACE WATER..... SW
- PROPOSED FOUL WATER..... FW
- EXISTING FOUL WATER..... EX_FW
- EXISTING COMBINED SEWER..... EXST_CS
- EXISTING SURFACE WATER..... EX_SW
- EXISTING FOUL WATER TO BE DECOMMISSIONED..... EX_FW
- EXISTING SURFACE WATER TO BE DECOMMISSIONED..... EX_SW
- DRAINAGE LINE REMOVED BY DCC.....
- EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY.....
- EXISTING GULLY.....
- FOUL WATER NETWORK BY OTHERS..... FW
- SURFACE WATER NETWORK BY OTHERS..... SW SW
- PROPOSED ATTENUATION TANK BY OTHERS
- PROPOSED ACO DRAIN AND RECESSED COVERS.....
- LAND DRAIN BY OTHERS.....
- SURFACE WATER BUILT BY OTHERS AND TO BE DECOMMISSIONED BY LDA..... SW SW
- PROPOSED PETROL & OIL INTERCEPTOR.....
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....

PROPOSED FOUL WATER NETWORK

Pipe Number	US/MH Name	Pipe Length (m)	Fall (m)	Slope (1:X)	US/IL (m)	DS/IL (m)	US/CL (m)	Pipe DIA (mm)	US D.Depth (m)
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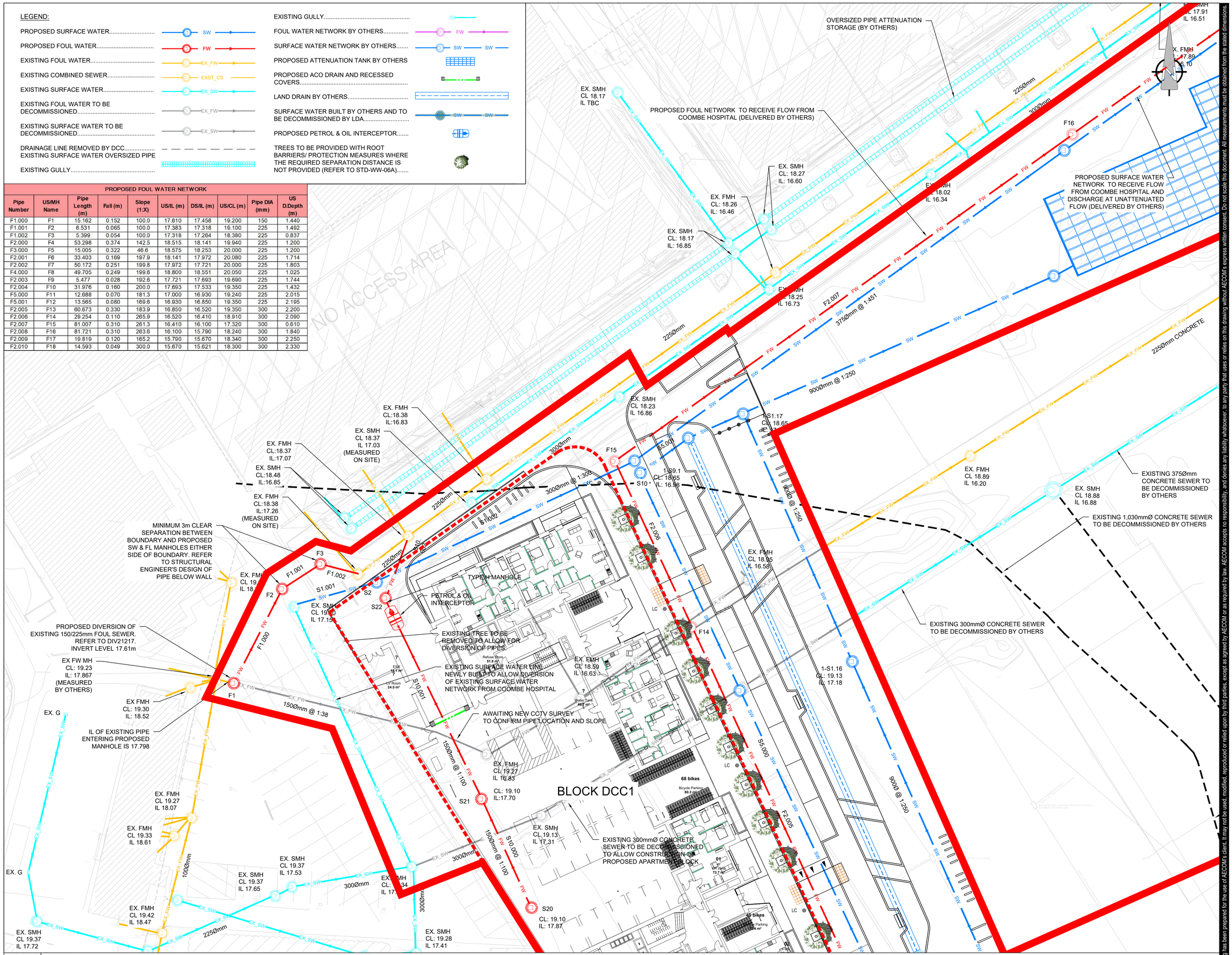

A PROPOSED DRAINAGE LAYOUT SHEET 2 OF 4

0502

SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

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4th Floor Adelphi Plaza,
George's Street Upper,
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AECOM
DRAFT

ISSUE/REVISION

I/R	DATE	DESCRIPTION
D	01.07.2022	DRAFT PLANNING ISSUE
C	21.06.2022	ISSUE FOR SODA TO IW
B	10.06.2022	ISSUED FOR DCC DISCUSSION
A	02.06.2022	ISSUED FOR DCC DISCUSSION

PROJECT NUMBER

60648061

SHEET TITLE

PROPOSED DRAINAGE LAYOUT SHEET 2 OF 4

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000502

ISO A1 594mm x 841mm

Project Management Initials: Drawn by: KM Checked: MI Approved: LS

Last saved by: PHIL.GRUNDY(2022-06-30) Last Plotted: 2022-06-30

Filename: \\NA.AECOMNET.COM\LFS\EMEAD\DUBLIN-IED\BL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP\60648061_LDA_STG_TERESAS\900_CAD_GIS\904_CE\01_WIP\02_SHEETS\STAGE 1B - STANDALONE APPLICATION\STG-AEC-S1B-00-00-DR-C-0000500 - 0502_DRAINAGELAYOUT.DWG

PROPOSED FOUL WATER NETWORK

Pipe Number	US/MH Name	Pipe Length (m)	Fall (m)	Slope (1:X)	US/IL (m)	DS/IL (m)	US/CL (m)	Pipe DIA (mm)	US D.Depth (m)
F1.000	F1	15.162	0.152	100.0	17.610	17.458	19.200	150	1.440
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F1.002	F3	5.399	0.054	100.0	17.318	17.264	18.380	225	0.837
F2.000	F4	53.298	0.374	142.5	18.515	18.141	19.940	225	1.200
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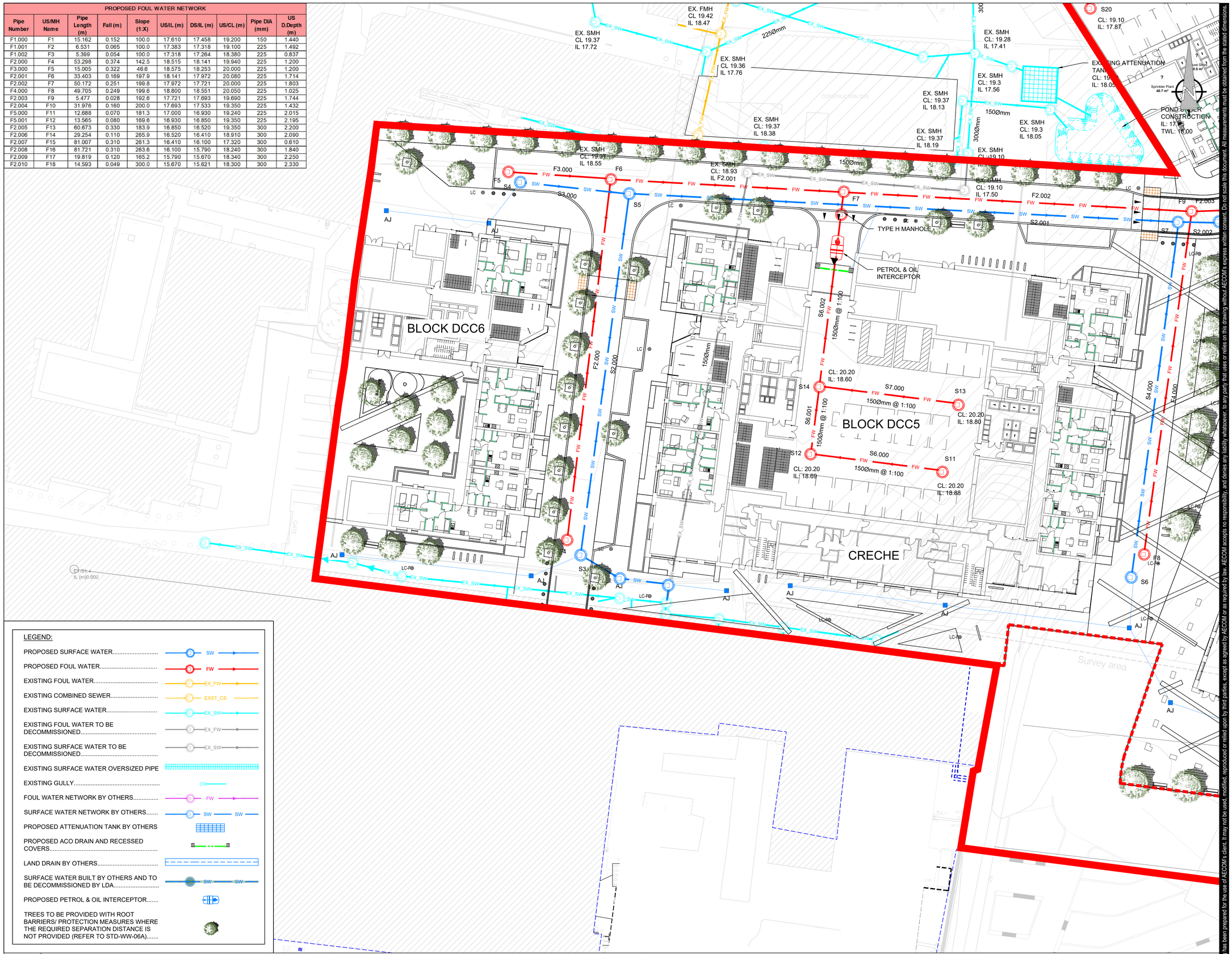
F2.010	F18	14.593	0.049	300.0	15.670	15.621	18.300	300	2.330



LEGEND:

- PROPOSED SURFACE WATER..... SW
- PROPOSED FOUL WATER..... FW
- EXISTING FOUL WATER..... EX_FW
- EXISTING COMBINED SEWER..... EXST_CS
- EXISTING SURFACE WATER..... EX_SW
- EXISTING FOUL WATER TO BE DECOMMISSIONED..... EX_FW
- EXISTING SURFACE WATER TO BE DECOMMISSIONED..... EX_SW
- EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY.....
- FOUL WATER NETWORK BY OTHERS..... FW
- SURFACE WATER NETWORK BY OTHERS..... SW SW
- PROPOSED ATTENUATION TANK BY OTHERS
- PROPOSED ACO DRAIN AND RECESSED COVERS.....
- LAND DRAIN BY OTHERS.....
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- PROPOSED PETROL & OIL INTERCEPTOR.....
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....

A | **PROPOSED DRAINAGE LAYOUT SHEET 3 OF 4**

0503 | SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

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PROJECT NUMBER

60648061

SHEET TITLE

PROPOSED DRAINAGE LAYOUT SHEET 3 OF 4

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000503

ISO A1 594mm x 841mm

Project Management Initials: Drawn by: KM Checked: MI Approved: LS

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PROPOSED FOUL WATER NETWORK									
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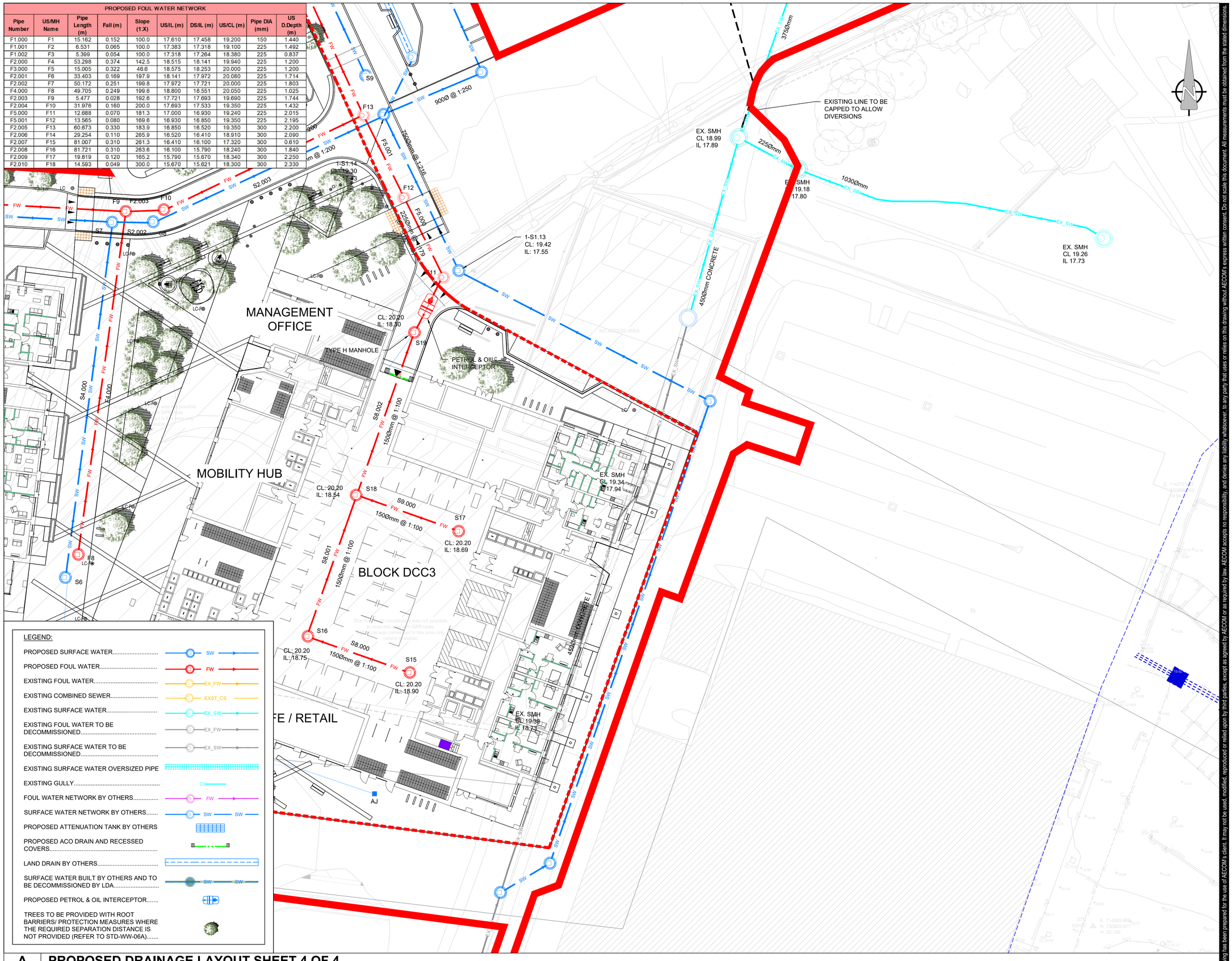
F1.002	F3	5.399	0.054	100.0	17.318	17.264	18.380	225	0.837
F2.000	F4	53.298	0.374	142.5	18.515	18.141	19.940	225	1.200
F3.000	F5	15.005	0.322	46.6	18.575	18.253	20.000	225	1.200
F2.001	F6	33.403	0.169	197.9	18.141	17.972	20.080	225	1.714
F2.002	F7	50.172	0.251	199.8	17.972	17.721	20.000	225	1.803
F4.000	F8	49.705	0.249	199.6	18.800	18.551	20.050	225	1.025
F2.003	F9	5.477	0.028	192.6	17.721	17.693	19.690	225	1.744
F2.004	F10	31.976	0.160	200.0	17.693	17.533	19.350	225	1.432
F5.000	F11	12.688	0.070	181.3	17.000	16.930	19.240	225	2.015
F5.001	F12	13.565	0.080	169.6	16.930	16.850	19.350	225	2.195
F2.005	F13	60.673	0.330	183.9	16.850	16.520	19.350	300	2.200
F2.006	F14	29.254	0.110	265.9	16.520	16.410	18.910	300	2.090
F2.007	F15	81.007	0.310	261.3	16.410	16.100	17.320	300	0.610
F2.008	F16	81.721	0.310	263.6	16.100	15.790	18.240	300	1.840
F2.009	F17	19.819	0.120	165.2	15.790	15.670	18.340	300	2.250
F2.010	F18	14.593	0.049	300.0	15.670	15.621	18.300	300	2.330



LEGEND:

- PROPOSED SURFACE WATER..... SW
- PROPOSED FOUL WATER..... FW
- EXISTING FOUL WATER..... EX_FW
- EXISTING COMBINED SEWER..... EXST_CS
- EXISTING SURFACE WATER..... EX_SW
- EXISTING FOUL WATER TO BE DECOMMISSIONED..... EX_FW
- EXISTING SURFACE WATER TO BE DECOMMISSIONED..... EX_SW
- EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY.....
- FOUL WATER NETWORK BY OTHERS..... FW
- SURFACE WATER NETWORK BY OTHERS..... SW SW
- PROPOSED ATTENUATION TANK BY OTHERS
- PROPOSED ACO DRAIN AND RECESSED COVERS.....
- LAND DRAIN BY OTHERS.....
- SURFACE WATER BUILT BY OTHERS AND TO BE DECOMMISSIONED BY LDA..... SW SW
- PROPOSED PETROL & OIL INTERCEPTOR.....
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....

A **PROPOSED DRAINAGE LAYOUT SHEET 4 OF 4**

0503 SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

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11. ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
12. CCTV SURVEY TO BE CONDUCTED PRIOR TO COMMENCEMENT OF ANY WORKS TO DETERMINE THE CONDITION AND VERIFY LEVELS OF THE EXISTING FOUL AND SURFACE WATER PIPES/MANHOLES TO BE REPORTED AND CORRECTED.
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14. ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
15. ALL PROPOSED FOUL SEWER LAYOUT SHALL BE BUILT IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE AND STANDARD DETAILS STD-WW-02 & STD-WW-03.

AECOM
DRAFT

ISSUE/REVISION

I/R	DATE	DESCRIPTION
D	01.07.2022	DRAFT PLANNING ISSUE
C	21.06.2022	ISSUE FOR SODA TO IW
B	10.06.2022	ISSUED FOR DCC DISCUSSION
A	02.06.2022	ISSUED FOR DCC DISCUSSION

PROJECT NUMBER

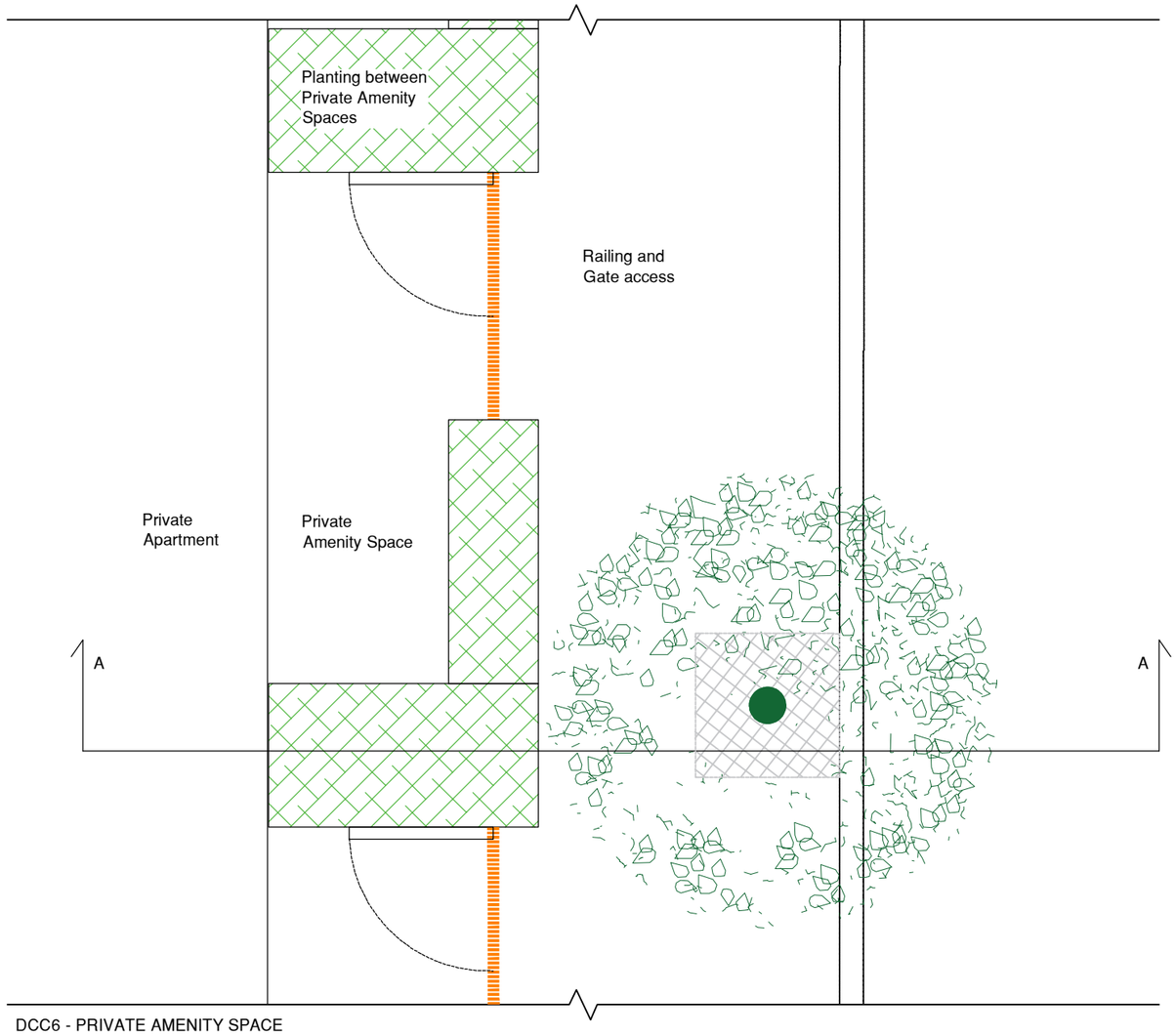
60648061

SHEET TITLE

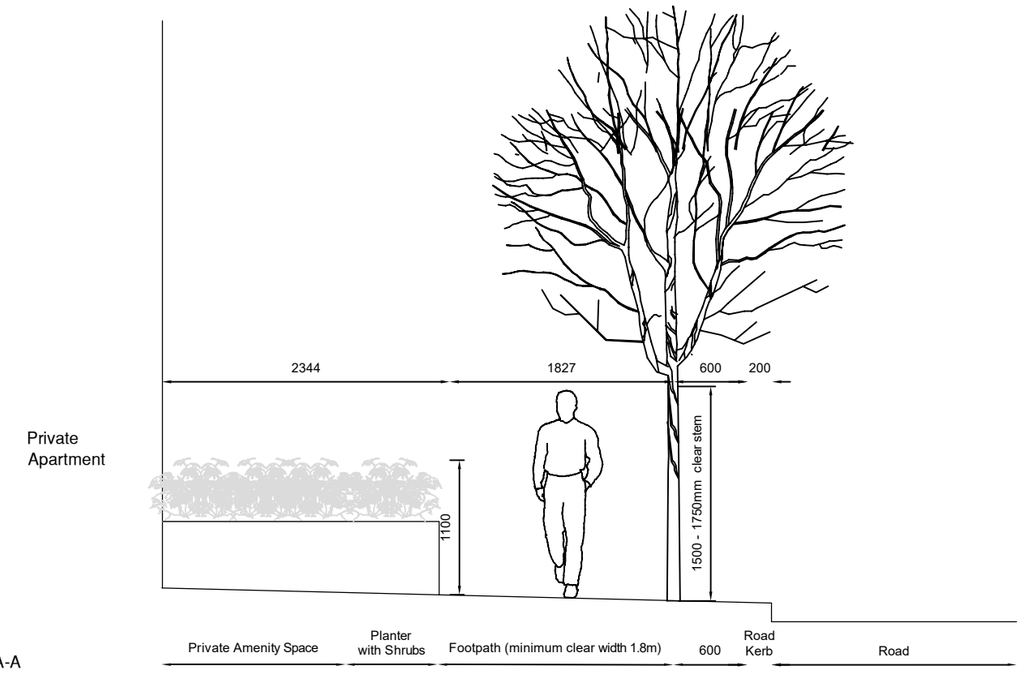
PROPOSED DRAINAGE LAYOUT SHEET 4 OF 4

SHEET NUMBER

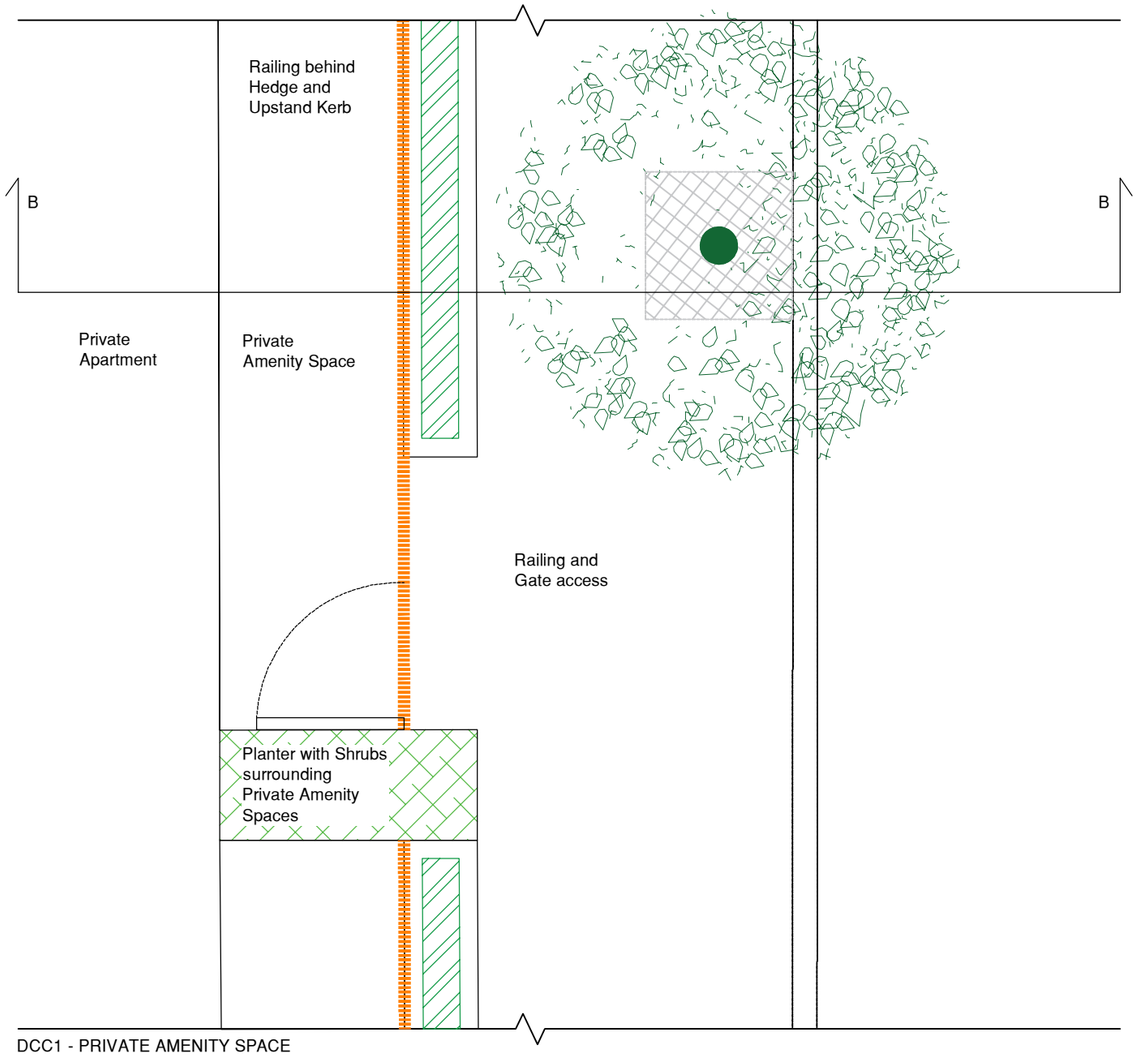
STG-AEC-S1b-00-00-DR-C-0000504



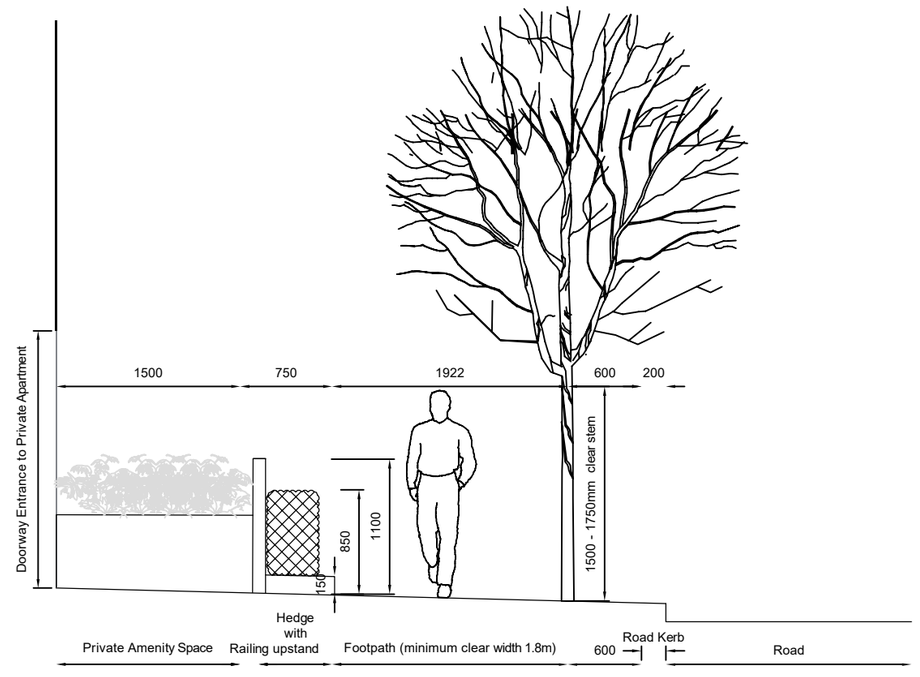
DCC6 - PRIVATE AMENITY SPACE
BRICK PLANTER BOUNDARY
PLAN 1:50



SECTION A-A



DCC1 - PRIVATE AMENITY SPACE
1.1M HIGH RAILING AND HEDGE
PLAN 1:50



SECTION B-B

Appendix E – Irish Water Wastewater Diversion DIV21217 CoF

Dara Magee
Engineer
Development Infrastructure, Consulting
AECOM
4th Floor Adelphi Plaza
George's Street Upper
Dún Laoghaire
Co. Dublin
A96 T927

31 March 2022

Dear Dara,

Re: Diversion Reference DIV21217 Diversion Enquiry - Subject to Contract | Contract Denied

Irish Water has reviewed your enquiry in relation to a diversion of I W ' 150mm diameter wastewater sewer as part of the proposed development at St. Teresa's Gardens, Donore Avenue, Dublin 8 as indicated on attached drawing nos. STG-AEC-XX-00-SK-C-00-0016, STG-AEC-XX-00-SK-C-00-0023 & STG-AEC-S2-ZZ-XX-ZZ-SK-S-000005.

Based upon the details you have provided with your enquiry and as assessed by Irish Water, we wish to advise you that, subject to valid agreement(s) being put in place, the proposed diversion can be facilitated.

You are advised that this correspondence does not constitute an agreement in whole or in part to provide a diversion or to build near any Irish Water infrastructure and is provided subject to the valid agreements being executed at a later date.

If you have any further questions, please contact K 'N from the diversions team on 0877093850 or email kioneill@water.ie.

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Drawings:
STG-AEC-XX-00-SK-C-00-0016, STG-AEC-XX-00-SK-C-00-0023 & STG-AEC-S2-ZZ-XX-ZZ-SK-S-000005

ISO A1 594mm x 841mm

Approved: BM

Checked: TB

Drawn by: HB

Project Management Initials:

Project No: 60648061_CE01_WIP\05_SKETCHES\STG-AEC-XX-00-SK-C-00-0015-0019 - DIVERSION LAYOUT.DWG

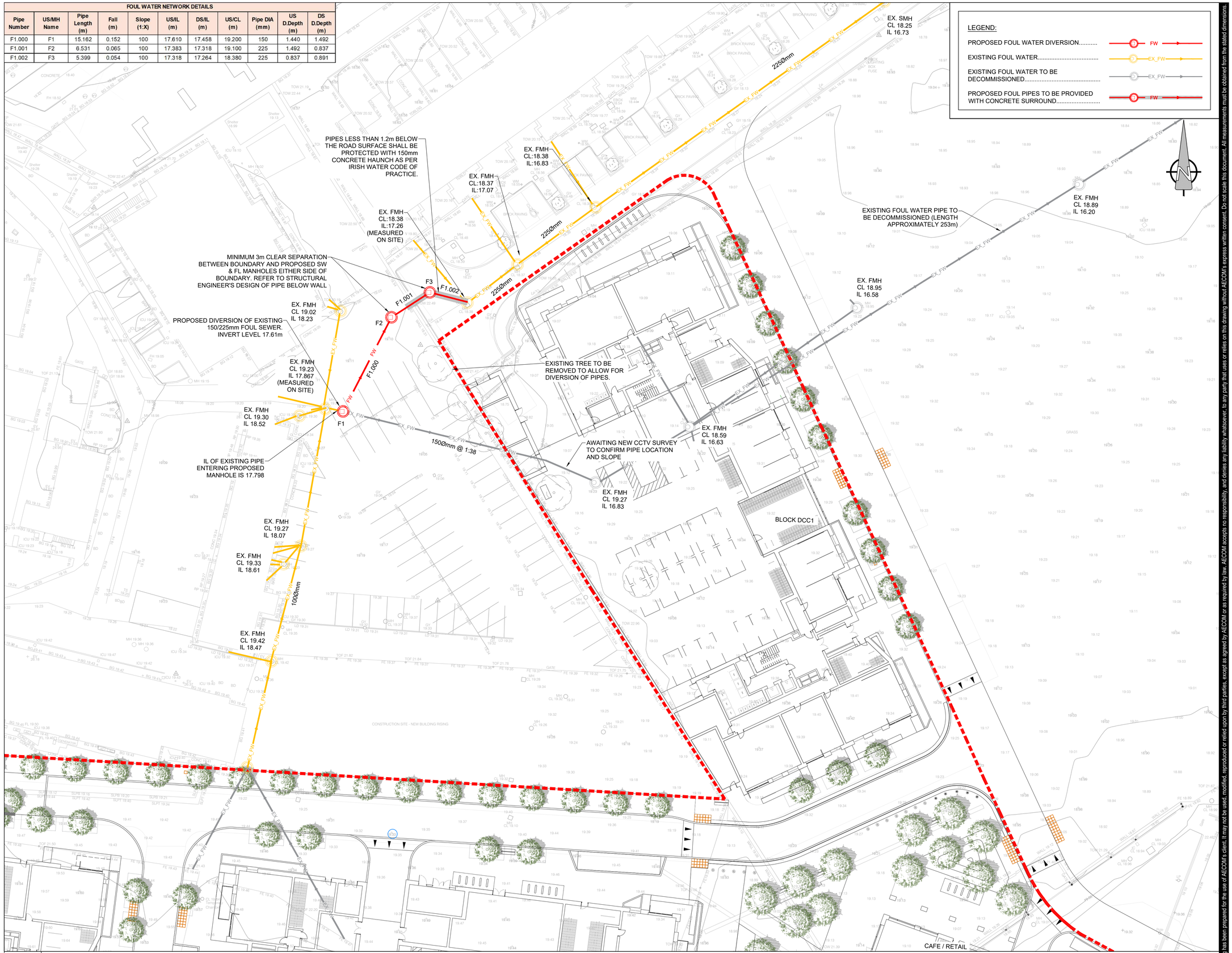
Last saved by: MICHAEL.COLLINS (2022-03-01) Last Plotted: 2022-03-01

Filename: \\WA.AECOMNET.COM\LFSI\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP\60648061_LDA_STG_TERESAS\900_CAD_GIS\904_CE\01_WIP\05_SKETCHES\STG-AEC-XX-00-SK-C-00-0015-0019 - DIVERSION LAYOUT.DWG

Printed on ____% Post-Consumer Recycled Content Paper

FOUL WATER NETWORK DETAILS

Pipe Number	US/MH Name	Pipe Length (m)	Fall (m)	Slope (1:X)	US/IL (m)	DS/IL (m)	US/CL (m)	Pipe DIA (mm)	US D.Depth (m)	DS D.Depth (m)
F1.000	F1	15.162	0.152	100	17.610	17.458	19.200	150	1.440	1.492
F1.001	F2	6.531	0.065	100	17.383	17.318	19.100	225	1.492	0.837
F1.002	F3	5.399	0.054	100	17.318	17.264	18.380	225	0.837	0.891



A | **PROPOSED FOUL WATER DIVERSION LAYOUT**

0016 | SCALE: 1:250

AECOM

PROJECT

THE DONORE PROJECT, DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

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AECOM
SKETCH

ISSUE/REVISION

I/R	DATE	DESCRIPTION
G	01/03/2022	ISSUED FOR IRISH WATER
F	26/01/2022	ISSUED FOR IRISH WATER
E	20/01/2022	UPDATED GRADIENTS
D	16/11/2021	UPDATED ALIGNMENT
C	02/11/2021	UPDATED ALIGNMENT
B	15/10/2021	AMENDED AS PER IW COMMENTS
A	06/10/2021	ISSUED FOR IRISH WATER

PROJECT NUMBER

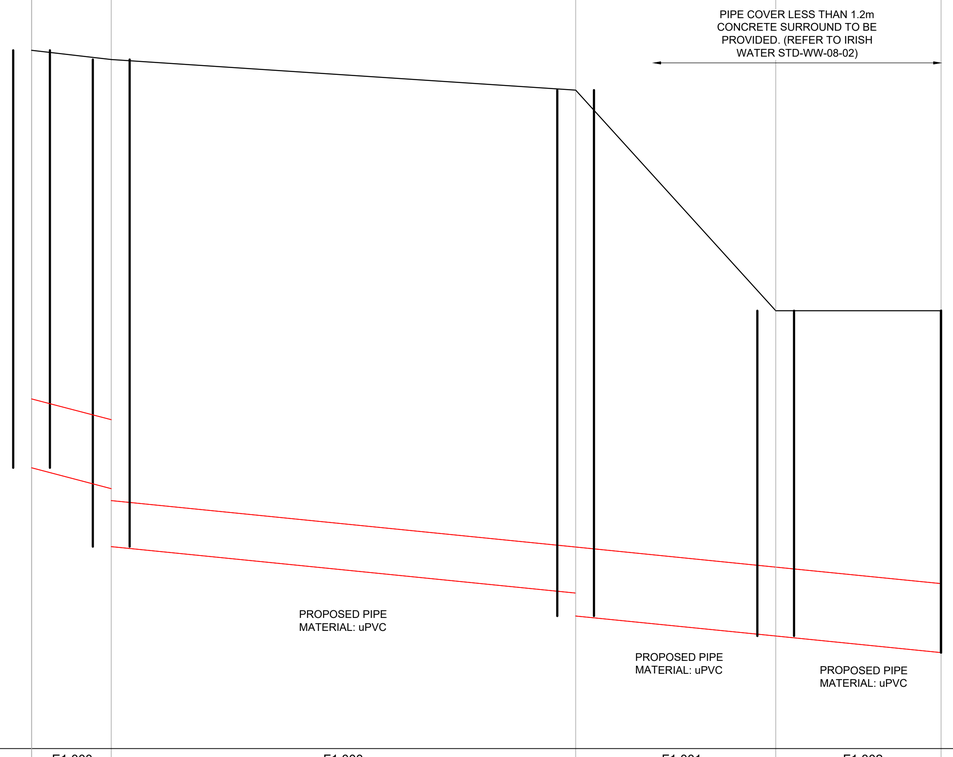
60648061

SHEET TITLE

PROPOSED FOUL WATER DIVERSION LAYOUT

SHEET NUMBER

STG-AEC-XX-00-SK-C-00-0016

MH Name		E1	F1	F2	F3	F
	 Hor Scale 1000 Ver Scale 100 Datum (m)18.000					
PN		E1.000	F1.000	F1.001	F1.002	
Dia (mm)		225	150	225	225	
Slope (1:X)		38.3	100.0	100.0	100.0	
Cover Level (m)		19.230	19.200	19.100	18.380	18.380
Invert Level (m)		17.867	17.799 17.610	17.458 17.383	17.318 17.318	17.264
Length (m)		2.601	15.162	6.531	5.399	

A **PROPOSED DIVERSION LONGSECTION**
0023 SCALE: 1:100

AECOM

PROJECT
THE DONORE PROJECT,
DUBLIN 8.

CLIENT
LAND DEVELOPMENT AGENCY

CONSULTANT
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AECOM
SKETCH

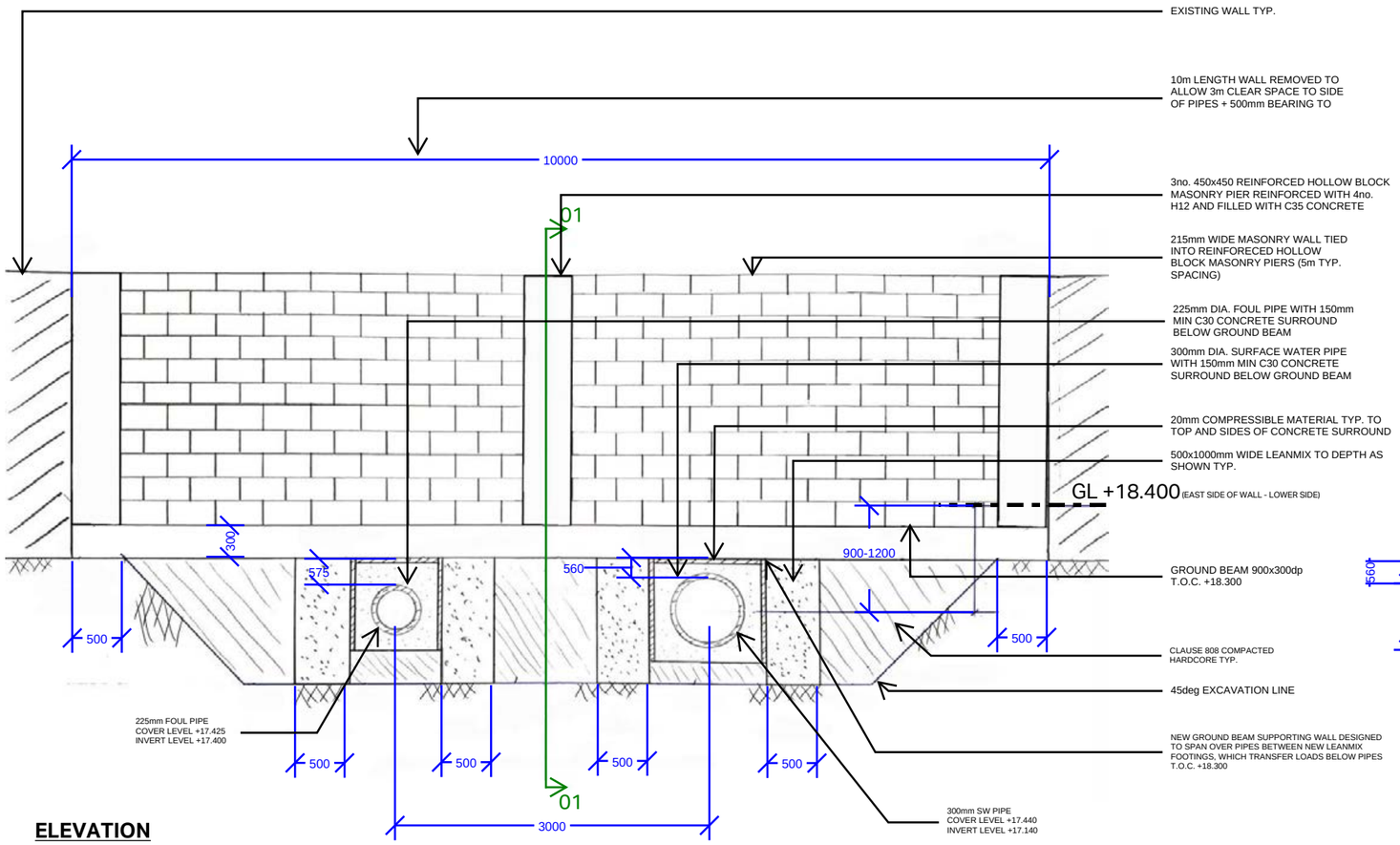
ISSUE/REVISION

I/R	DATE	DESCRIPTION
A	01.03.2022	ISSUED FOR IRISH WATER

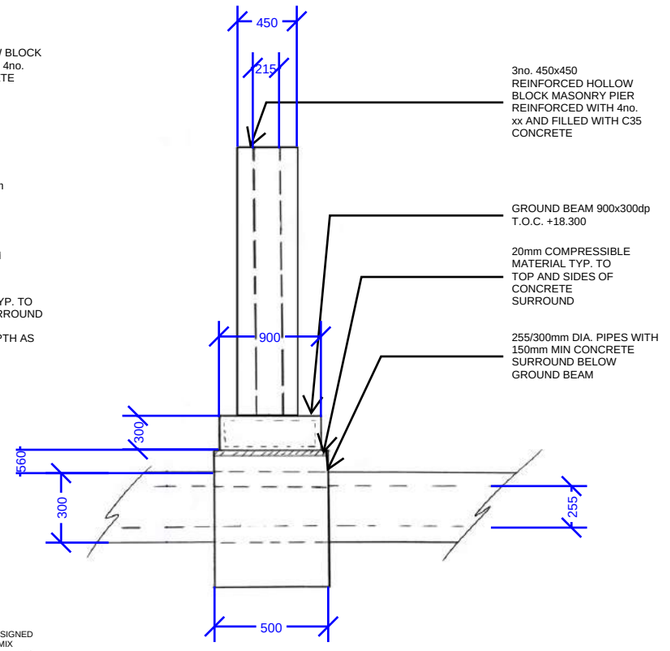
PROJECT NUMBER
60648061

SHEET TITLE
PROPOSED DIVERSION LONGSECTION

SHEET NUMBER
STG-AEC-XX-00-SK-C-00-0023



ELEVATION



SECTION 01

METHOD STATEMENT:

1. DEMOLISH 10m LENGTH OF WALL CENTERED ON NEW PIPE LAYOUT. MOVE 500mm OFF ENDS OF EXISTING WALL AND EXCAVATE AT 45DEG BERM TO DESIRED LEVEL

2. PLACE NEW PIPES AND SURROUND IN CONCRETE AS PER ABOVE SKETCHES 1m ZONE BELOW WALL. WHEN CURED, PLACE 20mm COMPRESSIBLE FILLER TO SIDES AND TOP OF PIPES.

3. PLACE 500mm x 1000mm WIDE LEANMIX CONCRETE TO EACH SIDE OF PIPE. THEREAFTER, BACKFILL EXCAVATION WITH CLAUSE 808 MATERIAL COMPACTED IN LAYERS.

4. CAST NEW GROUND BEAM AND RE-BUILD WALL AS PER ABOVE DETAILS.

NOTE: LEVELS OF NEW FOUNDATION TO MATCH EXISTING AND ARE SUBJECT TO ADJUSTMENT

AECOM

Project

ST. TERESA'S GARDENS

Client

LDA

Consultant

AECOM
4th Floor, Adelphi Plaza
George's Street Upper
Dun Laoghaire, Co. Dublin
Ireland
Fax +353 (0) 1 238 3199
Tel +353 (0) 1 238 3100
www.aecom.com

Notes

- Do not scale from this drawing. Work to figured dimensions only.
- Any discrepancies shall be referred to the Designer before work commences.

Keyplan

Issue/Revision

Rev.	Date	Description	Drn/Chk/Apr
P03	08/03/22	FOR INFORMATION	GT/CM/EH
P03	15/02/22	FOR INFORMATION	GT/CM/EH
P02	27/01/22	FOR INFORMATION	GT/CM/EH
P01	25/01/22	FOR INFORMATION	GT/CM/EH

Purpose Of Issue

FOR INFORMATION

Project Number

60648061

Sheet Title

NEW WALL DETAIL OVER DRAINAGE PIPES

Sheet Number

STG-AEC-S2-ZZ-XX-ZZ-SK-S-000005

Scale: @A1 **Rev:** P04

Appendix F – Irish Water Watermain Diversion DIV22181 CoF

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office
Cork City.

www.water.ie

Mr. Dara Magee,
Aecom,
4th Floor Adelphi Plaza,
George's St. Upper,
Dun Laoghaire,
Co. Dublin.

17 August 2022

Dear Mr. Magee,

Re: DIV22181 St.Teresa's Gardens, Donore Avenue, Dublin 8, Proposed diversion of Irish Water's 100mm Watermain Subject to contract / Contract denied

Irish Water has reviewed your enquiry in relation to the diversion of the Irish Water 100mm Watermain at St.Teresa's Gardens, Donore Avenue, Dublin 8. Based upon the details you have provided with your enquiry as indicated on drawings STG-AEC-XX-00-SK-C-00-0034, STG-AEC-S1b-00-00-DR-C-0002701 and STG-AEC-S2-ZZ-XX-ZZ-SK-S-000005 and as assessed by Irish Water, we wish to advise you that, subject to detailed design being agreed and valid agreements being put in place, the proposal can be facilitated.

The applicant will be required to coordinate with the applicant of DIV21315 where the works of that application will be required to be carried out and completed in their entirety prior to works described in the drawings listed above being carried out. The applicant will also be required to coordinate/seek approval with the Coombe Hospital.

You are advised that this correspondence does not constitute an agreement in whole or in part to build near any Irish Water infrastructure and is provided subject to associated Diversion Agreements being executed and a Deed of Easement being provided to Irish Water, prior to the commencement of any related construction activities. Please engage with Irish Water again in relation to this matter at such time planning permission has been granted for the proposed development.

If you have any further questions, please contact Niall Byrne from the Diversions team on 087 165 7337 or email niall.byrne@water.ie For further information, visit https://www.water.ie/connections/developer-services/diversion-and-build-over/.

