

The Donore Project

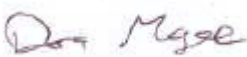



Part 10 Application
Infrastructure Report

The Land Development Agency

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

28 November 2022

Quality information

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Revision History

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

Distribution List

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10	Yes	Dublin City Council

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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).

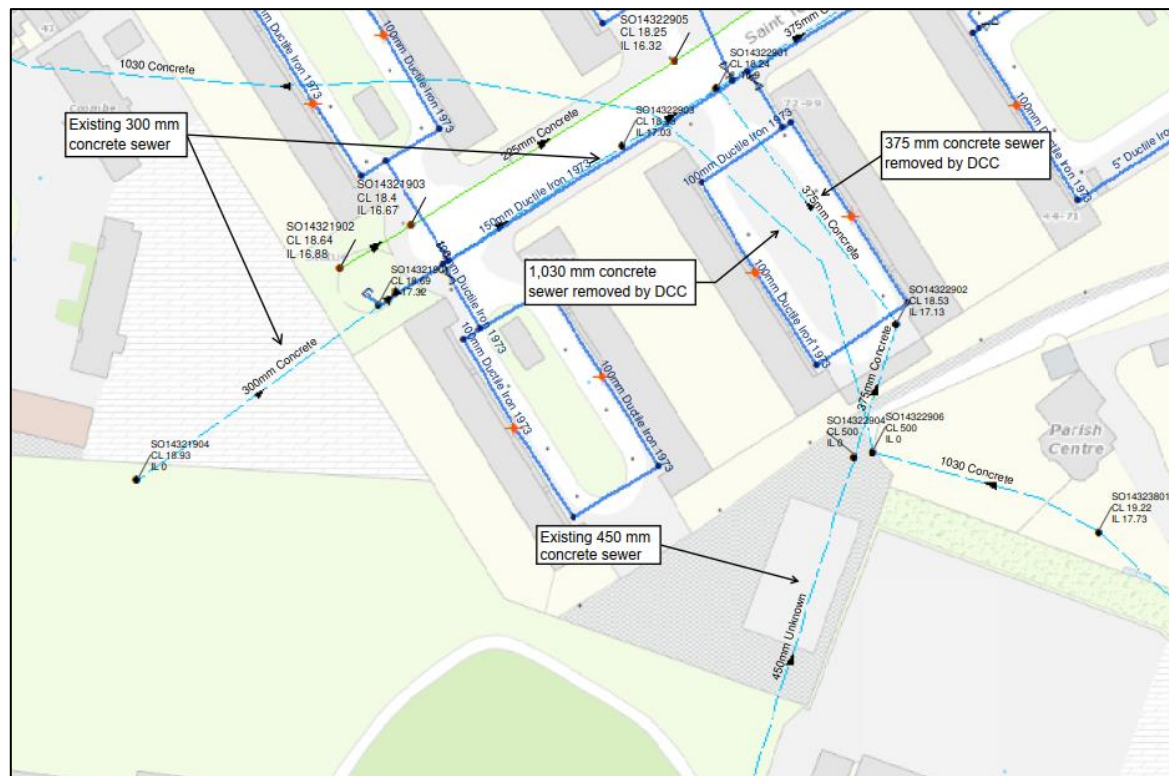
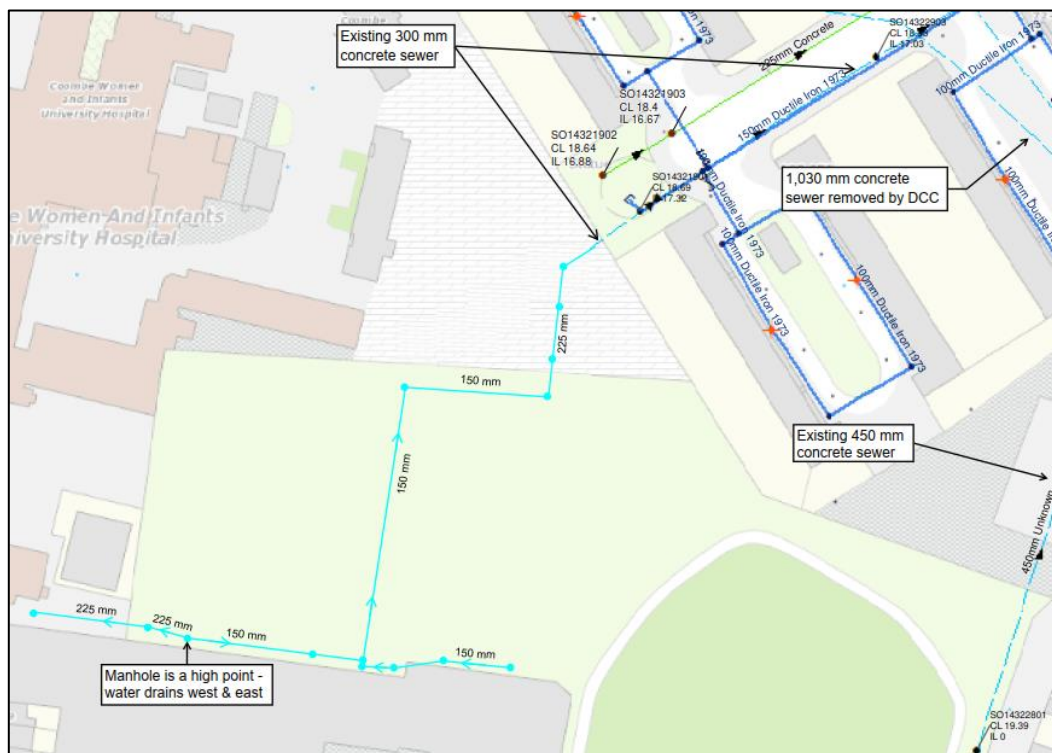


Figure 4.1: Surface Water sewers recorded within the Donore Project Site

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.

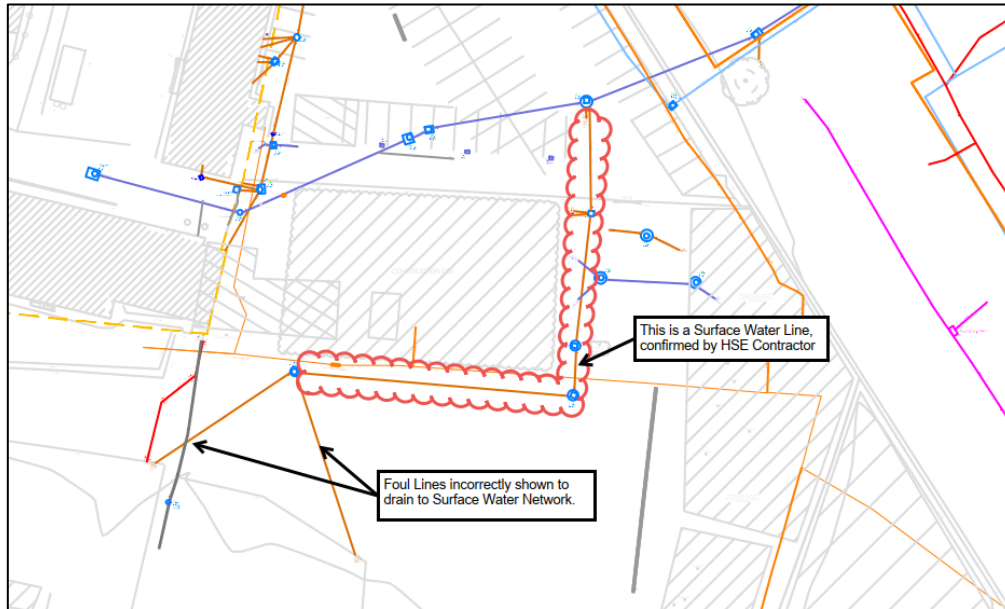


Figure 4.3: Corrections to Utility Survey, confirmed by HSE Contractor

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.

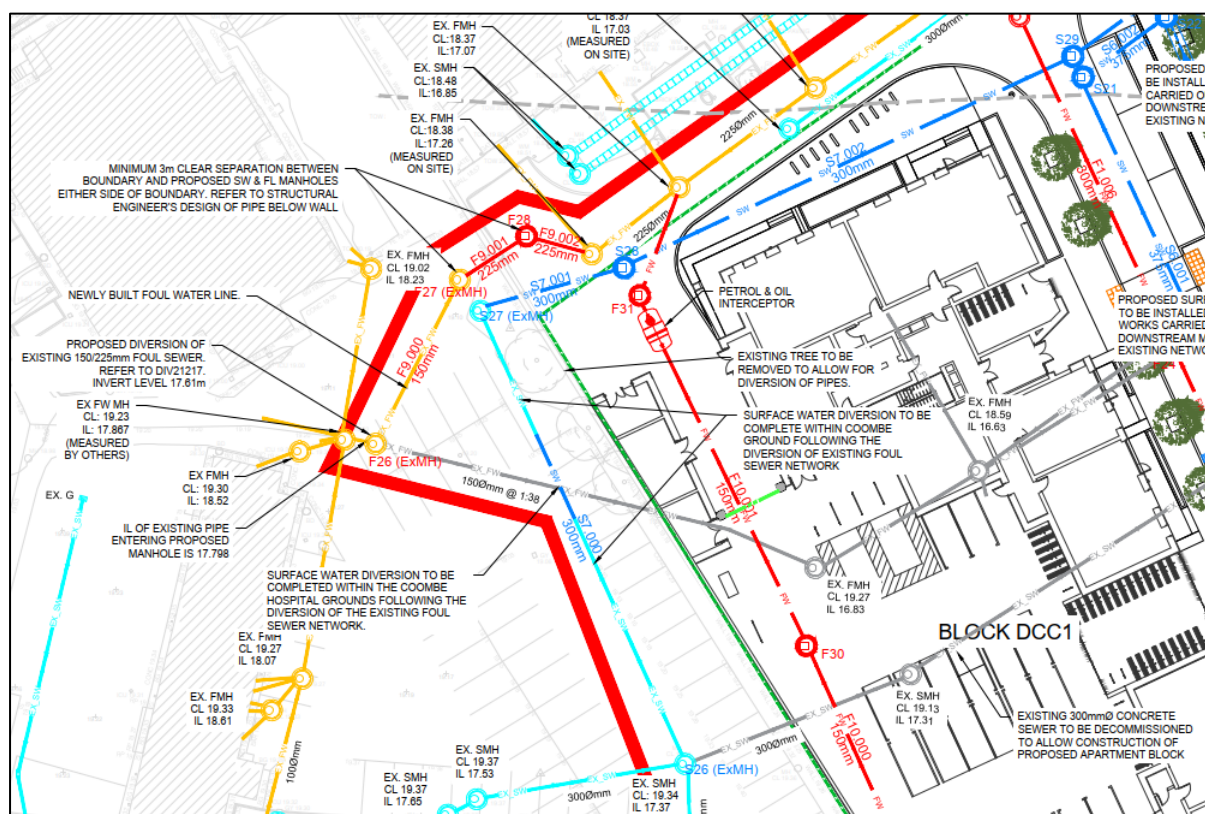


Figure 4.4: Proposed Wastewater & Surface Water Diversions

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:

$$Q_{\text{bar}_{\text{rural}}} \text{ (in m}^3 \text{ /s)} = 0.00108 \times (0.01 \times \text{AREA})^{0.89} \times \text{SAAR}^{1.17} \times \text{SPR}^{2.17}$$

where:

- $Q_{\text{bar}_{\text{rural}}}$ 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, $Q_{\text{bar}_{\text{rural}}}$ for a 50ha site has been calculated as follows:

$$Q_{\text{bar}_{\text{rural}}} \text{ (for a 50ha site)} = 0.00108 \times (0.01 \times 50)^{0.89} \times 721^{1.17} \times 0.45^{2.17}$$

$$\begin{aligned} Q_{\text{bar}_{\text{rural}}} \text{ (for a 50ha site)} &= 0.22738 \text{ m}^3 \text{ /s} \\ &= 227.385 \text{ l/s} \end{aligned}$$

Interpolating linearly, this corresponds with a Q_{bar} 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 m³. 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.	<p>Runoff from the site will be restricted to a maximum of 9.8 l/s.</p> <p>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.</p> <p>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.</p> <p>Refer to Appendix I for surface water network calculations.</p>
	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.	<p>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.</p> <p>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.</p> <p>Runoff is directed towards SuDS features where possible.</p>
	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	<p>No flooding of adjacent urban areas.</p> <p>Overland flooding managed within the development.</p>	<p>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.</p> <p>Refer to AECOM drawing no. 60639703-ACM-00-00-DR-CE-10-0550 for the overland flood routing.</p>
Criterion 4 River Flood Protection (Criterion 4.1, or 4.2 or 4.3 to be applied)	4.1	100	<p>"Long-term" floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume.</p> <p>Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only.</p> <p>100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff.</p>	<p>This sub-criterion is not applied. Only one of the three sub-criteria is required to be applied.</p>
	4.2	100	<p>Infiltration storage provided equal in volume to "long term" storage. Usually designed to operate for all events.</p> <p>100year, 6 hour duration storm to be used for assessment of the additional volume of runoff.</p>	<p>This sub-criterion is not applied. Only one of the three sub-criteria is required to be applied.</p>
	4.3	100	<p>Maximum discharge rate of Q_{bar} or 2 l/s/ha, whichever is the greater, for all attenuation storage where separate "long term" storage cannot be provided.</p>	<p>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.</p> <p>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.</p>

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.

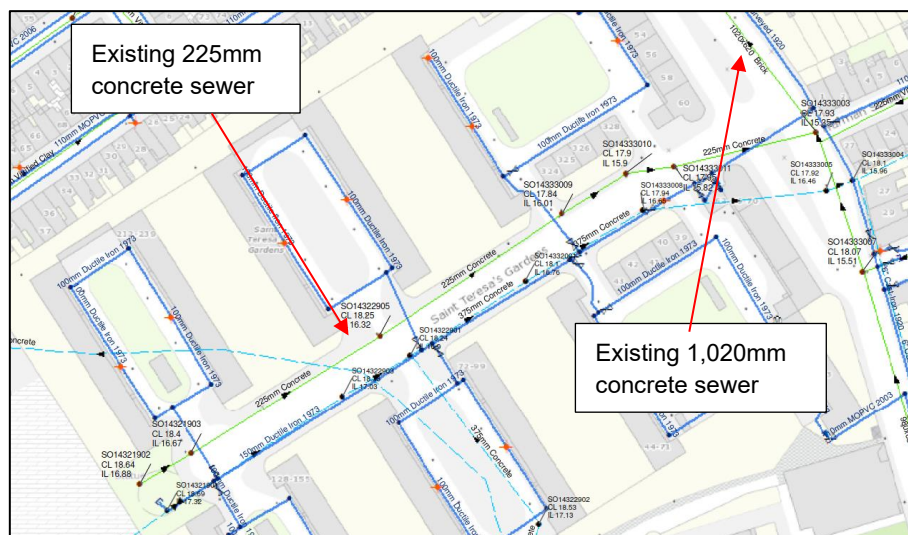


Figure 5.1: Existing Irish Water Foul Water Records

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 m² based on a food superstore in 'Employment Densities Guide' published by Drivers Jonas Deloitte.

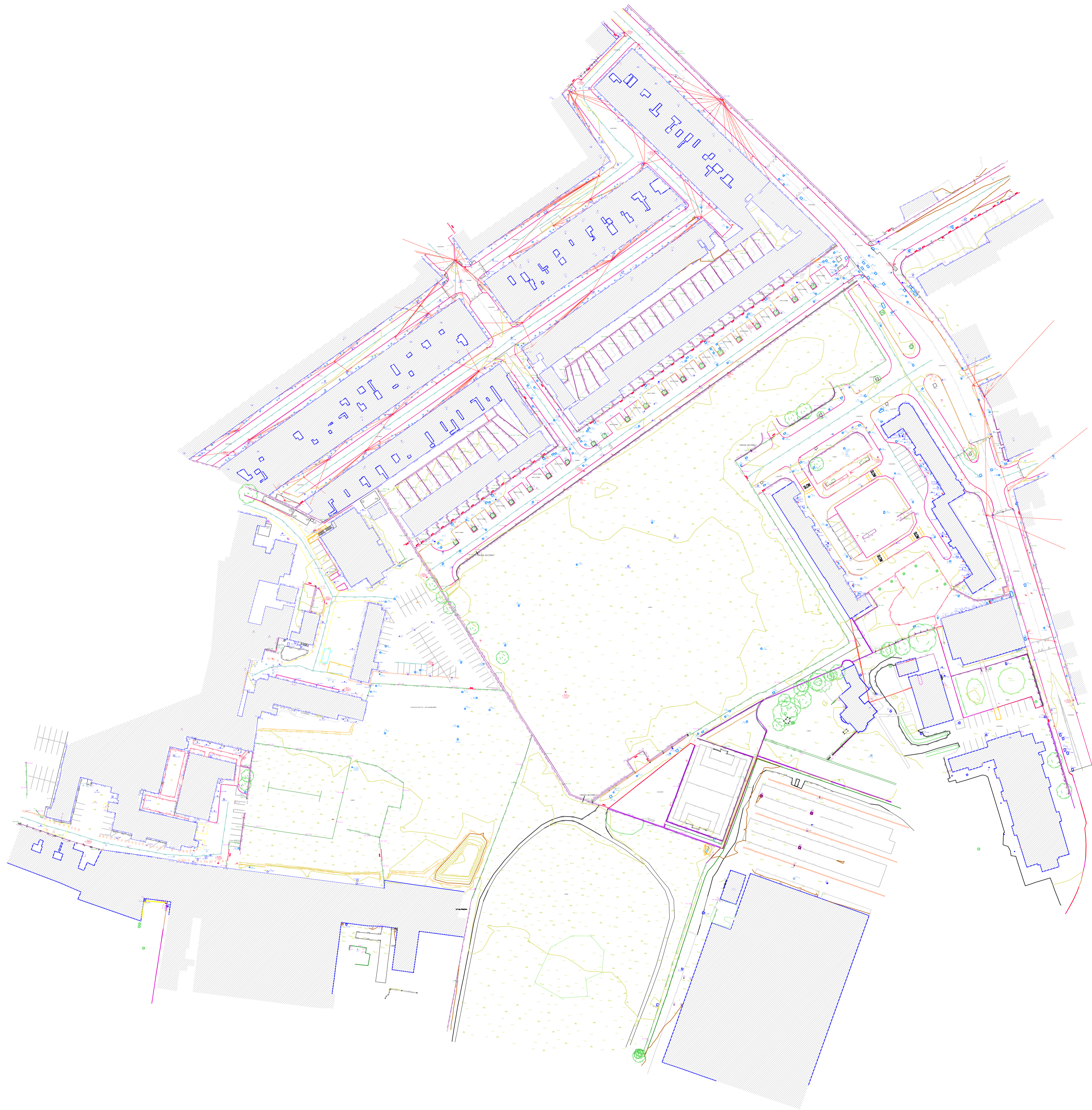
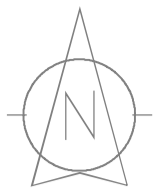
The watermain and drainage layouts have been designed to allow planting where possible. Proposed planting should be designed in accordance with Irish Water standard details STD-WW-06A and STD-W-12A (wastewater and watermain respectively).

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			

Natural Features			

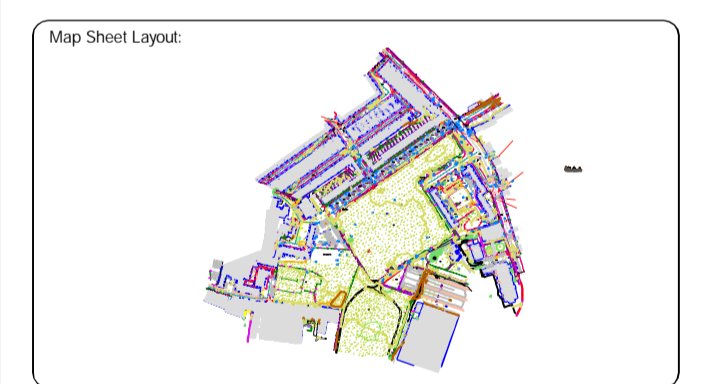
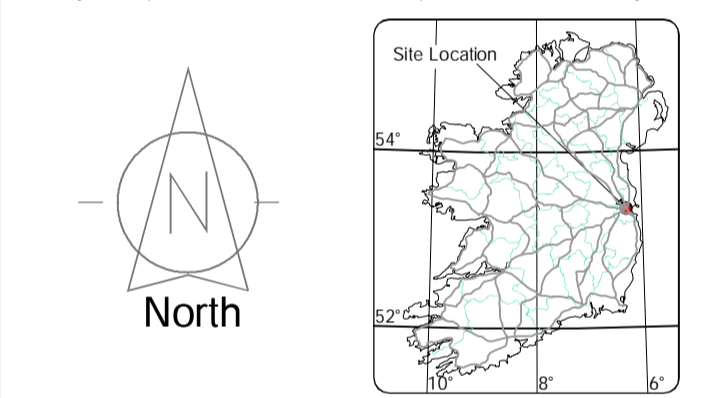
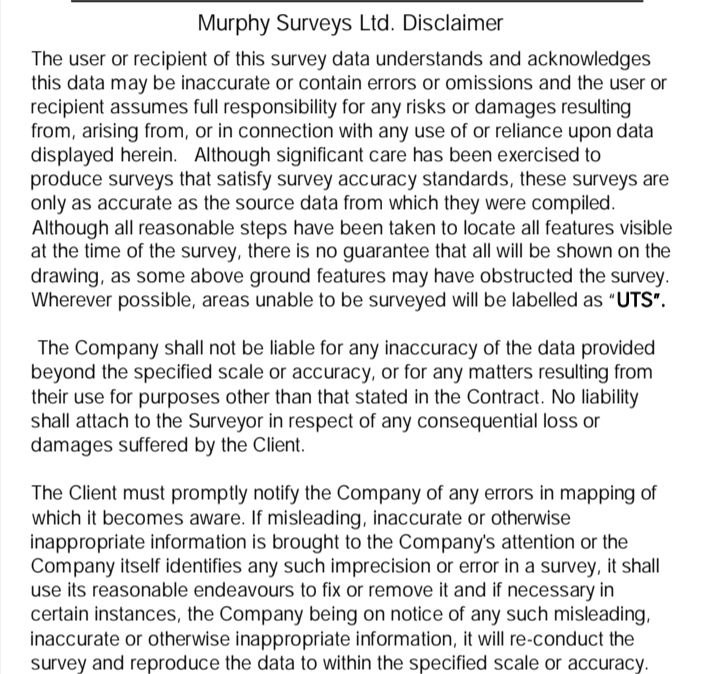
Built Features			
Roads & Road Markings			

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Surveyed by: MC	Date: 25.04.2021	Datum: Main Head
Drawn by: MC	Date: 20.05.2021	Grid System: Irish National Grid
Checked by: PK	Date: 21.05.2021	Irish National Grid: 11M
Revisions		
No.	Date	Description
0	21.05.2021	First Drawing
1	08.07.2021	Missing features and Spot Levels added.



