AtkinsRéalis

Civil, Mechanical & Electrical Part 8 Planning Report

Cork City Council

06 October 2026

CORK NORTHWEST REGENERATION; PHASE 4C WEST

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This document has 21 pages including the cover.

Document history

Document title: Civil, Structural, Mechanical & Electrical Stage 2A Report

Document reference: CNW P4F-AK-P4F-XX-RP-Z-XXXXXX

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0.0	Part 8 Planning	PP	EN	ROD	MOS	06/08/26
1.0	Part 8 Planning	PP	EN	ROD	MOS	06/10/26

Client signoff

Client	Cork City Council
Project	Cork Northwest Regeneration; Phase 4C West
Job number	100125176
Client signature/date	

Contents

1. Introduction 4

2. Existing Site 6

2.1 Existing Site 6

2.2 Existing Civils 6

3. Proposed Civil Works 7

3.1 Site Access & Circulation 7

3.2 Pavements 7

3.3 External Civils 7

4. Potable Water Supply 8

4.1 Proposed Water Infrastructure 8

5. Foul Water Drainage 8

5.1 Proposed Foul Infrastructure 8

6. Surface Water Drainage 9

6.1 Proposed Surface Water Drainage 9

6.2 Site Design Details 9

6.3 Sustainable Drainage Systems 11

Appendix A. Foul Drainage Design Criteria and Manhole Schedules 14

Appendix B. Surface Drainage: Design Criteria, Pipeline Schedules, Flow Control Design and Network Simulation Results 15

Appendix C. Engineering Drawings 16

Appendix D. Stage 1 Road Safety Audit 17

Appendix E. Public Lighting Report 18

Appendix F. Design report & Energy Statement (Part L Requirement) 19

Appendix G. Irish Water Confirmation of Feasibility Letter for Potable Water and Wastewater 20

Figures

Figure 1-1 - Site Location Map (Showing CNWQR Masterplan Phases) (Source: City Architect's Department) 4

Figure 1-2 - Site Location Map - Phase 4C West (Source: City Architect's Department) 5

Figure 6-1 - Temporary and Permanent Stormwater Connection 10

1. Introduction

This Report is submitted as part of the Phase 4C West development in the Cork Northwest Quarter Regeneration. This report encompasses the Civil, Mechanical and Electrical aspects of the project.

The project is part of the Cork City Northwest Regeneration Masterplan, which includes a phased programme of relocation, demolition and construction of replacement housing.

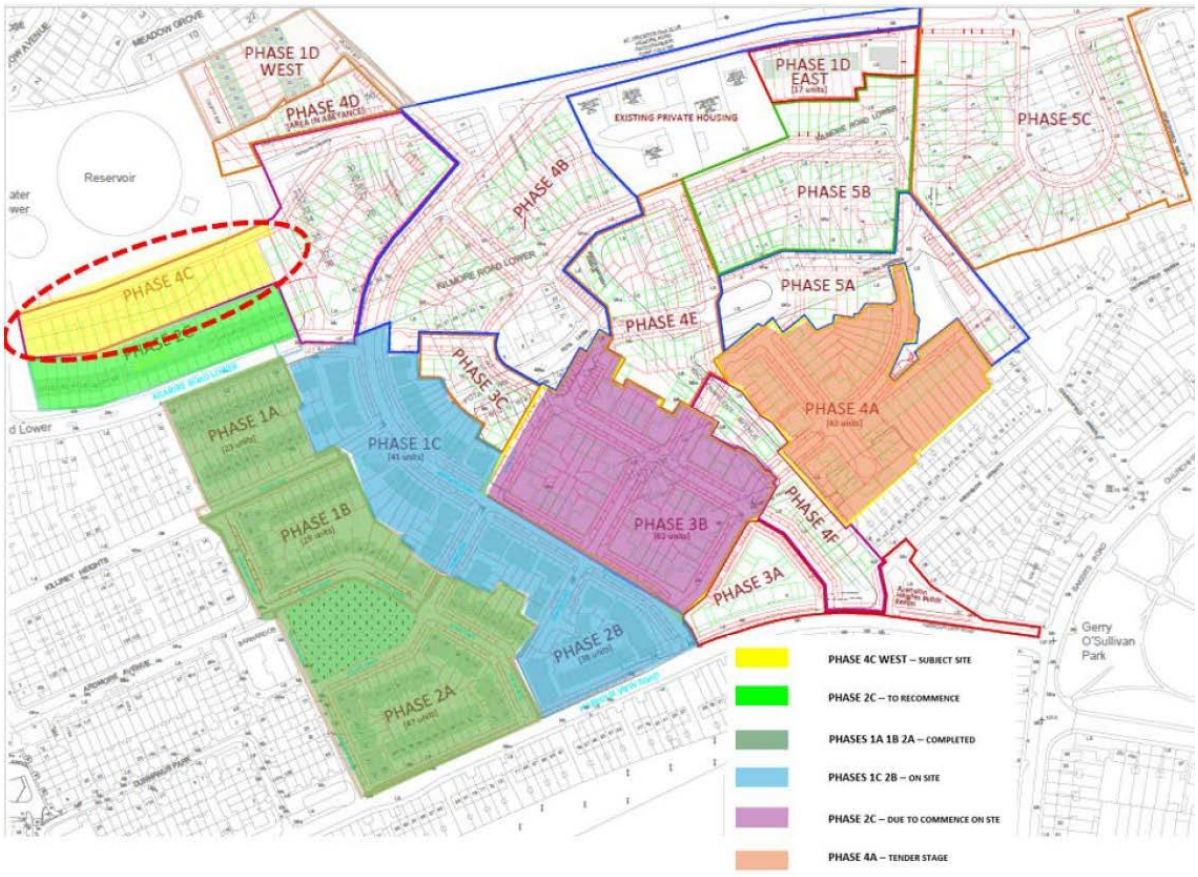


Figure 1-1 - Site Location Map (Showing CNWQR Masterplan Phases) (Source: City Architect's Department)

The report and its appendices address the following engineering aspects associated with the development:

- Road Engineering
- Foul Water Drainage
- Storm Water Drainage, including SuDS
- Potable Water Supply
- Part L 'Conservation of Fuel and Energy' – Report
- Public Lighting

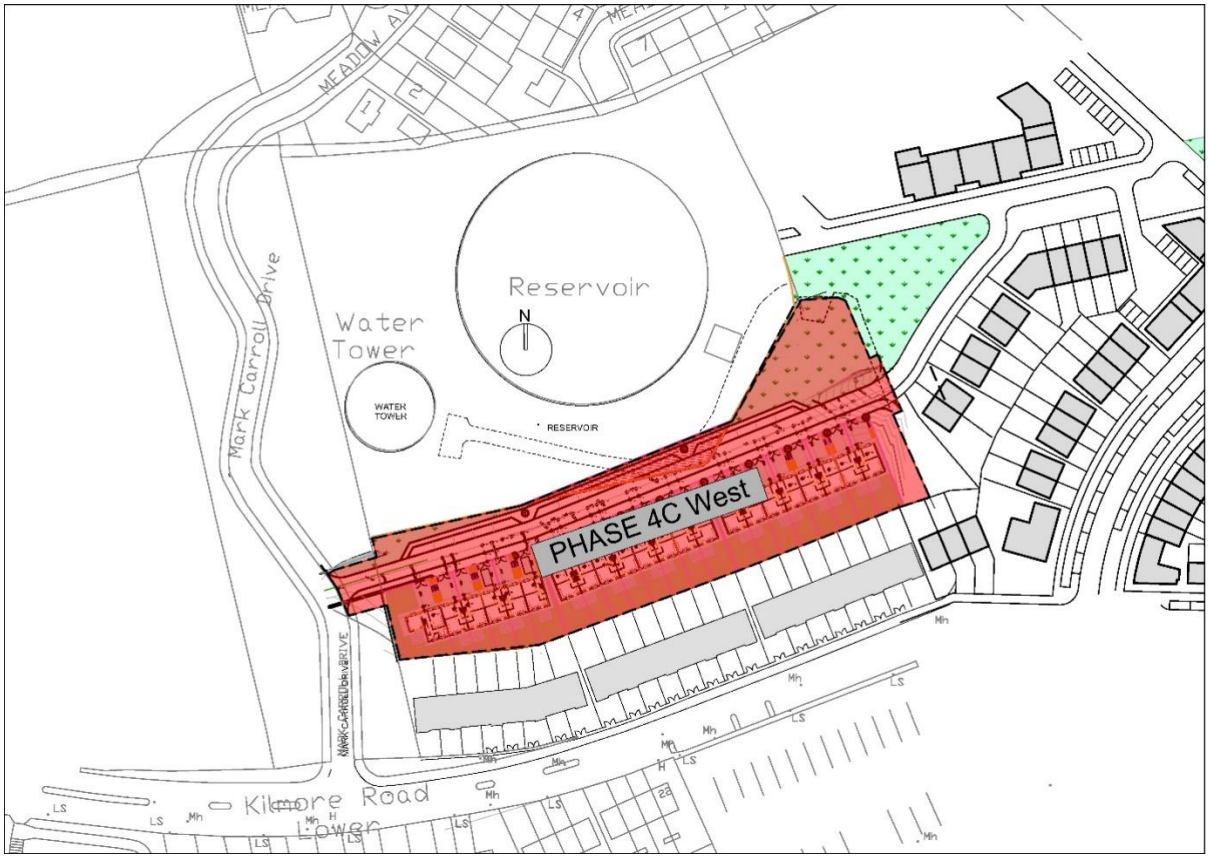


Figure 1-2 - Site Location Map - Phase 4C West (Source: City Architect's Department)

This report is to be read in conjunction with the applicable reports attached to this report and the Engineering Drawing set, as attached in Appendix C:

- P4CW-ZZZ-ZZZ-DR-ATK-CE-950700 Phase 4CW - Proposed road pavement layout
- P4CW-ZZZ-ZZZ-DR-ATK-CE-950710 Phase 4CW - Proposed road levels
- P4CW-ZZZ-ZZZ-DR-ATK-CE-950740 Phase 4CW - Proposed layout junction sightlines
- P4CW-ZZZ-ZZZ-DR-ATK-CE-950751 Phase 4CW - Proposed autotracking layout refuse truck
- P4CW-ZZZ-ZZZ-DR-ATK-CE-950752 Phase 4CW - Proposed autotracking layout pumping appliance
- P4CW-ZZZ-ZZZ-DR-ATK-CE-950753 Phase 4CW - Proposed autotracking layout private car
- P4CW-ZZZ-ZZZ-DR-ATK-CE-951200 Phase 4CW - Road signs and traffic markings
- P4CW-ZZZ-ZZZ-DR-ATK-CE-960500 Phase 4CW - Proposed storm water drainage layout
- P4CW-ZZZ-ZZZ-DR-ATK-CE-960520 Phase 4CW - Proposed foul water drainage layout
- P4CW-ZZZ-ZZZ-DR-ATK-CE-960580 Phase 4CW - Proposed SUDS
- P4CW-ZZZ-ZZZ-DR-ATK-CE-962700 Phase 4CW - Watermain layout
- P4CW-XXX-XXX-DR-ATK-CE-960590 Phase 4CW - Proposed services typical details
- P4CW-XXX-XXX-DR-ATK-CE-960591 Phase 4CW - Proposed SUDS typical details
- P4CW-ZZZ-ZZZ-DR-ATK-CE-910070 Phase 4CW - Proposed site layout
- P4CW-ZZZ-XXX-DR-ATK-EE-000001 Proposed Public Lighting
- P4CW-ZZZ-XXX-DR-ATK-EE-000002 Proposed Public Lighting Details

2. Existing Site

2.1 Existing Site

The Phase 4C West site is a greenfield site with an area of ca. 0.55 hectares located within the Knocknaheeny regeneration area as described in the 2011 Cork City Northwest Regeneration Masterplan.

Phase 4C West is bounded by Phase 2C to the South & the water tower reservoir site to the North.

Part of the proposal is to improve connectivity (vehicular, cycle, pedestrian) to 'The Meadows' an existing residential development to the far North of Phase 4C West. This connection will also allow ease of access to the completed Phase 4C West should the future phases to the east commence.

The proposal is to develop circa 22 no. dwellings. Phase 4C West is designated as 2 storey 3 bed dwellings.

2.2 Existing Civils

Following the demolition contract on the site, it is proposed that a final accurate topographical survey and GPR/Utility survey are to be carried out of the proposed site footprint.

A desktop study has identified the following utilities/services in the vicinity of the site:

- Foul Water Drainage
- Storm Water Drainage
- Watermains
- Telecoms (Eircom and Virgin Media)
- Overhead & Underground Electrical Cables
- Gas
- Public Lighting

3. Proposed Civil Works

3.1 Site Access & Circulation

The roads infrastructure for the proposed development is as per the adopted Masterplan design for the regeneration project. Access to the site will be provided via Dunmore Gardens Road at the east and Meadow Avenue at the west. Both routes connect to Kilmore Rd Lower to the south of the Site. The proposed civil works include the construction of a new road running east to west, connecting Dunmore Gardens Road and Meadow Avenue.

A Stage 01 Road Safety Audit has been completed for the proposed development and is attached in Appendix D. The findings of this Road Safety Audit have been incorporated in the design. The road layout, road section widths and road build-up will all be maintained in line with the adopted Masterplan design requirements.

3.2 Pavements

There are various pavement options proposed within the site, comprising bituminous and concrete.

Trafficked areas:

Road - 200mm total bituminous on 150mm CL 804 on minimum capping required in line with TII MCDRW.

Car Parking Bays:

Car Parking Bays - 120mm total porous asphalt on 30mm choker course on 220mm course graded aggregate (CGA) or MOT type 3/SHW CL805 subbase with minimum capping required in line with TII MCDRW. Subbase layer to be lined with a permeable non-woven textile.

Pedestrian areas:

Footpaths – 100mm Concrete on 100mm CL 804 subbase.

Footpaths at Vehicular Access Locations – 150mm Concrete with 1 Layer of A393 Mesh top & bottom CL 804 on minimum capping required in line with TII MCDRW.

3.3 External Civils

Works outside of the red-line site extents are required to facilitate the provision of foul, stormwater, and dry utility service connections. These works will include excavation, installation of new infrastructure, and tie-ins to existing networks. Temporary or permanent reinstatement of any affected footpaths, verges, or roadway surfaces will be carried out in accordance with local authority standards and current design requirements.

4. Potable Water Supply

4.1 Proposed Water Infrastructure

The potable water supply for the proposed development has been designed in accordance with Irish Water Code of Practice and Standard Construction Details.

The potable water supply for the development has been designed in accordance with the Irish Water Code of Practice and Standard Construction Details. A new 150 mm ductile iron water main will be installed within the proposed road and will connect to the existing main on Meadows Avenue, providing the primary supply to the scheme. This network includes provisions for future phase tie-ins and will deliver metered connections to all 22 proposed dwellings.

An Irish Water Pre-Connection Enquiry (ref. CDS26001502) has been submitted for the anticipated demand based on the information contained within this Report and the adopted Masterplan design, and a Confirmation of Feasibility has been issued. The water main layout is shown in Appendix C, and the feasibility letter is included in Appendix G.

5. Foul Water Drainage

5.1 Proposed Foul Infrastructure

The foul water network for Phase 4C West has been designed in accordance with the adopted Masterplan. A 225 mm diameter foul sewer will run within the proposed road from west to east. The system will initially form a temporary connection between an existing manhole in Phase 1C, located south of Phase 4C West. This temporary arrangement will be removed once the Phase 4C East foul network is constructed and the permanent connection is established.

An Irish Water Pre-Connection Enquiry (ref. CDS26001502) has been submitted to Irish Water for the proposed foul layout based on the information contained within this Report and the adopted Masterplan design. A confirmation-of-feasibility letter has been received for the proposal outlined above. Refer to Appendix G for a copy of the confirmation of feasibility letter.

“MicroDrainage” which is an industry standard tool for design and assessment of gravity sewer drainage networks has been used to model the proposed foul network. The MicroDrainage model shows that the proposed foul network has adequate capacity for the flows that will be generated from the proposed development and will achieve self-cleansing velocities. The foul network has been designed to achieve self-cleansing velocity in the pipe system at least once per day. This varies for pipe sizes with full bore self-cleansing are in accordance with Irish Water Wastewater Code of Practice.

Refer to Appendix C for Proposed Foul Water Drainage Layouts.

6. Surface Water Drainage

6.1 Proposed Surface Water Drainage

It is proposed that the development site will collect surface water runoff and discharge it under gravity into the storm infrastructure network, as adopted in the masterplan design and constructed under the Phase 4C West works. Pipe diameters will vary from 225mm to 300mm. The system will initially form a temporary connection between an existing manhole south of Phase 2C, located south of Phase 4C West. This temporary arrangement will be removed once the Phase 4C East stormwater network is constructed and the permanent connection is established.

“MicroDrainage”, which is an industry standard tool for design and assessment of gravity sewer drainage networks, has been used to model the proposed surface water network. The MicroDrainage model shows that the proposed surface water network has adequate capacity for the flows generated by the proposed development and will achieve full-bore self-cleansing velocities.

Given the nature of the site, overland surface water runoff has been considered, and site levels have been designed accordingly. Proposed levels allow surface water runoff to fall away and avoid ponding around buildings.

The entire surface water network will be constructed in accordance with the Greater Dublin Code of Practice for Drainage Works Version 6.0 and the Cork City Council standard details. Surface Water Drainage has been designed in accordance with the Greater Dublin Code of Practice for Drainage Works Version 6.0.

Refer to Appendix C for Proposed Surface Water Drainage Layouts.

6.2 Site Design Details

A minimum cover of 1.2m has been provided for the proposed network to give sufficient cover to the soffit level within road locations, with a minimum slope specified to achieve self-cleansing velocities and reduce drainage depths downstream of the site. Where the desired 1.2m cover cannot be achieved, an absolute minimum of 900mm is proposed, and the pipe is to be adequately protected with a concrete surround and protection slab as shown on the Proposed Surface Water Drainage Layout in Appendix C, and as per IW typical detail STD-WW-08. The overall primary infrastructure will be maintained as per the masterplan, with the tie-in points to future phase levels being fixed as per the masterplan requirements.

The proposed impermeable areas have been incorporated into the hydraulic model, with 100% of impermeable areas applied to the drainage network. The Phase 4C west roads shall drain via traditional proprietary products such as kerb, gullies and drains to the storm water network.

The proposed surface water design was designed to provide the following;

- For the overall stormwater network design, a 10% climate change was allowed for all storm events, as per the original masterplan
- No surcharging in the 1 in 5-year storm event. Pipes immediately upstream of flow control devices may encounter a small amount of surcharging due to the flow being throttled accordingly.
- No Flooding in the 1 in 30-year storm event.
- No flooding against a 1 in 100-year storm event or controlled flooding allowing the volume to be contained on site and not impact the surrounding infrastructure.

The Phase 4CWest site forms part of the wider CNWQ (City North West Quarter) adopted stormwater masterplan, with its attenuation strategy fully integrated into the hydraulic and environmental performance requirements of the overall network.

As part of the proposed development, the stormwater network will initially discharge via a temporary connection extending from the western boundary of the site to the existing manhole located south of Phase 2C, immediately south of Phase 4CWest. This temporary arrangement will remain in place until the Phase 4C East stormwater network is constructed and the permanent connection established, at which point the temporary connection will be decommissioned.

Under both the temporary and permanent drainage arrangements, runoff from Phase 4CWest will ultimately discharge to the attenuation tank located at the boundary between Phases 1B and 2A, as it is part of the overall designed SW network instead of an isolated development. This attenuation tank and flow control device have been designed and constructed to accommodate flows from the entire upstream catchment, including Phase 4CWest and other future development phases. As the Phase 4CWest stormwater network is part of the wider network that includes a flow control device located at the attenuation tank location, no additional flow control has been introduced as part of this development, as not required.

The introduction of the temporary connection does not alter the ultimate discharge location of the network, nor does it affect the approved discharge rates or the existing attenuation storage volume established under the adopted masterplan and constructed as part of Phase 2A works. Consequently, the temporary drainage arrangement will have no adverse impact on the hydraulic performance or capacity of the downstream stormwater network.

A schematic illustrating the temporary and permanent drainage arrangements is provided in Figure 6-1 below.

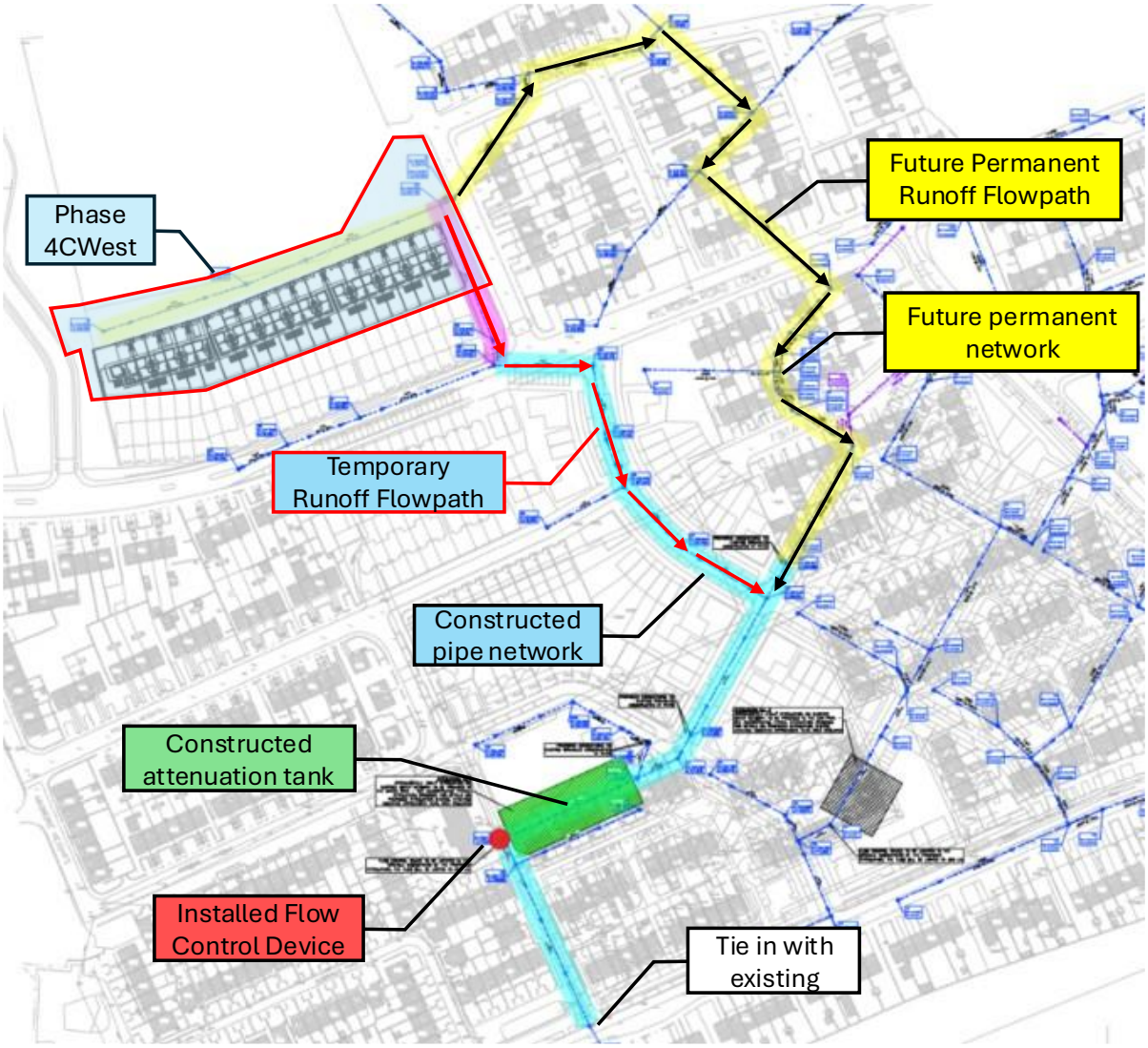


Figure 6-1 - Temporary and Permanent Stormwater Connection

6.3 Sustainable Drainage Systems

It is proposed that a combination of Sustainable Drainage Systems (SuDS) be utilised to attenuate flows throughout the site and allow for the calculated reduced discharge to the existing network.

There are 3 main types of SuDS proposed within the development:

- Porous asphalt on the proposed car parks
- Bioretention Raingardens
- Tree Pits

An overall layout of the proposed locations of SuDS is included as part of this planning application.

Porous Asphalt

Porous asphalt is proposed for the car parks as a cost-effective surface water drainage solution, owing to the substantial storage capacity provided within the pavement system, allowing rainfall to pass into a permeable sub-base structure beneath, where it is stored temporarily before infiltrating into the ground or being conveyed via an underdrain. This SuDS component provides both attenuation and treatment by filtering sediments and reducing runoff at source.

The porous asphalt surface will be laid over an open-graded stone sub-base designed to accommodate temporary stormwater storage. Infiltrating water will percolate through the sub-base, where fine sediments are trapped and flow velocities are reduced. Depending on ground permeability, the system will operate as either an infiltration pavement or a lined attenuation pavement with a controlled discharge.

Porous asphalt should be inspected regularly and after major storms, with vacuum sweeping carried out at least twice yearly (typically in spring and autumn) to remove sediment and debris and maintain infiltration performance. Any local clogging should be addressed promptly, while sand application, sealcoating and conventional crack sealing should be avoided as they can block surface voids.

Bioretention Raingardens

Bioretention raingardens will be provided at strategic locations across the site and adjacent to the road network to manage runoff from nearby hard surfaces. Raingardens are shallow, vegetated features that slow, filter, and attenuate surface water before it infiltrates into the ground or discharges to the surface water network, offering water quality, biodiversity, and amenity benefits.

Runoff will enter the raingardens via overland flow or small inlets/kerb depressions and water will then percolate through engineered bioretention media, providing treatment through filtration, adsorption, and biological uptake. Where ground conditions limit infiltration, an underdrain may be included to convey treated flows onward. Check dams may also be provided where appropriate depending on ground slope.

Raingardens should be maintained through regular inspection of infiltration surfaces, underdrains, planting, and inlets/outlets to identify silting, ponding, blockages, poor plant health or invasive species. Routine maintenance should include removal of litter, weeds, sediment and debris, replacement of failed planting, localised repair of erosion or silted areas, and replacement of filter media and vegetation where remedial works are required.

SuDS Tree Pits

It is proposed to include SuDS tree pits in selected areas of the development to provide localised surface water interception, treatment, and attenuation while contributing to site landscaping. SuDS tree pits are engineered planting pits designed to receive runoff from adjacent hardstanding areas, where water is filtered through a structured soil medium that supports tree growth and provides pollutant removal. They function as small-scale bioretention systems integrated within urban environments.

Surface water runoff will enter the tree pits via pavement inlets or direct overland flow. As water passes through the permeable soil media, sediments and pollutants are removed through filtration, adsorption, and biological uptake by vegetation and microorganisms within the rooting zone. Depending on the underlying ground conditions, the pits may include an underdrain to convey excess treated water into the surface water drainage network, while areas with suitable infiltration potential will allow a proportion of flows to infiltrate into the natural subgrade. Storage is provided within the soil matrix and voided sub-base layers, enabling attenuation and controlled discharge rates during rainfall events.

SuDS tree pits will reduce peak runoff flows and contribute an additional level of treatment within the overall surface water management strategy. They also offer landscape and ecological benefits by supporting healthy tree growth, improving urban cooling, and increasing local biodiversity.

Routine maintenance will be required to ensure the long-term performance and health of the system. Typical maintenance activities will include removal of litter, debris, and sediment from inlets; inspection of tree health, soil levels, and mulch conditions; checking for signs of waterlogging, erosion, or surface clogging and ensuring that inlets, outlets, and underdrain components remain free-flowing. Occasional maintenance may involve top-up of mulch, pruning of tree branches, removal of accumulated sediment from the upper soil layers, and replacement of soil media or tree stock where necessary, particularly in areas subject to higher pollution loads or heavy usage

APPENDICES

Appendix A.Foul Drainage Design Criteria and Manhole Schedules

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	10
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.650
Calculation Method	BS 8301	Maximum Backdrop Height (m)	1.600
Frequency Factor	0.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	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)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	81.012	1.879	43.1	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	133.809	0.000	0.0	140.0	0.4	40	0.99	1.75	69.6	4.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.000	61.195	1.550	39.5	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F2.001	91.057	2.147	42.4	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F2.002	53.970	0.745	72.4	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F2.003	10.580	0.195	54.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	47.840	1.139	42.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F3.001	12.568	0.327	38.4	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F3.002	34.100	0.941	36.2	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F2.004	44.125	0.956	46.2	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F2.005	9.847	0.245	40.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.000	138.169	0.000	0.0	140.0	0.4	39	1.02	1.83	72.8	4.7
F2.001	136.619	0.000	0.0	308.0	0.5	44	1.06	1.77	70.2	5.8
F2.002	134.071	0.000	0.0	406.0	0.6	52	0.90	1.35	53.7	6.3
F2.003	133.326	0.000	0.0	406.0	0.6	48	1.00	1.56	62.0	6.3
F3.000	135.538	0.000	0.0	84.0	0.4	37	0.97	1.77	70.5	4.2
F3.001	134.399	0.000	0.0	154.0	0.4	39	1.04	1.85	73.7	4.8
F3.002	134.072	0.000	0.0	210.0	0.5	40	1.09	1.91	76.0	5.2
F2.004	133.131	0.000	0.0	742.0	0.7	52	1.13	1.69	67.3	7.8
F2.005	132.175	0.000	0.0	742.0	0.7	50	1.19	1.81	72.1	7.8

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.001	54.400	1.520	35.8	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F4.000	20.394	0.160	127.5	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F4.001	45.624	0.236	193.3	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F1.002	32.879	0.143	229.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F5.000	33.373	0.757	44.1	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F5.001	39.429	1.069	36.9	0.000	196.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.001	131.410	0.000	0.0	966.0	0.8	51	1.28	1.92	76.4	8.7
F4.000	130.086	0.000	0.0	42.0	0.3	45	0.62	1.02	40.4	3.6
F4.001	129.926	0.000	0.0	140.0	0.4	57	0.58	0.82	32.8	4.7
F1.002	129.690	0.000	0.0	1190.0	0.9	87	0.67	0.76	30.0	9.6
F5.000	132.893	0.000	0.0	126.0	0.4	39	0.98	1.73	68.8	4.6
F5.001	132.136	0.000	0.0	322.0	0.5	43	1.12	1.89	75.3	5.9

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.003	68.767	1.507	45.6	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F1.004	24.484	0.163	150.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	10.235	0.341	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	5.442	0.181	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F6.000	30.192	1.006	30.0	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F6.001	30.192	1.006	30.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	9.377	0.313	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F1.008	10.682	0.356	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F1.009	28.570	0.952	30.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.003	129.547	0.000	0.0	1568.0	1.0	61	1.25	1.70	67.7	10.9
F1.004	128.040	0.000	0.0	1610.0	1.0	84	0.82	0.94	37.2	11.1
F1.005	127.877	0.000	0.0	1624.0	1.0	56	1.46	2.10	83.5	11.1
F1.006	127.536	0.000	0.0	1638.0	1.0	56	1.46	2.10	83.5	11.2
F6.000	130.767	0.000	0.0	56.0	0.3	33	1.06	2.10	83.5	3.8
F6.001	128.361	0.000	0.0	56.0	0.3	33	1.06	2.10	83.5	3.8
F1.007	126.256	0.000	0.0	1708.0	1.0	56	1.47	2.10	83.5	11.4
F1.008	125.943	0.000	0.0	1722.0	1.0	56	1.47	2.10	83.5	11.5
F1.009	125.587	0.000	0.0	1792.0	1.1	57	1.48	2.10	83.5	11.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.010	54.739	0.550	99.5	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F1.011	17.366	0.600	28.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F7.000	25.052	0.512	48.9	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F7.001	76.492	1.620	47.2	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	
F7.002	67.466	1.055	63.9	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	61.699	1.100	56.1	0.000	154.0	0.0	1.500	o	225	Pipe/Conduit	
F7.003	29.947	0.499	60.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F7.004	17.355	0.289	60.1	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.010	124.635	0.000	0.0	1890.0	1.1	79	0.97	1.15	45.8	12.1
F1.011	124.085	0.000	0.0	1974.0	1.1	58	1.53	2.14	85.0	12.4
F7.000	124.952	0.000	0.0	112.0	0.4	40	0.94	1.64	65.3	4.4
F7.001	124.440	0.000	0.0	294.0	0.5	45	1.02	1.67	66.5	5.7
F7.002	122.820	0.000	0.0	462.0	0.6	52	0.96	1.44	57.1	6.6
F8.000	122.485	0.000	0.0	154.0	0.4	43	0.91	1.53	61.0	4.8
F7.003	120.985	0.000	0.0	658.0	0.7	54	1.01	1.48	59.0	7.5
F7.004	120.486	0.000	0.0	700.0	0.7	55	1.02	1.48	59.0	7.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.005	12.882	0.215	59.9	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F9.000	36.532	0.285	128.2	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F9.001	44.460	0.539	82.5	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F9.002	8.216	0.198	41.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F9.003	16.974	0.268	63.3	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F9.004	34.519	0.777	44.4	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F7.006	61.036	0.763	80.0	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	53.673	1.579	34.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.005	118.775	0.000	0.0	742.0	0.7	55	1.03	1.48	59.0	7.8
F9.000	121.751	0.000	0.0	98.0	0.4	50	0.66	1.01	40.3	4.3
F9.001	120.530	0.000	0.0	140.0	0.4	46	0.79	1.26	50.3	4.7
F9.002	119.991	0.000	0.0	140.0	0.4	39	1.00	1.78	71.0	4.7
F9.003	119.793	0.000	0.0	168.0	0.4	45	0.88	1.44	57.4	4.9
F9.004	119.325	0.000	0.0	238.0	0.5	43	1.03	1.72	68.6	5.4
F7.006	118.560	0.000	0.0	1106.0	0.8	65	0.97	1.28	51.1	9.3
F10.000	119.376	0.000	0.0	140.0	0.4	37	1.08	1.97	78.4	4.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F11.000	36.460	1.053	34.6	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F7.007	38.376	0.203	189.0	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F7.008	14.168	0.075	189.0	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F7.009	19.050	0.314	60.7	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F12.000	46.044	1.993	23.1	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F7.010	25.575	1.174	21.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.011	38.723	1.291	30.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F11.000	118.850	0.000	0.0	126.0	0.4	37	1.06	1.95	77.7	4.6
F7.007	117.797	0.000	0.0	1470.0	1.0	88	0.74	0.83	33.1	10.6
F7.008	117.594	0.000	0.0	1498.0	1.0	88	0.74	0.83	33.1	10.7
F7.009	117.519	0.000	0.0	1582.0	1.0	66	1.13	1.48	58.7	11.0
F12.000	119.198	0.000	0.0	98.0	0.4	33	1.20	2.39	95.2	4.3
F7.010	117.205	0.000	0.0	1736.0	1.0	52	1.65	2.47	98.0	11.5
F7.011	114.862	0.000	0.0	1876.0	1.1	58	1.49	2.10	83.5	12.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.012	21.189	0.918	23.1	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F13.000	50.261	1.140	44.1	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	
F13.001	22.860	0.523	43.7	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F14.000	29.693	1.188	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F14.001	21.057	0.880	23.9	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F13.002	10.927	0.380	28.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F13.003	16.379	0.199	82.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.012	113.571	0.000	0.0	1988.0	1.1	55	1.65	2.39	95.2	12.4
F13.000	117.060	0.000	0.0	182.0	0.5	41	1.00	1.73	68.8	5.0
F13.001	115.920	0.000	0.0	224.0	0.5	42	1.02	1.74	69.1	5.3
F14.000	117.778	0.000	0.0	84.0	0.4	33	1.16	2.30	91.5	4.2
F14.001	116.590	0.000	0.0	112.0	0.4	34	1.20	2.35	93.5	4.4
F13.002	115.397	0.000	0.0	392.0	0.6	41	1.25	2.15	85.3	6.2
F13.003	115.017	0.000	0.0	392.0	0.6	54	0.86	1.27	50.3	6.2