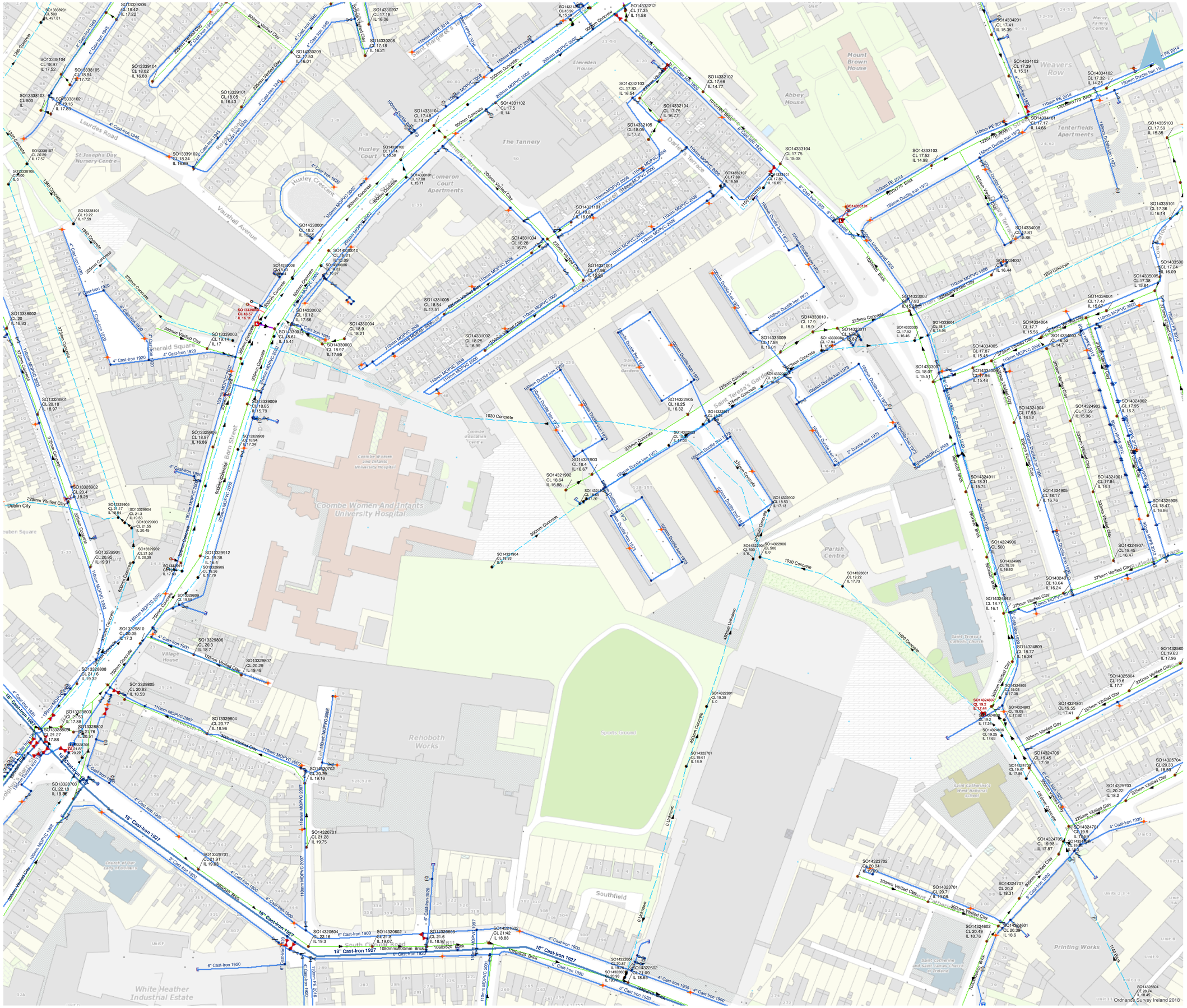
Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Appendix G – Water Supply & Drainage Records



UISCE ÉIREANN : IRISH WATER

Legend

- Boundary Meter
- Unknown Meter ; Other Meter
- Non-Return
- Sluice Valve Open
- Sluice Valve Closed
- Sluice Valve Open
- Sluice Valve Closed

Water Hydrants

Hydrant Function

- Fire Hydrant
- Water Pump Stations
- Water Kiosk
- Cap
- Other Fittings
- Tap

Water Distribution Mains

Owned By

- Irish Water
- Irish Water
- Irish Water

Sewer Manholes

Manhole Type

- Standard
- Other; Unknown
- Sewer Chambers
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow

Storm Manholes

Manhole Type

- Standard
- Other; Unknown

Storm Discharge Points

Discharge Type

- Outfall
- Surface Gravity Mains

Storm Inlets

Inlet Type

- Standard

1:1,000 at A0

Last edited: 14/01/2021

Metres

0 25 50 100

Appendix H – CCTV Survey Report

Mcbreen Environmental Drain Services Ltd
Lismagratty, Cootehil Rd
Tel. 0494326306
info@mcbreen.ie

Project

Project Name:	AECOM, ST TERESAS GARDEN
Project Description:	CCTV SURVEY
Project Number:	J-025413
Project Status:	Complete
Project Date:	29/01/2022

ISO A1 594mm x 841mm

Project Management Initials: Drawn by: KM Checked: MI Approved: LS

Last saved by: KARL.MULLIGAN(2022-10-12) Last Plotted: 2022-11-16

Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2F001\DATA\DCS\PROJECTS\BP60648061_LDA_STG_TERESAS\900_CAD_GIS\904_CE\01_WIP\02_SHEETS\STAGE 1B - STANDALONE APPLICATION\STG-AEC-S1B-00-00-DR-C-0000500 - 0504_DRAINAGELAYOUT.DWG

LEGEND:

- PROPOSED SURFACE WATER..... SW
- PROPOSED FOUL WATER..... FW
- EXISTING FOUL WATER..... EX_FW
- EXISTING COMBINED SEWER..... EXST_CS
- EXISTING SURFACE WATER..... EX_SW
- EXISTING FOUL WATER TO BE DECOMMISSIONED..... EX_FW
- EXISTING SURFACE WATER TO BE DECOMMISSIONED..... EX_SW
- DRAINAGE LINE REMOVED BY DCC.....
- EXISTING SURFACE WATER OVERSIZED PIPE
- EXISTING GULLY.....
- PROPOSED GULLY.....
- PROPOSED ATTENUATION TANK.....
- PROPOSED SLOT DRAIN AND RECESSED COVERS.....
- PROPOSED CLASS 2 PETROL INTERCEPTOR..
- PROPOSED LAND DRAIN.....
- TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....
- SITE BOUNDARY.....
- NET DEVELOPABLE AREA BOUNDARY.....
- PROPOSED DROPPED DRAINAGE KERB .....
- PROPOSED AJ AND 150mm DRAIN.....

DRAWING 0000501

DRAWING 0000502

TANK

SMH14

EXISTING MANHOLE TO BE RECONSTRUCTED WITH A NEW MANHOLE AT THE SAME LOCATION AND WITH THE SAME INVERT LEVEL.

PROPOSED MANHOLES AT NEW HEAD OF RUN ON EXISTING LINES

DRAINAGE LINE REMOVED BY DCC

PROPOSED 225 mm SEWER FROM SCOUR CHAMBER TO A NEW MANHOLE ON THE EXISTING SEWER. TO ALLOW FOR FLUSHING OF WATERMAIN.

AS PER THE EXISTING ARRANGEMENT, NO OUTFLOW TO A NETWORK IS PROPOSED FROM THE 1030 CULVERT, WHICH ACTS AS STORAGE. HOWEVER, THE 450mm SURFACE WATER WHICH ORIGINATES IN SOUTH CIRCULAR ROAD IS DIVERTED INTO THE PROPOSED DEVELOPMENTS NETWORK.

PROPOSED MANHOLE FOR MAINTENANCE OF EXISTING LINE.

EXISTING FOUL WATER LINE NEWLY BUILT TO ALLOW DIVERSION OF EXISTING FOUL WATER NETWORK FROM COOMBE HOSPITAL WHICH WILL BE MADE LIVE FOLLOWING DIVERSION OF PUBLIC NETWORK INTO PROPOSED NETWORK

EXISTING SURFACE WATER LINE NEWLY BUILT TO ALLOW DIVERSION OF EXISTING SURFACE WATER NETWORK FROM COOMBE HOSPITAL WHICH WILL BE MADE LIVE FOLLOWING DIVERSION OF PUBLIC NETWORK INTO PROPOSED NETWORK (THIS LINE WILL ONLY SERVE THE COOMBE CATCHMENT)

EXISTING SURFACE WATER SEWER STILL SERVING THE COOMBE HOSPITAL. WHEN CONSTRUCTION OF THE DONORE PROJECT STARTS, FLOW WILL BE DIVERTED INTO THE NEWLY BUILT SURFACE WATER NETWORK

EXISTING SURFACE WATER MANHOLE IS A HIGH POINT IN BOTH THE NETWORKS WHICH DRAIN TO THE WEST (COOMBE GROUNDS) AND EAST (DONORE PROJECT SITE)

PROPOSED TEMPORARY DIVERSION OF 150Ømm EXISTING SURFACE WATER LINE (ATTENUATION IS DESIGNED FOR THE DONORE PROJECT SITE)

SILT TRAP TO BE PROVIDED ON MANHOLE. EXISTING LINE IS NOTED TO BE TRANSPORTING SILT DOWNSTREAM.

150Ømm EXISTING SURFACE WATER LINE TO BE TEMPORARILY DIVERTED.

PROPOSED NEW MANHOLE OVER EXISTING SURFACE WATER LINE TO ALLOW DIVERSION AND CONSTRUCTION OF THE PROPOSED BLOCK

DRAWING 0000503

DRAWING 0000504

SEE: INSET B

The Coombe Hospital laboratory under construction. Planning permission reference 4049/19

BLOCK DCC1

BLOCK DCC2

BLOCK DCC5

BLOCK DCC3

MOBILITY HUB

THE DONORE PROJECT PARK

CULTURAL / ARTS SPACE

ARTIST WORKSPACES

CRECHE

CAFE / RETAIL

FMH1 FMH2 SMH1 SMH2 SMH3 SMH4 SMH5 SMH6 SMH7 SMH8 SMH9 SMH10 SMH11 SMH12 SMH13

Areas CCTV Surveyed

B	OVERALL PROPOSED DRAINAGE LAYOUT
0500	SCALE: 1:750

A	OVERALL PROPOSED DRAINAGE LAYOUT
0500	SCALE: 1:750

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AECOM

PROJECT

DONORE PROJECT, DONORE AVENUE, DUBLIN 8

CLIENT

THE LAND DEVELOPMENT AGENCY (LDA)

CONSULTANT

AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 696-6220
www.aecom.com

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. DO NOT SCALE, ALL MEASUREMENTS AND COORDINATES TO BE CHECKED ON SITE.
6. THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
7. MANHOLE COVERS IN PUBLICLY ACCESSIBLE AREAS SHALL BE HEAVY DUTY CAST IRON OR HEAVY DUTY CAST IRON, CLASS D400, DOUBLE SEALED AND LOCKABLE TYPE COMPLYING WITH BS EN 124:2015.
8. GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
9. EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
10. SURFACE WATER & FOUL PIPES LESS THAN 1.2m BELOW THE ROAD SURFACE OR LESS THAN 0.9m IN NON-TRAFFICKED FOOTPATHS AND LANDSCAPE AREAS (WITH AN ABSOLUTE MINIMUM DEPTH OF COVER ABOVE THE EXTERNAL CROWN OF THE PIPE Ø 750mm) SHALL BE PROTECTED FROM DAMAGE BY PROVIDING MINIMUM 150mm THICK CONCRETE C16/20 HAUNCH IN ACCORDANCE WITH IS EN 12620.
11. ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
12. CCTV SURVEY TO BE CONDUCTED PRIOR TO COMMENCEMENT OF ANY WORKS TO DETERMINE THE CONDITION AND VERIFY LEVELS OF THE EXISTING FOUL AND SURFACE WATER PIPES/MANHOLES TO BE REPORTED AND CORRECTED.
13. ALL PROPOSED SURFACE WATER MANHOLES AND GULLY CHAMBERS ARE TO BE BLOCKWORK, IN ACCORDANCE WITH DCC REQUIREMENTS.
14. ALL SURFACE WATER DRAINAGE DETAILS TO BE IN ACCORDANCE WITH THE GREATER DUBLIN STRATEGIC DRAINAGE STUDY AND THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR THE DRAINAGE WORKS.
15. ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
16. ALL PROPOSED FOUL SEWER LAYOUT SHALL BE BUILT IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE AND STANDARD DETAILS STD-WW-02 & STD-WW-03.
17. THIS DESIGN DRAWING HAS BEEN DEVELOPED USING THE FOLLOWING TOPOGRAPHICAL SURVEYS; LDA SURVEY (MSL39995 REV1 21.05.2021) AND HINES' SURVEY (MSL35430 REV2 24.06.2020).

AECOM
PLANNING

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	18.11.2022	ISSUED FOR PLANNING

PROJECT NUMBER

60648061

SHEET TITLE

OVERALL PROPOSED DRAINAGE LAYOUT

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000500

Mcbreen Environmental Drain Services Ltd
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Tel. 0494326306
info@mcbreen.ie

Table of Contents

Project Name	Project Number	Project Date
AECOM, ST TERESAS GARDEN	J-025413	29/01/2022

Mcbreen Environmental Drain Services Ltd
Lismagratty, Cootehil Rd
Tel. 0494326306
info@mcbreen.ie

Project Information

Project Name	Project Number	Project Date
AECOM, ST TERESAS GARDEN	J-025413	29/01/2022

Client

Company: AECOM
Department: 4th Floor, Adelphi Plaza
Street: George's Street Upper
Town or City: Dun Laoghaire
County: DUBLIN

Manager

Street: Donore Ave, Saint Catherine's,
Town or City: Dublin 8
County: DUBLIN

Contractor

Company: Mcbreen Environmental Drain Services Ltd
Contact: CCTV Department
Street: Lismagratty
Town or City: Cootehil Rd
County: Cavan
Post Code: H12 FP44
Phone: 0494326306
Email: info@mcbreen.ie

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Section Inspection - 21/02/2022 - FMH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	5	21/02/22	14:45	J-028275	No Rain Or Snow	Yes	FMH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
niall s	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:		**Inspection Direction:**	Downstream	**Upstream Node:**	FMH1
Road:	Donore Rd	**Inspected Length:**	39.90 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	39.90 m	**Downstream Node:**	FMH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Investigation of known defects	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:344

Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m					
FMH1					
0.00	MH	Start node, manhole, reference: FMH1	00:00:00		
0.02	WL	Water level, 5% of the vertical dimension	00:00:00		
39.90	MHF	Finish node, manhole, reference: FMH2	00:01:30		
FMH2					
Depth: m					

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 08/04/2022 - SMH2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	08/04/22	12:46	J-029560-1	No Rain Or Snow	Yes	SMH2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
mindaugas	172 CN 195 Mercedes Sprinter	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Dublin	**Inspection Direction:**	Downstream	**Upstream Node:**	SMH2
Road:	Dolphins Barn St	**Inspected Length:**	20.93 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	20.93 m	**Downstream Node:**	SMH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:181

Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m					
SMH2					
0.00	MH	Start node, manhole, reference: SMH2	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
0.40	RF	Roots, fine	00:00:11	SMH4X_4b387c41-09cd-4717-	2
3.21	CC	Crack, circumferential from 4 o'clock to 8 o'clock: CRACKS AND ROOTS	00:00:38	SMH4X_adab20d6-bcc8-4224-	2 / 2
3.77	FC	Fracture, circumferential from 8 o'clock to 10 o'clock	00:00:53	SMH4X_2da0b000-1b7d-41b2-	3 / 2
3.77	B	Broken pipe at 9 o'clock	00:00:56	SMH4X_3e775cd6-07bf-448a-b	4
6.49	JDM	Joint displaced, medium	00:01:20	SMH4X_0e795d9c-b08d-47e2-	1 / 3
10.32	FR	Fractures, radiating from 3 o'clock to 4 o'clock	00:01:58	SMH4X_92a2a218-7c0a-4af8-a	4 / 2
13.97	OJM	Open joint, medium	00:02:34	SMH4X_f82a13ab-69c4-45fd-8f	1
16.45	JDL	Joint displaced, large	00:02:54	SMH4X_640e99a1-0852-4f0b-b	1 / 4
19.60	H	Hole in drain or sewer from 1 o'clock to 2 o'clock	00:03:20	SMH4X_81fbdfc0-ff1d-458a-a5	4
20.93	MHF	Finish node, manhole, reference: SMH1	00:03:45		
SMH1					
Depth: m					

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
8	120.0	14.0	294.0	4.0	6	5.0	0.5	11.0	4.0

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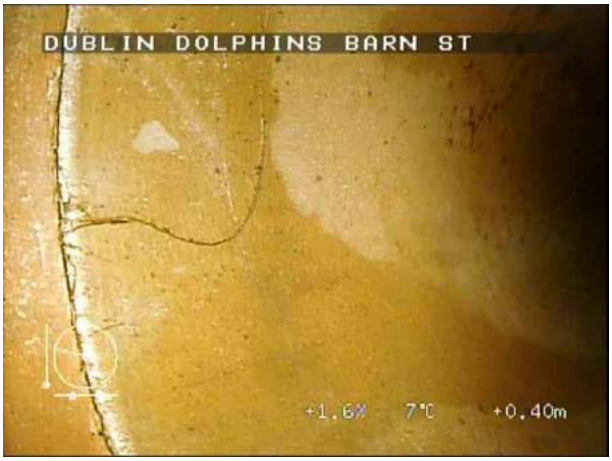
Section Pictures - 08/04/2022 - SMH2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Downstream	SMH2X	J-029560-1	MCBREEN



SMH4X_4b387c41-09cd-4717-b066-db1a2cc7a6cd_20220408_124648_682.jpg, 00:00:11, 0.40 m
Roots, fine

SMH4X_adab20d6-bcc8-4224-b896-5e7e801ac00a_20220408_124732_423.jpg, 00:00:38, 3.21 m
Crack, circumferential from 4 o'clock to 8 o'clock, CRACKS AND ROOTS

SMH4X_2da0b000-1b7d-41b2-8540-e041eeb42d3d_20220408_124806_045.jpg, 00:00:53, 3.77 m
Fracture, circumferential from 8 o'clock to 10 o'clock

SMH4X_3e775cd6-07bf-448a-b8af-f02383adeace_20220408_124815_187.jpg, 00:00:56, 3.77 m
Broken pipe at 9 o'clock

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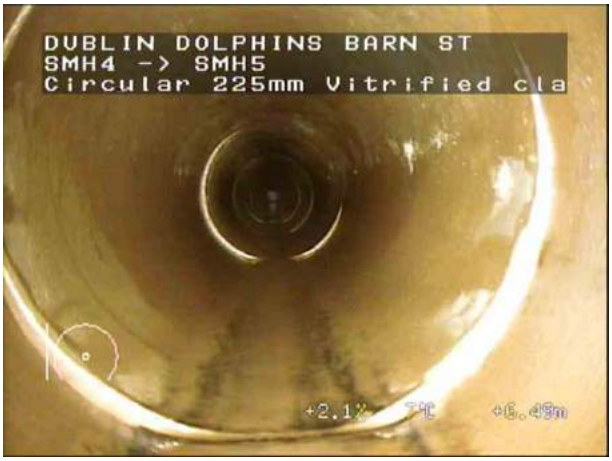
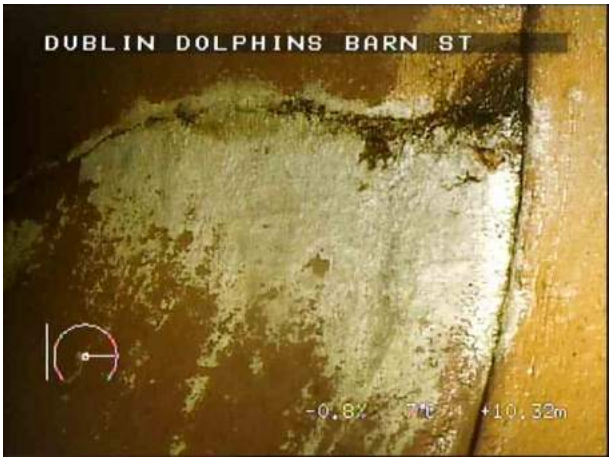
Section Pictures - 08/04/2022 - SMH2X

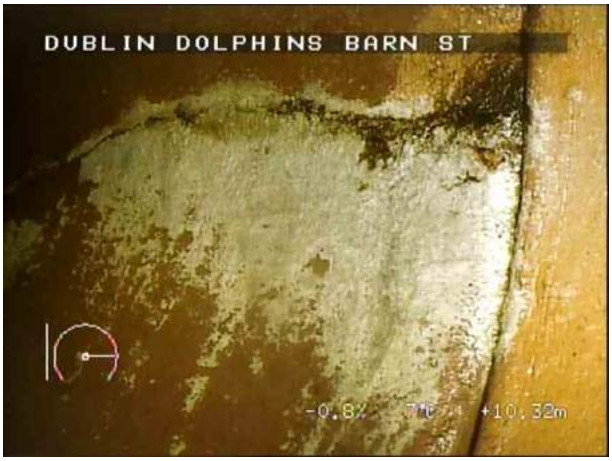
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Downstream	SMH2X	J-029560-1	MCBREEN



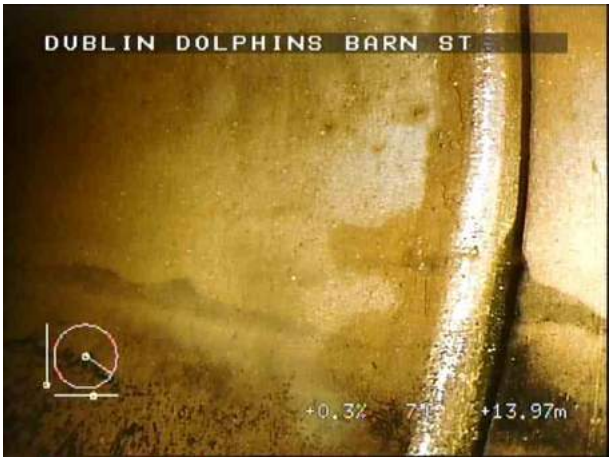
SMH4X_0e795d9c-b08d-47e2-a26b-d0cceace6cc8_20220408_124844_255.jpg, 00:01:20, 6.49 m
Joint displaced, medium



SMH4X_92a2a218-7c0a-4af8-a8bc-a1bf08f2b202_20220408_124933_070.jpg, 00:01:58, 10.32 m
Fractures, radiating from 3 o'clock to 4 o'clock



SMH4X_9f0fee19-06ee-4eac-a4d9-c5c9cc5831d0_20220408_124933_278.jpg, 00:01:58, 10.32 m
Fractures, radiating from 3 o'clock to 4 o'clock



SMH4X_f82a13ab-69c4-45fd-8f68-8b0b8f6aada8_20220408_125015_918.jpg, 00:02:34, 13.97 m
Open joint, medium

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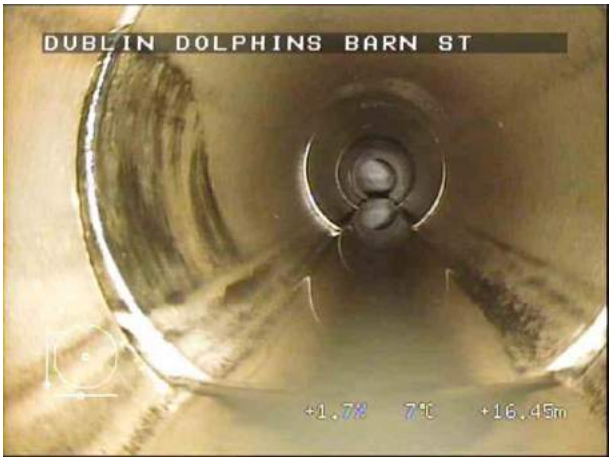
Section Pictures - 08/04/2022 - SMH2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Downstream	SMH2X	J-029560-1	MCBREEN



SMH4X_640e99a1-0852-4f0b-bc90-f30d2a366878_20220408_125041_365.jpg, 00:02:54, 16.45 m
Joint displaced, large

SMH4X_81fbdfc0-ff1d-458a-a526-edb992863217_20220408_125119_158.jpg, 00:03:20, 19.60 m
Hole in drain or sewer from 1 o'clock to 2 o'clock

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Section Inspection - 08/04/2022 - SMH3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	08/04/22	12:41	J-029560-1	No Rain Or Snow	Yes	SMH3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
mindaugas	172 CN 195 Mercedes Sprinter	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Dublin	**Inspection Direction:**	Downstream	**Upstream Node:**	SMH3
Road:	Dolphins Barn St	**Inspected Length:**	6.36 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	6.36 m	**Downstream Node:**	SMH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:55

Depth: m
SMH3

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH3	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
1.67	CR	Cracks, radiating from 8 o'clock to 10 o'clock	00:00:49	SMH3X_5d898e02-e1ea-4f7e-b	3 / 2
3.38	FR	Fractures, radiating from 8 o'clock to 11 o'clock	00:01:12	SMH3X_b86fdd8e-a315-41cf-9	4 / 2
3.43	RF	Roots, fine	00:01:24	SMH3X_f6659471-79aa-4ef4-a5	2
4.23	H	Hole in drain or sewer at 6 o'clock	00:01:49	SMH3X_f19e9c9c-3e15-4058-b	4
6.36	MHF	Finish node, manhole, reference: SMH2: welded lid mh covwe	00:02:14		

SMH2
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
3	80.0	31.4	200.0	4.0	3	2.0	0.5	3.0	3.0

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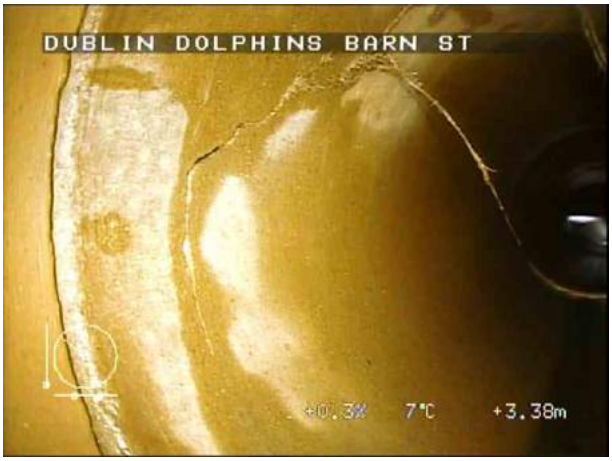
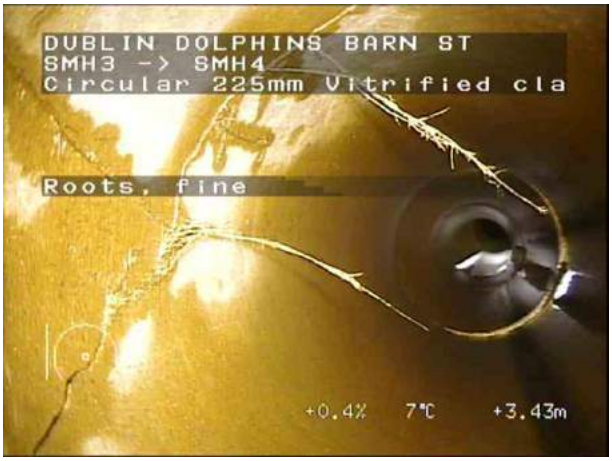
Section Pictures - 08/04/2022 - SMH3X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Downstream	SMH3X	J-029560-1	MCBREEN

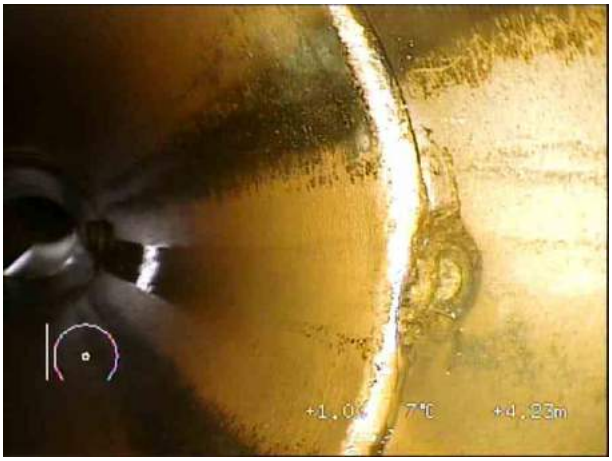
SMH3X_5d898e02-e1ea-4f7e-bf14-5680b51cd7bd_20220408_124241_795.jpg, 00:00:49, 1.67 m
Cracks, radiating from 8 o'clock to 10 o'clock



SMH3X_b86fdd8e-a315-41cf-9ab9-d544ffdc3481_20220408_124314_235.jpg, 00:01:12, 3.38 m
Fractures, radiating from 8 o'clock to 11 o'clock



SMH3X_f6659471-79aa-4ef4-a5ee-c77b76d7ee39_20220408_124332_580.jpg, 00:01:24, 3.43 m
Roots, fine



SMH3X_f19e9c9c-3e15-4058-b30f-a15ba3ec114a_20220408_124410_857.jpg, 00:01:49, 4.23 m
Hole in drain or sewer at 6 o'clock

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Section Inspection - 08/04/2022 - SMH4X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	08/04/22	10:08	J-029560-1	No Rain Or Snow	Yes	SMH4X

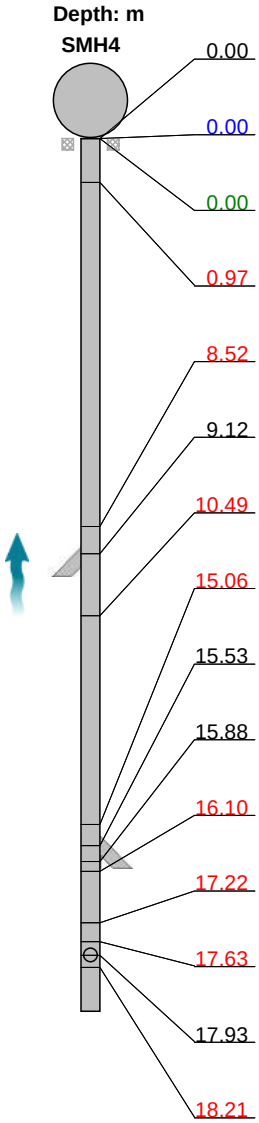
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
mindaugas	172 CN 195 Mercedes Sprinter	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH4
Road:	Dolphins Barn St	**Inspected Length:**	31.61 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	31.61 m	**Downstream Node:**	SMH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:166



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: SMH4	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:03		
0.00	S01	DEZ	Attached deposits, other from 12 o'clock to 12 o'clock, 5% cross-sectional area loss, start: SILT	00:00:04		3
0.97		SZ	Surface damage, other from 9 o'clock to 11 o'clock: OLD CONNECTION	00:00:26	SMH3X_3048078d-313b-4a0c-	
8.52		OJL	Open joint, large	00:02:23	SMH3X_f949510e-b4f6-4394-8a	1
9.12		JN	Junction at 3 o'clock, 100mm dia: OLD JUNCTION	00:02:50	SMH3X_a0c2e369-32cc-4cbc-b	
10.49		OJM	Open joint, medium	00:03:34	SMH3X_ee8eff8b-ef12-4309-8	1
15.06		OJL	Open joint, large: CRANCK ON JOINT	00:04:57	SMH3X_191414e8-b719-45b2-	1
15.53		JN	Junction at 9 o'clock, 100mm dia	00:05:13	SMH3X_53077791-5ac5-4dee-	
15.88		MCVC	Pipe material changes to vitrified clay at this point: PIPE CHANGES TO CLAY	00:05:41		
16.10		CR	Cracks, radiating from 8 o'clock to 10 o'clock	00:05:54	SMH3X_fe378036-504c-4eea-9	3 / 2
17.22		FCJ	Fracture, circumferential at joint from 10 o'clock to 12 o'clock	00:06:36	SMH3X_2856e269-1400-4a1e-	3 / 2
17.63		D	Deformed sewer or drain, 10%: OLD CONNECTION	00:06:54	SMH3X_4bc7a12c-afa4-49e1-a	4 / 3
17.93		CN	Connection other than junction at 12 o'clock, 100mm dia	00:07:34		
18.21		OJM	Open joint, medium	00:07:51	SMH3X_4560511f-a8a0-4761-	1

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Section Inspection - 08/04/2022 - SMH4X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	08/04/22	10:08	J-029560-1	No Rain Or Snow	Yes	SMH4X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
mindaugas	172 CN 195 Mercedes Sprinter	Not Specified	Not Specified	Not Specified	Not Specified

SMH3

Depth: m

Scale: 1:166	Position [m]	Code	Observation	MPEG	Photo	Grade
	20.13	CLJ	Crack, longitudinal at joint at 12 o'clock	00:08:26	SMH3X_0ac6157f-b4ab-4ad9-	2 / 2
	21.14	JDL	Joint displaced, large	00:08:54	SMH3X_b2ac8f39-db7c-4314-	1 / 4
	21.20	D	Deformed sewer or drain, 5%	00:09:18	SMH3X_d48bc823-7a6c-4735-	2 / 2
	24.65	CC	Crack, circumferential from 3 o'clock to 4 o'clock	00:10:19	SMH3X_0ebb6a48-de9d-4969-	2 / 2
	27.19	SR	Sealing ring intruding at 6 o'clock	00:11:01		1 / 1
	27.19	SR	Sealing ring intruding at 6 o'clock	00:11:01		1 / 1
	27.19	SR	Sealing ring intruding at 6 o'clock	00:11:01	SMH3X_4f6e492a-5e77-4b84-8	1 / 1
	28.37	D	Deformed sewer or drain, 10%	00:11:25		4 / 3
	28.37	D	Deformed sewer or drain, 10%	00:11:25	SMH3X_2d4f37a4-ef05-4947-9	4 / 3
	28.70	CN	Connection other than junction at 12 o'clock, 100mm dia	00:11:44		
	28.96	OJL	Open joint, large	00:12:01	SMH3X_c4e3b749-1326-407f-8	1
	29.61	OJL	Open joint, large	00:12:25	SMH3X_e097369b-9d07-4f80-b	1
	30.03	H	Hole in drain or sewer from 11 o'clock to 1 o'clock	00:12:44	SMH3X_31bada83-1254-45d7-	4
	30.03	OJL	Open joint, large	00:13:00	SMH3X_0aac7fce-5a23-446e-	1
	30.60	CN	Connection other than junction at 12 o'clock, 100mm dia	00:13:27		
	31.61	MHF	Finish node, manhole, reference: SMH4	00:13:54		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
20	160.0	14.8	469.0	4.0	13	5.0	0.6	18.0	4.0

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Section Pictures - 08/04/2022 - SMH4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN

SMH3X_3048078d-313b-4a0c-b62f-0b3dfd6fad3e_20220408_101131_664.jpg, 00:00:26, 0.97 m
Surface damage, other from 9 o'clock to 11 o'clock, OLD CONNECTION

SMH3X_f949510e-b4f6-4394-8afe-2daf860bfc1d_20220408_101348_771.jpg, 00:02:23, 8.52 m
Open joint, large

SMH3X_a0c2e369-32cc-4cbc-b45b-fe9c2527e042_20220408_101438_189.jpg, 00:02:50, 9.12 m
Junction at 3 o'clock, 100mm dia, OLD JUNCTION

SMH3X_97c281b6-352d-4a2b-aacf-9862c78501cb_20220408_101439_675.jpg, 00:02:50, 9.12 m
Junction at 3 o'clock, 100mm dia, OLD JUNCTION

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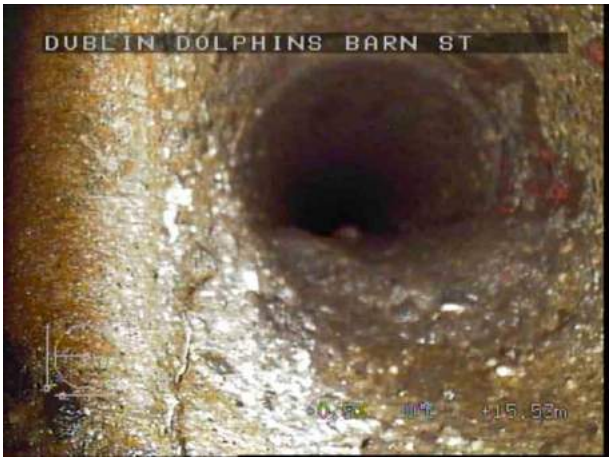
Section Pictures - 08/04/2022 - SMH4X

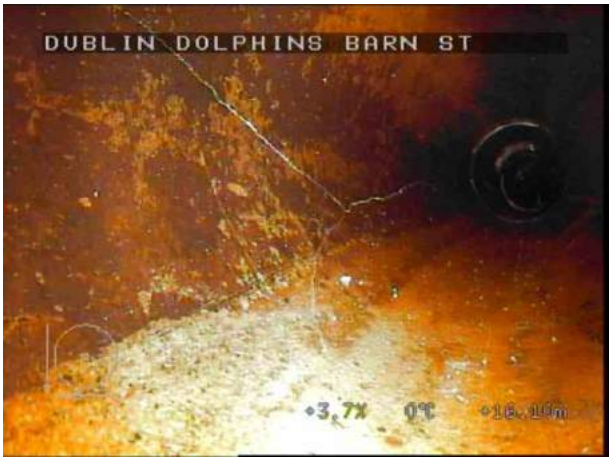
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN

SMH3X_ee8eff8b-ef12-4309-8494-48da32b7e79d_20220408_101528_559.jpg, 00:03:34, 10.49 m
Open joint, medium

SMH3X_191414e8-b719-45b2-aca3-856292a3ef3b_20220408_101720_789.jpg, 00:04:57, 15.06 m
Open joint, large, CRANCK ON JOINT



SMH3X_53077791-5ac5-4dee-879f-715ab5cb6e64_20220408_101811_303.jpg, 00:05:13, 15.53 m
Junction at 9 o'clock, 100mm dia



SMH3X_fe378036-504c-4eea-937a-ddab3fadaa73_20220408_102006_609.jpg, 00:05:54, 16.10 m
Cracks, radiating from 8 o'clock to 10 o'clock

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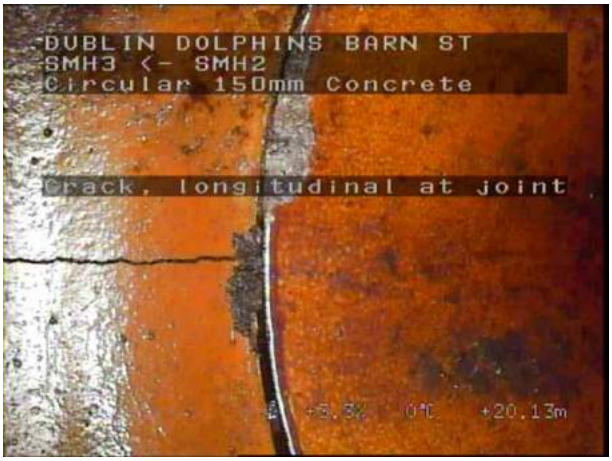
Section Pictures - 08/04/2022 - SMH4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN

SMH3X_2856e269-1400-4a1e-880a-86ee3f0c09ed_20220408_102207_967.jpg, 00:06:36, 17.22 m
Fracture, circumferential at joint from 10 o'clock to 12 o'clock

SMH3X_4bc7a12c-afa4-49e1-a5d1-6b8698e8d898_20220408_102308_252.jpg, 00:06:54, 17.63 m
Deformed sewer or drain, 10%, OLD CONNECTION

SMH3X_4560511f-a8a0-4761-b103-2ad8f21897b7_20220408_102426_372.jpg, 00:07:51, 18.21 m
Open joint, medium



SMH3X_0ac6157f-b4ab-4ad9-8172-19cf6c224f8e_20220408_102755_481.jpg, 00:08:26, 20.13 m
Crack, longitudinal at joint at 12 o'clock

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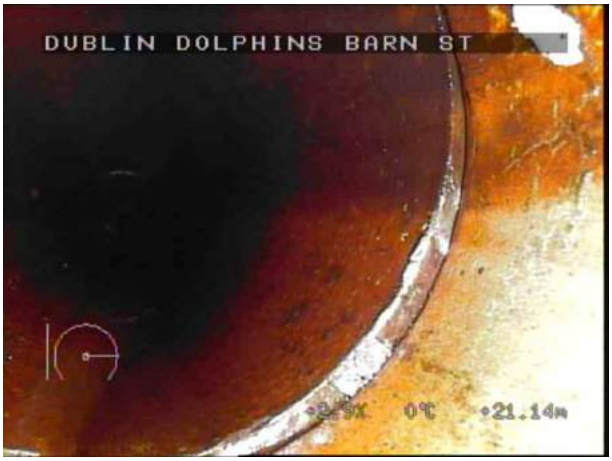
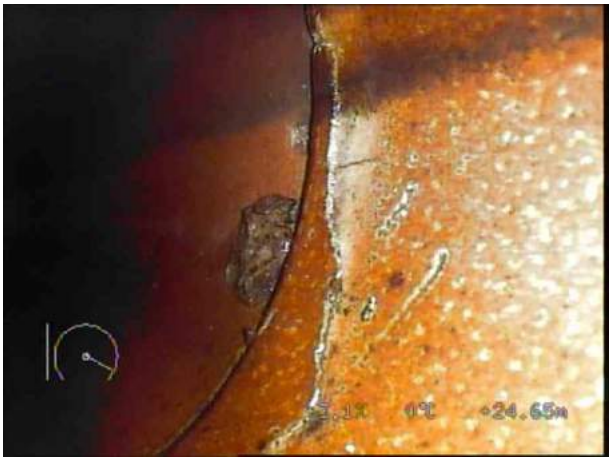
Section Pictures - 08/04/2022 - SMH4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN

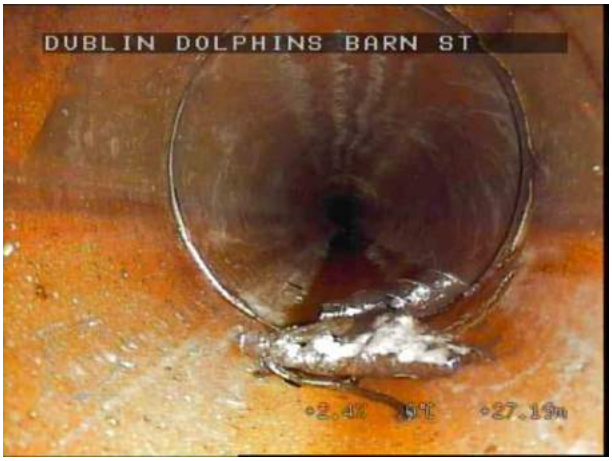


SMH3X_b2ac8f39-db7c-4314-b07c-01876c25bebb_20220408_102842_873.jpg, 00:08:54, 21.14 m
Joint displaced, large

SMH3X_d48bc823-7a6c-4735-a61d-b64428dd3433_20220408_102923_372.jpg, 00:09:18, 21.20 m
Deformed sewer or drain, 5%



SMH3X_0ebb6a48-de9d-4969-8cc3-2cbed6f102d8_20220408_103035_844.jpg, 00:10:19, 24.65 m
Crack, circumferential from 3 o'clock to 4 o'clock



SMH3X_4f6e492a-5e77-4b84-8bf2-9b37f8e05a1e_20220408_103145_695.jpg, 00:11:01, 27.19 m
Sealing ring intruding at 6 o'clock

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Section Pictures - 08/04/2022 - SMH4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN

SMH3X_2d4f37a4-ef05-4947-9a4c-4fce43f26fed_20220408_103232_340.jpg, 00:11:25, 28.37 m
Deformed sewer or drain, 10%

SMH3X_c4e3b749-1326-407f-856d-6befd816f5e4_20220408_103324_828.jpg, 00:12:01, 28.96 m
Open joint, large

SMH3X_e097369b-9d07-4f80-b9f6-642262c70cb6_20220408_103357_091.jpg, 00:12:25, 29.61 m
Open joint, large

SMH3X_31bada83-1254-45d7-9f25-eaef24bba3c3_20220408_103439_621.jpg, 00:12:44, 30.03 m
Hole in drain or sewer from 11 o'clock to 1 o'clock

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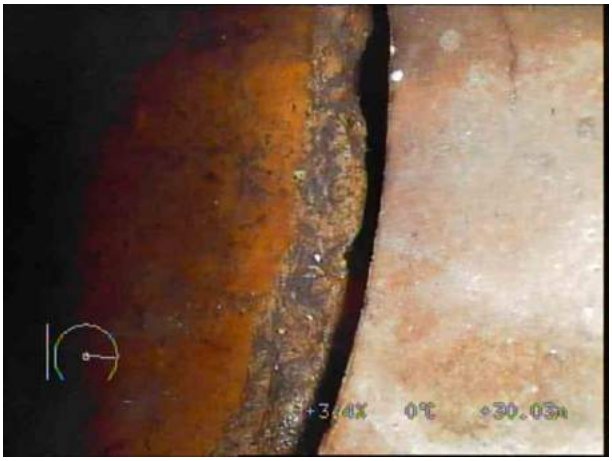
Section Pictures - 08/04/2022 - SMH4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN



SMH3X_0aac7fce-5a23-446e-884d-486e70784976_20220408_103502_848.jpg, 00:13:00, 30.03 m
Open joint, large

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Section Inspection - 21/02/2022 - SMH5X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	3	21/02/22	14:01	J-028275	No Rain Or Snow	Yes	SMH5X

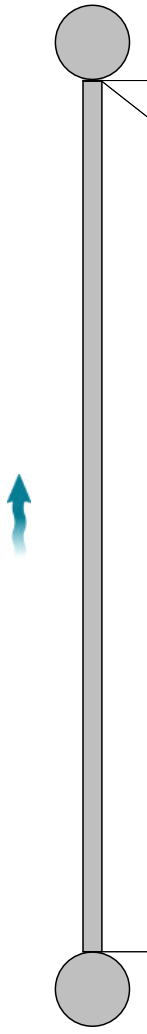
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
niall s	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:		**Inspection Direction:**	Upstream	**Upstream Node:**	SMH5
Road:	Donore Rd	**Inspected Length:**	14.06 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	14.06 m	**Downstream Node:**	SMH6
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Investigation of known defects	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:122



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH6	00:00:00		
0.02	WL	Water level, 5% of the vertical dimension	00:00:04		
14.06	MHF	Finish node, manhole, reference: SMH5	00:01:14		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 21/02/2022 - SMH6X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	2	21/02/22	13:59	J-028275	No Rain Or Snow	Yes	SMH6X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
niall s	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:		**Inspection Direction:**	Upstream	**Upstream Node:**	SMH6
Road:	Donore Rd	**Inspected Length:**	8.81 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	8.81 m	**Downstream Node:**	SMH7
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Investigation of known defects	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:76

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH7	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
2.28	CN	Connection other than junction at 12 o'clock, diameter: 100mm	00:00:17		
8.81	MHF	Finish node, manhole, reference: SMH6	00:00:43		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 21/02/2022 - SMH8X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	21/02/22	13:53	J-028275	No Rain Or Snow	Yes	SMH8X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
niall s	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:		**Inspection Direction:**	Upstream	**Upstream Node:**	SMH8
Road:	Donore Rd	**Inspected Length:**	8.38 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	8.38 m	**Downstream Node:**	SMH7
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Investigation of known defects	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:73	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m SMH8						
	0.00	MH	Start node, manhole, reference: SMH8	00:00:00		
	0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
	8.38	MHF	Finish node, manhole, reference: SMH7	00:00:24		
SMH7 Depth: m						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 29/01/2022 - SMH9X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	8	29/01/22	12:59	J-025413	No Rain Or Snow	Yes	SMH9X

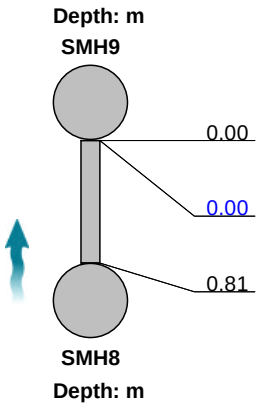
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH9
Road:	St Teresas Garden	**Inspected Length:**	0.81 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	0.81 m	**Downstream Node:**	SMH8
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH9	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
0.81	MHF	Finish node, manhole, reference: SMH8	00:00:12		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 08/04/2022 - SMH9X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	08/04/22	9:58	J-029560-1	No Rain Or Snow	Yes	SMH9X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
mindaugas	172 CN 195 Mercedes Sprinter	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH9
Road:	Dolphins Barn St	**Inspected Length:**	6.84 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	6.84 m	**Downstream Node:**	SMH4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:59

Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: SMH9	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:03		
0.00	F01	DEZ	Attached deposits, other from 12 o'clock to 12 o'clock, 5% cross-sectional area loss, finish: SILT	00:00:05	SMH2X_8c149130-048c-446d-	3
0.85		OJM	Open joint, medium	00:00:27	SMH2X_0889b6b3-45e6-4b41-	1
5.38		OJL	Open joint, large	00:01:52	SMH2X_148e6317-0075-47a9-	1
6.01		JN	Junction at 9 o'clock, 100mm dia	00:02:22	SMH2X_d3a5553c-1358-44da-	
6.84		MHF	Finish node, manhole, reference: SMH4: BURIED MH	00:03:07		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
2	2.0	0.4	3.0	1.0	1	0.0	0.3	2.0	1.0

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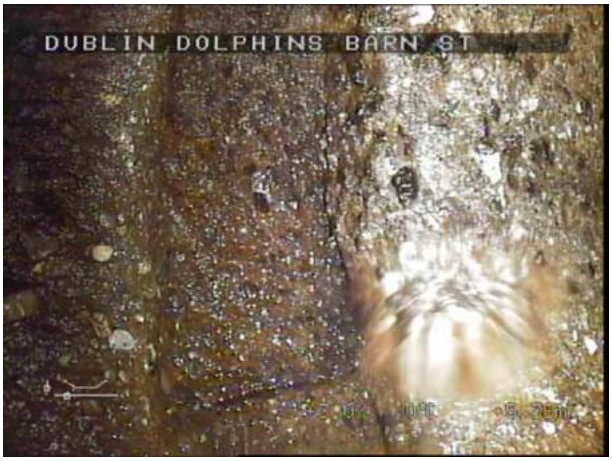
Section Pictures - 08/04/2022 - SMH9X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
9	Upstream	SMH9X	J-029560-1	MCBREEN

SMH2X_8c149130-048c-446d-86a1-1400bc3ca565_20220412_123830_327.jpg, 00:00:05, 0.00 m
Attached deposits, other from 12 o'clock to 12 o'clock, 5% cross-sectional area loss, finish, SILT

SMH2X_0889b6b3-45e6-4b41-bbfa-a42acf304ac4_20220408_100034_943.jpg, 00:00:27, 0.85 m
Open joint, medium



SMH2X_148e6317-0075-47a9-90ec-1b057ce0a7c8_20220408_100212_773.jpg, 00:01:52, 5.38 m
Open joint, large

SMH2X_d3a5553c-1358-44da-8de2-f74cbf6eea60_20220408_100312_296.jpg, 00:02:22, 6.01 m
Junction at 9 o'clock, 100mm dia

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Section Inspection - 29/01/2022 - SMH10X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	4	29/01/22	12:16	J-025413	No Rain Or Snow	Yes	SMH10X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH10
Road:	St Teresas Garden	**Inspected Length:**	55.96 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	55.96 m	**Downstream Node:**	MH9
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:301

Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: SMH10	00:00:00		
0.04		WL	Water level, 5% of the vertical dimension	00:00:02		
3.77		MCVC	Pipe material changes to vitrified clay at this point	00:00:24	MH2 TO MH1_3-77 m_121906	
4.62		H	Hole in drain or sewer from 10 o'clock to 1 o'clock	00:00:43	MH2 TO MH1_4-62 m_121933	5
8.01		JDM	Joint displaced, medium	00:01:01		1 / 3
17.14		H	Hole in drain or sewer from 9 o'clock to 1 o'clock	00:01:56	MH2 TO MH1_17-1 4m_12210	5
20.75		WL	Water level, 50% of the vertical dimension	00:02:13		
21.93	S01	CUW	Loss of vision, camera under water, start	00:02:20	MH2 TO MH1_21-9 3m_12213	
27.67	F01	CUW	Loss of vision, camera under water, finish	00:02:41		
27.67		WL	Water level, 15% of the vertical dimension	00:02:43		
30.36		WL	Water level, 70% of the vertical dimension	00:02:55		
30.42	S02	CUW	Loss of vision, camera under water, start	00:02:57	MH2 TO MH1_30-4 2m_12224	
32.71	F02	CUW	Loss of vision, camera under water, finish	00:03:10		
32.71		WL	Water level, 20% of the vertical dimension	00:03:12		
32.75		H	Hole in drain or sewer from 10 o'clock to 12 o'clock	00:03:16	MH2 TO MH1_32-7 5m_12233	4