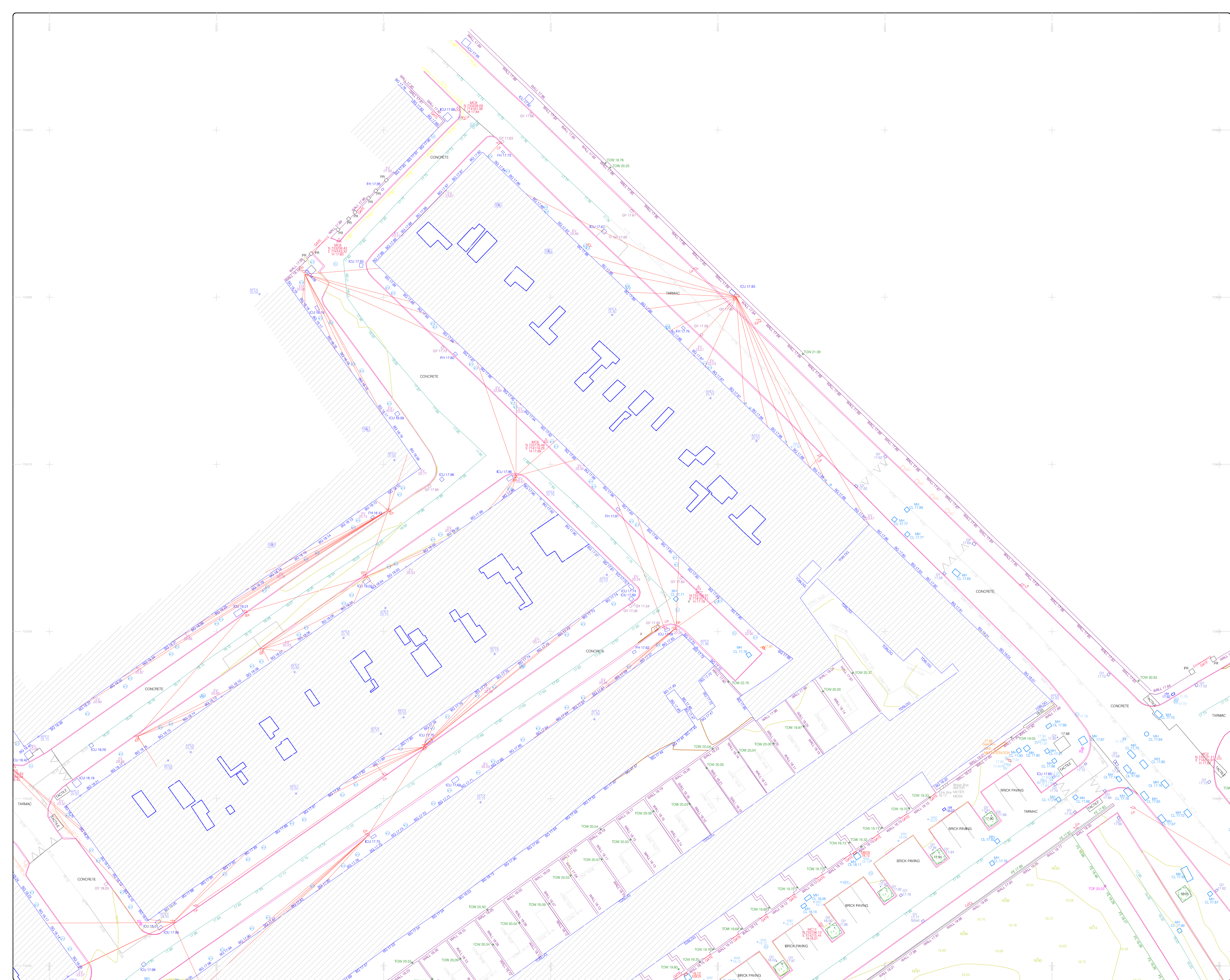
Topographic surveys, Measured Building Surveys, Setting Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping, Pipeline Surveys, Services Location, Ground Penetrating Radar, Laser Scanning, Rectified Photography

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Client :		AECOM	
Project :		Topo & GPR St Theresa's Gardens	
Date :	21.05.2021	Scale :	NTS
Description :		Topographical Survey	
Drawing Number :	MGL39995_T_ITM_Rev1-00		
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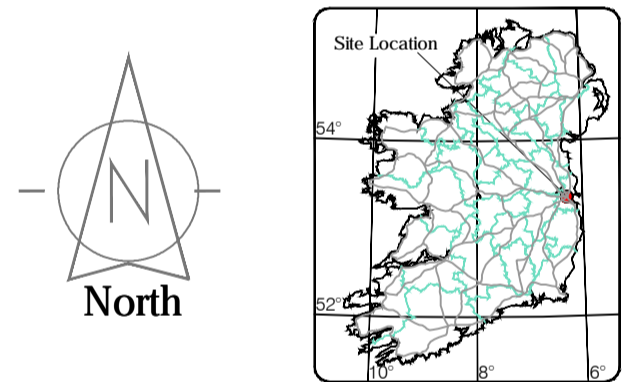
LEGEND			
Street furniture & Services			
	Over Head Wires (LIAS)	Pylon ESB	Road Signs Phone Box
	Flourescent	BS	Bus Stop
	Gas Valve	HT/C	Tram
	LI	HT/C	Beacon
	Banker	CH	Coalhole Cover
	UMP	HT/C	Bore Hole
	Tri-P	HT/C	Electricity Pole
	Bus/Tram Shelter	TP	Telephone pole
	Position	OCSC	OCPS Pole
	Valve - General	OCSC	CC Camera Pole
	Water Valve	TP	Lamp Post
	Gas Valve	TP	Post Meter
	Skate Valve	TP	Surface Water Meter
	Air Valve	TP	Manholes
	Stop Clock	AC	Air Conditioning Units
	C/P Post	KV	Services Inspection Cover
	Muster Post	KV	Traffic Inspection Cover
	Traffic Light	KV	CB Traffic Inspection Cover
	Parking Meter	KV	ESAT Inspection Cover
	Plant Area Mark	KV	Non Inspection Cover
	Smart Card Valuation	KV	TP
	Unknown Valve	KV	Rodding Eye
Natural Features			
	Surface Change	+W/L	Water Level
	Land Drain	+CRN	Crown Level
	Bottom of Slope	+L	Invert level
	Top of Slope	+BL	Bed Level
	Ditch	+S	Spotheight
	Water Edge / Land / Pond		
	Hedge / Trees Dip / Land / Vegetation		
	Trees Crossfence		
Golf			
	Surface Change	+W/L	Water Level
	Land Drain	+CRN	Crown Level
	Bottom of Slope	+L	Invert level
	Top of Slope	+BL	Bed Level
	Ditch	+S	Spotheight
	Water Edge / Land / Pond		
	Hedge / Trees Dip / Land / Vegetation		
	Trees Crossfence		
Other			
	Survey Station		
	Photo point		
Build Features			
Roads & Road Markings			
	Building		Fence
	Edge of Road		Gate
	Keo Bottom		Road Centreline
	Keo Top		Top of Wall
	Bridge Abutment		Hoarding
	Bridge Deck		Property Line
	Bridge Pier/Support		Street Furniture
	Street Furniture		Top of Fence
	Pier/Support / Platform / Ties / Tunnel		Wall / Retaining Wall
	Pump / Pond / Cover / Verge		Railway / Train Rail / Guttering / Ramp
	Bridge / Pier / Wall / Gate / Pier / LIAS / Trackbed		Building Canyon / Road / Overhang
	Cycleway / Private Landscaping Area		

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Map Sheet Layout:

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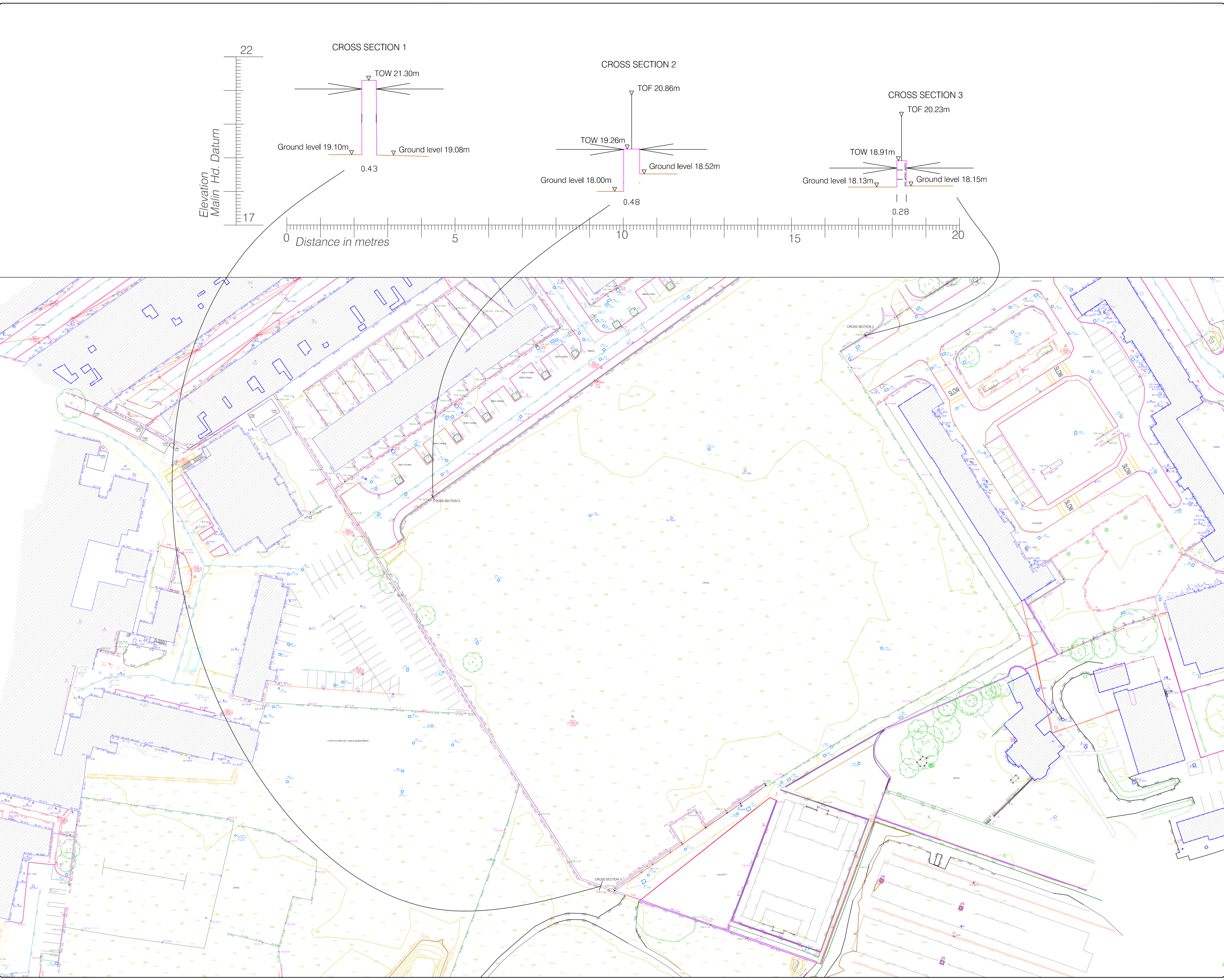
Topographic surveys, Measured Building Surveys,
Setting-Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping,
Pipeline Surveys, Services Location, Ground Penetrating Radar,
Laser Scanning, Rectified Photography

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Client :	
AECOM	
Project : Topo & GPR St Theresa's Gardens	
Date : 21.05.2021	Scale : 1:250@A1
Description : Topographical Survey	
Drawing Number : MGL39995_T_ITM Rev1-01	
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LEGEND

Street furniture & Services

Over Head Wires (LUAS) - Pylon ESB

Bin

Pipe

Light

Barrier

Pump

Tidal Pit

Bus/Train Shelter

Postbox

Valve - General

Water Valve

Gas Valve

Shut-off Valve

Air Valve

Stop Cock

C/P Post

Marker Post

Traffic Light

Parking Meter

Plane Aerial Mark

Smart Card Valves

Unknown Valve

Bus Stop

Roller

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

Falcon Inspection Cover

Bodding Eye

Road Sign

Beach Seat

Kiosk

Gully

UG Car Park

UG Car Park

Waste Bin

Hydrant

Fire Hydrant

ESB Box

ESB Inspection Cover

Traffic Control Box

LUAS Technical Cabinet

Ticket Vending Machine

Water Meter Cover

Telecom Inspection Cover

Monument / Totals

Tank Storage

Basement: Mtl. Cover & Pipe

Disposal Aerial Mark

Stop 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 Confensus

Water Level

Crown Level

Invert level

Bed Level

Spotheight

Fair Way

Green

Tee Box

Other

Survey Station

Photo point

Built Features

Roads & Road Markings

Fence

Gate

Road Centreline

Top of Wall

Hoarding

Bridge Deck

Bridge Pier

Scoring / Platform

Damp Proof Course / Verge

Bridge Pier / Wall & Gate Pillar / LUAS Trackbed

Cyclway / Private Landing Area

Floor Level

Apex Height

Eaves Height

Panopt Height

Soft Elevation

Step Level

Concrete Pad

Track

Wall / Retaining Wall

Railway / Train Rail / Gearing / Ramp

Building Canopy / Road / Overhang

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Map Sheet Layout

Site Location

Reviewed by: MC

Date: 25.04.2021

Datum: Malin Head

Drawn by: MC

Date: 20.05.2021

Grid System: Irish National Grid

Checked by: PK

Date: 21.05.2021

Revisions

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

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Murphy

GEOSPATIAL

Topographic surveys, Measured Building Surveys, Setting Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping, Pipeline Surveys, Service 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 :

1:50@A1

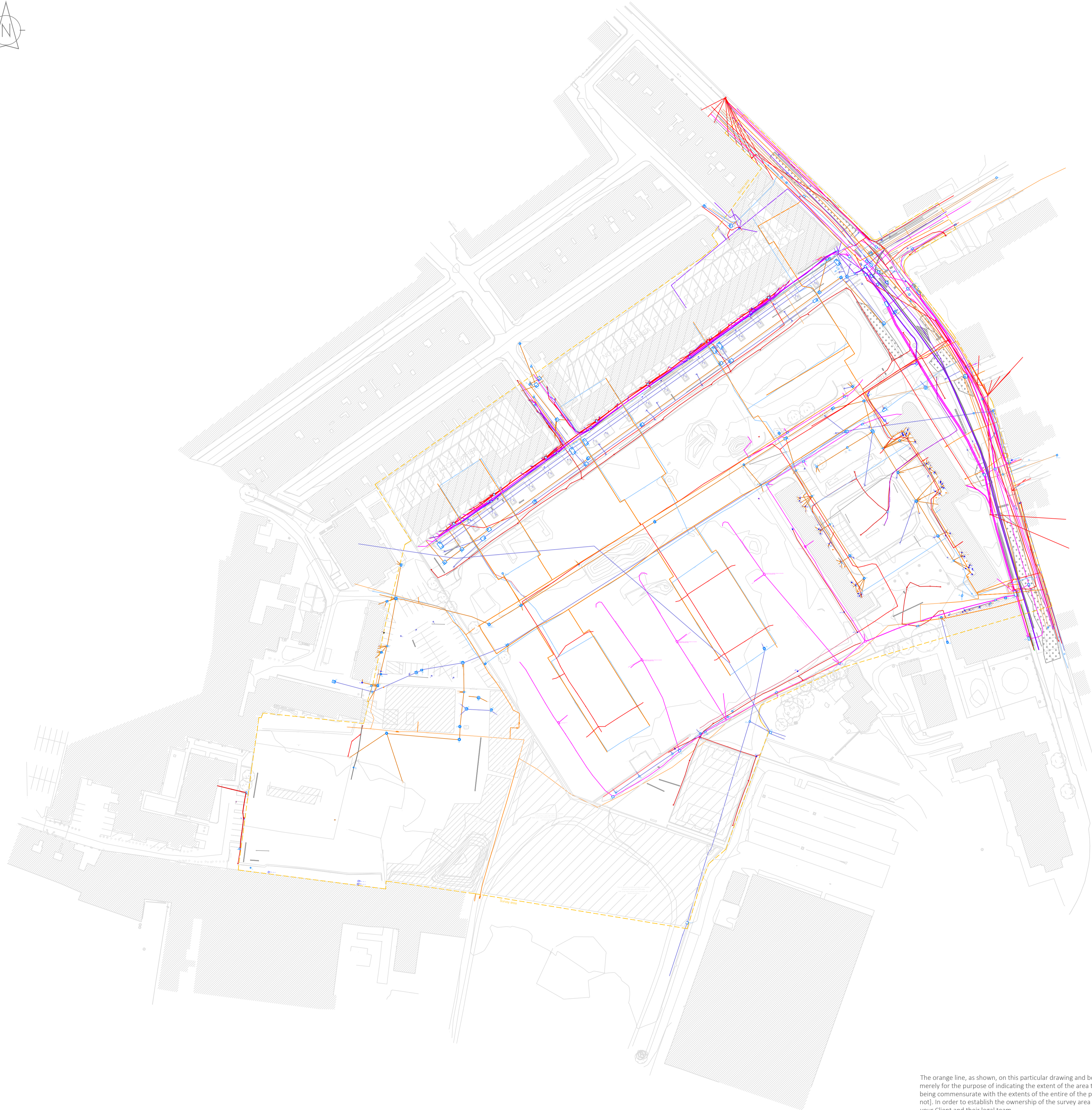
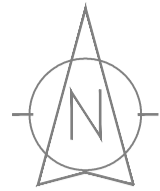
Description :

Typical wall sections

Drawing Number :

MGL39995_T_ITM_Rev1-02

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LEGEND	
Underground Utilities	
Water Main	Gas
Fire Water	Hydrogen Pipe
Process Water	Oil Pipe
Storm Water Drainage	Magnet
Road Sewer	Asphalt
Combined Sewer	Traffic
Manhole Chamber	Heating Pipe
Eicrom	Electrical
NTU/Origin	Public Lighting
ENET/OCEAN	GPR Anomaly
BT/ESAT	Unknown Cable Duct
Cell	Unknown Empty Duct
Aurora	Nitrogen Pipe
Bend / Weld	Undetected Service
Oxygen Pipe	Undetected Radio Signal
Weld Point	Undetected Power Signal
Reinforced Concrete (GPR)	Photo point
Other observations - see description (GPR)	Possible Slab (GPR)

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 R04000 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 +/- 100mm 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 the 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.

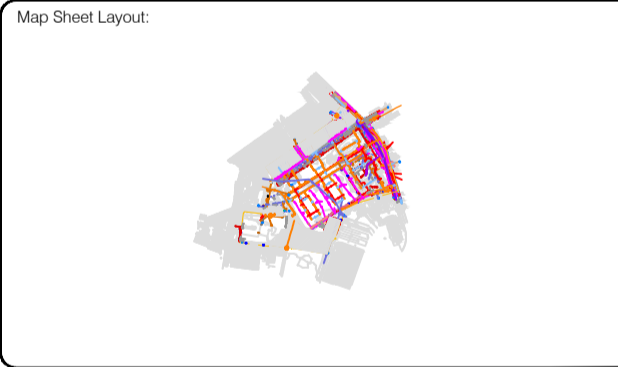
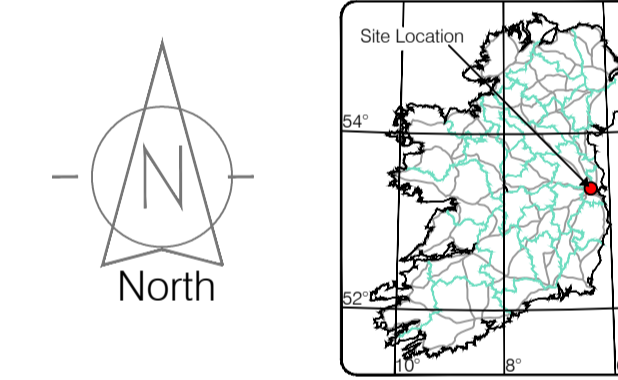
Where Murphy Geospatial Limited issues a CAD drawn utility service plan, this should be read in conjunction with all available public utility records etc. As part of our exhaustive Quality Control procedures, Murphy Geospatial Limited Endeavour to add relevant Public Utility record information onto the 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).
- Not 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 defective 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).



Surveyed by	MS	Date:	May 2021	Datum:	Main Head
Drawn by	AB, DS	Date:	27.09.2021	Grid System:	Irish National Grid
Checked by	DS	Date:	27.09.2021		

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



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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		

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.

Appendix B – Irish Water Confirmation of Feasibility

AECOM / Neil Byrne
4th Floor Adelphi Plaza
Upper George St, 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

1 October 2021

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

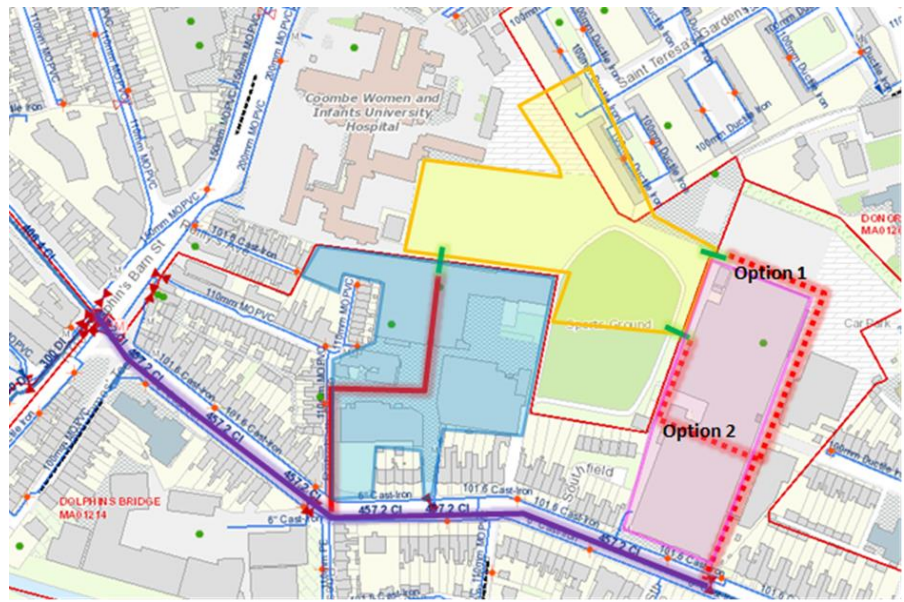
Connection for Housing Development of 750 units at St Teresa's Gardens, Donore Avenue, Dublin 8, Dublin

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 <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible Subject to upgrades
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	<p>The proposed connections are via adjacent developments (Bailey Gibson and Player Willis Sits) within St. Theresa's Garden Redevelopment Area. All 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.</p> <p>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.</p>

Additionally, 18" CI trunk main in Sth. Circular Road has to be upgraded to 450/500mm ID main (seen below in purple)



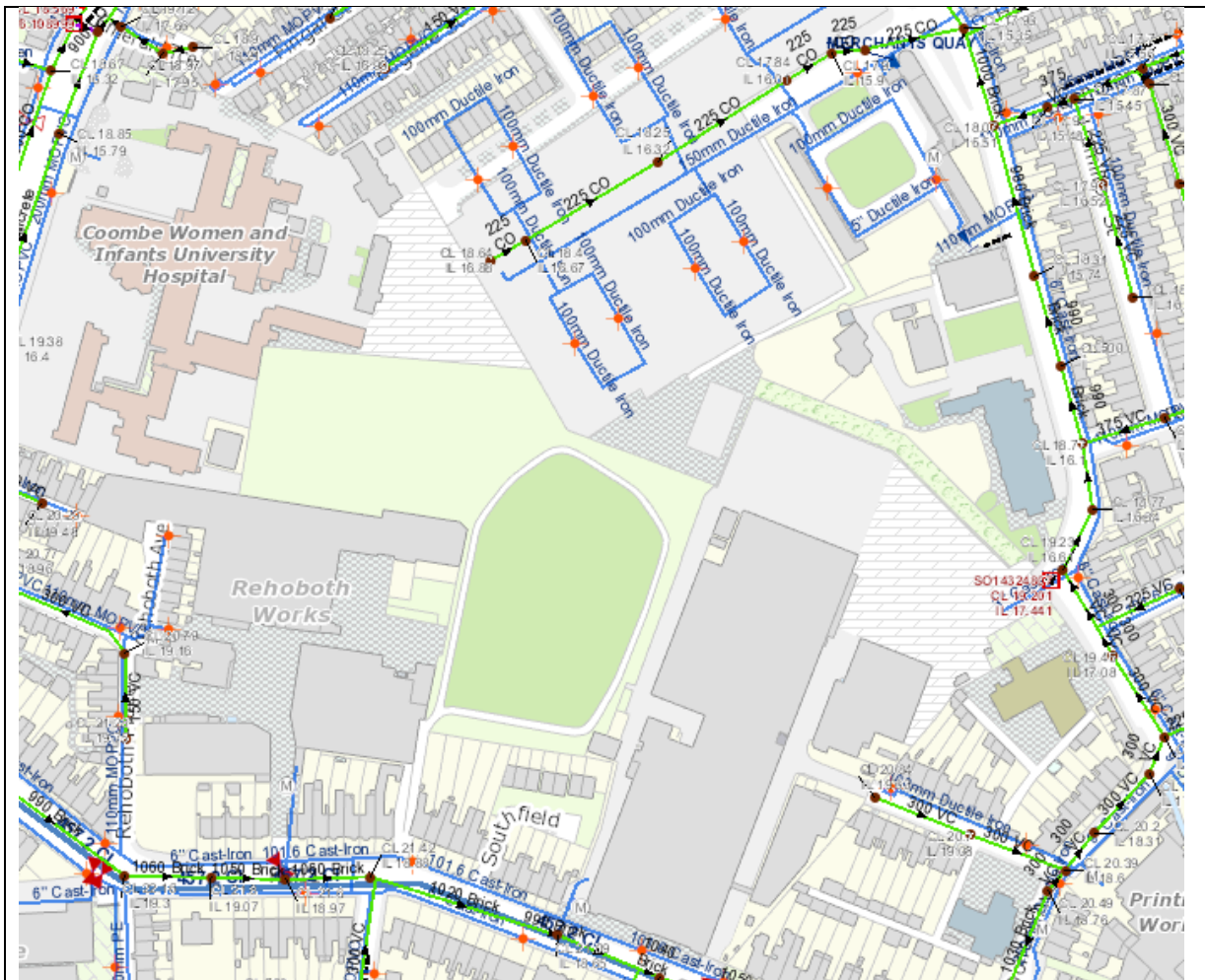
Wastewater Connection

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) within St. Theresa's Garden Redevelopment Area. All relevant core 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.

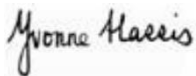
General Notes:

- 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@aeacom.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

CAUTION: This email originated from outside of your organisation. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

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/).

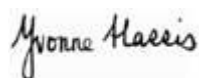
You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development 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
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.







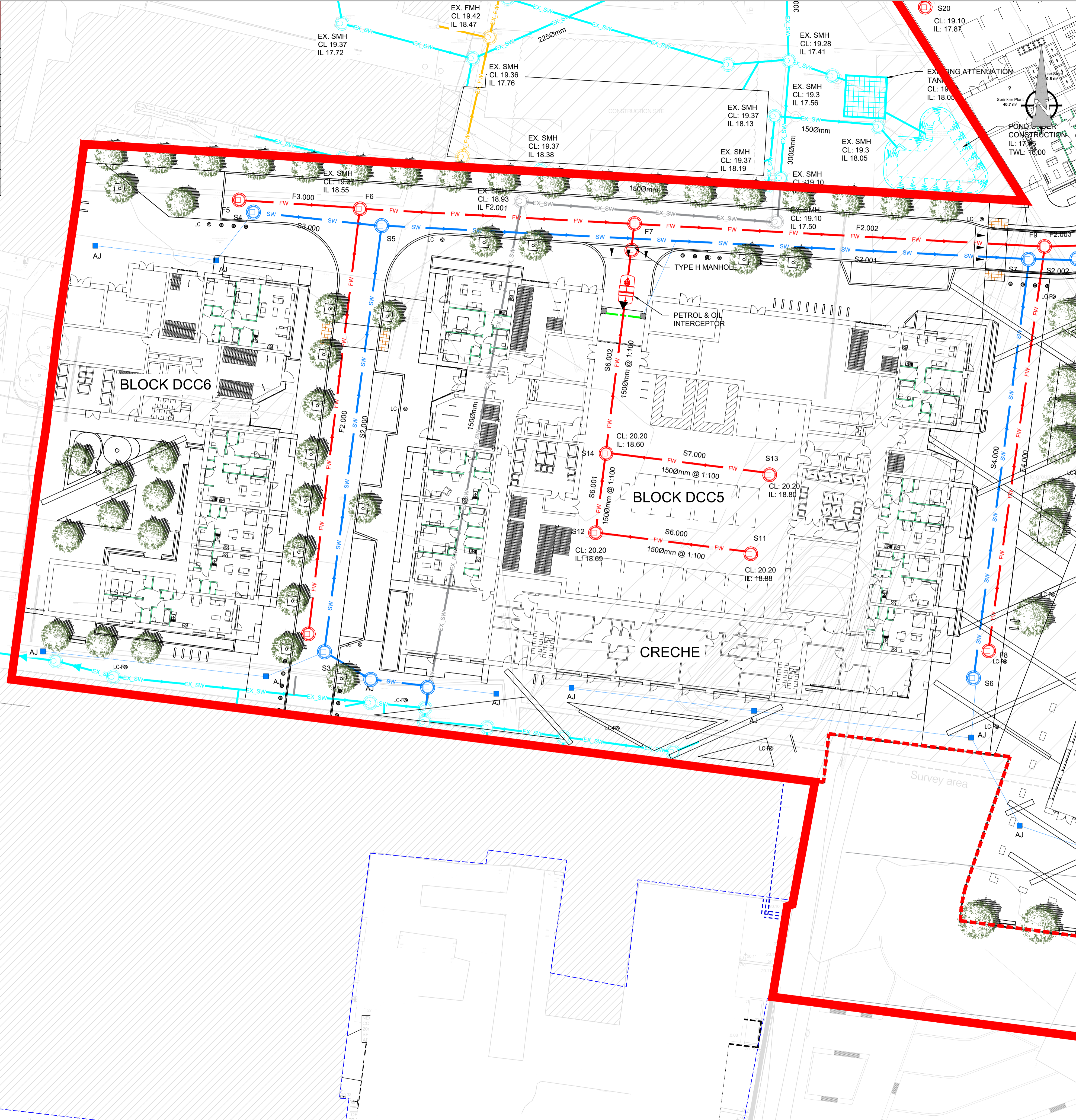
ISO A1 594mm x 841mm

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	5.309	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	16.240	300	1.840
F2.009	F17	19.819	0.120	165.2	15.790	15.670	16.340	300	2.250
F2.010	F18	14.593	0.049	300.0	15.670	15.621	16.300	300	2.330

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

Last saved by: PHIL GRUNDY(2022-06-30) Last Plotted: 2022-06-30
Filename: \\NA-AECOM\NET.COM\FS\EMEAD\BUBLIN\EDBL2\LEGACY\IEDBL2\FP001\DATA\DCS\PROJECTS\BP60648061_LDA_STG_TERESAS\000_CAD_GIS\04_CEO1_WIP\02_SHEETS\STAGE 1B - STANDALONE APPLICATION\STG-AEC-S1b-00-00-DR-C-0000500 - 0502_DRAINAGE\LAYOUT.DWG

LEGEND:	
PROPOSED SURFACE WATER.....	SW
PROPOSED FOUL WATER.....	FW
EXISTING FOUL WATER.....	EX_FW
EXISTING COMBINED SEWER.....	EX_ST_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
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).....	