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F15.000	74.944	1.500	50.0	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F13.004	17.208	0.319	53.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F13.005	27.110	0.559	48.5	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F13.006	23.807	0.749	31.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F13.007	15.194	0.576	26.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.013	32.780	0.998	32.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.014	53.685	2.868	18.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.015	38.476	1.977	19.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.016	14.946	0.217	68.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F15.000	116.631	0.000	0.0	168.0	0.4	42	0.96	1.63	64.7	4.9
F13.004	114.818	0.000	0.0	560.0	0.6	51	1.04	1.56	62.2	7.0
F13.005	114.499	0.000	0.0	616.0	0.7	51	1.09	1.65	65.6	7.3
F13.006	113.940	0.000	0.0	672.0	0.7	46	1.28	2.04	81.1	7.5
F13.007	113.191	0.000	0.0	672.0	0.7	44	1.36	2.24	89.1	7.5
F7.013	112.398	0.000	0.0	2660.0	1.3	65	1.53	2.01	79.8	14.7
F7.014	111.400	0.000	0.0	2660.0	1.3	57	1.87	2.66	105.8	14.7
F7.015	108.532	0.000	0.0	2660.0	1.3	57	1.85	2.61	103.7	14.7
F7.016	106.555	0.000	0.0	2660.0	1.3	79	1.17	1.38	55.0	14.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F16.000	19.564	0.444	44.1	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F16.001	9.895	0.043	230.1	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F16.002	47.831	0.846	56.5	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F17.000	33.614	0.300	112.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F16.003	50.148	0.218	230.0	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F16.004	11.170	0.274	40.8	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F18.000	43.766	0.337	129.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.000	127.178	0.000	0.0	56.0	0.3	36	0.93	1.73	68.9	3.8
F16.001	126.734	0.000	0.0	112.0	0.4	58	0.54	0.75	30.0	4.4
F16.002	126.691	0.000	0.0	196.0	0.5	44	0.93	1.53	60.8	5.1
F17.000	124.940	0.000	0.0	70.0	0.4	46	0.68	1.08	43.1	4.0
F16.003	124.640	0.000	0.0	364.0	0.6	69	0.59	0.76	30.0	6.1
F16.004	124.422	0.000	0.0	476.0	0.6	46	1.13	1.80	71.6	6.7
F18.000	123.403	0.000	0.0	84.0	0.4	49	0.65	1.01	40.0	4.2

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F16.005	14.526	0.063	230.6	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F19.000	53.006	1.287	41.2	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F16.006	26.123	0.773	33.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F20.000	30.265	0.609	49.7	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F20.001	40.185	0.470	85.5	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F20.002	11.638	0.051	228.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.005	123.066	0.000	0.0	560.0	0.6	74	0.62	0.75	30.0	7.0
F19.000	124.687	0.000	0.0	140.0	0.4	39	1.01	1.79	71.2	4.7
F16.006	123.003	0.000	0.0	700.0	0.7	47	1.25	1.98	78.7	7.7
F20.000	123.128	0.000	0.0	42.0	0.3	36	0.87	1.63	64.8	3.6
F20.001	122.519	0.000	0.0	70.0	0.4	43	0.74	1.24	49.4	4.0
F20.002	121.895	0.000	0.0	70.0	0.4	56	0.53	0.76	30.1	4.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F16.007	8.368	0.065	128.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F16.008	16.352	0.136	120.2	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F16.009	7.745	0.052	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F16.010	37.683	0.238	158.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F16.011	15.389	0.103	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F21.000	32.579	0.652	50.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F21.001	20.070	0.313	64.1	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F21.002	37.225	0.417	89.3	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F21.003	55.603	2.224	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.007	121.844	0.000	0.0	770.0	0.7	68	0.79	1.01	40.2	7.9
F16.008	121.779	0.000	0.0	812.0	0.7	67	0.81	1.05	41.6	8.1
F16.009	120.902	0.000	0.0	896.0	0.8	73	0.76	0.94	37.2	8.5
F16.010	120.850	0.000	0.0	896.0	0.8	74	0.74	0.91	36.2	8.5
F16.011	120.612	0.000	0.0	980.0	0.8	74	0.77	0.94	37.2	8.8
F21.000	126.400	0.000	0.0	70.0	0.4	38	0.90	1.63	64.7	4.0
F21.001	125.748	0.000	0.0	154.0	0.4	44	0.87	1.43	57.0	4.8
F21.002	124.043	0.000	0.0	224.0	0.5	50	0.80	1.22	48.3	5.3
F21.003	122.733	0.000	0.0	308.0	0.5	38	1.28	2.30	91.5	5.8

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F16.012	57.904	1.298	44.6	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F16.013	18.116	0.150	120.8	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.012	120.509	0.000	0.0	1428.0	0.9	59	1.24	1.72	68.4	10.4
F16.013	119.211	0.000	0.0	1470.0	1.0	78	0.87	1.04	41.5	10.6

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F1	135.234	1.425	Open Manhole	1200	F1.000	133.809	225				
F2	140.458	2.289	Open Manhole	1200	F2.000	138.169	225				
F3	138.044	1.425	Open Manhole	1200	F2.001	136.619	225	F2.000	136.619	225	
F4	135.897	1.826	Open Manhole	1200	F2.002	134.071	225	F2.001	134.472	225	401
F5	134.751	1.425	Open Manhole	1200	F2.003	133.326	225	F2.002	133.326	225	
F6	136.963	1.425	Open Manhole	1200	F3.000	135.538	225				
F7	135.961	1.562	Open Manhole	1200	F3.001	134.399	225	F3.000	134.399	225	
F8	135.497	1.425	Open Manhole	1200	F3.002	134.072	225	F3.001	134.072	225	
F9	134.556	1.425	Open Manhole	1200	F2.004	133.131	225	F2.003	133.131	225	
								F3.002	133.131	225	
F10	133.600	1.425	Open Manhole	1200	F2.005	132.175	225	F2.004	132.175	225	
F11	133.355	1.945	Open Manhole	1200	F1.001	131.410	225	F1.000	131.930	225	520
								F2.005	131.930	225	520
F12	131.487	1.401	Open Manhole	1200	F4.000	130.086	225				
F13	131.426	1.500	Open Manhole	1200	F4.001	129.926	225	F4.000	129.926	225	
F14	131.620	1.930	Open Manhole	1200	F1.002	129.690	225	F1.001	129.890	225	200
								F4.001	129.690	225	
F15	134.330	1.437	Open Manhole	1200	F5.000	132.893	225				
F16	133.595	1.459	Open Manhole	1200	F5.001	132.136	225	F5.000	132.136	225	
F17	132.498	2.951	Open Manhole	1200	F1.003	129.547	225	F1.002	129.547	225	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								F5.001	131.067	225	1520
F19	129.475	1.435	Open Manhole	1200	F1.004	128.040	225	F1.003	128.040	225	
F20	129.508	1.631	Open Manhole	1200	F1.005	127.877	225	F1.004	127.877	225	
F21	129.163	1.628	Open Manhole	1200	F1.006	127.536	225	F1.005	127.536	225	
F22	134.139	3.372	Open Manhole	1200	F6.000	130.767	225				
F22A	131.952	3.591	Open Manhole	1200	F6.001	128.361	225	F6.000	129.761	225	1400
F23	128.909	2.653	Open Manhole	1200	F1.007	126.256	225	F1.006	127.355	225	1099
								F6.001	127.355	225	1099
F24	128.343	2.400	Open Manhole	1200	F1.008	125.943	225	F1.007	125.943	225	
F25	127.698	2.111	Open Manhole	1200	F1.009	125.587	225	F1.008	125.587	225	
F26	126.046	1.411	Open Manhole	1200	F1.010	124.635	225	F1.009	124.635	225	
F27	125.622	1.537	Open Manhole	1200	F1.011	124.085	225	F1.010	124.085	225	
F38	125.569	2.084	Open Manhole	1200		OUTFALL		F1.011	123.485	225	
F1	126.377	1.425	Open Manhole	1200	F7.000	124.952	225				
F2	125.865	1.425	Open Manhole	1200	F7.001	124.440	225	F7.000	124.440	225	
F3	124.198	1.378	Open Manhole	1200	F7.002	122.820	225	F7.001	122.820	225	
F4	124.304	1.819	Open Manhole	1200	F8.000	122.485	225				
F5	123.189	2.204	Open Manhole	1200	F7.003	120.985	225	F7.002	121.765	225	780
								F8.000	121.385	225	400

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F6	122.339	1.853	Open Manhole	1200	F7.004	120.486	225	F7.003	120.486	225	
F8	121.819	3.044	Open Manhole	1200	F7.005	118.775	225	F7.004	120.197	225	1422
F9A	123.176	1.425	Open Manhole	1200	F9.000	121.751	225				
F9	123.651	3.121	Open Manhole	1200	F9.001	120.530	225	F9.000	121.466	225	936
F10	121.416	1.425	Open Manhole	1200	F9.002	119.991	225	F9.001	119.991	225	
F11	121.218	1.425	Open Manhole	1200	F9.003	119.793	225	F9.002	119.793	225	
F12	120.950	1.625	Open Manhole	1200	F9.004	119.325	225	F9.003	119.525	225	200
F13	121.436	2.888	Open Manhole	1200	F7.006	118.560	225	F7.005	118.560	225	
								F9.004	118.548	225	
F14	123.017	3.641	Open Manhole	1200	F10.000	119.376	225				
F15A	120.275	1.425	Open Manhole	1200	F11.000	118.850	225				
F15	120.002	2.205	Open Manhole	1200	F7.007	117.797	225	F7.006	117.797	225	
								F10.000	117.797	225	
								F11.000	117.797	225	
F16	119.535	1.941	Open Manhole	1200	F7.008	117.594	225	F7.007	117.594	225	
F17	119.404	1.885	Open Manhole	1200	F7.009	117.519	225	F7.008	117.519	225	
F18	121.926	2.728	Open Manhole	1200	F12.000	119.198	225				
F19	119.288	2.083	Open Manhole	1200	F7.010	117.205	225	F7.009	117.205	225	
								F12.000	117.205	225	
F20	117.879	3.017	Open Manhole	1200	F7.011	114.862	225	F7.010	116.031	225	1169

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F21	115.446	1.875	Open Manhole	1200	F7.012	113.571	225	F7.011	113.571	225	
F22	119.308	2.248	Open Manhole	1200	F13.000	117.060	225				
F23	117.495	1.575	Open Manhole	1200	F13.001	115.920	225	F13.000	115.920	225	
F24	119.884	2.106	Open Manhole	1200	F14.000	117.778	225				
F25	118.016	1.426	Open Manhole	1200	F14.001	116.590	225	F14.000	116.590	225	
F26	117.093	1.696	Open Manhole	1200	F13.002	115.397	225	F13.001	115.397	225	
								F14.001	115.710	225	313
F27	116.755	1.738	Open Manhole	1200	F13.003	115.017	225	F13.002	115.017	225	
F28	118.056	1.425	Open Manhole	1200	F15.000	116.631	225				
F29	116.641	1.823	Open Manhole	1200	F13.004	114.818	225	F13.003	114.818	225	
								F15.000	115.131	225	313
F30	116.237	1.738	Open Manhole	1200	F13.005	114.499	225	F13.004	114.499	225	
F31	115.678	1.738	Open Manhole	1200	F13.006	113.940	225	F13.005	113.940	225	
F32	114.929	1.738	Open Manhole	1200	F13.007	113.191	225	F13.006	113.191	225	
F33	114.353	1.955	Open Manhole	1200	F7.013	112.398	225	F7.012	112.653	225	255
								F13.007	112.615	225	217
F34	113.050	1.650	Open Manhole	1200	F7.014	111.400	225	F7.013	111.400	225	
F35	109.957	1.425	Open Manhole	1200	F7.015	108.532	225	F7.014	108.532	225	
F36	107.980	1.425	Open Manhole	1200	F7.016	106.555	225	F7.015	106.555	225	
FEx CMH	107.530	1.192	Open Manhole	0		OUTFALL		F7.016	106.338	225	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F45	128.959	1.781	Open Manhole	1200	F16.000	127.178	225				
F46	128.536	1.802	Open Manhole	1200	F16.001	126.734	225	F16.000	126.734	225	
F47	128.303	1.612	Open Manhole	1200	F16.002	126.691	225	F16.001	126.691	225	
F48	126.540	1.600	Open Manhole	1200	F17.000	124.940	225				
F49	127.274	2.634	Open Manhole	1200	F16.003	124.640	225	F16.002	125.845	225	1205
								F17.000	124.640	225	
F50	126.106	1.684	Open Manhole	1200	F16.004	124.422	225	F16.003	124.422	225	
F51	124.828	1.425	Open Manhole	1200	F18.000	123.403	225				
F52	125.561	2.495	Open Manhole	1200	F16.005	123.066	225	F16.004	124.148	225	1082
								F18.000	123.066	225	
F53	126.418	1.731	Open Manhole	1200	F19.000	124.687	225				
F54	124.851	1.848	Open Manhole	1200	F16.006	123.003	225	F16.005	123.003	225	
								F19.000	123.400	225	397
F55	124.553	1.425	Open Manhole	1200	F20.000	123.128	225				
F56	123.944	1.425	Open Manhole	1200	F20.001	122.519	225	F20.000	122.519	225	
F57	123.474	1.579	Open Manhole	1200	F20.002	121.895	225	F20.001	122.049	225	154
F58	123.633	1.789	Open Manhole	1200	F16.007	121.844	225	F16.006	122.230	225	386
								F20.002	121.844	225	
F59	123.344	1.565	Open Manhole	1200	F16.008	121.779	225	F16.007	121.779	225	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F60	122.954	2.052	Open Manhole	1200	F16.009	120.902	225	F16.008	121.643	225	741
F60	122.802	1.952	Open Manhole	1200	F16.010	120.850	225	F16.009	120.850	225	
F61	122.177	1.565	Open Manhole	1200	F16.011	120.612	225	F16.010	120.612	225	
F62	129.273	2.873	Open Manhole	1200	F21.000	126.400	225				
F63	127.603	1.855	Open Manhole	1200	F21.001	125.748	225	F21.000	125.748	225	
F64	126.550	2.507	Open Manhole	1200	F21.002	124.043	225	F21.001	125.435	225	1392
F65	125.680	2.947	Open Manhole	1200	F21.003	122.733	225	F21.002	123.626	225	893
F65	122.672	2.163	Open Manhole	1200	F16.012	120.509	225	F16.011	120.509	225	
								F21.003	120.509	225	
F66	120.654	1.443	Open Manhole	1200	F16.013	119.211	225	F16.012	119.211	225	
F70	120.652	1.591	Open Manhole	1200		OUTFALL		F16.013	119.061	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F1	165470.222	73163.979	165470.222	73163.979	Required	
F2	165307.510	72985.291	165307.510	72985.291	Required	

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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)
F3	165365.698	73004.237	165365.698	73004.237	Required	
F4	165449.900	73038.898	165449.900	73038.898	Required	
F5	165481.828	73082.412	165481.828	73082.412	Required	
F6	165409.431	73130.531	165409.431	73130.531	Required	
F7	165444.401	73097.884	165444.401	73097.884	Required	
F8	165447.219	73085.636	165447.219	73085.636	Required	
F9	165480.533	73092.912	165480.533	73092.912	Required	
F10	165523.643	73102.327	165523.643	73102.327	Required	

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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)
F11	165530.275	73109.605	165530.275	73109.605	Required	
F12	165617.686	73119.036	165617.686	73119.036	Required	
F13	165601.424	73106.730	165601.424	73106.730	Required	
F14	165570.601	73073.092	165570.601	73073.092	Required	
F15	165508.524	72989.059	165508.524	72989.059	Required	
F16	165521.926	73019.623	165521.926	73019.623	Required	
F17	165548.319	73048.915	165548.319	73048.915	Required	
F19	165599.757	73003.276	165599.757	73003.276	Required	

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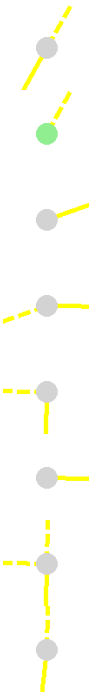
Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F20	165583.664	72984.824	165583.664	72984.824	Required	
F21	165577.924	72976.350	165577.924	72976.350	Required	
F22	165516.776	72971.839	165516.776	72971.839	Required	
F22A	165546.965	72971.401	165546.965	72971.401	Required	
F23	165577.154	72970.963	165577.154	72970.963	Required	
F24	165578.249	72961.650	165578.249	72961.650	Required	
F25	165584.754	72953.176	165584.754	72953.176	Required	
F26	165609.478	72938.860	165609.478	72938.860	Required	

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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)
F27	165582.420	72891.276	165582.420	72891.276	Required	
F38	165573.982	72876.099			No Entry	
F1	165723.416	73076.573	165723.416	73076.573	Required	
F2	165747.029	73084.938	165747.029	73084.938	Required	
F3	165823.515	73083.952	165823.515	73083.952	Required	
F4	165760.538	73017.928	165760.538	73017.928	Required	
F5	165822.221	73016.498	165822.221	73016.498	Required	
F6	165821.646	72986.557	165821.646	72986.557	Required	



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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)
F8	165819.680	72969.314	165819.680	72969.314	Required	
F9A	165869.264	73056.537	165869.264	73056.537	Required	
F9	165840.485	73034.034	165840.485	73034.034	Required	
F10	165868.123	72999.209	165868.123	72999.209	Required	
F11	165866.734	72991.111	165866.734	72991.111	Required	
F12	165853.756	72980.170	165853.756	72980.170	Required	
F13	165826.816	72958.589	165826.816	72958.589	Required	
F14	165745.446	72962.556	165745.446	72962.556	Required	

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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)
F15A	165801.074	72891.646	165801.074	72891.646	Required	
F15	165778.995	72920.660	165778.995	72920.660	Required	
F16	165748.757	72897.029	165748.757	72897.029	Required	
F17	165737.785	72888.066	165737.785	72888.066	Required	
F18	165688.262	72894.719	165688.262	72894.719	Required	
F19	165728.113	72871.654	165728.113	72871.654	Required	
F20	165750.247	72858.841	165750.247	72858.841	Required	
F21	165774.829	72828.921	165774.829	72828.921	Required	

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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)
F22	165725.960	72867.817	165725.960	72867.817	Required	
F23	165701.235	72824.058	165701.235	72824.058	Required	
F24	165642.446	72838.770	165642.446	72838.770	Required	
F25	165668.312	72824.187	165668.312	72824.187	Required	
F26	165683.514	72809.617	165683.514	72809.617	Required	
F27	165689.622	72800.556	165689.622	72800.556	Required	
F28	165627.910	72754.905	165627.910	72754.905	Required	
F29	165696.284	72785.592	165696.284	72785.592	Required	

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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)
F30	165712.009	72792.578	165712.009	72792.578	Required	
F31	165737.577	72801.592	165737.577	72801.592	Required	
F32	165760.927	72806.233	165760.927	72806.233	Required	
F33	165776.043	72807.767	165776.043	72807.767	Required	
F34	165808.823	72807.741	165808.823	72807.741	Required	
F35	165862.123	72801.315	165862.123	72801.315	Required	
F36	165900.097	72795.119	165900.097	72795.119	Required	
FEx CMH	165905.608	72781.226			No Entry	

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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)
F45	165618.968	73019.945	165618.968	73019.945	Required	
F46	165632.277	73034.285	165632.277	73034.285	Required	
F47	165640.032	73040.430	165640.032	73040.430	Required	
F48	165715.408	73071.278	165715.408	73071.278	Required	
F49	165684.299	73058.545	165684.299	73058.545	Required	
F50	165702.748	73011.914	165702.748	73011.914	Required	
F51	165745.291	73016.585	165745.291	73016.585	Required	
F52	165704.442	73000.874	165704.442	73000.874	Required	

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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)
F53	165654.223	72978.804	165654.223	72978.804	Required	
F54	165706.664	72986.519	165706.664	72986.519	Required	
F55	165754.411	73018.143	165754.411	73018.143	Required	
F56	165753.434	72987.894	165753.434	72987.894	Required	
F57	165722.046	72962.801	165722.046	72962.801	Required	
F58	165710.601	72960.694	165710.601	72960.694	Required	
F59	165711.869	72952.423	165711.869	72952.423	Required	
F60	165704.097	72938.036	165704.097	72938.036	Required	

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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)
F60	165700.349	72931.259	165700.349	72931.259	Required	
F61	165682.110	72898.283	165682.110	72898.283	Required	
F62	165611.773	73007.237	165611.773	73007.237	Required	
F63	165635.840	72985.278	165635.840	72985.278	Required	
F64	165639.291	72965.507	165639.291	72965.507	Required	
F65	165620.421	72933.419	165620.421	72933.419	Required	
F65	165668.718	72905.866	165668.718	72905.866	Required	
F66	165640.071	72855.545	165640.071	72855.545	Required	

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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)
F70	165631.015	72839.855			No Entry	



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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	o	225	F1	135.234	133.809	1.200	Open Manhole	1200
F2.000	o	225	F2	140.458	138.169	2.064	Open Manhole	1200
F2.001	o	225	F3	138.044	136.619	1.200	Open Manhole	1200
F2.002	o	225	F4	135.897	134.071	1.601	Open Manhole	1200
F2.003	o	225	F5	134.751	133.326	1.200	Open Manhole	1200
F3.000	o	225	F6	136.963	135.538	1.200	Open Manhole	1200
F3.001	o	225	F7	135.961	134.399	1.337	Open Manhole	1200
F3.002	o	225	F8	135.497	134.072	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	81.012	43.1	F11	133.355	131.930	1.200	Open Manhole	1200
F2.000	61.195	39.5	F3	138.044	136.619	1.200	Open Manhole	1200
F2.001	91.057	42.4	F4	135.897	134.472	1.200	Open Manhole	1200
F2.002	53.970	72.4	F5	134.751	133.326	1.200	Open Manhole	1200
F2.003	10.580	54.3	F9	134.556	133.131	1.200	Open Manhole	1200
F3.000	47.840	42.0	F7	135.961	134.399	1.337	Open Manhole	1200
F3.001	12.568	38.4	F8	135.497	134.072	1.200	Open Manhole	1200
F3.002	34.100	36.2	F9	134.556	133.131	1.200	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F2.004	o	225	F9	134.556	133.131	1.200	Open Manhole	1200
F2.005	o	225	F10	133.600	132.175	1.200	Open Manhole	1200
F1.001	o	225	F11	133.355	131.410	1.720	Open Manhole	1200
F4.000	o	225	F12	131.487	130.086	1.176	Open Manhole	1200
F4.001	o	225	F13	131.426	129.926	1.275	Open Manhole	1200
F1.002	o	225	F14	131.620	129.690	1.705	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F2.004	44.125	46.2	F10	133.600	132.175	1.200	Open Manhole	1200
F2.005	9.847	40.2	F11	133.355	131.930	1.200	Open Manhole	1200
F1.001	54.400	35.8	F14	131.620	129.890	1.505	Open Manhole	1200
F4.000	20.394	127.5	F13	131.426	129.926	1.275	Open Manhole	1200
F4.001	45.624	193.3	F14	131.620	129.690	1.705	Open Manhole	1200
F1.002	32.879	229.9	F17	132.498	129.547	2.726	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F5.000	o	225	F15	134.330	132.893	1.212	Open Manhole	1200
F5.001	o	225	F16	133.595	132.136	1.234	Open Manhole	1200
F1.003	o	225	F17	132.498	129.547	2.726	Open Manhole	1200
F1.004	o	225	F19	129.475	128.040	1.210	Open Manhole	1200
F1.005	o	225	F20	129.508	127.877	1.406	Open Manhole	1200
F1.006	o	225	F21	129.163	127.536	1.402	Open Manhole	1200
F6.000	o	225	F22	134.139	130.767	3.147	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F5.000	33.373	44.1	F16	133.595	132.136	1.234	Open Manhole	1200
F5.001	39.429	36.9	F17	132.498	131.067	1.206	Open Manhole	1200
F1.003	68.767	45.6	F19	129.475	128.040	1.210	Open Manhole	1200
F1.004	24.484	150.0	F20	129.508	127.877	1.406	Open Manhole	1200
F1.005	10.235	30.0	F21	129.163	127.536	1.403	Open Manhole	1200
F1.006	5.442	30.0	F23	128.909	127.355	1.329	Open Manhole	1200
F6.000	30.192	30.0	F22A	131.952	129.761	1.966	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F6.001	o	225	F22A	131.952	128.361	3.366	Open Manhole	1200
F1.007	o	225	F23	128.909	126.256	2.428	Open Manhole	1200
F1.008	o	225	F24	128.343	125.943	2.175	Open Manhole	1200
F1.009	o	225	F25	127.698	125.587	1.886	Open Manhole	1200
F1.010	o	225	F26	126.046	124.635	1.186	Open Manhole	1200
F1.011	o	225	F27	125.622	124.085	1.312	Open Manhole	1200
F7.000	o	225	F1	126.377	124.952	1.200	Open Manhole	1200
F7.001	o	225	F2	125.865	124.440	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F6.001	30.192	30.0	F23	128.909	127.355	1.329	Open Manhole	1200
F1.007	9.377	30.0	F24	128.343	125.943	2.174	Open Manhole	1200
F1.008	10.682	30.0	F25	127.698	125.587	1.886	Open Manhole	1200
F1.009	28.570	30.0	F26	126.046	124.635	1.186	Open Manhole	1200
F1.010	54.739	99.5	F27	125.622	124.085	1.312	Open Manhole	1200
F1.011	17.366	28.9	F38	125.569	123.485	1.859	Open Manhole	1200
F7.000	25.052	48.9	F2	125.865	124.440	1.200	Open Manhole	1200
F7.001	76.492	47.2	F3	124.198	122.820	1.153	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F7.002	o	225	F3	124.198	122.820	1.153	Open Manhole	1200
F8.000	o	225	F4	124.304	122.485	1.594	Open Manhole	1200
F7.003	o	225	F5	123.189	120.985	1.979	Open Manhole	1200
F7.004	o	225	F6	122.339	120.486	1.628	Open Manhole	1200
F7.005	o	225	F8	121.819	118.775	2.819	Open Manhole	1200
F9.000	o	225	F9A	123.176	121.751	1.200	Open Manhole	1200
F9.001	o	225	F9	123.651	120.530	2.896	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F7.002	67.466	63.9	F5	123.189	121.765	1.199	Open Manhole	1200
F8.000	61.699	56.1	F5	123.189	121.385	1.579	Open Manhole	1200
F7.003	29.947	60.0	F6	122.339	120.486	1.628	Open Manhole	1200
F7.004	17.355	60.1	F8	121.819	120.197	1.397	Open Manhole	1200
F7.005	12.882	59.9	F13	121.436	118.560	2.651	Open Manhole	1200
F9.000	36.532	128.2	F9	123.651	121.466	1.960	Open Manhole	1200
F9.001	44.460	82.5	F10	121.416	119.991	1.200	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F9.002	o	225	F10	121.416	119.991	1.200	Open Manhole	1200
F9.003	o	225	F11	121.218	119.793	1.200	Open Manhole	1200
F9.004	o	225	F12	120.950	119.325	1.400	Open Manhole	1200
F7.006	o	225	F13	121.436	118.560	2.651	Open Manhole	1200
F10.000	o	225	F14	123.017	119.376	3.416	Open Manhole	1200
F11.000	o	225	F15A	120.275	118.850	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F9.002	8.216	41.5	F11	121.218	119.793	1.200	Open Manhole	1200
F9.003	16.974	63.3	F12	120.950	119.525	1.200	Open Manhole	1200
F9.004	34.519	44.4	F13	121.436	118.548	2.663	Open Manhole	1200
F7.006	61.036	80.0	F15	120.002	117.797	1.980	Open Manhole	1200
F10.000	53.673	34.0	F15	120.002	117.797	1.980	Open Manhole	1200
F11.000	36.460	34.6	F15	120.002	117.797	1.980	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F7.007	o	225	F15	120.002	117.797	1.980	Open Manhole	1200
F7.008	o	225	F16	119.535	117.594	1.716	Open Manhole	1200
F7.009	o	225	F17	119.404	117.519	1.660	Open Manhole	1200
F12.000	o	225	F18	121.926	119.198	2.503	Open Manhole	1200
F7.010	o	225	F19	119.288	117.205	1.858	Open Manhole	1200
F7.011	o	225	F20	117.879	114.862	2.792	Open Manhole	1200
F7.012	o	225	F21	115.446	113.571	1.650	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F7.007	38.376	189.0	F16	119.535	117.594	1.716	Open Manhole	1200
F7.008	14.168	189.0	F17	119.404	117.519	1.660	Open Manhole	1200
F7.009	19.050	60.7	F19	119.288	117.205	1.858	Open Manhole	1200
F12.000	46.044	23.1	F19	119.288	117.205	1.858	Open Manhole	1200
F7.010	25.575	21.8	F20	117.879	116.031	1.623	Open Manhole	1200
F7.011	38.723	30.0	F21	115.446	113.571	1.650	Open Manhole	1200
F7.012	21.189	23.1	F33	114.353	112.653	1.475	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F13.000	o	225	F22	119.308	117.060	2.023	Open Manhole	1200
F13.001	o	225	F23	117.495	115.920	1.350	Open Manhole	1200
F14.000	o	225	F24	119.884	117.778	1.881	Open Manhole	1200
F14.001	o	225	F25	118.016	116.590	1.201	Open Manhole	1200
F13.002	o	225	F26	117.093	115.397	1.471	Open Manhole	1200
F13.003	o	225	F27	116.755	115.017	1.513	Open Manhole	1200
F15.000	o	225	F28	118.056	116.631	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F13.000	50.261	44.1	F23	117.495	115.920	1.350	Open Manhole	1200
F13.001	22.860	43.7	F26	117.093	115.397	1.471	Open Manhole	1200
F14.000	29.693	25.0	F25	118.016	116.590	1.201	Open Manhole	1200
F14.001	21.057	23.9	F26	117.093	115.710	1.158	Open Manhole	1200
F13.002	10.927	28.8	F27	116.755	115.017	1.513	Open Manhole	1200
F13.003	16.379	82.3	F29	116.641	114.818	1.598	Open Manhole	1200
F15.000	74.944	50.0	F29	116.641	115.131	1.285	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F13.004	o	225	F29	116.641	114.818	1.598	Open Manhole	1200
F13.005	o	225	F30	116.237	114.499	1.513	Open Manhole	1200
F13.006	o	225	F31	115.678	113.940	1.513	Open Manhole	1200
F13.007	o	225	F32	114.929	113.191	1.513	Open Manhole	1200
F7.013	o	225	F33	114.353	112.398	1.730	Open Manhole	1200
F7.014	o	225	F34	113.050	111.400	1.425	Open Manhole	1200
F7.015	o	225	F35	109.957	108.532	1.200	Open Manhole	1200
F7.016	o	225	F36	107.980	106.555	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F13.004	17.208	53.9	F30	116.237	114.499	1.513	Open Manhole	1200
F13.005	27.110	48.5	F31	115.678	113.940	1.513	Open Manhole	1200
F13.006	23.807	31.8	F32	114.929	113.191	1.513	Open Manhole	1200
F13.007	15.194	26.4	F33	114.353	112.615	1.513	Open Manhole	1200
F7.013	32.780	32.8	F34	113.050	111.400	1.425	Open Manhole	1200
F7.014	53.685	18.7	F35	109.957	108.532	1.200	Open Manhole	1200
F7.015	38.476	19.5	F36	107.980	106.555	1.200	Open Manhole	1200
F7.016	14.946	68.9	FEx CMH	107.530	106.338	0.967	Open Manhole	0