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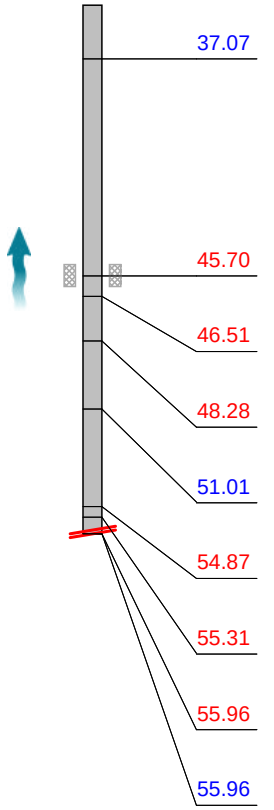
Section Inspection - 29/01/2022 - SMH10X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	4	29/01/22	12:16	J-025413	No Rain Or Snow	Yes	SMH10X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Scale: 1:301



Position [m]		Code	Observation	MPEG	Photo	Grade
37.07		WL	Water level, 60% of the vertical dimension	00:03:40		
45.70	S03	JDM	Joint displaced, medium, start	00:04:19	MH2 TO MH1_45-70m_12245	1 / 3
46.51		CM	Cracks, multiple, in roof slab at 12 o'clock	00:04:25	MH2 TO MH1_46-51m_12251	3 / 2
48.28		CL	Crack, longitudinal, in roof slab at 12 o'clock	00:04:41	MH2 TO MH1_48-28m_12254	2 / 2
51.01		WL	Water level, 30% of the vertical dimension	00:04:54		
54.87		CL	Crack, longitudinal, in roof slab at 12 o'clock	00:05:14	MH2 TO MH1_54-87m_12263	2 / 2
55.31		H	Hole in drain or sewer from 12 o'clock to 3 o'clock	00:05:26	MH2 TO MH1_55-31m_12265	5
55.96		XP	Collapsed drain or sewer	00:05:34	MH2 TO MH1_55-96m_12271	5
55.96		SA	Survey abandoned: CANT PASS	00:05:38	MH2 TO MH1_55-96m_12272	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
10	175.0	14.3	802.0	5.0	5	2.0	0.1	7.0	3.0

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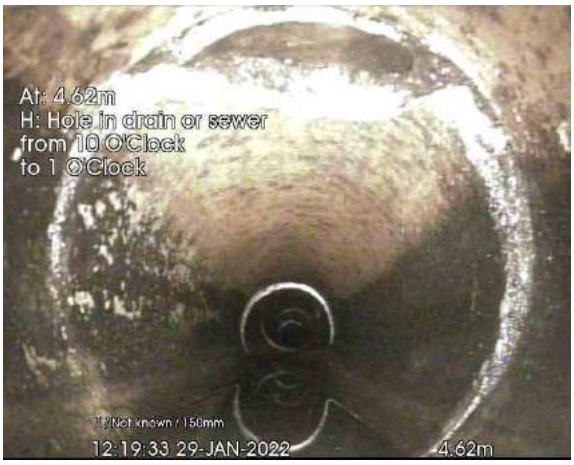
Section Pictures - 29/01/2022 - SMH10X

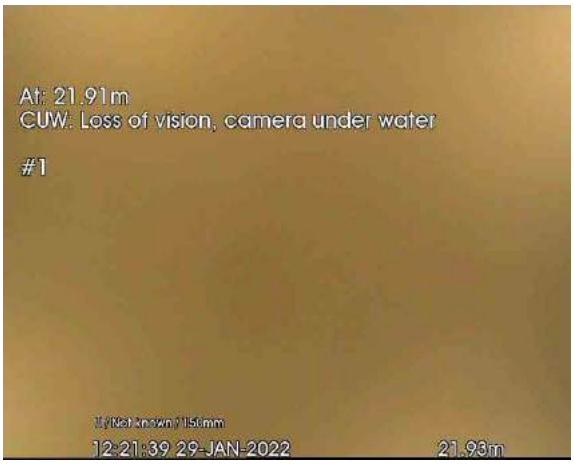
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Upstream	SMH10X	J-025413	MC BREEN

MH2 TO MH1_3-77m_121906.jpg, 00:00:24, 3.77 m
Pipe material changes to vitrified clay at this point



MH2 TO MH1_4-62m_121933.jpg, 00:00:43, 4.62 m
Hole in drain or sewer from 10 o'clock to 1 o'clock

MH2 TO MH1_17-14m_122100.jpg, 00:01:56, 17.14 m
Hole in drain or sewer from 9 o'clock to 1 o'clock



MH2 TO MH1_21-93m_122139.jpg, 00:02:20, 21.93 m
Loss of vision, camera under water, start

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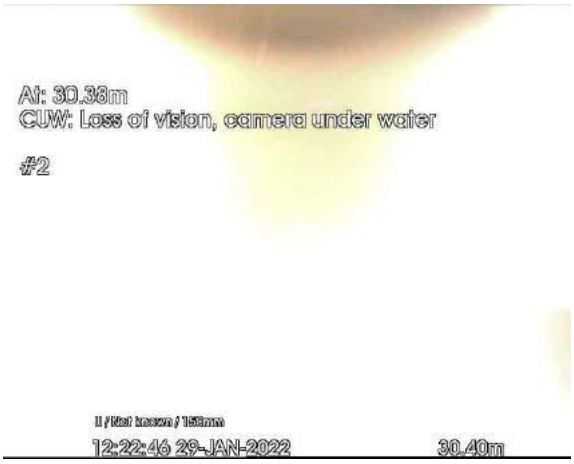
Section Pictures - 29/01/2022 - SMH10X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Upstream	SMH10X	J-025413	MC BREEN



MH2 TO MH1_30-42m_122246.jpg, 00:02:57, 30.42 m
Loss of vision, camera under water, start

MH2 TO MH1_32-75m_122337.jpg, 00:03:16, 32.75 m
Hole in drain or sewer from 10 o'clock to 12 o'clock

MH2 TO MH1_45-70m_122459.jpg, 00:04:19, 45.70 m
Joint displaced, medium, start

MH2 TO MH1_46-51m_122516.jpg, 00:04:25, 46.51 m
Cracks, multiple, in roof slab at 12 o'clock

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Section Pictures - 29/01/2022 - SMH10X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Upstream	SMH10X	J-025413	MC BREEN

MH2 TO MH1_48-28m_122540.jpg, 00:04:41, 48.28 m
Crack, longitudinal, in roof slab at 12 o'clock

MH2 TO MH1_54-87m_122630.jpg, 00:05:14, 54.87 m
Crack, longitudinal, in roof slab at 12 o'clock

MH2 TO MH1_55-31m_122651.jpg, 00:05:26, 55.31 m
Hole in drain or sewer from 12 o'clock to 3 o'clock

MH2 TO MH1_55-96m_122713.jpg, 00:05:34, 55.96 m
Collapsed drain or sewer

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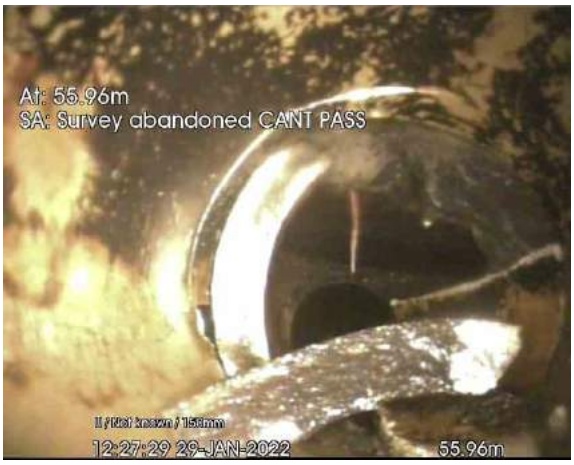
Section Pictures - 29/01/2022 - SMH10X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Upstream	SMH10X	J-025413	MC BREEN



MH2 TO MH1_55-96m_122729.jpg, 00:05:38, 55.96 m
Survey abandoned, CANT PASS

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Section Inspection - 29/01/2022 - SMH10X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
11	5	29/01/22	12:38	J-025413	No Rain Or Snow	Yes	SMH10X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Downstream	**Upstream Node:**	SMH10
Road:	St Teresas Garden	**Inspected Length:**	3.76 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	3.76 m	**Downstream Node:**	SMH9
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50 Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH9	00:00:00		
0.02	WL	Water level, 5% of the vertical dimension	00:00:01		
0.75	H	Hole in drain or sewer from 8 o'clock to 1 o'clock	00:00:09	MH1 TO MH2_0-75 m_123931	5
3.76	OBZ	Other obstacles from 9 o'clock to 3 o'clock, 75% cross-sectional area loss: CONCRETE	00:00:27	MH1 TO MH2_3-76 m_124020	5
3.76	SA	Survey abandoned: CANT PASS	00:00:30	MH1 TO MH2_3-76 m_124033	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	165.0	43.9	165.0	5.0	1	10.0	2.7	10.0	5.0

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Section Pictures - 29/01/2022 - SMH10X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
11	Downstream	SMH10X	J-025413	MC BREEN

MH1 TO MH2_0-75m_123931.jpg, 00:00:09, 0.75 m
Hole in drain or sewer from 8 o'clock to 1 o'clock

MH1 TO MH2_3-76m_124020.jpg, 00:00:27, 3.76 m
Other obstacles from 9 o'clock to 3 o'clock, 75% cross-sectional area loss, CONCRETE

MH1 TO MH2_3-76m_124033.jpg, 00:00:30, 3.76 m
Survey abandoned, CANT PASS

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Section Inspection - 29/01/2022 - SMH11X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
12	3	29/01/22	11:31	J-025413	No Rain Or Snow	Yes	SMH11X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH11
Road:	St Teresas Garden	**Inspected Length:**	29.31 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	29.31 m	**Downstream Node:**	SMH10
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:253

Position [m]	Code	Observation	MPEG	Photo	Grade
		Depth: m			
		SMH10			
0.00	MH	Start node, manhole, reference: SMH10	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:01		
29.31	MHF	Finish node, manhole, reference: SMH11	00:01:20		
		SMH11			
		Depth: m			

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 29/01/2022 - SMH12X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
13	2	29/01/22	11:28	J-025413	No Rain Or Snow	Yes	SMH12X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH12
Road:	St Teresas Garden	**Inspected Length:**	4.25 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	4.25 m	**Downstream Node:**	SMH11
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m						
SMH12						
	0.00	MH	Start node, manhole, reference: SMH12	00:00:00		
	0.00	WL	Water level, 5% of the vertical dimension	00:00:01		
	4.25	MHF	Finish node, manhole, reference: SMH11	00:00:18		
SMH11						
Depth: m						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 29/01/2022 - SMH13X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
14	1	29/01/22	11:17	J-025413	No Rain Or Snow	Yes	SMH13X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JR	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:	Dublin	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH13
Road:	St Teresas Garden	**Inspected Length:**	13.59 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	13.59 m	**Downstream Node:**	SMH12
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:118

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH13	00:00:02		
0.00	WL	Water level, 5% of the vertical dimension	00:00:06		
13.59	MHF	Finish node, manhole, reference: SMH12	00:00:56		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 21/02/2022 - SMH14X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
15	6	21/02/22	15:22	J-028275	No Rain Or Snow	Yes	SMH14X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
niall s	Not Specified	Not Specified	Not Specified	Not Specified	1

Town or Village:		**Inspection Direction:**	Upstream	**Upstream Node:**	SMH14
Road:	Donore Rd	**Inspected Length:**	5.35 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	5.35 m	**Downstream Node:**	TANK
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Investigation of known defects	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m tank						
	0.00	MH	Start node, manhole, reference: tank	00:00:00		
	0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
	5.17	REM	General remark: flow regulator	00:00:27		
	5.35	MHF	Finish node, manhole, reference: SMH14	00:00:33		
SMH14 Depth: m						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Appendix I – Surface Water Drainage Model Results & Longsections

Midpoint Alencon Link Basingstoke, RG21 7PP	Donore Project Donore Avenue Dublin 8
Date 07/10/2022 10:25 File The Donore Project.MDX	Designed by DM Checked by MI
Innovyze	Network 2020.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm Network

Pipe Sizes Circular Manhole Sizes Adoptable

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	16.400	Add Flow / Climate Change (%)	0
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for Storm Network

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	7.165	0.042	170.6	0.030	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	7.356	0.043	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	53.676	0.309	173.9	0.269	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.000	17.256	0.100	172.6	0.068	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	78.930	0.439	179.6	0.224	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	51.474	0.338	152.3	0.337	5.00	0.0	0.600	o	375	Pipe/Conduit	
S1.004	6.106	0.030	203.5	0.017	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.005	36.750	0.160	230.0	0.036	0.00	0.0	0.600	o	525	Pipe/Conduit	
S4.000	5.670	0.160	35.4	0.117	5.00	0.0	0.600	o	450	Pipe/Conduit	
S4.001	48.991	0.122	400.0	0.246	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.002	22.171	0.055	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.12	18.600	0.030	0.0	0.0	0.0	1.00	39.7	5.5
S1.001	50.00	5.24	18.558	0.030	0.0	0.0	0.0	1.00	39.8	5.5
S1.002	50.00	5.82	18.500	0.299	0.0	0.0	0.0	1.54	244.7	54.0
S2.000	50.00	5.24	18.800	0.068	0.0	0.0	0.0	1.19	84.4	12.3
S1.003	50.00	6.69	18.191	0.592	0.0	0.0	0.0	1.51	240.8	106.9
S3.000	50.00	5.59	18.500	0.337	0.0	0.0	0.0	1.47	161.9	60.8
S1.004	50.00	6.76	17.677	0.946	0.0	0.0	0.0	1.57	339.1	170.8
S1.005	50.00	7.17	17.647	0.982	0.0	0.0	0.0	1.47	318.8	177.2
S4.000	50.00	5.03	18.000	0.117	0.0	0.0	0.0	3.42	544.6	21.1
S4.001	50.00	5.84	17.840	0.362	0.0	0.0	0.0	1.01	160.7	65.4
S4.002	50.00	6.20	17.718	0.362	0.0	0.0	0.0	1.01	160.7	65.4

Network Design Table for Storm Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.003	43.495	0.112	388.3	0.069	0.00	0.0	0.600	o	750	Pipe/Conduit	
S4.004	24.642	0.120	205.3	0.044	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.006	15.158	0.060	252.6	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.007	48.420	0.245	197.6	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.008	39.296	0.160	245.6	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S5.000	9.148	0.060	152.5	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	82.023	0.820	100.0	0.118	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	45.097	0.251	180.0	0.264	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.001	34.408	0.222	155.0	0.060	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.002	8.581	0.028	306.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.002	8.049	0.080	100.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	50.082	0.200	250.4	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.010	94.338	0.250	377.4	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.011	7.110	0.010	711.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	41.044	0.207	198.3	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
S7.001	12.490	0.040	312.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.002	40.911	0.131	312.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.003	76.248	0.160	476.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.004	82.083	0.190	432.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.005	35.129	0.070	501.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.003	50.00	6.71	17.662	0.432	0.0	0.0	0.0	1.41	624.7	78.0
S4.004	50.00	6.92	17.550	0.476	0.0	0.0	0.0	1.95	861.1	85.9
S1.006	50.00	7.30	17.430	1.457	0.0	0.0	0.0	1.97	1251.2	263.1
S1.007	50.00	7.66	17.425	1.457	0.0	0.0	0.0	2.23	1415.7	263.1
S1.008	50.00	7.99	17.180	1.457	0.0	0.0	0.0	1.99	1269.1	263.1
S5.000	50.00	5.14	18.320	0.000	0.0	0.0	0.0	1.06	42.0	0.0
S5.001	50.00	6.19	18.270	0.118	0.0	0.0	0.0	1.31	52.0	21.4
S6.000	50.00	5.64	18.030	0.264	0.0	0.0	0.0	1.17	82.6	47.7
S6.001	50.00	6.04	17.704	0.324	0.0	0.0	0.0	1.45	160.5	58.6
S6.002	50.00	6.18	17.482	0.324	0.0	0.0	0.0	1.03	113.7	58.6
S5.002	50.00	6.26	17.450	0.443	0.0	0.0	0.0	1.81	200.1	79.9
S1.009	49.86	8.42	17.020	1.900	0.0	0.0	0.0	1.98	1256.8	342.1
S1.010	47.42	9.39	16.820	1.900	0.0	0.0	0.0	1.61	1022.3	342.1
S1.011	46.85	9.64	16.570	1.900	0.0	0.0	0.0	0.48	19.2«	342.1
S7.000	50.00	5.61	17.370	0.000	0.0	0.0	0.0	1.11	78.7	0.0
S7.001	50.00	5.85	17.154	0.000	0.0	0.0	0.0	0.88	62.5	0.0
S7.002	50.00	6.62	17.114	0.000	0.0	0.0	0.0	0.88	62.5	0.0
S7.003	50.00	8.16	16.980	0.000	0.0	0.0	0.0	0.82	90.9	0.0
S7.004	46.61	9.75	16.820	0.000	0.0	0.0	0.0	0.87	95.6	0.0
S7.005	45.04	10.48	16.630	0.000	0.0	0.0	0.0	0.80	88.6	0.0

Network Design Table for Storm Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.012	32.583	0.080	407.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.013	4.148	0.020	207.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.012	43.83	11.08	16.560	1.900	0.0	0.0	0.0	0.89	98.5«	342.1
S1.013	43.74	11.13	16.480	1.900	0.0	0.0	0.0	1.55	335.9«	342.1

Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	20.000	1.400	Open Manhole	1200	S1.000	18.600	225				
S2	20.000	1.442	Open Manhole	1200	S1.001	18.558	225	S1.000	18.558	225	
S3	19.990	1.490	Open Manhole	1350	S1.002	18.500	450	S1.001	18.515	225	
S4	20.070	1.270	Open Manhole	1200	S2.000	18.800	300				
S5	19.900	1.709	Open Manhole	1350	S1.003	18.191	450	S1.002	18.191	450	
								S2.000	18.700	300	359
S6	20.050	1.550	Open Manhole	1350	S3.000	18.500	375				
S7	19.620	1.943	Open Manhole	1500	S1.004	17.677	525	S1.003	17.752	450	
								S3.000	18.162	375	335
S8	19.680	2.033	Open Manhole	1500	S1.005	17.647	525	S1.004	17.647	525	
S9	19.800	1.800	Open Manhole	1350	S4.000	18.000	450				
S10	19.898	2.058	Open Manhole	1350	S4.001	17.840	450	S4.000	17.840	450	
S11	20.053	2.335	Open Manhole	1350	S4.002	17.718	450	S4.001	17.718	450	
S12	19.880	2.218	Open Manhole	1350	S4.003	17.662	750	S4.002	17.662	450	
S13	19.870	2.320	Open Manhole	1500	S4.004	17.550	750	S4.003	17.550	750	
S14	19.690	2.260	Open Manhole	1500	S1.006	17.430	900	S1.005	17.487	525	282
								S4.004	17.430	750	
S15	19.200	1.830	Open Manhole	1500	S1.007	17.425	900	S1.006	17.370	900	
S16	18.960	1.780	Open Manhole	1500	S1.008	17.180	900	S1.007	17.180	900	
S17	19.700	1.380	Open Manhole	1500	S5.000	18.320	225				
S18	19.170	0.910	Open Manhole	1500	S5.001	18.270	225	S5.000	18.260	225	
S19	19.640	1.610	Open Manhole	1200	S6.000	18.030	300				
S20	18.870	1.166	Open Manhole	1350	S6.001	17.704	375	S6.000	17.779	300	
S21	18.480	0.998	Open Manhole	1350	S6.002	17.482	375	S6.001	17.482	375	
S22	18.480	1.030	Open Manhole	1500	S5.002	17.450	375	S5.001	17.450	225	
								S6.002	17.454	375	304
S23	18.450	1.430	Open Manhole	1500	S1.009	17.020	900	S1.008	17.020	900	
								S5.002	17.370	375	275
S24	18.590	1.770	Open Manhole	1500	S1.010	16.820	900	S1.009	16.820	900	
S25	18.230	1.660	Open Manhole	1800	S1.011	16.570	225	S1.010	16.570	900	
S26 (ExMH)	19.340	1.970	Open Manhole	1200	S7.000	17.370	300				
S27 (ExMH)	19.200	2.046	Open Manhole	1200	S7.001	17.154	300	S7.000	17.163	300	9
S28	18.380	1.266	Open Manhole	1200	S7.002	17.114	300	S7.001	17.114	300	
S29	18.400	1.420	Open Manhole	1350	S7.003	16.980	375	S7.002	16.983	300	
S30	18.250	1.430	Open Manhole	1350	S7.004	16.820	375	S7.003	16.820	375	
S31	18.480	1.850	Open Manhole	1350	S7.005	16.630	375	S7.004	16.630	375	
S32	18.230	1.670	Open Manhole	1500	S1.012	16.560	375	S1.011	16.560	225	
								S7.005	16.560	375	
S33	17.850	1.370	Open Manhole	1500	S1.013	16.480	525	S1.012	16.480	375	
SOutfall	18.120	1.660	Open Manhole	1500		OUTFALL		S1.013	16.460	525	

Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	714050.395	732874.045	714050.395	732874.045	Required	
S2	714043.316	732875.151	714043.316	732875.151	Required	
S3	714036.871	732878.696	714036.871	732878.696	Required	
S4	714026.761	732932.928	714026.761	732932.928	Required	
S5	714043.987	732931.898	714043.987	732931.898	Required	
S6	714116.043	732875.598	714116.043	732875.598	Required	
S7	714122.741	732926.635	714122.741	732926.635	Required	
S8	714128.846	732926.484	714128.846	732926.484	Required	
S9	714178.675	732830.864	714178.675	732830.864	Required	
S10	714183.905	732833.053	714183.905	732833.053	Required	
S11	714200.639	732879.098	714200.639	732879.098	Required	
S12	714210.631	732898.889	714210.631	732898.889	Required	
S13	714172.700	732920.174	714172.700	732920.174	Required	
S14	714161.987	732942.365	714161.987	732942.365	Required	
S15	714175.823	732948.556	714175.823	732948.556	Required	
S16	714156.128	732992.789	714156.128	732992.789	Required	
S17	714161.987	732942.365	714161.987	732942.365	Required	
S18	714166.138	732950.517	714166.138	732950.517	Required	
S19	714159.294	732948.209	714159.294	732948.209	Required	
S20	714140.170	732989.049	714140.170	732989.049	Required	

Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S21	714125.876	733020.348	714125.876	733020.348	Required	
S22	714132.776	733025.449	714132.776	733025.449	Required	
S23	714140.145	733028.688	714140.145	733028.688	Required	
S24	714186.037	733048.740	714186.037	733048.740	Required	
S25	714272.398	733086.706	714272.398	733086.706	Required	
S26 (ExMH)	714093.007	732963.725	714093.007	732963.725	Required	
S27 (ExMH)	714076.051	733001.103	714076.051	733001.103	Required	
S28	714088.031	733004.635	714088.031	733004.635	Required	
S29	714125.046	733022.057	714125.046	733022.057	Required	
S30	714186.893	733066.653	714186.893	733066.653	Required	
S31	714253.810	733114.188	714253.810	733114.188	Required	
S32	714278.895	733089.595	714278.895	733089.595	Required	
S33	714302.598	733067.238	714302.598	733067.238	Required	
SOutfall	714306.642	733068.158			No Entry	

Midpoint Alencon Link Basingstoke, RG21 7PP	Donore Project Donore Avenue Dublin 8
Date 07/10/2022 10:25 File The Donore Project.MDX	Designed by DM Checked by MI
Innovyze	Network 2020.1

Area Summary for Storm Network

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Impermeable	100	0.030	0.030	0.030
1.001	-	-	100	0.000	0.000	0.000
1.002	Classification	Courtyard	60	0.035	0.021	0.021
	Classification	Impermeable	100	0.007	0.007	0.028
	Classification	Roads	80	0.096	0.077	0.105
	Classification	Impermeable	100	0.006	0.006	0.111
	Classification	Roof Terrace	90	0.025	0.022	0.134
	Classification	Green Roof	92	0.024	0.022	0.155
	Classification	Green Roof	92	0.052	0.048	0.203
	Classification	Roads	80	0.022	0.017	0.220
	Classification	Roof Terrace	90	0.026	0.023	0.244
	Classification	Roads	80	0.031	0.025	0.269
2.000	Classification	Roads	80	0.048	0.039	0.039
	Classification	Impermeable	100	0.007	0.007	0.046
	Classification	Impermeable	100	0.006	0.006	0.052
	Classification	Green Roof	92	0.017	0.016	0.068
1.003	Classification	Impermeable	100	0.007	0.007	0.007
	Classification	Roads	80	0.131	0.105	0.112
	Classification	Impermeable	100	0.076	0.076	0.189
	Classification	Courtyard	60	0.060	0.036	0.224
3.000	Classification	Impermeable	100	0.005	0.005	0.005
	Classification	Roads	80	0.135	0.108	0.113
	Classification	Green Roof	92	0.057	0.052	0.165
	Classification	Impermeable	100	0.019	0.019	0.184
	Classification	Roof Terrace	90	0.028	0.025	0.209
	Classification	Green Roof	92	0.068	0.062	0.271
	Classification	Roof Terrace	90	0.037	0.033	0.304
	Classification	Roof Terrace	90	0.037	0.033	0.337
1.004	Classification	Roads	80	0.021	0.017	0.017
1.005	Classification	Roads	80	0.045	0.036	0.036
4.000	Classification	Impermeable	100	0.117	0.117	0.117
4.001	Classification	Impermeable	100	0.090	0.090	0.090
	Classification	Green Roof	92	0.058	0.053	0.144
	Classification	Courtyard	60	0.079	0.047	0.191
	Classification	Green Roof	92	0.035	0.032	0.224
	Classification	Impermeable	100	0.010	0.010	0.233
	Classification	Impermeable	100	0.012	0.012	0.246
4.002	-	-	100	0.000	0.000	0.000
4.003	Classification	Roads	80	0.057	0.045	0.045
	Classification	Green Roof	92	0.026	0.024	0.069
4.004	Classification	Impermeable	100	0.044	0.044	0.044
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
5.001	Classification	Roads	80	0.148	0.118	0.118
6.000	Classification	Impermeable	100	0.010	0.010	0.010
	Classification	Impermeable	100	0.007	0.007	0.016
	Classification	Roof Terrace	90	0.081	0.073	0.089
	Classification	Green Roof	92	0.053	0.049	0.138
	Classification	Green Roof	92	0.041	0.038	0.176
	Classification	Courtyard	60	0.059	0.036	0.211
	Classification	Roads	80	0.066	0.053	0.264
6.001	Classification	Roads	80	0.075	0.060	0.060
6.002	-	-	100	0.000	0.000	0.000
5.002	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.000	0.000	0.000
7.001	-	-	100	0.000	0.000	0.000

Area Summary for Storm Network

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
7.002	-	-	100	0.000	0.000	0.000
7.003	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.000	0.000	0.000
7.005	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.226	1.900	1.900

Surcharged Outfall Details for Storm Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.013	SOutfall	18.120	16.460	0.000	1500	0

Datum (m) 16.519 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1440	0.000	4320	0.000	7200	0.000	10080	0.000	12960	0.000	15840	0.000	18720	0.000
2880	0.000	5760	0.000	8640	0.000	11520	0.000	14400	0.000	17280	0.000	20160	0.000

Simulation Criteria for Storm Network

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	1.000
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.400	Storm Duration (mins)	30
Ratio R	0.277		

Online Controls for Storm Network

Hydro-Brake® Optimum Manhole: S25, DS/PN: S1.011, Volume (m³): 63.2

Unit Reference	MD-SHE-0137-9800-1500-9800
Design Head (m)	1.500
Design Flow (l/s)	9.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	137
Invert Level (m)	16.570
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	9.8	Kick-Flo®	0.929	7.8
Flush-Flo™	0.441	9.7	Mean Flow over Head Range	-	8.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.9	0.800	8.9	2.000	11.2	4.000	15.6	7.000	20.4
0.200	8.8	1.000	8.1	2.200	11.7	4.500	16.5	7.500	21.1
0.300	9.5	1.200	8.8	2.400	12.2	5.000	17.3	8.000	21.7
0.400	9.7	1.400	9.5	2.600	12.7	5.500	18.1	8.500	22.4
0.500	9.7	1.600	10.1	3.000	13.6	6.000	18.9	9.000	23.0
0.600	9.6	1.800	10.7	3.500	14.6	6.500	19.7	9.500	23.6

Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 16.400	Cv (Summer) 1.000
Region	Scotland and Ireland	Ratio R 0.277	Cv (Winter) 1.000

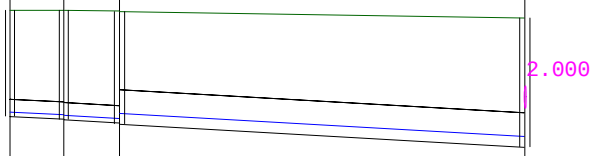
Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

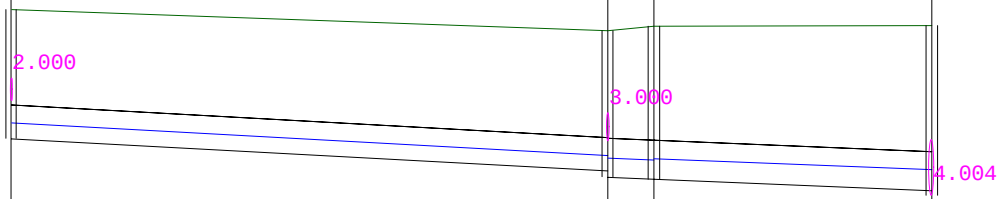
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	20, 20, 20

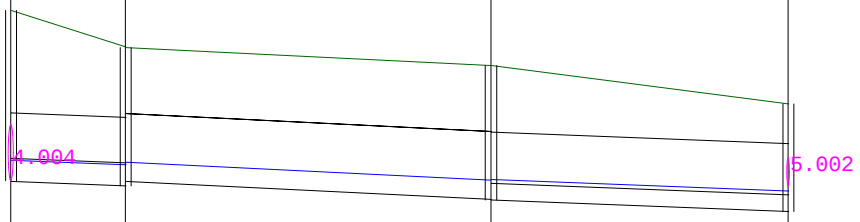
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S1	15 Summer	100	+20%	100/15 Summer				19.191	0.366	0.000
S1.001	S2	15 Summer	100	+20%	30/15 Summer				19.179	0.396	0.000
S1.002	S3	15 Summer	100	+20%	100/15 Summer				19.168	0.218	0.000
S2.000	S4	15 Summer	100	+20%	100/15 Summer				19.102	0.002	0.000
S1.003	S5	15 Summer	100	+20%	30/15 Summer				19.074	0.432	0.000
S3.000	S6	15 Summer	100	+20%	100/15 Summer				18.928	0.053	0.000
S1.004	S7	15 Summer	100	+20%	30/15 Summer				18.579	0.377	0.000
S1.005	S8	15 Summer	100	+20%	30/15 Summer				18.334	0.162	0.000
S4.000	S9	15 Summer	100	+20%					18.393	-0.057	0.000
S4.001	S10	15 Summer	100	+20%	100/15 Summer				18.383	0.093	0.000
S4.002	S11	15 Summer	100	+20%	100/15 Summer				18.187	0.020	0.000
S4.003	S12	15 Summer	100	+20%					18.076	-0.336	0.000
S4.004	S13	30 Summer	100	+20%					18.029	-0.271	0.000
S1.006	S14	15 Summer	100	+20%					18.006	-0.324	0.000
S1.007	S15	15 Summer	100	+20%					17.880	-0.445	0.000
S1.008	S16	15 Summer	100	+20%					17.693	-0.387	0.000
S5.000	S17	15 Summer	100	+20%					18.483	-0.062	0.000
S5.001	S18	15 Summer	100	+20%					18.484	-0.011	0.000
S6.000	S19	15 Summer	100	+20%	30/15 Summer				18.812	0.482	0.000
S6.001	S20	15 Summer	100	+20%	100/15 Summer				18.227	0.147	0.000
S6.002	S21	15 Summer	100	+20%	30/15 Summer				18.042	0.185	0.000
S5.002	S22	15 Summer	100	+20%	30/15 Summer				17.927	0.102	0.000
S1.009	S23	30 Summer	100	+20%					17.579	-0.341	0.000
S1.010	S24	30 Summer	100	+20%					17.415	-0.305	0.000
S1.011	S25	2160 Summer	100	+20%	1/240 Winter				17.361	0.566	0.000
S7.000	S26 (ExMH)	15 Summer	1	+20%					17.370	-0.300	0.000
S7.001	S27 (ExMH)	15 Summer	1	+20%					17.154	-0.300	0.000
S7.002	S28	15 Summer	1	+20%					17.114	-0.300	0.000
S7.003	S29	15 Summer	1	+20%					16.980	-0.375	0.000
S7.004	S30	15 Summer	1	+20%					16.820	-0.375	0.000
S7.005	S31	4320 Summer	100	+20%					16.643	-0.362	0.000
S1.012	S32	2160 Winter	100	+20%					16.643	-0.292	0.000
S1.013	S33	2160 Winter	100	+20%					16.562	-0.443	0.000

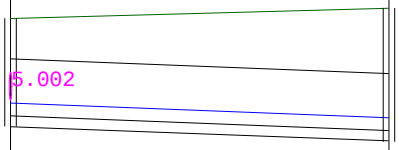
Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

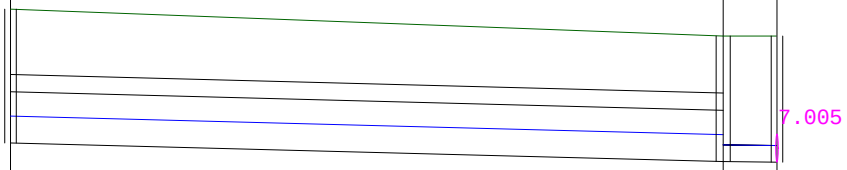
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.52			15.5	SURCHARGED	
S1.001	S2	0.58			17.4	SURCHARGED	
S1.002	S3	0.61			135.4	SURCHARGED	
S2.000	S4	0.45			32.3	SURCHARGED	
S1.003	S5	1.05			236.7	SURCHARGED	
S3.000	S6	1.07			161.1	SURCHARGED	
S1.004	S7	1.99			381.4	SURCHARGED	
S1.005	S8	1.41			386.7	SURCHARGED	
S4.000	S9	0.25			56.8	OK	
S4.001	S10	1.22			177.6	SURCHARGED	
S4.002	S11	1.29			170.8	SURCHARGED	
S4.003	S12	0.36			187.6	OK	
S4.004	S13	0.30			180.3	OK	
S1.006	S14	0.74			564.3	OK	
S1.007	S15	0.50			561.8	OK	
S1.008	S16	0.57			548.8	OK	
S5.000	S17	0.03			1.0	OK	
S5.001	S18	0.83		4	42.3	OK	
S6.000	S19	1.54			119.4	SURCHARGED	
S6.001	S20	0.93			133.4	SURCHARGED	
S6.002	S21	1.65			131.9	SURCHARGED	
S5.002	S22	1.57			174.2	SURCHARGED	
S1.009	S23	0.70			703.1	OK	
S1.010	S24	0.75			685.4	OK	
S1.011	S25	0.49			9.7	SURCHARGED	
S7.000	S26 (ExMH)	0.00			0.0	OK	
S7.001	S27 (ExMH)	0.00			0.0	OK	
S7.002	S28	0.00			0.0	OK	
S7.003	S29	0.00			0.0	OK	
S7.004	S30	0.00			0.0	OK	
S7.005	S31	0.00			0.0	OK	
S1.012	S32	0.11			9.7	OK	
S1.013	S33	0.06			9.7	OK	

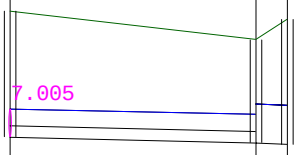
MH Name				S3	S5
Hor Scale 1000 Ver Scale 100 Datum (m)16.000					
PN				S1.002	
Dia (mm)				450	
Slope (1:X)				173.9	
Cover Level (m)		20.000	20.000	19.990	19.900
Invert Level (m)		18.600	18.558 18.515	18.500 18.191	
Length (m)				53.676	

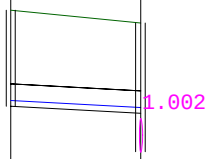
MH Name		S5		S8	S14
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		S1.003		S1.005	
Dia (mm)		450		525	
Slope (1:X)		179.6		230.0	
Cover Level (m)		19.900	19.620	19.680	19.690
Invert Level (m)		18.191 17.752	17.677	17.647 17.487	
Length (m)		78.930		36.750	

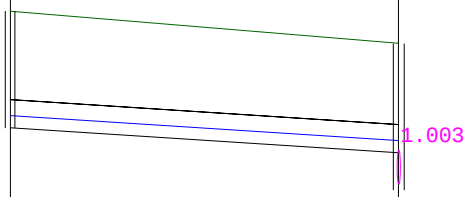
MH Name		S14	S15	S16	S23
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		S1.006	S1.007	S1.008	
Dia (mm)		900	900	900	
Slope (1:X)		252.6	197.6	245.6	
Cover Level (m)		19.690	19.200	18.960	18.450
Invert Level (m)		17.430 17.370	17.425 17.180	17.180 17.020	
Length (m)		15.158	48.420	39.296	

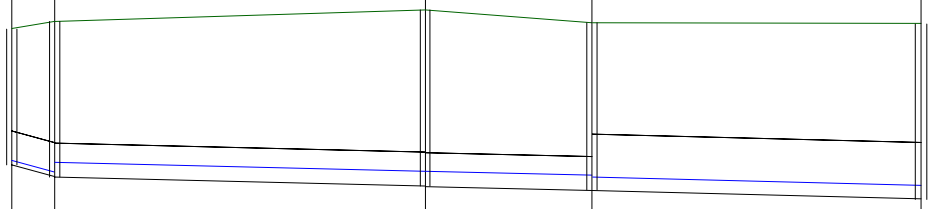
MH Name		S23	S24
Hor Scale 1000 Ver Scale 100 Datum (m)14.000			
PN		S1.009	
Dia (mm)		900	
Slope (1:X)		250.4	
Cover Level (m)		18.450	18.590
Invert Level (m)		17.020 16.820	
Length (m)		50.082	

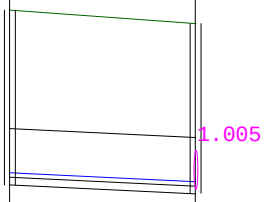
MH Name		S24		S32
Hor Scale 1000 Ver Scale 100 Datum (m)14.000				
PN		S1.010		
Dia (mm)		900		
Slope (1:X)		377.4		
Cover Level (m)		18.590	18.230	18.230
Invert Level (m)		16.820	16.570	16.570
Length (m)		94.338		

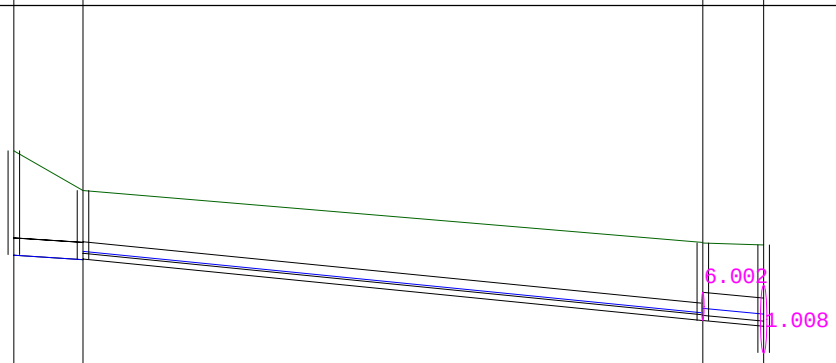
MH Name		S32		SOutfall
Hor Scale 1000 Ver Scale 100 Datum (m)14.000				
PN		S1.012		
Dia (mm)		375		
Slope (1:X)		407.3		
Cover Level (m)		18.230	17.850	18.120
Invert Level (m)		16.560	16.480	16.480
Length (m)		32.583		

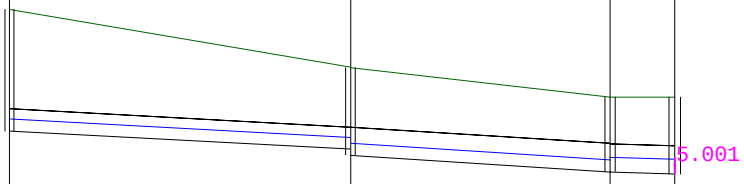
MH Name		S4	S5
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		S2.000	
Dia (mm)		300	
Slope (1:X)		172.6	
Cover Level (m)		20.070	19.900
Invert Level (m)		18.800	18.700
Length (m)		17.256	

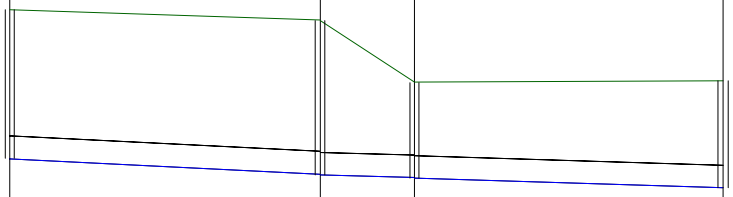
MH Name		S6	S7
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		S3.000	
Dia (mm)		375	
Slope (1:X)		152.3	
Cover Level (m)		20.050	19.620
Invert Level (m)		18.500	18.162
Length (m)		51.474	

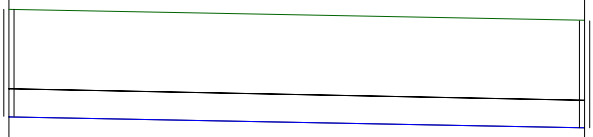
MH Name			S10	S11	S12	S13
Hor Scale 1000 Ver Scale 100 Datum (m)15.000						
PN			S4.001	S4.002	S4.003	
Dia (mm)			450	450	750	
Slope (1:X)			400.0	400.0	388.3	
Cover Level (m)		19.800	19.898	20.053	19.880	19.870
Invert Level (m)		18.000	17.840 17.718	17.718 17.662	17.662 17.550	
Length (m)			48.991	22.171	43.495	

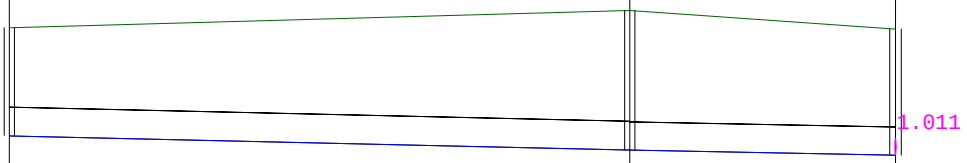
MH Name		S13	S14
Hor Scale 1000 Ver Scale 100 Datum (m)15.000			
PN		S4.004	
Dia (mm)		750	
Slope (1:X)		205.3	
Cover Level (m)		19.870	19.690
Invert Level (m)		17.550 17.430	
Length (m)		24.642	

MH Name			S18		S23
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN			S5.001		
Dia (mm)			225		
Slope (1:X)			100.0		
Cover Level (m)		19.700	19.170	18.480	18.450
Invert Level (m)		18.320 18.260	18.270 17.450	17.450 17.370	
Length (m)			82.023		

MH Name		S19	S20		S22
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		S6.000	S6.001		
Dia (mm)		300	375		
Slope (1:X)		180.0	155.0		
Cover Level (m)		19.640	18.870	18.480	18.480
Invert Level (m)		18.030 17.779	17.704 17.482	17.482 17.454	
Length (m)		45.097	34.408		

MH Name		S26 (ExMH)		S27 (ExMH)	S28		S29
Hor Scale 1000 Ver Scale 100 Datum (m)15.000							
PN		S7.000		S7.001	S7.002		
Dia (mm)		300		300	300		
Slope (1:X)		198.3		312.3	312.3		
Cover Level (m)		19.340		19.200	18.380		18.400
Invert Level (m)		17.370	17.163	17.154	17.114	16.983	
Length (m)		41.044		12.490	40.911		

MH Name		S29		S30
Hor Scale 1000 Ver Scale 100 Datum (m)14.000				
PN		S7.003		
Dia (mm)		375		
Slope (1:X)		476.5		
Cover Level (m)		18.400		18.250
Invert Level (m)		16.980	16.820	
Length (m)		76.248		

MH Name		S30	S31	S32
Hor Scale 1000 Ver Scale 100 Datum (m)14.000				
PN		S7.004	S7.005	
Dia (mm)		375	375	
Slope (1:X)		432.0	501.8	
Cover Level (m)		18.250	18.480	18.230
Invert Level (m)		16.820 16.630	16.630 16.560	
Length (m)		82.083	35.129	

Appendix J – Drainage Maintenance Inspection Checklist

Table B.25 SuDS maintenance inspection checklist			
General information			
Site ID			
Site location and co-ordinates (GIS if appropriate)			
Elements forming the SuDS scheme		Approved drawing reference(s)	
Inspection frequency		Approved specification reference	
Type of development		Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)	

Inspection date								
	Details	**Y/N**	**Action required**	**Date completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
General inspection items								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?								

Silt/sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)?								
Does permeable or porous surfacing require sweeping to remove silt?								
System blockages and litter build-up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Vegetation								
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)								
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required								
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (eg wheel ruts?)								

Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow controls?								
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
Other observations								
Information appended (eg photos)								
Suitability of current maintenance regime								
Continue as current Increase maintenance Decrease maintenance								
Next inspection								
Proposed date for next inspection								

Appendix K – Interception & Treatment Tables

Overall Site - Interception & Treatment Provision				
Total Area (m^2)	Interception		Treatment	
	Required (m^3) *	Provided (m^3)	Required (m^3) **	Provided (m^3)
17374	69.5	53.7	208.5	341.8

* Based on the first 5mm of rainfall, over 80% of the total area as a conservative measure.
** Based on the first 15mm of rainfall, over 80% of the total area as a conservative measure.

Proposed Interception & Treatment						
SuDS Type (m^2)	SuDS Area (m^2)	Depth: Substrate / Sub-base / Bedding Layer / Extended Detention (mm)	Porosity (%)	Interception (mm/m^2)	Interception Provided (m^3)	Treatment Provided (m^3)
Extensive Green Roof *	3034	80	30%	5	15.2	72.8
Intensive Green Roof **	1399	200	30%	15	21.0	83.9
Permeable Paving on Roof Terraces ***	3004	50	30%	5	15.0	45.1
Bioretention †	24	300	30%	3	0.1	2.2
Porous asphalt ††	230	350	30%	5	1.2	24.2
Swales with filter drain †††	421	900	30%	3	1.3	113.7
				Total Provision:	**53.7**	**341.8**

Note: The assumption of 30% porosity is based on Section 30.4.1 of the CIRIA SuDS Manual C753, for aggregates and inorganic clays.
* 5 mm of interception on extensive green roof for 80% of events during summer months and 50% in winter, as per Table 24.6 of the CIRIA C753 SuDS Manual. Treatment volume is calculated based on assumed porosity and substrate depth.
** 15 mm of interception is assumed, based on the various case studies of Section 12.4.2 of the CIRIA SuDS Manual C753, where interception depths range from 10 - 20 mm, notably 12 - 15 mm for the UK study, which would be most relevant. These case studies are of a significantly lower substrate depth than the substrate depth proposed in this scenario. Treatment volume is calculated based on assumed porosity and substrate depth.
*** Based on 5 mm interception for the area of permeable paving, as per Table 24.6 of the CIRIA C753 SuDS Manual, provided sufficient maintenance is carried out. Treatment volume is calculated based on assumed porosity and bedding layer.
† Interception via evapotranspiration: Box 24.3 of the CIRIA C753 SuDS Manual, states 3 mm/day is approximately the free surface evapotranspiration rate in mid-summer in the UK. The interception provided may be greater than this, if there is a large soil moisture deficit. Treatment volume is calculated based on assumed porosity and substrate depth.
†† Based on 5 mm interception for the area of permeable pavements, as per Table 24.6 of the CIRIA C753 SuDS Manual, provided sufficient maintenance is carried out. Treatment volume is calculated based on assumed porosity and sub-base depth.
††† Interception via evapotranspiration: Box 24.3 of the CIRIA C753 SuDS Manual, states 3 mm/day is approximately the free surface evapotranspiration rate in mid-summer in the UK. Swale channel filter medium assumed as 30 m x 0.5 m x 0.5 m, used in calculating treatment, multiplied by porosity.
Note:
Interception is most critical during summer months, as prolonged dry periods leave rivers most vulnerable to pollution, as flows are low and dilution is reduced.