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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

- 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.
- ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
- DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- DO NOT SCALE. ALL MEASUREMENTS AND COORDINATES TO BE CHECKED ON SITE.
- THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
- 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.
- GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
- EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
- 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.
- ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
- 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.
- 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.
- ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
- 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

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
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60648061

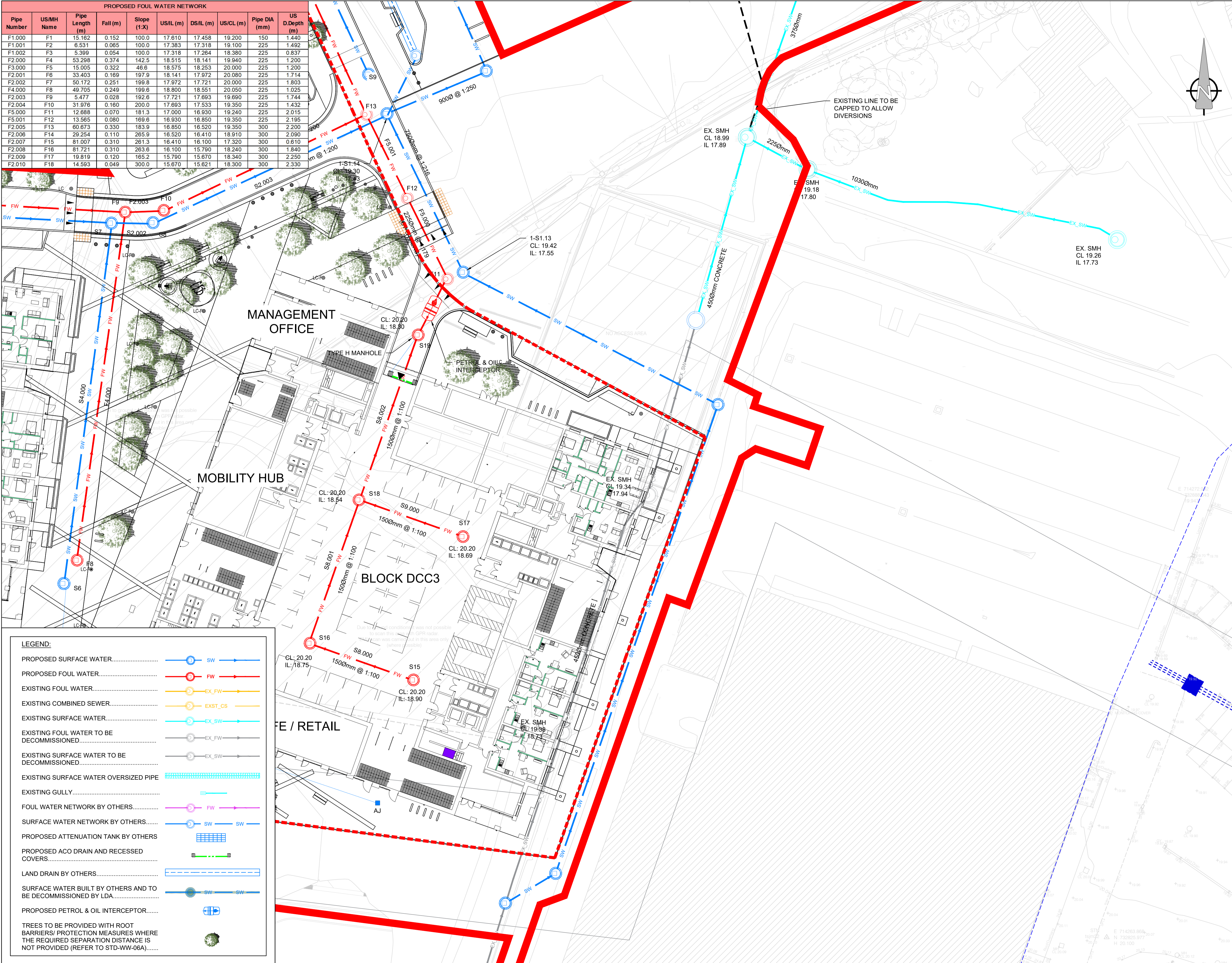
SHEET TITLE

PROPOSED DRAINAGE LAYOUT
SHEET 3 OF 4


















SHEET NUMBER

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

Pipe Number	US/MH Name	Pipe Length (m)	Fall (m)	Slope (1:X)	US/L (m)	DS/L (m)	US/CL (m)	Pipe DIA (mm)	US D.Depth (m)
F1000	F1	15.162	0.152	100.0	17.610	17.458	19.200	150	1.440
F1001	F2	6.531	0.085	100.0	17.383	17.318	19.100	225	1.492
F1002	F3	5.399	0.054	100.0	17.318	17.264	18.380	225	0.837
F2000	F2	53.298	0.374	146.5	18.515	18.171	19.840	225	1.740
F3000	F5	15.005	0.322	166.8	18.575	18.253	20.000	225	1.714
F2001	F6	33.043	0.169	197.9	18.141	17.972	20.080	225	1.700
F2002	F7	50.172	0.251	199.8	18.972	17.721	20.000	225	1.803
F4000	F8	49.705	0.249	199.6	18.800	18.551	20.050	225	1.025
F2003	F9	5.477	0.028	192.6	17.721	17.693	19.690	225	1.744
F2004	F10	31.976	0.160	200.0	17.693	17.533	19.350	225	1.432
F5000	F11	12.888	0.070	181.3	17.000	16.930	19.240	225	2.015
F5001	F12	15.583	0.080	186.8	16.930	16.850	19.350	225	2.156
F5002	F13	80.673	0.330	183.9	18.851	18.620	19.350	300	2.200
F2006	F14	29.254	0.110	265.9	16.520	16.410	18.910	300	2.090
F2007	F15	81.007	0.310	261.3	16.410	16.100	17.320	300	0.810
F2008	F16	81.721	0.310	263.6	16.100	15.790	18.240	300	1.840
F2009	F17	19.819	0.120	165.2	15.790	15.670	18.340	300	2.250
F2010	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
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
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: 1:25

ORDNANCE SURVEY IRELAND LICENCE NO **CYAL50217544**
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PROJECT

THE DONORE PROJECT,
DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

AECOM
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George's Street Upper,
Dun Laoghaire,
Co Dublin
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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 & PIPES LESS THAN 1.2m BELOW GROUND 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 IN ACCORDANCE WITH BS EN 12620.
11. ATTENTION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
12. CCTV SURVEY TO BE CONDUCTED PRIOR TO COMMENCEMENT OF ANY WORK TO DETERMINE THE CONDITION AND VERIFY LEVELS OF THE EXISTING FOUL AND SURFACE WATER PIPES/MANHOLE 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.



ISSUE/REVISION

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
I/R	DATE	DESCRIPTION

PROJECT NUMBER

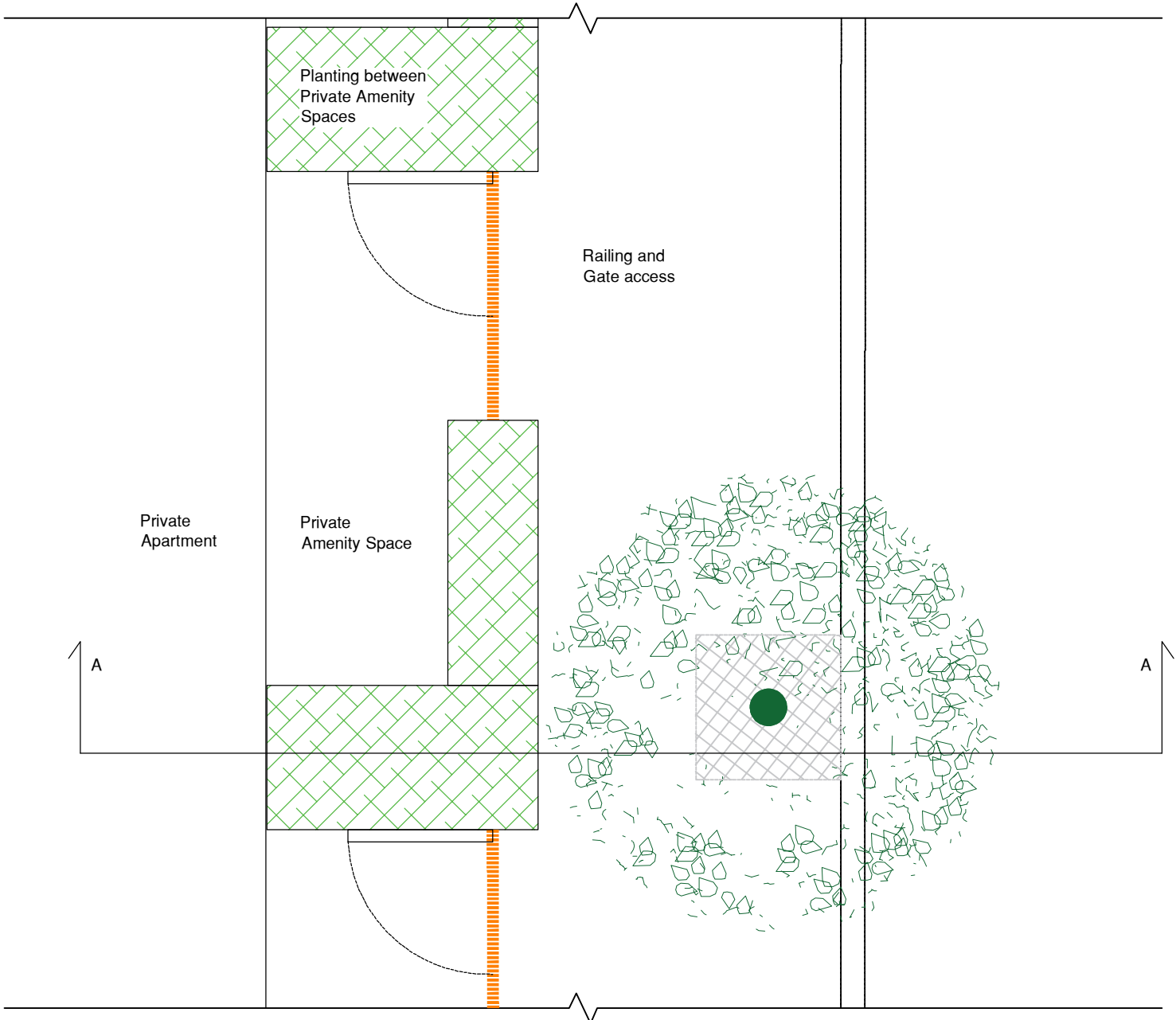
60648061

SHEET TITLE

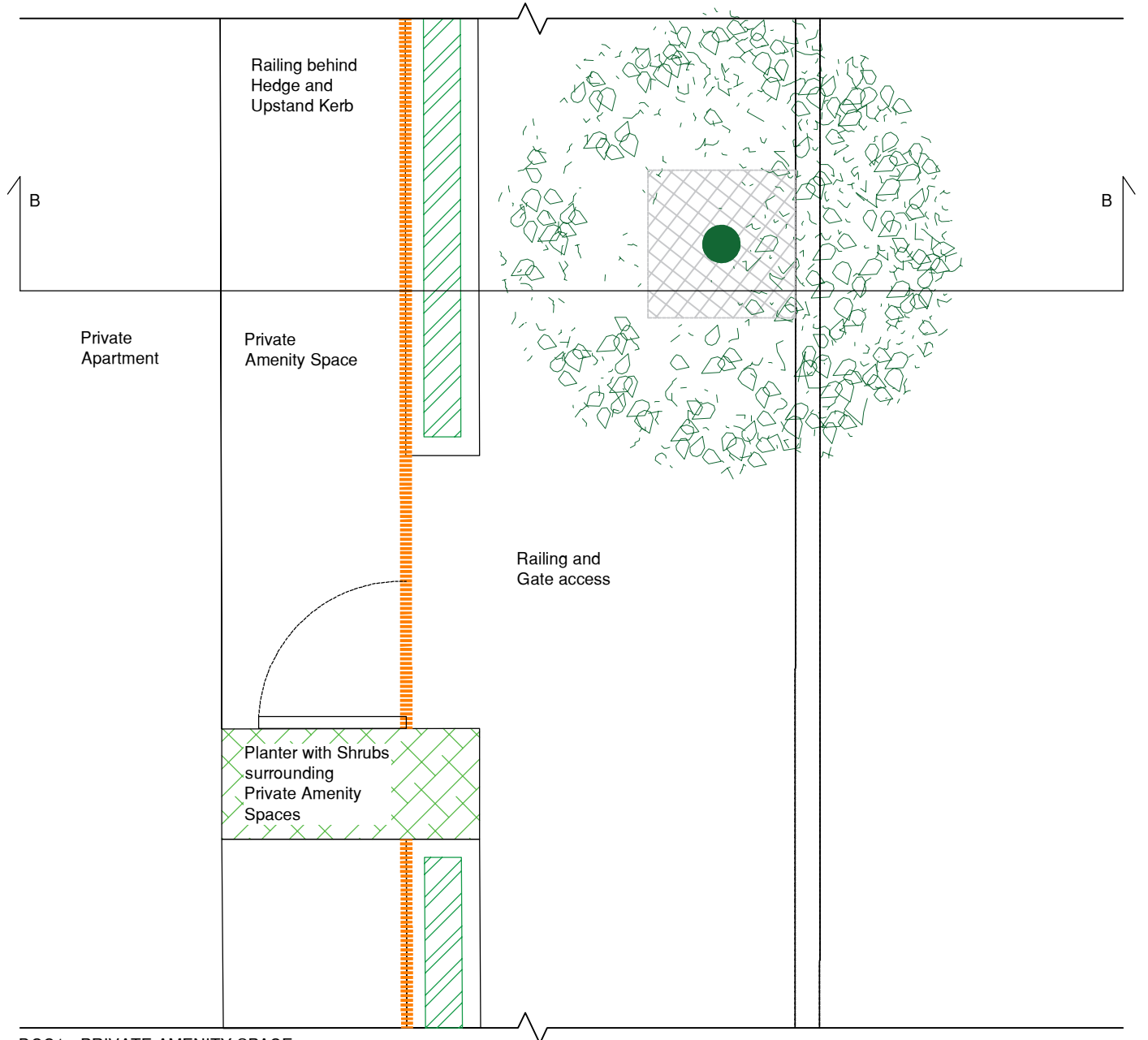
PROPOSED DRAINAGE LAYOUT
SHEET 4 OF 4

SHEET NUMBER

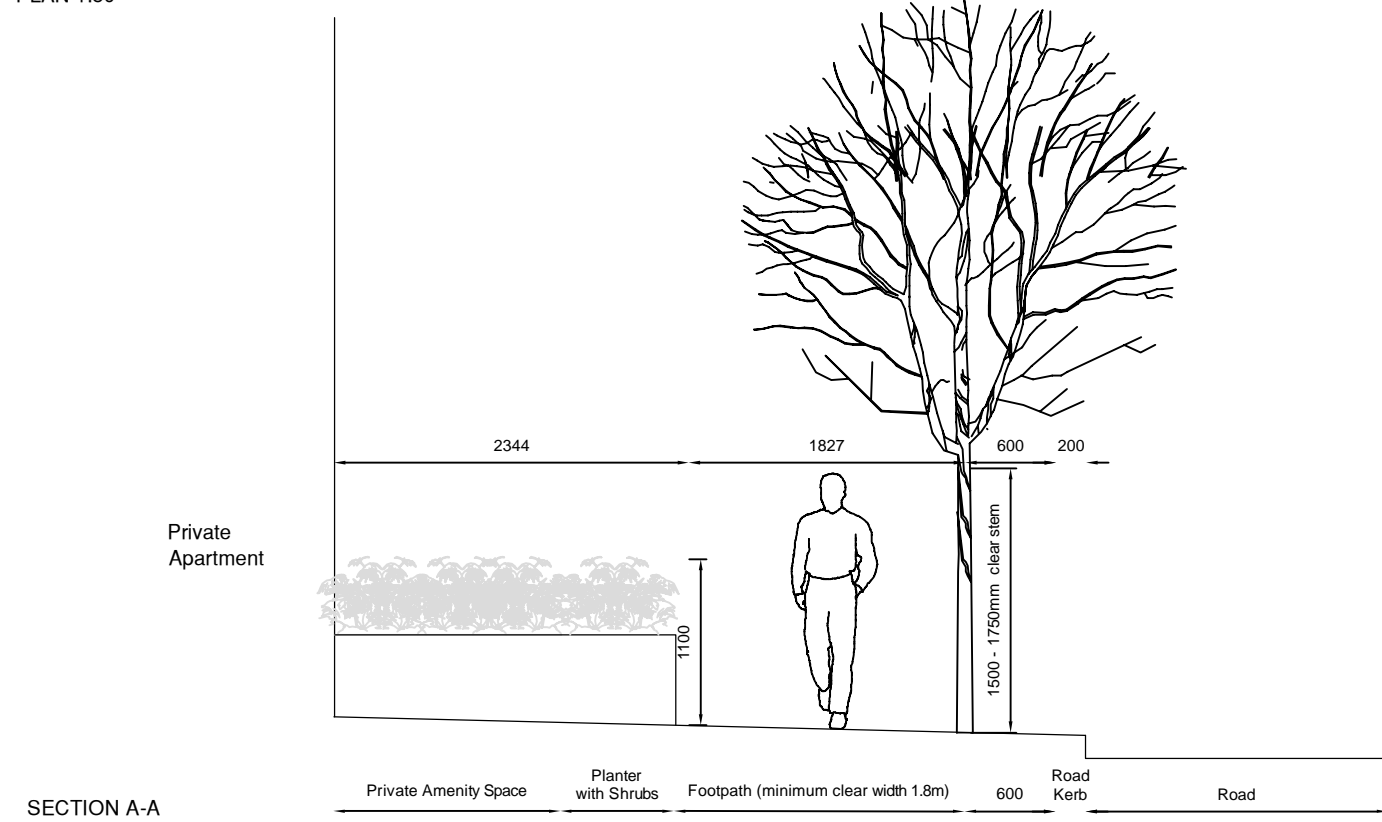
STG-AEC-S1b-00-00-DR-C-0000504



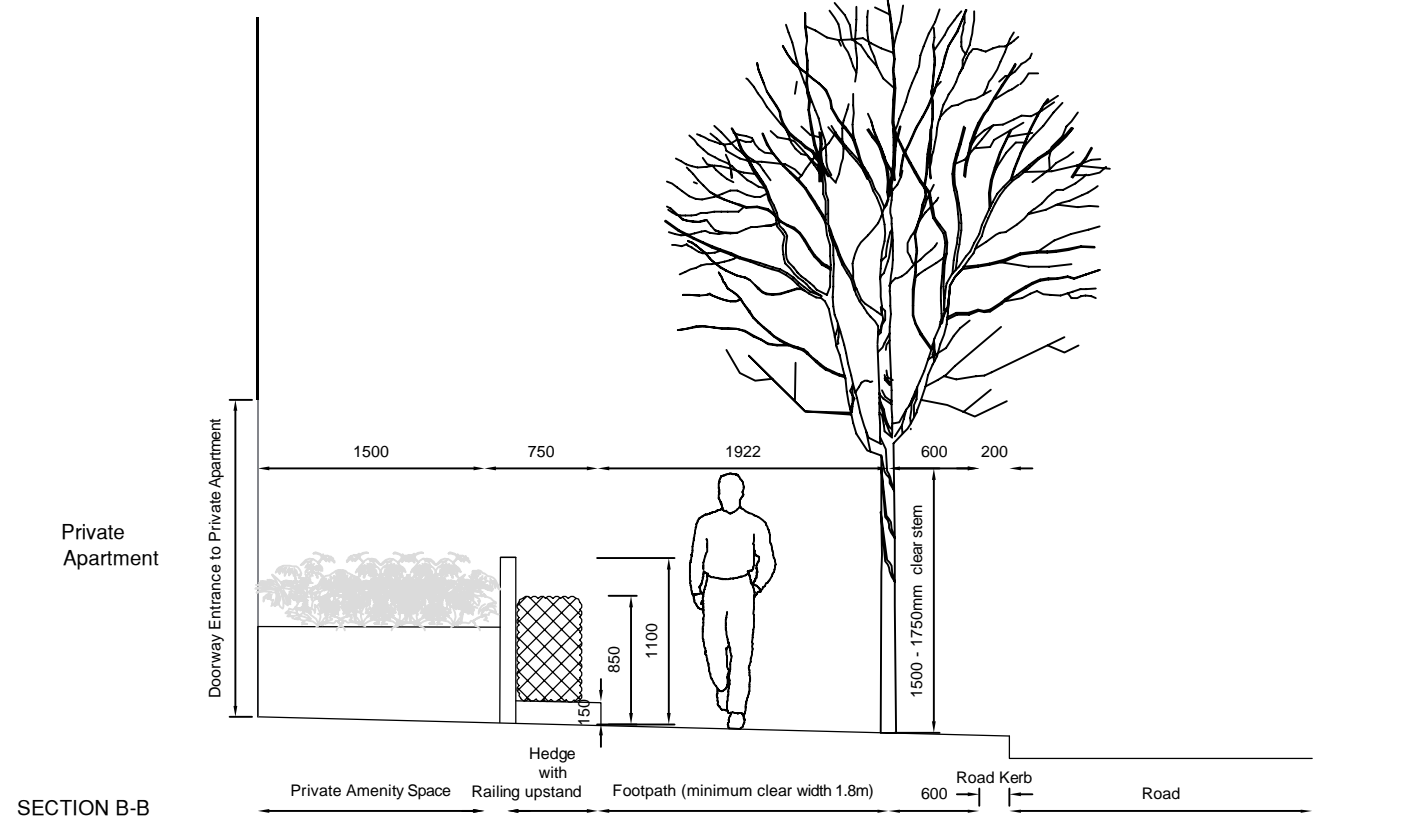
DCC6 - PRIVATE AMENITY SPACE
BRICK PLANTER BOUNDARY
PLAN 1:50



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



SECTION A-A



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

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

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 Irish Water's existing 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 Kieran O'Neill from the diversions team on 0877093850 or email kioneill@water.ie.

Yours sincerely,



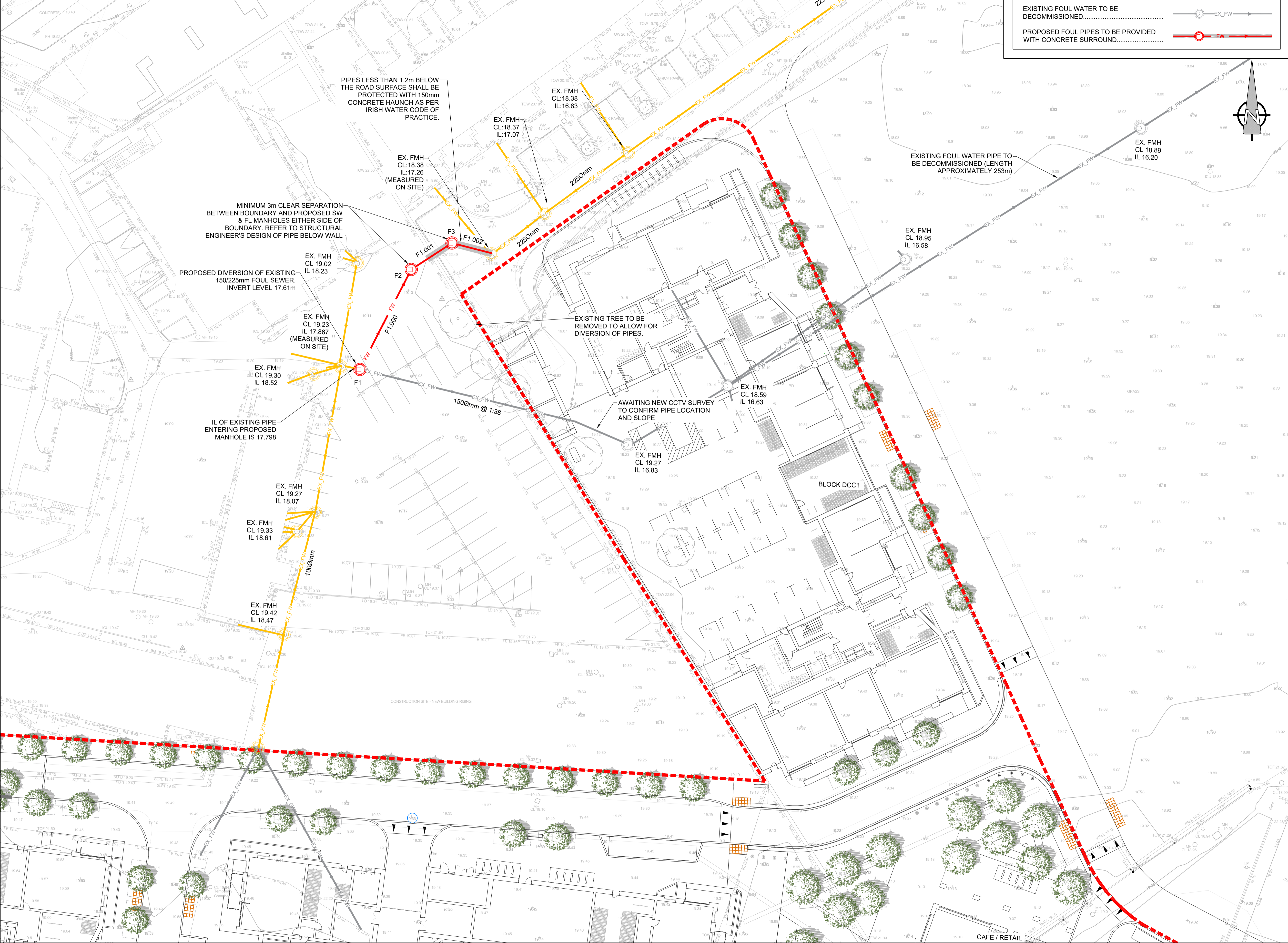
Yvonne Harris

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: DIVISION LAYOUT.DWG
Last saved by: MICHAEL COLLINS(2022.03.01)
Filename: \\A-AECOM\NET\COM\SE\MEA\EDBL\LEGACY\EDBL2\PROJECT\SBP\60648061_LDA_STG_TERESAS\900_GIS\904_CEO1_WIP05_SKETCHES\STG-AEC-XX-00-SK-C-00-0015-0019 - DIVISION 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

ORDNANCE SURVEY IRELAND LICENCE NO CYAL50217544
©ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND



PROJECT

THE DONORE PROJECT,
DUBLIN 8.