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F16.000	o	225	F45	128.959	127.178	1.556	Open Manhole	1200
F16.001	o	225	F46	128.536	126.734	1.577	Open Manhole	1200
F16.002	o	225	F47	128.303	126.691	1.387	Open Manhole	1200
F17.000	o	225	F48	126.540	124.940	1.375	Open Manhole	1200
F16.003	o	225	F49	127.274	124.640	2.409	Open Manhole	1200
F16.004	o	225	F50	126.106	124.422	1.459	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F16.000	19.564	44.1	F46	128.536	126.734	1.577	Open Manhole	1200
F16.001	9.895	230.1	F47	128.303	126.691	1.387	Open Manhole	1200
F16.002	47.831	56.5	F49	127.274	125.845	1.204	Open Manhole	1200
F17.000	33.614	112.0	F49	127.274	124.640	2.409	Open Manhole	1200
F16.003	50.148	230.0	F50	126.106	124.422	1.459	Open Manhole	1200
F16.004	11.170	40.8	F52	125.561	124.148	1.188	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F18.000	o	225	F51	124.828	123.403	1.200	Open Manhole	1200
F16.005	o	225	F52	125.561	123.066	2.270	Open Manhole	1200
F19.000	o	225	F53	126.418	124.687	1.506	Open Manhole	1200
F16.006	o	225	F54	124.851	123.003	1.623	Open Manhole	1200
F20.000	o	225	F55	124.553	123.128	1.200	Open Manhole	1200
F20.001	o	225	F56	123.944	122.519	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F18.000	43.766	129.9	F52	125.561	123.066	2.270	Open Manhole	1200
F16.005	14.526	230.6	F54	124.851	123.003	1.623	Open Manhole	1200
F19.000	53.006	41.2	F54	124.851	123.400	1.226	Open Manhole	1200
F16.006	26.123	33.8	F58	123.633	122.230	1.178	Open Manhole	1200
F20.000	30.265	49.7	F56	123.944	122.519	1.200	Open Manhole	1200
F20.001	40.185	85.5	F57	123.474	122.049	1.200	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F20.002	o	225	F57	123.474	121.895	1.354	Open Manhole	1200
F16.007	o	225	F58	123.633	121.844	1.564	Open Manhole	1200
F16.008	o	225	F59	123.344	121.779	1.340	Open Manhole	1200
F16.009	o	225	F60	122.954	120.902	1.827	Open Manhole	1200
F16.010	o	225	F60	122.802	120.850	1.727	Open Manhole	1200
F16.011	o	225	F61	122.177	120.612	1.340	Open Manhole	1200
F21.000	o	225	F62	129.273	126.400	2.648	Open Manhole	1200
F21.001	o	225	F63	127.603	125.748	1.630	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F20.002	11.638	228.2	F58	123.633	121.844	1.564	Open Manhole	1200
F16.007	8.368	128.7	F59	123.344	121.779	1.340	Open Manhole	1200
F16.008	16.352	120.2	F60	122.954	121.643	1.086	Open Manhole	1200
F16.009	7.745	150.0	F60	122.802	120.850	1.727	Open Manhole	1200
F16.010	37.683	158.3	F61	122.177	120.612	1.340	Open Manhole	1200
F16.011	15.389	150.0	F65	122.672	120.509	1.937	Open Manhole	1200
F21.000	32.579	50.0	F63	127.603	125.748	1.630	Open Manhole	1200
F21.001	20.070	64.1	F64	126.550	125.435	0.890	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F21.002	o	225	F64	126.550	124.043	2.282	Open Manhole	1200
F21.003	o	225	F65	125.680	122.733	2.722	Open Manhole	1200
F16.012	o	225	F65	122.672	120.509	1.938	Open Manhole	1200
F16.013	o	225	F66	120.654	119.211	1.218	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F21.002	37.225	89.3	F65	125.680	123.626	1.829	Open Manhole	1200
F21.003	55.603	25.0	F65	122.672	120.509	1.938	Open Manhole	1200
F16.012	57.904	44.6	F66	120.654	119.211	1.218	Open Manhole	1200
F16.013	18.116	120.8	F70	120.652	119.061	1.366	Open Manhole	1200

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Appendix B.Surface Drainage: Design Criteria, Pipeline Schedules, Flow Control Design and Network Simulation Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm Network

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	17.000	Add Flow / Climate Change (%)	0
Ratio R	0.238	Minimum Backdrop Height (m)	0.650
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.600
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm Network

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design

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)

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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
S1.000	84.437	1.890	44.7	0.256	4.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	61.349	1.566	39.2	0.184	4.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	91.077	2.271	40.1	0.259	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.002	52.961	1.199	44.2	0.140	0.00	0.0	0.600	o	375	Pipe/Conduit	
S2.003	8.722	0.025	348.8	0.006	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	47.840	1.186	40.3	0.136	4.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	12.568	0.387	32.5	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	34.100	0.946	36.0	0.070	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	48.40	4.72	133.813	0.256	0.0	0.0	0.0	1.96	78.0	33.6
S2.000	49.20	4.49	138.158	0.184	0.0	0.0	0.0	2.09	83.3	24.5
S2.001	47.11	5.10	136.517	0.443	0.0	0.0	0.0	2.49	175.9	56.5
S2.002	46.10	5.42	134.171	0.583	0.0	0.0	0.0	2.73	301.8	72.8
S2.003	45.69	5.56	132.897	0.589	0.0	0.0	0.0	1.08	172.2	72.9
S3.000	49.58	4.39	135.538	0.136	0.0	0.0	0.0	2.07	82.1	18.3
S3.001	49.30	4.46	134.277	0.159	0.0	0.0	0.0	2.77	195.6	21.2
S3.002	48.53	4.68	133.890	0.229	0.0	0.0	0.0	2.63	185.7	30.1

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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
S2.004	46.224	0.912	50.7	0.171	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.005	11.936	0.250	47.7	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	50.986	1.060	48.1	0.077	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.000	20.535	0.122	168.3	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	44.352	0.385	115.2	0.131	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.002	32.214	0.250	128.9	0.088	0.00	0.0	0.600	o	525	Pipe/Conduit	
S5.000	33.248	0.619	53.7	0.202	4.00	0.0	0.600	o	225	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)
S2.004	44.91	5.83	132.722	0.989	0.0	0.0	0.0	2.86	455.0	120.3
S2.005	44.72	5.89	131.810	1.001	0.0	0.0	0.0	2.95	468.9	121.2
S1.001	43.92	6.18	131.060	1.334	0.0	0.0	0.0	2.94	467.1	158.7
S4.000	49.75	4.34	129.994	0.158	0.0	0.0	0.0	1.00	40.0	21.3
S4.001	48.18	4.78	129.722	0.289	0.0	0.0	0.0	1.69	186.4	37.7
S1.002	43.20	6.46	129.337	1.711	0.0	0.0	0.0	1.97	426.9	200.2
S5.000	49.86	4.31	132.896	0.202	0.0	0.0	0.0	1.79	71.1	27.3

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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
S5.001	43.475	1.200	36.2	0.191	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	71.739	1.275	56.3	0.219	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.004	24.392	0.163	149.6	0.037	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.005	10.270	0.199	51.6	0.030	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.006	7.483	0.187	40.0	0.009	0.00	0.0	0.600	o	675	Pipe/Conduit	
S6.000	52.692	2.104	25.0	0.203	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	7.362	0.184	40.0	0.008	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.008	10.682	0.267	40.0	0.035	0.00	0.0	0.600	o	675	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)
S5.001	48.85	4.59	132.202	0.393	0.0	0.0	0.0	2.62	185.2	52.0
S1.003	42.20	6.86	128.429	2.323	0.0	0.0	0.0	2.99	647.4	265.5
S1.004	41.75	7.05	127.004	2.360	0.0	0.0	0.0	2.14	765.9	266.8
S1.005	41.64	7.09	126.841	2.390	0.0	0.0	0.0	3.65	1307.5	269.5
S1.006	41.57	7.12	126.642	2.399	0.0	0.0	0.0	4.15	1485.7	270.1
S6.000	49.77	4.33	129.304	0.203	0.0	0.0	0.0	2.63	104.4	27.4
S1.007	41.50	7.15	126.455	2.610	0.0	0.0	0.0	4.15	1485.7	293.3
S1.008	41.40	7.19	125.870	2.645	0.0	0.0	0.0	4.15	1485.7	296.5

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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
S1.009	28.570	0.888	32.2	0.048	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.010	55.169	0.110	501.5	0.195	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.011	16.425	0.060	273.7	0.035	0.00	0.0	0.600	o	675	Pipe/Conduit	
S7.000	26.407	0.550	48.0	0.120	4.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	31.418	0.500	62.8	0.129	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	58.823	1.421	41.4	0.250	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.003	40.231	0.940	42.8	0.173	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.004	30.573	0.650	47.0	0.085	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.005	20.428	0.390	52.4	0.076	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.009	41.16	7.30	124.578	2.693	0.0	0.0	0.0	4.63	1657.2	300.2
S1.010	39.46	8.09	123.690	2.888	0.0	0.0	0.0	1.16	416.3	308.6
S1.011	39.11	8.26	123.580	2.923	0.0	0.0	0.0	1.58	565.1	309.6
S7.000	50.00	4.23	136.550	0.120	0.0	0.0	0.0	1.89	75.2	16.2
S7.001	48.99	4.55	136.000	0.249	0.0	0.0	0.0	1.65	65.7	33.0
S7.002	47.34	5.03	135.500	0.499	0.0	0.0	0.0	2.04	81.1	64.0
S7.003	46.65	5.25	133.854	0.672	0.0	0.0	0.0	3.11	495.4	84.9
S7.004	46.12	5.42	131.470	0.757	0.0	0.0	0.0	2.97	472.4	94.5
S7.005	45.75	5.54	129.735	0.833	0.0	0.0	0.0	2.81	447.6	103.2

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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
S8.000	35.423	0.784	45.2	0.133	4.00	0.0	0.600	o	225	Pipe/Conduit	
S7.006	34.302	0.737	46.5	0.142	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.007	40.260	0.869	46.3	0.152	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.012	56.747	0.986	57.6	0.251	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.013	17.822	0.150	118.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.014	14.316	0.650	22.0	0.037	0.00	0.0	0.600	o	675	Pipe/Conduit	
S9.000	43.434	0.250	173.7	0.100	4.00	0.0	0.600	o	225	Pipe/Conduit	
S9.001	22.809	1.940	11.8	0.000	0.00	0.0	0.600	o	225	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)
S8.000	49.89	4.30	130.199	0.133	0.0	0.0	0.0	1.95	77.6	17.9
S7.006	45.19	5.73	127.643	1.108	0.0	0.0	0.0	2.99	474.9	135.5
S7.007	44.55	5.95	124.759	1.259	0.0	0.0	0.0	2.99	476.0	151.9
S1.012	38.58	8.53	122.816	4.433	0.0	0.0	0.0	3.46	1237.9	463.1
S1.013	38.34	8.66	121.750	4.433	0.0	0.0	0.0	2.40	860.1	463.1
S1.014	38.26	8.70	121.600	4.470	0.0	0.0	0.0	5.60	2003.9	463.2
S9.000	48.34	4.73	124.500	0.100	0.0	0.0	0.0	0.99	39.3	13.1
S9.001	48.00	4.83	124.250	0.100	0.0	0.0	0.0	3.84	152.6	13.1

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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
S9.002	20.992	0.112	187.4	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.015	4.197	0.095	44.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.016	59.629	0.150	397.5	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.017	11.534	0.636	18.1	0.006	0.00	0.0	0.600	o	600	Pipe/Conduit	
S10.000	55.345	1.161	47.7	0.165	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.018	72.205	1.420	50.8	0.130	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.019	1.395	0.003	498.4	0.000	0.00	0.0	0.600	o	600	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)
S9.002	46.80	5.20	122.310	0.197	0.0	0.0	0.0	0.95	37.8	25.0
S1.015	38.23	8.72	120.950	4.667	0.0	0.0	0.0	3.95	1413.4	483.1
S1.016	36.95	9.43	120.850	4.667	0.0	0.0	0.0	1.40	617.3	483.1
S1.017	36.89	9.46	120.700	4.673	0.0	0.0	0.0	5.74	1621.9	483.1
S10.000	49.22	4.49	121.181	0.165	0.0	0.0	0.0	1.90	75.5	22.0
S1.018	36.19	9.88	120.020	4.968	0.0	0.0	0.0	2.86	454.3«	486.9
S1.019	36.16	9.91	116.220	4.968	0.0	0.0	0.0	1.08	306.5«	486.9

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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
S11.000	23.884	0.550	43.4	0.061	4.00	0.0	0.600	o	225	Pipe/Conduit	
S11.001	74.475	1.518	49.1	0.265	0.00	0.0	0.600	o	225	Pipe/Conduit	
S11.002	67.079	1.119	59.9	0.191	0.00	0.0	0.600	o	300	Pipe/Conduit	
S12.000	59.486	1.114	53.4	0.208	4.00	0.0	0.600	o	225	Pipe/Conduit	
S11.003	28.096	0.511	55.0	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S11.004	17.367	0.316	55.0	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit	
S11.005	12.706	0.231	55.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.000	39.199	0.600	65.3	0.153	4.00	0.0	0.600	o	225	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)
S11.000	50.00	4.20	124.877	0.061	0.0	0.0	0.0	1.99	79.1	8.3
S11.001	47.90	4.86	124.327	0.326	0.0	0.0	0.0	1.87	74.4	42.3
S11.002	46.13	5.41	122.734	0.517	0.0	0.0	0.0	2.03	143.8	64.6
S12.000	48.97	4.55	122.804	0.208	0.0	0.0	0.0	1.79	71.3	27.6
S11.003	45.47	5.63	120.947	0.775	0.0	0.0	0.0	2.12	150.2	95.4
S11.004	45.07	5.77	120.436	0.811	0.0	0.0	0.0	2.13	150.2	99.1
S11.005	44.79	5.87	119.470	0.837	0.0	0.0	0.0	2.12	150.2	101.6
S13.000	49.52	4.40	121.676	0.153	0.0	0.0	0.0	1.62	64.4	20.5

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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
S13.001	45.461	1.085	41.9	0.081	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.002	7.016	0.198	35.4	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.003	16.389	0.268	61.2	0.052	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.004	35.841	0.211	169.9	0.075	0.00	0.0	0.600	o	375	Pipe/Conduit	
S11.006	58.196	0.707	82.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S14.000	50.706	1.525	33.2	0.203	4.00	0.0	0.600	o	225	Pipe/Conduit	
S15.000	36.505	0.243	150.2	0.131	4.00	0.0	0.600	o	225	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)
S13.001	48.19	4.78	121.076	0.234	0.0	0.0	0.0	2.03	80.6	30.5
S13.002	48.01	4.83	119.991	0.266	0.0	0.0	0.0	2.21	87.7	34.6
S13.003	47.46	4.99	119.793	0.318	0.0	0.0	0.0	1.68	66.6	40.9
S13.004	46.10	5.42	119.375	0.393	0.0	0.0	0.0	1.39	153.2	49.1
S11.006	43.47	6.35	119.164	1.230	0.0	0.0	0.0	2.00	220.7	144.8
S14.000	49.63	4.37	120.132	0.203	0.0	0.0	0.0	2.28	90.5	27.3
S15.000	48.91	4.57	118.850	0.131	0.0	0.0	0.0	1.06	42.3	17.3

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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
S11.007	40.509	0.455	89.0	0.202	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.008	14.168	0.182	77.8	0.058	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.009	17.588	0.229	76.7	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S16.000	44.490	1.539	28.9	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit	
S11.010	29.295	0.382	76.7	0.070	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.011	29.518	0.590	50.0	0.133	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.012	8.712	0.170	51.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S17.000	27.980	0.210	133.2	0.037	4.00	0.0	0.600	o	225	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)
S11.007	42.66	6.67	118.382	1.767	0.0	0.0	0.0	2.16	342.8	204.1
S11.008	42.41	6.77	117.927	1.824	0.0	0.0	0.0	2.31	366.8	209.6
S11.009	42.10	6.90	116.592	1.855	0.0	0.0	0.0	2.32	369.5	211.5
S16.000	49.89	4.30	119.202	0.158	0.0	0.0	0.0	2.44	97.1	21.4
S11.010	41.60	7.11	116.363	2.083	0.0	0.0	0.0	2.32	369.5	234.7
S11.011	41.21	7.28	114.381	2.216	0.0	0.0	0.0	2.88	458.1	247.3
S11.012	41.09	7.33	113.360	2.216	0.0	0.0	0.0	2.85	452.5	247.3
S17.000	49.48	4.41	113.400	0.037	0.0	0.0	0.0	1.13	45.0	5.0

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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
S11.013	10.081	0.100	100.8	0.048	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.014	12.954	0.537	24.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S18.000	49.948	0.938	53.2	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit	
S18.001	20.609	0.488	42.2	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
S19.000	29.946	1.050	28.5	0.119	4.00	0.0	0.600	o	225	Pipe/Conduit	
S19.001	18.889	0.805	23.5	0.061	0.00	0.0	0.600	o	225	Pipe/Conduit	
S18.002	13.041	0.380	34.3	0.018	0.00	0.0	0.600	o	300	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)
S11.013	40.91	7.41	113.190	2.301	0.0	0.0	0.0	2.02	322.0	254.9
S11.014	40.79	7.46	113.090	2.301	0.0	0.0	0.0	4.15	660.5	254.9
S18.000	49.30	4.46	117.213	0.158	0.0	0.0	0.0	1.80	71.4	21.1
S18.001	48.79	4.60	116.200	0.209	0.0	0.0	0.0	2.43	171.5	27.6
S19.000	50.00	4.20	117.565	0.119	0.0	0.0	0.0	2.46	97.8	16.1
S19.001	49.83	4.32	116.515	0.180	0.0	0.0	0.0	2.71	107.9	24.4
S18.002	48.50	4.69	115.710	0.407	0.0	0.0	0.0	2.69	190.3	53.5

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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
S18.003	18.156	0.296	61.3	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
S20.000	76.088	1.522	50.0	0.212	4.00	0.0	0.600	o	225	Pipe/Conduit	
S18.004	15.114	0.297	50.9	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	
S18.005	27.110	0.559	48.5	0.105	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.006	23.807	0.749	31.8	0.081	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.007	15.771	0.326	48.4	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.015	30.842	1.350	22.8	0.045	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.016	41.923	2.313	18.1	0.068	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S18.003	47.99	4.84	115.330	0.434	0.0	0.0	0.0	2.01	142.2	56.4
S20.000	48.51	4.68	116.556	0.212	0.0	0.0	0.0	1.85	73.7	27.9
S18.004	47.60	4.95	115.034	0.665	0.0	0.0	0.0	2.21	156.2	85.7
S18.005	47.04	5.12	114.737	0.770	0.0	0.0	0.0	2.61	288.0	98.1
S18.006	46.65	5.25	114.178	0.851	0.0	0.0	0.0	3.22	356.1	107.5
S18.007	46.37	5.34	113.029	0.871	0.0	0.0	0.0	2.93	465.8	109.4
S11.015	40.53	7.58	112.553	3.217	0.0	0.0	0.0	4.27	678.8	353.1
S11.016	40.21	7.73	111.203	3.285	0.0	0.0	0.0	4.79	762.3	357.7

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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
S21.000	23.841	0.100	238.4	0.000	4.00	0.0	0.600	o	450	Pipe/Conduit	
S11.017	12.421	0.443	28.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.018	35.114	1.341	26.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S11.019	15.617	0.306	51.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S22.000	31.941	0.198	161.3	0.092	4.00	0.0	0.600	o	225	Pipe/Conduit	
S23.000	18.826	0.208	90.5	0.096	4.00	0.0	0.600	o	225	Pipe/Conduit	
S23.001	8.764	0.150	58.5	0.053	0.00	0.0	0.600	o	225	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)
S21.000	49.89	4.30	108.600	0.000	0.0	0.0	0.0	1.31	208.7	0.0
S11.017	40.10	7.78	108.500	3.285	0.0	0.0	0.0	3.85	612.5	357.7
S11.018	39.70	7.97	108.057	3.285	0.0	0.0	0.0	3.08	218.1«	357.7
S11.019	39.46	8.09	106.641	3.285	0.0	0.0	0.0	2.21	155.9«	357.7
S22.000	49.10	4.52	125.172	0.092	0.0	0.0	0.0	1.03	40.8	12.2
S23.000	50.00	4.23	127.163	0.096	0.0	0.0	0.0	1.37	54.7	13.0
S23.001	49.85	4.31	126.955	0.149	0.0	0.0	0.0	1.71	68.1	20.1

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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
S23.002	50.896	1.003	50.7	0.161	0.00	0.0	0.600	o	225	Pipe/Conduit	
S22.001	52.448	0.450	116.6	0.147	0.00	0.0	0.600	o	300	Pipe/Conduit	
S22.002	12.408	0.393	31.6	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S24.000	41.936	0.250	167.7	0.112	4.00	0.0	0.600	o	225	Pipe/Conduit	
S22.003	14.715	0.312	47.2	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
S25.000	33.188	1.328	25.0	0.199	4.00	0.0	0.600	o	225	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)
S23.002	48.20	4.77	126.805	0.310	0.0	0.0	0.0	1.84	73.2	40.5
S22.001	46.25	5.37	124.899	0.549	0.0	0.0	0.0	1.46	102.9	68.8
S22.002	46.02	5.45	124.449	0.579	0.0	0.0	0.0	2.81	198.5	72.2
S24.000	48.47	4.69	123.403	0.112	0.0	0.0	0.0	1.01	40.0	14.7
S22.003	45.70	5.56	123.078	0.708	0.0	0.0	0.0	2.30	162.2	87.6
S25.000	50.00	4.21	124.024	0.199	0.0	0.0	0.0	2.63	104.5	26.9

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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
S22.004	26.052	0.647	40.3	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
S26.000	30.942	0.463	66.8	0.068	4.00	0.0	0.600	o	225	Pipe/Conduit	
S26.001	41.399	0.663	62.4	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
S26.002	10.338	0.062	166.7	0.011	0.00	0.0	0.600	o	375	Pipe/Conduit	
S22.005	7.457	0.160	46.6	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
S22.006	14.674	0.480	30.6	0.066	0.00	0.0	0.600	o	450	Pipe/Conduit	
S22.007	7.745	0.080	97.2	0.160	0.00	0.0	0.600	o	525	Pipe/Conduit	
S22.008	38.023	0.428	88.8	0.081	0.00	0.0	0.600	o	525	Pipe/Conduit	
S22.009	14.827	0.059	250.0	0.043	0.00	0.0	0.600	o	600	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)
S22.004	45.25	5.71	122.691	0.936	0.0	0.0	0.0	2.86	316.2	114.7
S26.000	49.82	4.32	122.979	0.068	0.0	0.0	0.0	1.60	63.7	9.2
S26.001	48.57	4.67	122.441	0.148	0.0	0.0	0.0	1.99	140.9	19.5
S26.002	48.14	4.79	121.703	0.159	0.0	0.0	0.0	1.40	154.7	20.7
S22.005	45.13	5.75	121.566	1.105	0.0	0.0	0.0	2.98	474.6	135.1
S22.006	44.94	5.82	121.406	1.171	0.0	0.0	0.0	3.69	586.5	142.5
S22.007	44.78	5.87	120.851	1.331	0.0	0.0	0.0	2.27	491.9	161.4
S22.008	44.04	6.14	120.771	1.412	0.0	0.0	0.0	2.38	514.6	168.5
S22.009	43.61	6.30	119.593	1.455	0.0	0.0	0.0	1.54	434.2	171.9

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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
S27.000	33.739	1.411	23.9	0.097	4.00	0.0	0.600	o	225	Pipe/Conduit	
S27.001	9.349	0.447	20.9	0.062	0.00	0.0	0.600	o	225	Pipe/Conduit	
S28.000	46.285	1.851	25.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S28.001	14.892	0.099	150.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S28.002	24.049	0.536	44.9	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
S27.002	11.170	0.062	180.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S27.003	37.006	0.370	100.0	0.058	0.00	0.0	0.600	o	225	Pipe/Conduit	
S27.004	55.145	0.551	100.1	0.194	0.00	0.0	0.600	o	225	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)
S27.000	50.00	4.21	127.173	0.097	0.0	0.0	0.0	2.69	106.8	13.1
S27.001	50.00	4.26	125.762	0.159	0.0	0.0	0.0	2.88	114.3	21.5
S28.000	49.92	4.29	126.330	0.000	0.0	0.0	0.0	2.63	104.5	0.0
S28.001	49.07	4.53	124.479	0.000	0.0	0.0	0.0	1.06	42.3	0.0
S28.002	48.35	4.73	124.380	0.038	0.0	0.0	0.0	1.96	77.9	5.0
S27.002	47.69	4.92	123.844	0.197	0.0	0.0	0.0	0.97	38.6	25.4
S27.003	46.18	5.40	123.782	0.255	0.0	0.0	0.0	1.31	52.0	31.8
S27.004	44.15	6.10	121.612	0.449	0.0	0.0	0.0	1.31	52.0«	53.6

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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
S22.010	58.107	0.232	250.0	0.166	0.00	0.0	0.600	o	600	Pipe/Conduit	
S22.011	19.056	0.112	170.1	0.233	0.00	0.0	0.600	o	600	Pipe/Conduit	
S29.000	46.778	2.425	19.3	0.250	4.00	0.0	0.600	o	225	Pipe/Conduit	
S29.001	9.390	0.417	22.5	0.003	0.00	0.0	0.600	o	225	Pipe/Conduit	
S22.012	21.299	0.261	81.6	0.172	0.00	0.0	0.600	o	600	Pipe/Conduit	
S22.013	36.323	1.044	34.8	0.097	0.00	0.0	0.600	o	600	Pipe/Conduit	
S22.014	19.068	0.150	127.1	0.026	0.00	0.0	0.600	o	600	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)
S22.010	42.02	6.93	119.534	2.070	0.0	0.0	0.0	1.54	434.2	235.6
S22.011	41.62	7.10	119.302	2.303	0.0	0.0	0.0	1.86	527.1	259.6
S29.000	50.00	4.26	122.017	0.250	0.0	0.0	0.0	2.99	119.0	33.9
S29.001	49.84	4.32	119.592	0.253	0.0	0.0	0.0	2.77	110.1	34.1
S22.012	41.31	7.23	118.830	2.728	0.0	0.0	0.0	2.70	762.6	305.2
S22.013	40.98	7.38	118.569	2.825	0.0	0.0	0.0	4.14	1169.9	313.5
S22.014	40.65	7.53	117.525	2.851	0.0	0.0	0.0	2.16	610.3	313.9

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	135.238	1.425	Open Manhole	1500	S1.000	133.813	225				
S2	140.458	2.300	Open Manhole	1500	S2.000	138.158	225				
S3	138.044	1.527	Open Manhole	1200	S2.001	136.517	300	S2.000	136.592	225	
S4	135.897	1.726	Open Manhole	1350	S2.002	134.171	375	S2.001	134.246	300	
S5	134.751	1.854	Open Manhole	1350	S2.003	132.897	450	S2.002	132.972	375	
S6	136.963	1.425	Open Manhole	1500	S3.000	135.538	225				
S7	135.961	1.684	Open Manhole	1500	S3.001	134.277	300	S3.000	134.352	225	
S8	135.497	1.607	Open Manhole	1500	S3.002	133.890	300	S3.001	133.890	300	
S9	134.519	1.797	Open Manhole	1500	S2.004	132.722	450	S2.003	132.872	450	150
								S3.002	132.944	300	72
S10	133.607	1.797	Open Manhole	1500	S2.005	131.810	450	S2.004	131.810	450	
S11	133.348	2.288	Open Manhole	1500	S1.001	131.060	450	S1.000	131.923	225	638
								S2.005	131.560	450	500
S12	131.476	1.482	Open Manhole	1500	S4.000	129.994	225				
S13	131.401	1.679	Open Manhole	1500	S4.001	129.722	375	S4.000	129.872	225	
S14	131.591	2.254	Open Manhole	1500	S1.002	129.337	525	S1.001	130.000	450	588
								S4.001	129.337	375	
S15	134.306	1.410	Open Manhole	1500	S5.000	132.896	225				
S16	133.620	1.418	Open Manhole	1500	S5.001	132.202	300	S5.000	132.277	225	
S17	132.468	4.039	Open Manhole	1500	S1.003	128.429	525	S1.002	129.087	525	658

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								S5.001	131.002	300	2348
S19	129.480	2.476	Open Manhole	1500	S1.004	127.004	675	S1.003	127.154	525	
S20	129.480	2.639	Open Manhole	1500	S1.005	126.841	675	S1.004	126.841	675	
S21	129.082	2.440	Open Manhole	1500	S1.006	126.642	675	S1.005	126.642	675	
S22	131.538	2.234	Open Manhole	1500	S6.000	129.304	225				
S23	128.626	2.171	Open Manhole	1500	S1.007	126.455	675	S1.006	126.455	675	
								S6.000	127.200	225	295
S24	128.148	2.278	Open Manhole	1500	S1.008	125.870	675	S1.007	126.271	675	401
S25	127.473	2.895	Open Manhole	1500	S1.009	124.578	675	S1.008	125.603	675	1025
S26	126.080	2.390	Open Manhole	1500	S1.010	123.690	675	S1.009	123.690	675	
S27	125.608	2.028	Open Manhole	1500	S1.011	123.580	675	S1.010	123.580	675	
S29	138.207	1.657	Open Manhole	1500	S7.000	136.550	225				
S30	137.950	1.950	Open Manhole	1500	S7.001	136.000	225	S7.000	136.000	225	
S31	137.600	2.100	Open Manhole	1500	S7.002	135.500	225	S7.001	135.500	225	
S32	135.980	2.126	Open Manhole	1500	S7.003	133.854	450	S7.002	134.079	225	
S33	134.487	3.017	Open Manhole	1500	S7.004	131.470	450	S7.003	132.914	450	1444
S34	132.472	2.737	Open Manhole	1500	S7.005	129.735	450	S7.004	130.820	450	1085
S35	131.624	1.425	Open Manhole	1500	S8.000	130.199	225				
S36	130.995	3.352	Open Manhole	1500	S7.006	127.643	450	S7.005	129.345	450	1702
								S8.000	129.415	225	1547

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S37	128.556	3.797	Open Manhole	1500	S7.007	124.759	450	S7.006	126.906	450	2147
S37	125.540	2.724	Open Manhole	1500	S1.012	122.816	675	S1.011	123.520	675	704
								S7.007	123.890	450	849
S37A	124.150	2.400	Open Manhole	1500	S1.013	121.750	675	S1.012	121.830	675	80
S41	123.600	2.000	Open Manhole	1500	S1.014	121.600	675	S1.013	121.600	675	
S40	126.250	1.750	Open Manhole	1500	S9.000	124.500	225				
S40A	126.000	1.750	Open Manhole	1500	S9.001	124.250	225	S9.000	124.250	225	
S41	124.570	2.260	Open Manhole	1500	S9.002	122.310	225	S9.001	122.310	225	
S42A	123.398	2.448	Open Manhole	1500	S1.015	120.950	675	S1.014	120.950	675	
								S9.002	122.198	225	798
S42	123.445	2.595	Open Manhole	1500	S1.016	120.850	750	S1.015	120.855	675	
S43	123.140	2.440	Open Manhole	1500	S1.017	120.700	600	S1.016	120.700	750	
S44	122.722	1.541	Open Manhole	1500	S10.000	121.181	225				
S45	122.170	2.150	Open Manhole	1500	S1.018	120.020	450	S1.017	120.064	600	194
								S10.000	120.020	225	
S79	120.141	3.922	Open Manhole	1800	S1.019	116.220	600	S1.018	118.600	450	2231
S94	117.117	0.900	Open Manhole	1500		OUTFALL		S1.019	116.217	600	
S1	126.377	1.500	Open Manhole	1050	S11.000	124.877	225				
S2	125.865	1.538	Open Manhole	1050	S11.001	124.327	225	S11.000	124.327	225	

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S3	124.175	1.441	Open Manhole	1050	S11.002	122.734	300	S11.001	122.809	225	
S4	124.304	1.500	Open Manhole	1050	S12.000	122.804	225				
S5	123.146	2.199	Open Manhole	1200	S11.003	120.947	300	S11.002	121.615	300	668
								S12.000	121.690	225	668
S6	122.344	1.908	Open Manhole	1200	S11.004	120.436	300	S11.003	120.436	300	
S7	121.817	2.347	Open Manhole	1200	S11.005	119.470	300	S11.004	120.120	300	650
S9	123.176	1.500	Open Manhole	1050	S13.000	121.676	225				
S9	123.651	2.575	Open Manhole	1050	S13.001	121.076	225	S13.000	121.076	225	
S10	121.416	1.425	Open Manhole	1050	S13.002	119.991	225	S13.001	119.991	225	
S11	121.218	1.425	Open Manhole	1050	S13.003	119.793	225	S13.002	119.793	225	
S12	120.950	1.575	Open Manhole	1350	S13.004	119.375	375	S13.003	119.525	225	
S13	121.436	2.272	Open Manhole	1350	S11.006	119.164	375	S11.005	119.239	300	
								S13.004	119.164	375	
S14	123.018	2.886	Open Manhole	1200	S14.000	120.132	225				
S15A	120.275	1.425	Open Manhole	1200	S15.000	118.850	225				
S15	120.038	1.656	Open Manhole	1350	S11.007	118.382	450	S11.006	118.457	375	
								S14.000	118.607	225	
								S15.000	118.607	225	
S16	119.517	1.590	Open Manhole	1350	S11.008	117.927	450	S11.007	117.927	450	
S17	119.395	2.803	Open Manhole	1350	S11.009	116.592	450	S11.008	117.745	450	1153

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S18	121.948	2.746	Open Manhole	1200	S16.000	119.202	225				
S19	119.311	2.949	Open Manhole	1350	S11.010	116.363	450	S11.009	116.363	450	
								S16.000	117.663	225	1075
S20	117.776	3.395	Open Manhole	1350	S11.011	114.381	450	S11.010	115.981	450	1600
S21A	115.881	2.521	Open Manhole	1350	S11.012	113.360	450	S11.011	113.791	450	431
S21B	114.900	1.500	Open Manhole	1200	S17.000	113.400	225				
S21	115.398	2.208	Open Manhole	1350	S11.013	113.190	450	S11.012	113.190	450	
								S17.000	113.190	225	
S21C	114.846	1.756	Open Manhole	1350	S11.014	113.090	450	S11.013	113.090	450	
S22	119.471	2.258	Open Manhole	1200	S18.000	117.213	225				
S23	117.484	1.284	Open Manhole	1200	S18.001	116.200	300	S18.000	116.275	225	
S24	119.791	2.226	Open Manhole	1200	S19.000	117.565	225				
S25	117.922	1.407	Open Manhole	1050	S19.001	116.515	225	S19.000	116.515	225	
S26	117.056	1.346	Open Manhole	1050	S18.002	115.710	300	S18.001	115.712	300	2
								S19.001	115.710	225	
S27	116.755	1.425	Open Manhole	1050	S18.003	115.330	300	S18.002	115.330	300	
S28	118.056	1.500	Open Manhole	1050	S20.000	116.556	225				
S29	116.641	1.607	Open Manhole	1050	S18.004	115.034	300	S18.003	115.034	300	
								S20.000	115.034	225	
S30	116.237	1.500	Open Manhole	1050	S18.005	114.737	375	S18.004	114.737	300	