Appendix L – Wastewater Drainage Model Results & Longsections

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.17	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	4.50	Minimum Backdrop Height (m)	0.000
Flow Per Person (l/per/day)	165.00	Maximum Backdrop Height (m)	0.000
Persons per House	2.70	Min Design Depth for Optimisation (m)	0.000
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	3.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	53.298	0.374	142.5	0.077	90	0.0	1.500	o	225	Pipe/Conduit	
F2.000	15.005	0.360	41.7	0.000	13	0.0	1.500	o	225	Pipe/Conduit	
F1.001	33.403	0.169	197.9	0.000	32	0.0	1.500	o	225	Pipe/Conduit	
F3.000	19.955	0.166	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F3.001	9.958	0.083	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F4.000	20.052	0.167	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F3.002	28.664	0.191	150.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F1.002	50.172	0.251	199.8	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F5.000	49.705	0.249	199.6	0.081	130	0.0	1.500	o	225	Pipe/Conduit	
F1.003	5.477	0.028	192.6	0.019	35	0.0	1.500	o	225	Pipe/Conduit	
F1.004	31.976	0.767	41.7	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	18.515	0.077	0.0	90	0.0	30	0.46	0.96	38.2	1.5
F2.000	18.500	0.000	0.0	13	0.0	9	0.37	1.78	70.8	0.2
F1.001	18.140	0.077	0.0	135	0.0	39	0.46	0.81	32.4	2.1
F3.000	19.050	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F3.001	18.884	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F4.000	18.970	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F3.002	18.801	0.000	0.0	0	0.0	0	0.00	0.82	14.5	0.0
F1.002	17.971	0.077	0.0	135	0.0	40	0.46	0.81	32.2	2.1
F5.000	18.800	0.081	0.0	130	0.0	39	0.45	0.81	32.2	2.1
F1.003	17.720	0.177	0.0	300	0.0	58	0.59	0.83	32.8	4.8
F1.004	17.692	0.177	0.0	300	0.0	40	1.01	1.78	70.8	4.8

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F6.000	15.398	0.154	100.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F6.001	21.430	0.179	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F7.000	15.436	0.129	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F6.002	24.970	0.208	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F6.003	8.676	0.072	120.0	0.000	0	0.0	0.600	o	150	Pipe/Conduit	
F8.000	54.962	0.308	178.4	0.000	0	0.0	0.600	o	225	Pipe/Conduit	
F8.001	3.245	0.018	178.0	0.000	0	0.0	0.600	o	225	Pipe/Conduit	
F8.002	9.608	0.054	178.0	0.000	0	0.0	0.600	o	225	Pipe/Conduit	
F8.003	41.911	0.220	190.5	0.000	0	0.0	0.600	o	225	Pipe/Conduit	
F6.004	12.688	0.070	181.3	0.000	167	8.4	1.500	o	225	Pipe/Conduit	
F6.005	13.565	0.080	169.6	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	60.673	0.330	183.9	0.041	42	0.0	1.500	o	300	Pipe/Conduit	
F1.006	30.306	0.110	275.5	0.013	34	0.0	1.500	o	300	Pipe/Conduit	
F1.007	80.302	0.310	259.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.008	81.362	0.310	262.5	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.009	20.441	0.115	177.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.010	14.593	0.049	300.0	0.000	0	0.0	1.500	o	375	Pipe/Conduit	
F9.000	15.162	0.152	99.8	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F9.001	6.531	0.065	100.5	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F9.002	5.399	0.054	100.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F6.000	18.900	0.000	0.0	0	0.0	0	0.00	1.00	17.8	0.0
F6.001	18.746	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F7.000	18.700	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F6.002	18.567	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F6.003	18.359	0.000	0.0	0	0.0	0	0.00	0.92	16.2	0.0
F8.000	17.600	0.000	0.0	0	0.0	0	0.00	0.98	38.8	0.0
F8.001	17.292	0.000	0.0	0	0.0	0	0.00	0.98	38.8	0.0
F8.002	17.274	0.000	0.0	0	0.0	0	0.00	0.98	38.8	0.0
F8.003	17.220	0.000	0.0	0	0.0	0	0.00	0.94	37.5	0.0
F6.004	17.000	0.000	8.4	167	0.0	88	0.76	0.85	33.8	11.0
F6.005	16.930	0.000	8.4	167	0.0	87	0.78	0.88	35.0	11.0
F1.005	16.850	0.218	8.4	509	0.0	97	0.83	1.02	72.2	16.4
F1.006	16.520	0.231	8.4	543	0.0	110	0.72	0.83	58.9	17.0
F1.007	16.410	0.231	8.4	543	0.0	108	0.74	0.86	60.8	17.0
F1.008	16.100	0.231	8.4	543	0.0	109	0.73	0.85	60.4	17.0
F1.009	15.790	0.231	8.4	543	0.0	98	0.85	1.04	73.6	17.0
F1.010	15.670	0.231	8.4	543	0.0	103	0.69	0.92	102.0	17.0
F9.000	17.610	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F9.001	17.383	0.000	0.0	0	0.0	0	0.00	1.15	45.5	0.0
F9.002	17.318	0.000	0.0	0	0.0	0	0.00	1.15	45.6	0.0

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F10.000	17.203	0.223	77.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F10.001	26.896	0.349	77.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F10.002	10.082	0.130	77.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.000	18.300	0.000	0.0	0	0.0	0	0.00	1.00	17.7	0.0
F10.001	18.077	0.000	0.0	0	0.0	0	0.00	1.00	17.7	0.0
F10.002	17.727	0.000	0.0	0	0.0	0	0.00	0.99	17.6	0.0

Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
F1	19.990	1.475	Open Manhole	1200	F1.000	18.515	225				
F2	20.070	1.570	Open Manhole	1200	F2.000	18.500	225				
F3	19.950	1.810	Open Manhole	1200	F1.001	18.140	225	F1.000	18.141	225	1
								F2.000	18.140	225	
F4	20.200	1.150	Open Manhole	1200	F3.000	19.050	150				
F5	20.200	1.316	Open Manhole	1200	F3.001	18.884	150	F3.000	18.884	150	
F6	20.200	1.230	Open Manhole	1200	F4.000	18.970	150				
F7	20.200	1.399	Open Manhole	1200	F3.002	18.801	150	F3.001	18.801	150	
								F4.000	18.803	150	2
F8	20.050	2.079	Open Manhole	1200	F1.002	17.971	225	F1.001	17.971	225	
								F3.002	18.610	150	563
F9	20.050	1.250	Open Manhole	1200	F5.000	18.800	225				
F10	19.620	1.900	Open Manhole	1200	F1.003	17.720	225	F1.002	17.720	225	
								F5.000	18.551	225	831
F11	19.690	1.998	Open Manhole	1200	F1.004	17.692	225	F1.003	17.692	225	
F12	20.200	1.300	Open Manhole	1200	F6.000	18.900	150				
F13	20.200	1.454	Open Manhole	1200	F6.001	18.746	150	F6.000	18.746	150	
F14	20.200	1.500	Open Manhole	1200	F7.000	18.700	150				
F15	20.200	1.633	Open Manhole	1200	F6.002	18.567	150	F6.001	18.567	150	
								F7.000	18.571	150	4
F16	20.200	1.841	Open Manhole	1200	F6.003	18.359	150	F6.002	18.359	150	
F17	20.000	2.400	Open Manhole	1200	F8.000	17.600	225				
F18	20.000	2.708	Open Manhole	1200	F8.001	17.292	225	F8.000	17.292	225	
F19	20.000	2.726	Open Manhole	1200	F8.002	17.274	225	F8.001	17.274	225	
F20	19.880	2.660	Open Manhole	1200	F8.003	17.220	225	F8.002	17.220	225	
F21	19.880	2.880	Open Manhole	1200	F6.004	17.000	225	F6.003	18.287	150	1212
								F8.003	17.000	225	
F22	19.850	2.920	Open Manhole	1200	F6.005	16.930	225	F6.004	16.930	225	
F23	19.690	2.840	Open Manhole	1200	F1.005	16.850	300	F1.004	16.925	225	
								F6.005	16.850	225	
F24	18.910	2.390	Open Manhole	1200	F1.006	16.520	300	F1.005	16.520	300	
F25	18.400	1.990	Open Manhole	1200	F1.007	16.410	300	F1.006	16.410	300	
F26	18.240	2.140	Open Manhole	1200	F1.008	16.100	300	F1.007	16.100	300	
F27	18.340	2.550	Open Manhole	1200	F1.009	15.790	300	F1.008	15.790	300	
F28	18.300	2.630	Open Manhole	1350	F1.010	15.670	375	F1.009	15.675	300	
F	18.300	2.679	Open Manhole	0		OUTFALL		F1.010	15.621	375	
F29 (ExMH)	19.200	1.590	Open Manhole	1200	F9.000	17.610	150				
F30	19.100	1.717	Open Manhole	1200	F9.001	17.383	225	F9.000	17.458	150	
F31	18.380	1.062	Open Manhole	1200	F9.002	17.318	225	F9.001	17.318	225	
F	18.380	1.116	Open Manhole	0		OUTFALL		F9.002	17.264	225	
F32	19.300	1.000	Open Manhole	1200	F10.000	18.300	150				
F33	19.200	1.123	Open Manhole	1200	F10.001	18.077	150	F10.000	18.077	150	
F34	18.500	0.773	Open Manhole	1200	F10.002	17.727	150	F10.001	17.727	150	
F	18.380	0.783	Open Manhole	0		OUTFALL		F10.002	17.597	150	

Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F1	714034.931	732881.431	714034.931	732881.431	Required	
F2	714026.455	732935.400	714026.455	732935.400	Required	
F3	714041.422	732934.332	714041.422	732934.332	Required	
F4	714089.926	732891.416	714089.926	732891.416	Required	
F5	714070.117	732893.820	714070.117	732893.820	Required	
F6	714091.332	732901.119	714091.332	732901.119	Required	
F7	714071.446	732903.690	714071.446	732903.690	Required	
F8	714074.754	732932.162	714074.754	732932.162	Required	
F9	714117.967	732879.488	714117.967	732879.488	Required	
F10	714124.808	732928.720	714124.808	732928.720	Required	
F11	714130.280	732928.937	714130.280	732928.937	Required	
F12	714165.727	732862.467	714165.727	732862.467	Required	
F13	714151.238	732867.676	714151.238	732867.676	Required	
F14	714172.722	732882.891	714172.722	732882.891	Required	
F15	714158.144	732887.962	714158.144	732887.962	Required	
F16	714166.453	732911.509	714166.453	732911.509	Required	
F17	714183.258	732835.559	714183.258	732835.559	Required	
F18	714201.402	732887.440	714201.402	732887.440	Required	
F19	714203.798	732889.629	714203.798	732889.629	Required	
F20	714206.978	732898.695	714206.978	732898.695	Required	

Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F21	714170.436	732919.217	714170.436	732919.217	Required	
F22	714164.855	732930.612	714164.855	732930.612	Required	
F23	714159.059	732942.876	714159.059	732942.876	Required	
F24	714133.467	732997.888	714133.467	732997.888	Required	
F25	714120.627	733025.340	714120.627	733025.340	Required	
F26	714186.370	733071.452	714186.370	733071.452	Required	
F27	714252.952	733118.212	714252.952	733118.212	Required	
F28	714269.086	733105.662	714269.086	733105.662	Required	
F	714280.108	733115.225			No Entry	
F29 (ExMH)	714067.371	732990.251	714067.371	732990.251	Required	
F30	714074.405	733003.683	714074.405	733003.683	Required	
F31	714079.908	733007.201	714079.908	733007.201	Required	
F	714085.145	733005.891			No Entry	
F32	714110.245	732957.846	714110.245	732957.846	Required	
F33	714103.030	732973.463	714103.030	732973.463	Required	
F34	714091.363	732997.697	714091.363	732997.697	Required	
F	714085.292	733005.746			No Entry	

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.010	F	18.300	15.621	0.000	0	0

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F9.002	F	18.380	17.264	17.260	0	0

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F10.002	F	18.380	17.597	0.000	0	0

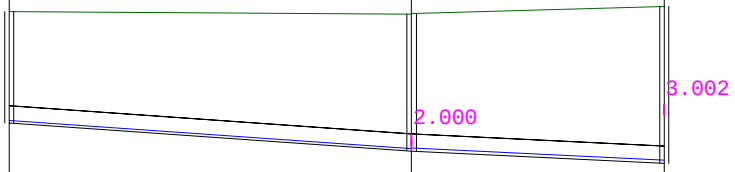
Simulation Criteria for Foul - Main

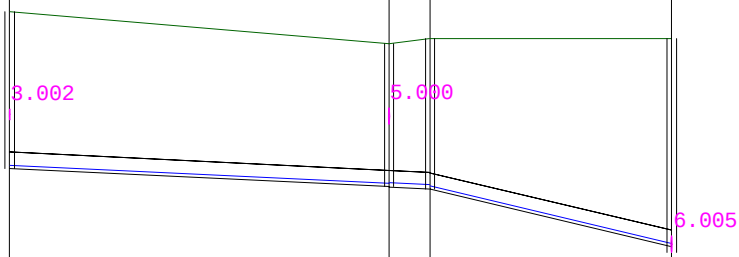
Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

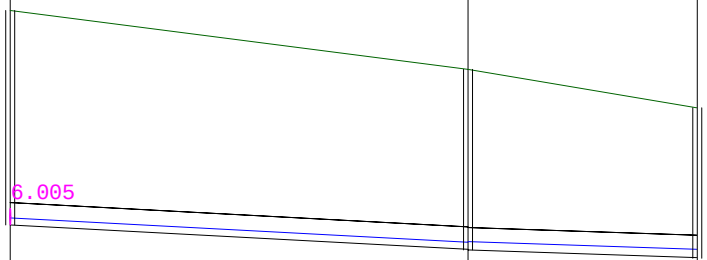
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

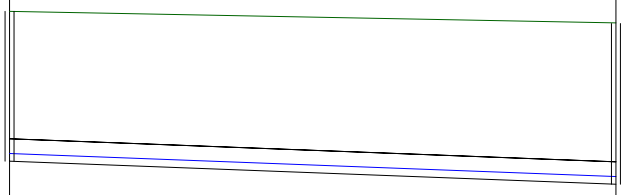
Synthetic Rainfall Details

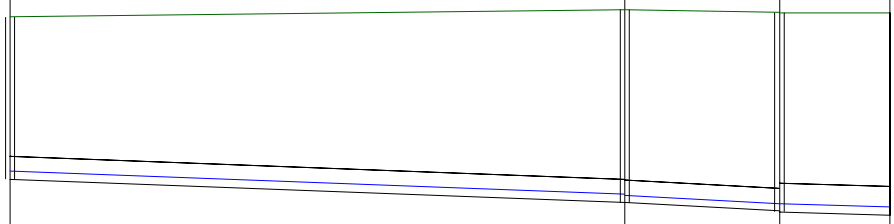
Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	1.000
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.400	Storm Duration (mins)	30
Ratio R	0.277		

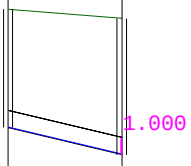
MH Name		F1	F3	F8
Hor Scale 1000 Ver Scale 100 Datum (m)16.000				
PN		F1.000	F1.001	
Dia (mm)		225	225	
Slope (1:X)		142.5	197.9	
Cover Level (m)		19.990	19.950	20.050
Invert Level (m)		18.515	18.141 18.140	17.971
Length (m)		53.298	33.403	

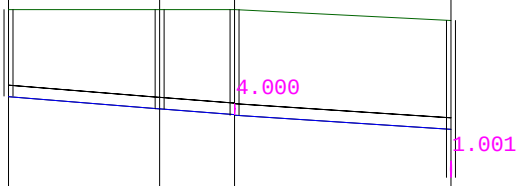
MH Name		F8		F11	F23
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		F1.002		F1.004	
Dia (mm)		225		225	
Slope (1:X)		199.8		41.7	
Cover Level (m)		20.050	19.620	19.690	19.690
Invert Level (m)		17.971	17.720 17.720	17.692	16.925
Length (m)		50.172		31.976	

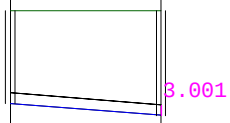
MH Name		F23	F24	F25
Hor Scale 1000 Ver Scale 100 Datum (m)15.000				
PN		F1.005	F1.006	
Dia (mm)		300	300	
Slope (1:X)		183.9	275.5	
Cover Level (m)		19.690	18.910	18.400
Invert Level (m)		16.850 / 16.520	16.520 / 16.410	
Length (m)		60.673	30.306	

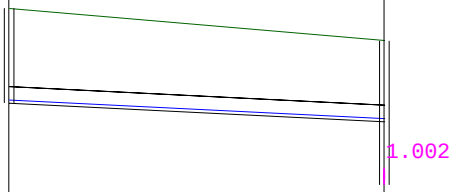
MH Name		F25	F26
Hor Scale 1000 Ver Scale 100 Datum (m)14.000			
PN		F1.007	
Dia (mm)		300	
Slope (1:X)		259.0	
Cover Level (m)		18.400	18.240
Invert Level (m)		16.410 / 16.100	
Length (m)		80.302	

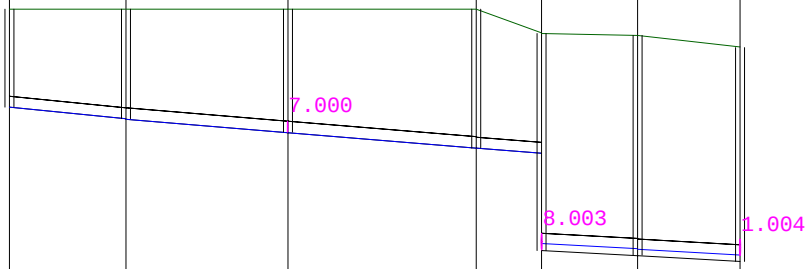
MH Name		F26		F27	F28	F
Hor Scale 1000 Ver Scale 100 Datum (m)14.000						
PN		F1.008		F1.009	F1.010	
Dia (mm)		300		300	375	
Slope (1:X)		262.5		177.0	300.0	
Cover Level (m)		18.240		18.340	18.300	18.300
Invert Level (m)		16.100	15.790	15.790	15.675 15.670	15.621
Length (m)		81.362		20.441	14.593	

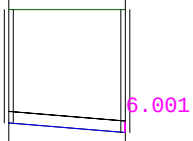
MH Name		F2	F3
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		F2.000	
Dia (mm)		225	
Slope (1:X)		41.7	
Cover Level (m)		20.070	19.950
Invert Level (m)		18.500	18.140
Length (m)		15.005	

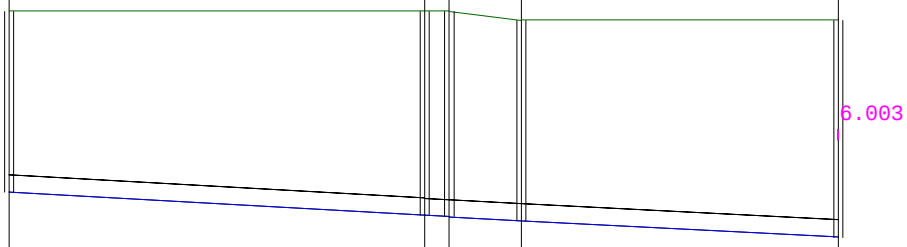
MH Name		F4		F7	F8
Hor Scale 1000 Ver Scale 100 Datum (m)16.000					
PN		F3.000		F3.002	
Dia (mm)		150		150	
Slope (1:X)		120.0		150.0	
Cover Level (m)		20.200	20.200	20.200	20.050
Invert Level (m)		19.050 18.884	18.884 18.801	18.801 18.610	
Length (m)		19.955		28.664	

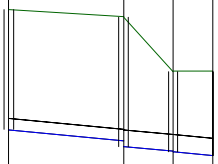
MH Name		F6	F7
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		F4.000	
Dia (mm)		150	
Slope (1:X)		120.0	
Cover Level (m)		20.200	20.200
Invert Level (m)		18.970 18.803	
Length (m)		20.052	

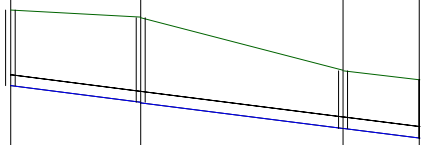
MH Name		F9	F10
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		F5.000	
Dia (mm)		225	
Slope (1:X)		199.6	
Cover Level (m)		20.050	19.620
Invert Level (m)		18.800	18.551
Length (m)		49.705	

MH Name		F12	F13	F15		F21	F22	F23
Hor Scale 1000 Ver Scale 100 Datum (m)15.000								
PN		F6.000	F6.001	F6.002		F6.004	F6.005	
Dia (mm)		150	150	150		225	225	
Slope (1:X)		100.0	120.0	120.0		181.3	169.6	
Cover Level (m)		20.200	20.200	20.200	20.200	19.880	19.850	19.690
Invert Level (m)		18.900 18.746	18.746 18.567	18.567 18.359	18.359 18.287	17.000 16.930	16.930 16.850	
Length (m)		15.398	21.430	24.970		12.688	13.565	

MH Name		F14	F15
Hor Scale 1000 Ver Scale 100 Datum (m)16.000			
PN		F7.000	
Dia (mm)		150	
Slope (1:X)		120.0	
Cover Level (m)		20.200	20.200
Invert Level (m)		18.700	18.571
Length (m)		15.436	

MH Name		F17			F20	F21
Hor Scale 1000 Ver Scale 100 Datum (m)15.000						
PN		F8.000			F8.003	
Dia (mm)		225			225	
Slope (1:X)		178.4			190.5	
Cover Level (m)		20.000		20.000	19.880	19.880
Invert Level (m)		17.600	17.292	17.274 17.220	17.220	17.000
Length (m)		54.962			41.911	

MH Name		F29 (ExMH)			F
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		F9.000			
Dia (mm)		150			
Slope (1:X)		99.8			
Cover Level (m)		19.200	19.100	18.380	18.380
Invert Level (m)		17.610 17.458	17.383	17.318	
Length (m)		15.162			

MH Name		F32	F33		F
Hor Scale 1000 Ver Scale 100 Datum (m)15.000					
PN		F10.000	F10.001		
Dia (mm)		150	150		
Slope (1:X)		77.0	77.0		
Cover Level (m)		19.300	19.200	18.500	18.380
Invert Level (m)		18.300 18.077	18.077 17.727	17.727 17.597	
Length (m)		17.203	26.896		

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Appendix J

The Donore Project

Part 10 Planning Application
Flood Risk Assessment

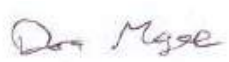
The Land Development Agency

STG-AEC-S1b-00-00-RE-C-0000002_Flood_Risk_Assessment

28 November 2022

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Dara Magee Consultant Engineer	Matteo Iannucci Senior Engineer	Laura Shaughnessy Associate Director	Laura Shaughnessy Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	28.11.2022	Issue for Planning	LS	Laura Shaughnessy	Associate Director

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Table of Contents

Figures

Tables

1. Introduction

In accordance with Section 175 of the Planning and Development Act 2000 (as amended) The Land Development Agency, on behalf of Dublin City Council, gives notice of its intention to make an application for approval to An Bord Pleanála for a seven year permission in relation to a proposed residential development at this site located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8. The site is bound by Donore Avenue to the north-east, Margaret Kennedy Road to the north-west, The Coombe Women & Infants University Hospital to the west, the former Bailey Gibson factory buildings to the south-west, and the former Player Wills factory to the south-east. The development will consist of the construction of a residential scheme of 543 no. apartments on an overall site of 3.26 ha.

This report contains a Stage 1 & 2 Flood Risk Assessment which identify and assess flood risk respectively. Mitigation measures are discussed thereafter.

This Site-Specific Flood Risk Assessment (SSFRA) has been carried out in accordance with "The Planning System and Flood Risk Management" Guidelines, 2009 and Policy SI15 of the Dublin City Development Plan 2022-2028. The proposed development was designed to accommodate sustainable drainage and effectively manage surface water flood risk, in accordance with Policy SI21 & Policy SI22 of the Development Plan.

The proposed development is hereafter referred to as the 'Donore Project'. The site is owned by Dublin City Council (DCC).

Figure 1.1: Site Location

The current site is part of the overall Strategic Development & Regeneration Area (SDRA) 11 in the 2022-2028 Dublin City Development Plan). This site lies at the centre of the SDRA lands and will be developed to provide 543 new homes.

The development (GFA of c. 53,227 sqm) contains the following mix of apartments: 225 No. 1 bedroom apartments (36 no. 1-person & 189 no. 2-person), 274 No. 2 bedroom apartments (including 52 No. 2 bed 3 person apartments and 222 No. 2 bed 4 person apartments), 44 No. 3 bedroom 5-person apartments, together with retail/café unit (168 sq.m.), mobility hub (52 sq.m.) and 952 sq.m. of community, artist workspace, arts and cultural space, including a creche, set out in 4 No. blocks.

The breakdown of each block will contain the following apartments:

- Block DCC1 comprises 111 No. apartments in a block of 6-7 storeys;
- Block DCC 3 comprises 247 No. apartments in a block of 6-15 storeys;
- Block DCC5 comprises 132 No. apartments in a block of 2-7 storeys;
- Block DCC6 comprises 53 No. apartments in a block of 7 storeys;

The proposed development will also provide for public open space of 3,408 sqm, communal amenity space of 4,417 sqm and an outdoor play space associated with the creche. Provision of private open space in the form of balconies or terraces is provided to all individual apartments.

The proposed development will provide 906 no. residential bicycle parking spaces which are located within secure bicycle stores. 5% of these are over-sized spaces which are for large bicycles, cargo bicycles and other non-standard bicycles. In addition, 138 spaces for visitors are distributed throughout the site.

A total of 79 no. car parking spaces are provided at undercroft level. Six of these are mobility impaired spaces (2 in each of DCC1, DCC3 & DCC5). 50% of standard spaces will be EV fitted. Up to 30 of the spaces will be reserved for car sharing (resident use only). A further 15 no. on-street spaces are proposed consisting of:

- 1 no. accessible bay (between DCC5 & DCC6)
- 1 no. short stay bay (between DCC5 & DCC6)
- 1 no. crèche set-down/ loading bay (between DCC5 & DCC6)
- 1 no. set-down / loading bay (northern side of DCC5)
- 1 no. set-down/loading bay (northern side of DCC 3)
- 10 no. short stay spaces (north-east of DCC1)

In addition, 4 no. motorcycle spaces are also to be provided.

Vehicular, pedestrian and cyclist access routes are provided from a new entrance to the north-west from Margaret Kennedy Road. Provision for further vehicular, pedestrian and cyclist access points have been made to facilitate connections to the planned residential schemes on the Bailey Gibson & Player Wills sites for which there are extant permissions (Ref. No.'s ABP-307221-20 & ABP-308917-20).

The development will also provide for all associated ancillary site development infrastructure including site clearance & demolition of boundary wall along Margaret Kennedy Road and playing pitch on eastern side of site and associated fencing/lighting, the construction of foundations, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, green roofs, hard and soft landscaping, play equipment, boundary walls, attenuation area and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

Refer to Figure 1.2 for the proposed site layout. The proposed development consists of the construction of 543 no. residential units, distributed over 4 no. proposed apartment blocks (DCC1, DCC3. DCC5 and DCC6). Table 1.1 summarises the current schedule of accommodation, per block.

Figure 1.2: Extract from drawing STG-MW-S1b-00-RF-DR-A-1100002 – Site Layout Plan Proposed

Table 1.1: Proposed Residential Units

Phase	Number of Proposed Units
DCC1	111
DCC3	247
DCC5	132
DCC6	53
Total	543

Source: <Metropolitan Workshop>

2. The Planning System and Flood Risk Management Guidelines

This Stage 1 & 2 Flood Risk Assessment (FRA) has been prepared in line with the requirements of "The Planning System & Flood Risk Management Guidelines for Planning Authorities" (The Guidelines) as published in November 2009, and the particular requirements of a site-specific Flood Risk Assessment as outlined in Appendix 6A of the Technical Appendices to those Guidelines.

In September 2008 "The Planning System and Flood Risk Management" Guidelines (The Guidelines) were published by the Department of the Environment, Heritage and Local Government in Draft format. In November 2009, the adopted version of the document was published.

The Flood Risk Management Guidelines give guidance on flood risk and development. The Guidelines recommend a precautionary approach when considering flood risk management in the planning system. The core principle of The Guidelines is to adopt a risk based sequential approach to managing flood risk and to avoid development in areas that are at risk. The sequential approach is based on the identification of flood zones for river and coastal flooding.

The objective of a Site-Specific Flood Risk Assessment (SSFRA) is to assess all types of flood risk to a development. The assessment should investigate potential sources of flood risk and include for the effects of climate change. The assessment is required to examine the impact of the development and the effectiveness of flood mitigation and management procedures proposed. It should also present the residual risks that remain after those measures are put in place.

As set out in the Flood Risk Management Guidelines, the assessment of flood risk *"requires an understanding of where the water comes from (i.e. the source), how and where it flows (i.e. the pathways) and the people and assets affected by it (i.e. the receptors)".*

This approach is based on the identification of flood zones for river and coastal flooding. "Flood Zones" are geographical areas used to identify areas at various levels of flood risk. It should be noted that these do not consider the presence of flood defences, as risks remain of overtopping and breach of the defences. There are three flood zones defined:

Zone A (high probability of flooding) is for lands where the probability of flooding is greatest (greater than 1% or the 1 in 100 for river flooding and 0.5% or 1 in 200 for coastal flooding).

Zone B (moderate probability of flooding) refers to lands where the probability of flooding is moderate (between 0.1% or 1 in 1,000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1,000 and 0.5% or 1 in 200 for coastal flooding).

Zone C (low probability of flooding) refers to lands where the probability of flooding is low (less than 0.1% or 1 in 1,000 for both river and coastal flooding).

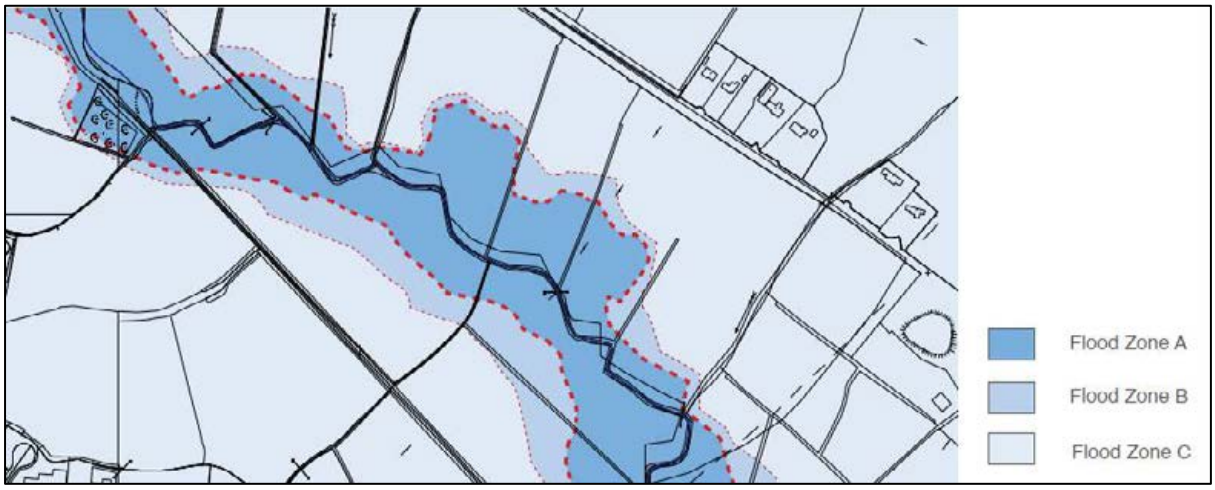


Figure 2.1: Indicative Flood Zone Map (Extract from The Guidelines)

Once a flood zone has been identified, The Guidelines set out the different types of development appropriate to each zone. Exceptions to the restriction of development due to potential flood risks are provided for using the **Justification Test**, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated. This recognises that there will be a need for future development in existing towns and urban centres that lie within flood risk zones, and that the avoidance of all future development in these areas would be unsustainable. The current Dublin City Development Plan (2016-2022) and new Dublin City Development Plan (2022-2028) Strategic Flood Risk Assessments (SFRAs) have been carried out in accordance with the Flood Risk Management Guidelines.

The Guidelines set out a staged approach to assessment. The stages of assessment are:

Flood Risk Identification (Stage 1) - Identification of any issues relating to the site that will require further investigation through a Flood Risk Assessment.

Initial Flood Risk Assessment (Stage 2) - Involves establishment of the sources of flooding, the extent of the flood risk, potential impacts of the development and possible mitigation measures.

Detailed Flood Risk Assessment (Stage 3) - Assess flood risk issues in sufficient detail to provide quantitative appraisal of potential flood risk of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.

3. Flood Risk Identification (Stage 1 FRA)

As part of the overall exercise to establish the potential flood risk to the development site, AECOM carried out a review of available and recorded information with regard to flooding in the area. The following sources were consulted as part of the review:

- Historic Flood Records
- GSI (Geological Survey Ireland) Groundwater Flooding Probability Maps
- Greater Dublin Strategic Drainage Study (GDSDS) Flooding Maps
- OPW PRFA Mapping & CFRAM Predictive Mapping
- Dublin City Development Plan 2016-2022: Strategic Food Risk Assessment (SFRA)
- Dublin City Development Plan 2022-2028: Strategic Food Risk Assessment (SFRA)

3.1 Historical Flood Records

The Office of Public Works (OPW) collates available reports of flooding from all sources (e.g. fluvial, pluvial, coastal, etc.) on a nationwide basis and provide mapping for the historical flooding events in specific areas. Figure 3.1 is an extract from the historical flooding report, showing the area in the vicinity of the development site and notes no reported instances of flooding within or around the frontage of the development site. Please refer to Appendix A for the OPW Past Flood Summary Report.

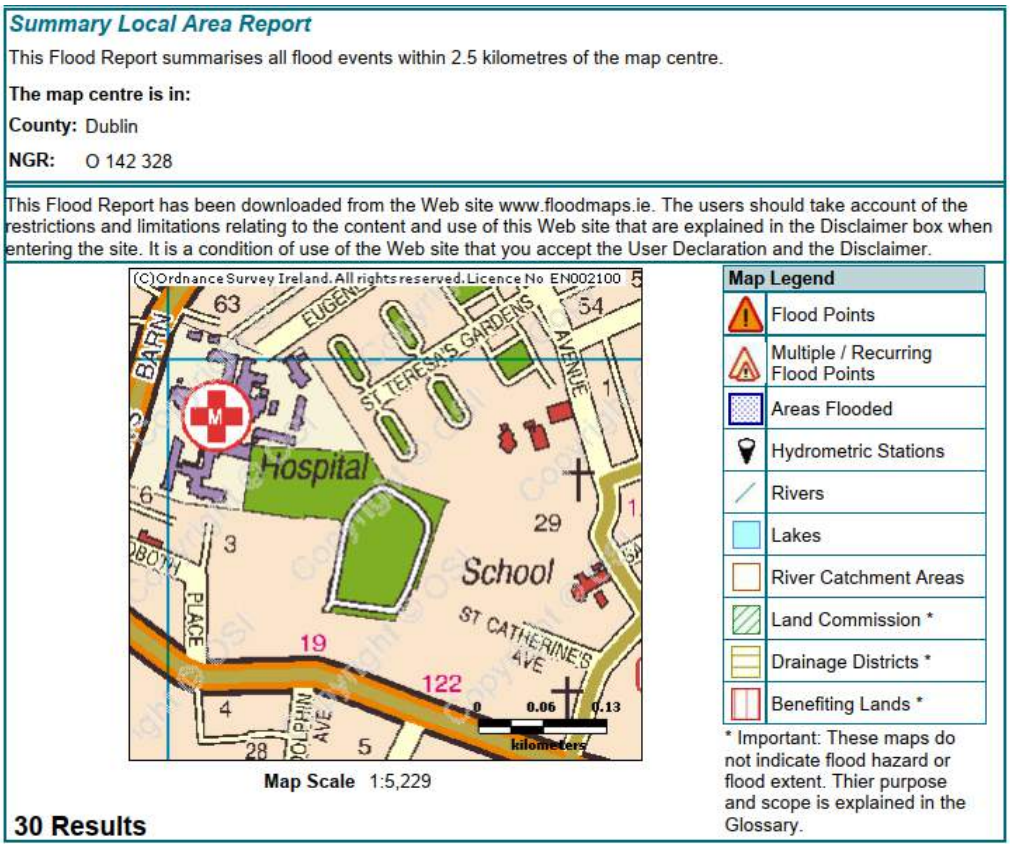


Figure 3.1: Historic Flood Events in the Vicinity of the Subject Site

3.2 GSI (Geological Survey Ireland) Groundwater Flooding Probability Maps

GSI Groundwater Flood Probability Maps are available on floodinfo.ie and show the probabilistic flood extent of groundwater flooding in limestone regions.

No groundwater flooding is shown to be predicted anywhere in Co. Dublin.

3.3 Greater Dublin Strategic Drainage Study (GDSDS) Flooding Maps

The Greater Dublin Strategic Drainage Study (GDSDS) provides significant information regarding the existing surface water and foul water infrastructure within the subject site. Performance Maps give flooding predictions and cataloguing existing hydraulic deficiencies in the network area. Refer to Figure 3.2.

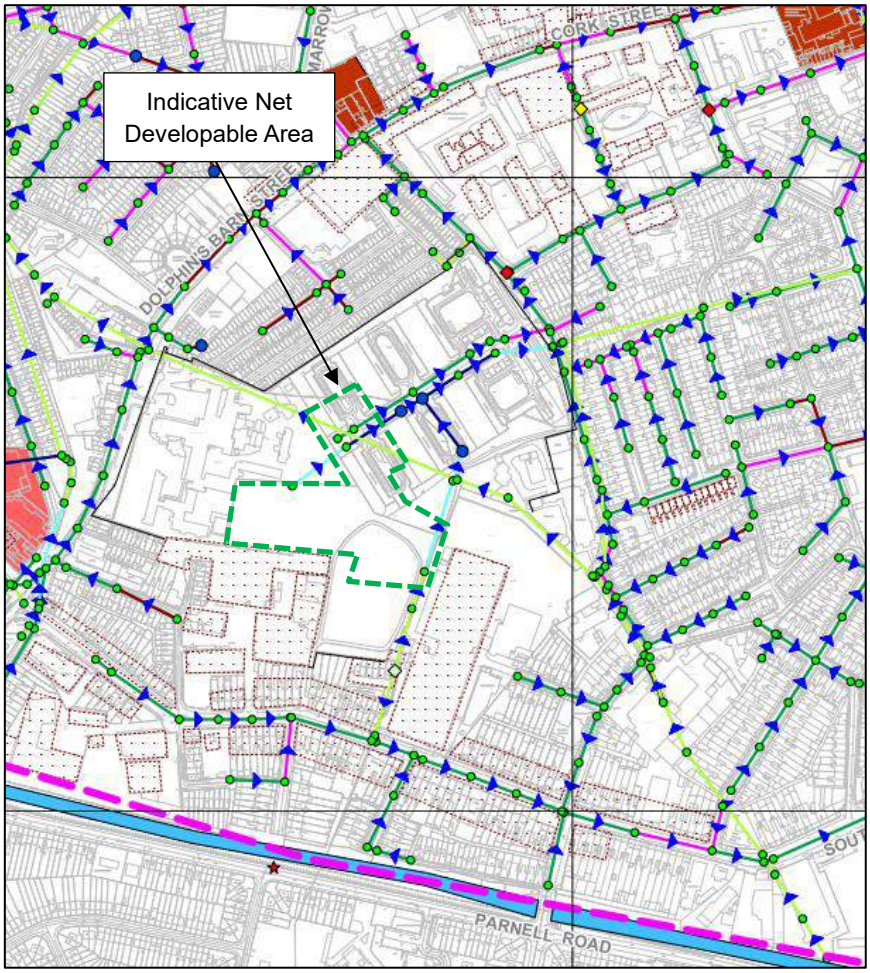


Figure 3.2: Extract from the GDSDS Existing Hydraulic Performance Map 2013

The colouring coding is as follows:

- **Brown Line** – Foul/Combined sewer flooding for the 30 year event or less,
- **Magenta Line** – Foul/Combined sewer surcharging for the 1 or 2 year event,
- **Dark Green Line** – Foul/Combined sewer does not surcharge/flood,
- **Green Dot** – Modelled Manhole does not flood for the 5 year event,
- **Light Green Line** – Surface Water does not surcharge/flood,
- **Light Blue Line** – Surface Water surcharging for the 1 or 2 year event,
- **Dark Blue Line** – Surface Water flooding for the 30 year event or less.

The sewer shown in light green, traversing the site, is noted to be obsolete (refer to Section *4.2 Existing Surface Water Drainage*, of the STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report enclosed with this application for further information) and will be removed as part of the overall future developments within the SDRA.

The existing surface water sewer shown in Dark Blue is running within a small portion of the subject site which receives flows from The Coombe Women & Infants University Hospital to the west. The extent of this line within the development will be diverted.

It should be noted that there are construction works underway within The Coombe Women & Infants University Hospital lands (on the western boundary of The Donore Project site) for a proposed new building which includes

attenuation proposals. It is therefore acknowledged that the flood risk of this sewer will be reduced as the proposed drainage upgrades, with associated attenuation, will also reduce the volume of stormwater entering the sewer. For further details on the diversion proposal please refer to the relevant section (Proposed Surface Water Drainage Diversions) of the Infrastructure Report (STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report).

In order to avoid further possible flooding events, the proposed drainage network in the area will be designed to minimise the risk of flooding occurring on site.

3.4 OPW CFRAM Flood Risk Mapping

The CFRAM (Catchment Flood Risk Assessment and Management) programme is a national programme which produced a series of Preliminary Flood Risk Assessment (PFRA) which cover the entire county. This assessment was carried out based on readily available information to identify areas where there may be a significant risk of flooding.

The PFRA was undertaken by:

- Reviewing records of floods that have happened in the past;
- Undertaking analysis to determine which areas might flood in the future, and what the impacts might be; and
- Consulting with Local Authorities and other Government departments and agencies.

The objective of the PFRA was to identify areas where the risk associated with flooding might be significant. These areas, which are referred to as ‘Areas for Further Assessment’ or AFAs, are where a more detailed assessment was then undertaken to more accurately assess the extent and degree of flood risk.

The CFRAM predictive flood risk mapping was based on the output of hydraulic modelling carried out as part of the study. The hydraulic model predicts the water levels for three fluvial flood events at given nodes. Based on the predicted water levels at these nodes, fluvial flood extents associated with the 10% AEP event, 1% AEP event (Flood Zone A), and the 0.1% AEP event (Flood Zone B) are mapped.

The Eastern CFRAM study provides predictive flooding within areas of further assessment from Fluvial and Coastal/Tidal sources. Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent lands, whereas, coastal flooding is the result of sea levels which are higher than normal and result in sea water overflowing onto the land. Coastal flooding can also be influenced by high tide level, storm surges and wave action.

The CFRAM mapping available for the area surrounding the development indicates that the site is within a predicted fluvial flooding area. The subject site is located approx. 1.2 km from the predicted coastal flood extent. Refer to Figure 3.3 and Figure 3.4.

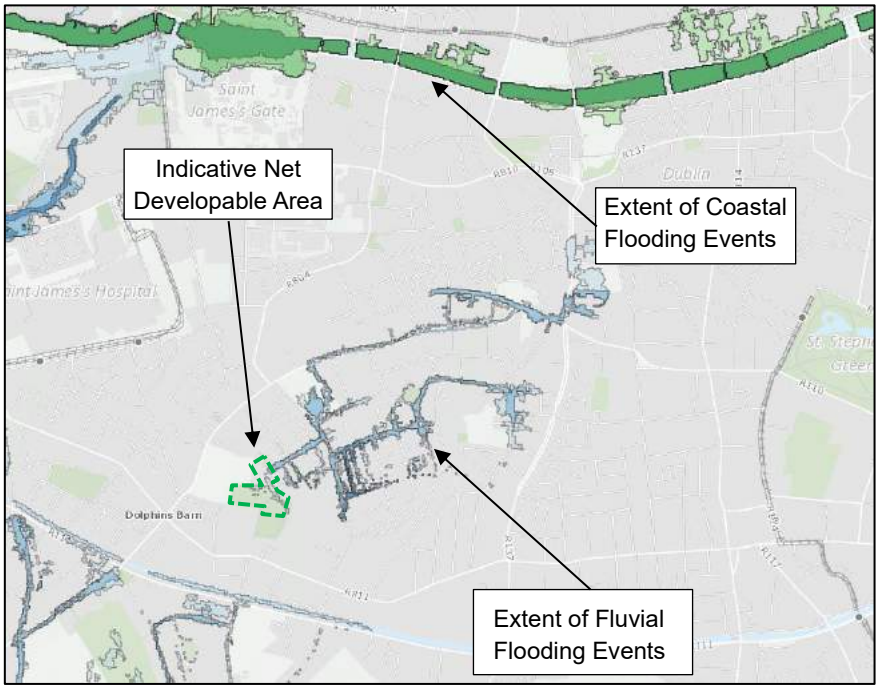


Figure 3.3: Fluvial Flood Zones at The Donore Project site, as defined by the CFRAM Mapping (www.floodinfo.ie)

3.4.1 CFRAM Mapping – Poddle River Fluvial Flooding

The Poddle River, located east of the proposed site, is the closest river to the proposed site, and the most likely source of possible fluvial flooding. The CFRAM mapping for the Poddle River near the site, illustrates the location of the closest fluvial model node to the development site (ref. No. SO14324909).

This map was published as part of the Eastern CFRAM project on the 11th August 2016. It should be noted that the previous apartment blocks have been demolished, and the access road has partly been removed. Given these changes, the 2016 mapping is not fully representative, as ground levels have changed since the date of publish. An analysis of flood levels and the latest ground has been undertaken, refer to Section 4.1.1 of this report.

An extract from the Eastern CFRAM map Drawing No. E09POD_EXFCD_F0_05 is illustrated in Figure 3.4. Refer to Appendix B for these CFRAM flood extent and flood depth maps.

On the outdated CFRAM mapping, fluvial flooding is predicted on the subject site, for the 1:100 year flood event (a minimal flood extent area, with 0 - 0.25 m flood depth predicted) and for the 1:1000 year event (a larger flood extent area with a 0 - 0.25 m flood depth predicted). Based on this mapping, approx. 90% of the site is located within Flood Zone C, 10% within Flood Zone B and <1% situated within Flood Zone A. Given a portion of the site is in Flood Zone A/B, it would be prudent to carry out a Justification Test, refer to Section 5.3.

However, given the topography has changed since this study, an analysis of flood levels and topography was carried out, refer to Section 4.1.1.

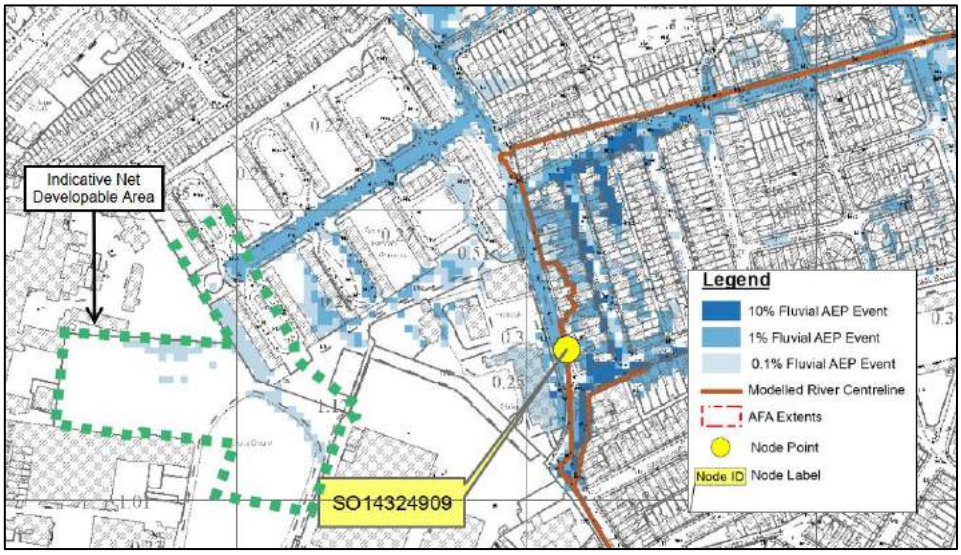


Figure 3.4: Extract from CFRAM Fluvial Flood Extents

3.4.2 CFRAM Mapping – Pluvial Flooding

As part of the CFRAM study, predictive pluvial flood maps were produced for Dublin City. Pluvial flooding is rainfall generated flooding, which arises during or after intense rainfall events which produce overland flows and ponding.

3.5 DCC Development Plan 2016-2022 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment (SFRA), published as part of the DCC Development Plan 2016-2022 is largely based on the CFRAM mapping and hence shows the same information. The subject site is within Site 13: Poddle – Inside Canal of the justification test tables in Appendix 3 of the DCC SFRA. Refer to Figure 3.5.

Figure 3.5: Site 13: Poddle – Inside Canal, from DCC Development Plan 2016-2022 SFRA

3.6 DCC Development Plan 2022-2028 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment (SFRA), published as part of the DCC Development Plan 2022-2028, includes SDRA Screening & Justification Tests for each SDRA. The subject site is within SDRA 11 of the 2022-2028 Development Plan and the Flood Zones for the SDRA (refer to Figure 3.6) show a larger Flood Zone B extent than the previous SFRA (2016-2022).

A study is ongoing for the River Poddle Flood Alleviation Scheme (flood levels are not available at the time of writing), and this may be part of the reason the larger Flood Zone areas are shown. The impact on the subject site appears to source from Donore Avenue, similar to the CFRAM mapping predictions, albeit a larger Flood Zone. As noted previously in Section 3.4.1, the CFRAM mapping appears to be based on topography which has changed since the CFRAM study, therefore, an analysis of flood levels and topography was carried out, refer to Section

4.1.1. This analysis concludes that the topography has changed following demolition of the previous St. Teresa's Gardens flats and the fluvial floods extent would also differ as a result.

Furthermore, it appears the flood extent shown in the SFRA is incorrect, relative to the OS (Ordnance Survey) Mapping, when comparing topographical levels. In addition to levels, it appears the flooding is mistakenly shown approx. 50 m southeast relative to the OS Mapping when comparing with the CFRAM mapping and the previous SFRA. (And as expected, the flood extents should generally be within roadways).

The Justification Test for SDRA 11 in the SFRA concludes SDRA 11 passes the Justification Test for Development Plans and notes '*The Poddle Flood Alleviation Scheme proposes to adapt portions of the drainage network to reduce flood risk in this area. Although this will be beneficial, the scheme is not required to allow development of the site.'*

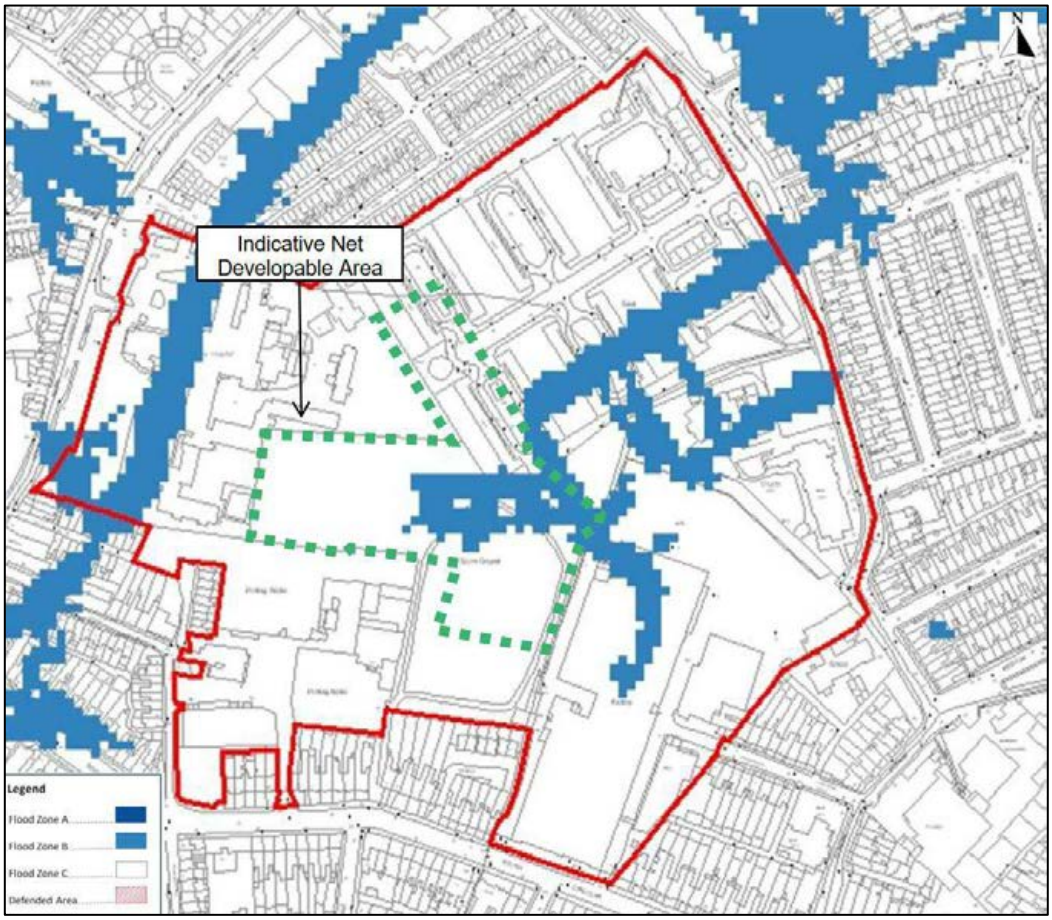


Figure 3.6: Flood Zones at SDRA 11 (DCC Development Plan 2022-2028 SFRA)

4. Initial Flood Risk Assessment (Stage 2)

4.1 Potential Sources of Flooding

Based on the review of the historical data and existing flood studies reviewed in the Stage 1 Flood Risk Identification, the potential sources of flooding at the proposed development site are the following;

- Fluvial;
- Coastal Flooding;
- Pluvial/Surface Water Flooding;
- Groundwater Flooding; and
- Flooding from Sewers.