CLIENT

LAND DEVELOPMENT AGENCY

CONSULTANT

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Dun Laoghaire,
Co Dublin
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- DO NOT SCALE. ALL MEASUREMENTS AND COORDINATES TO BE CHECKED ON SITE.
- THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
- 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.
- GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
- EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
- SURFACE WATER & FOUL PIPES LESS THAN 1.2m BELOW THE ROAD SURFACE & 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.
- 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.
- 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.
- ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
- 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.



ISSUE/REVISION

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 COMMENT
A	06/10/2021	ISSUED FOR IRISH WATER
I/R	DATE	DESCRIPTION

PROJECT NUMBER

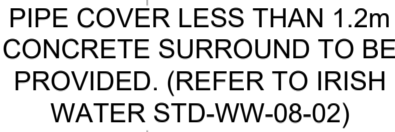
60648061

SHEET TITLE

PROPOSED FOUL WATER
DIVERSION LAYOUT

SHEET NUMBER

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



PROPOSED PIPE
MATERIAL: uPVC

PROPOSED PIPE
MATERIAL: uPVC

PROPOSED PIPE
MATERIAL: uPVC

Hor Scale 1000

Ver Scale 100

Datum (m)18.000

PN

Dia (mm)

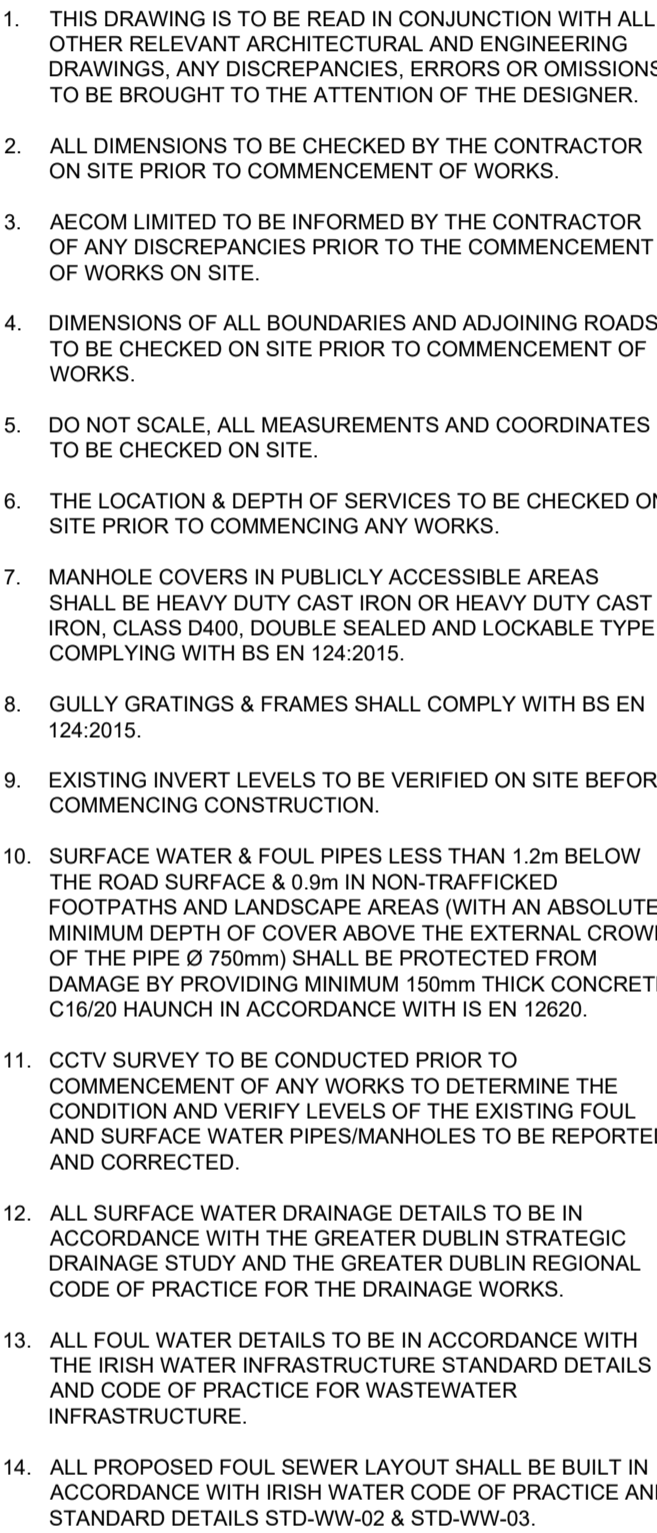
Slope (1:X)

Cover Level (m)

Invert Level (m)

Length (m)

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	01.03.2022	ISSUED FOR IRISH WATER
I/R	DATE	DESCRIPTION

PROJECT NUMBER

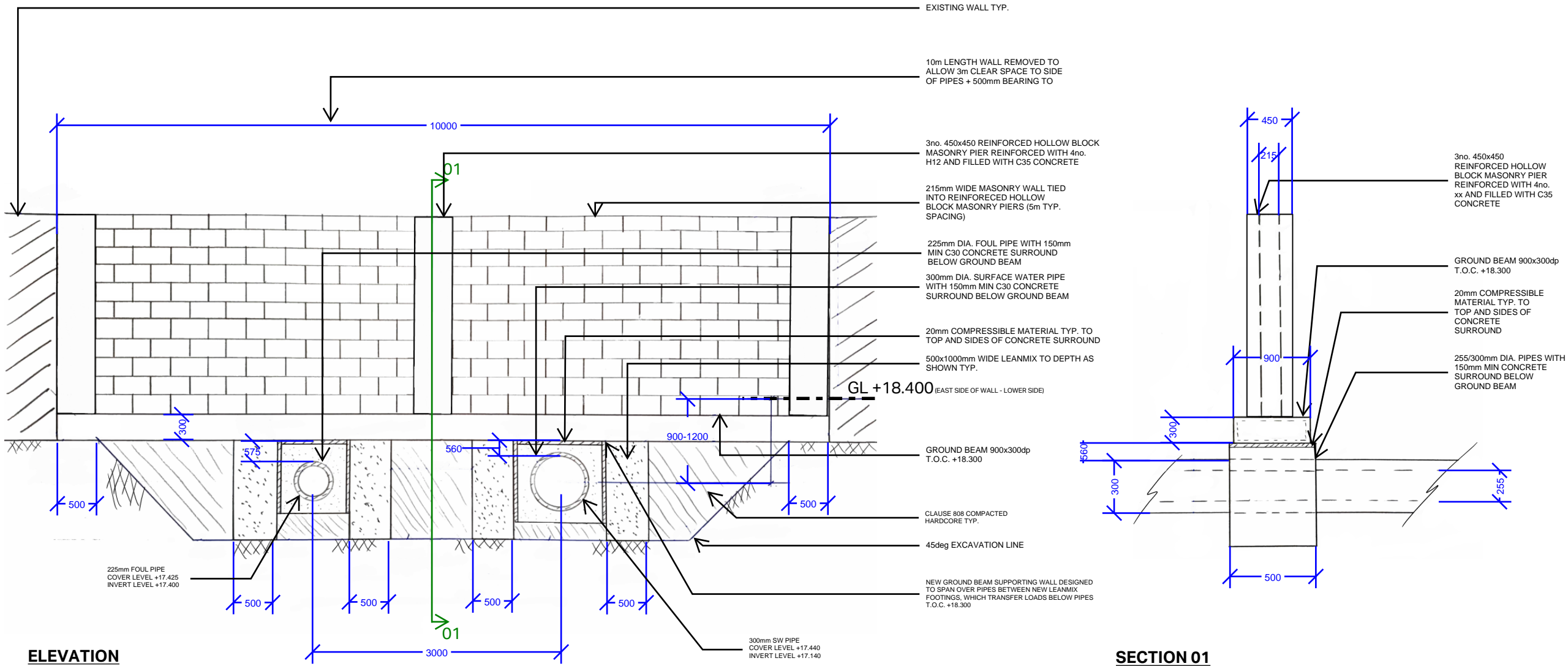
60648061

SHEET TITLE

PROPOSED DIVERSION LONGSECTION

SHEET NUMBER

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



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

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4th Floor, Adelphi Plaza
George's Street Upper
Dun Laoghaire, Co. Dublin
Ireland
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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

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
Rev.	Date	Description	Drm/Chk/Apr

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

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

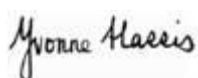
Irish Water has reviewed your enquiry in relation to the diversion of the Irish Water 100mm Watermain at St.Teresa's Gardens, Donore Avenue, Dublin 8. Based upon the details you have provided with your enquiry as indicated on drawings STG-AEC-XX-00-SK-C-00-0034, STG-AEC-S1b-00-00-DR-C-0002701 and STG-AEC-S2-ZZ-XX-ZZ-SK-S-000005 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

Head of Customer Operations

Appendix G – Water Supply & Drainage Records

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

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2. 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.

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Appendix H – CCTV Survey Report

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

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.....

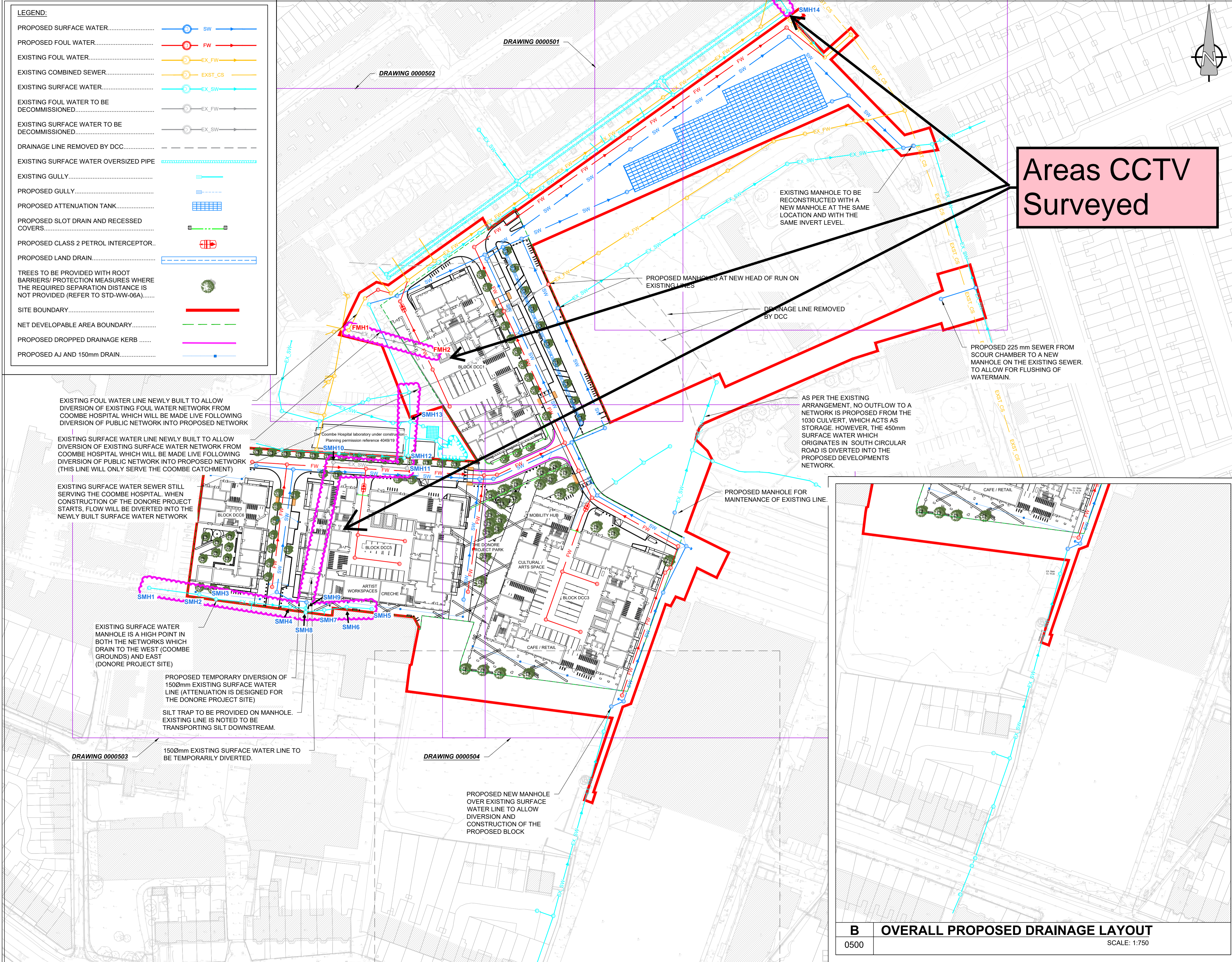
TREES TO BE PROVIDED WITH ROOT BARRIERS/ PROTECTION MEASURES WHERE THE REQUIRED SEPARATION DISTANCE IS NOT PROVIDED (REFER TO STD-WW-06A).....

SITE BOUNDARY.....

NET DEVELOPABLE AREA BOUNDARY.....

PROPOSED DROPPED DRAINAGE KERB.....

PROPOSED AJ AND 150mm DRAIN.....



PROJECT

DONORE PROJECT, DONORE AVENUE, DUBLIN 8

CLIENT

THE LAND DEVELOPMENT AGENCY (LDA)

CONSULTANT

AECOM
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Co Dublin
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NOTES

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- THE LOCATION & DEPTH OF SERVICES TO BE CHECKED ON SITE PRIOR TO COMMENCING ANY WORKS.
- 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.
- GULLY GRATINGS & FRAMES SHALL COMPLY WITH BS EN 124:2015.
- EXISTING INVERT LEVELS TO BE VERIFIED ON SITE BEFORE COMMENCING CONSTRUCTION.
- 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.
- ATTENUATION PROPOSALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
- 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.
- ALL PROPOSED SURFACE WATER MANHOLES AND GULLY CHAMBERS ARE TO BE BLOCKWORK, IN ACCORDANCE WITH DCC REQUIREMENTS.
- 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.
- ALL FOUL WATER DETAILS TO BE IN ACCORDANCE WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
- 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.
- THIS DESIGN DRAWING HAS BEEN DEVELOPED USING THE FOLLOWING TOPOGRAPHICAL SURVEYS: LDA SURVEY (MSL 39995 REV 1 21.05.2021) AND HINES SURVEY (MSL 35430 REV 2 24.06.2020).



ISSUE/REVISION

0	18.11.2022	ISSUED FOR PLANNING
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60648061

SHEET TITLE

OVERALL PROPOSED DRAINAGE LAYOUT

SHEET NUMBER

STG-AEC-S16-00-00-DR-C-0000500

A OVERALL PROPOSED DRAINAGE LAYOUT
0500
SCALE: 1:750

B OVERALL PROPOSED DRAINAGE LAYOUT
0500
SCALE: 1:750

SEE: INSET B

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AECOM, ST TERESAS GARDEN	J-025413	29/01/2022

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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

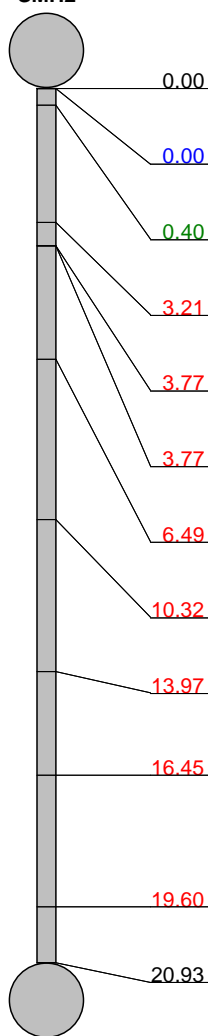
Company: McBreen Environmental Drain Services Ltd
Contact: CCTV Department
Street: Lismagratty
Town or City: Cootehil Rd
County: Cavan
Post Code: H12 FP44
Phone: 0494326306
Email: info@mcbreen.ie

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:

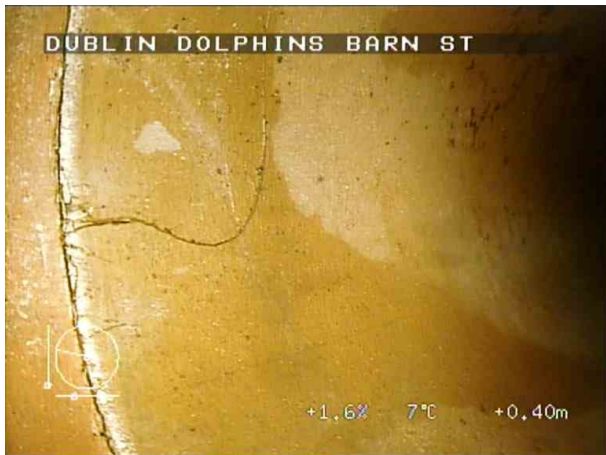
Scale:	1:181	Position [m]	Code	Observation	MPEG	Photo	Grade
<div><div><div>Depth: m</div><div>SMH2</div></div><div><div>SMH1</div><div>Depth: m</div></div></div>							
	0.00	MH	Start node, manhole, reference: SMH2		00:00:00		
	0.00	WL	Water level, 5% of the vertical dimension		00:00:02		
	0.40	RF	Roots, fine		00:00:11	SMH4X_4 b387c41-0 9cd-4717-	2
	3.21	CC	Crack, circumferential from 4 o'clock to 8 o'clock: CRACKS AND ROOTS		00:00:38	SMH4X_a dab20d6-b cc8-4224-	2 / 2
	3.77	FC	Fracture, circumferential from 8 o'clock to 10 o'clock		00:00:53	SMH4X_2 da0b000-1 b7d-41b2-	3 / 2
	3.77	B	Broken pipe at 9 o'clock		00:00:56	SMH4X_3 e775cd6-0 7bf-448a-b	4
	6.49	JDM	Joint displaced, medium		00:01:20	SMH4X_0 e795d9c-b 08d-47e2-	1 / 3
	10.32	FR	Fractures, radiating from 3 o'clock to 4 o'clock		00:01:58	SMH4X_9 2a2a218-7 c0a-4af8-a	4 / 2
	13.97	OJM	Open joint, medium		00:02:34	SMH4X_f8 2a13ab-69 c4-45fd-8f	1
	16.45	JDL	Joint displaced, large		00:02:54	SMH4X_6 40e99a1-0 852-4f0b-b	1 / 4
	19.60	H	Hole in drain or sewer from 1 o'clock to 2 o'clock		00:03:20	SMH4X_8 1fbdfc0-ff1 d-458a-a5	4
	20.93	MHF	Finish node, manhole, reference: SMH1		00:03:45		

Construction Features
Structural Defects
Miscellaneous Features
Service & Operational Observations

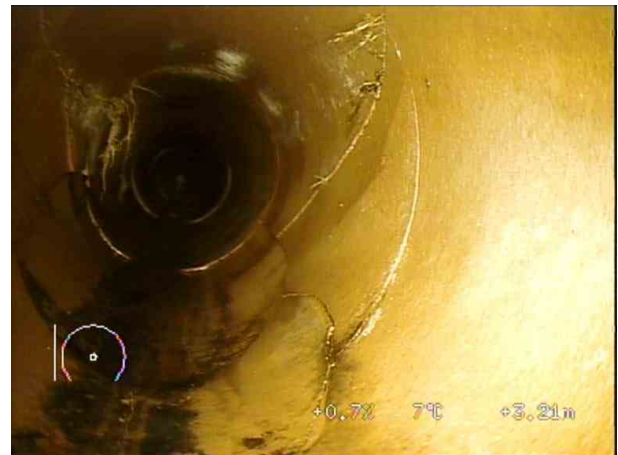
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
8	120.0	14.0	294.0	4.0	6	5.0	0.5	11.0	4.0

Section Pictures - 08/04/2022 - SMH2X

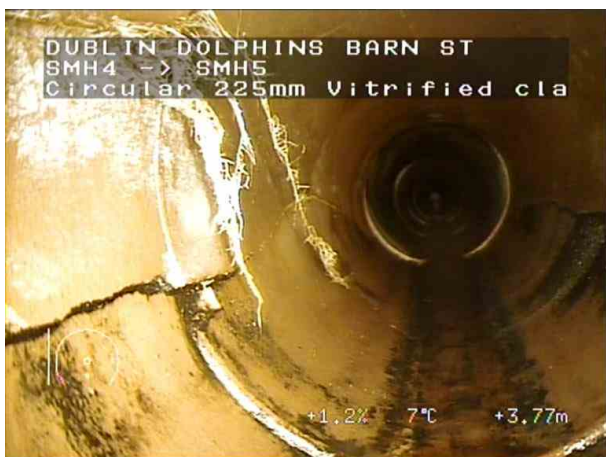
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	SMH2X	J-029560-1	MCBREEN



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



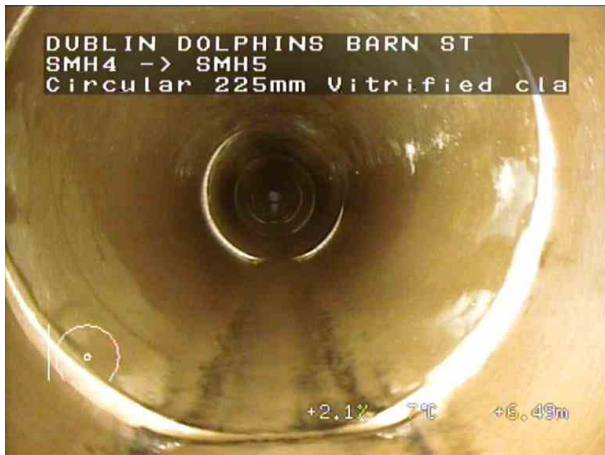
SMH4X_2da0b000-1b7d-41b2-8540-e041eeb42d3d_20220408_124806_045.jpg, 00:00:53, 3.77 m
Fracture, circumferential from 8 o'clock to 10 o'clock



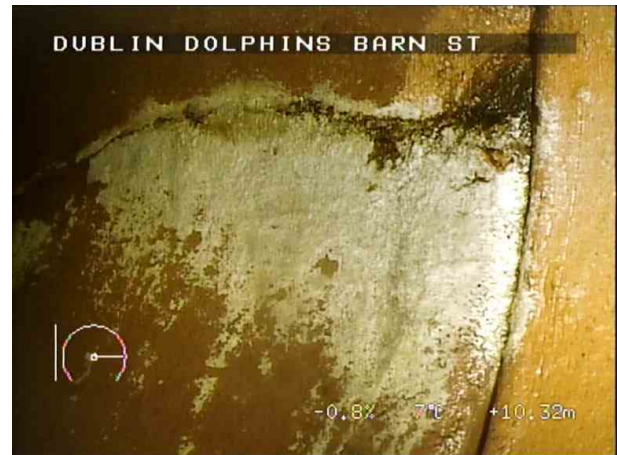
SMH4X_3e775cd6-07bf-448a-b8af-f02383adeace_20220408_124815_187.jpg, 00:00:56, 3.77 m
Broken pipe at 9 o'clock

Section Pictures - 08/04/2022 - SMH2X

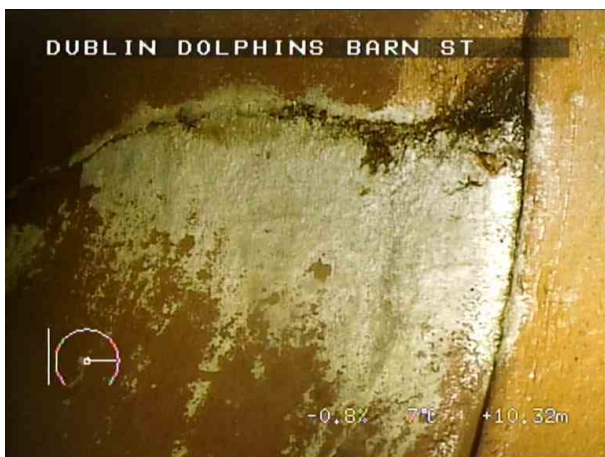
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	SMH2X	J-029560-1	MCBREEN