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S31	115.678	1.500	Open Manhole	1050	S18.006	114.178	375	S18.005	114.178	375	
S32	114.929	1.900	Open Manhole	1050	S18.007	113.029	450	S18.006	113.429	375	325
S33	114.353	1.800	Open Manhole	1500	S11.015	112.553	450	S11.014	112.553	450	
								S18.007	112.703	450	150
S34	113.050	1.847	Open Manhole	1500	S11.016	111.203	450	S11.015	111.203	450	
SAHPR TANK	112.080	3.480	Open Manhole	1350	S21.000	108.600	450				
S34A	110.780	2.280	Open Manhole	1350	S11.017	108.500	450	S11.016	108.890	450	390
								S21.000	108.500	450	
S35	109.957	1.900	Open Manhole	1500	S11.018	108.057	300	S11.017	108.057	450	
S36	107.980	1.339	Open Manhole	1500	S11.019	106.641	300	S11.018	106.716	300	75
SO/F 1	106.935	0.600	Open Manhole	1200		OUTFALL		S11.019	106.335	300	
S49	126.597	1.425	Open Manhole	1200	S22.000	125.172	225				
S46	128.947	1.784	Open Manhole	1500	S23.000	127.163	225				
S47	128.530	1.575	Open Manhole	1500	S23.001	126.955	225	S23.000	126.955	225	
S48	128.337	1.532	Open Manhole	1500	S23.002	126.805	225	S23.001	126.805	225	
S50	127.239	2.340	Open Manhole	1500	S22.001	124.899	300	S22.000	124.974	225	
								S23.002	125.802	225	828
S51	126.079	1.630	Open Manhole	1500	S22.002	124.449	300	S22.001	124.449	300	
S52	124.828	1.425	Open Manhole	1500	S24.000	123.403	225				

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S53	125.488	2.410	Open Manhole	1500	S22.003	123.078	300	S22.002	124.056	300	978
								S24.000	123.153	225	
S54	125.500	1.476	Open Manhole	1500	S25.000	124.024	225				
S55	124.780	2.089	Open Manhole	1500	S22.004	122.691	375	S22.003	122.766	300	
								S25.000	122.696	225	
S56	124.404	1.425	Open Manhole	1500	S26.000	122.979	225				
S57	123.944	1.503	Open Manhole	1500	S26.001	122.441	300	S26.000	122.516	225	
S58	123.469	1.766	Open Manhole	1500	S26.002	121.703	375	S26.001	121.778	300	
S59	123.581	2.015	Open Manhole	1500	S22.005	121.566	450	S22.004	122.044	375	403
								S26.002	121.641	375	
S60	123.340	1.934	Open Manhole	1500	S22.006	121.406	450	S22.005	121.406	450	
S61	122.997	2.146	Open Manhole	1500	S22.007	120.851	525	S22.006	120.926	450	
S61	122.839	2.068	Open Manhole	1500	S22.008	120.771	525	S22.007	120.771	525	
S62	122.124	2.531	Open Manhole	1500	S22.009	119.593	600	S22.008	120.343	525	675
S63	129.214	2.041	Open Manhole	1500	S27.000	127.173	225				
S64	127.140	1.378	Open Manhole	1500	S27.001	125.762	225	S27.000	125.762	225	
S54B	128.020	1.690	Open Manhole	1200	S28.000	126.330	225				
S59	126.160	1.681	Open Manhole	1200	S28.001	124.479	225	S28.000	124.479	225	
S60	125.814	1.434	Open Manhole	1200	S28.002	124.380	225	S28.001	124.380	225	
S58	126.639	2.795	Open Manhole	1200	S27.002	123.844	225	S27.001	125.315	225	1471

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Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								S28.002	123.844	225	
S65	126.072	2.290	Open Manhole	1200	S27.003	123.782	225	S27.002	123.782	225	
S66	125.593	3.981	Open Manhole	1200	S27.004	121.612	225	S27.003	123.412	225	1800
S68	122.637	3.103	Open Manhole	1500	S22.010	119.534	600	S22.009	119.534	600	
								S27.004	121.061	225	1152
S67	120.691	1.390	Open Manhole	1500	S22.011	119.302	600	S22.010	119.302	600	
S68	124.490	2.473	Open Manhole	1500	S29.000	122.017	225				
S69	121.020	1.428	Open Manhole	1500	S29.001	119.592	225	S29.000	119.592	225	
S71	120.650	1.820	Open Manhole	1500	S22.012	118.830	600	S22.011	119.190	600	360
								S29.001	119.175	225	
S72	120.371	1.802	Open Manhole	1500	S22.013	118.569	600	S22.012	118.569	600	
S72A	120.256	2.731	Open Manhole	1500	S22.014	117.525	600	S22.013	117.525	600	
S76	120.152	2.777	Open Manhole	0		OUTFALL		S22.014	117.375	600	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	165470.128	73166.388	165470.128	73166.388	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S2	165305.564	72985.946	165305.564	72985.946	Required	
S3	165363.885	73004.982	165363.885	73004.982	Required	
S4	165448.105	73039.652	165448.105	73039.652	Required	
S5	165479.492	73082.310	165479.492	73082.310	Required	
S6	165408.023	73128.643	165408.023	73128.643	Required	
S7	165442.993	73095.996	165442.993	73095.996	Required	
S8	165445.811	73083.748	165445.811	73083.748	Required	
S9	165479.125	73091.024	165479.125	73091.024	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S10	165524.285	73100.887	165524.285	73100.887	Required	
S11	165532.536	73109.512	165532.536	73109.512	Required	
S12	165616.487	73120.361	165616.487	73120.361	Required	
S13	165600.198	73107.857	165600.198	73107.857	Required	
S14	165570.221	73075.169	165570.221	73075.169	Required	
S15	165506.616	72988.243	165506.616	72988.243	Required	
S16	165519.704	73018.806	165519.704	73018.806	Required	
S17	165548.569	73051.317	165548.569	73051.317	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S19	165601.945	73003.383	165601.945	73003.383	Required	
S20	165585.557	72985.317	165585.557	72985.317	Required	
S21	165579.635	72976.927	165579.635	72976.927	Required	
S22	165526.091	72970.157	165526.091	72970.157	Required	
S23	165578.779	72969.493	165578.779	72969.493	Required	
S24	165579.960	72962.227	165579.960	72962.227	Required	
S25	165586.464	72953.753	165586.464	72953.753	Required	
S26	165611.165	72939.396	165611.165	72939.396	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S27	165584.125	72891.308	165584.125	72891.308	Required	
S29	165357.068	72927.833	165357.068	72927.833	Required	
S30	165380.690	72939.636	165380.690	72939.636	Required	
S31	165410.110	72950.661	165410.110	72950.661	Required	
S32	165464.926	72972.001	165464.926	72972.001	Required	
S33	165505.157	72971.752	165505.157	72971.752	Required	
S34	165510.693	72941.684	165510.693	72941.684	Required	
S35	165486.527	72905.959	165486.527	72905.959	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S36	165517.829	72922.542	165517.829	72922.542	Required	
S37	165541.503	72897.720	165541.503	72897.720	Required	
S37	165576.032	72877.016	165576.032	72877.016	Required	
S37A	165548.486	72827.403	165548.486	72827.403	Required	
S41	165539.835	72811.822	165539.835	72811.822	Required	
S40	165457.251	72817.364	165457.251	72817.364	Required	
S40A	165497.033	72834.797	165497.033	72834.797	Required	
S41	165517.104	72823.962	165517.104	72823.962	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S42A	165527.012	72805.455	165527.012	72805.455	Required	
S42	165523.252	72803.589	165523.252	72803.589	Required	
S43	165468.946	72778.965	165468.946	72778.965	Required	
S44	165524.405	72790.753	165524.405	72790.753	Required	
S45	165473.742	72768.475	165473.742	72768.475	Required	
S79	165503.668	72702.763	165503.668	72702.763	Required	
S94	165502.358	72702.281			No Entry	
S1	165724.611	73075.276	165724.611	73075.276	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S2	165747.098	73083.325	165747.098	73083.325	Required	
S3	165821.563	73082.101	165821.563	73082.101	Required	
S4	165761.148	73016.082	165761.148	73016.082	Required	
S5	165820.625	73015.029	165820.625	73015.029	Required	
S6	165820.233	72986.936	165820.233	72986.936	Required	
S7	165817.723	72969.752	165817.723	72969.752	Required	
S9	165868.962	73058.341	165868.962	73058.341	Required	
S9	165838.044	73034.245	165838.044	73034.245	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S10	165866.534	72998.819	165866.534	72998.819	Required	
S11	165865.348	72991.904	165865.348	72991.904	Required	
S12	165852.818	72981.340	165852.818	72981.340	Required	
S13	165824.690	72959.127	165824.690	72959.127	Required	
S14	165747.574	72962.305	165747.574	72962.305	Required	
S15A	165801.189	72893.535	165801.189	72893.535	Required	
S15	165779.278	72922.733	165779.278	72922.733	Required	
S16	165747.303	72897.863	165747.303	72897.863	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S17	165736.331	72888.899	165736.331	72888.899	Required	
S18	165689.077	72896.367	165689.077	72896.367	Required	
S19	165727.391	72873.753	165727.391	72873.753	Required	
S20	165752.619	72858.863	165752.619	72858.863	Required	
S21A	165771.010	72835.774	165771.010	72835.774	Required	
S21B	165804.493	72830.116	165804.493	72830.116	Required	
S21	165776.534	72829.037	165776.534	72829.037	Required	
S21C	165776.890	72818.962	165776.890	72818.962	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S22	165724.353	72868.381	165724.353	72868.381	Required	
S23	165699.765	72824.904	165699.765	72824.904	Required	
S24	165644.069	72839.729	165644.069	72839.729	Required	
S25	165670.133	72824.984	165670.133	72824.984	Required	
S26	165683.768	72811.911	165683.768	72811.911	Required	
S27	165691.431	72801.358	165691.431	72801.358	Required	
S28	165629.496	72753.898	165629.496	72753.898	Required	
S29	165699.001	72784.856	165699.001	72784.856	Required	

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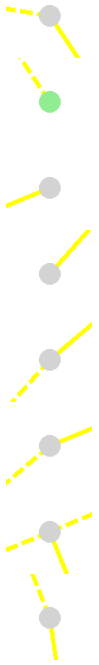
Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S30	165712.823	72790.970	165712.823	72790.970	Required	
S31	165738.390	72799.983	165738.390	72799.983	Required	
S32	165761.740	72804.624	165761.740	72804.624	Required	
S33	165777.449	72806.020	165777.449	72806.020	Required	
S34	165808.291	72806.128	165808.291	72806.128	Required	
SAHPR TANK	165830.768	72815.511	165830.768	72815.511	Required	
S34A	165849.940	72801.339	165849.940	72801.339	Required	
S35	165862.275	72799.873	165862.275	72799.873	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S36	165896.929	72794.209	165896.929	72794.209	Required	
SO/F 1	165905.608	72781.226			No Entry	
S49	165714.793	73073.147	165714.793	73073.147	Required	
S46	165619.060	73021.725	165619.060	73021.725	Required	
S47	165631.559	73035.803	165631.559	73035.803	Required	
S48	165638.258	73041.455	165638.258	73041.455	Required	
S50	165685.302	73060.879	165685.302	73060.879	Required	
S51	165704.692	73012.147	165704.692	73012.147	Required	



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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S52	165745.715	73014.676	165745.715	73014.676	Required	
S53	165706.480	72999.869	165706.480	72999.869	Required	
S54	165675.468	72980.403	165675.468	72980.403	Required	
S55	165708.298	72985.266	165708.298	72985.266	Required	
S56	165755.910	73018.090	165755.910	73018.090	Required	
S57	165754.909	72987.165	165754.909	72987.165	Required	
S58	165722.526	72961.374	165722.526	72961.374	Required	
S59	165712.353	72959.531	165712.353	72959.531	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S60	165713.427	72952.152	165713.427	72952.152	Required	
S61	165706.497	72939.217	165706.497	72939.217	Required	
S61	165702.749	72932.440	165702.749	72932.440	Required	
S62	165684.097	72899.306	165684.097	72899.306	Required	
S63	165613.083	73008.849	165613.083	73008.849	Required	
S64	165637.854	72985.943	165637.854	72985.943	Required	
S54B	165656.627	73034.294	165656.627	73034.294	Required	
S59	165673.537	72991.209	165673.537	72991.209	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S60	165663.265	72980.427	165663.265	72980.427	Required	
S58	165639.500	72976.740	165639.500	72976.740	Required	
S65	165641.633	72965.776	165641.633	72965.776	Required	
S66	165623.166	72933.707	165623.166	72933.707	Required	
S68	165671.186	72906.595	165671.186	72906.595	Required	
S67	165642.573	72856.022	165642.573	72856.022	Required	
S68	165588.677	72871.028	165588.677	72871.028	Required	
S69	165629.400	72848.009	165629.400	72848.009	Required	

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Manhole Schedules for Storm Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S71	165633.208	72839.425	165633.208	72839.425	Required	
S72	165622.653	72820.926	165622.653	72820.926	Required	
S72A	165604.651	72789.377	165604.651	72789.377	Required	
S76	165587.518	72781.009			No Entry	



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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	S1	135.238	133.813	1.200	Open Manhole	1500
S2.000	o	225	S2	140.458	138.158	2.075	Open Manhole	1500
S2.001	o	300	S3	138.044	136.517	1.227	Open Manhole	1200
S2.002	o	375	S4	135.897	134.171	1.351	Open Manhole	1350
S2.003	o	450	S5	134.751	132.897	1.404	Open Manhole	1350
S3.000	o	225	S6	136.963	135.538	1.200	Open Manhole	1500
S3.001	o	300	S7	135.961	134.277	1.384	Open Manhole	1500
S3.002	o	300	S8	135.497	133.890	1.307	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	84.437	44.7	S11	133.348	131.923	1.200	Open Manhole	1500
S2.000	61.349	39.2	S3	138.044	136.592	1.227	Open Manhole	1200
S2.001	91.077	40.1	S4	135.897	134.246	1.351	Open Manhole	1350
S2.002	52.961	44.2	S5	134.751	132.972	1.404	Open Manhole	1350
S2.003	8.722	348.8	S9	134.519	132.872	1.197	Open Manhole	1500
S3.000	47.840	40.3	S7	135.961	134.352	1.384	Open Manhole	1500
S3.001	12.568	32.5	S8	135.497	133.890	1.307	Open Manhole	1500
S3.002	34.100	36.0	S9	134.519	132.944	1.275	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S2.004	o	450	S9	134.519	132.722	1.347	Open Manhole	1500
S2.005	o	450	S10	133.607	131.810	1.347	Open Manhole	1500
S1.001	o	450	S11	133.348	131.060	1.838	Open Manhole	1500
S4.000	o	225	S12	131.476	129.994	1.257	Open Manhole	1500
S4.001	o	375	S13	131.401	129.722	1.304	Open Manhole	1500
S1.002	o	525	S14	131.591	129.337	1.729	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S2.004	46.224	50.7	S10	133.607	131.810	1.347	Open Manhole	1500
S2.005	11.936	47.7	S11	133.348	131.560	1.338	Open Manhole	1500
S1.001	50.986	48.1	S14	131.591	130.000	1.141	Open Manhole	1500
S4.000	20.535	168.3	S13	131.401	129.872	1.304	Open Manhole	1500
S4.001	44.352	115.2	S14	131.591	129.337	1.879	Open Manhole	1500
S1.002	32.214	128.9	S17	132.468	129.087	2.856	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.000	o	225	S15	134.306	132.896	1.185	Open Manhole	1500
S5.001	o	300	S16	133.620	132.202	1.118	Open Manhole	1500
S1.003	o	525	S17	132.468	128.429	3.514	Open Manhole	1500
S1.004	o	675	S19	129.480	127.004	1.801	Open Manhole	1500
S1.005	o	675	S20	129.480	126.841	1.964	Open Manhole	1500
S1.006	o	675	S21	129.082	126.642	1.765	Open Manhole	1500
S6.000	o	225	S22	131.538	129.304	2.009	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.000	33.248	53.7	S16	133.620	132.277	1.118	Open Manhole	1500
S5.001	43.475	36.2	S17	132.468	131.002	1.166	Open Manhole	1500
S1.003	71.739	56.3	S19	129.480	127.154	1.801	Open Manhole	1500
S1.004	24.392	149.6	S20	129.480	126.841	1.964	Open Manhole	1500
S1.005	10.270	51.6	S21	129.082	126.642	1.765	Open Manhole	1500
S1.006	7.483	40.0	S23	128.626	126.455	1.496	Open Manhole	1500
S6.000	52.692	25.0	S23	128.626	127.200	1.201	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.007	o	675	S23	128.626	126.455	1.496	Open Manhole	1500
S1.008	o	675	S24	128.148	125.870	1.603	Open Manhole	1500
S1.009	o	675	S25	127.473	124.578	2.220	Open Manhole	1500
S1.010	o	675	S26	126.080	123.690	1.715	Open Manhole	1500
S1.011	o	675	S27	125.608	123.580	1.353	Open Manhole	1500
S7.000	o	225	S29	138.207	136.550	1.432	Open Manhole	1500
S7.001	o	225	S30	137.950	136.000	1.725	Open Manhole	1500
S7.002	o	225	S31	137.600	135.500	1.875	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.007	7.362	40.0	S24	128.148	126.271	1.202	Open Manhole	1500
S1.008	10.682	40.0	S25	127.473	125.603	1.195	Open Manhole	1500
S1.009	28.570	32.2	S26	126.080	123.690	1.715	Open Manhole	1500
S1.010	55.169	501.5	S27	125.608	123.580	1.353	Open Manhole	1500
S1.011	16.425	273.7	S37	125.540	123.520	1.345	Open Manhole	1500
S7.000	26.407	48.0	S30	137.950	136.000	1.725	Open Manhole	1500
S7.001	31.418	62.8	S31	137.600	135.500	1.875	Open Manhole	1500
S7.002	58.823	41.4	S32	135.980	134.079	1.676	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.003	o	450	S32	135.980	133.854	1.676	Open Manhole	1500
S7.004	o	450	S33	134.487	131.470	2.567	Open Manhole	1500
S7.005	o	450	S34	132.472	129.735	2.287	Open Manhole	1500
S8.000	o	225	S35	131.624	130.199	1.200	Open Manhole	1500
S7.006	o	450	S36	130.995	127.643	2.902	Open Manhole	1500
S7.007	o	450	S37	128.556	124.759	3.347	Open Manhole	1500
S1.012	o	675	S37	125.540	122.816	2.049	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.003	40.231	42.8	S33	134.487	132.914	1.123	Open Manhole	1500
S7.004	30.573	47.0	S34	132.472	130.820	1.202	Open Manhole	1500
S7.005	20.428	52.4	S36	130.995	129.345	1.200	Open Manhole	1500
S8.000	35.423	45.2	S36	130.995	129.415	1.355	Open Manhole	1500
S7.006	34.302	46.5	S37	128.556	126.906	1.200	Open Manhole	1500
S7.007	40.260	46.3	S37	125.540	123.890	1.200	Open Manhole	1500
S1.012	56.747	57.6	S37A	124.150	121.830	1.645	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	o	675	S37A	124.150	121.750	1.725	Open Manhole	1500
S1.014	o	675	S41	123.600	121.600	1.325	Open Manhole	1500
S9.000	o	225	S40	126.250	124.500	1.525	Open Manhole	1500
S9.001	o	225	S40A	126.000	124.250	1.525	Open Manhole	1500
S9.002	o	225	S41	124.570	122.310	2.035	Open Manhole	1500
S1.015	o	675	S42A	123.398	120.950	1.773	Open Manhole	1500
S1.016	o	750	S42	123.445	120.850	1.845	Open Manhole	1500
S1.017	o	600	S43	123.140	120.700	1.840	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	17.822	118.8	S41	123.600	121.600	1.325	Open Manhole	1500
S1.014	14.316	22.0	S42A	123.398	120.950	1.773	Open Manhole	1500
S9.000	43.434	173.7	S40A	126.000	124.250	1.525	Open Manhole	1500
S9.001	22.809	11.8	S41	124.570	122.310	2.035	Open Manhole	1500
S9.002	20.992	187.4	S42A	123.398	122.198	0.975	Open Manhole	1500
S1.015	4.197	44.2	S42	123.445	120.855	1.915	Open Manhole	1500
S1.016	59.629	397.5	S43	123.140	120.700	1.690	Open Manhole	1500
S1.017	11.534	18.1	S45	122.170	120.064	1.506	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	o	225	S44	122.722	121.181	1.316	Open Manhole	1500
S1.018	o	450	S45	122.170	120.020	1.700	Open Manhole	1500
S1.019	o	600	S79	120.141	116.220	3.322	Open Manhole	1800
S11.000	o	225	S1	126.377	124.877	1.275	Open Manhole	1050
S11.001	o	225	S2	125.865	124.327	1.313	Open Manhole	1050
S11.002	o	300	S3	124.175	122.734	1.141	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	55.345	47.7	S45	122.170	120.020	1.925	Open Manhole	1500
S1.018	72.205	50.8	S79	120.141	118.600	1.091	Open Manhole	1800
S1.019	1.395	498.4	S94	117.117	116.217	0.300	Open Manhole	1500
S11.000	23.884	43.4	S2	125.865	124.327	1.313	Open Manhole	1050
S11.001	74.475	49.1	S3	124.175	122.809	1.141	Open Manhole	1050
S11.002	67.079	59.9	S5	123.146	121.615	1.231	Open Manhole	1200

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.000	o	225	S4	124.304	122.804	1.275	Open Manhole	1050
S11.003	o	300	S5	123.146	120.947	1.899	Open Manhole	1200
S11.004	o	300	S6	122.344	120.436	1.608	Open Manhole	1200
S11.005	o	300	S7	121.817	119.470	2.047	Open Manhole	1200
S13.000	o	225	S9	123.176	121.676	1.275	Open Manhole	1050
S13.001	o	225	S9	123.651	121.076	2.350	Open Manhole	1050
S13.002	o	225	S10	121.416	119.991	1.200	Open Manhole	1050
S13.003	o	225	S11	121.218	119.793	1.200	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.000	59.486	53.4	S5	123.146	121.690	1.231	Open Manhole	1200
S11.003	28.096	55.0	S6	122.344	120.436	1.608	Open Manhole	1200
S11.004	17.367	55.0	S7	121.817	120.120	1.397	Open Manhole	1200
S11.005	12.706	55.0	S13	121.436	119.239	1.897	Open Manhole	1350
S13.000	39.199	65.3	S9	123.651	121.076	2.350	Open Manhole	1050
S13.001	45.461	41.9	S10	121.416	119.991	1.200	Open Manhole	1050
S13.002	7.016	35.4	S11	121.218	119.793	1.200	Open Manhole	1050
S13.003	16.389	61.2	S12	120.950	119.525	1.200	Open Manhole	1350

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.004	o	375	S12	120.950	119.375	1.200	Open Manhole	1350
S11.006	o	375	S13	121.436	119.164	1.897	Open Manhole	1350
S14.000	o	225	S14	123.018	120.132	2.661	Open Manhole	1200
S15.000	o	225	S15A	120.275	118.850	1.200	Open Manhole	1200
S11.007	o	450	S15	120.038	118.382	1.206	Open Manhole	1350
S11.008	o	450	S16	119.517	117.927	1.140	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.004	35.841	169.9	S13	121.436	119.164	1.897	Open Manhole	1350
S11.006	58.196	82.3	S15	120.038	118.457	1.206	Open Manhole	1350
S14.000	50.706	33.2	S15	120.038	118.607	1.206	Open Manhole	1350
S15.000	36.505	150.2	S15	120.038	118.607	1.206	Open Manhole	1350
S11.007	40.509	89.0	S16	119.517	117.927	1.140	Open Manhole	1350
S11.008	14.168	77.8	S17	119.395	117.745	1.200	Open Manhole	1350

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.009	o	450	S17	119.395	116.592	2.353	Open Manhole	1350
S16.000	o	225	S18	121.948	119.202	2.521	Open Manhole	1200
S11.010	o	450	S19	119.311	116.363	2.498	Open Manhole	1350
S11.011	o	450	S20	117.776	114.381	2.945	Open Manhole	1350
S11.012	o	450	S21A	115.881	113.360	2.071	Open Manhole	1350
S17.000	o	225	S21B	114.900	113.400	1.275	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.009	17.588	76.7	S19	119.311	116.363	2.499	Open Manhole	1350
S16.000	44.490	28.9	S19	119.311	117.663	1.424	Open Manhole	1350
S11.010	29.295	76.7	S20	117.776	115.981	1.345	Open Manhole	1350
S11.011	29.518	50.0	S21A	115.881	113.791	1.640	Open Manhole	1350
S11.012	8.712	51.2	S21	115.398	113.190	1.758	Open Manhole	1350
S17.000	27.980	133.2	S21	115.398	113.190	1.983	Open Manhole	1350

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.013	o	450	S21	115.398	113.190	1.758	Open Manhole	1350
S11.014	o	450	S21C	114.846	113.090	1.306	Open Manhole	1350
S18.000	o	225	S22	119.471	117.213	2.033	Open Manhole	1200
S18.001	o	300	S23	117.484	116.200	0.984	Open Manhole	1200
S19.000	o	225	S24	119.791	117.565	2.001	Open Manhole	1200
S19.001	o	225	S25	117.922	116.515	1.182	Open Manhole	1050
S18.002	o	300	S26	117.056	115.710	1.046	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.013	10.081	100.8	S21C	114.846	113.090	1.306	Open Manhole	1350
S11.014	12.954	24.1	S33	114.353	112.553	1.350	Open Manhole	1500
S18.000	49.948	53.2	S23	117.484	116.275	0.984	Open Manhole	1200
S18.001	20.609	42.2	S26	117.056	115.712	1.044	Open Manhole	1050
S19.000	29.946	28.5	S25	117.922	116.515	1.182	Open Manhole	1050
S19.001	18.889	23.5	S26	117.056	115.710	1.121	Open Manhole	1050
S18.002	13.041	34.3	S27	116.755	115.330	1.125	Open Manhole	1050

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S18.003	o	300	S27	116.755	115.330	1.125	Open Manhole	1050
S20.000	o	225	S28	118.056	116.556	1.275	Open Manhole	1050
S18.004	o	300	S29	116.641	115.034	1.307	Open Manhole	1050
S18.005	o	375	S30	116.237	114.737	1.125	Open Manhole	1050
S18.006	o	375	S31	115.678	114.178	1.125	Open Manhole	1050
S18.007	o	450	S32	114.929	113.029	1.450	Open Manhole	1050
S11.015	o	450	S33	114.353	112.553	1.350	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S18.003	18.156	61.3	S29	116.641	115.034	1.307	Open Manhole	1050
S20.000	76.088	50.0	S29	116.641	115.034	1.382	Open Manhole	1050
S18.004	15.114	50.9	S30	116.237	114.737	1.200	Open Manhole	1050
S18.005	27.110	48.5	S31	115.678	114.178	1.125	Open Manhole	1050
S18.006	23.807	31.8	S32	114.929	113.429	1.125	Open Manhole	1050
S18.007	15.771	48.4	S33	114.353	112.703	1.200	Open Manhole	1500
S11.015	30.842	22.8	S34	113.050	111.203	1.397	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.016	o	450	S34	113.050	111.203	1.397	Open Manhole	1500
S21.000	o	450	SAHPR TANK	112.080	108.600	3.030	Open Manhole	1350
S11.017	o	450	S34A	110.780	108.500	1.830	Open Manhole	1350
S11.018	o	300	S35	109.957	108.057	1.600	Open Manhole	1500
S11.019	o	300	S36	107.980	106.641	1.039	Open Manhole	1500
S22.000	o	225	S49	126.597	125.172	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S11.016	41.923	18.1	S34A	110.780	108.890	1.440	Open Manhole	1350
S21.000	23.841	238.4	S34A	110.780	108.500	1.830	Open Manhole	1350
S11.017	12.421	28.0	S35	109.957	108.057	1.450	Open Manhole	1500
S11.018	35.114	26.2	S36	107.980	106.716	0.964	Open Manhole	1500
S11.019	15.617	51.0	SO/F 1	106.935	106.335	0.300	Open Manhole	1200
S22.000	31.941	161.3	S50	127.239	124.974	2.040	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S23.000	o	225	S46	128.947	127.163	1.559	Open Manhole	1500
S23.001	o	225	S47	128.530	126.955	1.350	Open Manhole	1500
S23.002	o	225	S48	128.337	126.805	1.307	Open Manhole	1500
S22.001	o	300	S50	127.239	124.899	2.040	Open Manhole	1500
S22.002	o	300	S51	126.079	124.449	1.330	Open Manhole	1500
S24.000	o	225	S52	124.828	123.403	1.200	Open Manhole	1500
S22.003	o	300	S53	125.488	123.078	2.110	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S23.000	18.826	90.5	S47	128.530	126.955	1.350	Open Manhole	1500
S23.001	8.764	58.5	S48	128.337	126.805	1.307	Open Manhole	1500
S23.002	50.896	50.7	S50	127.239	125.802	1.212	Open Manhole	1500
S22.001	52.448	116.6	S51	126.079	124.449	1.330	Open Manhole	1500
S22.002	12.408	31.6	S53	125.488	124.056	1.132	Open Manhole	1500
S24.000	41.936	167.7	S53	125.488	123.153	2.110	Open Manhole	1500
S22.003	14.715	47.2	S55	124.780	122.766	1.714	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S25.000	o	225	S54	125.500	124.024	1.251	Open Manhole	1500
S22.004	o	375	S55	124.780	122.691	1.714	Open Manhole	1500
S26.000	o	225	S56	124.404	122.979	1.200	Open Manhole	1500
S26.001	o	300	S57	123.944	122.441	1.203	Open Manhole	1500
S26.002	o	375	S58	123.469	121.703	1.391	Open Manhole	1500
S22.005	o	450	S59	123.581	121.566	1.565	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S25.000	33.188	25.0	S55	124.780	122.696	1.859	Open Manhole	1500
S22.004	26.052	40.3	S59	123.581	122.044	1.162	Open Manhole	1500
S26.000	30.942	66.8	S57	123.944	122.516	1.203	Open Manhole	1500
S26.001	41.399	62.4	S58	123.469	121.778	1.391	Open Manhole	1500
S26.002	10.338	166.7	S59	123.581	121.641	1.565	Open Manhole	1500
S22.005	7.457	46.6	S60	123.340	121.406	1.484	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S22.006	o	450	S60	123.340	121.406	1.484	Open Manhole	1500
S22.007	o	525	S61	122.997	120.851	1.621	Open Manhole	1500
S22.008	o	525	S61	122.839	120.771	1.543	Open Manhole	1500
S22.009	o	600	S62	122.124	119.593	1.931	Open Manhole	1500
S27.000	o	225	S63	129.214	127.173	1.816	Open Manhole	1500
S27.001	o	225	S64	127.140	125.762	1.153	Open Manhole	1500
S28.000	o	225	S54B	128.020	126.330	1.465	Open Manhole	1200
S28.001	o	225	S59	126.160	124.479	1.456	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S22.006	14.674	30.6	S61	122.997	120.926	1.621	Open Manhole	1500
S22.007	7.745	97.2	S61	122.839	120.771	1.543	Open Manhole	1500
S22.008	38.023	88.8	S62	122.124	120.343	1.256	Open Manhole	1500
S22.009	14.827	250.0	S68	122.637	119.534	2.503	Open Manhole	1500
S27.000	33.739	23.9	S64	127.140	125.762	1.153	Open Manhole	1500
S27.001	9.349	20.9	S58	126.639	125.315	1.099	Open Manhole	1200
S28.000	46.285	25.0	S59	126.160	124.479	1.456	Open Manhole	1200
S28.001	14.892	150.4	S60	125.814	124.380	1.209	Open Manhole	1200

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S28.002	o	225	S60	125.814	124.380	1.209	Open Manhole	1200
S27.002	o	225	S58	126.639	123.844	2.570	Open Manhole	1200
S27.003	o	225	S65	126.072	123.782	2.065	Open Manhole	1200
S27.004	o	225	S66	125.593	121.612	3.756	Open Manhole	1200
S22.010	o	600	S68	122.637	119.534	2.503	Open Manhole	1500
S22.011	o	600	S67	120.691	119.302	0.789	Open Manhole	1500
S29.000	o	225	S68	124.490	122.017	2.248	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S28.002	24.049	44.9	S58	126.639	123.844	2.570	Open Manhole	1200
S27.002	11.170	180.2	S65	126.072	123.782	2.065	Open Manhole	1200
S27.003	37.006	100.0	S66	125.593	123.412	1.956	Open Manhole	1200
S27.004	55.145	100.1	S68	122.637	121.061	1.351	Open Manhole	1500
S22.010	58.107	250.0	S67	120.691	119.302	0.790	Open Manhole	1500
S22.011	19.056	170.1	S71	120.650	119.190	0.860	Open Manhole	1500
S29.000	46.778	19.3	S69	121.020	119.592	1.203	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S29.001	o	225	S69	121.020	119.592	1.203	Open Manhole	1500
S22.012	o	600	S71	120.650	118.830	1.220	Open Manhole	1500
S22.013	o	600	S72	120.371	118.569	1.202	Open Manhole	1500
S22.014	o	600	S72A	120.256	117.525	2.131	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S29.001	9.390	22.5	S71	120.650	119.175	1.250	Open Manhole	1500
S22.012	21.299	81.6	S72	120.371	118.569	1.202	Open Manhole	1500
S22.013	36.323	34.8	S72A	120.256	117.525	2.131	Open Manhole	1500
S22.014	19.068	127.1	S76	120.152	117.375	2.177	Open Manhole	0