4.1.1 Fluvial Flooding

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out on to the adjacent floodplain. Mapping published in 2016 as part of the OPW CFRAM Study is used to evaluate the fluvial flood risk to the proposed development. Based on this mapping, the majority of the site area is located within Flood Zone B and C, with approx. 50-100 m^2 situated within Flood Zone A.

Table 4.1 includes the fluvial flood water levels for various Annual Exceedance Probabilities (AEP) at Node SO14324909 on the Poddle River.

Table 4.1: Predictive Fluvial Flood Water Levels in the Vicinity of the Site

Node	10% AEP Water level (m OD)	1% AEP Water Level (m OD)	0.1% AEP Water Level (m OD)
SO14324909	18.27	18.37	18.49

Source: floodmaps.ie

However, it is noted that this CFRAM mapping was carried out based on the topographical information available at the time of the study, which included the previous residential development on the site. The existing buildings have been demolished recently and a topographical survey carried out by Murphy Geospatial in June 2021. The survey shows the levels are higher than the predicted water levels in the table above, suggesting a regrading of the site following the demolition works. Refer to the Topographical Survey drawing appended to the Infrastructure Report.

The CFRAM mapping shows the original 12 apartment blocks of the St. Teresa's Gardens flats, however, 10 of these blocks have been demolished and only 2 blocks remain. Ground levels at the locations of the demolished flats are higher than the ground levels surrounding the remaining flats, as shown in the topographical survey (appended to STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report). In summary;

- Existing road levels on Donore Avenue range from 17.8 – 18.2 m,
- Existing levels on the access road from Donore Avenue to the flats range from 17.72 to 18.07 m,
- Existing road levels surrounding the remaining blocks of flats range from 17.99 – 18. 4 m,
- Existing levels at the fenced boundary between the greenfield and the remaining flats range from 18.03 – 18.5 m.
- Approximately 25 m west of the boundary fence (towards the subject site), the levels reach 19 m

Therefore, the CFRAM mapping flood extent is no longer representative as flood water would not pond at the area of the demolished flats. The likely flood routes would be along Donore Avenue and Brown Street. Levels on Brown Street are lower than levels on Margaret Kennedy Road, which also has a raised table which would block flood water, meaning flood water is likely to flow onto Brown Street, which wouldn't effect the proposed development. Furthermore, Cameron Street (a minor road off Margaret Kennedy Road), would also be a flood route if flood waters gathered on Margaret Kennedy Road, i.e., it is unlikely that flood water would approach the proposed development.

Based on the flood model's nearest node to the site, which predicts a flood level of 18.49 m for the 1 in 1000 year event, the proposed buildings are at minimal risk of flooding, given the lowest proposed Finished Floor Level is 19.1 m.

4.1.2 Coastal Flooding

Coastal flooding is the result of sea levels which are higher than normal and result in sea water overflowing onto the land. It can also be influenced by high tide level, storm surges and wave action.

As shown in Figure 3.3, tidal flooding is not predicted to affect the subject site.

4.1.3 Pluvial Flooding

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall. Flood risk from pluvial sources exists in all areas. Refer to Section 5.4 for mitigation measures regarding pluvial flooding.

4.1.4 Groundwater Flooding

Groundwater is the water that soaks into the ground from rain and can be stored beneath the ground. Groundwater floods occur when the water stored beneath the ground rises above the land surface. There is no evidence of groundwater flooding in the vicinity of the subject site on floodinfo.ie.

4.1.5 Flooding from Sewers

As shown in Figure 3.2: Extract from the GDSDS Existing Hydraulic Performance Map 2013Figure 3.2 (Section 3.3), there are 2 sewers which are noted to surcharge from the 1 or 2 year event. Both of these sewers are being diverted; one sewer is being diverted into the proposed network, which has been modelled and no flooding occurs for 100 year events with a 20% climate change allowance, and the other sewer is being diverted and as noted in Section 3.3 includes attenuation located within The Coombe Women & Infants University Hospital, which will reduce maximum flows draining to the sewer.

The proposed surface water connection is to the surface water sewer in Ebenezer Terrace which was not recorded to flood in the GDSDS performance study. DCC will advise at detailed design stage if a non-return valve is recommended to reduce flood risk to the proposed site and its environs, from this sewer.

The proposed wastewater connection is to the combined sewer in Donore Avenue and was not recorded to flood in the GDSDS performance study. The former St. Teresa's Gardens flats were in operation at the time of the study and have since been demolished with wastewater connections removed/capped, and similarly for surface water connections to the combined sewer. Irish Water have issued Confirmation of Feasibility for connection to this sewer without upgrade works.

4.2 Climate Change

The CFRAM map outputs, discussed in Section 3.4, 3.4.1 and 4.1, are a 'present day scenario' as allowances for climate change are not included.

Advice on the expected impacts of climate change and the allowances to provide for future flood risk management in Ireland is given in the "OPW Assessment of Potential Future Scenarios, Flood Risk Management Draft Guidance", 2009. Two climate change scenarios are considered, the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS).

The MRFS is intended to represent a 'likely' future scenario based on the wide range of future predictions available. The HEFS represents a more 'conservative' future scenario at the upper boundaries of future projections. Based on these two scenarios, the OPW recommended allowances for climate change are given in Table 4.2.

Table 4.2: Recommended allowances for climate change

Parameter	MRFS	HEFS
Extreme Rainfall Depths	+20%	+30%
Peak Flood Flows	+20%	+30%
Mean Sea Level Rise	+500 mm	+1000 mm
Land Movement	-0.5 mm/year *	-0.5 mm/year *
Forestation	- 1/6 Tp**	-1/3 Tp** + 10% SPR***

Notes:

* Applicable to the southern part of the country (Dublin – Galway and south of this).

** Reduce the time to peak (Tp) by a third; this allows for potential accelerated run-off that may arise as a result of drainage of afforested land.

*** Add 10% to the Standard Percentage Runoff (SPR) rate: This allows for temporary increased runoff rates that may arise following felling of forestry.

4.2.1 Fluvial Flooding Future Scenarios

The modelled future scenarios (MRFS & HEFS), available on floodinfo.ie, reveal increases in predicted fluvial floodplain extents for the different return period scenarios. Refer to the figures below for the current scenario, MRFS and HEFS for fluvial flooding.

As aforementioned, it should be noted the land use of the site has changed, therefore the 2016 mapping is no longer representative as ground levels have changed since the date of publish.

The 10% AEP flood extent involves large increases through the scenarios. The 0.1% AEP flood extent within the subject site is minorly increased; the majority of the site remains as Flood Zone C (approx. 85%), with approx. 15% of the site within Flood Zone B and <1% of the site within Flood Zone A.

However, as described, the flood routes are likely via Donore Avenue and Brown Street, due to the altered topography.

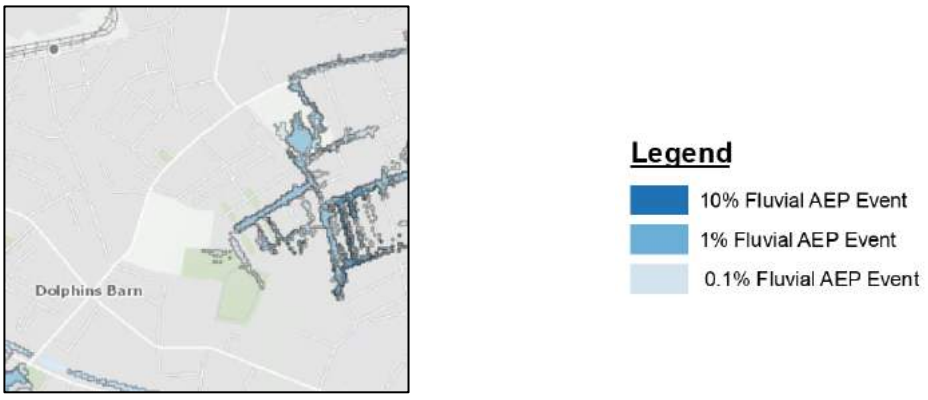


Figure 4.1: Current Scenario - Fluvial Flooding

Figure 4.2: MRFS Fluvial Flooding

Figure 4.3: HEFS Fluvial Flooding

4.2.2 Coastal Flooding Future Scenarios

Figure 4.4 shows the High-End Future Scenario (1 m mean sea level rises). As shown in the figure, the site is not predicted to be impacted by coastal flooding when climate change is considered.

Figure 4.4: HEFS Coastal Flooding

5. Flood Risk Management

Chapter 3 of the Planning System and Flood Risk Management Guidelines (DEHLG/ OPW, 2009) describes the key principles of a risk based sequential approach to managing flood risk. The sequential approach is aimed at directing development toward land that is at low risk of flooding. Figure 5.1 is extracted from The Guidelines and illustrates the sequence in which a site must be assessed from a flood risk standpoint. Specifically, the order in which the planning authority must be satisfied from a flood risk perspective is to *Avoid* (locate in an area that is not prone to flooding), then *Substitute* (if in a flood risk zone, then substitute the type of development), *Justify* (if substitution does not reduce flood risk sufficiently, then perform Justification Test) and *Mitigate*. This section discusses the sequential approach recommended in The Guidelines with regard to the proposed development.

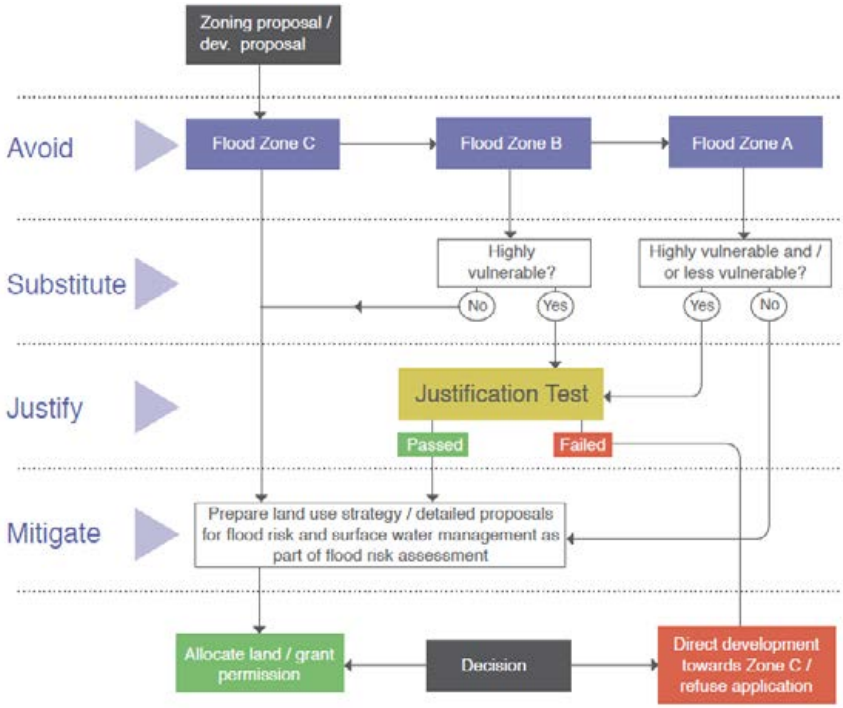


Figure 5.1: Sequential Approach Mechanism in the Planning Process

5.1 Sequential Approach

The first stage of the sequential approach is to avoid development in areas at risk of flooding. Flood Zones associated with river and coastal flooding are identified as Flood Zones A, B and C (refer to Section 2 for definitions). The planning implications for each of the flood zones include:

Flood Zone A – High probability of flooding: most types of development would be considered inappropriate in this zone. Development in this zone should be avoided or only considered in exceptional circumstances, such as in city and town centres where the Justification Test has been applied. Water compatible development such as docks or marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation would be considered appropriate in this zone.

Flood Zone B – Moderate probability of flooding: highly vulnerable development would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development and water compatible development would be considered appropriate in this zone. In general, less vulnerable development should only be considered in this zone if adequate lands or sites are not available within Flood Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will be adequately managed.

Flood Zone C – Low probability of flooding: Development in this zone is considered appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

The second stage of the sequential approach is to substitute the type of development to one less vulnerable to flooding.

5.2 Vulnerability

Table 3.1 of The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009, provides a classification of vulnerability of different types of development. Figure 5.2 is taken from The Guidelines (Table 3.1) and sets out the Vulnerability Classifications of different types of land uses. Figure 5.3 (Table 3.2 of The Guidelines) describes the vulnerability of developments relative to the identified Flood Zone and when the requirements of the Justification Test must be satisfied.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

Table 3.1 Classification of vulnerability of different types of development

Figure 5.2: Classification of Vulnerability (Table 3.1 taken from The Guidelines)

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Figure 5.3: Matrix of Vulnerability (Table 3.2 taken from The Guidelines)

The proposed land use for the proposed development is largely residential, which falls within the 'Highly Vulnerable Development' classification, as shown in Figure 5.2.

Based on the review carried out of the CFRAM mapping, which is noted to include outdated topographical information, the site is partially within Flood Zone A & B (<1% and approx. 10% of the site area, respectively). Therefore, as recommended in the matrix above, a Justification Test should be carried out for the 'Highly Vulnerable Development'.

5.3 Justification Test

As outlined in Section 3.4.1, 10% of the site is within Flood Zone B and <1% situated within Flood Zone A. Given a portion of the site is in Flood Zone A/B, it would be prudent to carry out a Justification Test.

The Justification Test is in place as it is recognised that established towns and cities are currently at risk of flooding and development must take place to meet the growing requirements of these urban centres. As part of the Development Plan review process, DCC have carried justification tests as part of the SFRA, using mapped flood zones to review the need for development of areas at high or moderate risk of flooding and which would generally be inappropriate. The land use zoning objective has been retained, DCC are satisfied that it has clearly demonstrated that the designation for development has satisfied the Justification Test for Development Plans.

The Development Management Justification Test is used at planning application stage and is intended to develop land at moderate or high risk of flooding. In order for the planning authority to consider an application for a proposed development in an area where a Justification Test is required, the following criteria must be satisfied. Refer to Figure 5.4 which is taken from The Planning System and Flood Risk Management Guidelines for Planning Authorities.

Box 5.1 Justification Test for development management (to be submitted by the applicant)

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
   - (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
   - (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
   - (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
   - (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.

Refer to section 5.28 in relation to minor and infill developments.

Figure 5.4: Development Management Justification Test (The Guidelines, 2009)

5.3.1 Justification Test – Part 1

Part 1 of the Justification Test requires the proposed land use to be in accordance with their assigned zoning. The subject site is within the SDRA 11 (Strategic Development & Regeneration Area) in the 2022-2028 Development Plan, the land use of which 'will primarily support residential uses' therefore the proposed development is deemed suitable on these lands by DCC.

5.3.2 Justification Test – Part 2 (i)

Part 2 (i) of the Justification Test requires that the development will not increase flood risk elsewhere.

It is proposed to raise ground levels of the proposed site to allow the site drain by gravity to the existing drainage networks. As described in Section 4.1.1, the site is not within a floodplain and therefore development of the site will not increase flood risk elsewhere.

The runoff generated within the site boundary will be attenuated within the proposed drainage network and discharged to the existing public sewer at a restricted rate, as per the recommendations set out in the Greater Dublin Strategic Drainage Study.

A flood exceedance route, shown in drawing STG-AEC-S1b-00-00-DR-C-0000510, shows flow paths for exceedance events. Roads and footpaths create potential to produce exceedance flows, however, this potential is reduced by the proposed ground level SuDS measures; swales, bioretention, tree pits and porous asphalt. Runoff is directed towards these measures where feasible. The road levels on the site contain multiple low points, which will allow water to pond, rather than directing excess flows off the site. Therefore, the potential for runoff to leave the site has been minimised as far as possible.

5.3.3 Justification Test – Part 2 (ii)

Part 2 (ii) of the Justification Test requires that the development includes measures to minimise flood risk to people property, the economy and the environment.

The lowest proposed building with associated undercroft car park is proposed at a level 19.1 m, 610 mm above the highest predicted fluvial flood level of 18.49 m. The floor level of this building is 19.1 m and the highest water level in the drainage network in the near vicinity to this building is less than 18.2, for the 1 in 100 year event including 20% climate change.

Flood risk has been reduced to properties by providing footpath crossfalls away from the building. In one location, where levels are constrained due to Part M access, it is necessary to have approx. 10 m of footpath falling towards the private amenity space/terrace outside the building. The terrace itself falls away from the building, therefore, the ground level at this point is achieved at 40 mm lower than the building, offering some protection. A slot drain is proposed along the private amenity space (the low point) to collect runoff from the footpath. Tree pits are also proposed at this location which include inlets for runoff. Runoff from higher areas draining to this location is reduced via kerb drains at the roadsides and another slot drain higher in the catchment.

The drainage network has been designed in accordance with the GDSDS (Greater Dublin Strategic Drainage Study) and the Greater Dublin Regional Code of Practice for Drainage Works, to ensure the proposed development will mitigate flood risk. Refer to Section 5.4 for further details and other possible mitigation measures.

5.3.4 Justification Test – Part 2 (iii)

Part 2 (iii) of the Justification Test requires that the development considers residual flood risk and future risk management.

Recommendations are included in Section 5.4 (Mitigation Measures), such as evacuation plans and raising electrical equipment. A drainage maintenance checklist is provided within the Infrastructure Report (ref: STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report, maintenance should be carried out on the drainage network every 6 months or after large rainfall events.

5.3.5 Justification Test – Part 2 (iv)

Part 2 (iv) of the Justification Test requires that the development is "compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant active streetscapes".

Please refer to the associated architectural and planning report for the associated amenity and urban design benefits of the proposed development.

5.4 Mitigation Measures

Fluvial Flooding

Due to the proximity of the site to a floodplain, it is proposed to apply a 610 mm freeboard from the flood water level (refer to Table 4.1, the 0.1% AEP water level is 18.49 mOD). Therefore, the lowest proposed Finished Floor Level (FFL) is 19.1 m.

Further measures which are recommended;

- Raising electrical equipment above the finished floor level where possible, or protection against water ingress into the equipment. If this cannot be achieved, then additional measures should be considered to ensure electrical supplies will be maintained in the event of a flood and that the assets will be protected from damage.
- Evacuation Plans directing residents, staff, customers etc. to exit the building areas of higher ground.

The retail & commercial units, which are considered 'less vulnerable' developments, are proposed at ground floor level, while the 'Highly Vulnerable' residential units are proposed at higher floors. A creche which is classified as 'Highly Vulnerable' is proposed at ground and first floor level.

Pluvial Flooding

Overland flow routes are shown in drawing STG-AEC-S1b-00-00-DR-C-0000510_FloodExceedanceRoute. Overland flows are directed to SuDS measures where possible. The road levels on the site contain multiple low points, which will allow water to pond, rather than directing excess flows off the site, thereby reducing risk to proposed and existing properties.

The proposed development includes a separate surface water drainage network to collect run-off generated within the site. This system will collect rainfall generated run-off within the site and convey flows through the proposed network.

The site's runoff will be restricted to runoff rates similar to the greenfield rate (QBAR) by providing a Hydrobrake flow control system (or similar approved) and attenuation tank. The proposed attenuation storage will be designed using a 1 in 100-year return period rainfall event, with a 20% increase in rainfall depths to allow for the impact of climate change on rainfall. Run-off in excess of greenfield run-off rates will be attenuated in the attenuation tank.

A series of SuDS systems will provide a "Management Train" (Interception and Treatment) on site and maintenance should be carried out on the drainage network every 6 months or after large rainfall events. Refer to the Infrastructure Report for further details (ref: STG-AEC-S1b-00-00-RE-C-0000001_Infrastructure_Report).

6. Conclusion

The mixed-use development is proposed on a SDRA (Strategic Development & Regeneration Area) and comprises of 'Less Vulnerable' retail and commercial units at ground floor, a creche ('Highly Vulnerable') at ground floor (and first floor) and residential units ('Highly Vulnerable') at higher floors.

Based on the available CFRAM mapping published in 2016, which is based on outdated and no longer relevant topography, approx. 90% of the site is located within Flood Zone C, 10% within Flood Zone B and <1% situated within Flood Zone A. However, by assessing the current topographical information, it is apparent that the flood routes are now different to what was modelled as part of CFRAM, and the site would not receive flood waters given the topography following the demolition of the St. Teresa's Gardens flats. This, coupled with the zoning for the subject site, results in the subject site passing the Justification Test.

Nevertheless, it is noted that the water level for the fluvial node SO14324909 from the CFRAM flooding model is 18.49m OD, for which it would be prudent to set all FFL's within the site to minimum 19.00 to allow a 500 mm freeboard above the 0.1% AEP (1 in 1000-year return period) storm event. The lowest proposed FFL is 19.1 m.

There are no recorded incidents of previous flooding on the site.

Sewers identified to be surcharging as part of the GDSDS (Greater Dublin Strategic Drainage Study) will be diverted and a new proposed surface water network including a 20% climate change allowance will be constructed, minimising the risk of flooding occurring on site and reducing the volume of runoff entering the sewers predicted to flood.

The proposed ground level SuDS measures (swales, raingardens, tree pits and porous asphalt) and low areas of the site will minimise exceedance runoff leaving the site before entering the drainage system (overland flows). Green roofs and permeable roof paving are proposed at roof level, which will delay runoff entering the drainage network, which is beneficial for 'flash' events.

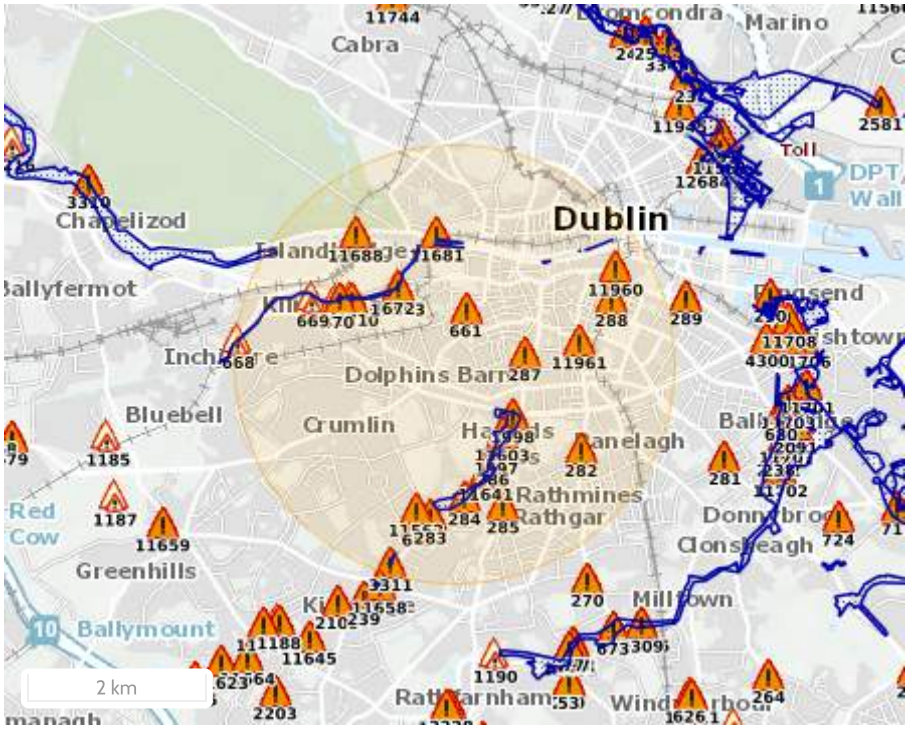
Appendix A – OPW Past Flood Summary Report

Past Flood Event Local Area Summary Report

Report Produced: **4/10/2021 14:41**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

33 Results

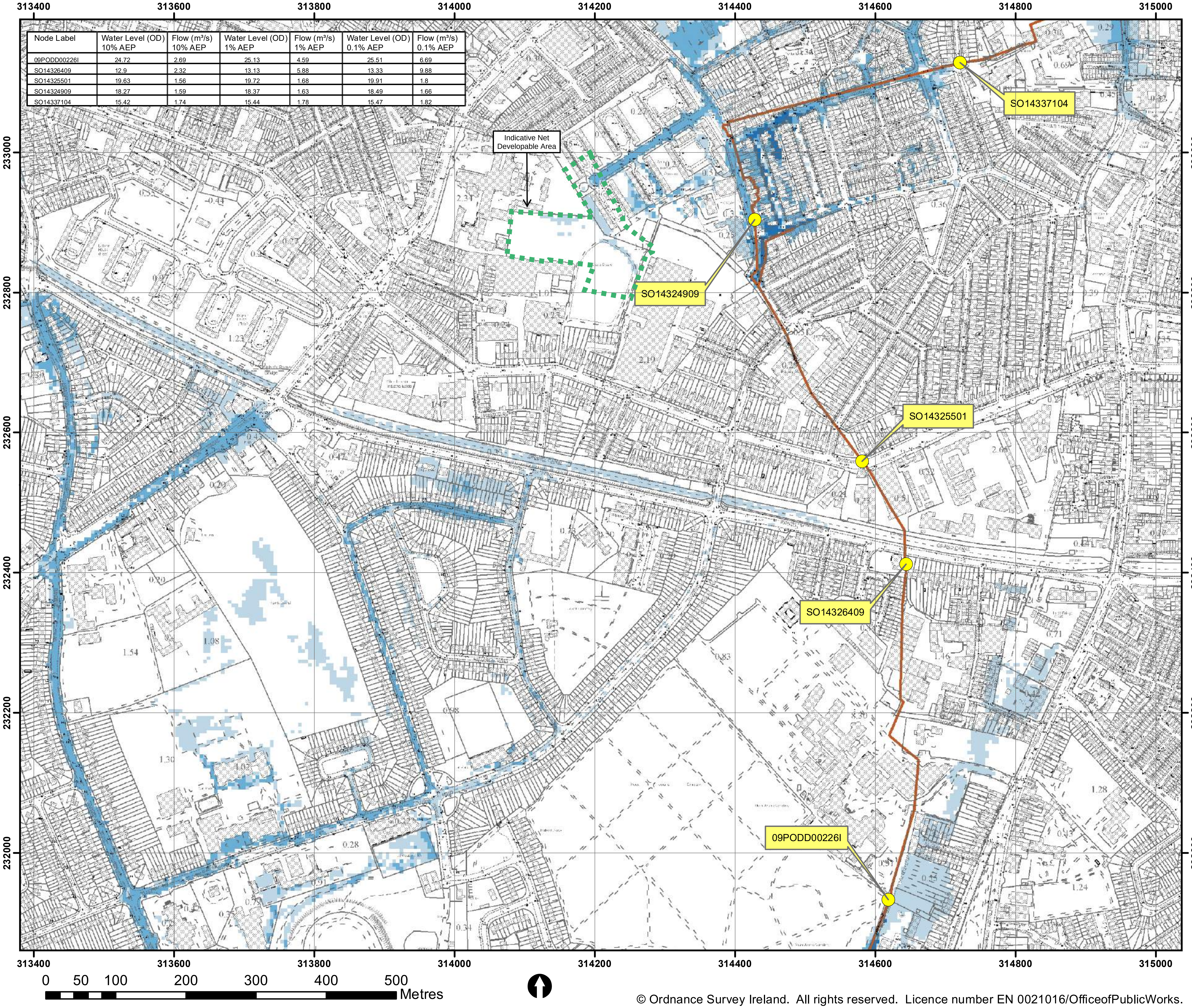
	Name (Flood_ID)	Start Date	Event Location
1.	Flooding at Trinity College, Dublin 2, 26th July 2013 (ID-11960) **Additional Information:** Reports (1) Press Archive (0)	26/07/2013	Approximate Point
2.	Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961) **Additional Information:** Reports (1) Press Archive (0)	26/07/2013	Approximate Point
3.	Poddle August 1986 (ID-32) **Additional Information:** Reports (9) Press Archive (1)	25/08/1986	Area
4.	Dublin City Tidal Feb 2002 (ID-456) **Additional Information:** Reports (45) Press Archive (27)	01/02/2002	Area
5.	Rathmines Lower June 1963 (ID-282) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
6.	Kimmage June 1963 (ID-283) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point

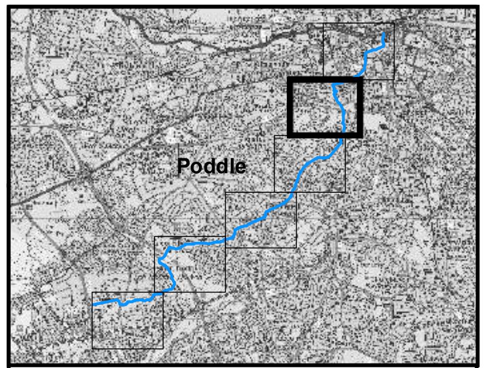
	Name (Flood_ID)	Start Date	Event Location
7.	 Kimmage Mount Argus June 1963 (ID-284) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
8.	 Harold's Cross June 1963 (ID-285) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
9.	 Mount Jerome Harold's Cross June 1963 (ID-286) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
10.	 Clanbrassil Street June 1963 (ID-287) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
11.	 Grafton Street June 1963 (ID-288) **Additional Information:** Reports (4) Press Archive (2)	11/06/1963	Exact Point
12.	 Camac Turvey Ave Recurring (ID-669) **Additional Information:** Reports (1) Press Archive (0)	n/a	Exact Point
13.	 Poddle Tributary Marrowbone Lane Jan 1941 (ID-661) **Additional Information:** Reports (1) Press Archive (0)	21/01/1941	Approximate Point
14.	 Poddle Harold's Cross undated 1940's (ID-662) **Additional Information:** Reports (1) Press Archive (0)	n/a	Exact Point
15.	 Poddle Larkfield Mills Undated 1940s (ID-663) **Additional Information:** Reports (1) Press Archive (0)	n/a	Approximate Point
16.	 Camac Goldenbridge Recurring (ID-668) **Additional Information:** Reports (1) Press Archive (0)	n/a	Approximate Point
17.	 Camac Carrickfoyle Terrace Recurring (ID-670) **Additional Information:** Reports (1) Press Archive (0)	n/a	Exact Point
18.	 Camac Kearns Place Recurring (ID-671) **Additional Information:** Reports (1) Press Archive (0)	n/a	Exact Point
19.	 Camac Bow Bridge Recurring (ID-672) **Additional Information:** Reports (1) Press Archive (0)	n/a	Approximate Point
20.	 Poddle St Claires Ave Sept 1931 (ID-1997) **Additional Information:** Reports (1) Press Archive (0)	03/09/1931	Approximate Point
21.	 Poddle Limekiln Lane Aug 1905 (ID-1998) **Additional Information:** Reports (1) Press Archive (0)	24/08/1905	Approximate Point
22.	 Poddle Limekiln Lane Sept 1931 (ID-3267) **Additional Information:** Reports (1) Press Archive (0)	03/09/1931	Approximate Point
23.	 Poddle Park Nov 2000 (ID-3311) **Additional Information:** Reports (1) Press Archive (0)	05/11/2000	Approximate Point
24.	 Liffey Lower - Dec 1954 (ID-241) **Additional Information:** Reports (5) Press Archive (2)	08/12/1954	Area

	Name (Flood_ID)	Start Date	Event Location
25.	Camac August 1986 (ID-125) **Additional Information:** Reports (3) Press Archive (0)	25/08/1986	Area
26.	Flooding at Blarney Park, Crumlin, Dublin 12 on 24th Oct 2011 (ID-11562) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
27.	Flooding at Bow Lane, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11563) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
28.	Flooding at Harold's Cross, Dublin City on 24th Oct 2011 (ID-11603) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
29.	Flooding at Kearns Place, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11620) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
30.	Flooding at Lady's Lane, Kilmainham, Co. Dublin on 24th Oct 2011 (ID-11622) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
31.	Flooding at Mount Argus Road and Kimmage Road Lower on 24th Oct 2011 (ID-11641) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point
32.	Flooding at Ashling Hotel, Parkgate Street, Dublin 8 on 24th Oct 2011 (ID-11681) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point
33.	Flooding at Bridgewater Quay Apartments, Islandbridge, Dublin 8. on 24th Oct 2011 (ID-11688) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point

Appendix B – CFRAM Maps

Node Label	Water Level (OD) 10% AEP	Flow (m^3/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m^3/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m^3/s) 0.1% AEP
09PODD00226I	24.72	2.69	25.13	4.59	25.51	6.69
SO14326409	12.9	2.32	13.13	5.88	13.33	9.88
SO14325501	19.63	1.56	19.72	1.68	19.91	1.8
SO14324909	18.27	1.59	18.37	1.63	18.49	1.66
SO14337104	15.42	1.74	15.44	1.78	15.47	1.82





IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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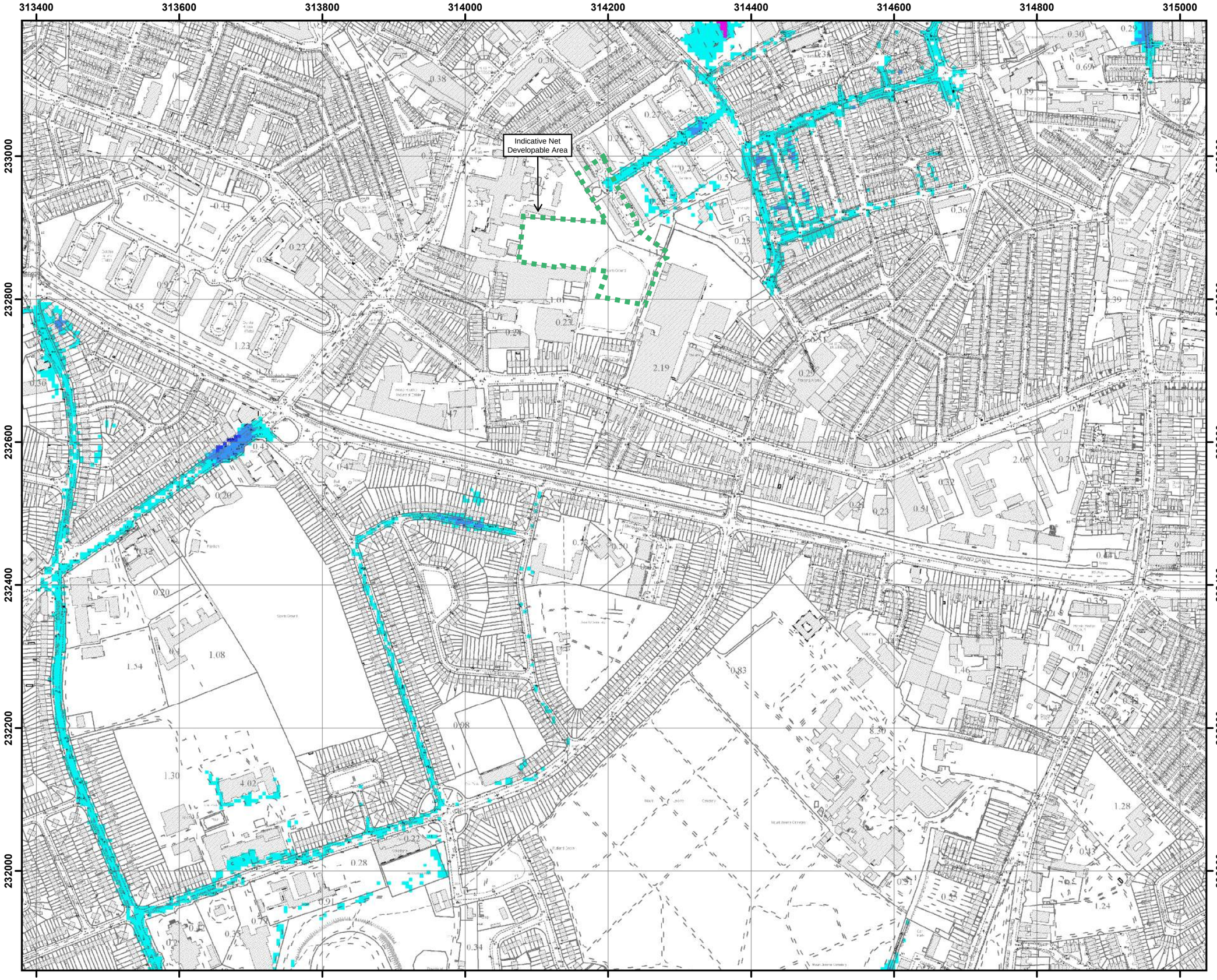
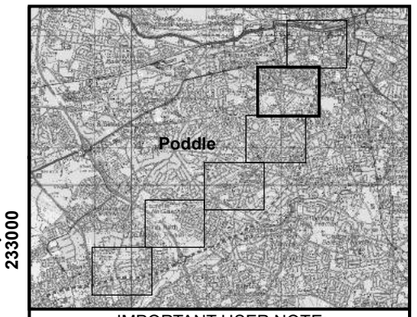
Map:
Poddle River Fluvial Flood Extents

Map Type: EXTENT
Source: FLUVIAL
Map Area: HPW
Scenario: CURRENT
Drawn By : F.M.C. Date : 11 August 2016
Checked By : A.S. Date : 11 August 2016
Approved By : S.P. Date : 11 August 2016
Drawing No. :
E09POD_EXFCD_F0_05
Map Series : Page 5 of 6
Drawing Scale : 1:5,000 @A3





IMPORTANT USER NOTE:
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Legend

1% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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Map:
Poddle River Fluvial Flood Depths

Map Type:	**DEPTH**	
Source:	**FLUVIAL**	
Map Area:	**HPW**	
Scenario:	**CURRENT**	
Drawn By :	**F.M.C.**	**Date : 20 October 2016**
Checked By :	**A.S.**	**Date : 20 October 2016**
Approved By :	**S.P.**	**Date : 20 October 2016**

Drawing No. :
E09POD_DPFCD010_F0_05

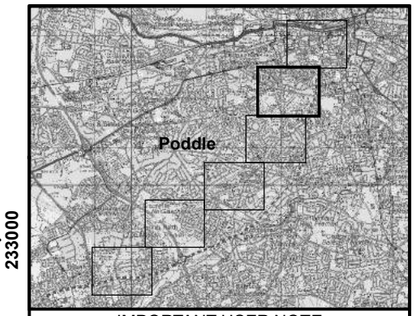
Map Series : Page 5 of 6

Drawing Scale : 1:5,000 @ A3

313400 313600 313800 314000 314200 314400 314600 314800 315000

233000 232800 232600 232400 232200 232000

Indicative Net Developable Area



IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

0.1% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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Map:
Poddle River Fluvial Flood Depths

Map Type:	**DEPTH**	
Source:	**FLUVIAL**	
Map Area:	**HPW**	
Scenario:	**CURRENT**	
Drawn By :	**F.M.C.**	**Date : 20 October 2016**
Checked By :	**A.S.**	**Date : 20 October 2016**
Approved By :	**S.P.**	**Date : 20 October 2016**

Drawing No. :
E09POD_DPFCD001_F0_05

Map Series : Page 5 of 6

Drawing Scale : 1:5,000 @ A3

0 50 100 200 300 400 500 Metres

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Appendix K

Appendix 11A Dublin City Development Plan 2022 – 2028

The draft Dublin City Development Plan 2022 – 2028 out a new approach to meet the needs and aspirations of citizens of Dublin and the country, not only for the 6-year life of the plan, but for the long term. This approach is based on the principles of sustainability and resilience on the social, economic and environmental fronts.

Chapter 11 of the Plan provides for a strategic context in relation to heritage. It recognises that the archaeology of Dublin is a unique and non-renewable resource that includes the industrial heritage of the city dating to 1950. Preservation in situ is the preferred option of protection. Given this, it is policy of Dublin City Council:

- BHA26 Archaeological Heritage: To protect and preserve Sites and Zones of Archaeological interest which have been identified in the Record of Monuments and Places and the Historic Environment Viewer (www.archaeology.ie).

  To protect archaeological material in situ by ensuring that only minimal impact on archaeological layers is allowed, by way of re-use of standing buildings, the construction of light buildings, low impact foundation design, or the omission of basements (except in exceptional circumstances) in the Zones of Archaeological Interest.
- To seek the preservation in situ (or where this is not possible or appropriate, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and Places, and of previously unknown sites, features and objects of archaeological interest that become revealed through development activity. In respect of decision making on development proposals affecting sites listed in the Record of Monuments and Places, the Council will have regard to the advice and/or recommendations of the Department of Housing, Heritage and Local Government.
- Development proposals within Sites and Zones of Archaeological Interest, of sites over 0.5 hectares size and of sites listed in the Dublin City Industrial Heritage Record, will be subject to consultation with the City Archaeologist and archaeological assessment prior to a planning application being lodged.
- Development proposals in marine, lacustrine and riverine environments and areas of reclaimed land shall have regard to the Shipwreck Inventory maintained by the Department of Culture, Heritage and the Gaeltacht and be subject to an appropriate level of archaeological assessment.
- To have regard to national policy documents and guidelines relating to archaeology and to best practice guidance published by the Heritage Council, the Institute of Archaeologists of Ireland and Transport Infrastructure Ireland

It is an Objective of Dublin City Council:

- BHAO10 Conservation Plans: To prepare and implement conservation plans for National Monuments and Recorded Monuments in Dublin City Council ownership.

- BHAO11 Dublin City Archaeological Archive: To maintain, develop and promote the Dublin City Archaeological Archive (DCAA) at Pearse Street Library and Archives.
- BHAO12 Findings of Licenced Archaeological Activity: To ensure the public dissemination of the findings of licenced archaeological activity in Dublin through the Dublin County Archaeological GIS, publications and public lectures and to promote awareness of, and access to, the city's archaeological inheritance and foster high quality public archaeology.
- BHAO13 Management Plan: To develop a long-term management plan to promote the conservation, management and interpretation of archaeological sites and monuments and to identify areas for strategic research.

In terms of architectural heritage, or historic built environment, it is the Policy of Dublin City council:

- BHA2 Development of Protected Structures. That development will conserve and enhance Protected Structures and their curtilage and will:

  (a) Ensure that any development proposals to Protected Structures, their curtilage and setting shall have regard to the 'Architectural Heritage Protection Guidelines for Planning Authorities' 2011 published by the Department of Culture, Heritage and the Gaeltacht.

  (b) Protect Structures included on the RPS from any works that would negatively impact their special character and appearance.

  (c) Ensure that any development, modification, alteration, or extension affecting a Protected Structure and/or its setting is sensitively sited and designed, and is appropriate in terms of the proposed scale, mass, height, density, layout and materials.

  (d) Ensure that the form and structural integrity of the Protected Structure is retained in any redevelopment and ensure that new development does not adversely impact the curtilage or the special character of the Protected Structure.

  (e) Protect and retain important elements of built heritage including historic gardens, stone walls, entrance gates and piers and any other associated curtilage features.
- BHA4 Ministerial Recommendations: To have regard to the National Inventory of Architectural Heritage (NIAH) rating of a structure and any associated Ministerial Recommendation in the assessment of planning applications.
- BHA5 Demolition of Regional Rated Building on NIAH: That there is a presumption against the demolition or substantial loss of any building or other structure assigned a 'Regional' rating or higher by the National Inventory of Architectural Heritage (NIAH), unless it is clearly justified in a written conservation assessment that the building has no special interest and is not suitable for addition to the City Council's Record of Protected Structures (RPS); having regard to the provisions of Section 51, Part IV of the Planning and Development Act, 2000 (as amended) and the Architectural Heritage Protection Guidelines for Planning Authorities (2011).
- BHA6 Buildings on Historic Maps: That there will be a presumption against the demolition or substantial loss of any building or other structure which appears on historic maps up to and including the Ordnance Survey of Dublin City, 1847. A conservation report shall be submitted with the application and there will be a presumption against the demolition or substantial loss of the building or structure, unless demonstrated in the submitted conservation report this it has little or no special interest or merit having regard to

the provisions of the Architectural Heritage Protection Guidelines for Planning Authorities (2011).

It is an Objective of Dublin City Council:

- BHAO1 Buildings-at-Risk Register: To continue to maintain and proactively manage the Buildings-at-Risk Register of Protected Structures that are considered to be endangered or have the potential to become endangered through neglect, decay, damage and harm.

It is the Policy of Dublin City Council:

- BHA16 Industrial Heritage: To have regard to the city's industrial heritage and Dublin City Industrial Heritage Record (DCIHR) in the preparation of Local Area Plans and the assessment of planning applications. To review the DCHIR in accordance with Ministerial recommendations arising from the National Inventory of Architectural Heritage (NIAH) survey of Dublin City. Appendix 11A Dublin City Development Plan 2016 – 2022

Appendix 11B Gazetteers of Recorded Heritage Assets

Recorded Monuments within, or just outside, 500m of the Proposed Development site

RMP Ref	RPS Ref	Type	Period	Description	Condition
DU018-020		Settlement Site	Multiple	Zone of Archaeological Interest for Dublin City	Some visible remains
DU018-020092		Mills	16th-17th century	Formerly the property of St Thomas's Abbey, the mills were granted to William Brabazon in 1544; there were two mills in 1610 (Clarke 2002, 26, G4). The site of watermills known as the Double Mills were located on a millpond S of the present Mill Street (Bradley & King 198; FMD map 1978, N2).	No visible remains
DU018-020202		House	18th century	Walsh (1973, 67-9) mentions a Dutch Billy at No. 10 Mill Street.	No visible remains
DU018-020203		Bridge	Medieval	This bridge formerly crossed a stream at the junction of Ardee Street and Cork Street. It is shown on the Friends of Medieval Dublin Map (1978) and mentioned by Bradley and King (1987, 3, 196, No. 158). No visible surface trace.	No visible remains
DU018-020503		Quaker Burial Ground	18th century	This is marked on the 1st edition OS map (1837) as Quakers' Burial Ground in a lot adjacent to the later James Weir Home. Some gravestones were still visible within the grounds during the 1990s.	No visible remains
DU018-020329		House	18th century	Craig (1982, 159) notes the former existence of 'Dutch Billy' houses at Poole Street. These contain cruciform roof construction held together by crossed purlins from gable to gable. They were weavers houses from c. 1700 AD.	No visible remains
DU018-020330		Malt Mill	Medieval	The site of the medieval 'Malt Mill' was located at the southern boundary of the Liberty of St. Thomas, at the N end of Ardee Street (Bradley & King 1987, 8, 1, 39; FMD map (1978) N5). No visible surface remains (Clarke 2002, 26, G7).	No visible remains
DU018-020331		Bridge	Medieval	Listed in the Dublin City Development Plan 1991 a 'site of Bridge' on ArdeeStreet (No. 3, 277; FMD map (1978)). It crossed a millrace which fed a malt mill onArdee Street (CDP 6:32/3).	No visible remains
DU018-020332		Hospital	Medieval	Listed on the Dublin City Development Plan 19991 as 'site of Hospital' between Ardee Street and Chamber Street (No. 2, 277). Shown as a religious house on the Friends of Medieval Dublin Map (FMD map 1978).	No visible remains

RMP Ref	RPS Ref	Type	Period	Description	Condition
DU018-020357		Dwelling Site	18th centuries	Walsh (1973, 64-5) mentions a former Dutch Billy which had a date stone of 1721.	No visible remains
DU018-020358		Dwelling Site	18th/19th centuries	The former presence of houses in Weaver's Square which had been settled by cloth weavers in the early 18th century. Houses built in this area as known as 'Chamber Street type' after Chamber Street which runs eastwards from the northwestern corner of Weavers Square. These were gable fronted houses and forerunners to the Dutch Billys which characterised much of the Dublin streetscape in the 18th century.	No visible remains
DU018-020364		House	18th century	Murtagh (1973, 49) mentions Old Ardee House which was a Dutch Billy. Date uncertain.	No visible remains
DU018-020398		Millpond	17th century	The site of a millpond is shown on the map that accompanies the Irish Historic Towns Atlas (HTA, No. 11) Part 1. to 1610 (Clarke 2002)	No visible remains
DU018-020400		Mill-unclassified	Medieval	Shown on the Friends of medieval Dublin map (1978).	No visible remains
DU018-020490		House	18th century	Walsh (1973, 69-70) mentions a stone-gabled house in the Liberties in Warrenmount . Part of this house is incorporated in the Presentation Convent which occupies the site.	Some remains
DU018-047001	2325	Unclassified castle	Medieval	This location is marked as the 'Site of Donore Castle' on the 1st edition map of 1837. The presence of the castle is primarily based on local tradition and Bradley (2000) notes that medieval records do not mention of a castle within the manor of Donore. He suggests that the original building may have been a mill. The earliest upstanding remains date to the 18th century while archaeological testing by Swan in 2000 and Walsh in 2003 did not uncover any medieval remains or deposits	No visible remains
DU018-043001		Watercourse		Part of the watercourse DU018-020576 which continued northwards along St. James' Walk to the City Basin. This section of the watercourse is marked on the Down Survey map of the mid-17th century as 'the water that supporteth Dublin' and as 'The City Water' on Rocque's 18th century map of County Dublin.	No visible remains
DU018-04304		Watercourse	13th century	The Abbey Stream was an artificial branch of the River Poddle built during the medieval period to divert water through the Liberty of St Thomas' Abbey (later Liberty of Donore) and is thought to date to the late 12th or early 13th centuries. While initially under the control of the Abbey, the primary control of the water courses passed to the	Some remains

RMP Ref	RPS Ref	Type	Period	Description	Condition
				city during the 15th century. The line of the stream was culverted during the 17th century although the section within the Proposed Development site appears to have remained open	
DU018-121		Mill	Uncertain	No details provided.	No visible remains
DU018-122		Tannery	Uncertain	No details provided.	No visible remains
DU018-020575		Watercourse	13th century	On N angle of Ardee Street and Cork Street excavations in 1993 exposed an N-S extending watercourse which was part of the new course of the Poddle River diverted through the area in the 12th-century (Hayden, 1993, 19, 20).	No visible remains
DU018-020576		Watercourse	13th century	This watercourse was uncovered during archaeological investigations in 1993 which were carried out in advance of the Coombe Relief Road (Hayden, 1993). It was located at a spot known as 'The Back of the Pipes' in Dolphin's Barn and is thought to be a section of the watercourse diverted from the Rivers Poddler and Doddler at Mount Argus. This watercourse was diverted in the mid-13th century in order to supply Dublin with clean water. The watercourse was uncovered at 1.8m below modern ground level and was filled with grey silt containing 17th and 18th century pottery. The watercourse continued northwards along St. James' Walk to the City Basin.	No visible remains
DU018-020679		Hospital	Medieval	Listed on the Dublin City Development Plan (1991) as 'site of Hospital'between Ardee Street and Chamber Street (No. 2, 277). Shown as a religious house on the Friends of Medieval Dublin Map (FMD map 1978).	No visible remains
DU018-020692		Watercourse	13th century	Another section of water course located at Herbeton Walk. This was uncovered during archaeological testing in 2002. The section of watercourse proved to be less than 0.5m deep and unlined (Hayden, 2002).	No visible remains

Architectural Heritage within 300m of the Proposed Development site

RPS Ref	NIAH Ref	Name	Description
1849	50080748	Church of Our Lady of Dolours	Freestanding cruciform-plan gable-fronted double-height Roman Catholic church, built c.1890, comprising six-bay nave, gabled transepts to north and south elevations, single-bay chancel to east, single-bay porches to front (west) of transepts, gabled to north elevation, flat-roofed to south elevation, confessional projections and side altars to nave, square-profile four-stage bell tower having octagonal fourth stage to north elevation. Built to designs by William Hague, with later additions by Robinson & Keefe, it occupies a prominent position at the junction of South Circular Road and Dolphin's Barn. It continues to play an important social role in the local community.
2053	50080733	Brú Chaoimhín, Cork Street, Dublin 8	Attached five-bay three-storey over basement former fever hospital, built 1801-04, having central stairwell and recent elevator extension to rear (east) elevation. Now in use as community nursing unit. Pitched artificial slate roof with brown brick chimneystacks, cast-iron rainwater goods, and granite eaves course to north and south elevations
2053	50080734	Brú Chaoimhín, Cork Street, Dublin 8	Attached three-bay three-storey over basement former fever hospital, built 1801-04, having single-storey lean-to corridor to rear (south) elevation, connecting to wards to east and west. Now in use as community nursing unit.
2053	50080735	Brú Chaoimhín, Cork Street, Dublin 8	Attached five-bay three-storey over basement former fever hospital, built 1801-04, having later full-height extension to rear (west) elevation, and canted oriel windows to first and second floors to front (east) elevation, added 1881. Recent elevator tower to rear elevation. Now in use as community nursing unit.
2054	50080728	The James Weir Home for Nurses, 103-4 Cork Street	Attached seven-bay three-storey former nurses' home, dated 1903, having dormer attic and adjoining lower single-bay three-storey with half-dormer attic gable-fronted block to north elevation. Pitched slate roofs with terracotta ridge tiles, red brick chimneystacks, gabled dormer windows to front (west) elevation, with timber bargeboards and paired square-headed window openings having one-over-one pane timber sash windows to front (west) elevation. Square-headed dormer windows to rear elevation.
2308	50080467	Rom Massey & Sons	Attached pair of double-pile two-bay three-storey former houses, built c.1800, subsequently also used as shops, now amalgamated with neighbouring building and in use as funeral home. M-profile hipped slate roof having terracotta ridge crestings, rendered parapet having cornice to front (east) elevation and rendered chimneystacks having clay chimneypots.
2326	50080771	Church of Ireland Church of Saint Catherine and James	Freestanding double-height Church of Ireland church, built 1896, extended 1906. Comprising four-bay nave, gable-fronted transepts to north and south elevations, single-bay chancel to east, square-profile three-stage bell tower to east, single-storey gable-fronted porches to east and north elevations, and vestry to south of chancel. North transept now in use as hall.
	50080224	Rialto Cinema	Detached three-bay three-storey former cinema, dated 1936, having recessed second floor to front (north-east) elevation with pedimented central bay. Later in use as retail outlet, now disused. Pitched metal roof having stepped rendered parapet with concrete capping to front elevation. Flat roof to projecting first floor front. Painted brick walls to ground and first floors of front elevation, banded brick piers to upper floors of front elevation. Render date and name lettering to pediment.