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

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

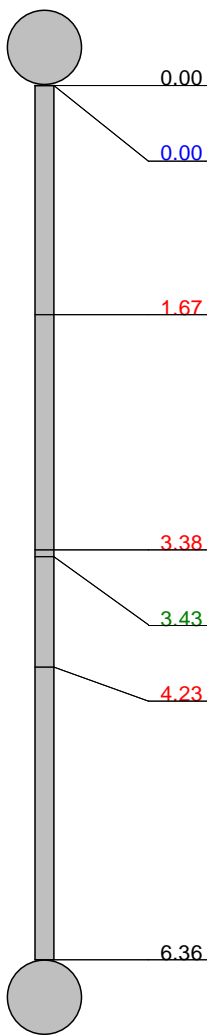
Section Inspection - 08/04/2022 - SMH3X

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	Position [m]	Code	Observation	MPEG	Photo	Grade
<div> <div> <div>Depth: m</div> <div>SMH3</div> <div>  </div> </div> </div>							
		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_5 d898e02-e 1ea-4f7e-b	3 / 2
		3.38	FR	Fractures, radiating from 8 o'clock to 11 o'clock	00:01:12	SMH3X_b 86fdd8e-a 315-41cf-9	4 / 2
		3.43	RF	Roots, fine	00:01:24	SMH3X_f6 659471-79 aa-4ef4-a5	2
		4.23	H	Hole in drain or sewer at 6 o'clock	00:01:49	SMH3X_f1 9e9c9c-3e 15-4058-b	4
		6.36	MHF	Finish node, manhole, reference: SMH2: welded lid mh covwe	00:02:14		
<div> <div>SMH2</div> <div>Depth: m</div> </div>							

Construction Features

Structural Defects

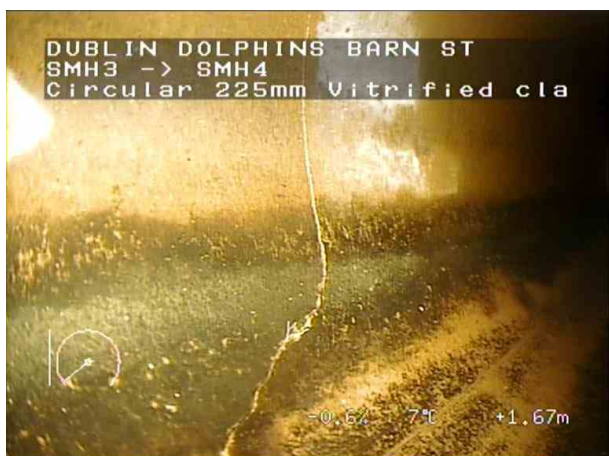
Miscellaneous Features

Service & Operational Observations

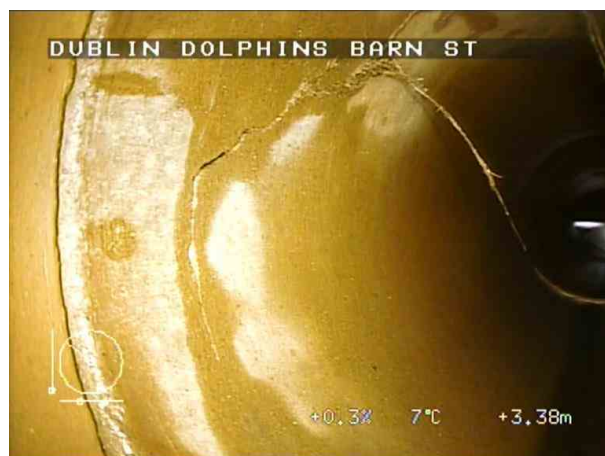
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
3	80.0	31.4	200.0	4.0	3	2.0	0.5	3.0	3.0

Section Pictures - 08/04/2022 - SMH3X

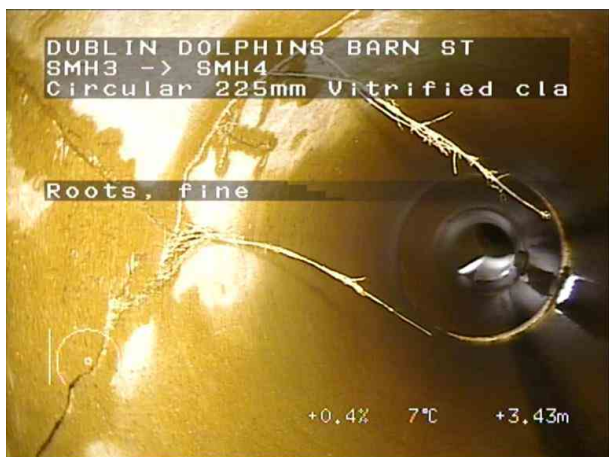
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Downstream	SMH3X	J-029560-1	MCBREEN



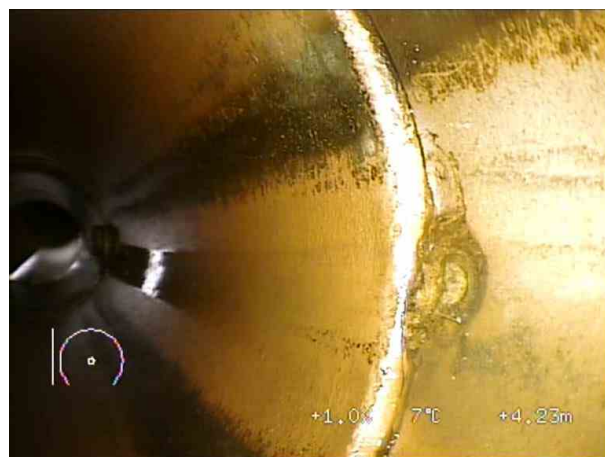
SMH3X_5d898e02-e1ea-4f7e-bf14-5680b51cd7bd_20220408_124241_795.jpg, 00:00:49, 1.67 m
Cracks, radiating from 8 o'clock to 10 o'clock



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



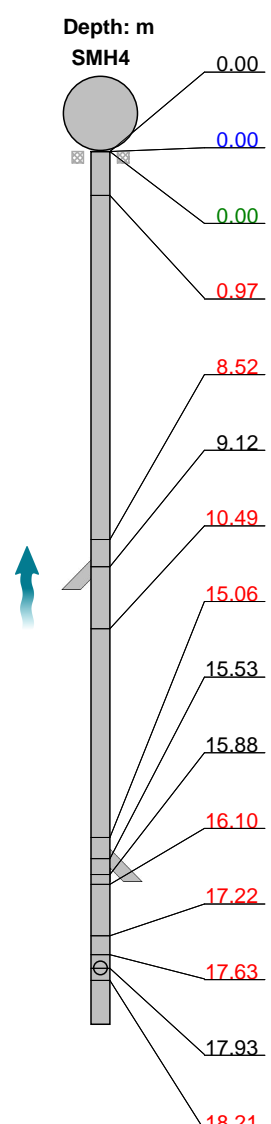
SMH3X_f19e9c9c-3e15-4058-b30f-a15ba3ec114a_20220408_124410_857.jpg, 00:01:49, 4.23 m
Hole in drain or sewer at 6 o'clock

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

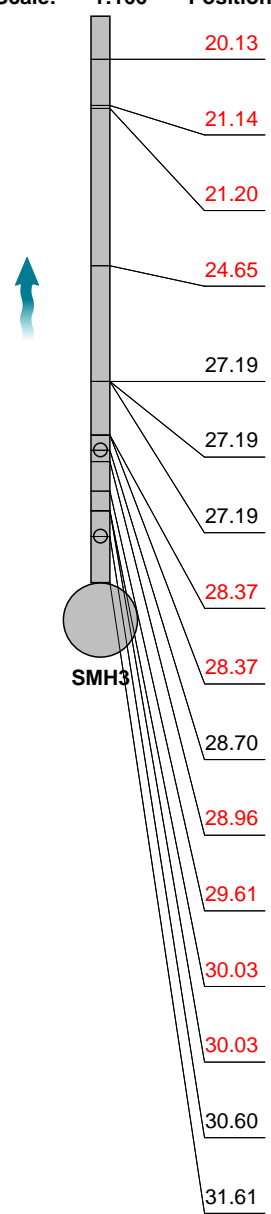
Town or Village:	Dublin	Inspection Direction:	Upstream	Upstream Node:	SMH4
Road:	Dolphins Barn St	Inspected Length:	31.61 m	Upstream Pipe Depth:	
Location:		Total Length:	31.61 m	Downstream Node:	SMH2
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular		
Type 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
Depth: m 							
		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_3 048078d-3 13b-4a0c-	
		8.52	OJL	Open joint, large	00:02:23	SMH3X_f9 49510e-b4 f6-4394-8a	1
		9.12	JN	Junction at 3 o'clock, 100mm dia: OLD JUNCTION	00:02:50	SMH3X_a 0c2e369-3 2cc-4cbc-b	
		10.49	OJM	Open joint, medium	00:03:34	SMH3X_e e8eff8b-ef 12-4309-8	1
		15.06	OJL	Open joint, large: CRANCK ON JOINT	00:04:57	SMH3X_1 91414e8-b 719-45b2-	1
		15.53	JN	Junction at 9 o'clock, 100mm dia	00:05:13	SMH3X_5 3077791-5 ac5-4dee-	
		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_fe 378036-50 4c-4eea-9	3 / 2
		17.22	FCJ	Fracture, circumferential at joint from 10 o'clock to 12 o'clock	00:06:36	SMH3X_2 856e269-1 400-4a1e-	3 / 2
		17.63	D	Deformed sewer or drain, 10%: OLD CONNECTION	00:06:54	SMH3X_4 bc7a12c-a fa4-49e1-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_4 560511f-a 8a0-4761-	1

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

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_0 ac6157f-b 4ab-4ad9-	2 / 2
		21.14	JDL	Joint displaced, large	00:08:54	SMH3X_b 2ac8f39-d b7c-4314-	1 / 4
		21.20	D	Deformed sewer or drain, 5%	00:09:18	SMH3X_d 48bc823-7 a6c-4735-	2 / 2
		24.65	CC	Crack, circumferential from 3 o'clock to 4 o'clock	00:10:19	SMH3X_0 ebb6a48-d e9d-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_4f 6e492a-5e 77-4b84-8	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_2 d4f37a4-ef 05-4947-9	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_c 4e3b749-1 326-407f-8	1
		29.61	OJL	Open joint, large	00:12:25	SMH3X_e 097369b-9 d07-4f80-b	1
		30.03	H	Hole in drain or sewer from 11 o'clock to 1 o'clock	00:12:44	SMH3X_3 1bada83-1 254-45d7-	4
		30.03	OJL	Open joint, large	00:13:00	SMH3X_0 aac7fce-5 a23-446e-	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		

Depth: m

Construction Features

Structural Defects

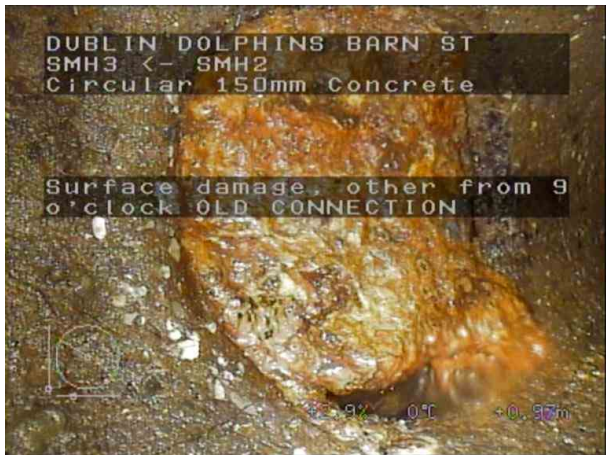
Miscellaneous Features

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

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

Section Pictures - 08/04/2022 - SMH4X

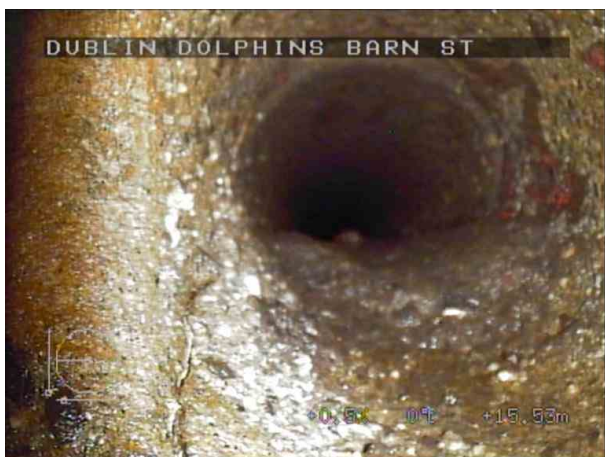
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
4	Upstream	SMH4X	J-029560-1	MCBREEN



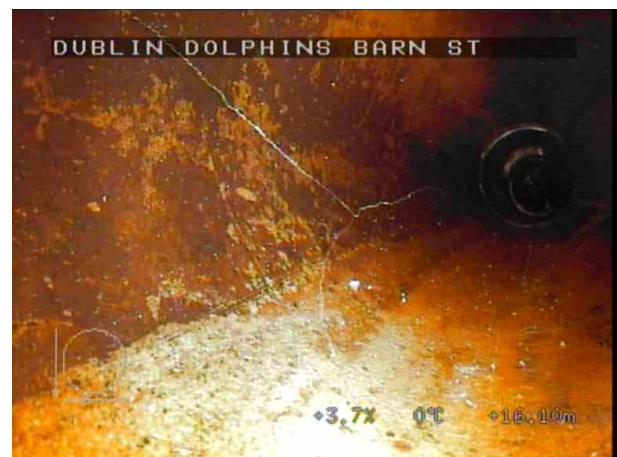
SMH3X_ee8eff8b-ef12-4309-8494-48da32b7e79d_20220408_101528_559.jpg, 00:03:34, 10.49 m
Open joint, medium



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

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



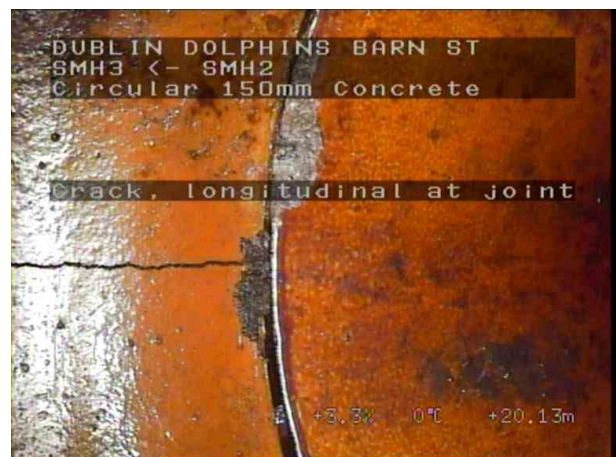
SMH3X_2856e269-1400-4a1e-880a-86ee3f0c09ed_20220408_102207_967.jpg, 00:06:36, 17.22 m
Fracture, circumferential at joint from 10 o'clock to 12 o'clock



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

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



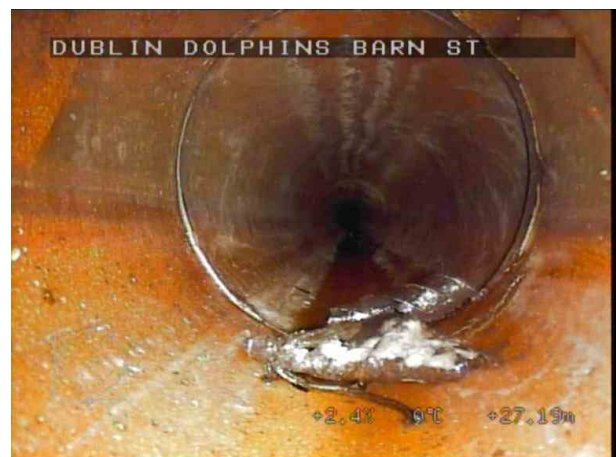
SMH3X_b2ac8f39-db7c-4314-b07c-01876c25bebb_20220408_102842_873.jpg, 00:08:54, 21.14 m
Joint displaced, large



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



SMH3X_0ebb6a48-de9d-4969-8cc3-2cbcd6f102d8_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

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

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

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
<div> <div>Depth: m</div> <div>SMH6</div> <div>0.00</div> <div>0.02</div> <div>14.06</div> <div>SMH5</div> <div>Depth: m</div> </div>							
			MH	Start node, manhole, reference: SMH6	00:00:00		
			WL	Water level, 5% of the vertical dimension	00:00:04		
			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

Section Inspection - 21/02/2022 - SMH6X

Item No. 6	Insp. No. 2	Date 21/02/22	Time 13:59	Client's Job Ref J-028275	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH6X
Operator niall s		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 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
<div> <div>Depth: m</div> <div>SMH7</div> </div>						
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			
<div> <div>SMH6</div> <div>Depth: m</div> </div>						

Construction Features

Structural Defects

Miscellaneous Features

Service & Operational Observations

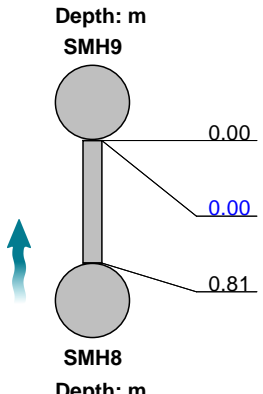
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Inspection - 29/01/2022 - SMH9X

Item No. 8	Insp. No. 8	Date 29/01/22	Time 12:59	Client's Job Ref J-025413	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH9X
Operator JR		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 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
Structural Defects
Miscellaneous Features
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

Section Pictures - 08/04/2022 - SMH9X

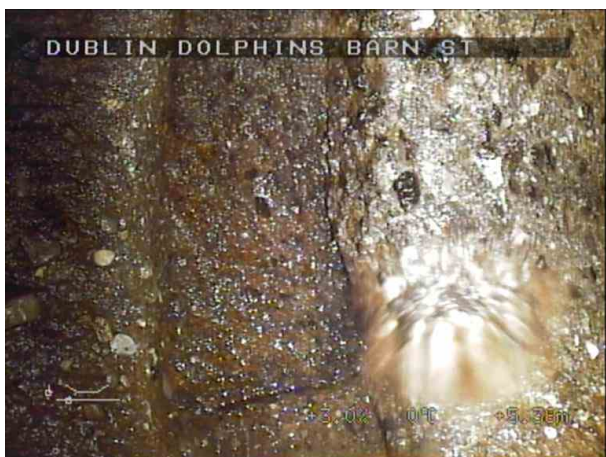
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
9	Upstream	SMH9X	J-029560-1	MCBREEN



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

Section Inspection - 29/01/2022 - SMH10X

Item No. 10	Insp. No. 4	Date 29/01/22	Time 12:16	Client's Job Ref J-025413	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH10X
Operator JR		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 1

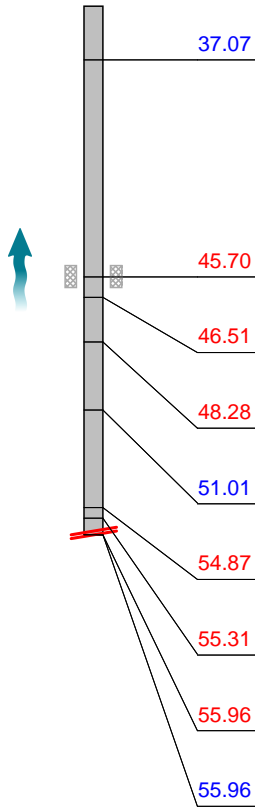
Town or Village:	Dublin	Inspection Direction:	Upstream	Upstream Node:	SMH10
Road:	St Teresas Garden	Inspected Length:	55.96 m	Upstream Pipe Depth:	
Location:		Total Length:	55.96 m	Downstream Node:	MH9
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular		
Type 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
<div><div><div>Depth: m</div><div>SMH10</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div><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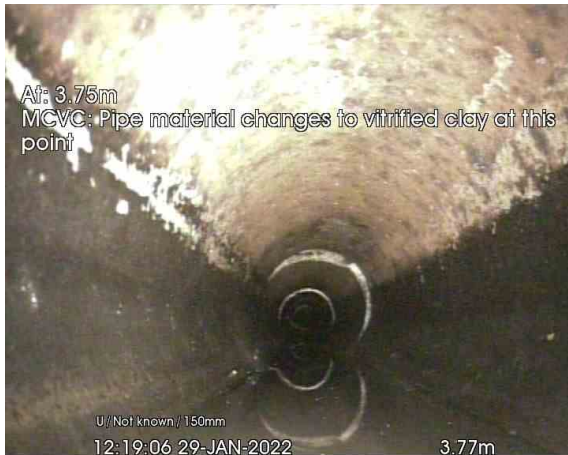
Section Inspection - 29/01/2022 - SMH10X

Item No. 10	Insp. No. 4	Date 29/01/22	Time 12:16	Client's Job Ref J-025413	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH10X
Operator JR		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 1

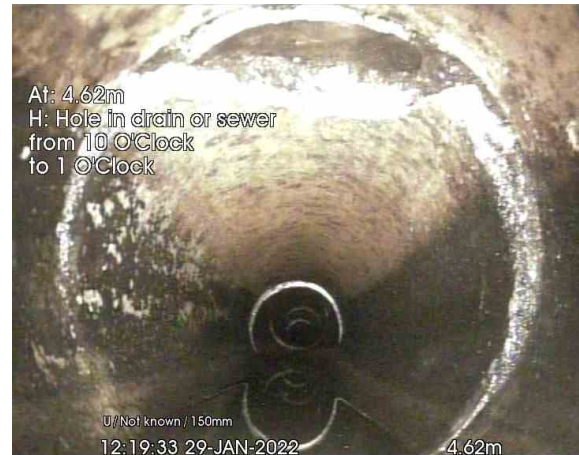
Scale:	1:301	Position [m]	Code	Observation	MPEG	Photo	Grade		
		37.07	WL	Water level, 60% of the vertical dimension	00:03:40				
		45.70	S03	JDM	Joint displaced, medium, start	00:04:19	MH2 TO MH1_45-7 0m_12245	1 / 3	
		46.51	CM	Cracks, multiple, in roof slab at 12 o'clock	00:04:25	MH2 TO MH1_46-5 1m_12251	3 / 2		
		48.28	CL	Crack, longitudinal, in roof slab at 12 o'clock	00:04:41	MH2 TO MH1_48-2 8m_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_54-8 7m_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_55-3 1m_12265	5		
		55.96	XP	Collapsed drain or sewer	00:05:34	MH2 TO MH1_55-9 6m_12271	5		
		55.96	SA	Survey abandoned: CANT PASS	00:05:38	MH2 TO MH1_55-9 6m_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

Section Pictures - 29/01/2022 - SMH10X

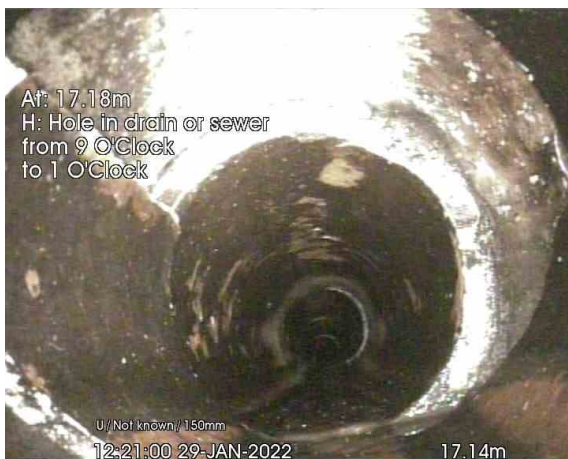
Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
10	Upstream	SMH10X	J-025413	MC BREEN



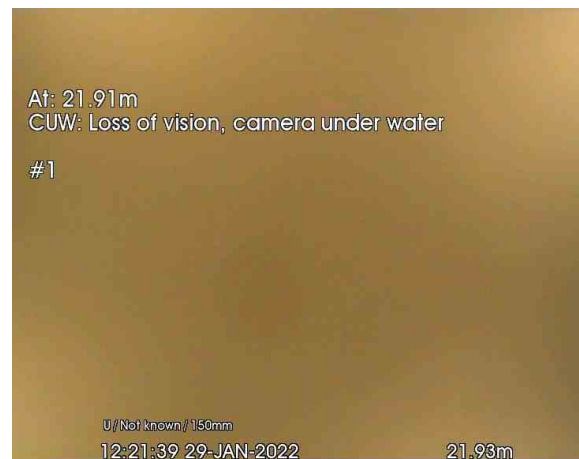
MH2 TO MH1_3-77m_121906.jpg, 00:00:24, 3.77 m
Pipe material changes to vitrified clay at this point



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

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

At: 30.38m
CUW: Loss of vision, camera under water
#2

U / Not known / 150mm

12:22:46 29-JAN-2022

30.40m

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

At: 32.75m
H: Hole in drain or sewer
from 10 O'Clock
to 12 O'Clock

U / Not known / 150mm

12:23:37 29-JAN-2022

32.75m

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

At: 45.70m
JDM: Joint displaced, medium

#3

U / Not known / 150mm

12:24:59 29-JAN-2022

45.70m

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

At: 46.49m
CM: Cracks, multiple
in roof slab: Yes at 12 O'Clock

U / Not known / 150mm

12:25:16 29-JAN-2022

46.51m

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

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



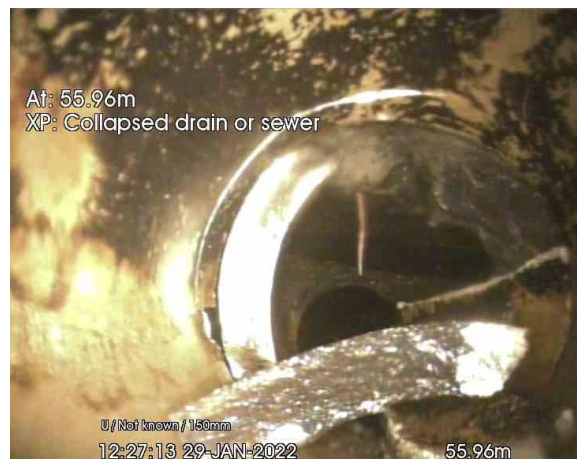
MH2 TO MH1_48-28m_122540.jpg, 00:04:41, 48.28 m
Crack, longitudinal, in roof slab at 12 o'clock



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

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



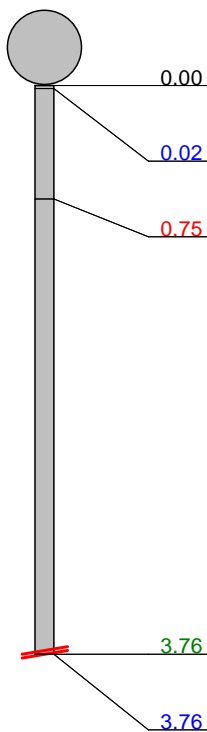
MH2 TO MH1_55-96m_122729.jpg, 00:05:38, 55.96 m
Survey abandoned, CANT PASS

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
<div> <div> Depth: m SMH9 </div>  </div>							
		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
Structural Defects
Miscellaneous Features
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