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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	-	-	100	0.256	0.256	0.256
2.000	-	-	100	0.184	0.184	0.184
2.001	-	-	100	0.259	0.259	0.259
2.002	-	-	100	0.140	0.140	0.140
2.003	-	-	100	0.006	0.006	0.006
3.000	-	-	100	0.136	0.136	0.136
3.001	-	-	100	0.023	0.023	0.023
3.002	-	-	100	0.070	0.070	0.070
2.004	-	-	100	0.171	0.171	0.171
2.005	-	-	100	0.012	0.012	0.012
1.001	-	-	100	0.077	0.077	0.077
4.000	-	-	100	0.158	0.158	0.158
4.001	-	-	100	0.131	0.131	0.131
1.002	-	-	100	0.088	0.088	0.088
5.000	-	-	100	0.202	0.202	0.202
5.001	-	-	100	0.191	0.191	0.191
1.003	-	-	100	0.219	0.219	0.219
1.004	-	-	100	0.037	0.037	0.037
1.005	-	-	100	0.030	0.030	0.030
1.006	-	-	100	0.009	0.009	0.009
6.000	-	-	100	0.203	0.203	0.203
1.007	-	-	100	0.008	0.008	0.008
1.008	-	-	100	0.035	0.035	0.035
1.009	-	-	100	0.048	0.048	0.048
1.010	As Zoned	Default	100	0.193	0.193	0.193
		Grass	0	0.056	0.000	0.195
1.011	-	-	100	0.035	0.035	0.035
7.000	-	-	100	0.120	0.120	0.120

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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)
7.001	-	-	100	0.129	0.129	0.129
7.002	-	-	100	0.250	0.250	0.250
7.003	-	-	100	0.173	0.173	0.173
7.004	-	-	100	0.085	0.085	0.085
7.005	-	-	100	0.076	0.076	0.076
8.000	-	-	100	0.133	0.133	0.133
7.006	-	-	100	0.142	0.142	0.142
7.007	-	-	100	0.152	0.152	0.152
1.012	-	-	100	0.251	0.251	0.251
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.037	0.037	0.037
9.000	-	-	100	0.100	0.100	0.100
9.001	-	-	100	0.000	0.000	0.000
9.002	-	-	100	0.097	0.097	0.097
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.000	0.000	0.000
1.017	-	-	100	0.006	0.006	0.006
10.000	-	-	100	0.165	0.165	0.165
1.018	-	-	100	0.130	0.130	0.130
1.019	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.061	0.061	0.061
11.001	-	-	100	0.265	0.265	0.265
11.002	-	-	100	0.191	0.191	0.191
12.000	-	-	100	0.208	0.208	0.208
11.003	As Zoned	Default	100	0.050	0.050	0.050
		Grass	0	0.006	0.000	0.050
11.004	As Zoned	Default	100	0.036	0.036	0.036
		Grass	0	0.017	0.000	0.036

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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)
11.005	As Zoned	Default	100	0.026	0.026	0.026
		Grass	0	0.023	0.000	0.026
13.000	-	-	100	0.153	0.153	0.153
13.001	-	-	100	0.081	0.081	0.081
13.002	-	-	100	0.032	0.032	0.032
13.003	-	-	100	0.052	0.052	0.052
13.004	As Zoned	Default	100	0.074	0.074	0.074
		Grass	0	0.043	0.000	0.075
11.006	-	-	100	0.000	0.000	0.000
14.000	As Zoned	Default	100	0.204	0.204	0.204
		Grass	0	0.075	0.000	0.203
15.000	As Zoned	Default	100	0.130	0.130	0.130
		Grass	0	0.104	0.000	0.131
11.007	As Zoned	Default	100	0.049	0.049	0.049
	As Zoned	Default	100	0.153	0.153	0.202
		Grass	0	0.057	0.000	0.202
11.008	As Zoned	Default	100	0.058	0.058	0.058
		Grass	0	0.026	0.000	0.058
11.009	As Zoned	Default	100	0.030	0.030	0.030
16.000	As Zoned	Default	100	0.159	0.159	0.159
		Grass	0	0.055	0.000	0.158
11.010	As Zoned	Default	100	0.070	0.070	0.070
		Grass	0	0.026	0.000	0.070
11.011	As Zoned	Default	100	0.134	0.134	0.134
		Grass	0	0.046	0.000	0.133
11.012	-	-	100	0.000	0.000	0.000
17.000	-	-	100	0.037	0.037	0.037
11.013	-	-	100	0.048	0.048	0.048

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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)
11.014	-	-	100	0.000	0.000	0.000
18.000	-	-	100	0.158	0.158	0.158
18.001	-	-	100	0.051	0.051	0.051
19.000	-	-	100	0.119	0.119	0.119
19.001	-	-	100	0.061	0.061	0.061
18.002	-	-	100	0.018	0.018	0.018
18.003	-	-	100	0.027	0.027	0.027
20.000	-	-	100	0.212	0.212	0.212
18.004	-	-	100	0.019	0.019	0.019
18.005	-	-	100	0.105	0.105	0.105
18.006	-	-	100	0.081	0.081	0.081
18.007	-	-	100	0.021	0.021	0.021
11.015	-	-	100	0.045	0.045	0.045
11.016	-	-	100	0.068	0.068	0.068
21.000	-	-	100	0.000	0.000	0.000
11.017	-	-	100	0.000	0.000	0.000
11.018	-	-	100	0.000	0.000	0.000
11.019	-	-	100	0.000	0.000	0.000
22.000	-	-	100	0.092	0.092	0.092
23.000	-	-	100	0.096	0.096	0.096
23.001	-	-	100	0.053	0.053	0.053
23.002	-	-	100	0.161	0.161	0.161
22.001	-	-	100	0.147	0.147	0.147
22.002	-	-	100	0.030	0.030	0.030
24.000	-	-	100	0.112	0.112	0.112
22.003	-	-	100	0.017	0.017	0.017
25.000	-	-	100	0.199	0.199	0.199
22.004	-	-	100	0.029	0.029	0.029

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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)
26.000	-	-	100	0.068	0.068	0.068
26.001	-	-	100	0.080	0.080	0.080
26.002	-	-	100	0.011	0.011	0.011
22.005	-	-	100	0.010	0.010	0.010
22.006	-	-	100	0.066	0.066	0.066
22.007	-	-	100	0.160	0.160	0.160
22.008	As Zoned	Default	100	0.082	0.082	0.082
		Grass	0	0.032	0.000	0.081
22.009	As Zoned	Default	100	0.043	0.043	0.043
		Grass	0	0.007	0.000	0.043
27.000	-	-	100	0.097	0.097	0.097
27.001	-	-	100	0.062	0.062	0.062
28.000	-	-	100	0.000	0.000	0.000
28.001	-	-	100	0.000	0.000	0.000
28.002	-	-	100	0.038	0.038	0.038
27.002	-	-	100	0.000	0.000	0.000
27.003	As Zoned	Default	100	0.058	0.058	0.058
		Grass	0	0.018	0.000	0.058
27.004	As Zoned	Default	100	0.195	0.195	0.195
		Grass	0	0.064	0.000	0.194
22.010	As Zoned	Default	100	0.165	0.165	0.165
		Grass	0	0.045	0.000	0.166
22.011	-	-	100	0.233	0.233	0.233
29.000	-	-	100	0.250	0.250	0.250
29.001	-	-	100	0.003	0.003	0.003
22.012	-	-	100	0.172	0.172	0.172
22.013	-	-	100	0.097	0.097	0.097
22.014	-	-	100	0.026	0.026	0.026

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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)
				Total 11.800	Total 11.104	Total 11.104

Free Flowing 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)
S1.019	S94	117.117	116.217	0.000	1500	0

Free Flowing 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)
S11.019	SO/F 1	106.935	106.335	0.000	1200	0

Free Flowing 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)
S22.014	S76	120.152	117.375	0.000	0	0

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Simulation Criteria for Storm Network

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	4.000	Output Interval (mins)	1

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 4	Number of Storage Structures 4	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.700	Cv (Summer)	0.750
Return Period (years)	5	Ratio R	0.264	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	15

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Online Controls for Storm Network

Depth/Flow Relationship Manhole: S43, DS/PN: S1.017, Volume (m³): 30.0

Invert Level (m) 120.700

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)	Depth (m)	Flow (l/s)
0.100	160.3600	0.600	392.7900	1.100	531.8400	1.600	641.4300	2.100	34.8500	2.600	817.6600
0.200	226.7800	0.700	424.2600	1.200	555.4900	1.700	661.1700	2.200	752.1400	2.700	833.2400
0.300	277.7500	0.800	453.5600	1.300	578.1700	1.800	680.3400	2.300	769.0400	2.800	848.5300
0.400	320.7100	0.900	481.0700	1.400	6000.0000	1.900	698.9800	2.400	785.5800	2.900	863.5500
0.500	358.5700	1.000	507.0900	1.500	621.0600	2.000	717.1400	2.500	801.7800	3.000	878.3100

Hydro-Brake® Optimum Manhole: S13, DS/PN: S11.006, Volume (m³): 7.9

Unit Reference	MD-CHE-0241-3500-1000-3500	Sump Available	No
Design Head (m)	1.000	Diameter (mm)	241
Design Flow (l/s)	35.0	Invert Level (m)	119.164
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	300
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	35.0	Kick-Flo®	0.515	25.7
Flush-Flo™	0.395	34.9	Mean Flow over Head Range	-	25.6

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

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Hydro-Brake® Optimum Manhole: S13, DS/PN: S11.006, Volume (m³): 7.9

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)	Depth (m)	Flow (l/s)
0.100	6.5	0.600	27.2	1.600	44.1	2.600	55.9	5.000	77.1	7.500	94.1
0.200	19.9	0.800	31.4	1.800	46.7	3.000	60.0	5.500	80.8	8.000	97.2
0.300	29.9	1.000	35.0	2.000	49.2	3.500	64.7	6.000	84.4	8.500	100.1
0.400	34.9	1.200	38.3	2.200	51.5	4.000	69.1	6.500	87.8	9.000	103.0
0.500	25.8	1.400	41.3	2.400	53.8	4.500	73.2	7.000	91.0	9.500	105.7

Hydro-Brake® Manhole: S34A, DS/PN: S11.017, Volume (m³): 13.3

Design Head (m) 1.850 Design Flow (l/s) 250.0 Hydro-Brake® Type Md14 Diameter (mm) 368 Invert Level (m) 108.500

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)	Depth (m)	Flow (l/s)
0.100	8.2	0.600	147.2	1.600	232.4	2.600	296.3	5.000	410.9	7.500	503.2
0.200	31.1	0.800	166.6	1.800	246.5	3.000	318.2	5.500	430.9	8.000	519.7
0.300	62.8	1.000	183.9	2.000	259.8	3.500	343.7	6.000	450.1	8.500	535.7
0.400	96.7	1.200	201.3	2.200	272.5	4.000	367.5	6.500	468.4	9.000	551.2
0.500	126.6	1.400	217.4	2.400	284.6	4.500	389.8	7.000	486.1	9.500	566.3

Hydro-Brake® Manhole: S72A, DS/PN: S22.014, Volume (m³): 14.7

Design Head (m) 1.500 Hydro-Brake® Type Md5 SW Only Invert Level (m) 117.525
Design Flow (l/s) 300.0 Diameter (mm) 566

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)	Depth (m)	Flow (l/s)
0.100	20.0	0.400	150.0	0.800	277.3	1.400	300.9	2.000	301.1	2.600	320.7
0.200	57.8	0.500	193.9	1.000	297.5	1.600	298.6	2.200	306.1	3.000	338.7
0.300	103.2	0.600	231.4	1.200	302.6	1.800	298.5	2.400	312.8	3.500	362.6

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Hydro-Brake® Manhole: S72A, DS/PN: S22.014, Volume (m³): 14.7

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)	Depth (m)	Flow (l/s)
4.000	386.3	5.000	431.2	6.000	472.3	7.000	510.1	8.000	545.3	9.000	578.4
4.500	409.3	5.500	452.2	6.500	491.6	7.500	528.0	8.500	562.1	9.500	594.3

Pre-initialised control selected, excessive flows may result.

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Storage Structures for Storm Network

Tank or Pond Manhole: S43, DS/PN: S1.017

Invert Level (m) 120.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	800.0	0.200	800.0	0.400	800.0	0.600	800.0	0.800	800.0	1.000	800.0
0.100	800.0	0.300	800.0	0.500	800.0	0.700	800.0	0.900	800.0	1.100	0.0

Tank or Pond Manhole: S13, DS/PN: S11.006

Invert Level (m) 119.164

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	0.200	600.0	0.400	600.0	0.600	600.0	0.800	600.0	1.000	600.0
0.100	600.0	0.300	600.0	0.500	600.0	0.700	600.0	0.900	600.0	1.001	0.0

Tank or Pond Manhole: SAHPR TANK, DS/PN: S21.000

Invert Level (m) 108.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	162.8	2.300	162.8	2.301	0.0

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Tank or Pond Manhole: S72A, DS/PN: S22.014

Invert Level (m) 117.525

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	410.0	0.200	410.0	0.400	410.0	0.600	410.0	0.800	410.0	1.000	410.0
0.100	410.0	0.300	410.0	0.500	410.0	0.700	410.0	0.900	410.0	1.100	0.0

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	4.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	4	Number of Storage Structures	4	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR M5-60 (mm)	18.700	Cv (Summer)	0.750
Region	Scotland and Ireland	Ratio R	0.264	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	5, 30, 100
Climate Change (%)	10, 10, 10

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S1	15 minute 5 year Winter I+10%	135.238	133.959	-0.079	0.000	0.74		56.5	OK
S2.000	S2	15 minute 5 year Winter I+10%	140.458	138.272	-0.111	0.000	0.51		40.7	OK
S2.001	S3	15 minute 5 year Winter I+10%	138.044	136.669	-0.148	0.000	0.50		85.2	OK
S2.002	S4	15 minute 5 year Winter I+10%	135.897	134.334	-0.212	0.000	0.39		109.0	OK
S2.003	S5	15 minute 5 year Winter I+10%	134.751	133.291	-0.056	0.000	1.00		107.2	OK
S3.000	S6	15 minute 5 year Winter I+10%	136.963	135.635	-0.128	0.000	0.39		30.4	OK
S3.001	S7	15 minute 5 year Winter I+10%	135.961	134.373	-0.204	0.000	0.22		34.5	OK
S3.002	S8	15 minute 5 year Winter I+10%	135.497	133.997	-0.193	0.000	0.27		46.5	OK
S2.004	S9	15 minute 5 year Winter I+10%	134.519	132.931	-0.241	0.000	0.44		181.2	OK
S2.005	S10	15 minute 5 year Winter I+10%	133.607	132.076	-0.184	0.000	0.65		182.0	OK
S1.001	S11	15 minute 5 year Winter I+10%	133.348	131.309	-0.201	0.000	0.58		247.8	OK
S4.000	S12	15 minute 5 year Winter I+10%	131.476	130.170	-0.049	0.000	0.96		34.9	OK
S4.001	S13	15 minute 5 year Winter I+10%	131.401	129.873	-0.224	0.000	0.34		57.7	OK
S1.002	S14	15 minute 5 year Winter I+10%	131.591	129.725	-0.137	0.000	0.89		321.6	OK
S5.000	S15	15 minute 5 year Winter I+10%	134.306	133.032	-0.089	0.000	0.67		44.9	OK
S5.001	S16	15 minute 5 year Winter I+10%	133.620	132.344	-0.158	0.000	0.45		77.8	OK
S1.003	S17	15 minute 5 year Winter I+10%	132.468	128.762	-0.192	0.000	0.72		427.5	OK
S1.004	S19	15 minute 5 year Winter I+10%	129.480	127.480	-0.199	0.000	0.84		429.4	OK
S1.005	S20	15 minute 5 year Winter I+10%	129.480	127.290	-0.226	0.000	0.77		434.2	OK
S1.006	S21	15 minute 5 year Winter I+10%	129.082	127.101	-0.216	0.000	0.80		437.4	OK
S6.000	S22	15 minute 5 year Winter I+10%	131.538	129.410	-0.119	0.000	0.45		45.4	OK
S1.007	S23	15 minute 5 year Winter I+10%	128.626	126.936	-0.194	0.000	0.85		463.5	OK
S1.008	S24	15 minute 5 year Winter I+10%	128.148	126.292	-0.253	0.000	0.71		468.2	OK
S1.009	S25	15 minute 5 year Winter I+10%	127.473	124.872	-0.381	0.000	0.40		473.7	OK
S1.010	S26	15 minute 5 year Winter I+10%	126.080	124.500	0.135	0.000	1.30		471.9	SURCHARGED
S1.011	S27	15 minute 5 year Winter I+10%	125.608	124.304	0.049	0.000	1.22		479.0	SURCHARGED

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S7.000	S29	15 minute 5 year Summer I+10%	138.207	136.647	-0.128	0.000	0.39		26.9	OK
S7.001	S30	15 minute 5 year Winter I+10%	137.950	136.155	-0.070	0.000	0.80		48.9	OK
S7.002	S31	15 minute 5 year Winter I+10%	137.600	135.877	0.152	0.000	1.05		82.4	SURCHARGED
S7.003	S32	15 minute 5 year Winter I+10%	135.980	134.007	-0.297	0.000	0.25		110.5	OK
S7.004	S33	15 minute 5 year Winter I+10%	134.487	131.641	-0.279	0.000	0.31		125.1	OK
S7.005	S34	15 minute 5 year Winter I+10%	132.472	129.931	-0.254	0.000	0.39		138.2	OK
S8.000	S35	15 minute 5 year Winter I+10%	131.624	130.298	-0.126	0.000	0.41		29.7	OK
S7.006	S36	15 minute 5 year Winter I+10%	130.995	127.859	-0.234	0.000	0.46		191.3	OK
S7.007	S37	15 minute 5 year Winter I+10%	128.556	124.990	-0.219	0.000	0.52		218.6	OK
S1.012	S37	15 minute 5 year Winter I+10%	125.540	123.205	-0.286	0.000	0.62		668.2	OK
S1.013	S37A	15 minute 5 year Winter I+10%	124.150	122.520	0.095	0.000	1.36		665.9	SURCHARGED
S1.014	S41	15 minute 5 year Winter I+10%	123.600	122.229	-0.046	0.000	0.65		664.6	OK
S9.000	S40	15 minute 5 year Winter I+10%	126.250	124.625	-0.100	0.000	0.57		21.4	OK
S9.001	S40A	15 minute 5 year Winter I+10%	126.000	124.309	-0.166	0.000	0.15		21.5	OK
S9.002	S41	15 minute 5 year Winter I+10%	124.570	122.549	0.014	0.000	1.08		37.3	SURCHARGED
S1.015	S42A	15 minute 5 year Winter I+10%	123.398	121.947	0.322	0.000	1.46		681.6	SURCHARGED
S1.016	S42	15 minute 5 year Winter I+10%	123.445	121.654	0.054	0.000	1.25		670.1	SURCHARGED
S1.017	S43	30 minute 5 year Winter I+10%	123.140	121.070	-0.230	0.000	0.39		307.9	OK
S10.000	S44	15 minute 5 year Winter I+10%	122.722	121.295	-0.111	0.000	0.50		36.4	OK
S1.018	S45	30 minute 5 year Winter I+10%	122.170	120.311	-0.159	0.000	0.74		315.5	OK
S1.019	S79	30 minute 5 year Winter I+10%	120.141	116.822	0.003	0.000	1.33		315.6	SURCHARGED
S11.000	S1	15 minute 5 year Winter I+10%	126.377	124.943	-0.159	0.000	0.19		13.7	OK
S11.001	S2	15 minute 5 year Winter I+10%	125.865	124.486	-0.066	0.000	0.82		59.5	OK
S11.002	S3	15 minute 5 year Winter I+10%	124.175	122.915	-0.119	0.000	0.67		92.0	OK
S12.000	S4	15 minute 5 year Winter I+10%	124.304	122.940	-0.089	0.000	0.67		46.3	OK
S11.003	S5	15 minute 5 year Winter I+10%	123.146	121.492	0.245	0.000	1.12		141.8	SURCHARGED

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S11.004	S6	15 minute 5 year Winter I+10%	122.344	120.835	0.099	0.000	1.16		148.7	SURCHARGED
S11.005	S7	15 minute 5 year Winter I+10%	121.817	119.899	0.129	0.000	1.26		151.9	SURCHARGED
S13.000	S9	15 minute 5 year Winter I+10%	123.176	121.796	-0.105	0.000	0.56		34.0	OK
S13.001	S9	15 minute 5 year Winter I+10%	123.651	121.206	-0.095	0.000	0.62		47.5	OK
S13.002	S10	15 minute 5 year Winter I+10%	121.416	120.167	-0.049	0.000	0.84		52.7	OK
S13.003	S11	15 minute 5 year Winter I+10%	121.218	120.030	0.012	0.000	1.03		60.8	SURCHARGED
S13.004	S12	15 minute 5 year Winter I+10%	120.950	119.571	-0.179	0.000	0.53		73.2	OK
S11.006	S13	180 minute 5 year Winter I+10%	121.436	119.478	-0.061	0.000	0.16		31.0	OK
S14.000	S14	15 minute 5 year Winter I+10%	123.018	120.248	-0.109	0.000	0.52		45.5	OK
S15.000	S15A	15 minute 5 year Winter I+10%	120.275	118.993	-0.082	0.000	0.72		28.9	OK
S11.007	S15	15 minute 5 year Winter I+10%	120.038	118.585	-0.247	0.000	0.41		111.2	OK
S11.008	S16	15 minute 5 year Winter I+10%	119.517	118.153	-0.224	0.000	0.51		121.5	OK
S11.009	S17	15 minute 5 year Winter I+10%	119.395	116.808	-0.234	0.000	0.47		126.2	OK
S16.000	S18	15 minute 5 year Winter I+10%	121.948	119.298	-0.129	0.000	0.38		35.4	OK
S11.010	S19	15 minute 5 year Winter I+10%	119.311	116.599	-0.214	0.000	0.54		170.8	OK
S11.011	S20	15 minute 5 year Winter I+10%	117.776	114.603	-0.228	0.000	0.49		193.4	OK
S11.012	S21A	15 minute 5 year Winter I+10%	115.881	113.777	-0.033	0.000	0.82		191.1	OK
S17.000	S21B	15 minute 5 year Winter I+10%	114.900	113.677	0.052	0.000	0.16		6.6	SURCHARGED
S11.013	S21	15 minute 5 year Winter I+10%	115.398	113.659	0.019	0.000	1.16		207.3	SURCHARGED
S11.014	S21C	15 minute 5 year Winter I+10%	114.846	113.318	-0.222	0.000	0.50		208.4	OK
S18.000	S22	15 minute 5 year Winter I+10%	119.471	117.328	-0.110	0.000	0.51		35.0	OK
S18.001	S23	15 minute 5 year Winter I+10%	117.484	116.311	-0.189	0.000	0.29		43.8	OK
S19.000	S24	15 minute 5 year Winter I+10%	119.791	117.648	-0.142	0.000	0.29		26.6	OK
S19.001	S25	15 minute 5 year Winter I+10%	117.922	116.612	-0.128	0.000	0.39		37.6	OK
S18.002	S26	15 minute 5 year Winter I+10%	117.056	115.869	-0.141	0.000	0.54		84.0	OK
S18.003	S27	15 minute 5 year Winter I+10%	116.755	115.522	-0.108	0.000	0.73		88.8	OK

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S20.000	S28	15 minute 5 year Winter I+10%	118.056	116.690	-0.091	0.000	0.64		45.7	OK
S18.004	S29	15 minute 5 year Winter I+10%	116.641	115.345	0.011	0.000	1.03		134.6	SURCHARGED
S18.005	S30	15 minute 5 year Winter I+10%	116.237	114.951	-0.161	0.000	0.60		151.5	OK
S18.006	S31	15 minute 5 year Winter I+10%	115.678	114.377	-0.176	0.000	0.54		165.8	OK
S18.007	S32	15 minute 5 year Winter I+10%	114.929	113.263	-0.216	0.000	0.53		169.7	OK
S11.015	S33	15 minute 5 year Winter I+10%	114.353	112.820	-0.183	0.000	0.66		385.6	OK
S11.016	S34	15 minute 5 year Winter I+10%	113.050	111.449	-0.204	0.000	0.58		395.0	OK
S21.000	SAHPR TANK	30 minute 5 year Winter I+10%	112.080	109.166	0.116	0.000	0.25		43.6	SURCHARGED
S11.017	S34A	30 minute 5 year Winter I+10%	110.780	109.311	0.361	0.000	0.42		157.2	SURCHARGED
S11.018	S35	30 minute 5 year Winter I+10%	109.957	108.265	-0.092	0.000	0.78		156.5	OK
S11.019	S36	15 minute 5 year Summer I+10%	107.980	107.081	0.140	0.000	1.20		158.2	SURCHARGED
S22.000	S49	15 minute 5 year Winter I+10%	126.597	125.289	-0.108	0.000	0.53		20.2	OK
S23.000	S46	15 minute 5 year Summer I+10%	128.947	127.267	-0.121	0.000	0.44		21.5	OK
S23.001	S47	15 minute 5 year Winter I+10%	128.530	127.077	-0.103	0.000	0.56		30.8	OK
S23.002	S48	15 minute 5 year Winter I+10%	128.337	126.965	-0.065	0.000	0.85		59.4	OK
S22.001	S50	15 minute 5 year Winter I+10%	127.239	125.213	0.014	0.000	1.02		98.8	SURCHARGED
S22.002	S51	15 minute 5 year Winter I+10%	126.079	124.627	-0.122	0.000	0.66		103.1	OK
S24.000	S52	15 minute 5 year Winter I+10%	124.828	123.536	-0.092	0.000	0.63		23.8	OK
S22.003	S53	15 minute 5 year Winter I+10%	125.488	123.307	-0.071	0.000	0.94		127.1	OK
S25.000	S54	15 minute 5 year Summer I+10%	125.500	124.130	-0.119	0.000	0.45		44.6	OK
S22.004	S55	15 minute 5 year Winter I+10%	124.780	122.906	-0.160	0.000	0.62		171.2	OK
S26.000	S56	15 minute 5 year Winter I+10%	124.404	123.056	-0.148	0.000	0.26		15.2	OK
S26.001	S57	15 minute 5 year Winter I+10%	123.944	122.537	-0.204	0.000	0.22		28.9	OK
S26.002	S58	15 minute 5 year Winter I+10%	123.469	121.917	-0.161	0.000	0.28		30.4	OK
S22.005	S59	15 minute 5 year Winter I+10%	123.581	121.899	-0.117	0.000	0.90		202.0	OK
S22.006	S60	15 minute 5 year Winter I+10%	123.340	121.645	-0.211	0.000	0.54		212.3	OK

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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S22.007	S61	15 minute 5 year Winter I+10%	122.997	121.265	-0.111	0.000	0.97		240.3	OK
S22.008	S61	15 minute 5 year Winter I+10%	122.839	121.056	-0.240	0.000	0.57		254.1	OK
S22.009	S62	15 minute 5 year Winter I+10%	122.124	120.076	-0.117	0.000	0.85		259.6	OK
S27.000	S63	15 minute 5 year Winter I+10%	129.214	127.244	-0.154	0.000	0.22		21.7	OK
S27.001	S64	15 minute 5 year Winter I+10%	127.140	125.853	-0.134	0.000	0.35		32.7	OK
S28.000	S54B	15 minute 5 year Summer I+10%	128.020	126.330	-0.225	0.000	0.00		0.0	OK
S28.001	S59	15 minute 5 year Summer I+10%	126.160	124.479	-0.225	0.000	0.00		0.0	OK
S28.002	S60	15 minute 5 year Winter I+10%	125.814	124.426	-0.179	0.000	0.09		6.7	OK
S27.002	S58	15 minute 5 year Winter I+10%	126.639	124.090	0.021	0.000	1.20		39.2	SURCHARGED
S27.003	S65	15 minute 5 year Winter I+10%	126.072	123.970	-0.037	0.000	1.00		49.1	OK
S27.004	S66	15 minute 5 year Winter I+10%	125.593	122.575	0.738	0.000	1.53		76.6	SURCHARGED
S22.010	S68	15 minute 5 year Winter I+10%	122.637	120.037	-0.097	0.000	0.90		348.5	OK
S22.011	S67	15 minute 5 year Winter I+10%	120.691	119.888	-0.014	0.000	1.00		347.1	OK
S29.000	S68	15 minute 5 year Winter I+10%	124.490	122.128	-0.114	0.000	0.49		55.9	OK
S29.001	S69	15 minute 5 year Winter I+10%	121.020	119.721	-0.096	0.000	0.62		56.3	OK
S22.012	S71	15 minute 5 year Winter I+10%	120.650	119.240	-0.190	0.000	0.79		405.6	OK
S22.013	S72	15 minute 5 year Winter I+10%	120.371	118.845	-0.324	0.000	0.43		421.7	OK
S22.014	S72A	60 minute 5 year Winter I+10%	120.256	118.052	-0.073	0.000	0.53		204.6	OK

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	4.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	4	Number of Storage Structures	4	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR M5-60 (mm)	18.700	Cv (Summer)	0.750
Region	Scotland and Ireland	Ratio R	0.264	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	5, 30, 100
Climate Change (%)	10, 10, 10