RPS Ref	NIAH Ref	Name	Description
			Rendered walls to second floor of front elevation. Red and brown brick walls to side elevations. Square-headed window and door openings, now boarded up. Metal framed window to first floor front elevation. Paving to forecourt.
	50080759	Dolphin Villa	Detached three-bay two-storey house, built c.1880, having flat-roofed porch to front (north) elevation. Hipped artificial slate roof, with polychrome brick chimneystacks, terracotta ridge tiles and ridge cresting, rendered parapet, cast-iron rainwater goods and moulded render eaves cornice and fascia.
	50080751	Bee Cycles	Attached two-bay two-storey house and shop, built c.1890, having shopfront to front (south-west) elevation. Pitched artificial slate roof, hipped to front, with polychrome brick chimneystack, cast-iron rainwater goods and moulded red brick eaves course. Brown brick laid in Flemish bond to walls, with granite quoins.
	50080750	Deveney's Off Licence	Attached three-bay two-storey house and shop, built c.1900, having shopfront to front (south-west) elevation. Now in use as apartments. M-profile pitched slate roof, hipped to north-west, having red brick chimneystacks, moulded brick eaves course, and cast-iron rainwater goods. Red brick laid in Flemish bond having moulded brick string course to first floor. Segmental-headed window openings to first floor, with brick keystones and moulded hood mouldings, granite sills and one-over-one pane timber sash windows. Shopfront comprising moulded brick pilasters with fluted capitals, surmounted by pedimented consoles. Square-headed opening having steel roller shutter over. Square-headed door opening to north-west of shopfront, with steel door and overlight.
	50080749	Rose Buds	Attached three-bay two-storey gable-fronted house and shop, built c.1900, having attic accommodation, oriel window and recent shopfront to front (south-west) elevation and shared return to rear (north-east) elevation. Pitched slate roof with red brick chimneystacks and cast-iron rainwater goods, hidden behind raised gable to front having moulded brick cornice with dentils, surmounted by carved terracotta ball finial.
	50080745	A.C. Boles	Corner-sited attached three-bay two-storey house, built c.1860, having two-bay south elevation, with vitrolite shopfront inserted c.1940 to front (west) and south elevations, and single-storey return to rear. Now also in use as pharmacy.
	50080768	Player Wills Factory, 148-160 South Circular Road	Detached nine-bay three-storey factory having projecting end-bays and central breakfront to front (south-west) elevation, built 1935, arranged around central courtyard, now with glazed roof over basement. Three-storey extension to rear (north-east) elevation, extensive multiple-pile single-storey warehouse adjoining rear. Flat roof to factory, sawtooth roof to warehouse to rear. Red brick parapet to front, having render coping, stepped render parapets to end-bays and breakfront, and carved insignia panels to parapets over breakfronts.
	50080794	Saint Catherine's National School	Detached gable-fronted multiple-bay national school, dated 1901, having two-bay gabled entrance hall with gabled single-bay entrance porch to south elevation to front (east) elevation, ten-bay north elevation with three-bay single-storey block having hipped roof to north elevation, and later single-storey extensions to west elevation and west end of south elevation.
	50080781	Church of Saint Theresa of	Freestanding gable-fronted double-height Roman Catholic church, built 1924, extended c.1950, comprising ten-bay nave, single-storey lean-to side aisles to east and west elevations, having side altar

RPS Ref	NIAH Ref	Name	Description
		the Child Jesus	projections with catslide roofs. Single-bay flat-roofed porch to front (south) elevation, flat-roofed porches to east elevation, single-storey sacristy adjoining west elevation.
	50080803	Carrig	End-of-terrace L-plan three-bay two-storey house, built c.1905, having full-height bay window with shaped gablet to front (north) elevation. Pitched artificial slate roof having terracotta ridge tiles and red brick chimneystacks with red brick cornice. Flat roof with render cornice to bay window, having moulded render cornice to shaped gablet. Red brick walls laid in Flemish bond to front and rear elevations.
	50080770-	248 South Circular Road, Donore Avenue	End-of-terrace two-bay two-storey rectory, built c.1905, having gabled end-bays to front (south) and rear (north) elevations, return to rear, pedimented breakfronts to east elevation, and double-height canted bay window to front. Pitched slate roofs with red brick chimneystacks having clay chimney pots, decorative timber bargeboards and finials to gables, cast-iron rainwater goods and moulded brick eaves course.
	50080812	Mason Technology 228 Circular Road	Detached three-bay two-storey former synagogue, built c.1925, having pedimented breakfront to front (south) elevation, and full-width single-storey extension to rear. Now in use as offices.

Appendix 11C Plates

Plate 11.1 Donore Avenue, part of Zone of Archaeological Interest for Dublin City (DU018-020).

Plate 11.2 Cork Street

Plate 11.3 South Circular Road with the Player Wills Factory (NIAH 50080768).

Plate 11.4 Entrance from Donore Avenue.

Plate 11.5 Remaining St. Teresa's Gardens blocks of flats.

Plate 11.6 Northeast extent of the Proposed Development.

Plate 11.7 Northwest extent of the Proposed Development.

Plate 11.8 Former basketball court and hardstanding.

Plate 11.9 The southwest extent of the Proposed Development.

Plate 11.10 Looking towards the southwest extent of the Proposed Development.

Plate 11.11 Spoil heap and building supplies in southwest extent.

Plate 11.12 Temporary car park and builder's compound.

Plate 11.13 The Player Wills Factory (NIAH 50080768).

Plate 11.14 Looking west at the Coombe Hospital including new Laboratory Building.

Plate 11.15 The former printing works.

Plate 11.16 Church of Saint Theresa of the Child Jesus (NIAH 50080781).

Plate 11.17 Saint Catherine's National School (NIAH 50080794).

Plate 11.18 Church of Our Lady of Dolours (NIAH 50080748).

Appendix 11D Figures

Revision: 0 Drawn: MAB Checked: BS Approved: DK Date: 2022-08-05

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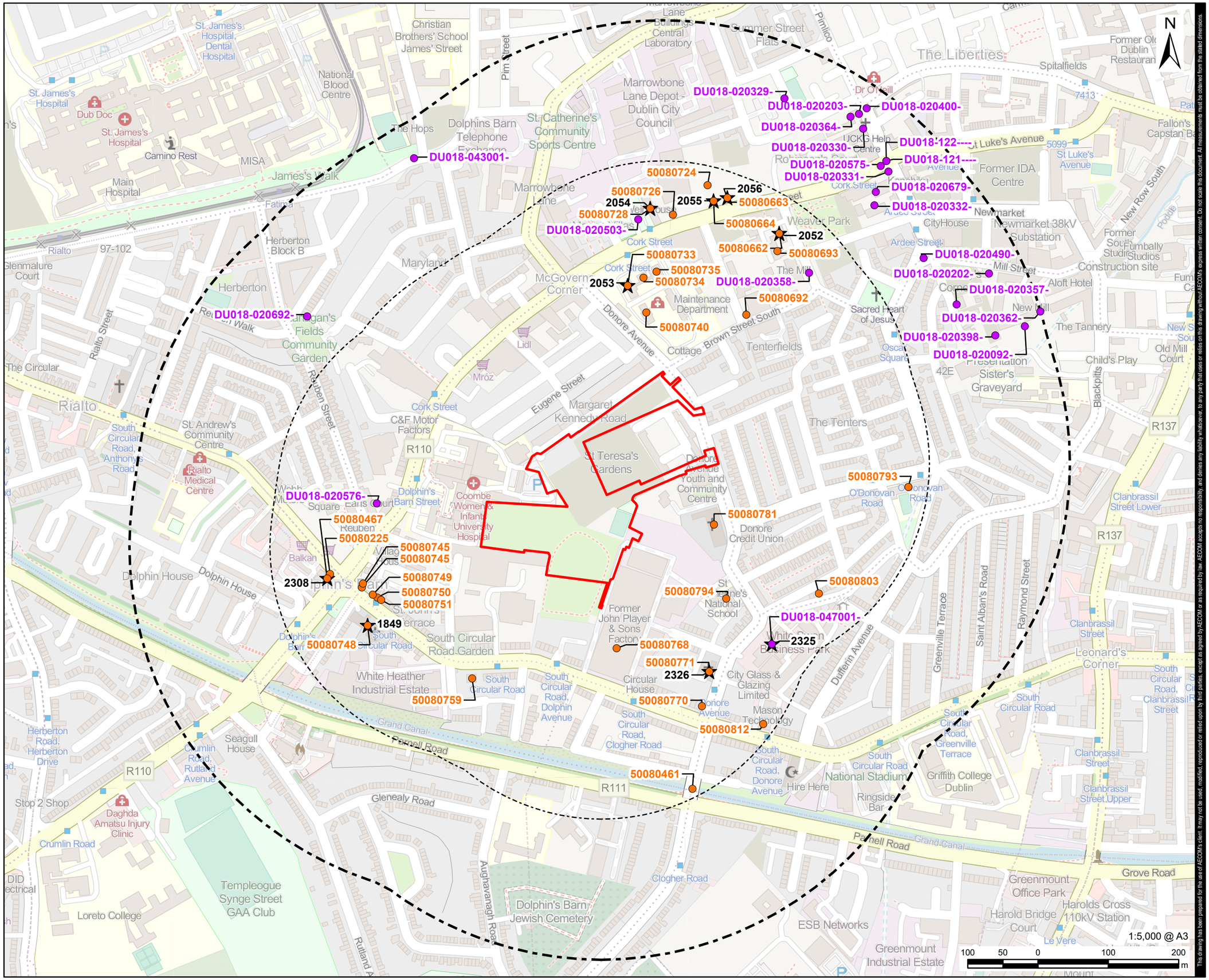

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LEGEND

- Site Boundary
- 300m Study Area
- 500m Study Area
- Protected Structures
- Historic Sites and Monuments
- Architectural Heritage Assets

NOTES

ISSUE PURPOSE

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PROJECT NUMBER

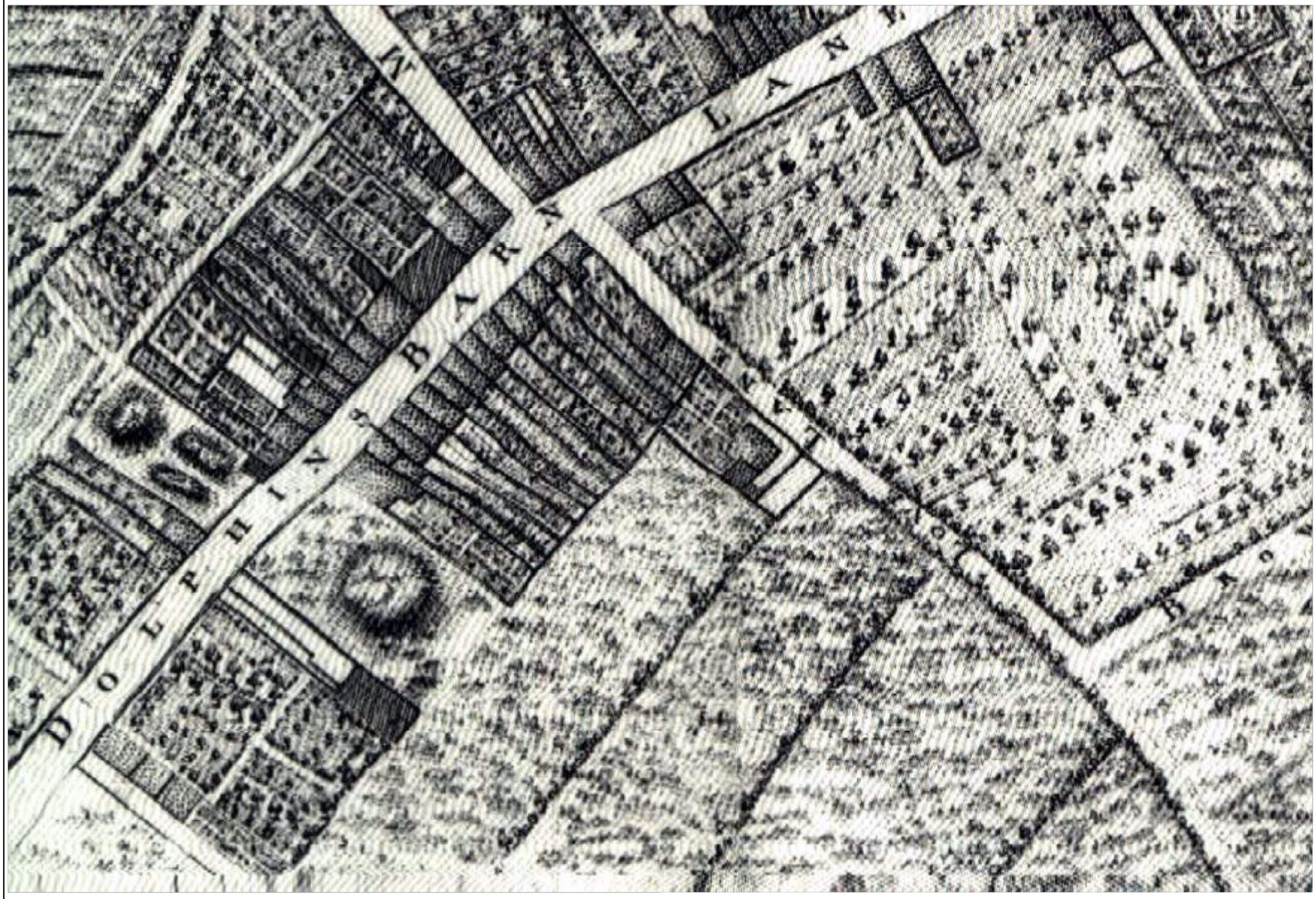
60648061

FIGURE TITLE

Heritage assets within the study areas

FIGURE NUMBER

Figure 11.1



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Charles Brooking, 1728 (After Lennon, 2008)

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FOR INFORMATION

PROJECT NUMBER

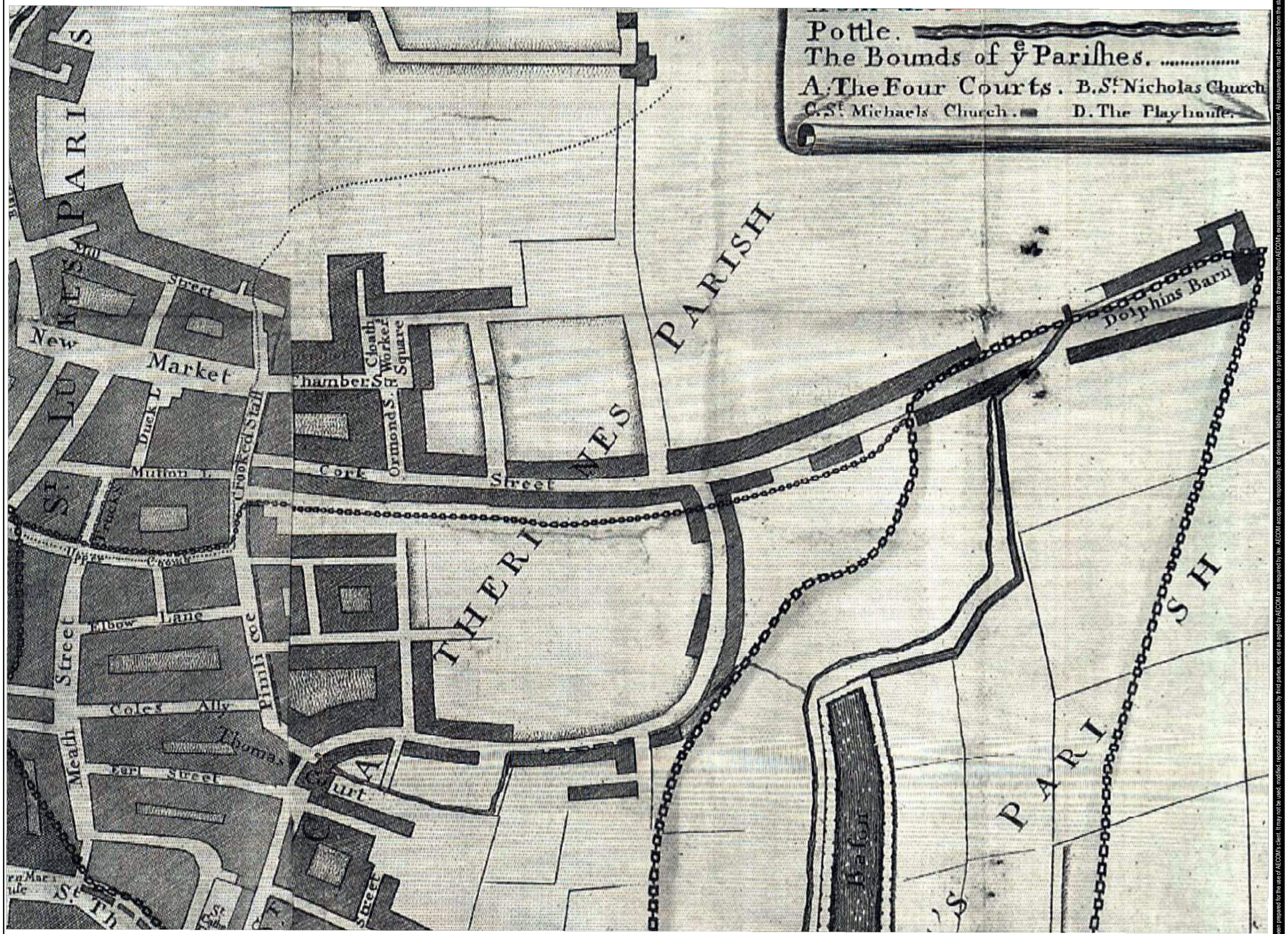
60648061

FIGURE TITLE

Map of the city and suburbs of Dublin by Charles Brooking, 1728 (After Lennon, 2008).

FIGURE NUMBER

Figure 11.2



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John Rocque, 1756 (After Lennon, 2008)

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FOR INFORMATION

PROJECT NUMBER

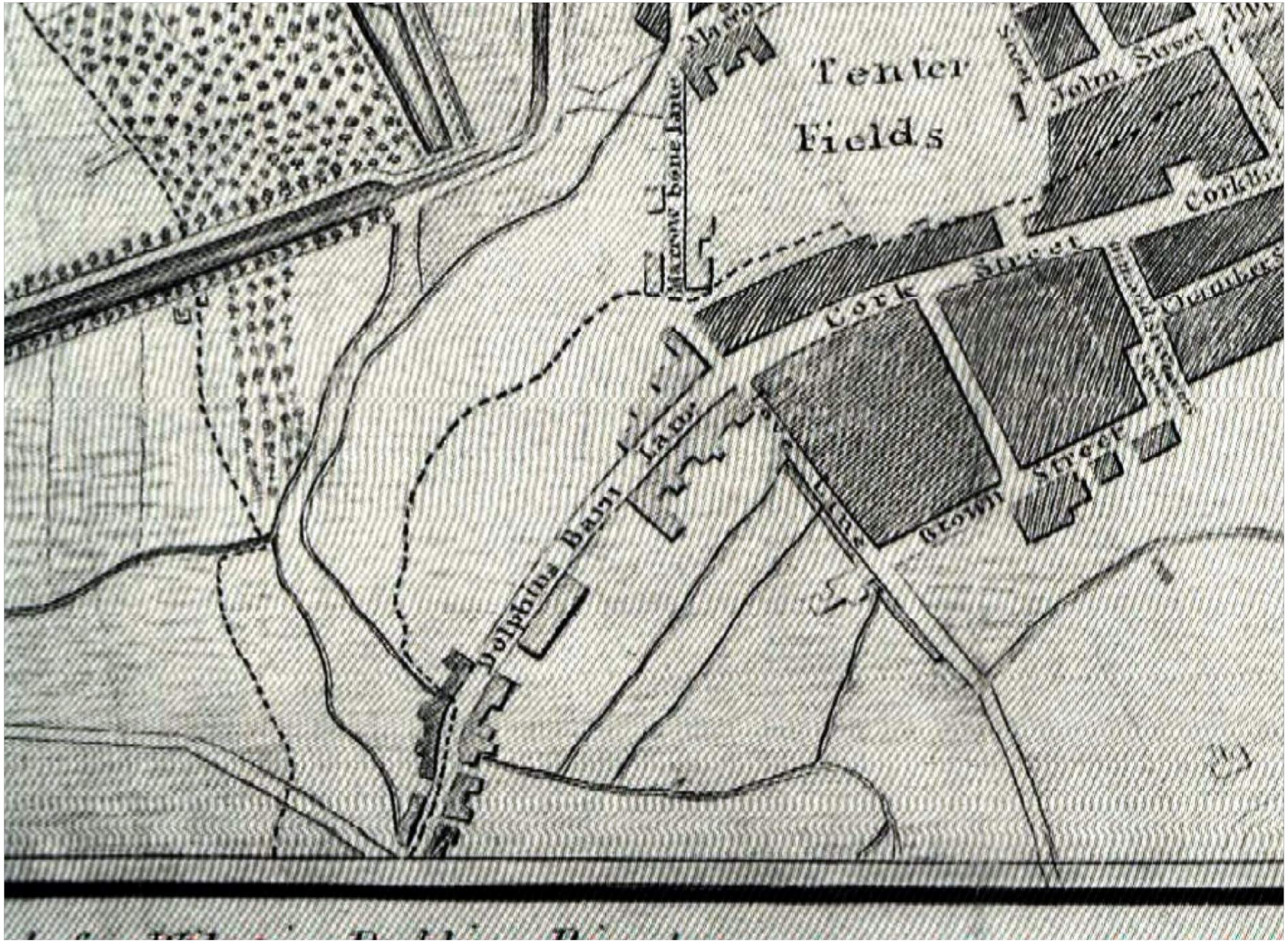
60648061

FIGURE TITLE

An Exact Survey of the City and Suburbs of Dublin by John Rocque, 1756 (After Lennon, 2008).

FIGURE NUMBER

Figure 11.3



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William Wilson, 1801 (After Goodbody, 2014)

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PROJECT NUMBER

60648061

FIGURE TITLE

New Plan of the city of Dublin by William Wilson, 1801 (After Goodbody, 2014).

FIGURE NUMBER

Figure 11.4

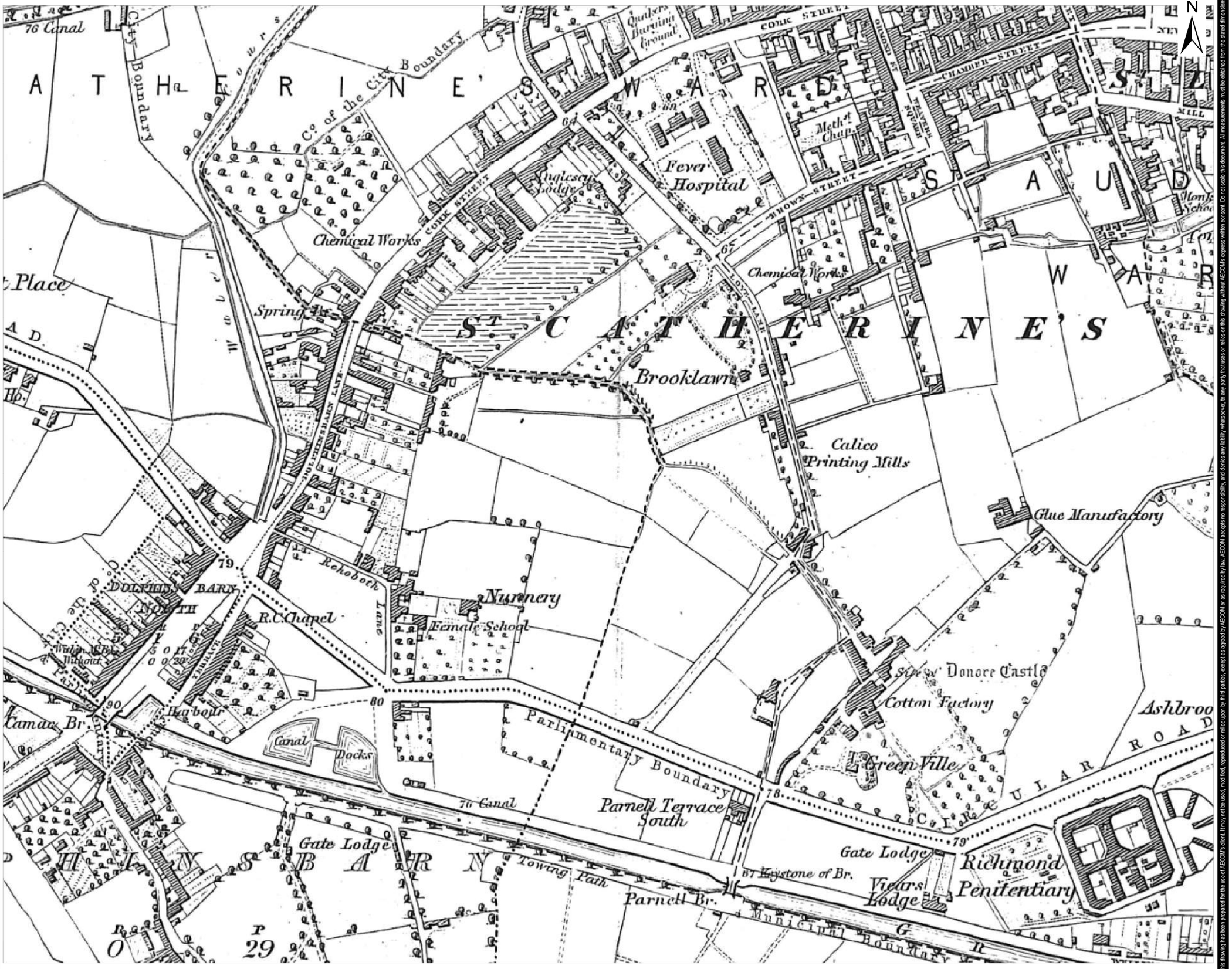

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FIGURE TITLE

1st edition Ordnance Survey map 1837 (Copyright TCD, 2022)

FIGURE NUMBER

Figure 11.5

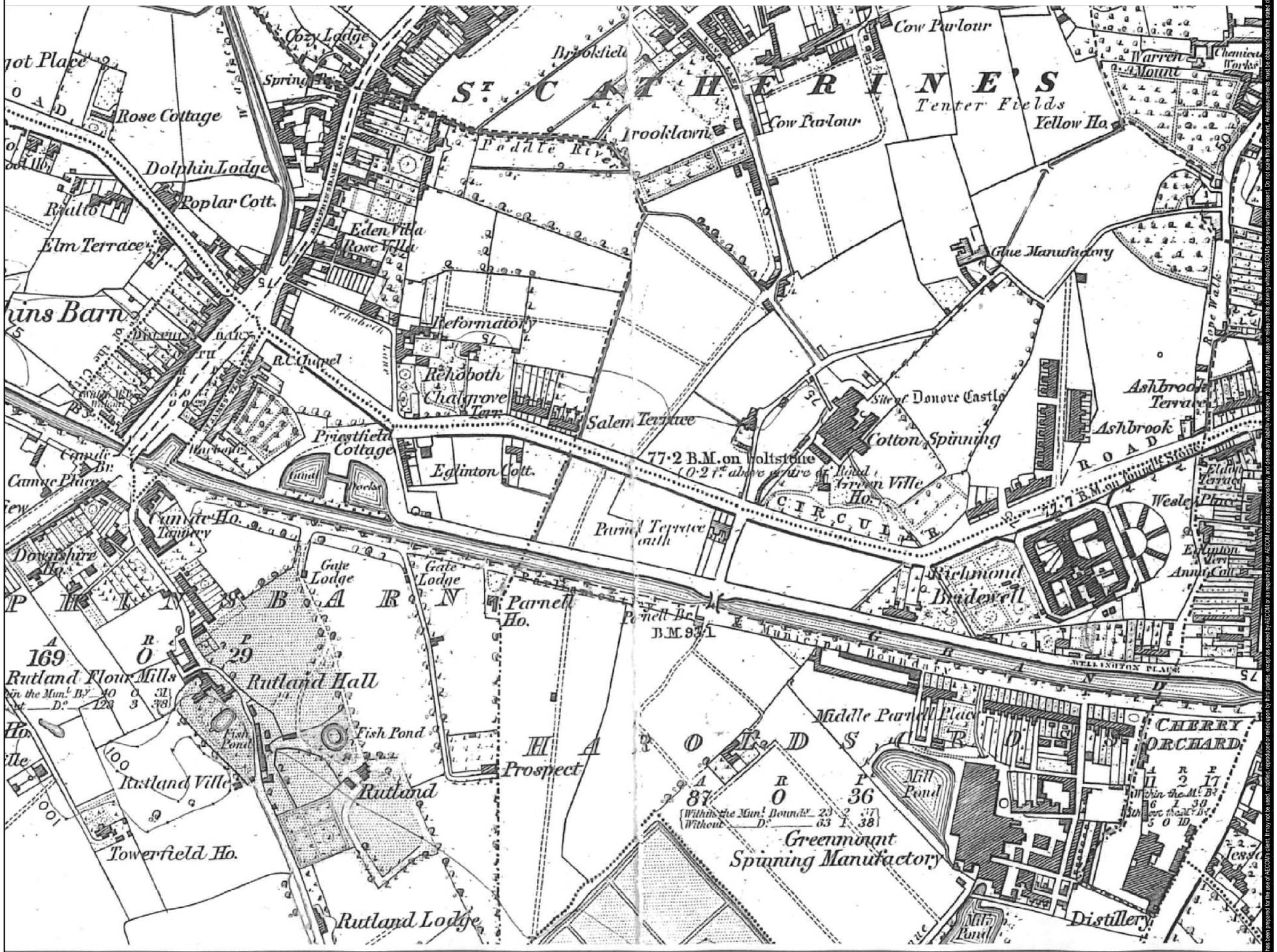

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FIGURE TITLE

2nd edition Ordnance Survey map 1876 (Copyright TCD, 2022)

FIGURE NUMBER

Figure 11.6

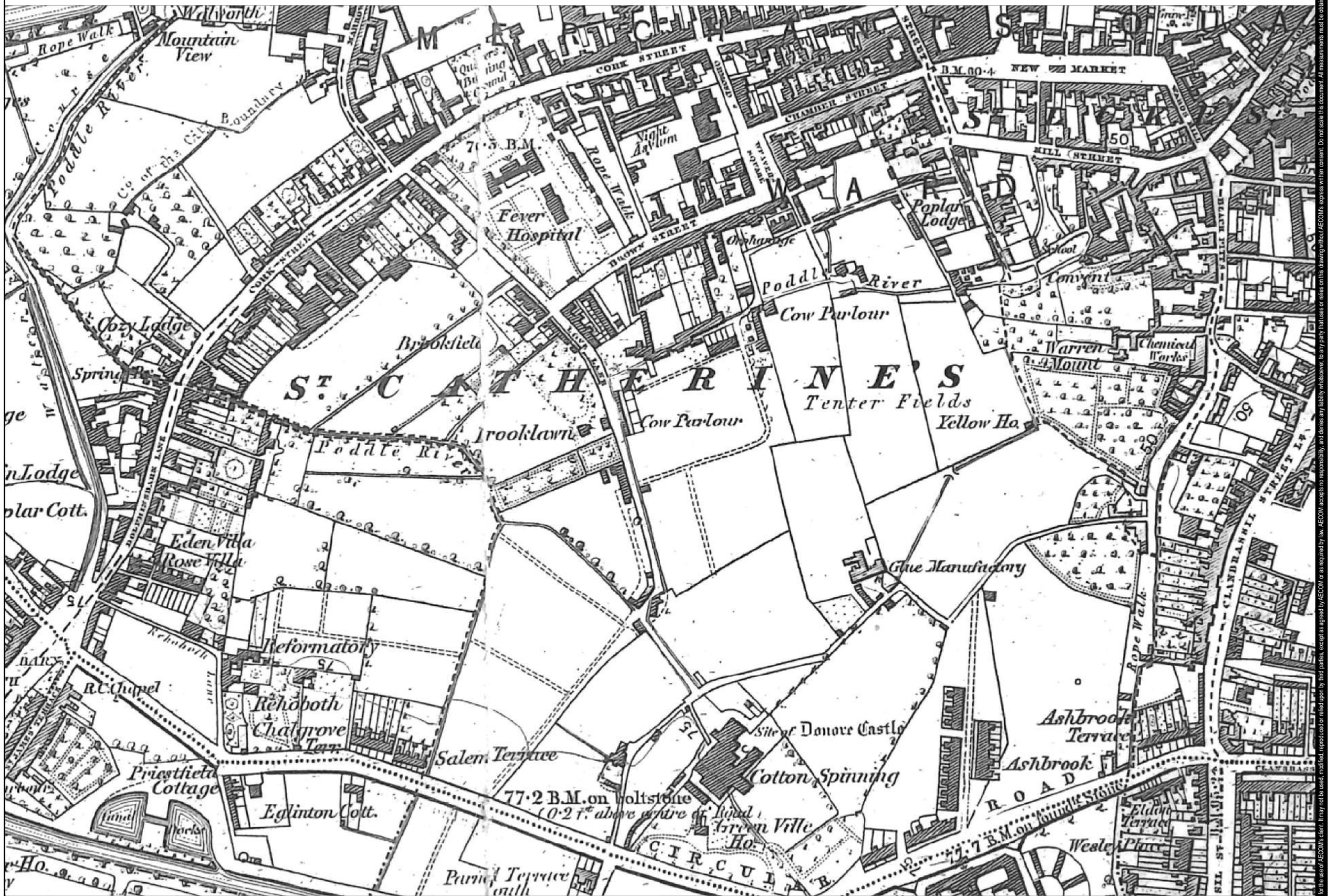

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FIGURE TITLE

Ordnance Survey map of Dublin 1912 (Copyright TCD, 2022)

FIGURE NUMBER

Figure 11.7

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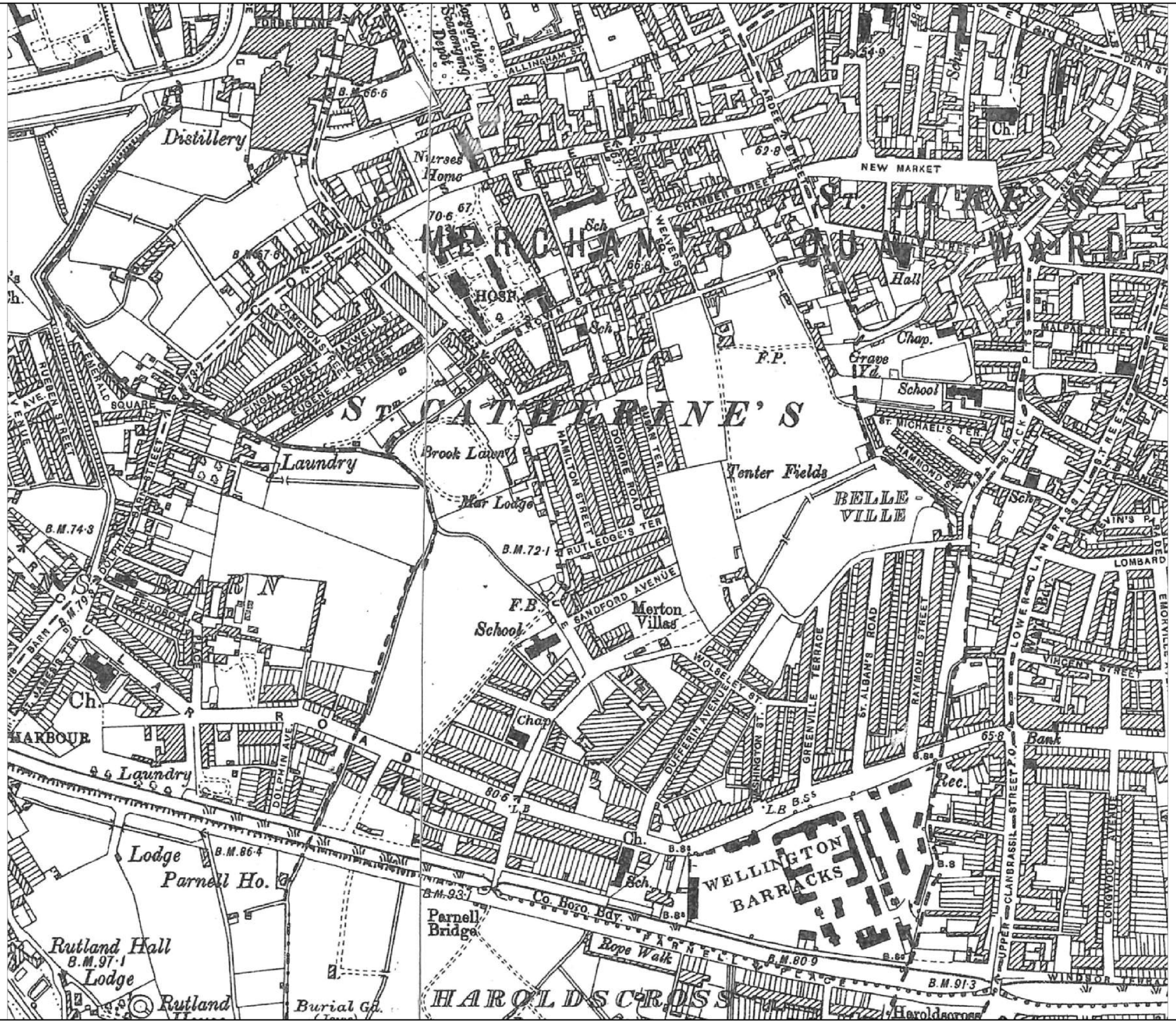

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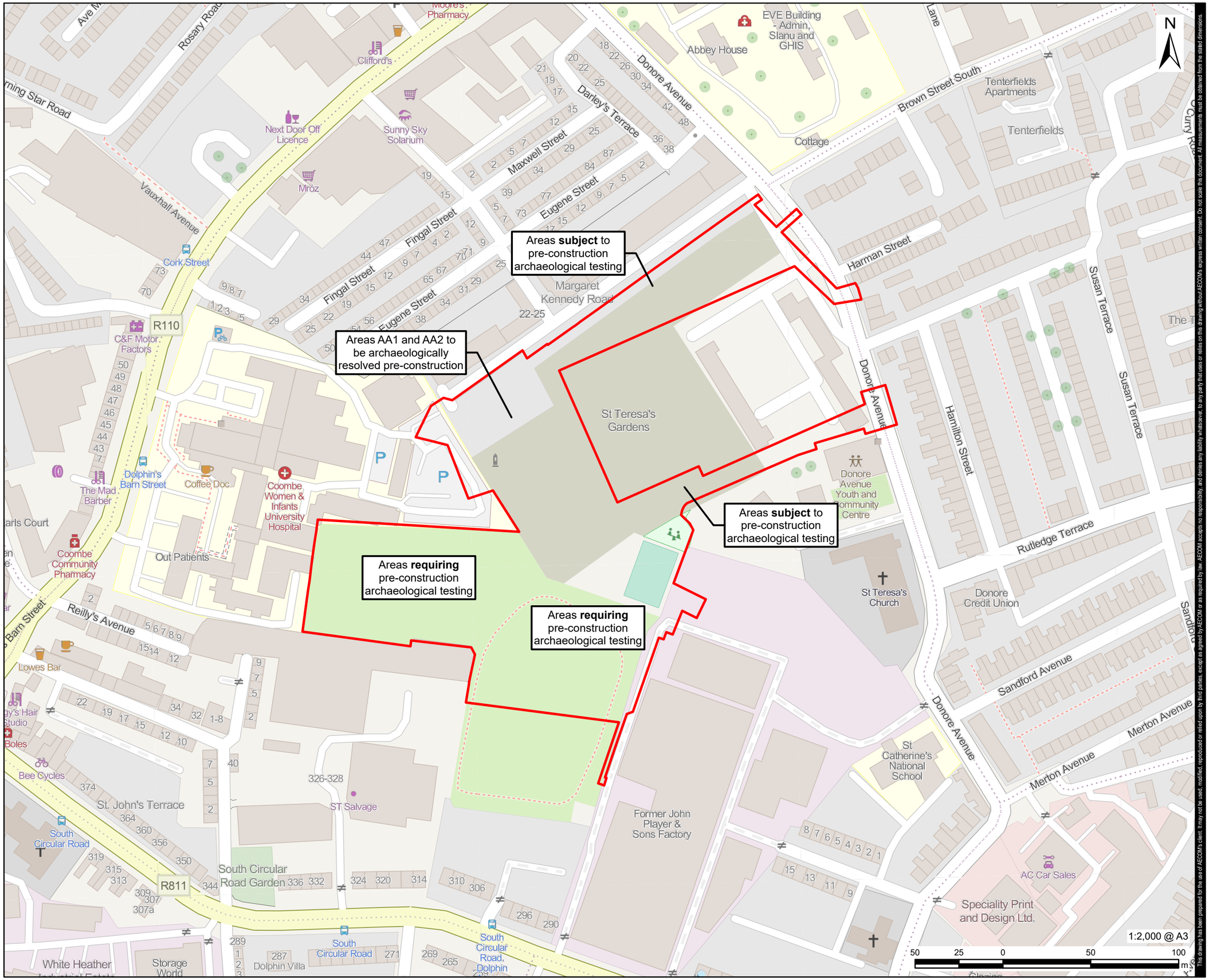
FIGURE TITLE

Ordnance Survey map of Dublin 1943-4 (Copyright TCD, 2022)

FIGURE NUMBER

Figure 11.8



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LEGEND

Site Boundary

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PROJECT NUMBER

60648061

FIGURE TITLE

Proposed archaeological mitigation

FIGURE NUMBER

Figure 11.9

Appendix 11E IAC Archaeology (2021) Archaeological Assessment at St. Teresa's Gardens, Donore Avenue, Dublin 8.

IAC Archaeology

ARCHAEOLOGICAL ASSESSMENT
AT
ST TERESA'S GARDENS, DONORE AVENUE, DUBLIN 8

LICENCE: 21E0455

ON BEHALF OF: AECOM LIMITED

I.T.M.: 714124,732899

LICENCEE: DAVID MCILREAVY
AUTHOR: DAVID MCILREAVY

REPORT STATUS: FINAL
SEPTEMBER 2021

IAC PROJECT REF.: J3822

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DOCUMENT CONTROL SHEET

DATE	DOCUMENT TITLE	REV.	PREPARED BY	REVIEWED BY	APPROVED BY
08.09.21	Archaeological Test Excavation at St Teresa's Gardens, Donore Avenue, Dublin 8	0	D. McIlreavy	D. Lee	

ABSTRACT

IAC Archaeology has prepared this report on behalf of AECOM Ltd, to study the impact, if any, on the archaeological and historical resource of a proposed development site, located at St Teresa's Gardens, Donore Avenue, Dublin 8 (ITM 714124, 732899). Archaeological testing was recommended following a previous desktop archaeological assessment (AECOM 2021). The report was undertaken by David McIlreavy of IAC Archaeology under licence 21E0455.

Archaeological testing was carried out over the course of three days from 10th August 2021 using a mechanical excavator fitted with a flat grading bucket. The trenches targeted open space to fully investigate the archaeological potential of the site. Two significant constraints prevented the full excavation of all test trenches across the proposed development area. The first of these constraints, resulting from areas of the proposed development site being under an active construction compound and modern concrete and tarmacadam surfaces, meant that approximately half the test trenches could not be excavated. The second constraint resulted from the significant depth of test trenches, which meant it was only possible to fully investigate features of potential archaeological significance in the northern extent of the test area (Test Trenches 1-4).

Despite the above constraints two areas of archaeological significance, which have been designated as Archaeological Areas (AA) 1 and 2, were recorded. AA1 comprised the remains of several linear features of possible archaeological significance. Unfortunately, no artefactual evidence was recovered to confirm a date of construction. AA2 comprised another linear feature, unfortunately which could not be excavated due to the depth of the test trench. This feature may correspond to a laundry diversion channel depicted on the 1st Edition OS mapping of the area.

A significant amount of groundworks will be required for the proposed development of the testing area, both in terms of the investigation and rerouting of modern services, and those directly associated with new residential buildings. Due to the projected scale of groundworks it is considered that preservation *in situ* is not a viable option, and thus all features recorded within AA1 and 2 should be fully exposed and *preserved by record* prior to any groundworks

In addition, a suitably qualified archaeologist should be appointed to archaeologically monitor groundworks across the remainder of the proposed development site.

CONTENTS

LIST OF FIGURES

LIST OF PLATES

1 INTRODUCTION

1.1 GENERAL

The following report details the results of a programme of archaeological testing undertaken at St Teresa's Gardens, Donore Avenue, Dublin 8 (Figure 1), to ascertain the potential impact of the proposed development on any archaeological resource that may exist within a proposed urban regeneration site. The assessment was undertaken by David McIlreavy of IAC Archaeology (IAC), on behalf of AECOM Ltd and under licence 21E0455, as issued by the National Monuments Service of the Department of Housing, Local Government and Heritage (DOHLGH) and the National Museum of Ireland (NMI).

It was initially proposed to excavate 28 no. test trenches across the proposed development area (Figure 2). However, two significant constraints prevented the full excavation of all test trenches across the proposed development area. The first of these constraints, resulting from areas of the proposed development site being under an active construction compound and modern concrete and tarmacadam surfaces, meant that approximately half the test trenches could not be excavated. The second constraint resulted from the significant depth of test trenches, which meant it was only possible to fully investigate features of potential archaeological significance in the northern extent of the test area (Test Trenches 1-4).

Test trenching commenced at the site on 10th August 2021 and continued for 3 days. All mechanical excavation was carried out using a 13 tonne 360 degree tracked excavator, with a flat, toothless bucket, under strict archaeological supervision. A total of 14 trenches were mechanically investigated across the test area which measured 178 linear metres in total.

This report follows on from a previous archaeological desk top assessment (AECOM 2021). This report noted that the construction and subsequent demolition of the majority of the St Teresa's complex is likely to have had a detrimental impact on any previously unrecorded archaeological resource. However, it also noted that that the results of archaeological monitoring associated with recent ground investigation works (Giacometti 2014) suggest that the line of the former Abbey Stream and later laundry diversion channel may have remained somewhat extant within the proposed development area.

However, reassessment of the 2014 monitoring results *(ibid*) by the present author suggest that whilst the laundry diversion channel definitely crossed the proposed development area, the Abbey Stream would seem to be located its very north western extent (Figure 3).

1.2 THE DEVELOPMENT

The Proposed Development is marked for residential development to the north and mixed use to the south under the Dublin City Development Plan 2016-2022. It is

proposed to create residential development occupying the entire footprint of the Proposed Development.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 SUMMARY OF DESKTOP ASSESSMENT

The site is owned by Dublin City Council and comprises an area of ground 170m to the southwest of Donore Avenue, 120m to the east of Dolphin's Barn Street and 160m to the north of South Circular Road (ITM 714124, 732899; Figure 1). The north extent was previously occupied by the 1950s residential development of St. Teresa's Gardens (now partially demolished; Plate 1) while the southern extent comprised a former sports and recreational area (Plates 34 and 35).

The sports and recreational area were disused and heavily overgrown by 2013 with plant species characteristic of disturbed ground suggesting the former may have been dug up (Archaeology Plan, 2013). The Proposed Development site is bounded to the west by the Coombe Women and Infants University Hospital, to the southwest by the former Bailey Gibson Site, a printing works and by the former Player Will tobacco factory to the southeast.

The ground level across the Site is generally flat, lying at 23m above Ordnance Datum.

2.1.1. Archaeological Monuments

There are no National Monuments within the Proposed Development site or the surrounding study area. A review of the Record of Monument and Places (RMP) dataset identified eight sites within, or just outside, 500m of the Proposed Development site (Figure 4). One of these, a watercourse (DU018-04304) that was part of the course of the 12th/13th Century Abbey Stream, crosses close to the north eastern extent of the proposed development site (Figure 3). The Archaeological Impact Assessment for Regeneration, St Teresa's Gardens, Donore Avenue, Dublin 8 (Archaeology Plan 2013) identified through cartographic evidence that the course of the stream crosses through the former St. Teresa's Gardens and this was corroborated during the archaeological monitoring of engineering test pits within the site in June 2014 (Giacometti, 2014).

2.1.2 Protected structures

There are 12 Protected Structures as recorded on the Dublin City Development Plan 2016- 2022 within the study area. None of these are located within the boundaries of the Proposed Development site (Figure 1). All are considered of regional importance.

The closest is the Church of Our Lady of Dolours (RPS 1849) which is a Roman Catholic Church dating to 1890 and located 194m to the southwest. It occupies a prominent position at Archaeological Programme of Works Prepared for: Land Development Agency AECOM 9 the junction of South Circular Road and Dolphin's Barn. It is also recorded on the National Inventory of Architectural Heritage (NIAH) as 50080748.

Saint Catherine and St. James Church of Ireland Church (RPS 2326) is located 195m to the southeast. This church was built in 1896 and was extended in 1906. It forms an elegant and well-formed landmark in the locality with its tower providing a focal point in the skyline. It is also recorded as NIAH 50080771. Rom Massey and Sons Undertakers (RPS 2308) is located 218m to the southwest on Dolphin's Barn Street. This is a former bank (Royal Bank of Ireland) which was built in 1925. It is considered to make an important contribution to the streetscape and is also recorded as NIAH 50080467. The location of Donore castle (RPS 2325) is located 72m to the southeast of the church. There are no visible upstanding remains associated with this Protected Structure.