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



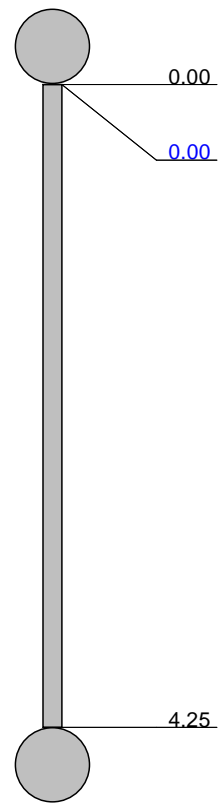
MH1 TO MH2_3-76m_124033.jpg, 00:00:30, 3.76 m
Survey abandoned, CANT PASS

Section Inspection - 29/01/2022 - SMH12X

Item No. 13	Insp. No. 2	Date 29/01/22	Time 11:28	Client's Job Ref J-025413	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH12X
Operator JR		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 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
<div> <div>Depth: m</div> <div>SMH12</div>  </div>							
		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		
<div> <div>SMH11</div> <div>Depth: m</div> </div>							

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

Section Inspection - 29/01/2022 - SMH13X

Item No. 14	Insp. No. 1	Date 29/01/22	Time 11:17	Client's Job Ref J-025413	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH13X
Operator JR		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 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
<div> <div>Depth: m</div> <div>SMH13</div> <div> <div>0.00</div> <div>0.00</div> </div> <div> <div>13.59</div> </div> <div>SMH12</div> <div>Depth: m</div> </div>							
		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

Section Inspection - 21/02/2022 - SMH14X

Item No. 15	Insp. No. 6	Date 21/02/22	Time 15:22	Client's Job Ref J-028275	Weather No Rain Or Snow	Pre Cleaned Yes	PLR SMH14X
Operator niall s		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Not Specified	Alternative ID 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
<div> <div>Depth: m</div> <div>tank</div> <div> <div>0.00</div> <div>0.00</div> <div>5.17</div> <div>5.35</div> </div> <div>SMH14</div> <div>Depth: m</div> </div>						
	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		





















Construction Features
Structural Defects
Miscellaneous Features
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


AECOM		Page 2
Midpoint	Donore Project	
Alencon Link	Donore Avenue	
Basingstoke, RG21 7PP	Dublin 8	
Date 07/10/2022 10:25	Designed by DM	
File The Donore Project.MDX	Checked by MI	
Innovyze	Network 2020.1	

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

AECOM		Page 3
Midpoint	Donore Project	
Alencon Link	Donore Avenue	
Basingstoke, RG21 7PP	Dublin 8	
Date 07/10/2022 10:25	Designed by DM	
File The Donore Project.MDX	Checked by MI	
Innovyze	Network 2020.1	

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	

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Midpoint Alencon Link Basingstoke, RG21 7PP	Donore Project Donore Avenue Dublin 8	
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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 Online Controls	1	Number of Storage Structures	2
		Number of Time/Area Diagrams	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		

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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 Coefficient 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

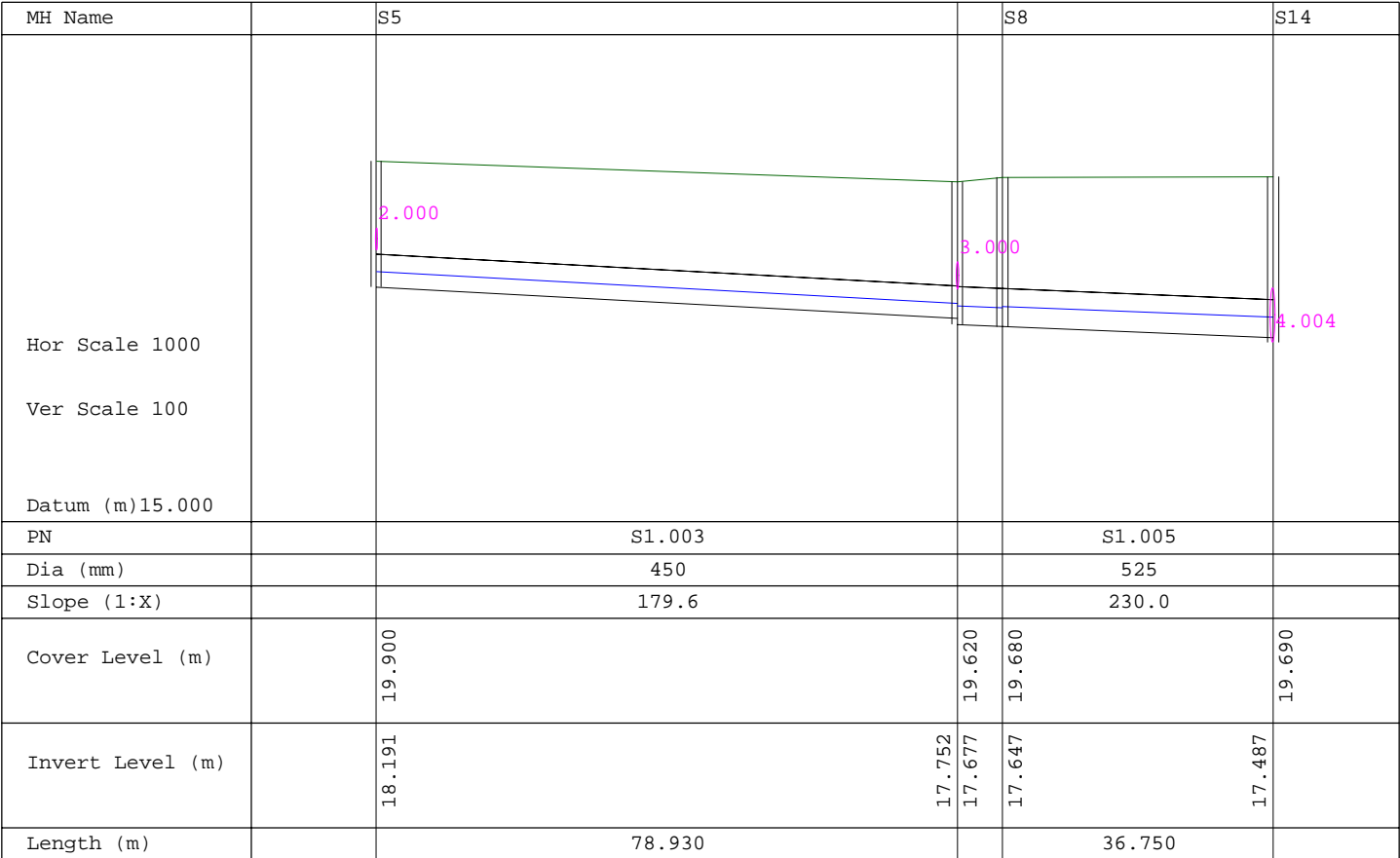
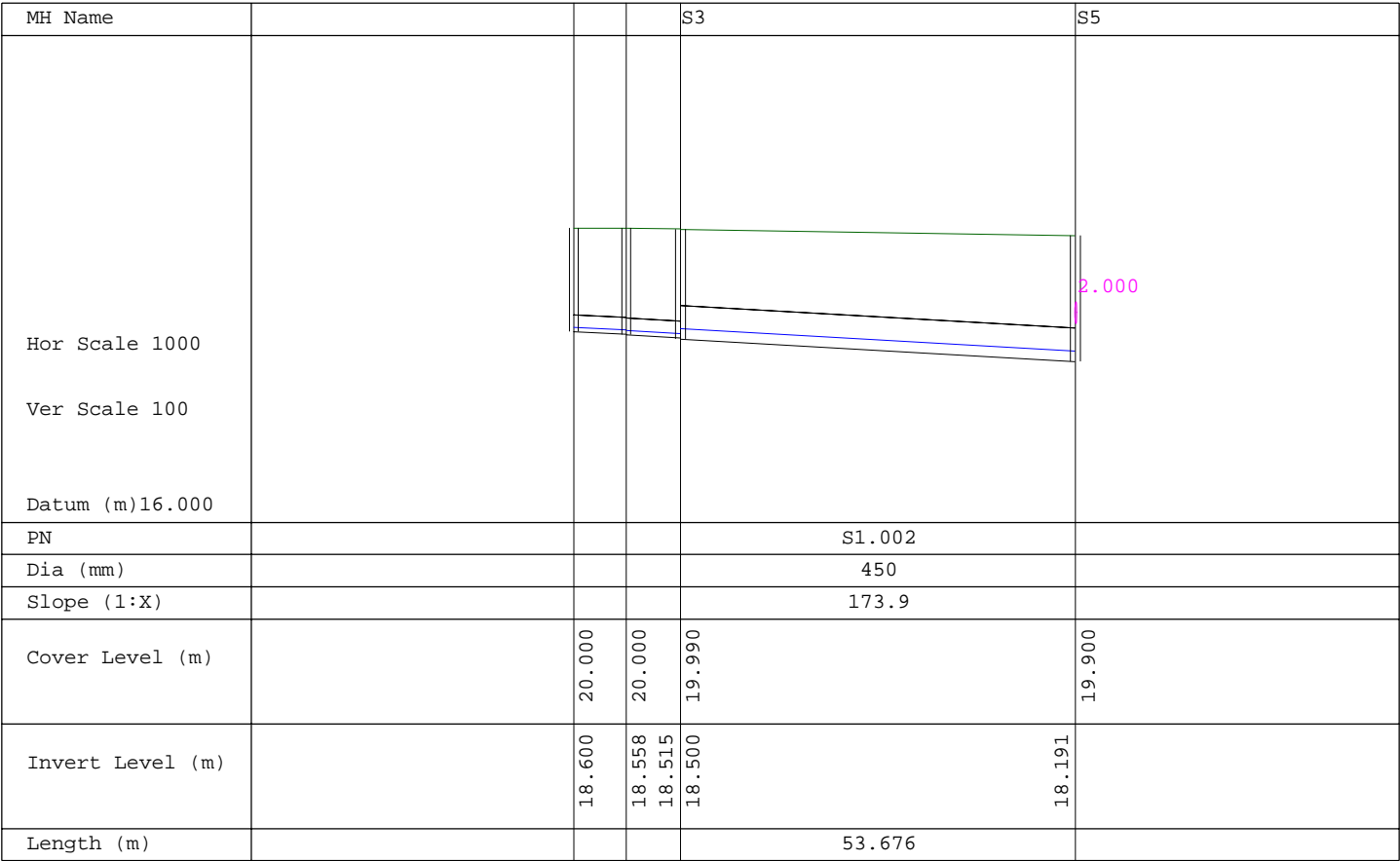
Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440,
2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 20, 20, 20

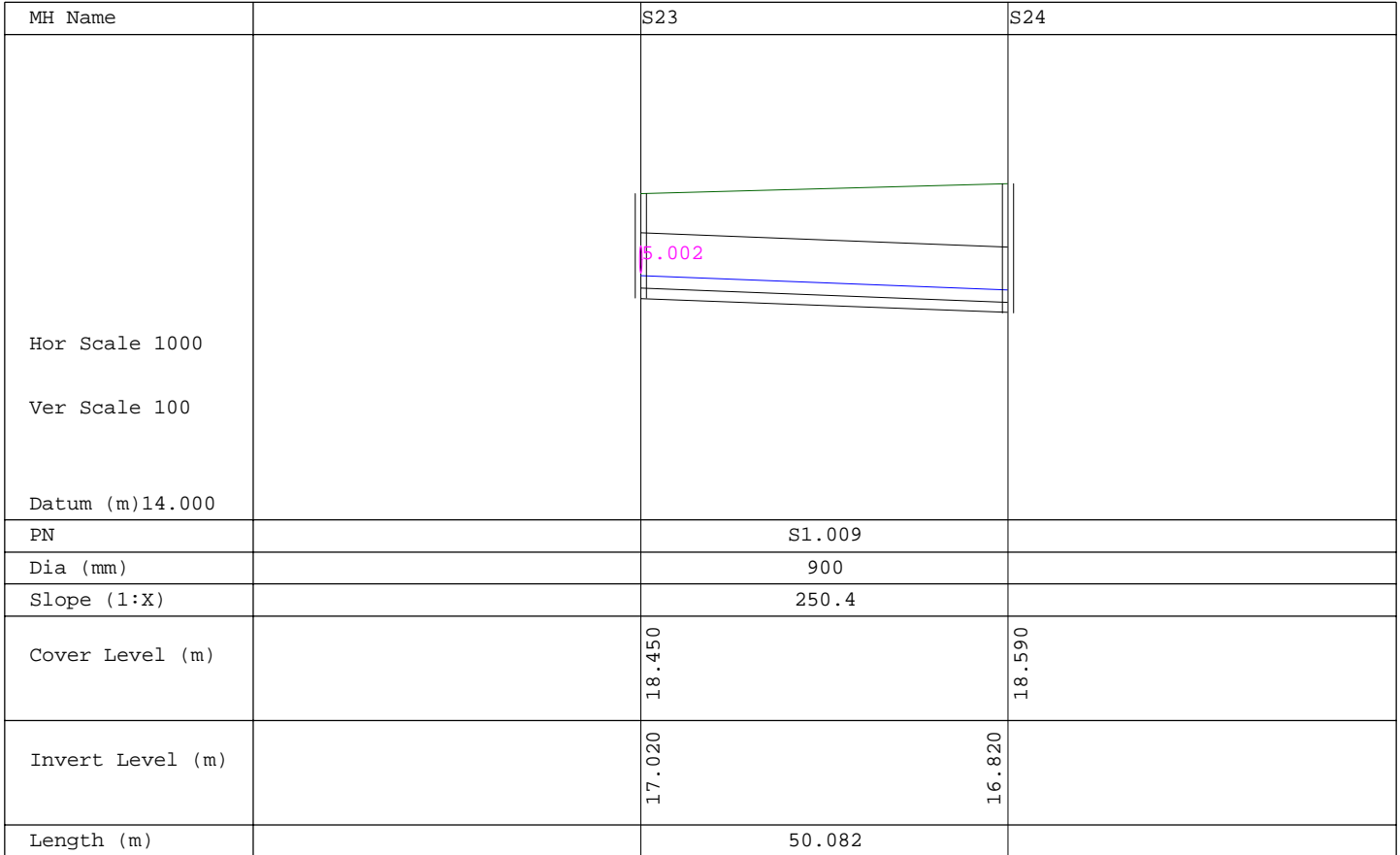
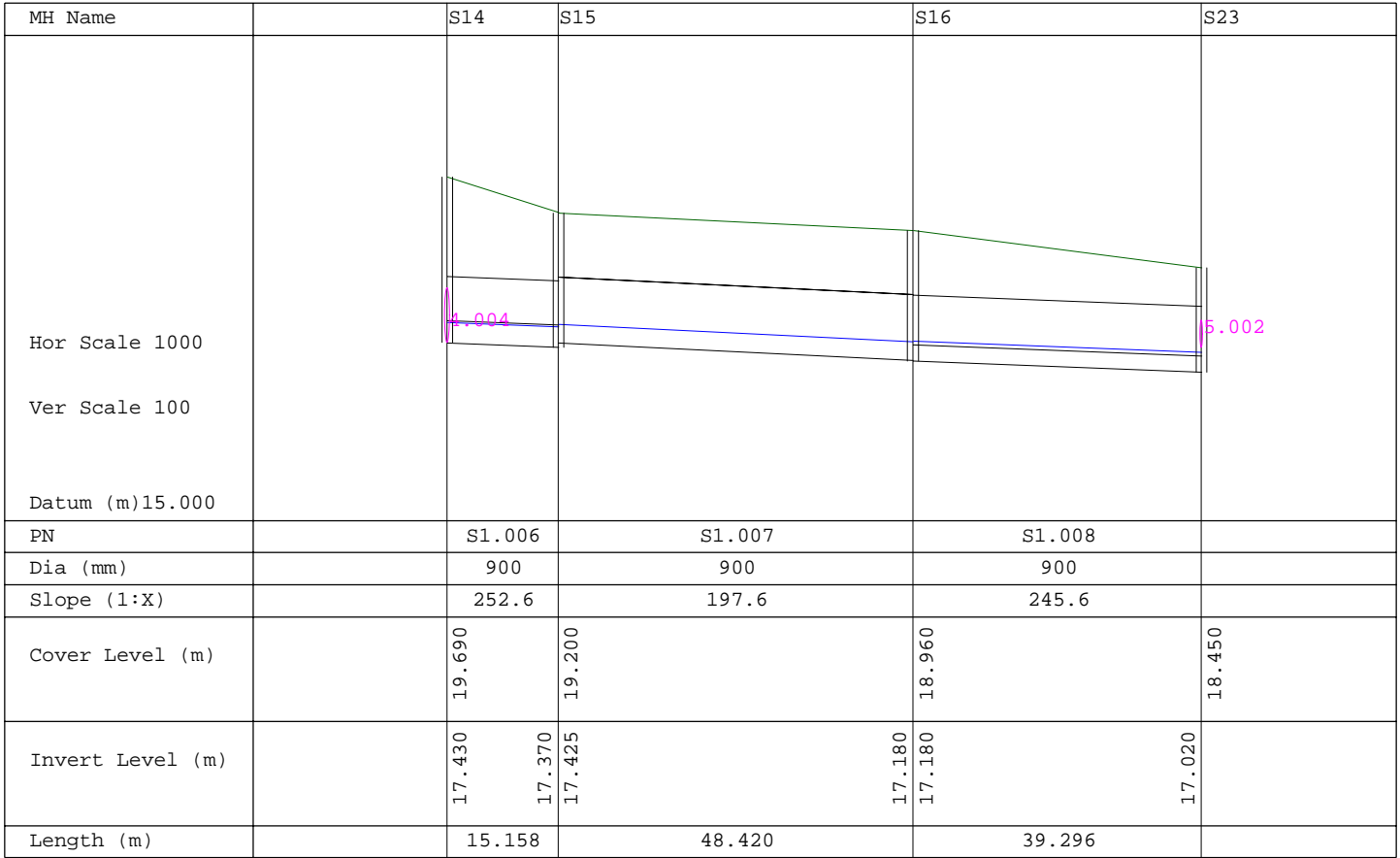
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S1	15 Summer	100	+20%	100/15 Summer				19.191	0.366	0.000
S1.001	S2	15 Summer	100	+20%	30/15 Summer				19.179	0.396	0.000
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

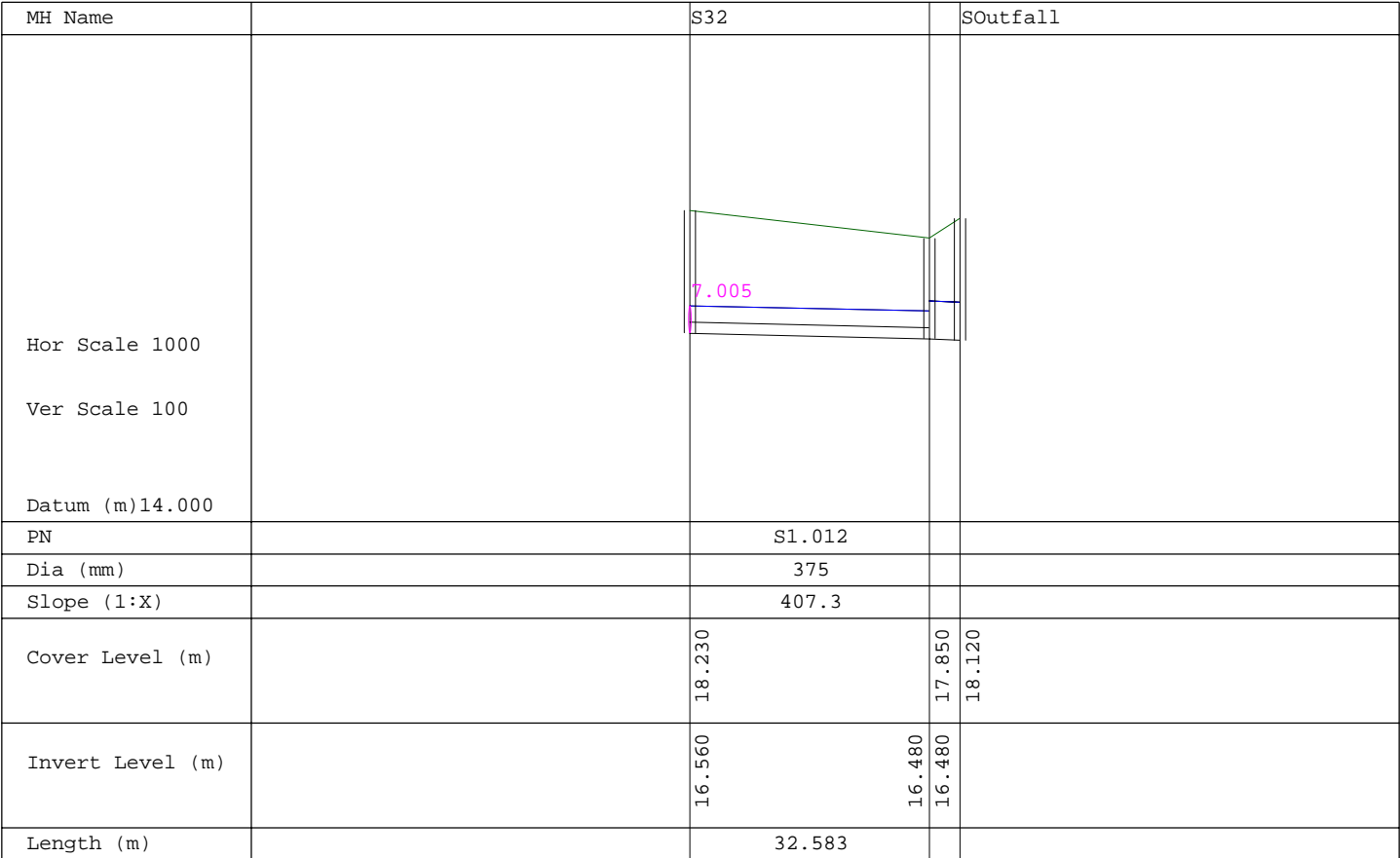
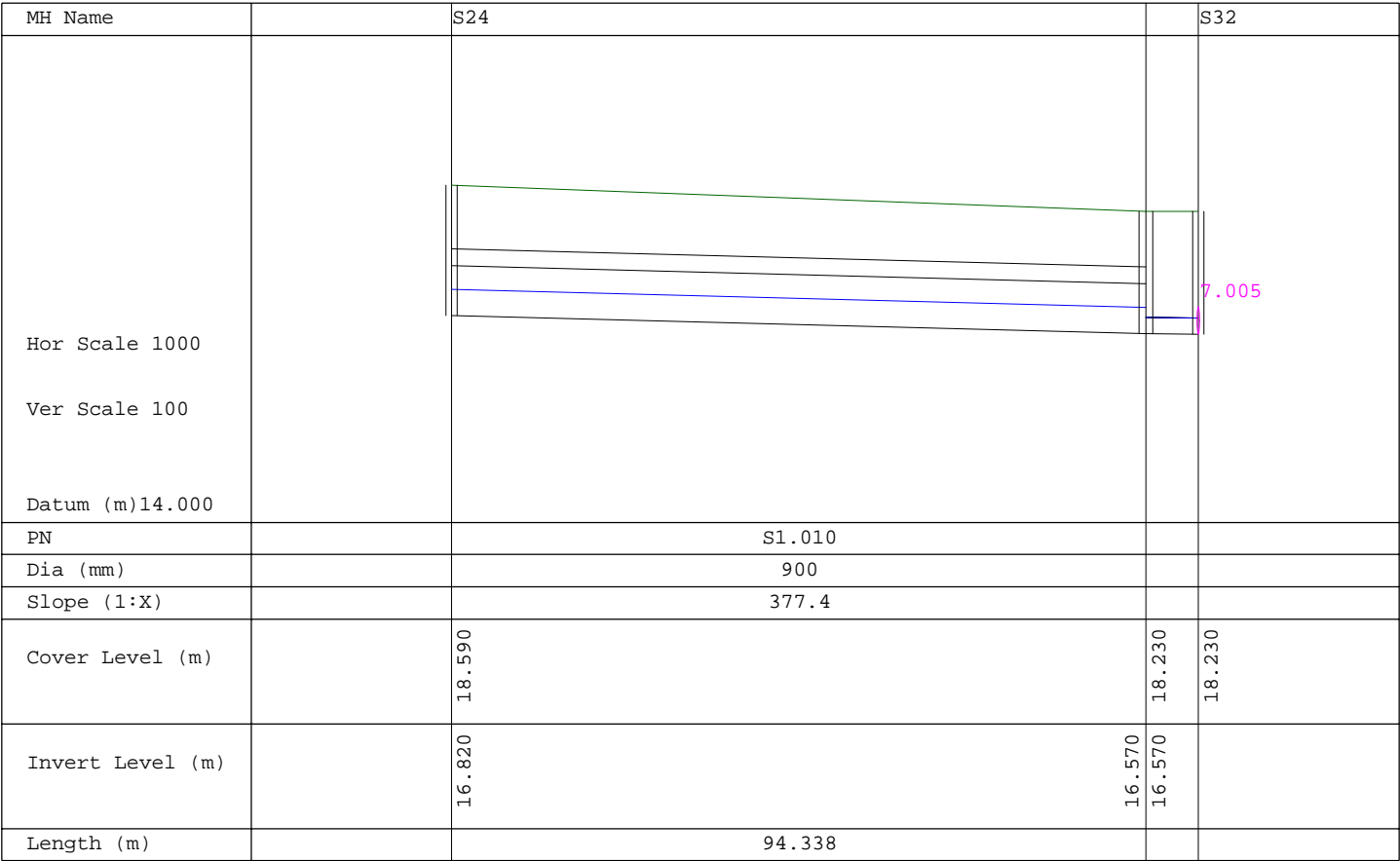
AECOM		Page 11
Midpoint	Donore Project	
Alencon Link	Donore Avenue	
Basingstoke, RG21 7PP	Dublin 8	
Date 07/10/2022 10:25	Designed by DM	
File The Donore Project.MDX	Checked by MI	
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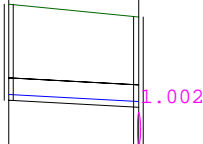
Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

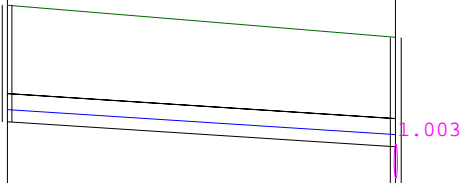
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.52			15.5	SURCHARGED	
S1.001	S2	0.58			17.4	SURCHARGED	
S1.002	S3	0.61			135.4	SURCHARGED	
S2.000	S4	0.45			32.3	SURCHARGED	
S1.003	S5	1.05			236.7	SURCHARGED	
S3.000	S6	1.07			161.1	SURCHARGED	
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	