US/MH PN	Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S1	15 minute 30 year Winter I+10%	135.238	134.087	0.049	0.000	1.01		77.0	SURCHARGED
S2.000	S2	15 minute 30 year Winter I+10%	140.458	138.305	-0.078	0.000	0.75		60.2	OK
S2.001	S3	15 minute 30 year Winter I+10%	138.044	136.732	-0.085	0.000	0.82		139.6	OK
S2.002	S4	15 minute 30 year Winter I+10%	135.897	134.397	-0.149	0.000	0.66		183.6	OK
S2.003	S5	15 minute 30 year Winter I+10%	134.751	133.416	0.069	0.000	1.75		187.4	SURCHARGED
S3.000	S6	15 minute 30 year Winter I+10%	136.963	135.660	-0.103	0.000	0.57		44.7	OK
S3.001	S7	15 minute 30 year Winter I+10%	135.961	134.397	-0.180	0.000	0.33		52.1	OK
S3.002	S8	15 minute 30 year Winter I+10%	135.497	134.030	-0.160	0.000	0.44		74.8	OK
S2.004	S9	15 minute 30 year Winter I+10%	134.519	133.019	-0.153	0.000	0.76		309.8	OK
S2.005	S10	15 minute 30 year Winter I+10%	133.607	132.300	0.040	0.000	1.08		305.7	SURCHARGED
S1.001	S11	15 minute 30 year Winter I+10%	133.348	131.413	-0.097	0.000	0.95		405.2	OK
S4.000	S12	15 minute 30 year Winter I+10%	131.476	130.359	0.140	0.000	1.32		47.8	SURCHARGED
S4.001	S13	15 minute 30 year Winter I+10%	131.401	130.214	0.117	0.000	0.44		75.6	SURCHARGED
S1.002	S14	15 minute 30 year Winter I+10%	131.591	130.084	0.222	0.000	1.38		499.7	SURCHARGED
S5.000	S15	15 minute 30 year Winter I+10%	134.306	133.076	-0.045	0.000	0.99		66.4	OK
S5.001	S16	15 minute 30 year Winter I+10%	133.620	132.397	-0.105	0.000	0.74		128.4	OK
S1.003	S17	15 minute 30 year Winter I+10%	132.468	129.374	0.420	0.000	1.06		634.6	SURCHARGED
S1.004	S19	15 minute 30 year Winter I+10%	129.480	127.948	0.269	0.000	1.24		633.0	SURCHARGED
S1.005	S20	15 minute 30 year Winter I+10%	129.480	127.701	0.185	0.000	1.13		636.6	SURCHARGED
S1.006	S21	15 minute 30 year Winter I+10%	129.082	127.447	0.130	0.000	1.16		636.5	SURCHARGED
S6.000	S22	15 minute 30 year Winter I+10%	131.538	129.439	-0.090	0.000	0.67		67.1	OK
S1.007	S23	15 minute 30 year Winter I+10%	128.626	127.195	0.065	0.000	1.24		672.2	SURCHARGED
S1.008	S24	15 minute 30 year Winter I+10%	128.148	126.545	0.000	0.000	1.03		673.5	OK
S1.009	S25	15 minute 30 year Winter I+10%	127.473	125.154	-0.099	0.000	0.57		677.0	OK
S1.010	S26	15 minute 30 year Winter I+10%	126.080	124.871	0.506	0.000	1.90		688.5	SURCHARGED
S1.011	S27	15 minute 30 year Winter I+10%	125.608	124.462	0.207	0.000	1.76		692.2	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S7.000	S29	15 minute 30 year Winter I+10%	138.207	137.078	0.303	0.000	0.54		37.4	SURCHARGED
S7.001	S30	15 minute 30 year Winter I+10%	137.950	137.009	0.784	0.000	0.85		52.2	SURCHARGED
S7.002	S31	15 minute 30 year Winter I+10%	137.600	136.712	0.987	0.000	1.30		101.7	SURCHARGED
S7.003	S32	15 minute 30 year Winter I+10%	135.980	134.037	-0.267	0.000	0.34		148.7	OK
S7.004	S33	15 minute 30 year Winter I+10%	134.487	131.680	-0.240	0.000	0.43		175.5	OK
S7.005	S34	15 minute 30 year Winter I+10%	132.472	129.982	-0.203	0.000	0.57		199.3	OK
S8.000	S35	15 minute 30 year Winter I+10%	131.624	130.325	-0.099	0.000	0.60		43.9	OK
S7.006	S36	15 minute 30 year Winter I+10%	130.995	127.924	-0.169	0.000	0.70		288.8	OK
S7.007	S37	15 minute 30 year Winter I+10%	128.556	125.067	-0.142	0.000	0.80		337.1	OK
S1.012	S37	30 minute 30 year Winter I+10%	125.540	124.070	0.579	0.000	0.83		892.2	SURCHARGED
S1.013	S37A	30 minute 30 year Winter I+10%	124.150	123.400	0.975	0.000	1.81		890.5	SURCHARGED
S1.014	S41	30 minute 30 year Winter I+10%	123.600	122.904	0.629	0.000	0.88		895.9	SURCHARGED
S9.000	S40	15 minute 30 year Winter I+10%	126.250	124.664	-0.061	0.000	0.84		31.6	OK
S9.001	S40A	15 minute 30 year Winter I+10%	126.000	124.323	-0.152	0.000	0.23		31.8	OK
S9.002	S41	15 minute 30 year Winter I+10%	124.570	122.771	0.236	0.000	1.77		61.0	SURCHARGED
S1.015	S42A	30 minute 30 year Winter I+10%	123.398	122.403	0.778	0.000	1.99		927.3	SURCHARGED
S1.016	S42	30 minute 30 year Winter I+10%	123.445	121.866	0.266	0.000	1.72		921.5	SURCHARGED
S1.017	S43	30 minute 30 year Winter I+10%	123.140	121.312	0.012	0.000	0.50		396.5	SURCHARGED
S10.000	S44	15 minute 30 year Winter I+10%	122.722	121.327	-0.079	0.000	0.74		53.8	OK
S1.018	S45	60 minute 30 year Winter I+10%	122.170	120.370	-0.100	0.000	0.96		408.1	OK
S1.019	S79	60 minute 30 year Winter I+10%	120.141	116.953	0.133	0.000	1.72		408.1	SURCHARGED
S11.000	S1	15 minute 30 year Winter I+10%	126.377	125.047	-0.055	0.000	0.27		19.9	OK
S11.001	S2	15 minute 30 year Winter I+10%	125.865	125.012	0.460	0.000	1.10		79.4	SURCHARGED
S11.002	S3	15 minute 30 year Winter I+10%	124.175	123.176	0.142	0.000	0.93		127.1	SURCHARGED
S12.000	S4	15 minute 30 year Winter I+10%	124.304	123.056	0.027	0.000	0.92		63.5	SURCHARGED
S11.003	S5	15 minute 30 year Winter I+10%	123.146	122.290	1.043	0.000	1.49		189.0	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S11.004	S6	15 minute 30 year Winter I+10%	122.344	121.154	0.418	0.000	1.53		196.7	SURCHARGED
S11.005	S7	15 minute 30 year Winter I+10%	121.817	120.181	0.411	0.000	1.68		202.3	SURCHARGED
S13.000	S9	15 minute 30 year Winter I+10%	123.176	121.833	-0.068	0.000	0.82		50.2	OK
S13.001	S9	15 minute 30 year Winter I+10%	123.651	121.459	0.158	0.000	0.87		67.1	SURCHARGED
S13.002	S10	15 minute 30 year Winter I+10%	121.416	120.633	0.417	0.000	1.21		75.6	SURCHARGED
S13.003	S11	15 minute 30 year Winter I+10%	121.218	120.348	0.330	0.000	1.49		88.1	SURCHARGED
S13.004	S12	180 minute 30 year Winter I+10%	120.950	119.649	-0.101	0.000	0.25		34.8	OK
S11.006	S13	180 minute 30 year Winter I+10%	121.436	119.642	0.103	0.000	0.18		34.9	SURCHARGED
S14.000	S14	15 minute 30 year Winter I+10%	123.018	120.281	-0.076	0.000	0.77		67.1	OK
S15.000	S15A	15 minute 30 year Winter I+10%	120.275	119.087	0.012	0.000	1.02		40.7	SURCHARGED
S11.007	S15	15 minute 30 year Winter I+10%	120.038	118.651	-0.181	0.000	0.65		173.5	OK
S11.008	S16	15 minute 30 year Winter I+10%	119.517	118.236	-0.141	0.000	0.80		193.1	OK
S11.009	S17	15 minute 30 year Winter I+10%	119.395	116.886	-0.156	0.000	0.75		202.3	OK
S16.000	S18	15 minute 30 year Winter I+10%	121.948	119.323	-0.104	0.000	0.56		52.3	OK
S11.010	S19	15 minute 30 year Winter I+10%	119.311	116.690	-0.123	0.000	0.86		272.9	OK
S11.011	S20	15 minute 30 year Winter I+10%	117.776	114.690	-0.141	0.000	0.80		312.4	OK
S11.012	S21A	15 minute 30 year Winter I+10%	115.881	114.176	0.366	0.000	1.32		307.3	SURCHARGED
S17.000	S21B	15 minute 30 year Winter I+10%	114.900	113.898	0.273	0.000	0.24		10.0	SURCHARGED
S11.013	S21	15 minute 30 year Winter I+10%	115.398	113.873	0.233	0.000	1.85		328.9	SURCHARGED
S11.014	S21C	15 minute 30 year Winter I+10%	114.846	113.399	-0.141	0.000	0.80		331.4	OK
S18.000	S22	15 minute 30 year Winter I+10%	119.471	117.361	-0.077	0.000	0.75		51.7	OK
S18.001	S23	15 minute 30 year Winter I+10%	117.484	116.343	-0.157	0.000	0.46		68.2	OK
S19.000	S24	15 minute 30 year Winter I+10%	119.791	117.668	-0.122	0.000	0.43		39.4	OK
S19.001	S25	15 minute 30 year Summer I+10%	117.922	116.643	-0.097	0.000	0.62		59.8	OK
S18.002	S26	15 minute 30 year Winter I+10%	117.056	116.249	0.239	0.000	0.79		122.4	SURCHARGED
S18.003	S27	15 minute 30 year Winter I+10%	116.755	116.026	0.396	0.000	1.04		127.7	SURCHARGED

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S20.000	S28	15 minute 30 year Winter I+10%	118.056	116.817	0.036	0.000	0.87		62.6	SURCHARGED
S18.004	S29	15 minute 30 year Winter I+10%	116.641	115.699	0.365	0.000	1.49		195.2	SURCHARGED
S18.005	S30	15 minute 30 year Winter I+10%	116.237	115.014	-0.098	0.000	0.87		219.8	OK
S18.006	S31	15 minute 30 year Winter I+10%	115.678	114.434	-0.119	0.000	0.79		242.0	OK
S18.007	S32	15 minute 30 year Winter I+10%	114.929	113.329	-0.150	0.000	0.77		247.2	OK
S11.015	S33	15 minute 30 year Winter I+10%	114.353	112.935	-0.068	0.000	1.00		585.0	OK
S11.016	S34	15 minute 30 year Winter I+10%	113.050	111.533	-0.120	0.000	0.88		599.8	OK
S21.000	SAHPR TANK	30 minute 30 year Winter I+10%	112.080	109.681	0.631	0.000	0.38		66.7	SURCHARGED
S11.017	S34A	60 minute 30 year Winter I+10%	110.780	109.755	0.805	0.000	0.52		194.8	SURCHARGED
S11.018	S35	30 minute 30 year Winter I+10%	109.957	108.560	0.203	0.000	0.97		194.8	SURCHARGED
S11.019	S36	30 minute 30 year Winter I+10%	107.980	107.293	0.352	0.000	1.48		194.9	SURCHARGED
S22.000	S49	15 minute 30 year Winter I+10%	126.597	125.749	0.352	0.000	0.61		23.5	SURCHARGED
S23.000	S46	15 minute 30 year Winter I+10%	128.947	127.484	0.096	0.000	0.61		30.0	SURCHARGED
S23.001	S47	15 minute 30 year Winter I+10%	128.530	127.412	0.232	0.000	0.72		39.5	SURCHARGED
S23.002	S48	15 minute 30 year Winter I+10%	128.337	127.279	0.249	0.000	1.12		78.4	SURCHARGED
S22.001	S50	15 minute 30 year Winter I+10%	127.239	125.674	0.475	0.000	1.42		138.0	SURCHARGED
S22.002	S51	15 minute 30 year Winter I+10%	126.079	124.676	-0.073	0.000	0.92		144.7	OK
S24.000	S52	15 minute 30 year Winter I+10%	124.828	123.716	0.088	0.000	0.84		31.8	SURCHARGED
S22.003	S53	15 minute 30 year Winter I+10%	125.488	123.580	0.202	0.000	1.30		176.0	SURCHARGED
S25.000	S54	15 minute 30 year Summer I+10%	125.500	124.159	-0.090	0.000	0.67		65.9	OK
S22.004	S55	15 minute 30 year Winter I+10%	124.780	122.961	-0.105	0.000	0.86		235.8	OK
S26.000	S56	15 minute 30 year Winter I+10%	124.404	123.074	-0.130	0.000	0.38		22.4	OK
S26.001	S57	15 minute 30 year Winter I+10%	123.944	122.568	-0.173	0.000	0.37		48.3	OK
S26.002	S58	15 minute 30 year Winter I+10%	123.469	122.188	0.110	0.000	0.45		48.1	SURCHARGED
S22.005	S59	15 minute 30 year Winter I+10%	123.581	122.093	0.077	0.000	1.26		285.0	SURCHARGED
S22.006	S60	15 minute 30 year Winter I+10%	123.340	121.778	-0.078	0.000	0.78		303.7	OK

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PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S22.007	S61	15 minute 30 year Winter I+10%	122.997	121.480	0.104	0.000	1.38		342.1	SURCHARGED
S22.008	S61	15 minute 30 year Winter I+10%	122.839	121.136	-0.160	0.000	0.81		361.7	OK
S22.009	S62	15 minute 30 year Winter I+10%	122.124	120.590	0.397	0.000	1.20		366.4	SURCHARGED
S27.000	S63	15 minute 30 year Winter I+10%	129.214	127.260	-0.138	0.000	0.32		32.1	OK
S27.001	S64	15 minute 30 year Summer I+10%	127.140	125.883	-0.104	0.000	0.56		52.7	OK
S28.000	S54B	15 minute 30 year Summer I+10%	128.020	126.330	-0.225	0.000	0.00		0.0	OK
S28.001	S59	15 minute 30 year Winter I+10%	126.160	124.600	-0.104	0.000	0.05		1.8	OK
S28.002	S60	15 minute 30 year Winter I+10%	125.814	124.616	0.011	0.000	0.24		17.0	SURCHARGED
S27.002	S58	15 minute 30 year Winter I+10%	126.639	124.604	0.535	0.000	1.64		53.7	SURCHARGED
S27.003	S65	15 minute 30 year Winter I+10%	126.072	124.456	0.449	0.000	1.39		68.4	SURCHARGED
S27.004	S66	15 minute 30 year Winter I+10%	125.593	123.802	1.965	0.000	2.14		106.9	SURCHARGED
S22.010	S68	15 minute 30 year Winter I+10%	122.637	120.458	0.324	0.000	1.30		501.4	SURCHARGED
S22.011	S67	15 minute 30 year Winter I+10%	120.691	120.057	0.155	0.000	1.55		539.7	SURCHARGED
S29.000	S68	15 minute 30 year Winter I+10%	124.490	122.160	-0.082	0.000	0.73		82.6	OK
S29.001	S69	15 minute 30 year Summer I+10%	121.020	119.762	-0.055	0.000	0.92		83.5	OK
S22.012	S71	15 minute 30 year Winter I+10%	120.650	119.550	0.120	0.000	1.23		629.4	SURCHARGED
S22.013	S72	15 minute 30 year Winter I+10%	120.371	118.932	-0.237	0.000	0.66		650.9	OK
S22.014	S72A	60 minute 30 year Winter I+10%	120.256	118.310	0.185	0.000	0.71		275.1	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	4.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	4	Number of Storage Structures	4	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR M5-60 (mm)	18.700	Cv (Summer)	0.750
Region	Scotland and Ireland	Ratio R	0.264	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	5, 30, 100
Climate Change (%)	10, 10, 10

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status

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PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S1	15 minute 100 year Winter I+10%	135.238	134.502	0.464	0.000	1.11		84.6	SURCHARGED
S2.000	S2	15 minute 100 year Winter I+10%	140.458	138.349	-0.034	0.000	0.97		77.7	OK
S2.001	S3	15 minute 100 year Winter I+10%	138.044	136.920	0.103	0.000	1.02		173.1	SURCHARGED
S2.002	S4	15 minute 100 year Winter I+10%	135.897	134.432	-0.114	0.000	0.81		226.5	OK
S2.003	S5	15 minute 100 year Winter I+10%	134.751	133.469	0.122	0.000	2.14		230.0	SURCHARGED
S3.000	S6	15 minute 100 year Winter I+10%	136.963	135.683	-0.080	0.000	0.74		58.1	OK
S3.001	S7	15 minute 100 year Winter I+10%	135.961	134.416	-0.161	0.000	0.43		67.7	OK
S3.002	S8	15 minute 100 year Winter I+10%	135.497	134.054	-0.136	0.000	0.57		97.2	OK
S2.004	S9	15 minute 100 year Winter I+10%	134.519	133.240	0.068	0.000	0.92		378.8	SURCHARGED
S2.005	S10	15 minute 100 year Winter I+10%	133.607	132.457	0.197	0.000	1.36		382.8	SURCHARGED
S1.001	S11	15 minute 100 year Winter I+10%	133.348	132.004	0.494	0.000	1.12		474.9	SURCHARGED
S4.000	S12	15 minute 100 year Winter I+10%	131.476	130.894	0.675	0.000	1.43		51.7	SURCHARGED
S4.001	S13	15 minute 100 year Winter I+10%	131.401	130.804	0.707	0.000	0.59		101.0	SURCHARGED
S1.002	S14	15 minute 100 year Winter I+10%	131.591	130.673	0.811	0.000	1.56		562.9	SURCHARGED
S5.000	S15	15 minute 100 year Winter I+10%	134.306	133.320	0.199	0.000	1.15		76.8	SURCHARGED
S5.001	S16	15 minute 100 year Winter I+10%	133.620	132.426	-0.076	0.000	0.89		153.8	OK
S1.003	S17	15 minute 100 year Winter I+10%	132.468	130.108	1.154	0.000	1.21		723.2	SURCHARGED
S1.004	S19	15 minute 100 year Winter I+10%	129.480	128.256	0.577	0.000	1.40		719.2	SURCHARGED
S1.005	S20	15 minute 100 year Winter I+10%	129.480	127.936	0.420	0.000	1.28		723.2	SURCHARGED
S1.006	S21	15 minute 100 year Winter I+10%	129.082	127.609	0.292	0.000	1.32		726.1	SURCHARGED
S6.000	S22	15 minute 100 year Winter I+10%	131.538	129.467	-0.062	0.000	0.87		87.3	OK
S1.007	S23	15 minute 100 year Winter I+10%	128.626	127.285	0.155	0.000	1.41		769.0	SURCHARGED
S1.008	S24	30 minute 100 year Winter I+10%	128.148	126.681	0.136	0.000	1.13		743.1	SURCHARGED
S1.009	S25	30 minute 100 year Winter I+10%	127.473	126.346	1.093	0.000	0.62		746.8	SURCHARGED
S1.010	S26	30 minute 100 year Winter I+10%	126.080	126.000	1.635	0.000	2.13		772.2	FLOOD RISK
S1.011	S27	30 minute 100 year Winter I+10%	125.608	125.490	1.235	0.000	1.99		779.8	FLOOD RISK

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PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S7.000	S29	15 minute 100 year Winter I+10%	138.207	137.829	1.054	0.000	0.57		39.6	SURCHARGED
S7.001	S30	15 minute 100 year Winter I+10%	137.950	137.749	1.524	0.000	0.95		58.4	FLOOD RISK
S7.002	S31	15 minute 100 year Winter I+10%	137.600	137.368	1.643	0.000	1.47		114.7	FLOOD RISK
S7.003	S32	15 minute 100 year Winter I+10%	135.980	134.055	-0.249	0.000	0.40		175.7	OK
S7.004	S33	15 minute 100 year Winter I+10%	134.487	131.704	-0.216	0.000	0.52		210.5	OK
S7.005	S34	15 minute 100 year Winter I+10%	132.472	130.015	-0.170	0.000	0.69		241.4	OK
S8.000	S35	15 minute 100 year Winter I+10%	131.624	130.349	-0.075	0.000	0.78		57.1	OK
S7.006	S36	15 minute 100 year Winter I+10%	130.995	127.970	-0.123	0.000	0.86		357.6	OK
S7.007	S37	30 minute 100 year Winter I+10%	128.556	125.480	0.271	0.000	0.84		355.7	SURCHARGED
S1.012	S37	30 minute 100 year Winter I+10%	125.540	125.126	1.635	0.000	0.99		1070.1	SURCHARGED
S1.013	S37A	30 minute 100 year Winter I+10%	124.150	124.153	1.728	2.804	2.14		1052.2	FLOOD
S1.014	S41	30 minute 100 year Winter I+10%	123.600	123.478	1.203	0.000	1.03		1055.9	FLOOD RISK
S9.000	S40	15 minute 100 year Winter I+10%	126.250	124.775	0.050	0.000	1.08		40.3	SURCHARGED
S9.001	S40A	15 minute 100 year Winter I+10%	126.000	124.332	-0.143	0.000	0.29		40.3	OK
S9.002	S41	15 minute 100 year Winter I+10%	124.570	123.003	0.468	0.000	2.21		76.1	SURCHARGED
S1.015	S42A	30 minute 100 year Winter I+10%	123.398	122.793	1.168	0.000	2.35		1094.8	SURCHARGED
S1.016	S42	30 minute 100 year Winter I+10%	123.445	122.044	0.444	0.000	2.04		1090.3	SURCHARGED
S1.017	S43	60 minute 100 year Winter I+10%	123.140	121.561	0.261	0.000	0.56		449.9	SURCHARGED
S10.000	S44	15 minute 100 year Winter I+10%	122.722	121.363	-0.043	0.000	0.96		69.7	OK
S1.018	S45	60 minute 100 year Winter I+10%	122.170	120.727	0.257	0.000	1.09		464.0	SURCHARGED
S1.019	S79	60 minute 100 year Winter I+10%	120.141	117.001	0.182	0.000	1.96		464.0	SURCHARGED
S11.000	S1	15 minute 100 year Winter I+10%	126.377	125.692	0.590	0.000	0.29		20.9	SURCHARGED
S11.001	S2	15 minute 100 year Winter I+10%	125.865	125.659	1.107	0.000	1.16		83.6	FLOOD RISK
S11.002	S3	15 minute 100 year Winter I+10%	124.175	123.620	0.586	0.000	0.96		131.6	SURCHARGED
S12.000	S4	15 minute 100 year Winter I+10%	124.304	123.541	0.512	0.000	0.96		65.9	SURCHARGED
S11.003	S5	15 minute 100 year Winter I+10%	123.146	122.603	1.356	0.000	1.61		204.3	SURCHARGED

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S11.004	S6	15 minute 100 year Winter I+10%	122.344	121.274	0.538	0.000	1.65		211.7	SURCHARGED
S11.005	S7	15 minute 100 year Winter I+10%	121.817	120.285	0.515	0.000	1.81		217.8	SURCHARGED
S13.000	S9	15 minute 100 year Winter I+10%	123.176	122.240	0.339	0.000	0.88		54.0	SURCHARGED
S13.001	S9	15 minute 100 year Winter I+10%	123.651	121.867	0.566	0.000	0.96		73.6	SURCHARGED
S13.002	S10	15 minute 100 year Winter I+10%	121.416	120.857	0.641	0.000	1.34		83.7	SURCHARGED
S13.003	S11	15 minute 100 year Winter I+10%	121.218	120.511	0.493	0.000	1.68		99.3	SURCHARGED
S13.004	S12	120 minute 100 year Winter I+10%	120.950	119.845	0.095	0.000	0.42		57.8	SURCHARGED
S11.006	S13	240 minute 100 year Winter I+10%	121.436	119.825	0.286	0.000	0.18		34.9	SURCHARGED
S14.000	S14	15 minute 100 year Winter I+10%	123.018	120.329	-0.028	0.000	1.00		86.6	OK
S15.000	S15A	15 minute 100 year Winter I+10%	120.275	119.254	0.179	0.000	1.30		51.8	SURCHARGED
S11.007	S15	15 minute 100 year Winter I+10%	120.038	118.703	-0.129	0.000	0.84		224.6	OK
S11.008	S16	15 minute 100 year Winter I+10%	119.517	118.329	-0.048	0.000	1.00		240.3	OK
S11.009	S17	15 minute 100 year Winter I+10%	119.395	117.064	0.022	0.000	0.93		251.5	SURCHARGED
S16.000	S18	15 minute 100 year Winter I+10%	121.948	119.346	-0.081	0.000	0.73		68.0	OK
S11.010	S19	15 minute 100 year Winter I+10%	119.311	116.862	0.049	0.000	1.07		339.9	SURCHARGED
S11.011	S20	15 minute 100 year Winter I+10%	117.776	115.238	0.407	0.000	0.96		375.6	SURCHARGED
S11.012	S21A	15 minute 100 year Winter I+10%	115.881	114.789	0.979	0.000	1.54		357.4	SURCHARGED
S17.000	S21B	15 minute 100 year Winter I+10%	114.900	114.423	0.798	0.000	0.43		17.9	SURCHARGED
S11.013	S21	15 minute 100 year Winter I+10%	115.398	114.400	0.760	0.000	2.07		368.2	SURCHARGED
S11.014	S21C	15 minute 100 year Winter I+10%	114.846	114.008	0.468	0.000	0.88		362.2	SURCHARGED
S18.000	S22	15 minute 100 year Winter I+10%	119.471	117.460	0.022	0.000	0.95		65.0	SURCHARGED
S18.001	S23	15 minute 100 year Winter I+10%	117.484	116.832	0.332	0.000	0.50		75.2	SURCHARGED
S19.000	S24	15 minute 100 year Winter I+10%	119.791	117.686	-0.104	0.000	0.56		51.2	OK
S19.001	S25	15 minute 100 year Winter I+10%	117.922	116.983	0.243	0.000	0.72		69.7	SURCHARGED
S18.002	S26	15 minute 100 year Winter I+10%	117.056	116.646	0.636	0.000	0.90		138.6	SURCHARGED
S18.003	S27	15 minute 100 year Winter I+10%	116.755	116.337	0.707	0.000	1.20		146.8	SURCHARGED

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S20.000	S28	15 minute 100 year Winter I+10%	118.056	117.298	0.517	0.000	0.95		68.0	SURCHARGED
S18.004	S29	15 minute 100 year Winter I+10%	116.641	115.904	0.570	0.000	1.68		220.5	SURCHARGED
S18.005	S30	15 minute 100 year Winter I+10%	116.237	115.067	-0.045	0.000	1.00		251.4	OK
S18.006	S31	15 minute 100 year Winter I+10%	115.678	114.464	-0.089	0.000	0.92		281.8	OK
S18.007	S32	15 minute 100 year Winter I+10%	114.929	113.815	0.336	0.000	0.88		283.1	SURCHARGED
S11.015	S33	15 minute 100 year Winter I+10%	114.353	113.610	0.607	0.000	1.09		635.9	SURCHARGED
S11.016	S34	15 minute 100 year Winter I+10%	113.050	112.089	0.436	0.000	0.93		635.0	SURCHARGED
S21.000	SAHPR TANK	60 minute 100 year Winter I+10%	112.080	110.255	1.205	0.000	0.47		81.5	SURCHARGED
S11.017	S34A	30 minute 100 year Winter I+10%	110.780	110.432	1.482	0.000	0.58		216.8	SURCHARGED
S11.018	S35	30 minute 100 year Winter I+10%	109.957	109.009	0.652	0.000	1.07		215.4	SURCHARGED
S11.019	S36	30 minute 100 year Winter I+10%	107.980	107.446	0.505	0.000	1.64		215.6	SURCHARGED
S22.000	S49	15 minute 100 year Winter I+10%	126.597	126.136	0.739	0.000	0.74		28.2	SURCHARGED
S23.000	S46	15 minute 100 year Winter I+10%	128.947	127.897	0.509	0.000	0.64		31.5	SURCHARGED
S23.001	S47	15 minute 100 year Winter I+10%	128.530	127.808	0.628	0.000	0.78		42.8	SURCHARGED
S23.002	S48	15 minute 100 year Winter I+10%	128.337	127.692	0.662	0.000	1.28		89.9	SURCHARGED
S22.001	S50	15 minute 100 year Winter I+10%	127.239	126.026	0.827	0.000	1.65		160.7	SURCHARGED
S22.002	S51	15 minute 100 year Winter I+10%	126.079	124.788	0.039	0.000	1.06		166.6	SURCHARGED
S24.000	S52	15 minute 100 year Winter I+10%	124.828	123.999	0.371	0.000	0.92		35.2	SURCHARGED
S22.003	S53	15 minute 100 year Winter I+10%	125.488	123.770	0.392	0.000	1.51		204.1	SURCHARGED
S25.000	S54	15 minute 100 year Summer I+10%	125.500	124.187	-0.062	0.000	0.87		85.7	OK
S22.004	S55	15 minute 100 year Winter I+10%	124.780	123.085	0.019	0.000	1.02		280.2	SURCHARGED
S26.000	S56	15 minute 100 year Winter I+10%	124.404	123.090	-0.114	0.000	0.49		29.2	OK
S26.001	S57	15 minute 100 year Winter I+10%	123.944	122.588	-0.153	0.000	0.48		62.9	OK
S26.002	S58	15 minute 100 year Winter I+10%	123.469	122.421	0.343	0.000	0.53		56.3	SURCHARGED
S22.005	S59	15 minute 100 year Winter I+10%	123.581	122.350	0.334	0.000	1.51		339.4	SURCHARGED
S22.006	S60	15 minute 100 year Winter I+10%	123.340	121.989	0.133	0.000	0.92		359.5	SURCHARGED

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S22.007	S61	15 minute 100 year Winter I+10%	122.997	121.577	0.201	0.000	1.65		410.7	SURCHARGED
S22.008	S61	15 minute 100 year Winter I+10%	122.839	121.301	0.005	0.000	0.96		428.6	SURCHARGED
S22.009	S62	15 minute 100 year Winter I+10%	122.124	120.917	0.724	0.000	1.44		437.7	SURCHARGED
S27.000	S63	15 minute 100 year Winter I+10%	129.214	127.274	-0.124	0.000	0.42		41.7	OK
S27.001	S64	15 minute 100 year Summer I+10%	127.140	125.906	-0.081	0.000	0.73		68.5	OK
S28.000	S54B	15 minute 100 year Summer I+10%	128.020	126.330	-0.225	0.000	0.00		0.0	OK
S28.001	S59	15 minute 100 year Winter I+10%	126.160	125.397	0.693	0.000	0.31		11.4	SURCHARGED
S28.002	S60	15 minute 100 year Winter I+10%	125.814	125.394	0.789	0.000	0.39		28.0	SURCHARGED
S27.002	S58	15 minute 100 year Winter I+10%	126.639	125.358	1.289	0.000	1.74		56.8	SURCHARGED
S27.003	S65	15 minute 100 year Winter I+10%	126.072	125.213	1.206	0.000	1.45		71.1	SURCHARGED
S27.004	S66	15 minute 100 year Winter I+10%	125.593	124.629	2.792	0.000	2.45		122.3	SURCHARGED
S22.010	S68	15 minute 100 year Winter I+10%	122.637	120.732	0.598	0.000	1.53		590.5	SURCHARGED
S22.011	S67	15 minute 100 year Winter I+10%	120.691	120.178	0.276	0.000	1.84		637.8	SURCHARGED
S29.000	S68	15 minute 100 year Winter I+10%	124.490	122.196	-0.046	0.000	0.94		107.1	OK
S29.001	S69	15 minute 100 year Winter I+10%	121.020	120.203	0.386	0.000	1.11		100.4	SURCHARGED
S22.012	S71	15 minute 100 year Winter I+10%	120.650	119.752	0.322	0.000	1.51		774.9	SURCHARGED
S22.013	S72	60 minute 100 year Winter I+10%	120.371	119.372	0.203	0.000	0.61		600.4	SURCHARGED
S22.014	S72A	60 minute 100 year Winter I+10%	120.256	119.047	0.922	0.000	0.78		301.6	SURCHARGED

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Appendix C.Engineering Drawings

DO NOT SCALE

MANHOLE GENERAL NOTES:

I.) ALL BRICK TO BE SOLID ENGINEERING BRICK CLASS A OR B
II.) FOR PIPE DIAMETER >750MM USE MANHOLE WITH INTERNAL DIAMETER SIZE = PIPE SIZE + 1 METER + 300MM
III.) DISTANCE FROM TOP RUNG OF THE LADDER TO GROUND LEVEL MUST BE A MAXIMUM OF 500MM

MANHOLE DRAWING NOTES:

1.) 225mm THICK CL20/20 MASS CONCRETE FOUNDATIONS.

2.) PREFORMED HALF CIRCLE CHANNEL PIPES. THE PIPELINE MAY WHERE PRACTICABLE, BE LAID THROUGH THE MANHOLE AND THE CROWN CUT OUT TO HALF DIAMETER, PROVIDED FLEXIBLE JOINTS ARE SITUATED ON EACH SIDE NO FURTHER THAN 600mm FROM THE INNER FACE OF THE MANHOLE WALL.

3.) MANHOLE CONSTRUCTION
FOR SURFACE WATER MANHOLES HIGH DENSITY BLOCKS TO CL.S10 OF I.S.20 PART 1: 1987 OR CL.30/20 IN-SITU CONCRETE.
BLOCKWORK SHALL BE BEDDED AND JOINTED USING MORTAR DESIGNATION THREE TO I.S.406. BEDS AND VERTICAL JOINTS SHALL BE COMPLETELY FILLED WITH MORTAR AS THE BLOCKS ARE LAID.
JOINTS SHALL BE FLUSH POINTED AS THE WORK PROCEEDS
ALL FOUL MANHOLES MUST BE FACED IN SOLID ENGINEERING BRICK (MIN CLASS A OR B), OR IN-SITU CONCRETE FOR 1m ABOVE BENCHING LEVEL
BRICK TO BE BONDED TO BLOCKWORK USING ENGLISH GARDEN WALL BOND.

4.) RELIVING ARCH FORMED BY 215x103x65 BRICK CLASS A OR B AS PER DRAWING.
RELIEVING ARCHES USED IN BRICK OR BLOCKWORK MANHOLES TO EXTEND OVER FULL THICKNESS OF WALL.
A DOUBLE ARCHE IS TO BE FORMED FOR PIPE DIAMETERS GREATER THAN 600mm.

5.) BENCHING AND PIPE CHANNEL PIPE SURROUND -CL.20/20 CONCRETE.

6.) BENCHING FINISHED IN 2:1 SAND-CEMENT MORTAR WITH SMOOTH TROWEL FINISH, AT 1 IN 30 SLOPE TOWARDS CHANNEL.

7.) STANDARD RUNGS AT 300c/c VERTICALLY AND GALVANISED TO LATEST VERSION OF BS729 OR EQUIVALENT.

8.) 600mm SQUARE OPE. IN ROOF SLAB.

9.) PRECAST R.C. ROOF SLAB SHALL BE 200MM THICK IN CL.30N/20MM CONCRETE, WITH 40MM COVER TO STEEL.

10.) 1 TO 2 COURSES OF SOLID ENGINEERING BRICKS CLASS B TO I.S.91:1983 SET IN HIGH STRENGTH MORTAR (MIN 60N AFTER 14 DAYS)

11.) CLASS D400 OR E600 MANHOLE COVER AND FRAME TO IS/EN 124. 150mm DEEP FRAME FOR ROADS, 100mm DEEP FOR FOOTPATHS AND GREEN AREAS. NON-ROCK DESIGN, CLOSED KEYWAYS, MANUFACTURED FROM SPHEROIDAL GRAPHITE CAST IRON (DUCTILE CAST IRON), 600x600 (OR 600 DIAM) CLEAR OPENING, COVER & FRAME COATED IN BITUMEN OR OTHER APPROVED MATERIAL, COVER TO HAVE A MINIMUM MASS OF 140kg/m2, FRAME BEARING AREA SHALL BE 80,000mm2 MIN.,FRAMES SHALL BE DESIGNED TO PREVENT COVERS FALLING INTO MANHOLE. FRAMES SHALL BE BEDDED ON APPROVED MORTAR TO MANUFACTURER'S CONSTRUCTIONS.

12.) SHORT LENGTH PIPE, PIPE JOINT EXTERNAL TO MANHOLE SHALL NOT EXCEED 600mm FROM THE INNER FACE OF MANHOLE WALL.

13.) TOE HOLES OF 230mm MIN. DEPTH AND GALVANISED STEEL SAFETY RAILINGS TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 525 DIAMETER, AND DEPTH TO INVERT >3m FOR ACCESS TO INVERT.

14.) SAFETY CHAIN TO BE PROVIDED ON PIPES THAT EXCEED450mm IN DIAMETER. MILD STEEL SAFETY CHAIN SHALL BE 10mm NOMINAL SIZE GRADE M(H) NON CALIBRATED CHAIN TYPE 1, COMPLYING WITH BS: 4942 Part 2 OR EQUIVALENT.

15.) WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 3.0m LADDERS SHALL BE USED, INSTEAD OF RUNGS, TO BS4211 EXCEPT THAT STRINGERS SHOULD BE NOT LESS THAN 65x12mm IN SECTION AND RUNGS 25mm IN DIAMETER. FIXED LADDERS SHOULD MEET THE DIMENSIONAL REQUIREMENTS OF BS 4211.

16.) LADDER STRINGERS SHOULD BE ADEQUATELY SUPPORTED FROM THE MANHOLE WALL AT INTERVALS OF NOT MORE THAN 2.0m. STRINGERS SHOULD BE BOLTED TO CLEATS TO FACILITATE RENEWAL.

17.) ALL LADDERS, RUNGS, HANDRAILS, SAFETY CHAINS ETC. SHALL BE HOT DIP GALVANISED TO BS729.

18.) SOCKET OF PIPE SHOULD BE CUT FLUSH WITH THE INSIDE SURFACE OF THE MANHOLE WALL SO THAT THE CHANNEL EXTENDS FULL LENGTH OF THE MANHOLE (EXCEPT FOR PRECAST MANHOLES).

19.) POSITION OF 910 SQUARE OPENING IN INTERMEDIATE ROOF SLAB.