Bru Chaoimhin (RPS 2053) is located 233m to the northwest of the Proposed Development site. This Protected Structure is the former fever hospital on Cork Street. It was founded by the Quakers in 1804 and existed at this location until it transferred to Cherry Orchard in 1960 (Archaeology Plan, 2013). The former fever hospital is also recorded as NIAH 50080733 – 50080735.

The James Weir Home for Nurses (RPS 2054) is located 310m to the northeast at 104 Cork Street. Dating to the early 20th century, this building was constructed to provide accommodation for nurses working in the fever hospital to the southwest across Cork Street. The home is also recorded as NIAH 50080728.

Parnell Bridge (RPS 874) is located 335m to the southeast of the Proposed Development site. It is a single-arch limestone bridge which was built in 1791 to carry Parnell Street over the Grand Canal. It is recorded as NIAH 50080461.

The International Language and Business School (RPS 2055) is located 384m to the northeast at 112 Cork Street. It is a terraced, double-pile, four-bay, three-storey over basement former house dating to 1770. It is recorded as NIAH 50080664. Immediately adjacent to the east is 116 Cork Street (RPS 2056). This end of terrace, double pile, two-bay, three storeys former house dates to 1770 with an older portion dating to the 17th century. It is recorded as NIAH 50080663.

The former convent building and chapel (RPS 2052) located on the corner of Cork Street and Ormond Street is located 405m to the northeast. The former convent is an attached five bay, three-storeys building while the former church is L-plan, gable fronted Gothic Revival. They were built in 1875. The convent is NIAH 50080693 while the church is NIAH 50080662.

The remaining Protected Structures are located to the southeast within the study area.

The Dublin Mosque (RPS 1848) is located on South Circular Road 367m to the northeast of the Proposed Development site. This building was originally a Presbyterian Church built in 1880 and has been a mosque since the 1980s. Directly adjacent to the east is the former manse (RPS 1847) which is a freestanding three-bay, two-storey over basement building constructed in 1880. It is now the Islamic

Information Centre. The former church and manse are also recorded as NIAH 50080970 and 50080971 respectively.

The last Protected Structure partially within the study area is the Griffith College Multidenominational school (RPS 1846) which is located 499m from the Proposed Development site. It is comprised of the former Griffith Barracks consisting of the north block, the west block, former jail blocks, brick guardhouse, boundary walls, entrance gates and railings. The detached former bridewell is the only structure partly within the study area. It was built between 1813 and 1818 and is notable for housing political prisoners including Daniel O'Connell. It was later extensively remodelled as a barracks during the late 19th century. It is now a school. The former bridewell is recorded as NIAH 50080974.

2.1.3 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) records 40 buildings within the study area around the Proposed Development site (Figure 2). None of these are located within the boundaries of the Proposed Development site. Ten are also recorded as Protected Structures as have been discussed under this designation. The closest NIAH asset is the Player Wills Factory (NIAH 50080768) which is located immediately adjacent to the southeast. It consists of a detached nine-bay, three-storeys factory having projecting endbays and central breakfront to the front (southwest) elevation arranged around a central courtyard with a glazed roof over the basement. It was built as a tobacco factory in 1935 and continued in use until 2005. It is a rare surviving example of the Art Deco style in Dublin.

2.2 SUMMARY OF PREVIOUS ARCHAEOLOGICAL FIELDWORK

Examination of the Excavations Bulletin 1970-2020 has revealed 37 previous archaeological investigations within the study area of the Proposed Development site. Three of these previous investigations were in the immediate vicinity of the Proposed Development site including within the former St Teresa's Gardens site to the immediate northeast of the Proposed Development site in 2014 (Giacometti, 2014). This has already been discussed in regard to the watercourse (DU018-04304).

A second archaeological investigation was carried out within the Player Wills tobacco factory (NIAH 50080768) which is located to the immediate southeast of the Proposed Development site. The investigation took the form of three trenches excavated within the former factory (Walsh, 2006). No archaeological deposits or evidence for the city watercourse were identified.

In June 2019, archaeological monitoring of the excavation of slit trenches was carried out as part of the geotechnical investigation works to inform preparation of the EIAR relating to the former Bailey Gibson factory located to the immediate southwest of the Proposed Development site (McCutcheon Halley, 2020). The slit trenches were excavated within the former factory premises revealing demotion material to a depth of 0.7m overlying fill material to a depth of 1m. Nothing of archaeological significance was noted during the monitoring.

An archaeological investigation was carried out in 2011 within the Coombe Women and Infants University Hospital which is located to the immediate west of the Proposed Development site (Bailey, 2011). Nothing of archaeological significance was uncovered.

Comprehensive evidence for an 18th century tannery was uncovered in 2001 during the realignment of Cork Street (Hayden, 2001) on Cork Street to the west of the Proposed Development site. The tannery was enclosed by a stone wall which contained brick and stone tanks used for dehairing the animal hides while the tanning was conducted within 29 timber-lined tanks. A brick lined drainage system was also uncovered. The remains of late 18th century housing which replaced the tannery was also uncovered. A later investigation in 2014 adjacent to the tannery revealed evidence for the 13th century watercourse (DU018-043001) (Dennehy, 2014). The watercourse (DU018-043001) was formalised by the construction of retaining walls which had been truncated by a concrete sewer pipe. The remains of two 18th century houses were also uncovered.

Archaeological testing at the site of Donore Castle (DU018-047001) in 2003 did not uncover any evidence for the castle. However, the solid brick culvert arch of the Poddle river was uncovered as were the foundations for Post Medieval buildings. Test excavation in 2005 of a large site at Mill Street and Blackpitts to the east of the Proposed Development site uncovered post-medieval activity on the site, associated with the Warrenmount Mills to the south-west, and 19th century and earlier tanneries (Walsh, 2005).

Evidence for two mid-17th century tannery developments were excavated at Blackpitts in advance of a hotel and student accommodation development in 2016 (McIlreavy 2021). These excavations, carried out under licence 15E0555, also uncovered the remains of a possible dismantled timber cage work house re used within the base of later 'Dutch Billy' style buildings.

The remains of 19th century latrine and occupation debris were uncovered in 2004 during archaeological testing at 40-45 Cork Street to the north of the Proposed Development site (McConway, 2004). In 2000, archaeological monitoring of groundworks was undertaken at 109 Cork Street to the northeast of the Proposed Development site (Carroll, 2000). Six wood-lined pits were uncovered which were dated to the 19th century. No further archaeological features were uncovered. A mid-19th century tannery was uncovered during testing at 115-117 Cork Street to the northeast of the Proposed Development site. This testing in 2004 revealed that the tannery was dug into riverine silt associated with a tributary of the River Poddle which is located to the north (Walsh, 2004). A piece of moulded Dundry stone was recovered from the tannery.

Archaeological testing was also conducted in advance of the development of a new park at Chamber Street, Ormond Street and Cork Street in 2016 (Stirland, 2016). The site was previously occupied by a 20th century housing development which had severely disturbed the ground. Despite this, some evidence for the Georgian period

settlement was uncovered and this was recorded by the attending archaeologist in accordance with a methodology agreed with the Dublin City archaeologist. The formation level of this development had a restricted depth and the attendant archaeologist noted that features and depths associated with the early Georgian development Dublin could exist those depths greater than the formation of the proposed park.

2.3 CARTOGRAPHIC ANALYSIS

The Archaeology Plan assessment (2013) contains comprehensive cartographic source examination which is specific to the Proposed Development site. A synopsis of the cartographic assessment is reproduced below.

Down Survey, Barony of Newcastle and Uppercross, Co. Dublin, C.1656

This is the earliest known map that shows the area of Dolphin's Barn and Donore which would have been outside the walled city of Dublin at this time. The River Poddle is clearly marked dividing at 'The Tongue' (present day Mount Argus) with the left branch forming the western boundary of Dolphin's Barn to the south of the road to Crumlin. The eastern branch formed the Abbey Stream runs northeast towards Roper's Rest where it divides around the building before turning northwest crossing the future location of St. Teresa's Gardens and the northeast extent of the Proposed Development site. There are no features marked within the Proposed Development site at this time.

The line of Cork Street / Dolphin's Barn Street is marked as a dotted line to the north of the Proposed Development site. The road is labelled 'the highway to Tallaght' on the map. A Map of the city and suburbs of Dublin by Charles Brooking, 1728.This map shows the area of the Proposed Development site towards the middle of the 18th century. The city has expanded outwards with buildings along both sides of Cork Street and Dolphin's Barn. The future Donore Avenue is marked as a lane running south from Cork Street providing access to Roper's Rest. The Abbey Water is not marked and the Proposed Development site is shown as open ground.

An Exact Survey of the City and Suburbs of Dublin by John Rocque, 1756

Rocque's map of Dublin only includes the northeast extent of St. Teresa's Gardens with only the extreme north of the Proposed Development site shown. This is marked as part of open ground which has been subdivided into rectangular fields. No features are marked within the fields and the Abbey Stream is not shown crossing to the northwest although it is shown to the north of Dolphin's Barn. Cork Street and Dolphin's Barn have development shown on both sides but the future Donore Street remains largely undeveloped and appears to be still a country lane at this time.

A plan of the City of Dublin by William Faden, 1797

Faden's map shows the location of the Proposed Development site at the end of the 18th century. The area has witnessed considerable development with the Grand Canal constructed and the lands between Ormond Street and Donore Avenue now fully built upon. The Proposed Development site is marked as open ground crossed on its

northeast corner by the Abbey Stream which appears as an open stream. It is joined by a stream from the south as it enters the limits of St. Teresa's Gardens. A succession of three channels are shown running northeast from the Abbey Stream to supply a larger channel which runs south along the west side of Donore Street. A possible mill building is marked straddling this channel on the west side of Donore Street and immediately opposite Brown Street. It is located within the boundaries of St. Teresa's Gardens but outside the Proposed Development site.

Map of the county of Dublin by William Duncan, 1821

Duncan's map shows the area of the Proposed Development site during the first half of the 19th century. This map is drawn at a small scale with the result that few details are apparent. The Proposed Development site is shown as open ground crossed by the Abbey Stream and part of a larger area of open ground on the outskirts of the city. There has been some development with the Richmond Penitentiary (later Griffiths Barracks) constructed to the southeast and the Fever hospital off Cork Street to the north.

1st edition Ordnance Survey map 1837.

This map sheet (Figure 5) shows the area of the Proposed Development site in good detail towards the middle of the 19th century. The Proposed Development site remains under fields with the channel of the Abbey Stream still crossing its northeast corner following the course depicted on the previous maps. A channel is now shown running westwards from the Abbey Stream across the north extent of the Proposed Development site while the most northerly of the two channels previously shown running to the northeast are still extant. These two channels are not within the Proposed Development site (Figure 5).

There has been some development within the immediate vicinity with a long building range and associated gardens now occupying the area to the northeast of the Proposed Development site. A large structure with a curving surrounding wall is shown to the southeast of this. A nunnery and female school are now marked to the southwest of the Proposed Development site.

2nd edition Ordnance Survey map 1864

The 2nd edition Ordnance Survey map shows the area of the Proposed Development site towards the end of the 19th century. It is still largely under greenfield with the Abbey Stream crossing from southeast to northwest. This is labelled as the Poddle River on this map sheet while the two channels running north eastwards and the single channel running west across the Proposed Development site are still shown. The structures to the northeast of the Proposed Development site are still shown.

3rd edition Ordnance Survey map of Dublin 1911

This map sheet (Figure 6) shows the area of the Proposed Development site during the first half of the 20th century (Figure 6). It is still shown as open ground subdivided into fields although urban development is now starting to encroach especially to the north, west and south. The Abbey Stream is clearly marked crossing its north extent with channels running off from it. The channel running to the west across the

Proposed Development site is now shown to feed a laundry located at the southwest end of Eugene Street. A firework manufactory is now marked adjacent to the north of the Abbey Stream with its associated magazine located a distance immediately abutting the stream. This may have been deliberate placing to ensure a ready water supply in the event of fire although the results of the archaeological monitoring in 2014 suggest that the watercourses may have largely silted up by that stage (Giacometti, 2014).

A large oval exercise track is shown to the east of the Proposed Development site. This was associated with Brook Lawn house and would have been used to exercise horses. The Rehoboth tent and marquee factory is now marked to the immediate southwest of the Proposed Development site. This consisted of three buildings and a rope walk set within a large yard. An unnamed stream is clearly marked running northeast into the Abbey Stream. This is the Hangman's Water which formed the east boundary of the Proposed Development site at that time.

Ordnance Survey map of Dublin 1943-4

The middle of the 20th century saw the Proposed Development site still consisting of open ground but completely surrounded by urban development. The Player Wills tobacco factory has now been built to the immediate southeast while the tent and marquee manufactory had been replaced by a Factory and Printing Works. This is a high-density building complex which occupied the entire footprint of the property.

The laundry is still marked to the west although the channel feeding it is no longer marked possibly suggesting it has been culverted and buried. Similarly, the channels that ran to the northeast are no longer shown. The line of the Hangman's Water from the south and the Abbey Stream are still marked but were mostly culverted underground by this stage. The fireworks factory and its magazine have been removed although the exercise track is still extant. The northwest extent of this feature is missing suggesting that it is now derelict.

Within 10 years of this map, the north extent of the Proposed Development site would be developed with the housing of St. Teresa's Gardens while the areas to the south would be converted to a sports ground.

3 ARCHAEOLOGICAL TESTING

3.1 GENERAL

Test trenching took place on 10th August 2021 and continued for 3 days. All mechanical excavation works were conducted using a [13 tonne 360 degree tracked excavator] equipped with a flat, toothless bucket under strict archaeological supervision. Any investigated deposits were preserved by record. This was by means of written, drawn and photographic records.

It was initially planned to excavate 28 no. archaeological test trenches across the proposed development area (Figure 2). However, two significant constraints prevented the full excavation of all test trenches across the proposed development area. The first of these constraints, resulting from areas of the proposed development site being under an active construction compound and modern concrete and tarmacadam surfaces, meant that approximately half the test trenches could not be excavated. The second constraint resulted from the significant depth of test trenches, which meant it was only possible to fully investigate features of potential archaeological significance in the northern extent of the test area (Test Trenches 1-4).

A total of 14 trenches were excavated across the site measuring a total of 178 linear metres (Figures 7 and 8, Plates 1-41). The test trenches were excavated to determine, as far as reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains threatened by the proposed development. Test trenching was also carried out to clarify the nature and extent of existing disturbance and intrusions and to assess the degree of archaeological survival in order to formulate further mitigation strategies. These are designed to reduce or offset the impact of the proposed development scheme.

3.2 TESTING RESULTS

The topsoil (C1; Plate 2) across the northern extent of the proposed development area was recorded as a mixed mid brown clay, 0.25-0.35m in depth, containing frequent stone and modern demolition waste materials. At the south western extent of the proposed development area the topsoil was recorded as a dark brown silty clay, consistent with a disturbed former sports area surface.

Across the northern extent of the proposed development area stratigraphy underlying the topsoil deposit is considered consistent with modern levelling materials. These comprised the remains of a former construction compound (C3; Plates 4 and 6), partially overlying a black clay with frequent modern demolition materials (C26). The latter deposit was recorded as c. 0.85m in depth. Significant modern disturbance, consistent with modern services, was also recorded in this area.

The subsoil across the proposed development area consisted mainly of a light brown silty clay (C2). Towards the southwestern extent of the proposed development area the subsoil contained more stone derived from the underlying regolith material.

TABLE 1: Test Trench Results

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
1	30	2	1.35	Northwest–southeast	One linear feature was recorded extending east-west across the test trench (Plates 3-8) The cut (C4) was recorded as 0.6m in width, 0.2m in maximum depth, with steep sides and flat base. The fill material (C5) was recorded as a loose, light brown silty clay, considered to be derivative from the surrounding subsoil (C2)
2	30	2	1.85	North–south	Two linear features were recorded within the northern extent of the trench. (Plates 9-12). The northernmost feature extended northwest-southeast, whilst the southernmost feature extended east-west. The cut of the northernmost feature (C6) was recorded as 0.85m in width, 0.35m in maximum depth, with sloping sides and a rounded base. The fill material (C7) was recorded as a light grey silty clay, considered to be consistent with an overlying flood deposit. The southern feature (C8) was recorded as a red brick lined drainage feature, 0.55m in width, 0.4m in maximum depth, with steep sides and a flat unlined base. The drain was covered with split limestone calp slabs. The fill material (C9) was recorded as a waterlogged black silty clay.
3	26	2	1.55	Northwest–southeast	Five linear features were recorded throughout the test trench (Plates 13-20) C10 was recorded as the cut of a linear feature extending northeast-southwest, 1.15m in width, 0.35m maximum depth, with gradually sloping sides and a flat base. The fill material consisted of (C11), a compact black clay with frequent demolition inclusions, overlain by a grey silty clay (C12) considered consistent with the flood deposit (C7) noted above. C13 was recorded as the cut of a linear feature extending north-south, 0.85m in width, 0.25m in maximum depth, with sloping sides and flat base. The fill material (C14) consisted of a black clay with frequent clinker and demolition material inclusions. C15 was recorded as the cut of a linear feature extending north-south, 0.85m in width, 0.25m in maximum depth, with sloping sides and flat base. The fill material (C16) consisted of a black clay with frequent clinker and demolition material inclusions. This feature is considered analogous with C13. C17 was recorded as the cut of a linear feature extending east-west, 1m in width, 0.35m in maximum depth, with sloping sides and a flat base. The fill material (C18) was recorded as analogous with C14 and C16. C19 was recorded as the cut of a linear feature

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
					extending north-south, 1.25m in width, 0.55m in maximum depth, with V shaped sides and a flat base. The fill material (C20) was recorded as analogous with C14 and C16
4	30	2	1.6	North-south	One linear feature was recorded extending northeast-southwest across the trench (Plates 21-29). The cut (C21) of the feature was recorded as 1.25m in width, 0.6m in observable depth, with gradually sloping sides on western side. The feature was heavily waterlogged, and only one fill (C22) consisting of a dark grey clay. Four wooden elements (C23) were recovered from C22, which were identified as two oval profile stake, a post with a tapered end, and a plank element. The wooden elements were all considered to be part of a disturbed superstructure to a water channel.
5	5	2	1.9	Northwest-southeast	Nothing of archaeological significance (Plate 30).
6	6	2	1.85	Northwest-southeast	Nothing of archaeological significance (Plate 31).
7	7	2	1.85	Northwest-southeast	Nothing of archaeological significance (Plate 32).
8	6	2	1.87	Northwest-southeast	One linear feature was recorded extending east-west across the trench (Plate 33). The cut (C24) could not be full explored due to the depth of the trench but the fill material (C25) was recorded as analogous with C14 and C16
9	6	2	1.25	Northeast-southwest	Nothing of archaeological significance (Plate 36)
10	8	2	1	Northeast-southwest	Nothing of archaeological significance (Plate 37).
11	6	2	1.2	Northwest-southeast	Nothing of archaeological significance (Plate 38).
12	6	2	1	Northwest-southeast	Nothing of archaeological significance (Plate 39)
13	6	2	1	Northwest-southeast	Nothing of archaeological significance (Plate 40).
14	6	2	1	Northwest-southeast	Nothing of archaeological significance (Plate 41).

Archaeological Features

Two areas of potential archaeological significance were identified within the proposed development area.

The first (AA1) encompasses Test Trenches 1-3 and the northern extent of Test Trench 4. The features identified consisted of ten linears, with maximum widths of 1.25m, and depths of 0.6m.

The majority of the features identified within AA1 would appear to have been heavily affected by later development, with modern demolition debris recorded in, at least, the upper surfaces of fill materials. The linear identified as C4 may be the potentially earliest feature, the fill material (C5) consisting of material considered to be derived from the surrounding subsoil (C2).

Another feature with high potential for archaeological significance was recorded within Trench 4 as a linear (C21). The feature had been heavily disturbed by the insertion of a modern cast iron pipe, but it could be identified that the feature contained *in situ* wooden elements consisting of stakes, posts and planks. Four of these elements were recovered from the feature for examination, with tool marks being discerned on the post element at least. Unfortunately, no artefactual evidence was recovered to suggest a date of construction.

The second area of potential significance (AA2) was located to the southeast of that above and consisted of a linear (C24) identified within Test Trench 8. This feature could not be investigated due to the depth of the test trench; however, it is considered that it is analogous with the linear features identified within Test Trench 3.

3.3 CONCLUSION

The northern area of the proposed development area has a complex range of features of potential archaeological significance, identified within AA1 and AA2. As noted above, the majority of these features would seem to have been affected to at least some extent by modern development, but it is impossible to indicate if they are not archaeological in terms of initial construction.

The features identified within Test Trenches 1 and 4 (C4 and C21 respectively) have the clearest potential to be archaeological in nature, with no evidence that they have been significantly affected by modern development.

The results from the test trenching programme would seem to confirm that the course of the Abbey Stream does not cross the proposed development are, although the later laundry diversion channel may equate with the linear feature identified in Test Trench 8 (C24). Unfortunately, due to the depth of the test trench this could not be confirmed during the investigations.

4 IMPACT ASSESSMENT AND MITIGATION STRATEGY

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological resources potentially affected. Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping; disturbance by vehicles working in unsuitable conditions; and burial of sites, limiting access for future archaeological investigation.

4.1 IMPACT ASSESSMENT

- It is considered that the scale of groundworks required in conjunction with any development of the proposed development area would be seriously detrimental to the features identified during the test trenching programme.

- There may be an adverse impact on other previously unrecorded archaeological feature or deposits that have the potential to survive beneath the current ground level.

4.2 MITIGATION

We recommend the following actions in mitigation of the impacts above.

- The full archaeological excavation, and thus preservation by record, of the areas of potential archaeological significance (AA1 and 2).

- It is recommended that all ground disturbances associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation *in-situ* or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

It is the developer's responsibility to ensure full provision is made available for the resolution of any archaeological remains, both on site and during the post excavation process, should that be deemed the appropriate manner in which to proceed.

Please note that all recommendations are subject to approval by the National Monuments Service of the Heritage and Planning Division, Department of Housing, Local Government and Heritage.

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www.bingmaps.com – Satellite coverage of the proposed development area

APPENDICES

APPENDIX 1 CONTEXTS

CONTEXT NO.	TRENCH NO.	DESCRIPTION
1	All	Topsoil
2	All	Subsoil
3	1-4	Hardcore stone and geotextile, former compound material
4	1	Linear cut, steep sides, flat base
5	1	Loose, light brown silty clay
6	2	Linear cut, sloping sides, rounded base
7	1-7	Light grey silty clay
8	2	Red brick lined drainage channel
9	2	Waterlogged black silty clay
10	3	Linear cut, sloping sides, flat base
11	3	Compact, black clay with frequent demolition inclusions
12	3	Light grey silty clay
13	3	Linear cut, sloping sides, flat base
14	3	Compact, black clay with frequent demolition inclusions
15	3	Linear cut, sloping sides, flat base
16	3	Compact, black clay with frequent demolition inclusions
17	3	Linear cut, sloping sides, flat base
18	3	Compact, black clay with frequent demolition inclusions
19	3	Linear cut, V shaped profile, flat base
20	3	Compact, black clay with frequent demolition inclusions
21	4	Linear cut, sloping sides, flat base
22	4	Waterlogged, dark grey clay
23	4	Wooden elements
24	8	Linear cut, not investigated
25	8	Compact, black clay with frequent demolition inclusions
26	1-9	Compact black clay with frequent demolition inclusions, c. 0.85m in depth.

APPENDIX 2 RMP SITES WITHIN THE SURROUNDING AREA

SMR NO.:	DU018-04304
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	
CLASSIFICATION:	House - 18th/19th century
DIST. TO SITE:	
DESCRIPTION:	No information is available
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-020576
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	713850, 732940
CLASSIFICATION:	Watercourse
DIST. TO SITE:	c. 274m
DESCRIPTION:	No information available.
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-043001
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	713903, 733433
CLASSIFICATION:	Watercourse
DIST. TO SITE:	c. 568m
DESCRIPTION:	No information available.
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-020692
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	713752, 733207
CLASSIFICATION:	Watercourse
DIST. TO SITE:	c. 474m

DESCRIPTION:	No Information available.
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-020
RMP STATUS:	Yes
TOWNLAND:	Dublin North City,Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	715076, 733908
CLASSIFICATION:	Historic town
DIST. TO SITE:	c. 1371m
DESCRIPTION:	No Information available.
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-047001
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	714414, 732737
CLASSIFICATION:	Castle - unclassified
DIST. TO SITE:	c. 334m
DESCRIPTION:	Shown on the OS 1837 map as 'Site of Donore castle'. The site is occupied by a Business park. This castle was located within a medieval borough which is mentioned in Alen's Register for the year 1228 (Martin 1981, 40). No visible surface trace.
REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-020503
RMP STATUS:	No
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	714221, 73343
CLASSIFICATION:	Graveyard
DIST. TO SITE:	c. 445m
DESCRIPTION:	A walled burial ground, square in plan and accessible centrally from Cork Street is situated on the N side of the street. The E portion of the graveyard is utilised as a car-park for the adjacent property, formerly known as the James Weir Home for Nurses. Within the burial ground are small clusters of recumbent memorials, mainly mid-19th century in date, set in a lawn. A single upright grave marker survives close to the vehicular entrance to the site. Mature trees bound the parking area at the E and there are others along the wall at W. In 1901 a plan was drawn in advance of the construction of the Home for Nurses (see attached) referring to the Burial Ground of the Religious Society of Friends, indicating the then location of 18 gravestones and whom they memorialise. According to published sources (Butler, 2004) the graveyard was in existence in the 1690's.

REFERENCE:	www.archaeology.ie/ SMR file

SMR NO.:	DU018-020358
RMP STATUS:	Yes
TOWNLAND:	Dublin South City
PARISH:	The Liberties
BARONY:	The Liberties
I.T.M.:	714467,733268
CLASSIFICATION:	House - 18th/19th century
DIST. TO SITE:	c. 469m
DESCRIPTION:	No Information available
REFERENCE:	www.archaeology.ie/ SMR file

APPENDIX 3 LEGISLATION PROTECTING THE ARCHAEOLOGICAL RESOURCE

PROTECTION OF CULTURAL HERITAGE

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

THE ARCHAEOLOGICAL RESOURCE

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act 1997* are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

OWNERSHIP AND GUARDIANSHIP OF NATIONAL MONUMENTS

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

REGISTER OF HISTORIC MONUMENTS

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

PRESERVATION ORDERS AND TEMPORARY PRESERVATION ORDERS

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site

illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

RECORD OF MONUMENTS AND PLACES

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister of Housing, Local Government and Heritage.) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that 'where the owner or occupier (other than the Minister for of Housing, Local Government and Heritage.) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice'.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989,* Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document's recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

THE PLANNING AND DEVELOPMENT ACT 2000

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable

development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

DUBLIN CITY DEVELOPMENT PLAN 2016-2022

It is the Policy of Dublin City Council:

CHC9: To protect and preserve National Monuments.
1. To protect archaeological material in situ by ensuring that only minimal impact on archaeological layers is allowed, by way of the re-use of buildings, light buildings, foundation design or the omission of basements in the Zones of Archaeological Interest.
2. That where preservation in situ is not feasible, sites of archaeological interest shall be subject to 'preservation by record' according to best practice in advance of re-development.
3. That sites within Zones of Archaeological Interest will be subject to consultation with the City Archaeologist and archaeological assessment prior to a planning application being lodged.
4. That the National Monuments Service will be consulted in assessing proposals for development which relate to Monuments and Zones of Archaeological Interest.
5. To preserve known burial grounds and disused historic graveyards, where appropriate, to ensure that human remain are re-interred, except where otherwise agreed with the National Museum of Ireland.
6. That in evaluating proposals for development in the vicinity of the surviving sections of the city wall that due recognition be given to their national significance and their special character.
7. To have regard to the Shipwreck inventory maintained by the DAHG. Proposed developments that may have potential to impact on riverine, inter-tidal and sub-tidal environments shall be subject to an underwater archaeological assessment in advance of works.
8. To have regard to DAHG policy documents and guidelines relating to archaeology.

APPENDIX 4 IMPACT ASSESSMENT & THE CULTURAL HERITAGE RESOURCE

POTENTIAL IMPACTS ON ARCHAEOLOGICAL AND HISTORICAL REMAINS

Impacts are defined as 'the degree of change in an environment resulting from a development' (Environmental Protection Agency 2003: 31). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.

- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.

- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.

- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.

- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.

- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.

- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

PREDICTED IMPACTS

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site specific terms, as may be provided by other specialists.

APPENDIX 5 MITIGATION MEASURES & THE CULTURAL HERITAGE RESOURCE

POTENTIAL MITIGATION STRATEGIES FOR CULTURAL HERITAGE REMAINS

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ*.

DEFINITION OF MITIGATION STRATEGIES

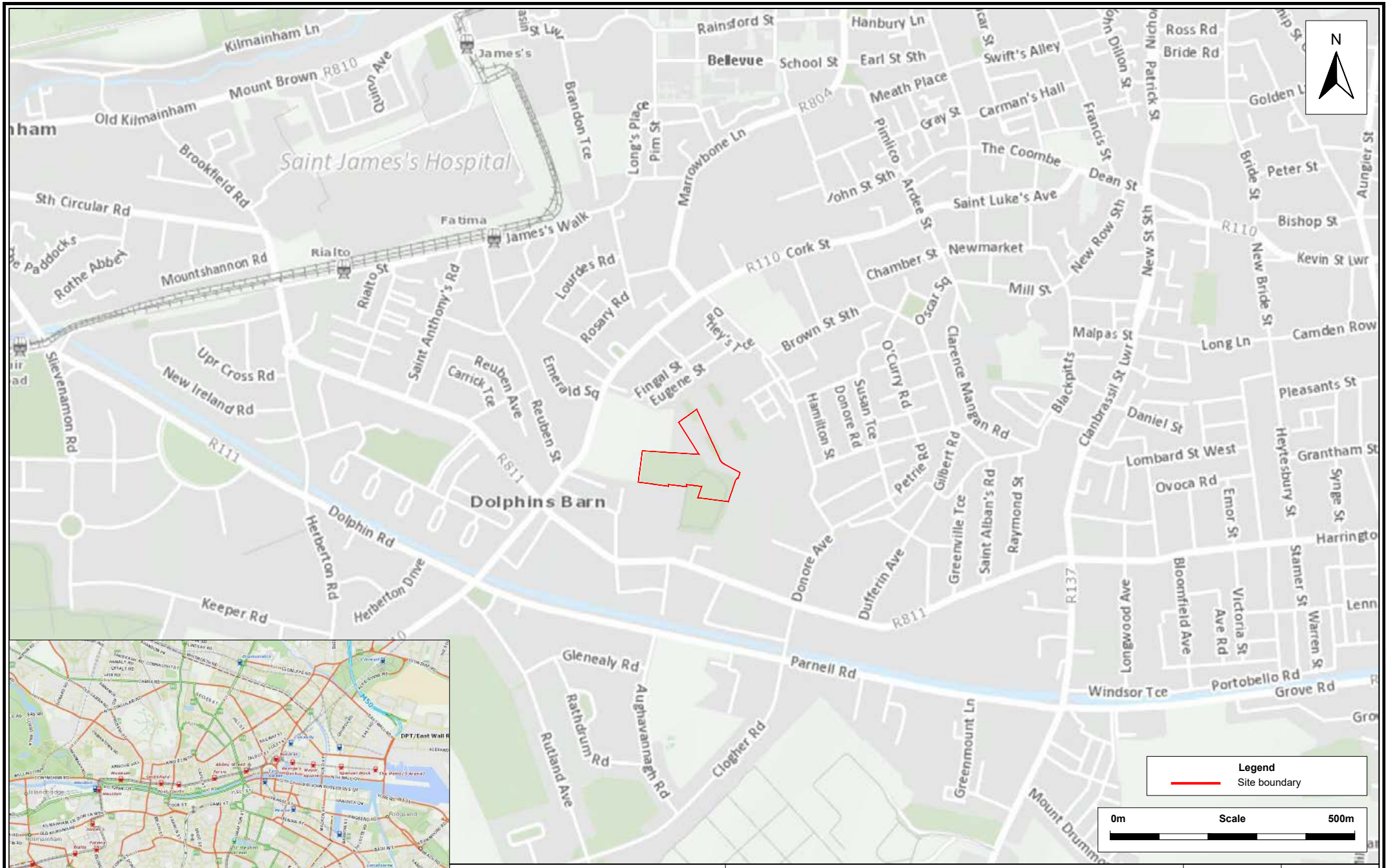
ARCHAEOLOGICAL RESOURCE

The ideal mitigation for all archaeological sites is preservation *in situ*. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

Full Archaeological Excavation involves the scientific removal and recording of all archaeological features, deposits and objects to the level of geological strata or the base level of any given development. Full archaeological excavation is recommended where initial investigation has uncovered evidence of archaeologically significant material or structures and where avoidance of the site is not possible. (CIfA 2020b)

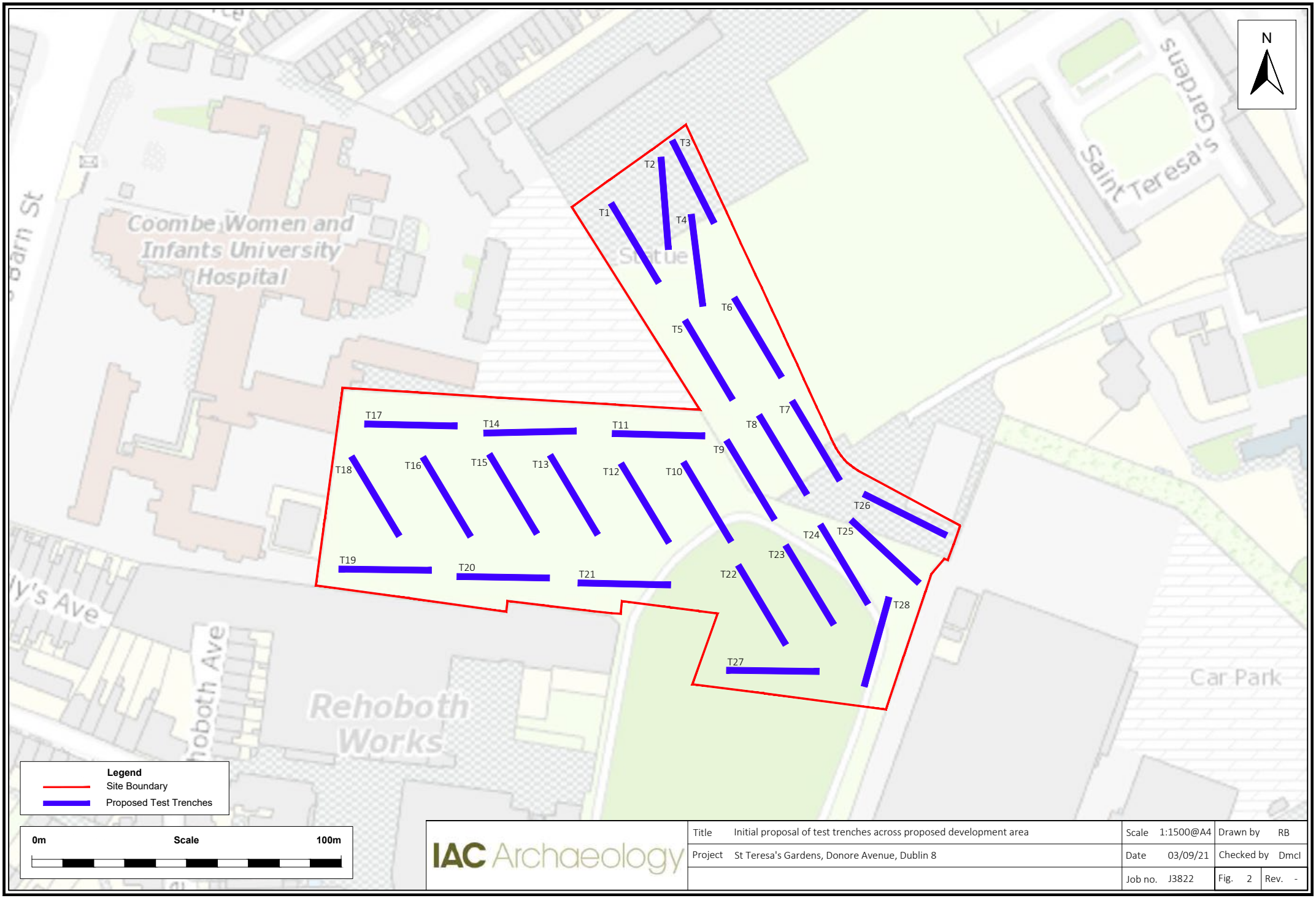
Archaeological Test Trenching can be defined as 'a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality.' (CIfA 2020a)

Archaeological Monitoring can be defined as a 'formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons within a specified area or site on land or underwater, where there is possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.' (CIfA 2020c)



IAC Archaeology

Title	Site of proposed development	Scale 1:10,000@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 1 Rev. -


N
Coombe Women and Infants University Hospital
Saint Teresa's Gardens
Rehoboth Works
Car Park
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19
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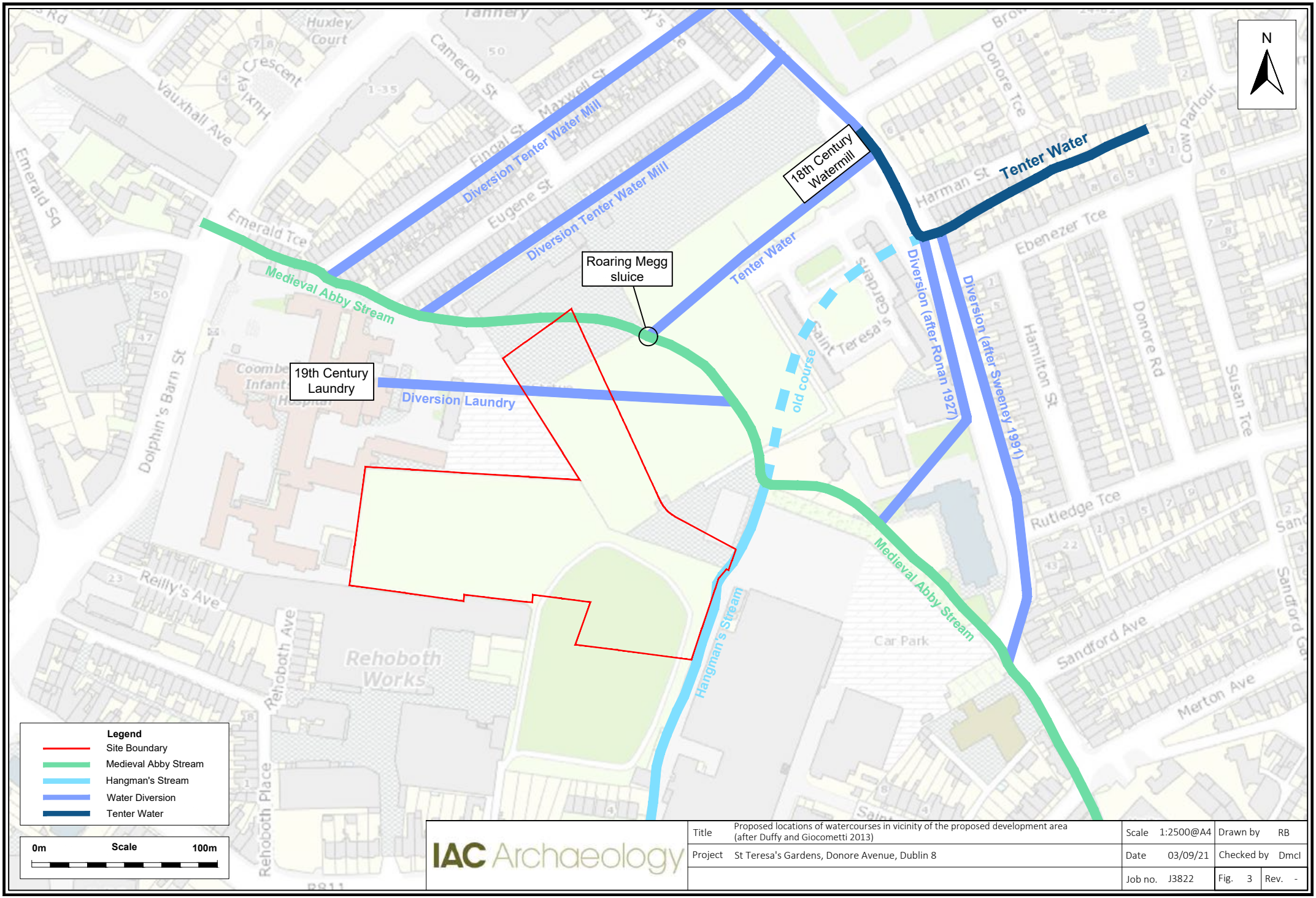
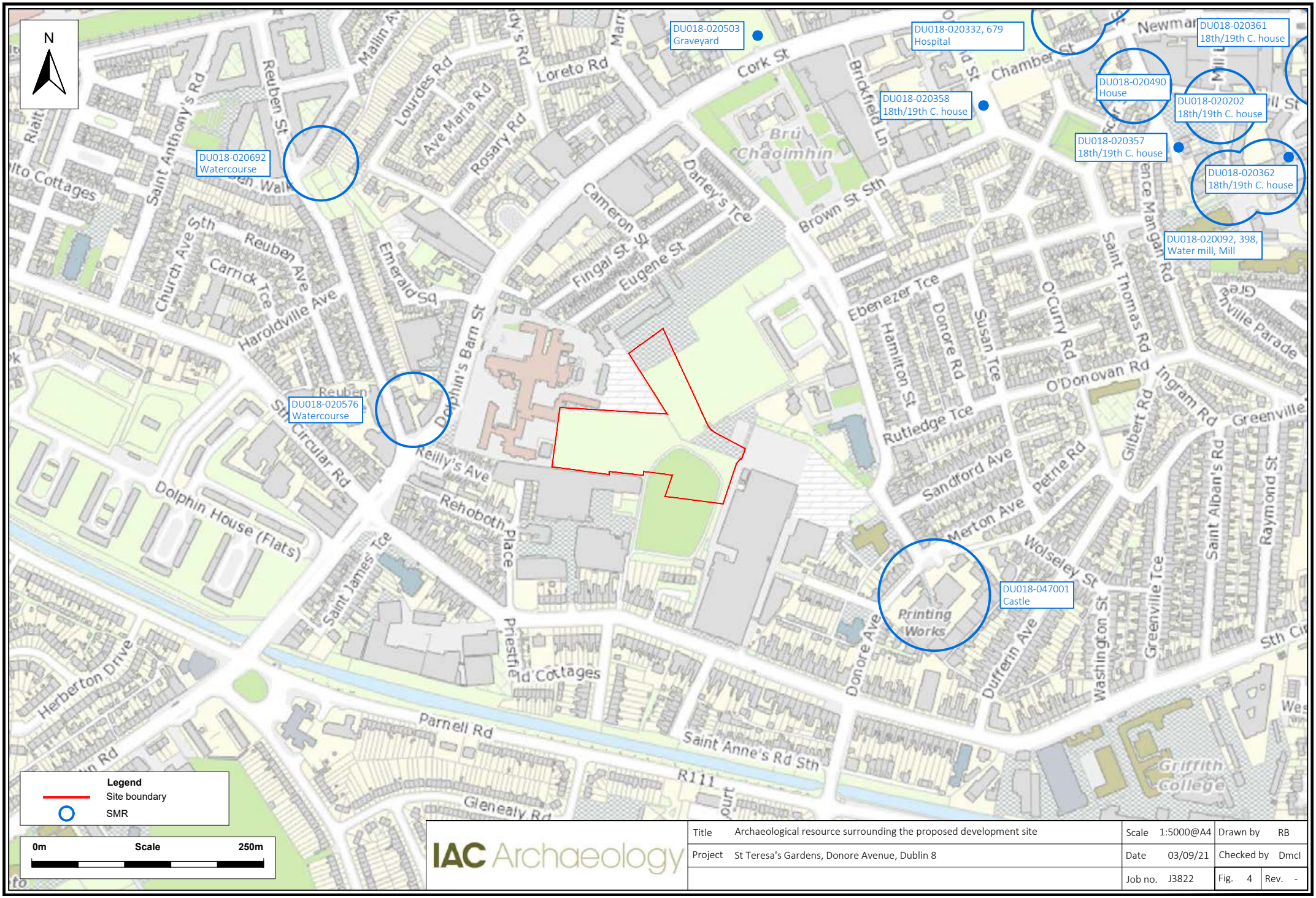
T21
T22
T23
T24
T25
T26
T27
T28
Legend
Site Boundary
Proposed Test Trenches
0m
Scale
100m
IAC Archaeology
Title Initial proposal of test trenches across proposed development area
Project St Teresa's Gardens, Donore Avenue, Dublin 8
Scale 1:1500@A4
Date 03/09/21
Job no. J3822
Drawn by RB
Checked by Dmcl
Fig. 2
Rev. -



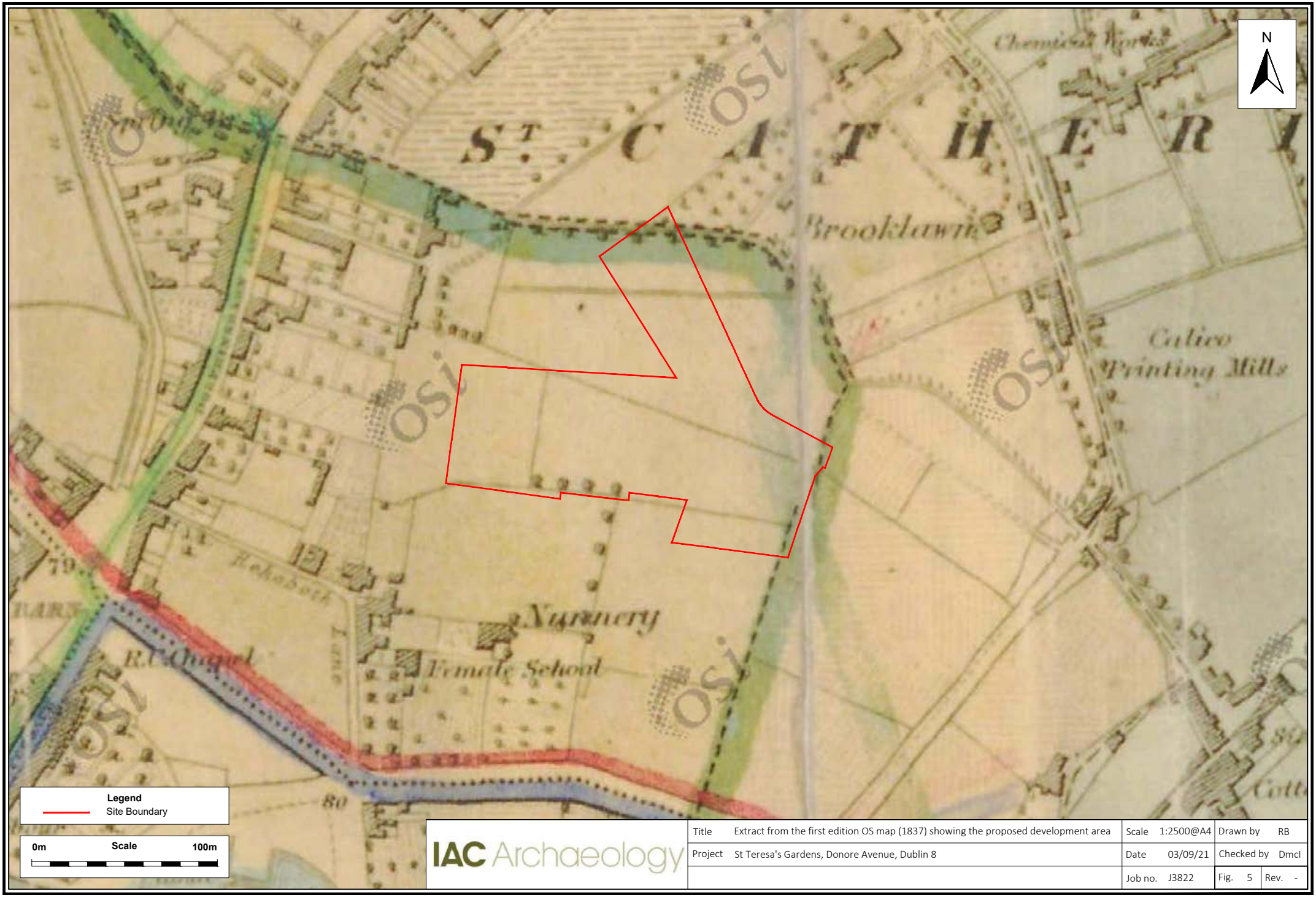
IAC Archaeology

Title	Proposed locations of watercourses in vicinity of the proposed development area (after Duffy and Giocometti 2013)	Scale 1:2500@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 3 Rev. -



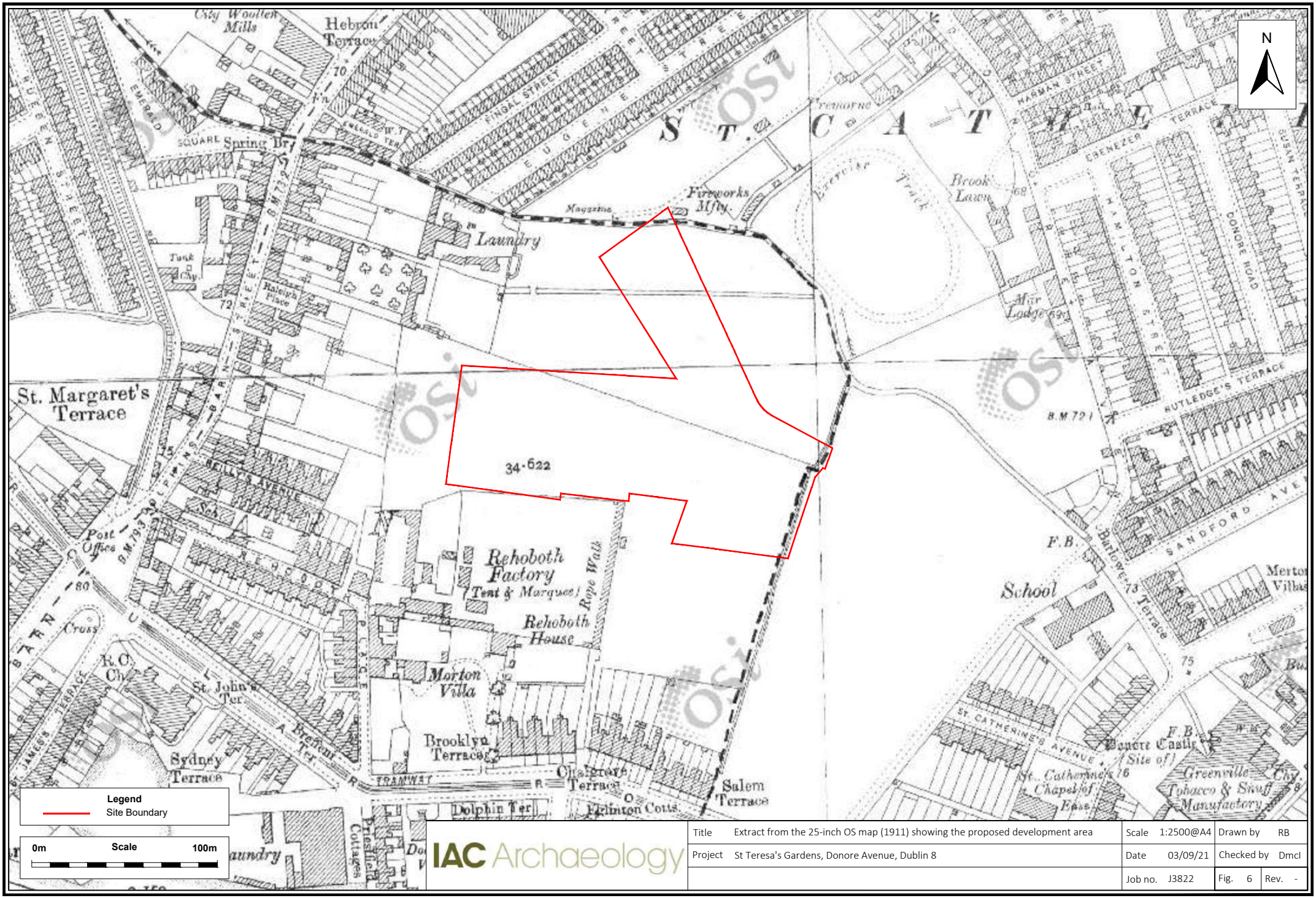
IAC Archaeology

Title	Archaeological resource surrounding the proposed development site	Scale 1:5000@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 4 Rev. -