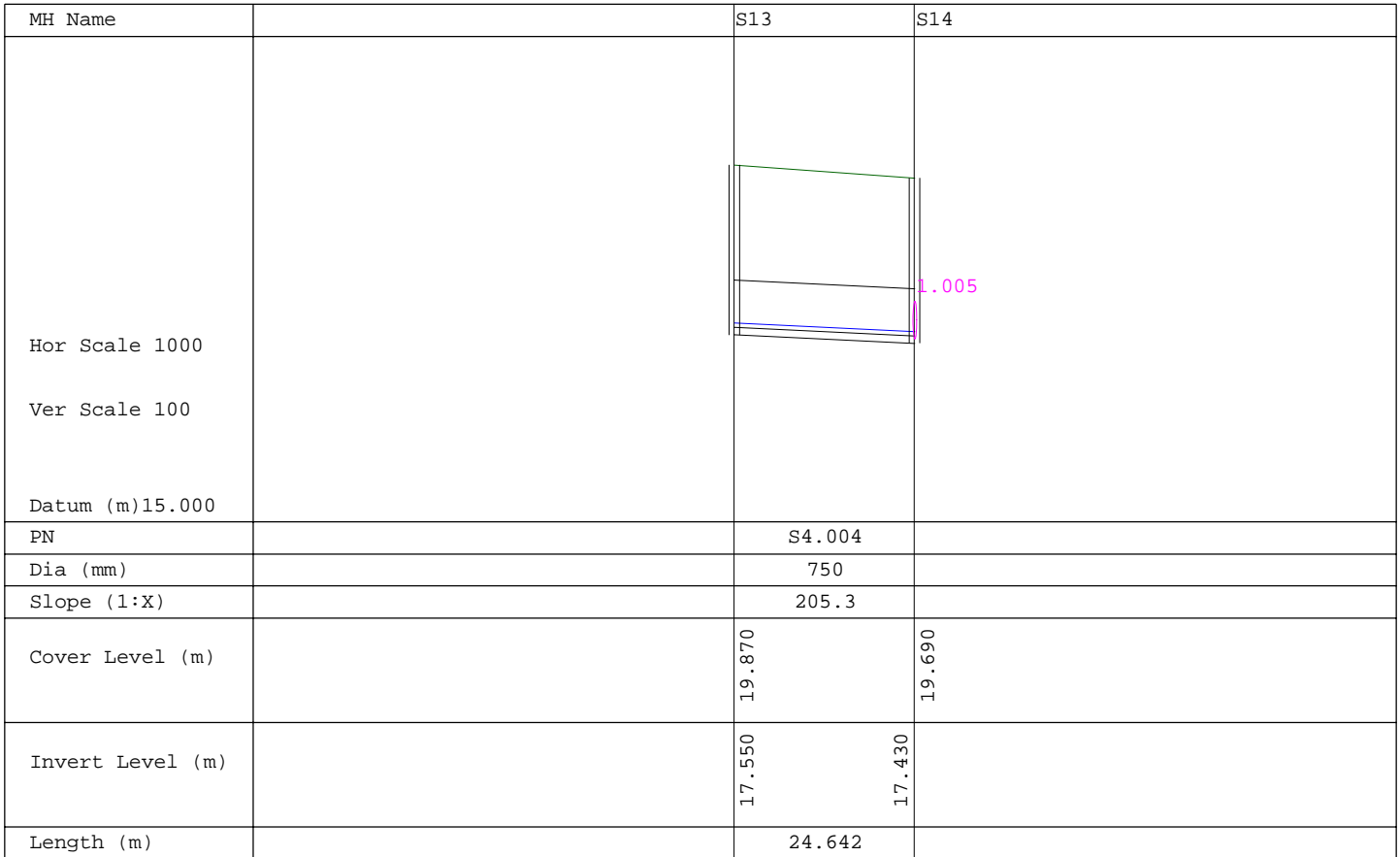
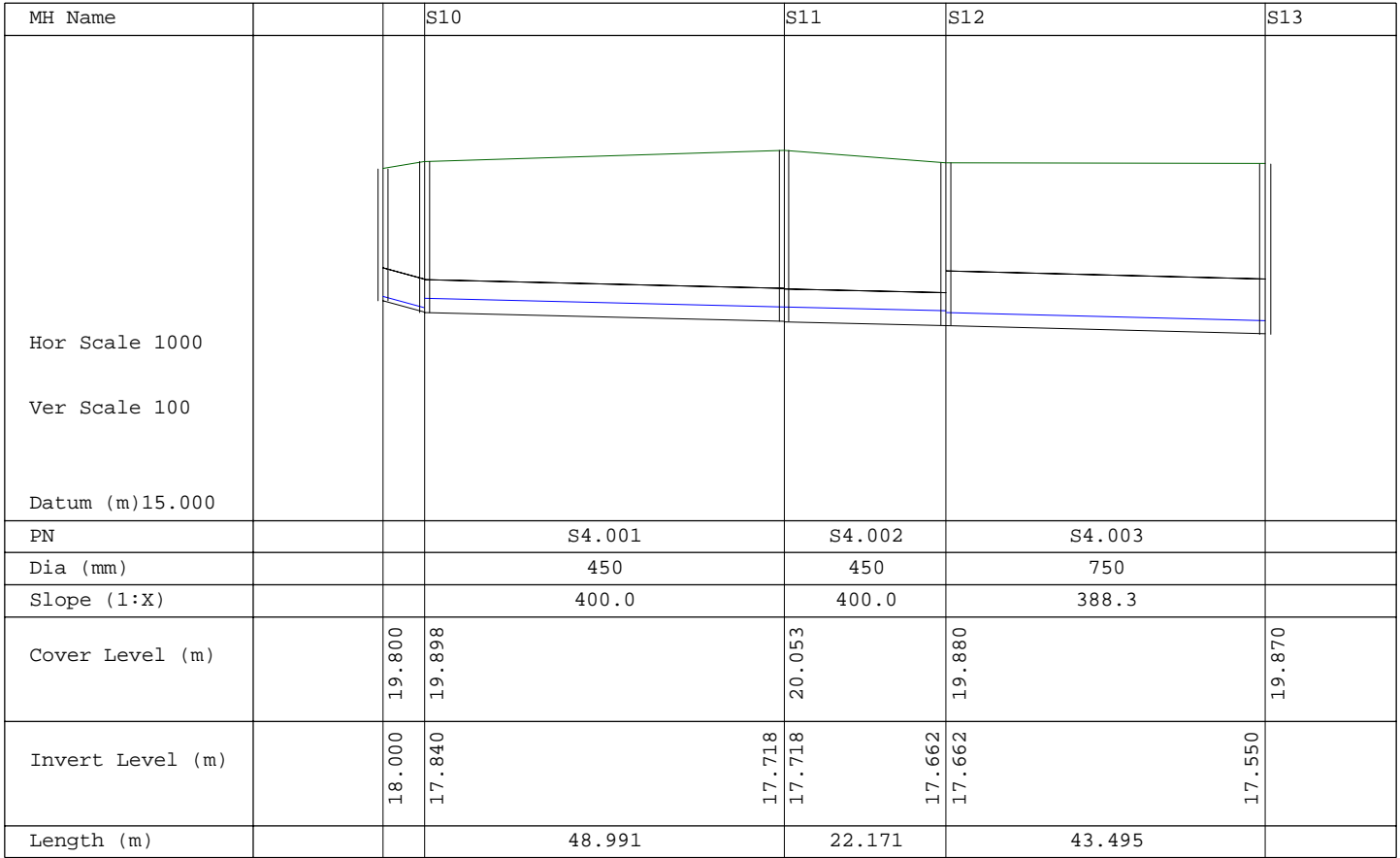


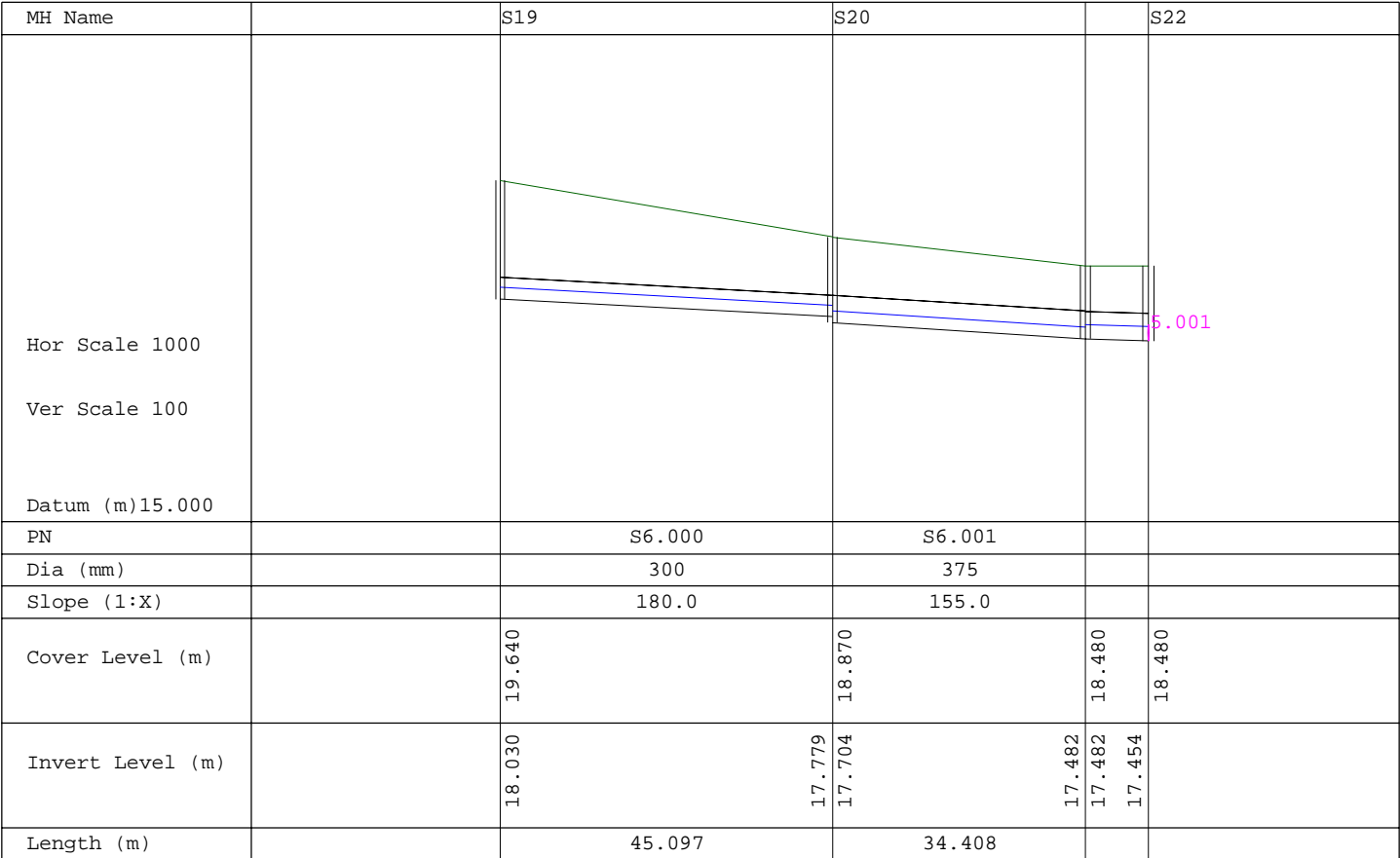
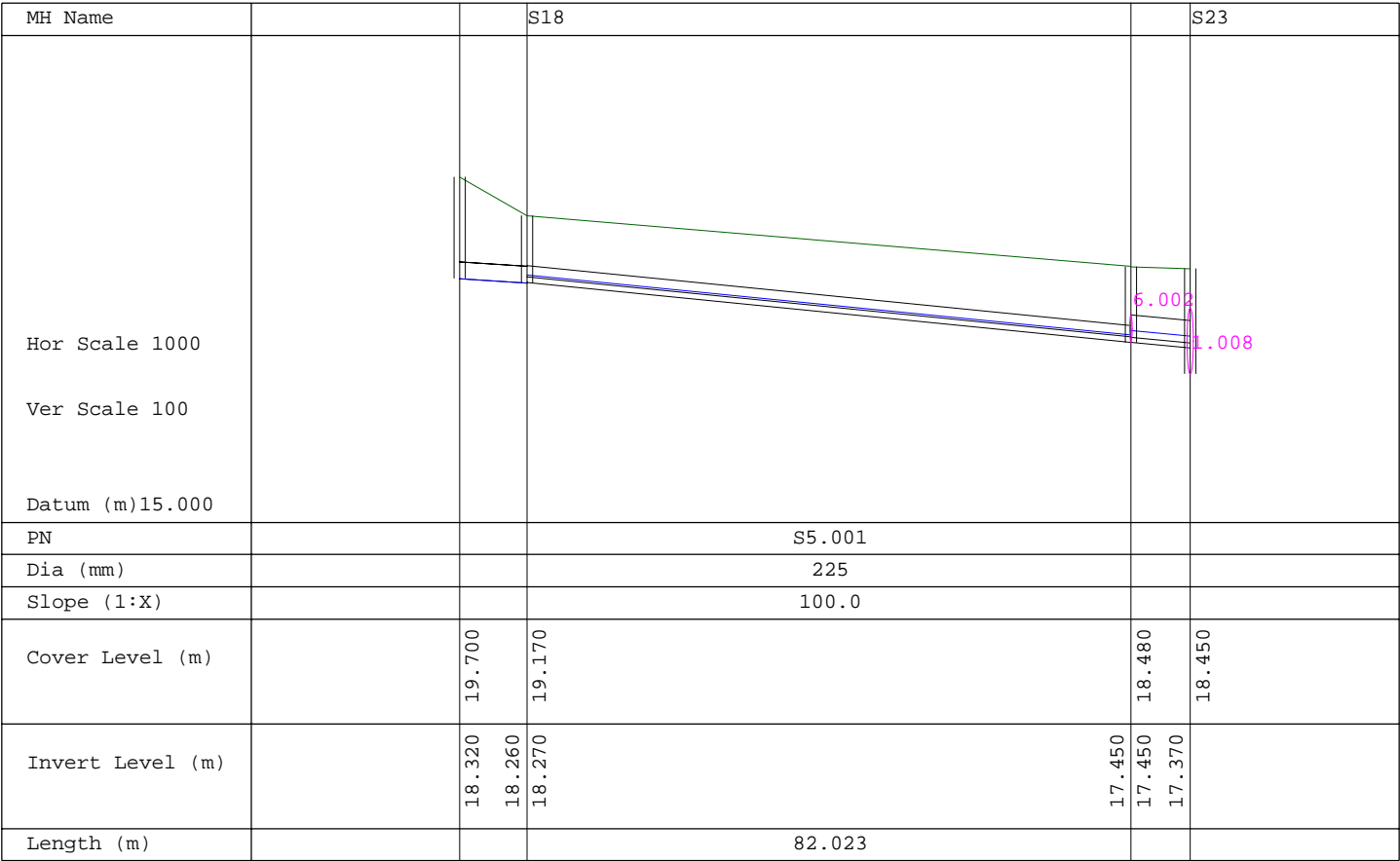




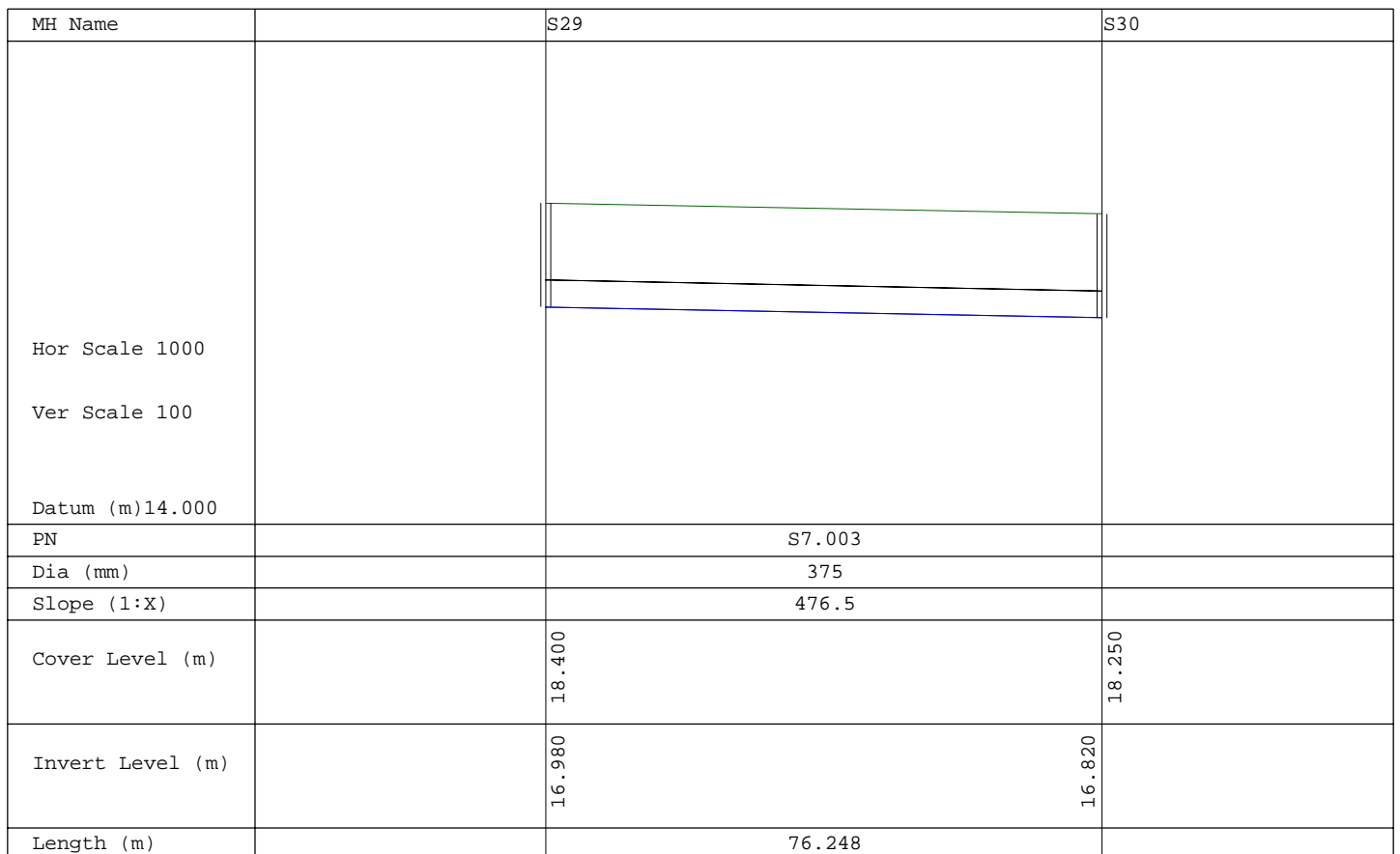
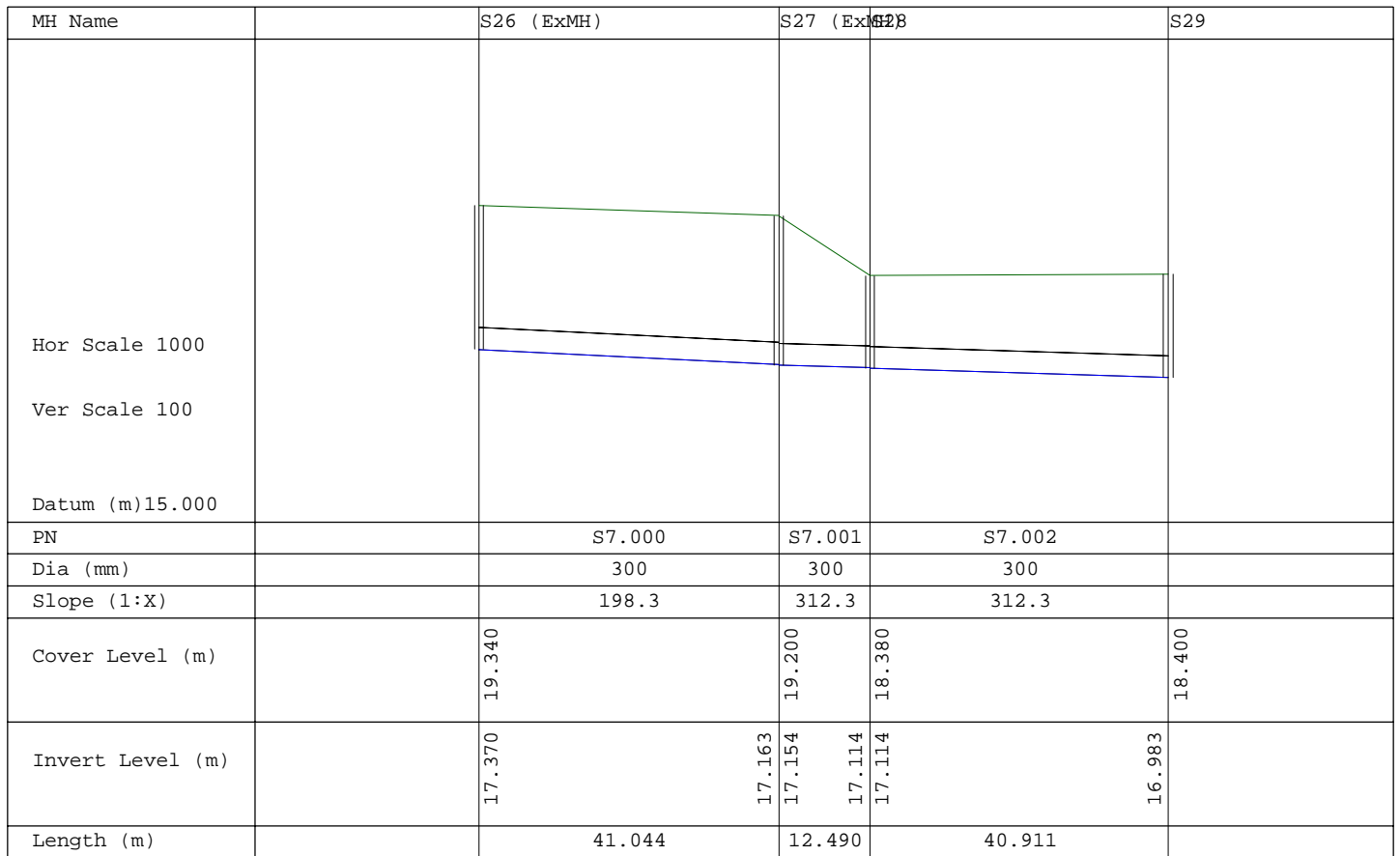
MH Name		S4	S5
<div> <div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)16.000</div> </div> 			
PN		S2.000	
Dia (mm)		300	
Slope (1:X)		172.6	
Cover Level (m)		20.070	19.900
Invert Level (m)		18.800	18.700
Length (m)		17.256	

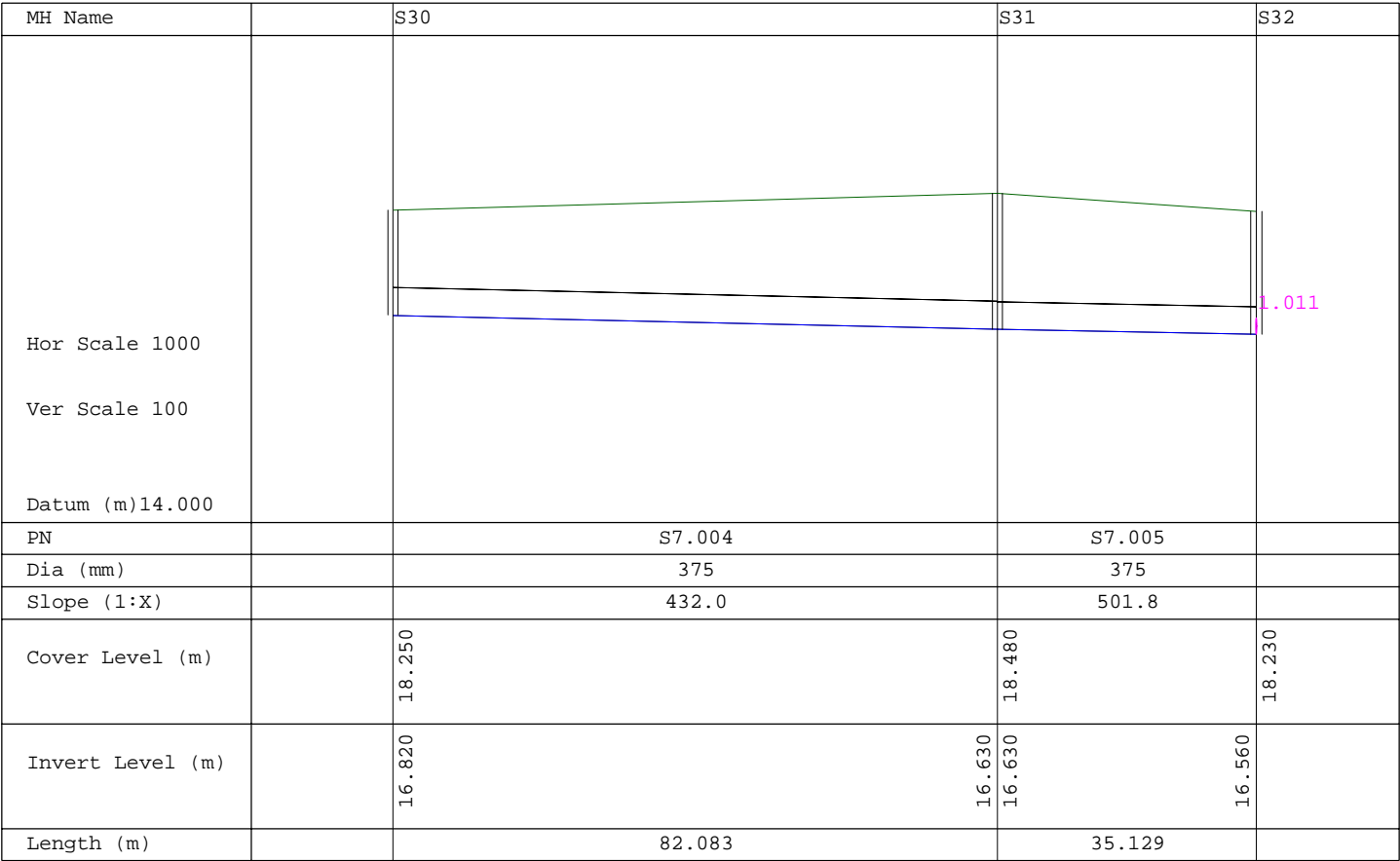
MH Name		S6	S7
<div> <div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)16.000</div> </div> 			
PN		S3.000	
Dia (mm)		375	
Slope (1:X)		152.3	
Cover Level (m)		20.050	19.620
Invert Level (m)		18.500	18.162
Length (m)		51.474	