-ALL MANHOLES SHALL BE WATERTIGHT TO THE SATISFACTION OF THE ENGINEER.
-FORMWORK TO REINFORCEMENT CONCRETE AND MASS CONCRETE SHALL COMPLY TO CLASS 2, SECTION 6.2.7, BS8110: PART 1: 1997.
-FINISH TO THE TOP OF SLABS SHALL COMPLY TO TYPE A, SECTION 6.2.7, BS8110: PART 1: 1997.
-PLAN DIMENSIONS OF MANHOLES ARE BASED ON BLOCKWORK HAVING A CO-ORDINATING SIZE OF 450x225x100.
-MANHOLES ARE DESIGNED TO BS8005 AND WALL THICKNESSES TO IS325 BLOCKWORK DESIGN CODE TAKING GRANULAR FILL PRESSURE AND H.B. SURCHARGE.
-REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.

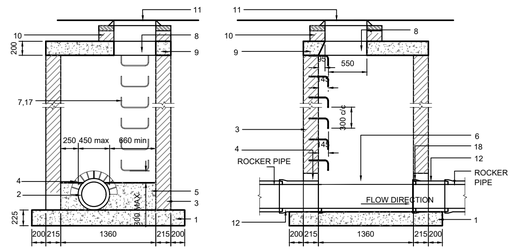
20.) FOR MANHOLES >3.0m DEPTH TO INVERT USE 30N/20 IN-SITU CONCRETE. REINFORCING MESH REF. A393 @6.16kg/m TO BE FIXED AT MID POINT OF WALL. ADDITIONAL REINFORCEMENT TO BE SUPPLIED OVER PIPE CROWN.

21.) FOR PRECAST MANHOLES, CHAMBER WALLS AND COVER SLAB TO BE CONSTRUCTED TO IS EN 1917 AND 1S 420 2004.

22.) MANHOLE OPENING TO BE SITUATED FURTHEST FROM THE NEAREST CARRIAGEWAY. MANHOLE STEPS/ACCESS TO BE POSITIONED TO ALLOW VIEWING OF ONCOMING TRAFFIC.

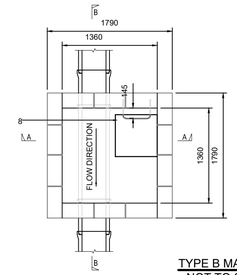
23.) FOR BEDDING AND SEALING OF CHAMBER RINGS, THE TOP RING (TO PRECAST COVER SLAB) AND BOTTOM TING TO BE BEDDED WITH CEMENT MORTAR. FOR INTERMEDIATE RINGS, JOINTS TO BE SEALED WITH APPROVED PRE-FORMED JOINTING STRIP.

24.) PRECAST MANHOLES TO BE SURROUNDED WITH A MINIMUM OF 150MM THINK GRADE C20/40 CONCRETE



SECTION A-A

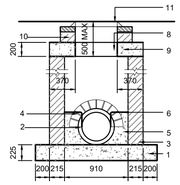
SECTION B-B



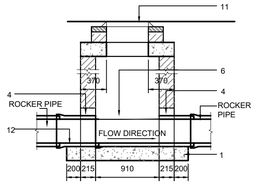
PLAN

TYPE B MANHOLE
NOT TO SCALE

MANHOLE DTEAILS FOR PIPE Ø's 225, 300, 375 & 450mm.
DEPTH TO INVERT 1.0m TO 3.0m.

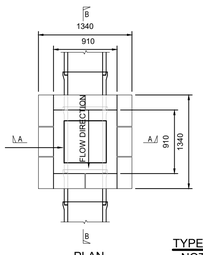


SECTION A-A



SECTION B-B

MANHOLE DETAILS FOR PIPE Ø's 150, 225, 300, 375 & 450mm.
DEPTH TO INVERT LESS THAN 1.0m.

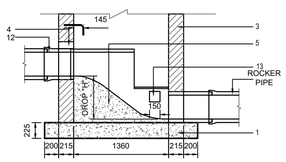


PLAN

TYPE A MANHOLE
NOT TO SCALE

INLET DIA (mm)	"H" (MAX) (mm)
225	600
300	600
375	750
450	750
525	750
600	750
750	750

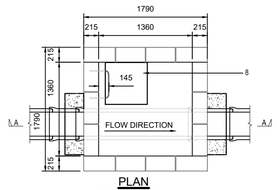
WHEN THE DROP "H" IS GREATER THAN THE MAX. VALUE SHOWN USE BACKDROP MANHOLE.



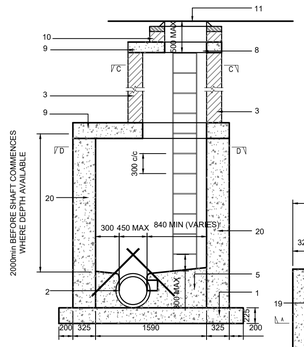
SECTION A-A

RAMP MANHOLE DETAIL FOR PIPE Ø's 150, 225, 300, 375, 450, 525, 600 & 750mm.
DROP < 750mm

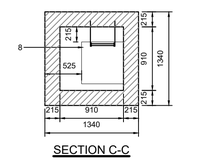
TYPE F MANHOLE (RAMP)
NOT TO SCALE



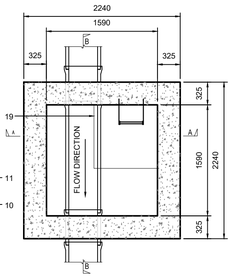
PLAN
NOT TO SCALE



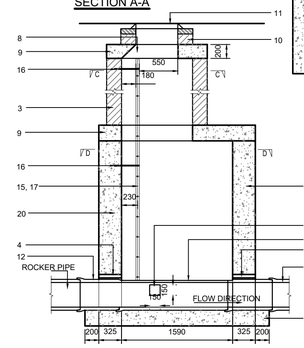
SECTION A-A



SECTION C-C



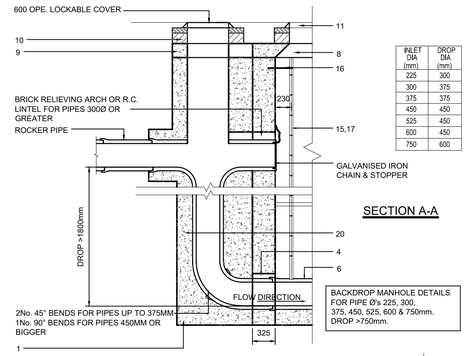
SECTION D-D



SECTION B-B

TYPE C MANHOLE
NOT TO SCALE

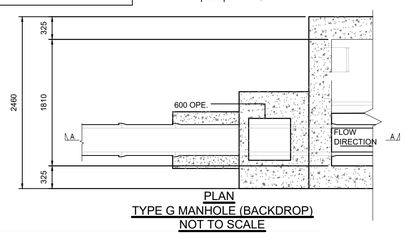
MANHOLE DETAILS FOR PIPE Ø's 225, 300, 375 & 450mm.
DEPTH TO INVERT 3m TO 6m.



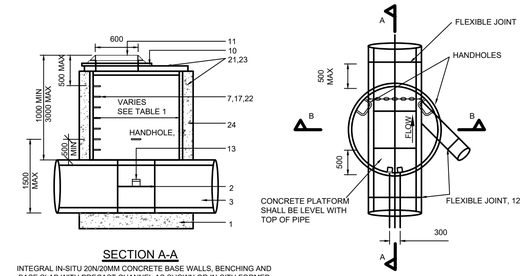
SECTION A-A

INLET DIA (mm)	DROP DIA (mm)
225	300
300	375
375	375
450	450
525	450
600	450
750	600

BACKDROP MANHOLE DETAILS FOR PIPE Ø's 225, 300, 375, 450, 525, 600 & 750mm.
DROP >750mm.



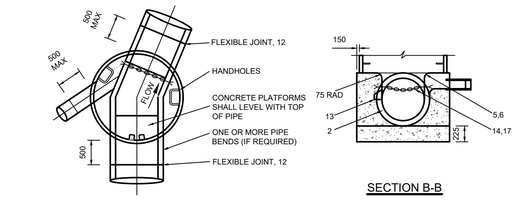
PLAN
TYPE G MANHOLE (BACKDROP)
NOT TO SCALE



SECTION A-A

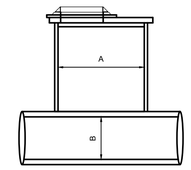
INTEGRAL IN-SITU 20N/20MM CONCRETE BASE WALLS, BENCHING AND BASE SLAB WITH PRECAST CHANNEL AS SHOWN OR IN-SITU FORMED INVERT AS ALTERNATIVE. WALLS TO EXTEND 150mm BEYOND OUTER FACES OF CHAMBER RING. ALTERNATIVELY PRECAST CONCRETE CHAMBER RINGS MAY BE BEDDED IN MORTOR OR ON IN-SITU 20N/20MM CONCRETE BASE SLAB 300MM GREATHER IN DIAMETER THAN CHAMBER RINGS

PLAN ON STRAIGHT INVERT
(WITHOUT COVER SLAB)



SECTION B-B

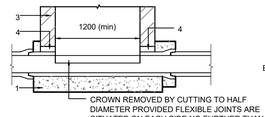
PLAN ON CURVED INVERT
(WITHOUT COVER SLAB)



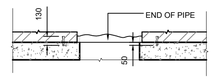
MAXIMUM PIPE DIAMETER B (mm)	CHAMBER INTERNAL DIAMETER A (mm)
225	1200
300	1200
375	1200
450	1200
525	1200
600	1200
675	1350
750	1350
900	1500
1050	2100
1200	2100

TABLE 1

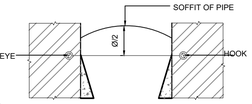
TYPE J MANHOLE (PRECAST)
NOT TO SCALE



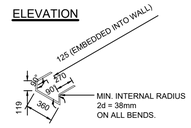
ALTERNATIVE METHOD OF
FORMING CHANNEL THROUGH MANHOLE



ELEVATION (SAFETY CHAIN, HOOK & EYE)



ELEVATION



STANDARD RUNG
(HOT DIP GALVANISED)

STANDARD RUNG & SAFETY CHAIN DETAILS
NOT TO SCALE

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
P01	08.04.26	ISSUED FOR STAGE 2A	PP	EN	MB	MOS
P00	31.03.26	ISSUED FOR STAGE 2A	PP	EN	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

AtkinsRéalis
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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST PROPOSED SERVICES TYPICAL DETAILS

Scale	Drawn	Checked	Reviewed	Authorised
NOT TO SCALE	PP	EN	MB	MOS
Original Size: A3	Date: 31.03.26	Date: 31.03.26	Date: 31.03.26	Date: 31.03.26

Drawing Number: P4CW-XXX-XXX-DR-ATK-CE-960590
Revision: C00

Atkins Project Number: 100125176

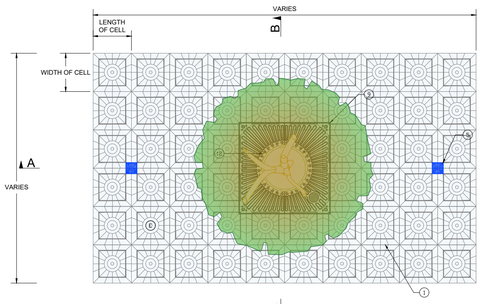
CLASSIFICATION - AtkinsRéalis Base Line (Low Risk)

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Millimetres 0 10 100

DO NOT SCALE

Millimetres 100 10 0



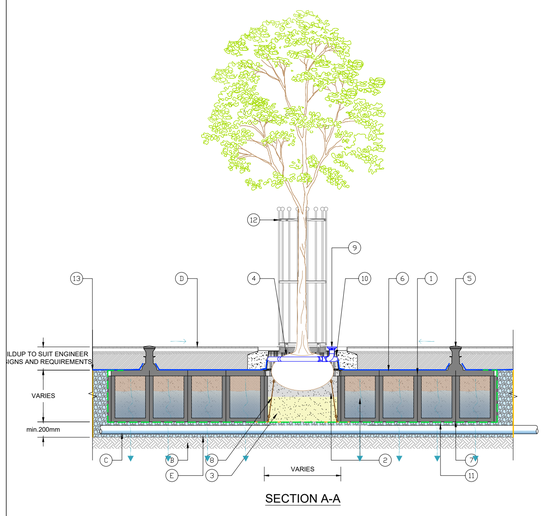
PLAN VIEW

GENERAL NOTES:

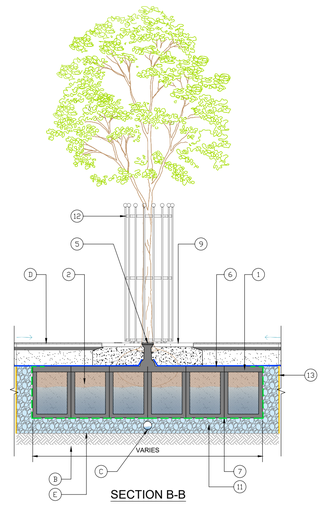
1. PAVEMENT SUPPORT SYSTEM @ 600mm DEPTH (1 UNIT DEEP) WITH STRUCTURAL TWIN WALLED GEOTEXTILE
2. TOPSOIL FOR USE WITHIN TOP 600mm OF SOIL PROFILE
3. SUBSOIL FOR USE WITHIN SOIL PROFILES 600mm OR DEEPER
4. ROOTBALL
5. CAST ALUMINUM TRAFFICABLE AERATION INLET WITH 150mm SQUARE TOP AND MANIFOLD
6. TWIN WALLED STRUCTURAL GEOTEXTILE
7. 20mm OPEN REINFORCING MESH
8. ANCHOR SYSTEM
9. CAST DUCTILE TREE GRILLE 1200mm SQUARE WITH 600mm CENTRAL APERTURE WITH GALVANISED SUPPORT FRAME. INCLUDING IRRIGATION SYSTEM
10. ROOT DEFLECTOR WITH DEFLECTING RIBS
11. 10mm - 20mm CLEAN ANGULAR DRAINAGE AGGREGATE
12. VERTICAL STEEL TREE GUARD 1800mm HIGH x 600mm Ø, INCLUDING TREE GUARD TIE
13. FLAT ROOT BARRIER 600mm DEEP, WITH JOINTING TAPE FOR ANY JOINS

ADDITIONAL NOTES:

A. ALLOW 20% ADDITIONAL FOR GEOTEXTILE AND REINFORCED GEOGRID FOR OVERLAP AND CUTTING REQUIREMENTS
B. EXISTING GROUND
C. DRAINAGE PIPE (110mm PERFORATED PIPE)
D. BUILD-UP TO SUIT ENGINEER DESIGNS AND REQUIREMENTS
E. ADDITIONAL TWINWALL STRUCTURAL GEOTEXTILE TO BE INSTALLED WHERE SUB-BASE IS INSTALLED BELOW 3% CBR - MINIMUM 2% CBR OF FORMATION LEVEL

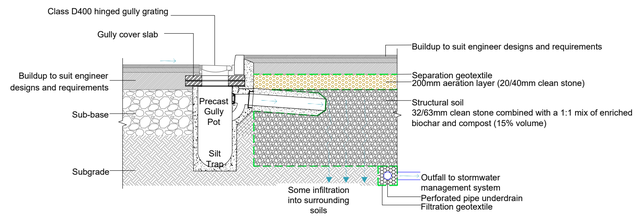


SECTION A-A

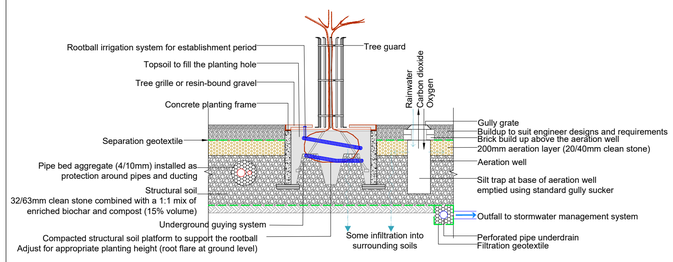


SECTION B-B

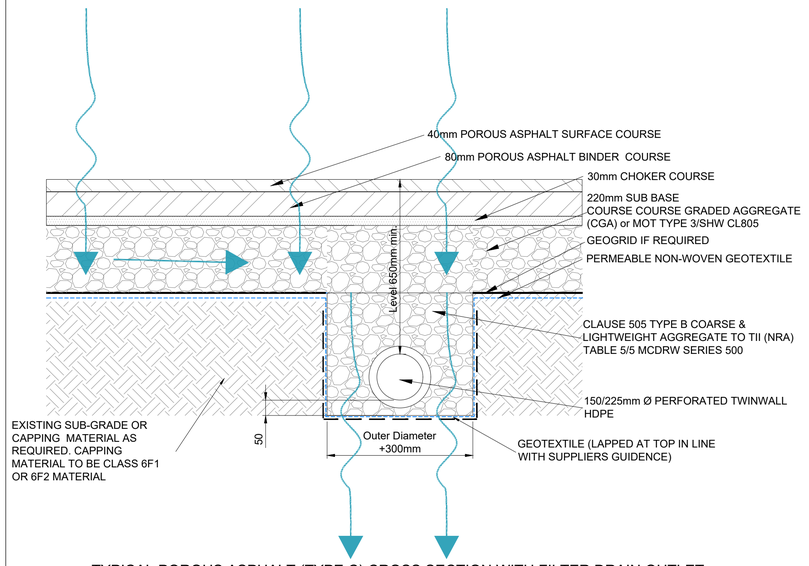
TYPICAL SUDS TREE PIT w/ GEOCELLULAR SYSTEM (CRATES)



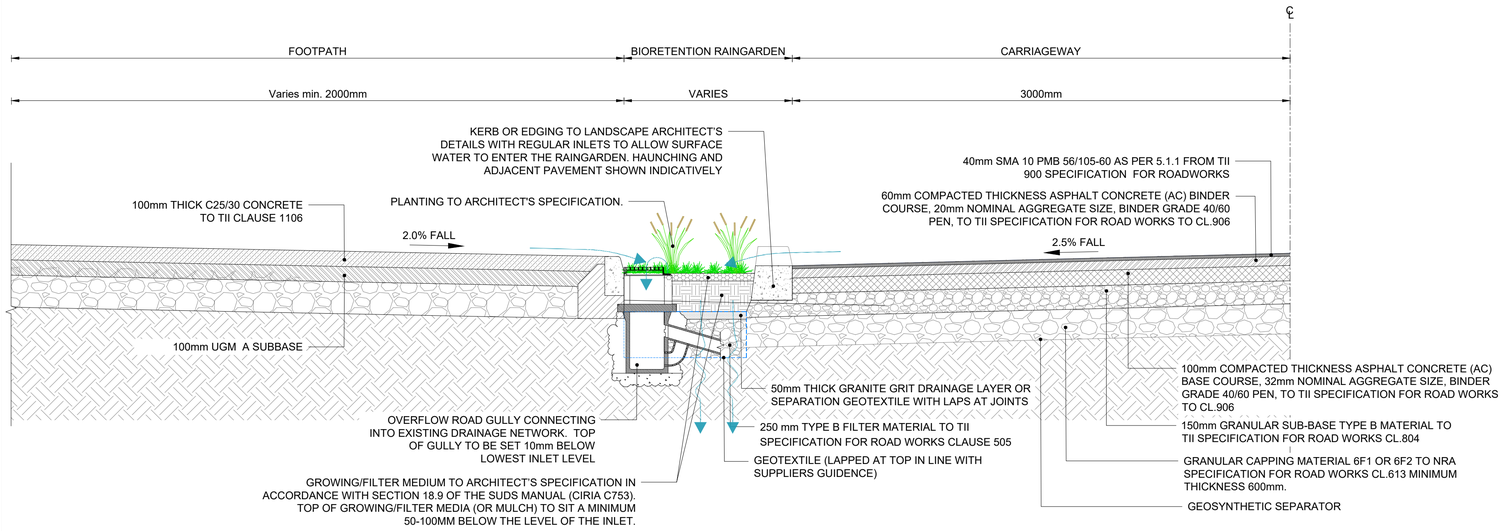
TYPICAL SUDS TREE PIT w/ STRUCTURAL SOIL, KERB INLET



TYPICAL SUDS TREE PIT w/ STRUCTURAL SOIL



TYPICAL POROUS ASPHALT (TYPE C) CROSS SECTION WITH FILTER DRAIN OUTLET



TYPICAL RAINGARDEN

C00	06.08.26	ISSUED FOR PLANNING	PP	EN	MB	MOS
Rev.	Date	Description	By	Rev'd	Chk'd	App'd

Drawing Status: FOR PLANNING
Suitability: A2

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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST PROPOSED SUDS TYPICAL DETAILS

Scale	Drawn	Checked	Reviewed	Authorised
NOT TO SCALE	PP	EN	MB	MOS
Original Size	**Date**	**Date**	**Date**	**Date**
A3	13.03.26	13.03.26	13.03.26	13.03.26

Drawing Number: P4CW-XXX-XXX-DR-ATK-CE-960591 Revision: C00

Atkins Project Number: 100125176

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CLASSIFICATION - AtkinsRéalis Base Line (Low Risk)

OUTGOING TRANSMITTAL

AtkinsRéalis

Project Name: CNWQR Phase 4C West
Project Reference No: P4CW

Unit 2B, 2200 Cork Airport Business Park, Cork, Ireland, T12 R279

Day	06	06
Month	08	10
Year	26	26

File Reference No.	Title	Status		
P4CW-ZZZ-ZZZ-DR-ATK-CE-910070	Phase 4CW - Proposed site layout	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950700	Phase 4CW - Proposed road pavement layout	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950710	Phase 4CW - Proposed road levels	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950740	Phase 4CW - Proposed layout junction sightlines	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950751	Phase 4CW - Proposed autotracking layout refuse truck	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950752	Phase 4CW - Proposed autotracking layout pumping appliance	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-950753	Phase 4CW - Proposed autotracking layout private car	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-951200	Phase 4CW - Road signs and traffic markings	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-960500	Phase 4CW - Proposed storm water drainage layout	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-960520	Phase 4CW - Proposed foul water drainage layout	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-960580	Phase 4CW - Proposed SUDS	A2	C00	C01
P4CW-ZZZ-ZZZ-DR-ATK-CE-962700	Phase 4CW - Watermain layout	A2	C00	C01
P4CW-XXX-XXX-DR-ATK-CE-960590	Phase 4CW - Proposed services typical details	A2	C00	
P4CW-XXX-XXX-DR-ATK-CE-960591	Phase 4CW - Proposed SUDS typical details	A2	C00	

Total number of sets			1	1

Drawing Status Codes				
	S1 - Fit for coordination, **S2** - Fit for Information, **S3** - Fit for internal review and comment, **S4** - Fit for construction approval **S5** - Issued for manufacture, **S6** - Issued for PIM authorization, **S7** - Issued for AIM authorization **D1** - Fit for costing, **D2** - Fit for Tender, **D3** - Fit for contractor design, **D4** - Fit for manufacture/procurement **AM** - As maintained, **A0** - Published Strategy Files, **A1** - Published Brief Files **A2** - Published Definition Files, **A3** - Published Concept Files **A4** - As Design Files, **A5** - Published Build Files **A6** - Published Handover Files, **A7** - Published Operation Files **B** - Partial sign off. For Construction with minor comments, **AB** - As built	A2	A2	

Format of Issue codes			
	D - Disk, **E** - Email/Ipronet, **P** - Print, **R** - A3 Reduction	E	E

Outgoing correspondence register number			

OUTGOING TRANSMITTAL

AtkinsRéalis

Project Name:	**CNWQR Phase 4C West**
Project Reference No:	**P4CW**

Unit 2B, 2200 Cork Airport Business Park, Cork, Ireland, T12 R279

Date of Issue	
Day	31
Month	07
Year	26

File Reference No.	Title	Status	Revision
P4CW-ZZZ-XXX-DR-ATK-EE-000001	Proposed Public Lighting	A2	C00
P4CW-ZZZ-XXX-DR-ATK-EE-000002	Proposed Public Lighting Details	A2	C00
P4CW-ZZZ-XXX-RP-ATK-EE-000001	Outdoor Lighting Report		
P4CW-ZZZ-XXX-RP-ATK-EE-000002	Mechanical & Electrical Stage 2A report		

		Number of Issues
Total number of sets		

Drawing Status Codes	Purpose of Issue
S1 - Fit for coordination, **S2** - Fit for Information, **S3** - Fit for internal review and comment, **S4** - Fit for construction approval **S5** - Issued for manufacture, **S6** - Issued for PIM authorization, **S7** - Issued for AIM authorization **D1** - Fit for costing, **D2** - Fit for Tender, **D3** - Fit for contractor design, **D4** - Fit for manufacture/procurement **AM** - As maintained, **A0** - Published Strategy Files, **A1** - Published Brief Files **A2** - Published Definition Files, **A3** - Published Concept Files **A4** - As Design Files, **A5** - Published Build Files **A6** - Published Handover Files, **A7** - Published Operation Files **B** - Partial sign off. For Construction with minor comments, **AB** - As built	

Format of Issue codes	Format of Issue
D - Disk, **E** - Email/Ipronet, **P** - Print, **R** - A3 Reduction	

Outgoing correspondence register number

DO NOT SCALE

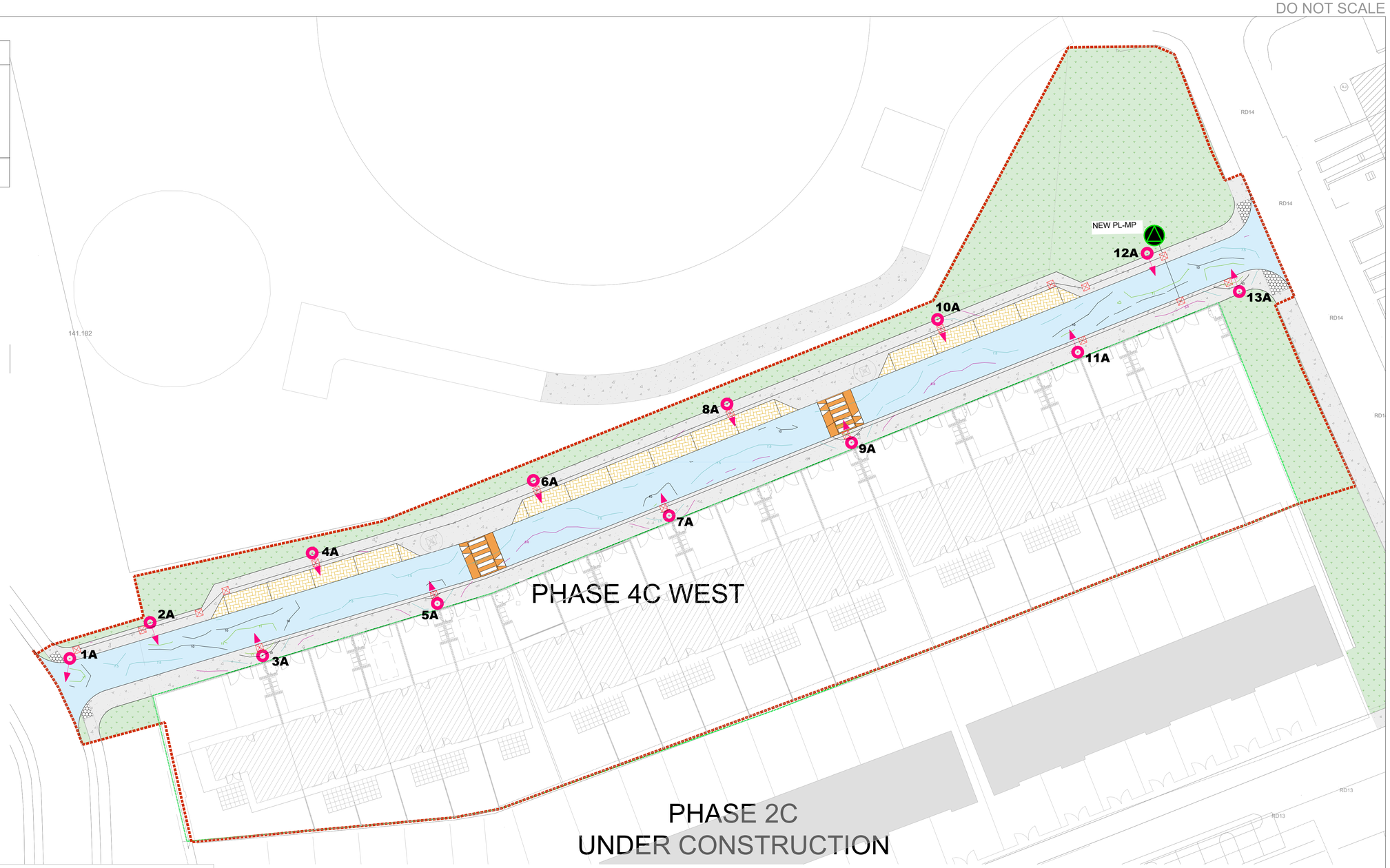
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LEGEND

SYMBOL	IMAGE	DESCRIPTION
TYPE A		SUPPLIER: C U Phosco TYPE: E950-28-P6A-730-SD0275-13W COLOUR TEMPERATURE: 3000K LAMP FLUX (klm): 1.64 MAINTENANCE FACTOR: 0.88 NO IN PROJECT: 13 COLUMN HEIGHT: 6m
		PHASE 4C WEST BOUNDARY LINE

NOTES

1. PRIMARY STREETS ARE DESIGNED IN ACCORDANCE WITH EN13201-2:2015 TO CATEGORY P2.
2. SECONDARY STREETS ARE DESIGNED IN ACCORDANCE WITH EN13201-2:2015 TO CATEGORY P3.
3. FOOTPATHS ARE DESIGNED IN ACCORDANCE WITH EN13201-2:2015 TO CATEGORY P4.
4. MAINTENANCE FACTOR 0.88.
5. NEW PUBLIC LIGHTING MINI PILLARS (REF. PL-MP) TO BE INSTALLED NEXT TO THE ESB MINI PILLARS AND BE SUPPLIED FROM THERE. DISTANCE SHOULDN'T BE LESS THAN 2m.



SYMBOL	DESCRIPTION
EX	EXISTING LUMINAIRE FROM ADJACENT PHASE
	5 LUX
	7.5 LUX
	10 LUX
	11 LUX

	NEW 600X600 MM LV CABLE ACCESS CHAMBER FOR PUBLIC LIGHTING
	PROPOSED NEW LIGHTING 125MM DIAMETER RED LV DUCT, TO BE LAID AT 750MM BELOW GROUND LEVEL, AS MEASURED TO THE TOP OF THE DUCT
NEW PL-MP	NEW PROPOSED PUBLIC LIGHTING MICRO PILLAR TO BE SUPPLIED OF THE ADJACENT ESB MINI PILLAR

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C00	31/07/26	ISSUED FOR PLANNING	AJ	GK	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

AtkinsRéalis
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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
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Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED PUBLIC LIGHTING

Scale	Drawn	Checked	Reviewed	Authorised
1:200	AJ	MB	GK	MOS
Original Size	Date	Date	Date	Date
A1	13/03/26	13/03/26	13/03/26	13/03/26

Drawing Number: P4CW-ZZZ-XXX-DR-ATK-EE-000001
Revision: C00

Atkins Project Number: 100125176

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ORDNANCE SURVEY IRELAND & GOVERNMENT OF IRELAND

ATKINSREALIS WILL NOT BE HELD LIABLE FOR THE USE OF THIS DATA ON ANY PROJECT OTHER THAN THE PROJECT:

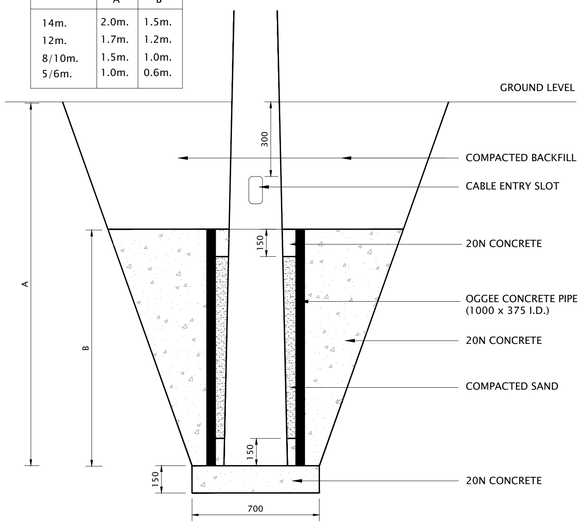
CLASSIFICATION - AtkinsRéalis Base Line (Low Risk)

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DO NOT SCALE

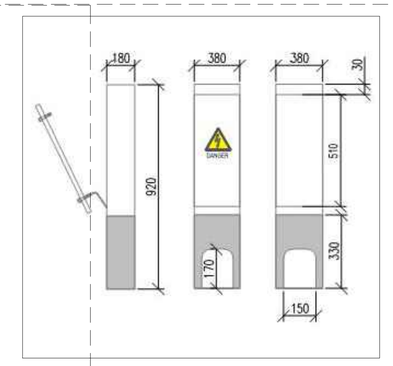
Millimetres 0 10 100

COLUMN HEIGHT	ROOTING DIMENSIONS	
	A	B
14m.	2.0m.	1.5m.
12m.	1.7m.	1.2m.
8/10m.	1.5m.	1.0m.
5/6m.	1.0m.	0.6m.