IAC Archaeology

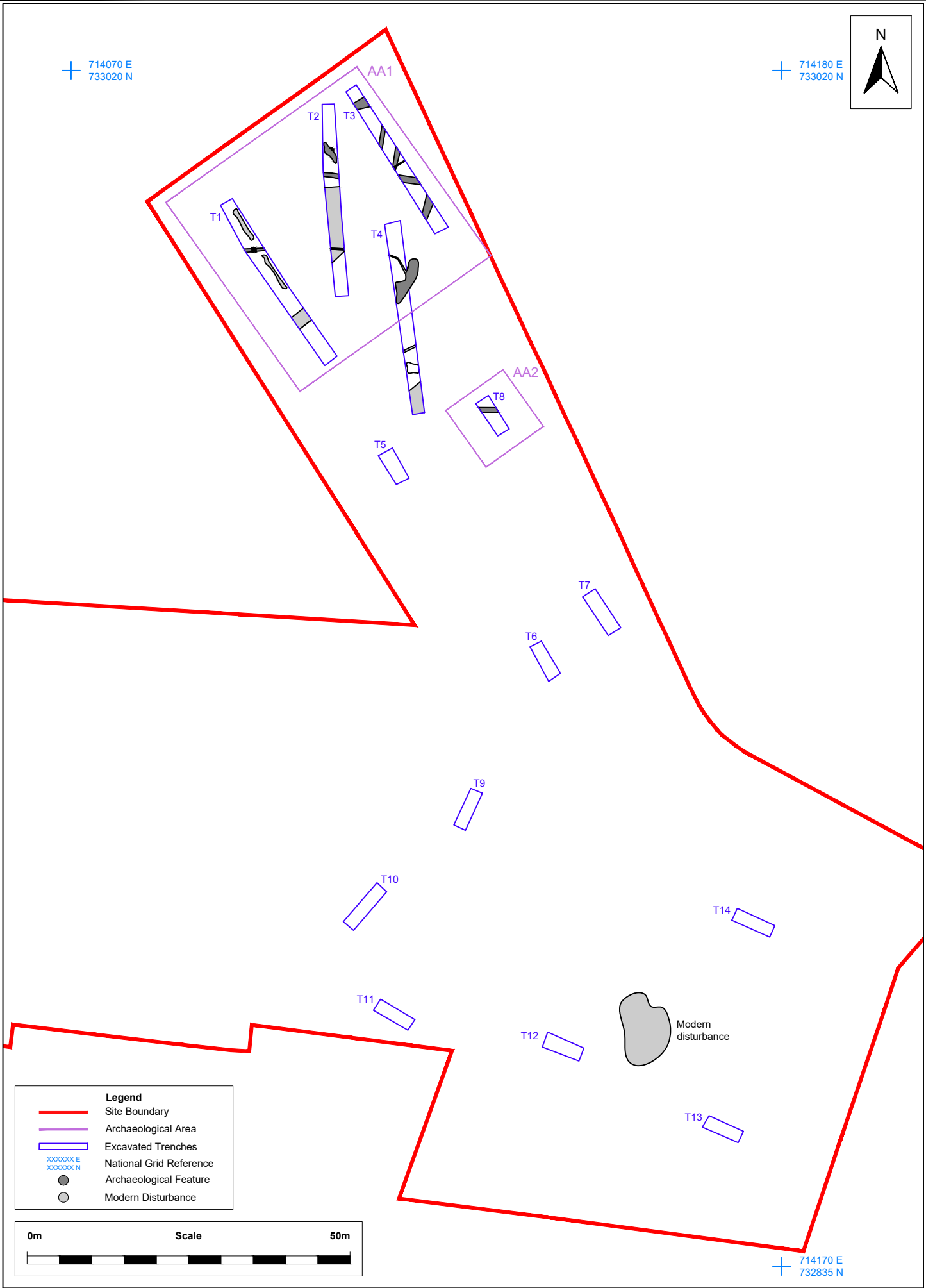
Title	Extract from the first edition OS map (1837) showing the proposed development area	Scale 1:2500@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 5 Rev. -



IAC Archaeology

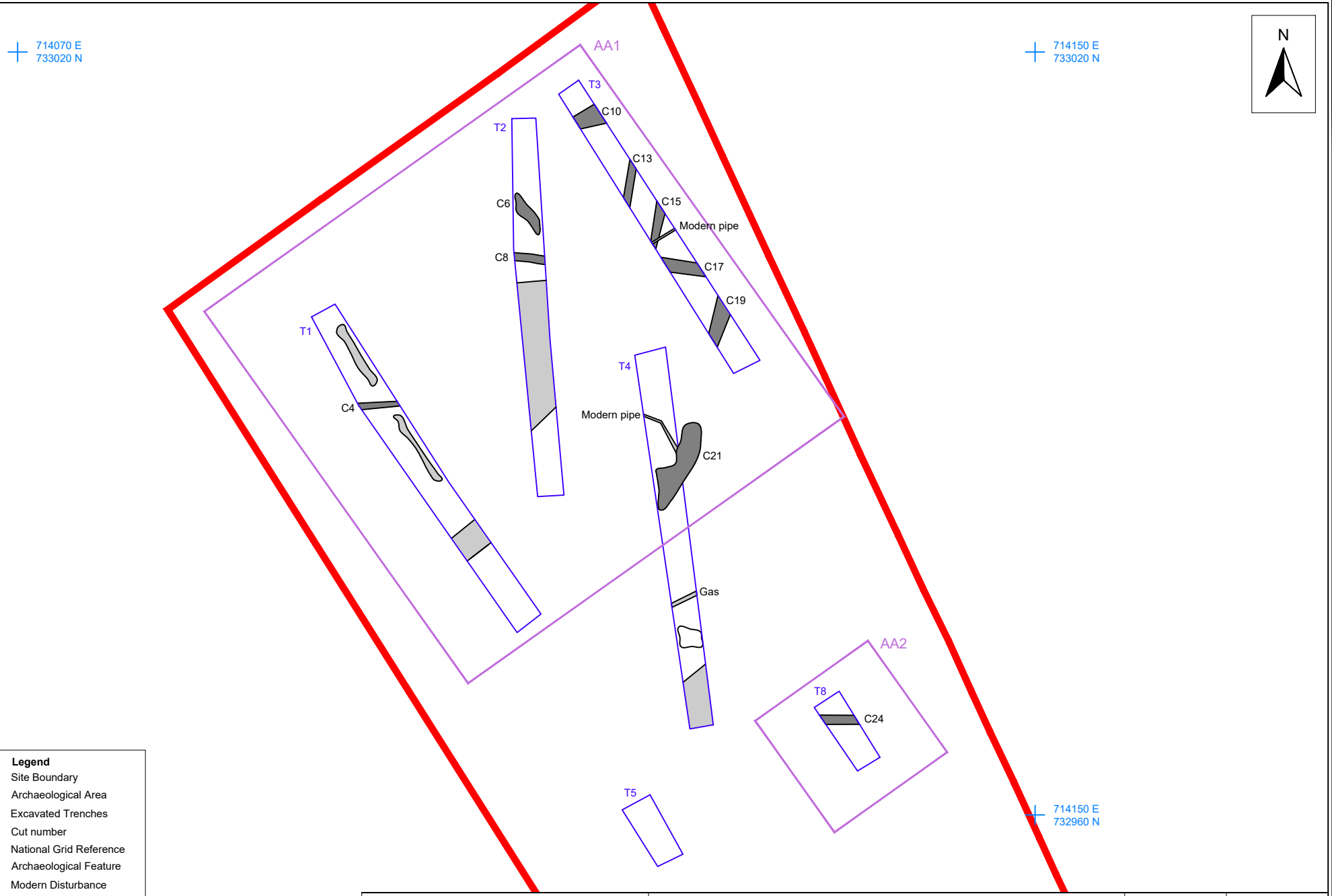
Title	Extract from the 25-inch OS map (1911) showing the proposed development area	Scale	1:2500@A4
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date	03/09/21
		Job no.	J3822

Drawn by	RB
Checked by	Dmcl
Fig.	6
Rev.	-



IAC Archaeology

Title	Excavated test trenches 1-14	Scale 1:750@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 7 Rev. -



IAC Archaeology

Title	Archaeological Areas 1 and 2	Scale 1:400@A4	Drawn by RB
Project	St Teresa's Gardens, Donore Avenue, Dublin 8	Date 03/09/21	Checked by Dmcl
		Job no. J3822	Fig. 8 Rev. -

Plate 1 Remaining flat complex, St Theresa's Gardens, facing southwest

Plate 2 Proposed development area, facing west

Plate 3 Test Trench 1, pre excavation, facing south

Plate 4 Test Trench 1, former compound surface, facing south

Plate 5 Test Trench 1, post excavation, facing south

Plate 6 Test Trench 1 stratigraphy, facing west

Plate 7 Test Trench 1, modern disturbance, facing southeast

Plate 8 Test Trench 1, C4, facing east

Plate 9 Test Trench 2, post excavation, facing south

Plate 10 Test Trench 2, C6, facing southeast

Plate 11 Test Trench 2, C8, facing southeast

Plate 12 Test Trench 2, modern services, facing southeast

Plate 13 Test Trench 3, post excavation, facing south

Plate 14 Test Trench 3 stratigraphy, facing southeast

Plate 15 Test Trench 3, C12 deposit within base of trench, facing southeast

Plate 16 Test Trench 3, C10, facing northeast

Plate 13 Test Trench 3, post excavation, facing south

Plate 14 Test Trench 3 stratigraphy, facing southeast

Plate 15 Test Trench 3, C12 deposit within base of trench, facing southeast

Plate 16 Test Trench 3, C10, facing northeast

Plate 17 Test Trench 3, C13 and C15, facing northeast

Plate 18 Test Trench 3, C17, facing southeast

Plate 19 Test Trench 3, C19 pre excavation, facing northeast

Plate 20 Test Trench 3, C19, facing northeast

Plate 21 Test Trench 4, waterlogging, facing southwest

Plate 22 Test Trench 4, modern services, facing northwest

Plate 23 Test Trench 4, C21 mid excavation facing northeast

Plate 24 Test Trench 4, wooden elements, C23 closeup

Plate 25 Test Trench 4, wooden elements, C23 closeup

Plate 26 Test Trench 4, C23 elements

Plate 27 Test Trench 4, C23 stake elements

Plate 28 Test Trench 4,C23 axe marks on post element

Plate 29 Test Trench 4, C23 shaped plank

Plate 30 Test Trench 5, post excavation, facing southwest

Plate 31 Test Trench 6, post excavation, facing southwest

Plate 32 Test Trench 7,post excavation, facing southwest

Plate 33 Test Trench 8, C24, facing northeast

Plate 34 Concrete and tarmacadam area of test area, facing east

Plate 35 Southwestern extent of test area, facing west

Plate 36 Test Trench 9, post excavation, facing northeast

Plate 37 Test Trench 10, post excavation, facing northwest

Plate 38 Test Trench 11, post excavation, facing southeast

Plate 39 Test Trench 12, post excavation, facing southeast

Plate 40 Test Trench 13, post excavation, facing northwest

Plate 41 Test Trench 14, post excavation, facing northwest

Appendix L

Donore Project

Building Lifecycle Report

December 2022

LDA
Ghníomhaireacht Forbartha Talún
Land Development Agency

Metropolitan Workshop
Architecture + Urbanism

Table of contents

1. INTRODUCTION

Metropolitan Workshop were instructed by the LDA to provide a Building Lifecycle Report for their proposed residential scheme at the former St. Teresa's Gardens, Donore Avenue, Dublin 8.

The purpose of this report is to provide an initial assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application, as well as demonstrating what measures have been specifically considered to effectively manage and reduce costs for the benefit of the residents. This is achieved by producing a Building Lifecycle Report.

This Building Lifecycle Report has been developed on foot of the revised guidelines for Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities) under Section 28 of the Planning and Development Act 2000 (as amended). Within the new guidelines, new guidance is being provided on residential schemes.

Section 6.13 of the Apartment Guidelines 2020 requires that apartment applications shall:

"include a building lifecycle report which in turn includes an assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application, as well as demonstrating what measures have been specifically considered by the proposer to effectively manage and reduce costs for the benefit of the residents."

2. DESCRIPTION OF DEVELOPMENT

In accordance with Section 175(4) of the Planning and Development Act, 2000 (as amended) The Land Development Agency, on behalf of Dublin City Council gives notice of its intention to make an application for approval to An Bord Pleanála under Section 175(3) of the Planning and Development Act, 2000 (as amended) for a seven year approval to carry out the following proposed development which is located on a site of c. 3.26 hectares, located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8. The site is bound by Donore Avenue to the north-east, Margaret Kennedy Road to the north-west, The Coombe Women & Infants University Hospital to the west, the former Bailey Gibson factory buildings to the south-west, and the former Player Wills factory to the south-east. The development will consist of the construction of a residential scheme of 543 no. apartments on an overall site of 3.26 ha.

The development (GFA of c. 53,227 sqm) contains the following mix of apartments: 225 No. 1 bedroom apartments (36 no. 1-person & 189 no. 2-person), 274 No. 2 bedroom apartments (including 52 No. 2 bed 3 person apartments and 222 No. 2 bed 4 person apartments), 44 No. 3 bedroom 5-person apartments, together with retail/café unit (168 sq.m.), mobility hub (52 sq.m.) and 952 sq.m. of community, artist workspace, arts and cultural space, including a creche, set out in 4 No. blocks.

The breakdown of each block will contain the following apartments:

- Block DCC1 comprises 111 No. apartments in a block of 6-7 storeys;
- Block DCC 3 comprises 247 No. apartments in a block of 6-15 storeys;
- Block DCC5 comprises 132 No. apartments in a block of 2-7 storeys;
- Block DCC6 comprises 53 No. apartments in a block of 7 storeys;

The proposed development will also provide for public open space of 3,408 sqm, communal amenity space of 4,417 sqm and an outdoor play space associated with the creche. Provision of private open space in the form of balconies or terraces is provided to all individual apartments.

The proposed development will provide 906 no. residential bicycle parking spaces which are located within secure bicycle stores. 5% of these are over-sized spaces which are for large bicycles, cargo bicycles and other non-standard bicycles. In addition, 138 spaces for visitors are distributed throughout the site.

A total of 79 no. car parking spaces are provided at undercroft level. Six of these are mobility impaired spaces (2 in each of DCC1, DCC3 & DCC5). 50% of standard spaces will be EV fitted. Up to 30 of the spaces will be reserved for car sharing (resident use only). A further 15 no. on-street spaces are proposed consisting of:

- 1 no. accessible bay (between DCC5 & DCC6)
- 1 no. short stay bay (between DCC5 & DCC6)
- 1 no. crèche set-down / loading bay (between DCC5 & DCC6)
- 1 no. set-down / loading bay (northern side of DCC5)
- 1 no. set-down/loading bay (northern side of DCC 3)
- 10 no. short stay spaces (north-east of DCC1)

In addition, 4 no. motorcycle spaces are also to be provided.

Vehicular, pedestrian and cyclist access routes are provided from a new entrance to the north-west from Margaret Kennedy Road. Provision for further vehicular, pedestrian and cyclist access points have been made to facilitate connections to the planned residential schemes on the Bailey Gibson & Player Wills sites for which there are extant permissions (Ref. No.'s ABP-307221-20 & ABP-308917-20).

The development will also provide for all associated ancillary site development infrastructure including site clearance & demolition of boundary wall along Margaret Kennedy Road and playing pitch on eastern side of site and associated fencing/lighting, the construction of foundations, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, green roofs, hard and soft landscaping, play equipment, boundary walls, attenuation area and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

3. EXECUTIVE SUMMARY – BUILDING LIFE CYCLE REPORT

Measures to effectively manage and reduce costs for the benefit of residents:

The following document reviews the outline specification set out for the proposed residential development at the former St. Teresa's Gardens, Donore Avenue, Dublin 8 and explores the practical implementation of the design and material principles which has informed the design of the buildings, roofs, façades, internal layouts and detailing of the proposed development.

Building materials proposed for use on elevations and in the public realm achieve a durable standard of quality that will not need regular fabric replacement or maintenance outside general day to day care. The choice of high quality and long-lasting materials, as well as both soft and hardscaping in the public, semi-public and private realm will contribute to lower maintenance costs for future residents and occupiers.

As the building design develops this document will be updated and a schedule will be generated from the items below detailing maintenance and replacement costs over the lifespan of the building. This will enable a robust schedule of building component repair and replacement costs which will be available to the LDA and DCC so that the running and maintenance costs of the development are kept within the agreed annual operational budget. This will take the form of a Planned Preventative Maintenance Schedule (PPM) at operational commencement of the development.

4. OPERATIONAL MANAGEMENT PLAN

The Multi-Unit Development Act 2011 (the "MUD Act") introduced a statutory framework for the operation and governance of multi-unit developments. It focused on issues arising between developers and homeowners, which can include the transfer of common areas, completion of developments, duties of homeowners and developers, service charges and dispute resolution. While the 'MUD' Act's principal focus was on enabling apartment owners to take control of common areas and the management of the complex for the benefit of all residents, it also placed obligations on Developers who were selling these units. In this proposed scheme, all residential units are to be retained under ownership of DCC and the LDA with no onwards sale. The social homes will remain in the ownership of DCC, with the management of these units being provided by or on behalf of DCC also. The ownership of the cost rental homes will be transferred to the LDA, with the management of these units being by the LDA also.

It is the intention of DCC and the LDA to establish a specific onsite entity to manage the shared services elements of the proposed development, such as common areas, shared semi-private open space, cleaning, lighting, landscaping, health and safety, fire system management and maintenance, waste management and insurance etc. . This would include the creation of distinct Estate, Apartment and Commercial budget lines to ensure the transparent and effective operation of the site into perpetuity and fair apportionment of costs. It will follow the format outlined in the MUD Act and will also adopt a life cycle view of site operations and maintenance when budgeting and in the procurement of support services. This will include the establishment of a building investment or 'sinking fund' to pay for refurbishment, improvement, or maintenance of a non-recurring nature. This will be also utilised to fund the planned preventative maintenance strategy, with projected replacement and refurbishment timelines developed for key infrastructure. It will also encompass a professional property manager operating as per the Property Service Regulator standards who will oversee all aspects of the site operations, including the creation and administration of House Rules which will apply across the site and help to create a positive living environment for all residents. Overall, based on the long-term ownership of units, there is an onus on the LDA and DCC as landowners, to ensure that the delivered site operates to best practice and is sustainable in order to create desirable long term rental accommodation.

5. RESPONSE TO SECTION 15.9.14 OF THE DUBLIN CITY DEVELOPMENT PLAN 2022-2028

The Dublin City Development Plan 2022-2028 notes that the Building Lifecycle Report should address the following headings:

Assessment of Long Term Running & Maintenance Costs	
Property / Owner Management Company & Common Areas	Refer to Section 4 Operational Management Plan above.
Service Charge Budget	Refer to Appendix
Measures to Manage and Reduce Costs	
Treatment, Materials and Finishes	As set out in sections 6 and 7 of this document, materials have been selected with consideration for design life. Areas of high exposure, be it due to weather or footfall, will be finished with the most durable materials e.g. brick to external facades, PPC Cast aluminium downpipes at ground floor to all buildings. In addition, consideration has been given to accessibility for maintenance e.g PPC cast aluminium downpipes are proposed to the full height of the 15 storey tower in DCC3 where access is more complex. The materials strategy is described further in Chapter 6 the Architectural Design Statement.
Construction Methodology	At detailed design stage, a variety of construction methods will be considered and the pros and cons of each reviewed with cost management and reduction in mind. Options relating to the construction contract will be considered, including the potential benefits of Design & Build which can bring the experience and knowledge of the contractor to the design process, including construction methodology. A detailed inspection plan will be requested from contractors as part of the tender process to ensure regular inspection of the works to monitor quality and mitigate against the risk of the post-occupancy issues which could incur repair costs.
Material Specification	At detailed design stage a clear set of appropriate performance requirements will be set out as part of the tender Preliminaries to ensure the scheme is constructed in line with design life requirements. The design will be specified at a minimum to comply with national building regulations and where possible to exceed these requirements.
Landscaping	The landscape design has focused on high quality, durable materials (natural stone) in the key areas of the site i.e. Donore Park in response to the expectation of higher footfall in these areas. The incorporation of suds and rain gardens within the design will reduce the cost implication related to maintenance of wider drainage infrastructure required across the site. Proposed planting is native and therefore require less yearly maintenance coupled with the inclusion of suds/raingardens this reduces further the requirement for maintenance.

Waste Management	Preventing and minimising waste will be encouraged among residents through the use of resident's handbooks: • Links to sites such as Stop Food Waste https://stopfoodwaste.ie/; and • Promotion of reuse for unwanted household goods / textiles where residents can buy cheaper items – listings of local organisations in the handbook. A detailed Operational Waste Management & Recycling Strategy has been prepared as part of the Part 10 application.
Human Health and Well-being	The site-wide design has been developed with human health and well-being in mind including: • The inclusion of a mobility hub, to share information regarding public transport networks, bike rental schemes and facilities to repair bicycles; • Reduced parking provision to encourage active travel; • Key design changes during design development to improve daylighting to dwellings e.g. offsetting balconies and incorporating full height windows. • Communal amenity space at podium and roof level, providing nearby amenity space to residents throughout the scheme. The Donore Project will be designed and constructed in compliance with Building Regulations, mitigating the risk of issues that could impact negatively on human health such as damp, slips trips and falls and toxins from materials used etc.
Residential Management	Design inclusions that will help to reduced or minimise costs relating to residential management includes: • Appropriate material selection in terms of design life to limit maintenance costs. – refer to 'Treatments, Materials and Finishes' above, Section 6 of this document and the • Consideration of tenure split with Cost Rental and Social being separated by lift core to allow for simplified management strategy • Refer to Section 4 Operational Management Plan above.
Energy and Carbon Emissions	As noted in the Energy and Sustainability Strategy Report which accompanies this Part 10 application *"Passive energy reductions will be maximised through the specification of a high performing building fabric. Active energy reductions include the provision of a high efficiency air to water heat pump systems for space heating & domestic hot water, provision of mechanical heat recovery ventilation, specification of high efficiency lighting & controls and other discrete energy measures. Embodied carbon will be a key consideration in the design. Materials of low embodied carbon, including recycled materials, will be preferred. Where possible locally sourced materials will be used to reduce the embodied carbon associated with transport. A*

	number of sustainable urban drainage systems (SuDS) are to be used to effectively intercept and treat water leaving the site including green roof and permeable paving at roof level, as well as swales, bio-retention, tree pits and porous asphalt at ground level. The green roof will provide matters that will allow local birds and insects to thrive. Native planting will be used to integrate with the local habitat. *The site benefits from local transport links including bus & cycle lanes, which will encourage sustainable transport to and from the development. Cycle parking will be provided to encourage cycling. Limited parking is provided to discourage car use. Electric vehicle charging will be provided in line with the requirements of Part L of the Building Regulations - Conservation of Fuel and Energy (Dwellings) 2021 and Part L of the Building Regulations – Conservation of Fuel and Energy (Buildings other than Dwellings) 2021."* Refer to the Energy and Sustainability Strategy Report for further detail.
Transport and Accessibility	The TTA forming part of this Part X application outlines the transport strategy for the scheme. The design includes reduced parking provision, and it is anticipated that "that commuting will generally be undertaken on foot, bicycle or public transport". In addition, it is proposed to incorporated car club spaces within the scheme, each of which can serve up to 20 properties. The mobility hub will encourage bicycle owners to repair their own bikes. All of the above will serve to reduce costs associated with transport for future residents.
Multi-Unit Development Act 2011	Regard will be had for the provisions of the Multi-Unit Development Act 2011 when developing the detailed design of the Donore Project. Refer to Section 4 Operational Management Plan above for further detail.

6. EXTERNAL BUILDING FABRIC SCHEDULE

Green Roofs

Location	All flat roof areas (excluding accessible roof terraces, plant spaces, lift overruns etc)
Description	• Green roof; Pre-cultivated Sedum vegetation blanket. • Substrate: Concrete Deck. • Drainage / protection layer: 20 mm drainage / protection layer. • Vegetation blanket: sedum blanket, applied in standard length rolls 2m x 1 m. • Landscaping depth: ca. 48 mm (excluding vegetation). • Vegetation: Mainly Sedum with some moss and grasses. Bauder AL40 Sedum blanket edge trim, fitted to all protrusions and perimeters. Installation as clause 820A. 20 - 40 mm round washed pebble vegetation barrier provided at all perimeters and protrusions.
Lifecycle	Average lifecycle of 15-35 years on most green roofs. Lifecycle will be extended with robust proven detailing to adjoining roof elements and appropriate and regular maintenance of the roof materials.
Required maintenance	Quarterly maintenance visits to include inspection of drainage layer and outlets and removal of any blockages to prevent ponding. Inspection of vegetation layer for fungus and decay. Carry out weeding as necessary. No irrigation necessary with sedum blankets.
Year	Quarterly
Priority	Medium
Selection process	A green roof will add to the character of the overall scheme, as well as providing attenuation to storm water run-off and less burden on rainwater goods, increased thermal and sound insulation to the building and increased bio-diversity. Natural soft finishes can provide visual amenity for residents where roof areas are visible or accessible from within areas of the scheme. Sedum roofs are a popular and varied choice for green roofs requiring minimal maintenance.
Reference	N/A

Roof Terraces

Location	Roof terraces
Description	• Light weight precast concrete / stone paving slabs on support system, or • Timber decking, or • Resin bound gravel surfacing. Roof deck build up to architects' and engineers' instructions.
Lifecycle	• Average lifecycle of 30 years for paving slabs. • Average lifecycle of 10-20 years for timber. • Average lifecycle of 10-20 years for gravel surfacing.
Required maintenance	Quarterly maintenance visits to include: • Inspection of drainage layer and outlets and removal of any blockages to prevent water build up. • Inspection of all metalwork and fixings for loosening or degradation including railings, planters, flashings, decking, drainage channels and repair/replace as necessary. • Check for displacement of slabs and mortar decay and remove organic matter. • Power-washing of hard surfaces. • Timber decking requires cleaning, sanding and recoating with proprietary wood stain on an annual basis to ensure safety, longevity and maintained aesthetic value.
Year	Quarterly / annual
Priority	Medium
Selection process	Paving slabs provide a robust and long-lasting roof terrace surface, requiring considerably less maintenance when compared to timber decking or gravel surfaces.
Reference	N/A

Fall Arrest System for Roof Maintenance Access

Location	Roofs
Description	• Latchways Constant Force B1 Fall Restraint System/B2 Fall Arrest System • Installation in accordance with BS 7883 by the system manufacturer or a contractor approved by the system manufacturer
Lifecycle	25-30 years. Generally steel finishes to skyward facing elements can be expected to maintain this life expectancy.
Required maintenance	• Check and reset tension on the line as per manufacturer's specifications. • Check all hardware components for wear (shackles, eye bolts, turn buckles). • Check elements for signs of wear and/or weathering. • Lubricate all moving parts. • Check for structural damage or modifications.
Year	Annually
Priority	High
Selection process	Fall Protection Systems (FPS) are a standard life safety system, provided for safe maintenance of roofs and balconies where there is not adequate parapet protection. A FPS must comply with relevant quality standards.
Reference	N/A

Roof Cowls

Location	Roofs
Description	• Roof Cowl System to be supplied with weather apron for flat roofs. • Stainless Steel goose neck tube to facilitate power supply to external roof level bolted to roof and weathered using proprietary weather apron.
Lifecycle	25-35 years.
Required maintenance	Check fixings annually, inspect for onset of leading edge corrosion if epoxy powder coat finish and treat.
Year	Annually
Priority	Low
Selection process	Standard fitting for roof termination of mechanical ventilation system
Reference	N/A

Flashings

Location	Roof abutments, roof penetrations and upstand details
Description	Lead to be used for all flashing and counter flashings
Lifecycle	Typical life expectancy of 70 years recorded for lead flashings. Recessed joint sealing will require regular inspections.
Required maintenance	Check joint fixings for lead flashing, ground survey annually and close up inspection every 5 years. Re-secure as necessary.
Year	Ground level inspection annually and close up inspection every 5 years
Priority	Medium
Selection process	Lead has longest life expectancy of comparable materials such as copper (60 years) and zinc (50 years). Lead is easily formed into the required shapes for effective weathering of building junctions according to Lead Sheet Association details.
Reference	N/A

Smoke vents and access hatches

Location	Roofs
Description	Companionway Access Roof Hatches hinged to act as Automatic Opening Vent in the event of the activation of the fire alarm system
Lifecycle	25-35 years
Required maintenance	Check fixings annually, inspect for onset of leading edge corrosion if epoxy powder coat finish and treat
Year	Annually
Priority	Medium
Selection process	Manufactured with anti-corrosive composite materials to give long low maintenance life
Reference	N/A

Rainwater Drainage

Location	All buildings
Description	• Rainwater outlets: Suitable for specified roof membranes • Pipework: PPC Cast aluminium downpipes (to ground floor)/uPVC downpipes. PPC Aluminium (recessed) downpipes to towers as indicated on the drawings. • Below ground drainage: To M&E/ Civil Engineers design and specification • Disposal: To surface water drainage to Civil Engineers design • Controls: To M&E/ Civil Engineers design and specification • Accessories: allow for outlet gradings, spigots, downspout nozzle, hopper heads, balcony and main roof outlets Note: strategy includes for all balconies draining to downpipe regardless of surface area.
Lifecycle	Aluminium gutters and downpipes have an expected life expectancy of 50 years in rural and suburban conditions (25 years in industrial and marine conditions), this is comparable to cast iron of 50 years and plastic, less so at 30 years.
Required maintenance	As with roofing systems routine inspection is key to preserving the lifecycle of rainwater systems. Regular cleaning and rainwater heads and gutters, checking joints and fixings and regularly cleaning polyester coated surfaces (no caustic or abrasive materials). Expected maintenance on surface water network: • Gullies & rainwater pipes (every 6-months) • Hydrobrake (every 6-monhts) • Attenuation Tank (every 6-months) • SuDS Systems (every 6-months)
Year	Annually, cleaning bi-annually
Priority	High
Selection process	As above, aluminium fittings compare well against cast iron (in terms of cost) and plastic (in terms of lifespan and aesthetic)
Reference	N/A

External Wall

Brick

Location	Façades
Description	Facing brickwork infills to selected colour
Lifecycle	While bricks have a high embodied energy, they are an extremely durable material. Brickwork in this application is expected to have a lifespan of 50- 80 years. The mortar pointing however has a shorter lifespan of 25-50 years.
Required maintenance	In general, given their durability, brickwork finishes require little maintenance. Most maintenance is preventative: checking for hairline cracks, deterioration of mortar, plant growth on walls, or other factors that could signal problems or lead to eventual damage.
Year	Annual
Priority	Low
Selection process	Aesthetic, lightweight, cost-efficient and low maintenance cladding option, indistinguishable from traditional brick construction.
Reference	N/A

External windows and doors

Location	Façades
Description	• Composite windows/doors.; Thermally broken Alclad double glazed windows 1.22 W/m2k; ID handle with childproofing; foam filled insulation to gaps around windows; including all required ironmongery; including extruded aluminium sill flashing screw fixed to underside of window frame sealed at jambs with similar coloured silicone; • All opening sections in windows to be fitted with suitable restrictors. Include for all necessary ironmongery; include for all pointing and mastic sealant as necessary; fixed using stainless steel metal straps screwed to masonry reveals; include for all bends, drips, flashings, thermal breaks etc.
Lifecycle	PPC Aluminium has a typical lifespan of 45-50 years.
Required maintenance	Check surface of windows and doors regularly so that damage can be detected at early stage and remedial action taken. Silicone seals and gaskets should be checked to ensure they are intact and secure. Check fixings and furniture and lubricate at least once a year. Ensure regular cleaning regime. Check for condensation on frame from window and ensure ventilation louvres are operable.
Year	Annual
Priority	Medium
Selection process	Aluminium is low maintenance with good effective lifespan
Reference	N/A

Structure

Location	Façades
Description	• Powder-coated steel frame balcony system to engineer's detail • Thermally-broken farrat plate connections to main structure of building.
Lifecycle	• Metal structure has a typical life expectancy of 70 years dependent on maintenance of components. • Concrete structures have a high embodied energy, however it is an extremely durable material. Concrete frame has a typical life expectancy of over 80 years.
Required maintenance	Relatively low maintenance required. Check balcony system as per manufacturer's specifications. Check all hardware components for wear. Check elements for signs of wear and/or weathering. Check for structural damage or modifications.
Year	Annual
Priority	High
Selection process	Engineered detail; designed for strength and safety.
Reference	N/A

Balustrades and handrails

Location	Balconies
Description	• Metal balustrades • Fixing in accordance with manufacturer's details
Lifecycle	General metal items with a 25-45 year lifespan
Required maintenance	Regular visual inspection of connection pieces for impact damage or alterations
Year	Annual
Priority	High
Selection process	Long low maintenance lifespan versus timber options
Reference	N/A

7. INTERNAL BUILDING FABRIC SCHEDULE

Common Areas

Location	Entrance lobbies / Reception areas / corridors
Description	• Selected large format anti-slip porcelain or ceramic floor tile • Inset matwell with Forbo Nuway Tuftiguard or similar
Lifecycle	Lifespan expectancy of 20-30 years in heavy wear areas, likely requirement to replace for modernisation within this period also
Required maintenance	Visual inspection, intermittent replacement of chipped / loose tiles
Year	Annual
Priority	Low
Selection process	Durable, low maintenance floor finish. Slip rating required at entrance lobby, few materials provide this and are as hard wearing.
Reference	N/A

Common Areas

Location	Stairwells, landings / half landings
Description	Selected carpet tiled covering. Approved anodised aluminium nosings to stairs.
Lifecycle	• 10-15 year lifespan for carpet. Likely requirement to replace for modernisation within this period also. Using carpet tiles allows for localised replacement thus extending the life of the overall installation 20 year lifespan for aluminium nosings.
Required maintenance	Visual inspection with regular cleaning.
Year	Annual
Priority	Low
Selection process	Durable, low maintenance floor finish. Slip rating required at entrance lobby, few materials provide this and are as hard wearing.
Reference	N/A

Floors - Common Areas

Location	Entrance lobbies / Reception areas / corridors
Description	• Selected large format anti-slip porcelain or ceramic floor tile • Inset matwell with Forbo Nuway Tuftiguard or similar
Lifecycle	Lifespan expectancy of 20-30 years in heavy wear areas, likely requirement to replace for modernisation within this period also
Required maintenance	Visual inspection, intermittent replacement of chipped / loose tiles
Year	Annual
Priority	Low
Selection process	Durable, low maintenance floor finish. Slip rating required at entrance lobby, few materials provide this and are as hard wearing.
Reference	N/A

Lifts

Location	Entrance lobbies / Reception areas / corridors
Description	• Lift car floor: tiles to match adjacent apartment lobbies.
Lifecycle	Lifespan expectation of 20-25 years in heavy wear areas for the tiling.
Required maintenance	Visual inspection, intermittent replacement of chipped / loose tiles
Year	Annual
Priority	Low
Selection process	Durable, low maintenance floor finish. Slip rating required at entrance lobby, few materials provide this and are as hard wearing.
Reference	N/A

Walls

Common Areas

Location	Entrance lobbies / Reception areas
Description	• Selected paint finish with primer to skimmed plasterboard
Lifecycle	2-10 years for finishes; 40 years for plasterboard
Required maintenance	Regular maintenance required, damp cloth to remove stains and replacement when damaged
Year	Bi – annually
Priority	Low
Selection process	Decorative and durable finish.
Reference	N/A

Common Areas

Location	Lobbies / corridors / stairs
Description	Selected paint finish with primer to skimmed plasterboard
Lifecycle	2-10 years for finishes; 40 years for plasterboard
Required maintenance	Regular maintenance required, damp cloth to remove stains and replacement when damaged
Year	Bi – annually
Priority	Low
Selection process	Decorative and durable finish.
Reference	N/A

Ceilings

Location	Common areas & tenant amenity areas
Description	Selected paint finish with primer to skimmed plasterboard ceiling on M/F (metal furring) frame. Perforated plasterboard acoustic ceiling to lift core and apartment lobbies. Moisture board to wet areas.
Lifecycle	2-10 years for finishes; 40 years for plasterboard
Required maintenance	Regular maintenance required, damp cloth to remove stains and replacement when damaged
Year	Bi – annually
Priority	Low
Selection process	Decorative and durable finish.
Reference	N/A

Location	Apartments
Description	Emulsion paint finish with primer to skimmed plasterboard ceiling on M/F frame. Moisture board to wet areas.
Lifecycle	2-10 years for finishes; 40 years for plasterboard
Required maintenance	Regular maintenance required, damp cloth to remove stains and replacement when damaged
Year	Bi – annually
Priority	Low
Selection process	Decorative and durable finish.
Reference	N/A

Internal handrails and balustrades

Location	Stairs & landings
Description	• PPC welded steel balusters, steel/timber balustrade fixed to steel sub-plate.
Lifecycle	25-30 years typical lifecycle
Required maintenance	Regular inspections of holding down bolts and joints
Year	Annually
Priority	High
Selection process	Hard-wearing long-life materials against timber options
Reference	N/A

Carpentry and Joinery

Internal doors and frames

Location	All buildings
Description	• Selected white primed and painted/varnished solid internal doors, or hardwood veneered internal doors • All fire rated doors and joinery items to be manufactured in accordance with B.S. 476. Timber saddle boards. • Brushed aluminium door ironmongery or similar
Lifecycle	30 years average expected lifespan
Required maintenance	General maintenance in relation to impact damage and general wear and tear
Year	Annual
Priority	Low priority except in the case of fire doors (which would be high priority).
Selection process	Industry standard
Reference	N/A

Skirtings and architraves

Location	All buildings
Description	• Painted timber/MDF skirtings and architraves
Lifecycle	30 years average expected lifespan
Required maintenance	General maintenance in relation to impact damage and general wear and tear
Year	Annual
Priority	Low
Selection process	Industry standard
Reference	N/A

Window boards

Location	Residential blocks
Description	• Painted timber/MDF window boards
Lifecycle	30 years average expected lifespan
Required maintenance	General maintenance in relation to impact damage and general wear and tear
Year	Annual
Priority	Low
Selection process	Industry standard
Reference	N/A

Kitchen Fittings

Location	Residential blocks
Description	• 18 mm MFC (melamine faced chipboard) carcasses and units
Lifecycle	30 years average expected lifespan
Required maintenance	• General maintenance in relation to impact damage and general wear and tear. • Overhaul and lubricate hinges and fixings on annual basis
Year	Annual
Priority	Low.
Selection process	MFC offers good resistance to scouring and impact damage.
Reference	N/A

Sanitary ware

Location	Residential blocks
Description	• High quality acrylic sheet with glass reinforced polymer reinforcement bath and shower bases • Vitreous china ceramic wash basins and W.C's • Chrome plated brass taps and wastes
Lifecycle	30 years average expected lifespan
Required maintenance	Regular cleaning with non-aggressive pH neutral agents. Annual overhaul and lubrication of fittings. Replacement of valves and seals when defective
Year	Annual
Priority	Low
Selection process	Robust and durable products offering low maintenance and long effective life incorporating water saving design and features.
Reference	N/A

Building services

Mechanical plant

Locations	Roof Plant Area Centralised Mechanical Plant Room Water Tank Rooms Sprinkler Tank Rooms Carpark Areas Apartment Service Cupboards
Description	1. Heating & Domestic Hot Water - Centralised Heating Network providing the primary heat input to the apartment HIUs (Heat Interface Units) which subsequently provide both the heating and domestic hot water to the apartment. The centralised system will also be providing heat to communal areas. The primary plant heat pumps will be installed at roof level to serve the Centralised System. All secondary sub-circuits (apartments and commercial units) and the main block supplies (DCC1, DCC3, DCC5 & DCC6) will be metered. 2. Domestic Water - Mains and Cold Water Services – Each Block has a Mains Water Tank and Booster Set and a Cold Water Tank and Booster Set which subsequently serve each apartment and commercial unit. All supplies are to be metered. 3. Ventilation - Apartments and commercial units will be served by MVHRs (Mechanical Ventilation Heat Recovery Units). 4. Localised Heat Pumps – Commercial units are to be served by localised high efficiency heat pumps providing both heating and cooling. 5. BMS (Building Management System) – The BMS system will manage and control all landlord devices including energy and domestic water meters. 6. Sprinkler Systems – The centralised plant in Block DCC3 serves the DCC1, DCC3 and DCC6 sprinkler systems via a below ground service network.
Lifecycle	1. Heating & Domestic Hot Water - 3 Monthly and Annual maintenance checks/actions for Centralised Heat Pumps at Roof Level - Range of 3 Monthly, 6 Monthly and Annual maintenance checks/actions for primary and secondary plant within the Centralised Mechanical Plant Room - Annual Maintenance / Inspection to Apartment HIUs (Heat Interface Units)

	2. Mains and Cold Water Services - Range of 3 Monthly, 6 Monthly and Annual maintenance checks/actions 3. Ventilation – MVHRs (Mechanical Ventilation Heat Recovery Units). - 6 Monthly check of units and clean of filters - Annual change of filters 4. Localised Heat Pumps (By registered maintenance specialist) - 3 Monthly – System check of operation as per manufacturer recommendations - 3 Monthly - Indoor Units - Cleaning of filters - 3 Monthly - Outdoor Units - Check of unit for damage 5. BMS (Building Management System) - Annual maintenance and operation check of the Landlord BMS system 6. Sprinkler System - Range of 3 Monthly, 6 Monthly and Annual maintenance checks/actions Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage. Replacement of equipment at (End of Life) EOL to be determined at detailed design stage.
Required maintenance	The range of Mechanical Service Inspections to be included as part of Development Planned Preventative Maintenance Programme
Year	Range of 3 Monthly, 6 Monthly & Annually
Priority	Medium
Selection process	All equipment to be detailed as part of the detailed design section of the development. This equipment will be selected in conjunction with the design and management team to meet and exceed the CIBSE recommended lifecycles.
Reference	N/A

Soils and Wastes

Location	All Areas – Residential
Description	PVC Soils and Wastes Pipework
Lifecycle	PVC Soils and Wastes Pipework • Pipework: uPVC pipework as per Irish Water Standards Details and Code of Practice • Below ground drainage: To M&E/ Civil Engineers design and specification • Disposal: To foul water drainage to Civil Engineers design
Required maintenance	Annual Service Inspections to be included as part of Development Planned Preventative Maintenance Programme
Year	Annually
Priority	Medium
Selection process	All equipment to be detailed as part of the detailed design section of the development. This equipment will be selected in conjunction with the design and management team to meet and exceed the CIBSE recommended lifecycles.
Reference	N/A

Water services

Location	All Areas – Residential
Description	Exhaust Air Heat Pump for Domestic Hot Water Copper Water Services Pipework and associated fittings and accessories. • External network pipework: HPDE as per the Irish Water Standard Details and Code of Practice. • Below ground drainage: To M&E/ Civil Engineers design and specification • Water Supply: to Civil Engineers design
Lifecycle	Annual Maintenance / Inspection of EAHP. Annual inspections required for all pipework within landlord areas. Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual Inspections, including legionella testing to be included as part of Development Planned Preventative Maintenance Programme Annual inspection of watermain fittings Annual water pressure tests on proposed hydrants on site.
Year	Annually
Priority	Medium
Selection process	All equipment to be detailed as part of the detailed design section of the development. This equipment will be selected in conjunction with the design and management team to meet and exceed the CIBSE recommended lifecycles.
Reference	N/A

Ventilation services

Location	All Areas – Residential
Description	Mechanical Whole House Extract Ventilation System, Ducting & Grilles (MVHR)
Lifecycle	Annual inspection of Extract Ventilation System and grilles Annual Inspection of operation of fan and boost / setback facility. Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual Service Inspections to be included as part of Development Planned Preventative Maintenance Programme
Year	Annually
Priority	Medium
Selection process	All equipment to be detailed as part of the detailed design section of the development. This equipment will be selected in conjunction with the design and management team to meet and exceed the CIBSE recommended lifecycles.
Reference	N/A

Electrical infrastructure

Location	Switch rooms / Risers
Description	Maintenance of Electrical Switchgear
Lifecycle	Annual Inspection of Electrical Switchgear and switchboards. Thermographic imagining of LV switchgear every 3 years. Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual / Every three years to be included as part of Development Planned Preventative Maintenance Programme
Year	Annually
Priority	High
Selection process	All equipment to meet and exceed ESB, IS 10101:2020, CIBSE recommendations and be code compliant in all cases.
Reference	N/A

Lighting services – internal

Location	All Areas – Residential - Internal
Description	Lighting – LED throughout with Presence detection in circulation areas and locally controlled in apartments.
Lifecycle	Annual Inspection of All Luminaires Quarterly Inspection of Emergency Lighting. Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual / Quarterly Inspections certification as required per above.
Year	Annually / Quarterly
Priority	High
Selection process	All equipment to meet requirements and be in accordance with the current IS 3217:2013 +A1 2017, Part M and DAC Requirements.
Reference	N/A

Lighting services – external

Location	All Areas – Residential – External
Description	Lighting – All LED with Vandal Resistant Diffusers where exposed. Controlled via solar dial timeclock / photocell & manual override.
Lifecycle	Annual Inspection of All Luminaires Quarterly Inspection of Emergency Lighting Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual / Quarterly Inspections certification as required per above remedial works.
Year	Annually / Quarterly
Priority	High
Selection process	All equipment to meet requirements and be in accordance with the current IS 3217:2013+A1 2017, Part M and DAC Requirements.
Reference	N/A

Protective services – fire alarm

Location	All Areas – Residential — Landlord / common areas
Description	Fire alarm
Lifecycle	Quarterly Inspection of panels and testing of devices as per IS 3218:2013 +A1 2019 requirements. Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Annual / Quarterly Inspections certification as required per above
Year	Annually / Quarterly
Priority	High
Selection process	All equipment to meet requirements and be in accordance with the current IS3218 and the Fire Cert
Reference	N/A

Protective services – fire extinguishers

Location	All Areas – Residential – External
Description	Fire Extinguishers and Fire Blankets
Lifecycle	Annual Inspection
Required maintenance	Annual with Replacement of all extinguishers at year 10
Year	Annually
Priority	Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Selection process	All fire extinguishers must meet the requirements of I.S 291:2015 Selection, commissioning, installation, inspection and maintenance of portable fire extinguishers.
Reference	N/A

Protective services – Apartment sprinkler system

Location	All Areas – Residential
Description	Apartment Sprinkler System
Lifecycle	Weekly / Annual Inspection
Required maintenance	Weekly Check of Sprinkler Pumps and plant and annual testing and certification of plant by specialist.
Year	All
Priority	Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Selection process	The Apartment sprinkler system shall be installed in accordance with BS 9251:2005 – Sprinkler Systems for Residential and Domestic Occupancies – Code of Practice Selection process to make reference to BS 9251 2021
Reference	N/A

Protective services – Dry risers

Location	All Areas – Residential
Description	Dry Risers
Lifecycle	Weekly / Annual Inspection
Required maintenance	Visual Weekly Checks of Pipework and Landing Valves with Annual testing and certification by specialist.
Year	All
Priority	Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Selection process	The system shall be installed in accordance with BS 5041 & BS 9999 Selection process to make reference to BS 9990 2015
Reference	N/A

Protective services – Standby Generators

Location	1nr. provided per block, positioned at ground floor level
Description	Standby diesel generators to provide backup supply for life safety systems
Lifecycle	Inspection - Quarterly Cost for replacement equipment to be updated on completion of design matrix of equipment at detailed design stage.
Required maintenance	Run the generator (typically on no-load, verify automatic transfer switch operation). Verify that the unit runs with no alarms or warnings. Ensure adequate fuel levels.
Year	Quarterly / Annually
Priority	Medium
Selection process	The equipment shall meet and exceed the CIBSE Guide M lifecycle expectancies.
Reference	N/A

Fire Fighting Lobby Ventilation (To Fire Consultants Design and Specification)

Location	Common Area Lobby's
Description	Smoke Extract / Exhaust Systems
Lifecycle	Regular Tests of the system Annual inspection of Fans Annual inspection of automatic doors and AVOs All systems to be backed up by life safety systems.
Required maintenance	Annual Service Inspections to be included as part of Development Planned Preventative Maintenance Programme
Year	Weekly / Annually
Priority	Medium
Selection process	All equipment to be detailed as part of the detailed design section of the development. This equipment will be selected in conjunction with the design and management team to meet and exceed the CIBSE recommended lifecycles. Selection process to make reference to TGD-B 2020
Reference	N/A

7. APPENDIX: SERVICE CHARGE BUDGET

St Teresa's Garden Property Management Budget Lines

Sample Service charge budget lines based on Plans for Four Blocks

Service	A Estate Charge	B Arts/Retail/Community Space Charge	C Apt Charge	D Undercroft Car Park and Bike Stores Charge	TOTALS
Sinking Fund	50,000	10,000	300,000		**360,000**
Insurance	300000		0	30,000	**330,000**
Electricity	20,000	0	80,000	4,991	**104,991**
Lift Maint			50,000		**50,000**
Lift Insurance			12000		**12,000**
Telephone Lifts			6000		**6,000**
Cleaning/Janatorial	50,000		80,000	20,000	**150,000**
Security and Access Control	80,000	10,000	40,000	1,000	**131,000**
Gulley Cleaning/Water Pump Maintenan	1,500			2,300	**3,800**
Landscaping	100,000	0	0		**100,000**
Landscaping Planting		500	1,000		**1,500**
Repair & Maintenance	70,000	1,000	100,000		**171,000**
Fire System Maintenance	10,000	5,000	90000	5,000	**110,000**
AOV Maintenance	5000			15,000	**20,000**
Emergency Lighting Maintenance	5000	3,000	10,000	5,000	**23,000**
24 hour on call service	40,000				**40,000**
Gate/Barrier Maintenance				10,000	**10,000**
Refuse			240000		**240,000**
Provision for Hardware			1800		**1,800**
CCTV/Access control/Satellite TV/	5000	2,000	80,000	20,000	**107,000**
Vermin Control	10000				**10,000**
Sundry	5,000		3000	2,500	**10,500**
Bank Fees	6,000		2500		**8,500**
Legal/Professional Fees	5000				**5,000**
Audit Fees	10,000				**10,000**
Annual Reports	2,000				**2,000**
Company Secretarial Admin	5000				**5,000**
Managing Agents Fees (Incl VAT)	90,000			10,000	**100,000**
	€869,500	**€31,500**	**€1,096,300**	**€125,791**	**€2,123,091**

N.B This budget is designed to illustrate the overall approach. Detailed budget lines and costs can only be produced post planning when specifications and finishes are confirmed and final detailed designs are completed.

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