Network 2020.1





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

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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


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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

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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
F10.001	18.077	0.000	0.0	0	0.0	0	0.00	1.00	17.7
F10.002	17.727	0.000	0.0	0	0.0	0	0.00	0.99	17.6

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	

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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)
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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

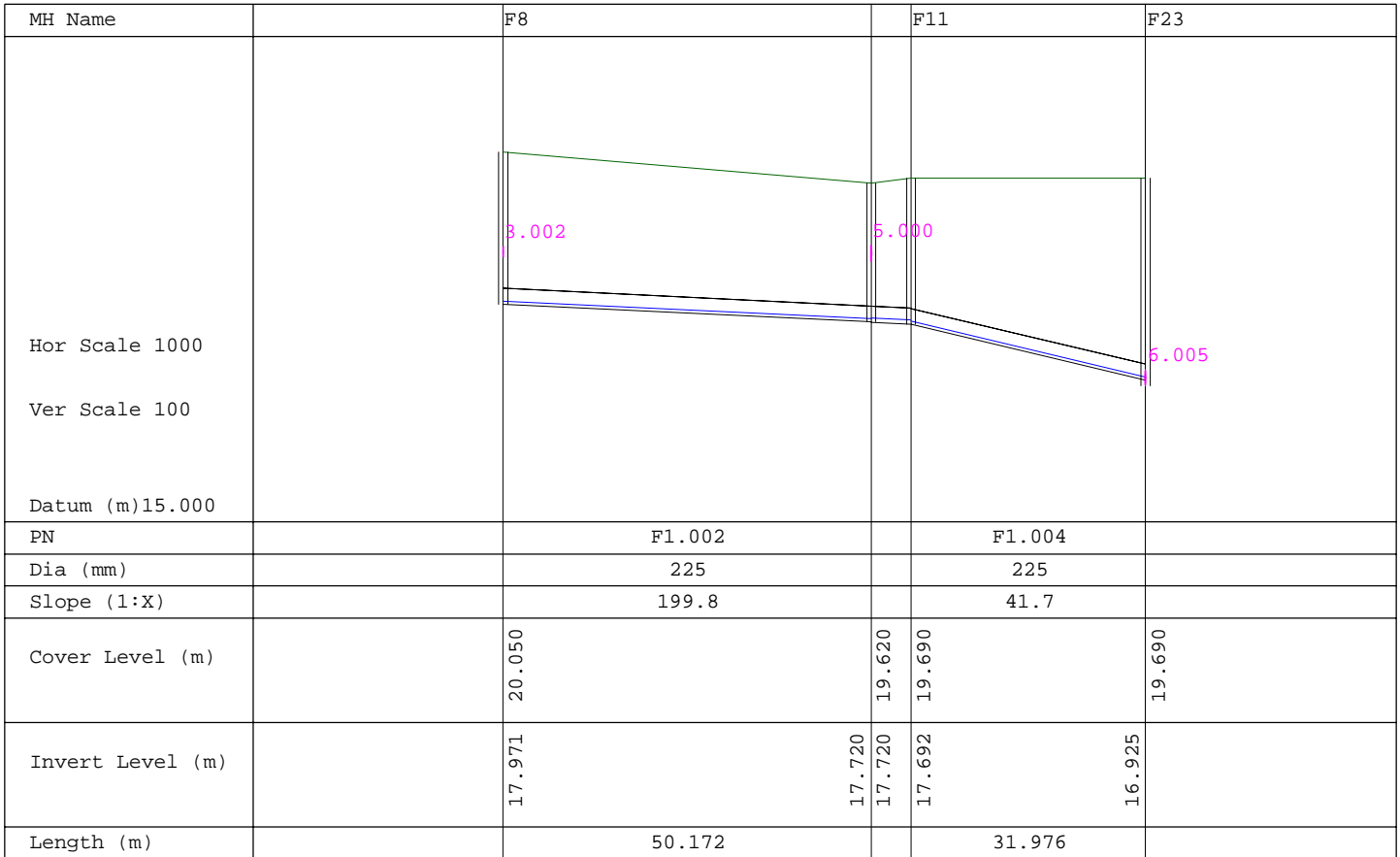
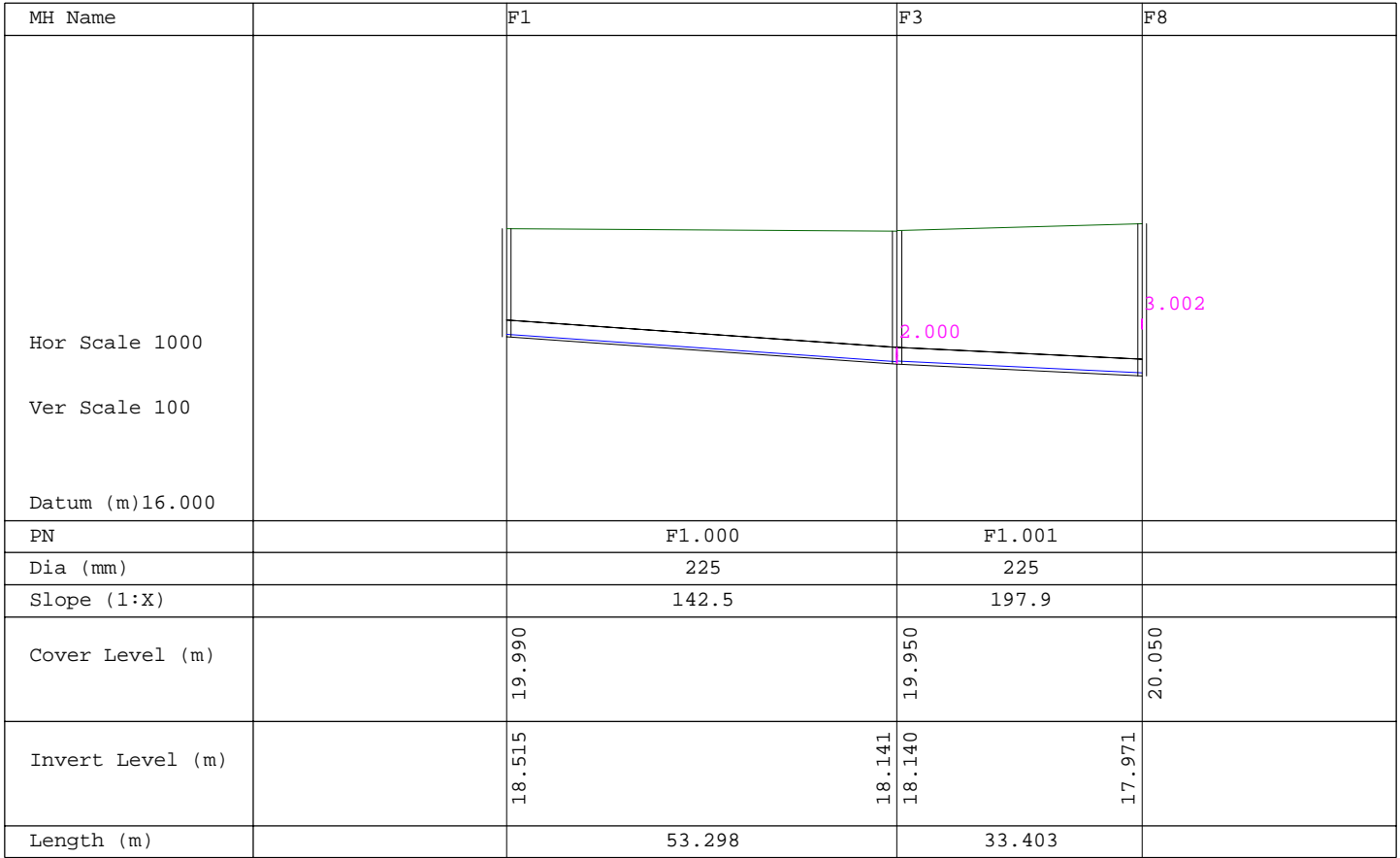
Simulation Criteria for Foul - Main

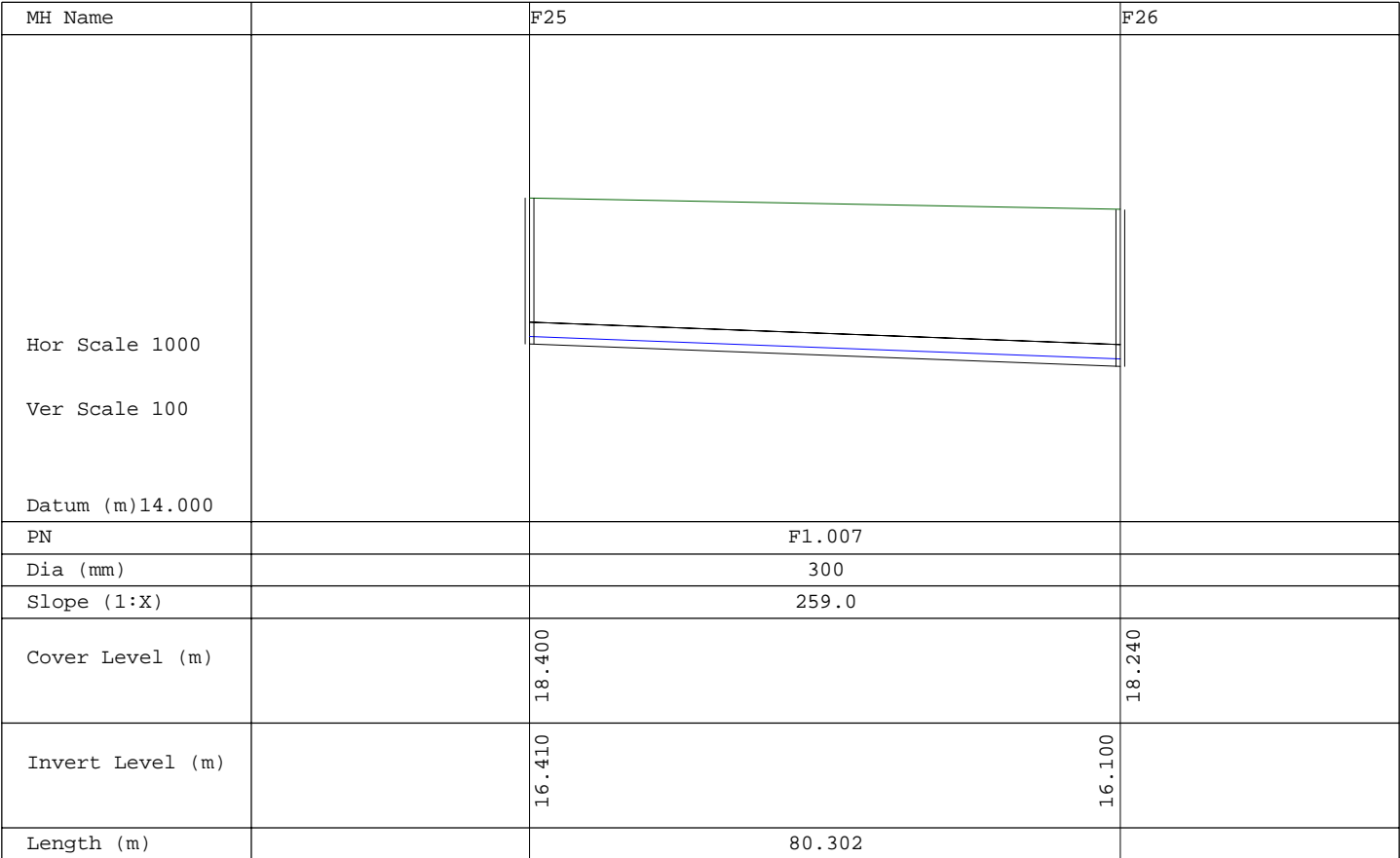
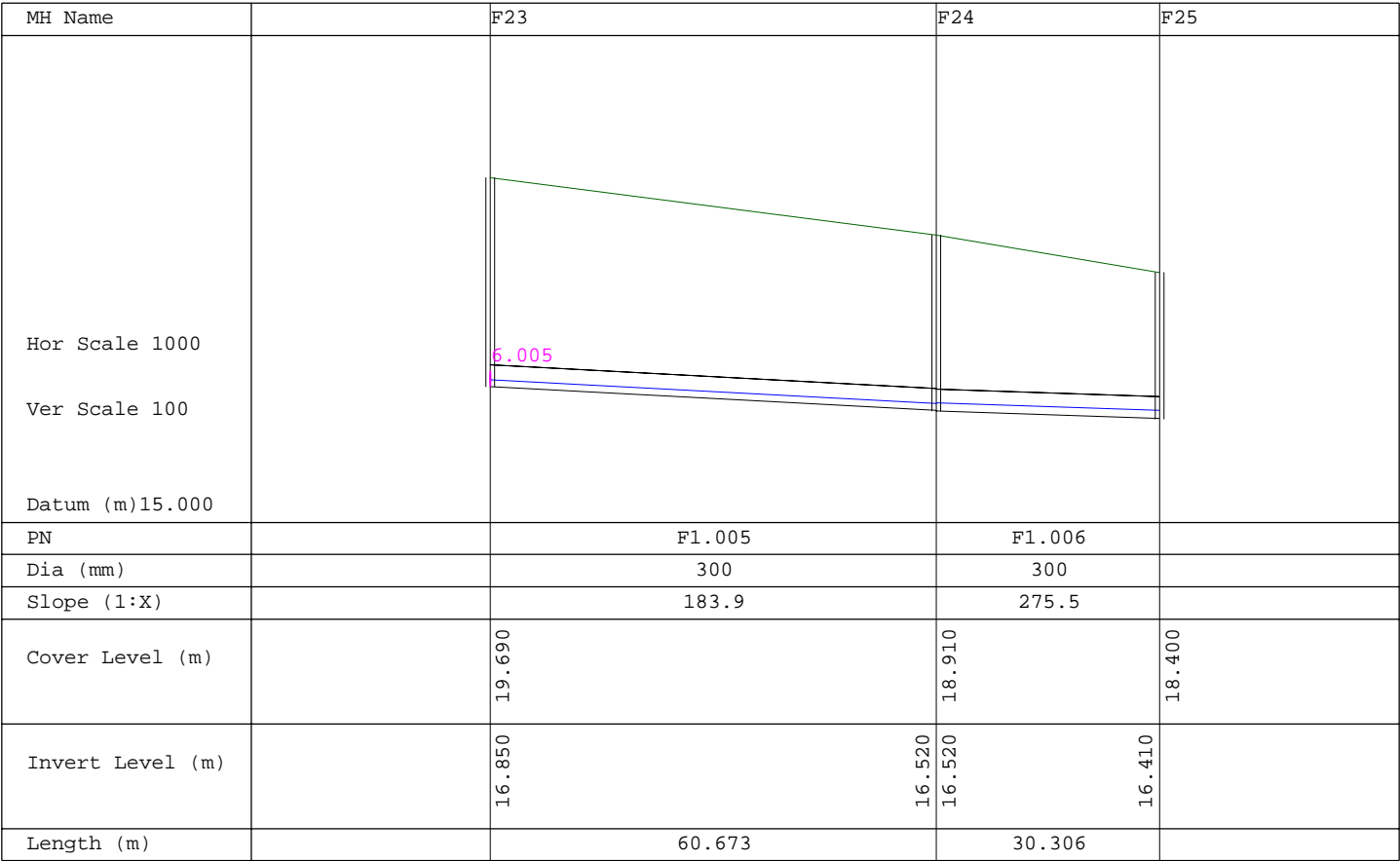
Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul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

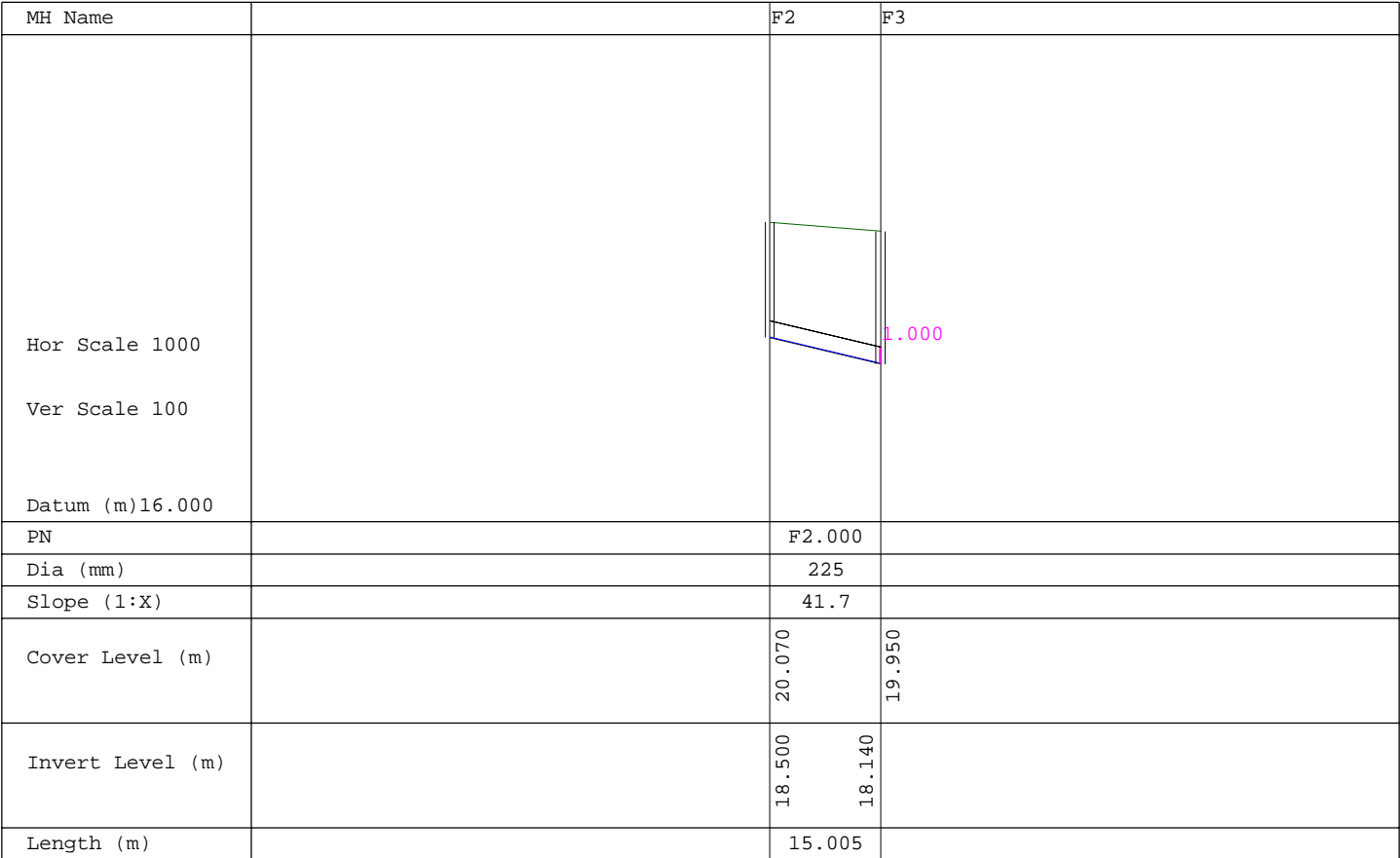
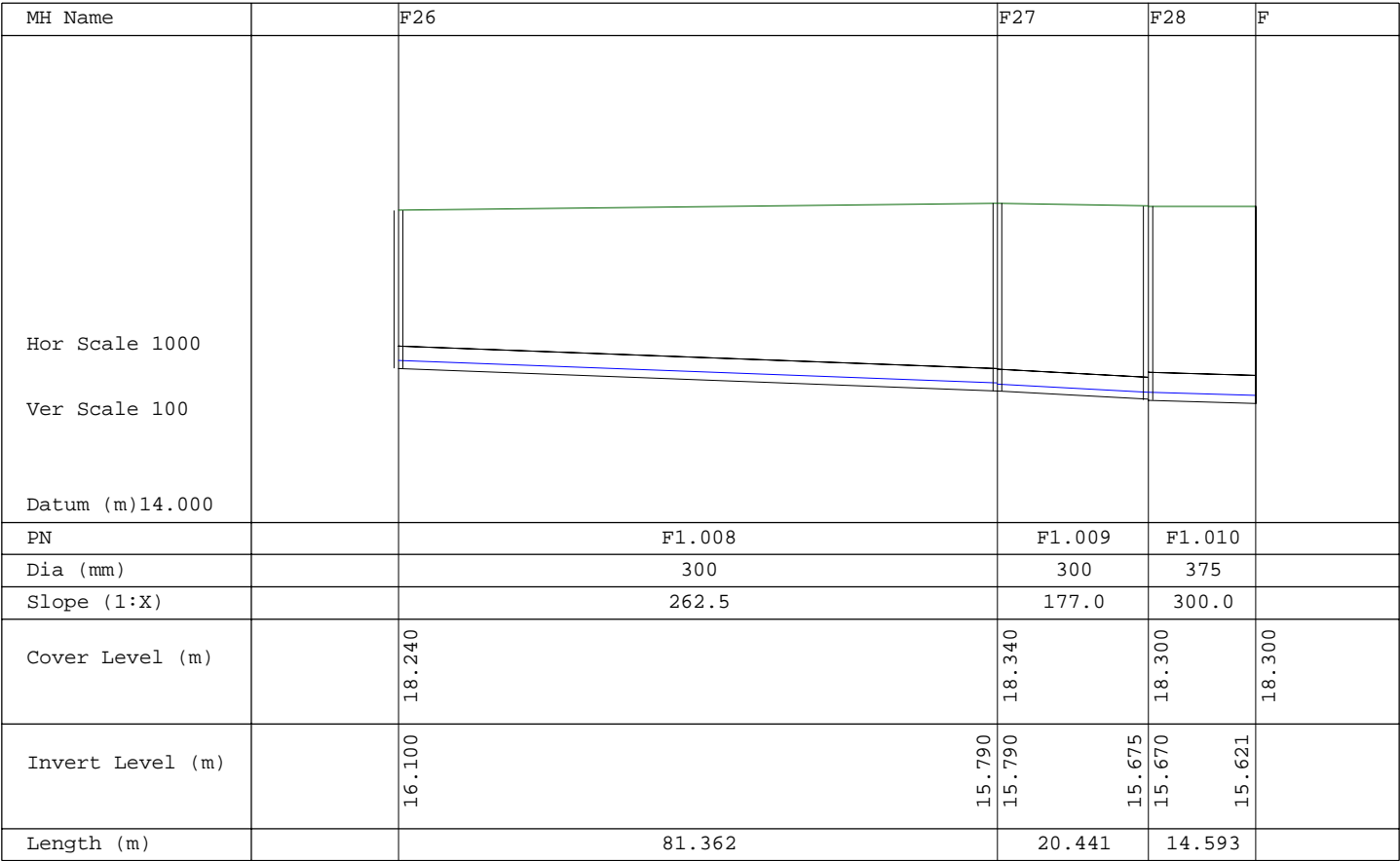
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

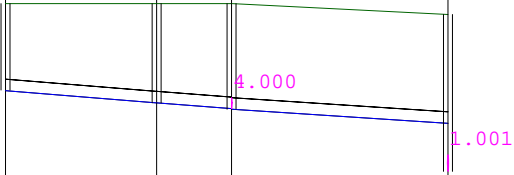
Synthetic Rainfall Details

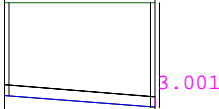
Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	1.000
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.400	Storm Duration (mins)	30
Ratio R	0.277		

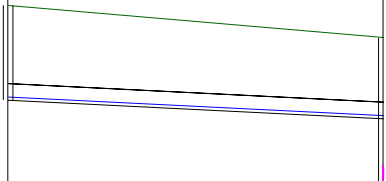


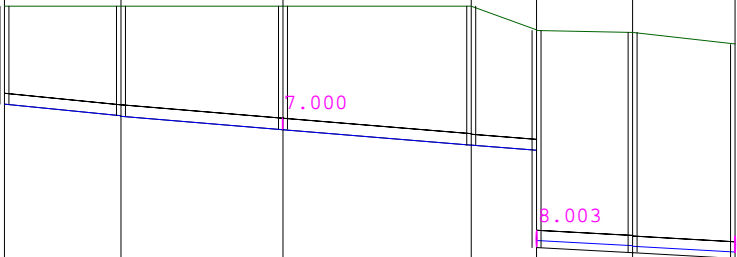


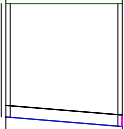


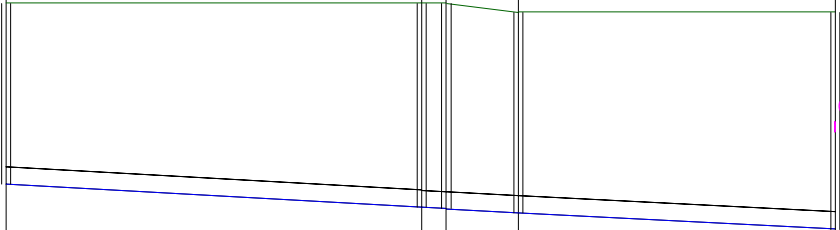
MH Name		F4		F7	F8
<div> <div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)16.000</div> </div> 					
PN		F3.000		F3.002	
Dia (mm)		150		150	
Slope (1:X)		120.0		150.0	
Cover Level (m)		20.200	20.200	20.200	20.050
Invert Level (m)		19.050	18.884 18.884	18.801 18.801	18.610
Length (m)		19.955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

MH Name		F6	F7
<div> <div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)16.000</div> </div> 			
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
<div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)16.000</div>			
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
<div>Hor Scale 1000</div> <div>Ver Scale 100</div> <div>Datum (m)15.000</div>								
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	18.567	18.359	17.000	16.930	16.850
Length (m)		15.398	21.430	24.970		12.688	13.565	

MH Name		F14	F15
<p>Hor Scale 1000</p> <p>Ver Scale 100</p> <p>Datum (m)16.000</p>			
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
<p>Hor Scale 1000</p> <p>Ver Scale 100</p> <p>Datum (m)15.000</p>					
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	17.000
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
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		