1 961391 PUBLIC LIGHTING COLUMN Sleeved Foundation

SCALE : NTS

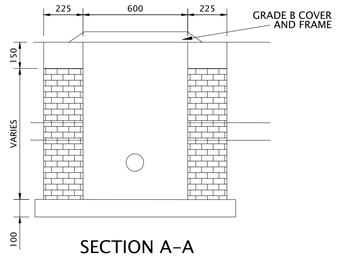


KEY NOTES:

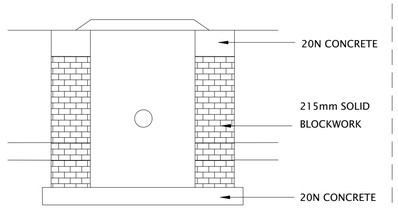
1. THE PILLAR SHALL BE FITTED WITH LOCKABLE FULLY REMOVABLE DOOR.
2. THE PILLAR SHALL BE GALVANISED INTERNALLY AND EXTERNALLY TO BS EN 1461.
3. INCLUDE FOR EARTH LEAD CONNECTION SUPPLIED FROM PILLAR BODY TO DOOR.
4. DANGER WARNING LABEL SHALL BE FITTED TO A DOOR
5. ALL OUTGOING LIGHT CIRCUITS SHALL BE INDIVIDUALLY FUSED, CAPABLE OF ACCOMMODATING CABLE SIZES UP TO 25mm².
6. THE FUSE SHALL BE RATED 16kA WITH MINIMUM RUPTURING CAPACITY AND SHALL COMPLY T BS 1361

3 961391 SINGLE PHASED MICRO PILLAR FOR PUBLIC LIGHTING

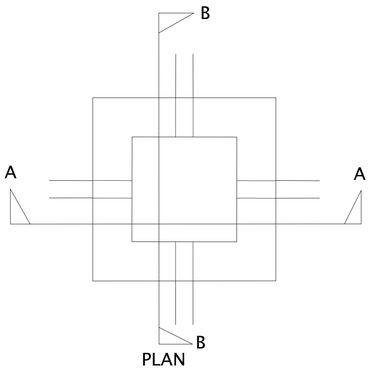
SCALE : NTS



SECTION A-A



SECTION B-B



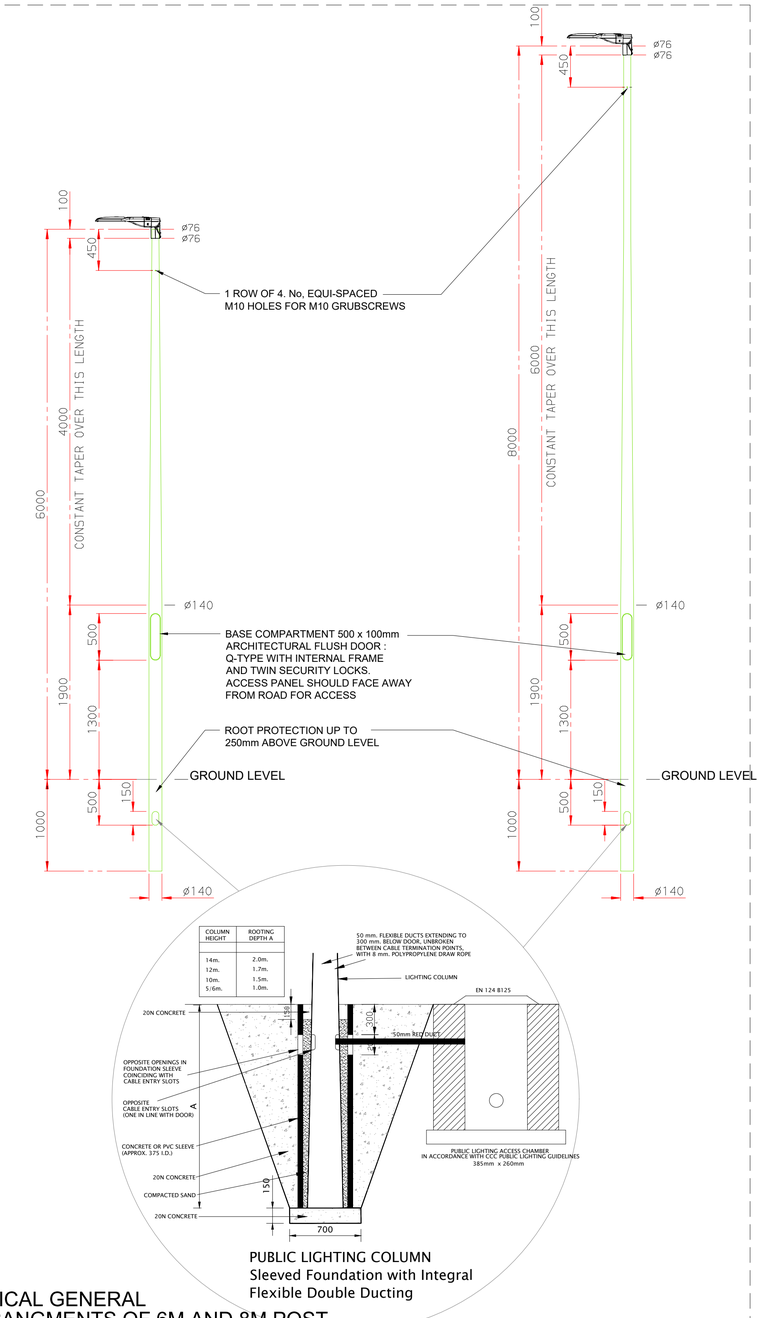
PLAN

NOTE:
1 DEPTH OF CHAMBER DETERMINED BY DUCT DEPTH. DUCT ENTRY TO CHAMBER TO BE 200mm min. ABOVE FLOOR.

2 SEE SPECIFICATION FOR BACKFILLING AND REINSTATEMENT DETAILS.

2 961391 CABLE ACCESS CHAMBER DETAILS

SCALE : NTS



COLUMN HEIGHT	ROOTING DEPTH A
14m.	2.0m.
12m.	1.7m.
10m.	1.5m.
5/6m.	1.0m.

PUBLIC LIGHTING COLUMN
Sleeved Foundation with Integral
Flexible Double Ducting

4 961391 TYPICAL GENERAL ARRANGMENTS OF 6M AND 8M POST CONICAL TAPERED TUBULAR LIGHTING COLUMNS

SCALE : NTS

CONSTRUCTION

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C00	31/07/26	ISSUED FOR PLANNING	AJ	MB	GK	MOS

Drawing Status: FOR PLANNING
Suitability: A2

AtkinsRéalis
DUBLIN | CORK | GALWAY | DUNDALK
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SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED PUBLIC LIGHTING DETAILS

Scale	Drawn	Checked	Reviewed	Authorised
NTS	AJ	MB	GK	MOS
Original Size	Date	Date	Date	Date
A1	13.03.26	13.03.26	13.03.26	13.03.26

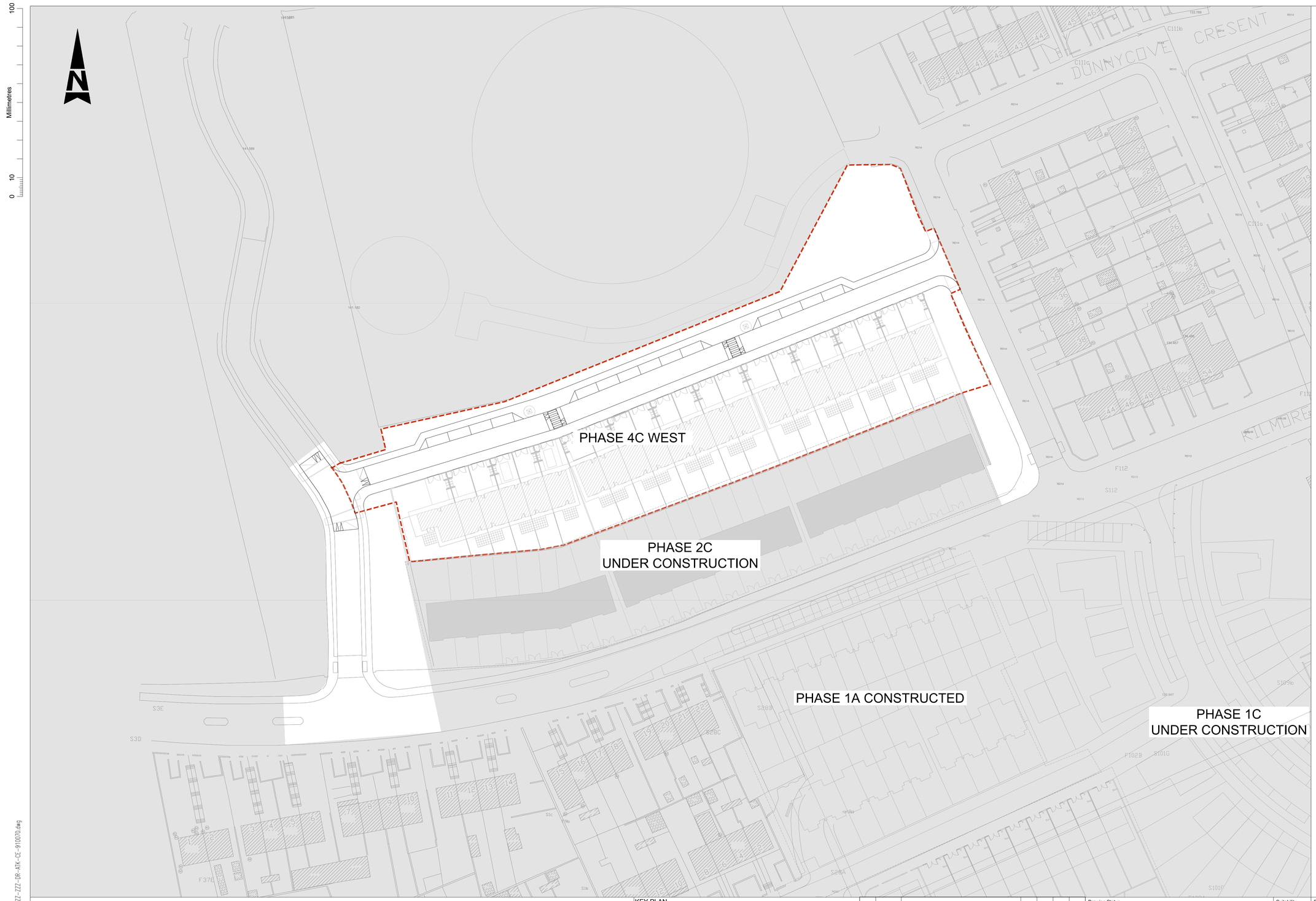
Drawing Number: P4CW-ZZZ-XXX-DR-ATK-EE-000002
Revision: C00

Atkins Project Number: 100125176

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DO NOT SCALE



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KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED SITE LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size	Date	Date	Date	Date
A1	13.03.26	13.03.26	13.03.26	13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-910070
Revision: C01

Atkins Project Number: 100125176

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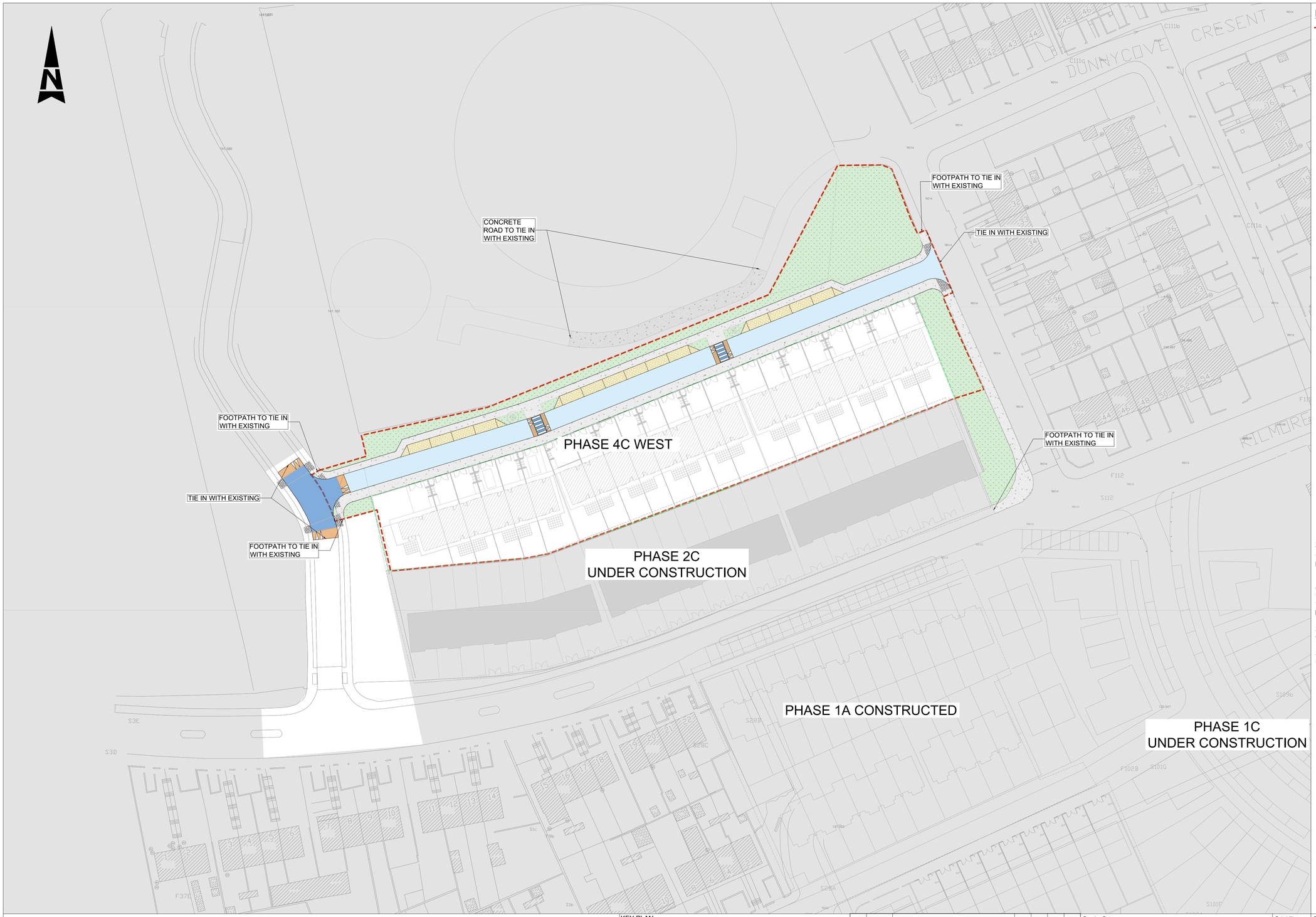
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DO NOT SCALE

Millimetres 0 10 100



LEGEND:

- PHASE BOUNDARY
- PROPOSED BUILDING
- PROPOSED TACTILE PAVING
- PROPOSED TREE PIT
- PROPOSED PERMEABLE PARKING PAVEMENT
- AREAS INSIDE THE GREEN LINE BOUNDARY TO BE AS PER ARCHITECT'S REQUIREMENTS
- PROPOSED ROAD RAMP

TYPE 1: CONCRETE FOOTPATHS/YARD AREAS

1. CONCRETE FOOTPATHS & PAVING TO TII CC-SCD-01105 DETAILS & SPEC.
2. SEE LANDSCAPE ARCHITECTS LAYOUT FOR SURFACE TREATMENTS & FINISH.
3. AT VEHICULAR ACCESS CONCRETE PAVING TO BE THICKENED FROM 100mm CONCRETE ON 100mm GRANULAR SUB-BASE TO CC-SPW-00800 TO 150mm INSITU CONCRETE WITH 1 LAYER OF A393 MESH TOP & BOTTOM. SURFACE OF RAMP TO BE BRUSHED TOP FROM "NON-SLIP FINISH. SEE TII CC-SCD-01103 FOR DETAILS.

TYPE 2: ASPHALT ROAD

1. 40mm SURFACE COURSE SMA 14 SURF PMB 65/105-60 DES TO CLAUSE 5.1.3 OF TII SRW 900 SERIES
2. 60mm BINDER COURSE: AC 20 HDM BIN 40/60 DES TO CLAUSE 3.1.4 OF TII SRW 900 SERIES
3. 100mm BASE COURSE: AC 32 DENSE BASE 40/60 DES TO CLAUSE 3.1.1 OF TII SRW 900 SERIES
4. 150mm SUB-BASE: GRANULAR MATERIAL TYPE B CL 804
5. GRANULAR CAPPING MATERIAL 6F1 OR 6F2 TO TII SPECIFICATION FOR ROAD WORKS CL.613.

TYPE 3: ASPHALT RAISED RAMPS

1. 40mm SURFACE COURSE HRA 14 SURF PMB 65/105-60 DES TO CLAUSE 5.1.3 OF TII SRW 900 SERIES
2. 60mm BINDER COURSE: AC 20 HDM BIN 40/60 DES TO CLAUSE 3.1.4 OF TII SRW 900 SERIES
3. 100mm BASE COURSE: AC 32 DENSE BASE 40/60 DES TO CLAUSE 3.1.1 OF TII SRW 900 SERIES
4. 150mm SUB-BASE: GRANULAR MATERIAL TYPE B CL 804
5. GRANULAR CAPPING MATERIAL 6F1 OR 6F2 TO TII SPECIFICATION FOR ROAD WORKS CL.613.

TYPE 4: GRASSED AREAS

1. REFER TO LANDSCAPE ARCHITECT DRAWINGS FOR DETAILS .

SPECIAL NOTES:

1. CAPPING 6F1 OR 6F2 IN ACCORDANCE WITH TII MCDRW. MINIMUM THICKNESS 300mm (MIN CBR 2%)
SOFT SPOTS ENCOUNTERED TO BE FILLED WITH CAPPING.
CONTRACTOR TO INCLUDE 20 NO. IN SITU CBR TESTS TO VERIFY CBR AT FORMATION LEVEL. THIS INFORMATION IS TO BE MADE AVAILABLE TO THE ENGINEER PRIOR TO INSTALLATION OF CAPPING.

2. EXPANSION JOINTS TO BE LOCATED AT MAXIMUM 4.5m C/C AND AT CHANGE IN CONCRETE DEPTH.

3. REFER TO ARCHITECTS DRAWINGS FOR PUBLIC REALM SURFACE FINISHES AND LANDSCAPING DETAILS.

GENERAL NOTES

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4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST PROPOSED ROAD PAVEMENT LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size	Date	Date	Date	Date
A1	13.03.26	13.03.26	13.03.26	13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950700
Revision: C01

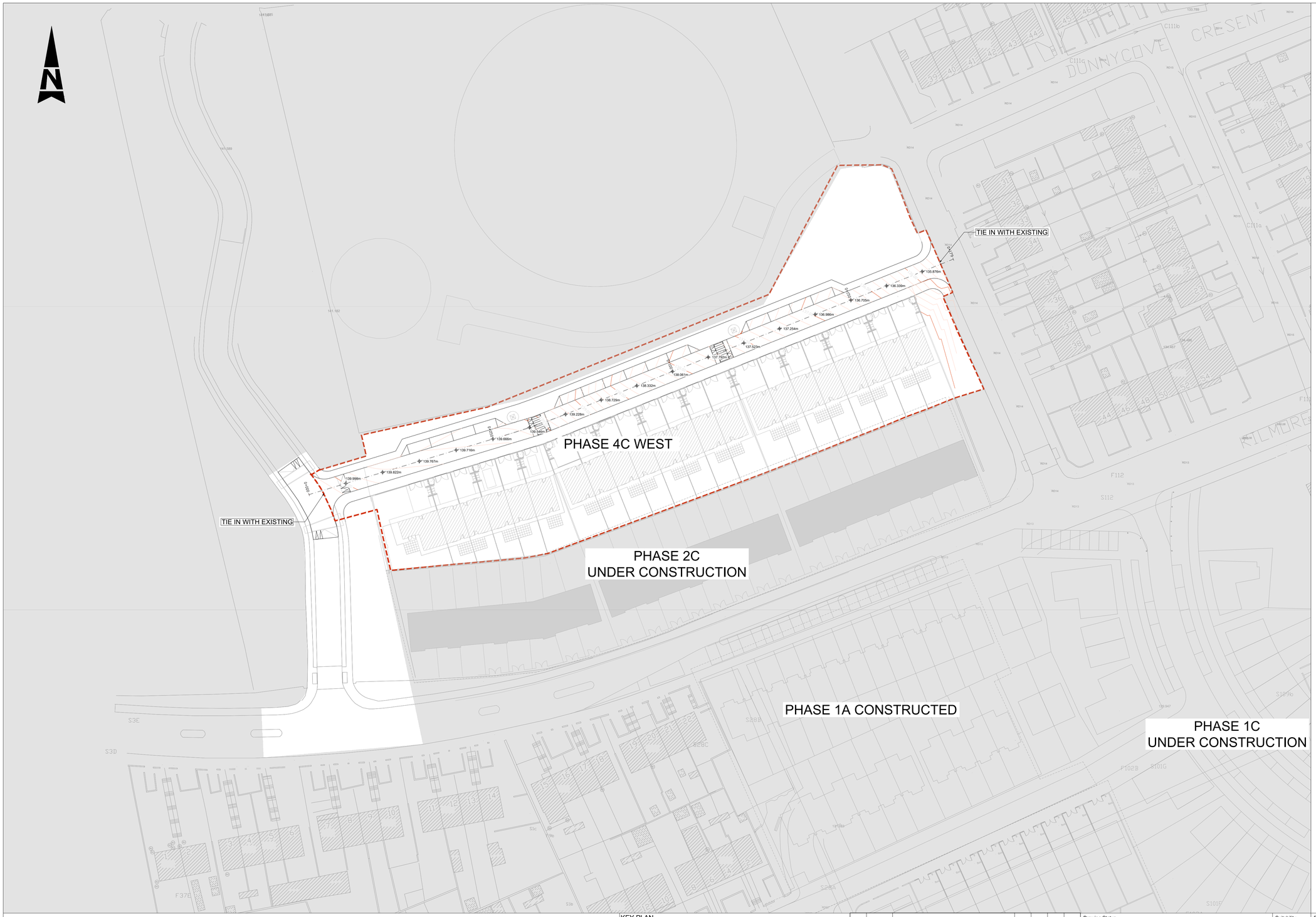
Atkins Project Number: 100125176

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DO NOT SCALE

Millimetres 0 10 100



LEGEND:

- PHASE BOUNDARY
- 125.992m PROPOSED LEVEL
- MAJOR CONTOUR (0.5m INTERVAL)
- MINOR CONTOUR (0.1m INTERVAL)

GENERAL NOTES

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Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING

Suitability: A2

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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED ROAD LEVELS

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size	Date	Date	Date	Date
A1	01.05.26	01.05.26	01.05.26	01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950710 Revision: C01

Atkins Project Number: 100125176

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DO NOT SCALE

Millimetres 0 10 100



LEGEND:

- PHASE BOUNDARY
- JUNCTION SIGHT LINES

GENERAL NOTES

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KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING

Suitability: A2

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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED LAYOUT
JUNCTION SIGHTLINES

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size	Date	Date	Date	Date
A1	01.05.26	01.05.26	01.05.26	01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950740 Revision: C01

Atkins Project Number: 100125176

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DO NOT SCALE

Millimetres 0 10 100



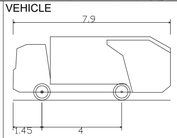
LEGEND:

PHASE BOUNDARY

GENERAL NOTES

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VEHICLE



DB32 Refuse Vehicle

Overall Length	7.900m
Overall Width	2.400m
Overall Body Height	3.183m
Min Body Ground Clearance	0.388m
Max Track Width	2.400m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	9.625m

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING

Suitability: A2

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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED AUTOTRACKING LAYOUT
REFUSE TRUCK

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size: A1	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950751

Revision: C01

Atkins Project Number: 100125176

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Millimetres 0 10 100



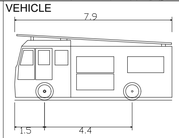
LEGEND:

PHASE BOUNDARY

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VEHICLE



Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING

Suitability: A2

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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED AUTOTRACKING LAYOUT
PUMPING APPLIANCE

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size: A1	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950752

Revision: C01

Atkins Project Number: 100125176

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LEGEND:

PHASE BOUNDARY

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VEHICLE



DB32 Private Car

Overall Length	4.223m
Overall Width	1.715m
Overall Body Height	1.392m
Min Body Ground Clearance	0.233m
Max Track Width	1.629m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.780m

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING

Suitability: A2

AtkinsRéalis
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ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
PROPOSED AUTOTRACKING LAYOUT
PRIVATE CAR

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size: A1	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-950753

Revision: C01

Atkins Project Number: 100125176

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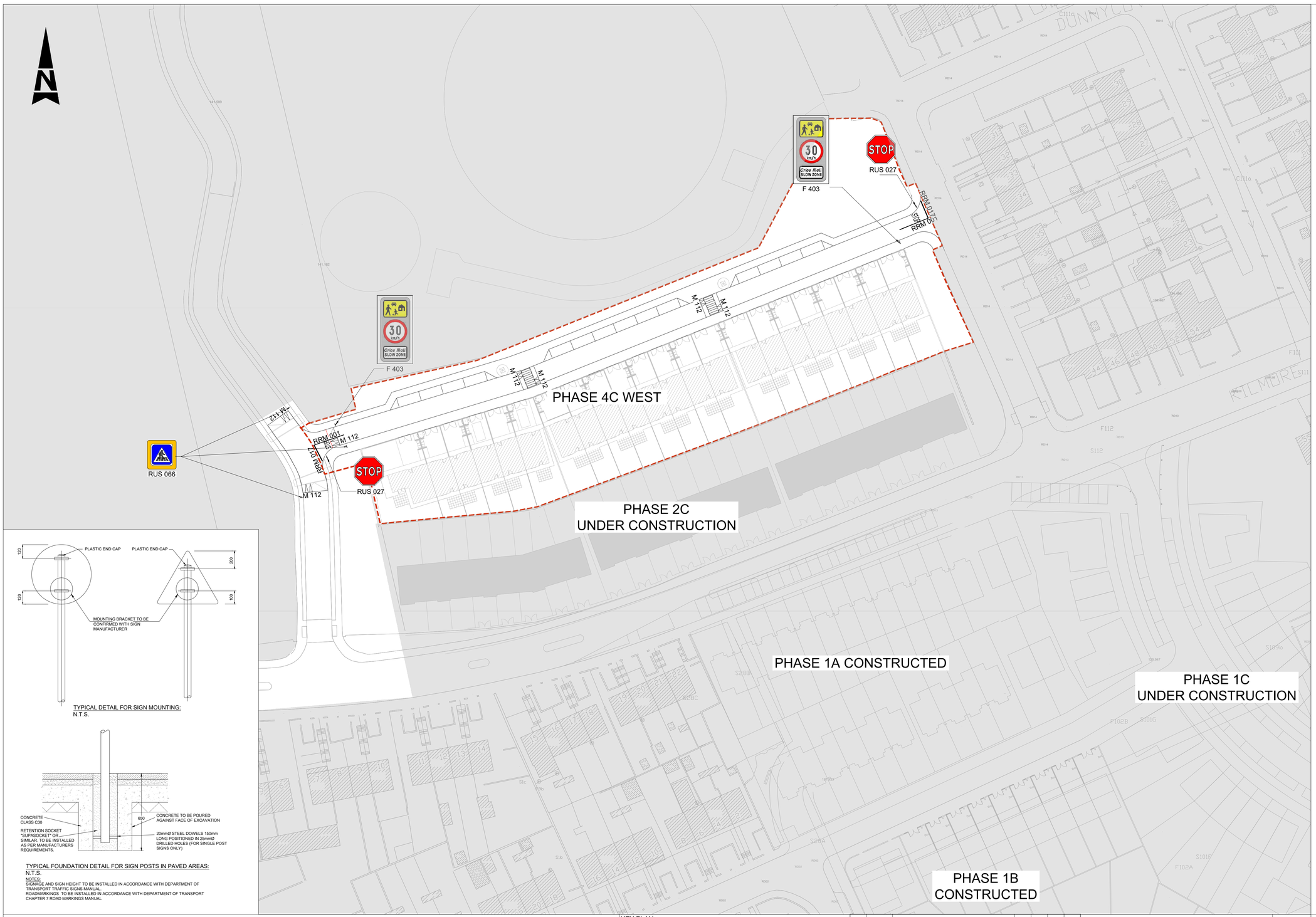
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DO NOT SCALE

Millimetres 0 10 100



TYPICAL DETAIL FOR SIGN MOUNTING:
N.T.S.

TYPICAL FOUNDATION DETAIL FOR SIGN POSTS IN PAVED AREAS:
N.T.S.
NOTES:
SIGNAGE AND SIGN HEIGHT TO BE INSTALLED IN ACCORDANCE WITH DEPARTMENT OF TRANSPORT TRAFFIC SIGNS MANUAL.
ROADMARKINGS TO BE INSTALLED IN ACCORDANCE WITH DEPARTMENT OF TRANSPORT CHAPTER 7 ROAD MARKINGS MANUAL

GENERAL NOTES

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5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST
ROAD SIGNS AND TRAFFIC MARKINGS

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size	Date	Date	Date	Date
A1	13.03.26	13.03.26	13.03.26	13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-951200
Revision: C01

Atkins Project Number: 100119710

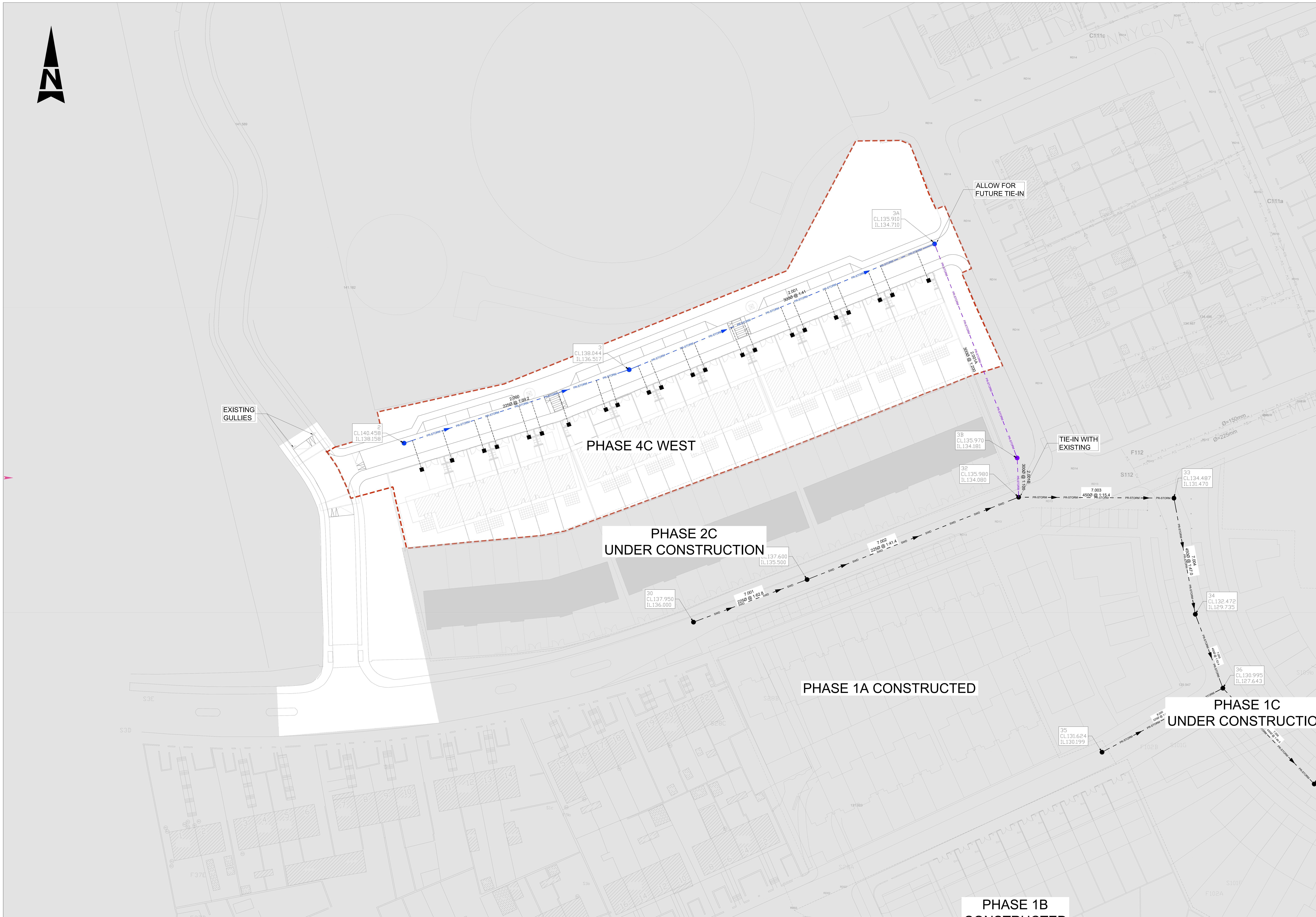
P:\ECKA\datastore\01\251716 Data-Graphics\61 AutoCad\P4CW-ZZZ-ZZZ-DR-ATK-CE-951200.dwg

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CLASSIFICATION - AtkinsRéalis Base Line (Low Risk)

DO NOT SCALE



LEGEND:

	PHASE BOUNDARY LINE
	STORM SEWER & MANHOLE - PROPOSED AS PART OF CURRENT PHASE
	PROPOSED STORM SEWER TO BE ENCASED IN CONCRETE IN LINE WITH IW AND CCC DRAINAGE REQUIREMENTS
	STORM SEWER & MANHOLE - CONSTRUCTED
	STORM SEWER & MANHOLE - TEMPORARY TO BE REMOVED AT FUTURE PHASES
10.016 225Ø @ 1:228.6	PIPE DETAILS SHOWING PIPE NUMBER, DIAMETER AND SLOPE
S15A CL120.275 IL118.850	MANHOLE DETAILS SHOWING MANHOLE NUMBER, COVER LEVEL AND INVERT LEVEL
■	PROPOSED INSPECTION CHAMBER (MAX 7 RISERS PER INSPECTION CHAMBER)
	PROPOSED HOUSE CONNECTIONS 100mmØ
	EXISTING UNDERGROUND UTILITIES

SPECIAL NOTES:

ALL DRAINAGE WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS FOR WASTEWATER NETWORKS DRAWINGS STD-WW-01 TO STD-WW-34 AND IN ACCORDANCE WITH CCC DRAINAGE DEPARTMENT REQUIREMENTS.
ALL DRAINAGE WORKS SHALL COMPLY WITH CORK CITY COUNCIL'S MINIMUM ENGINEERING REQUIREMENTS FOR NEW DEVELOPMENTS.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST PROPOSED STORM WATER DRAINAGE LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size A1	Date 13.03.26	Date 13.03.26	Date 13.03.26	Date 13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-960500
Revision: C01

Atkins Project Number: 100119710

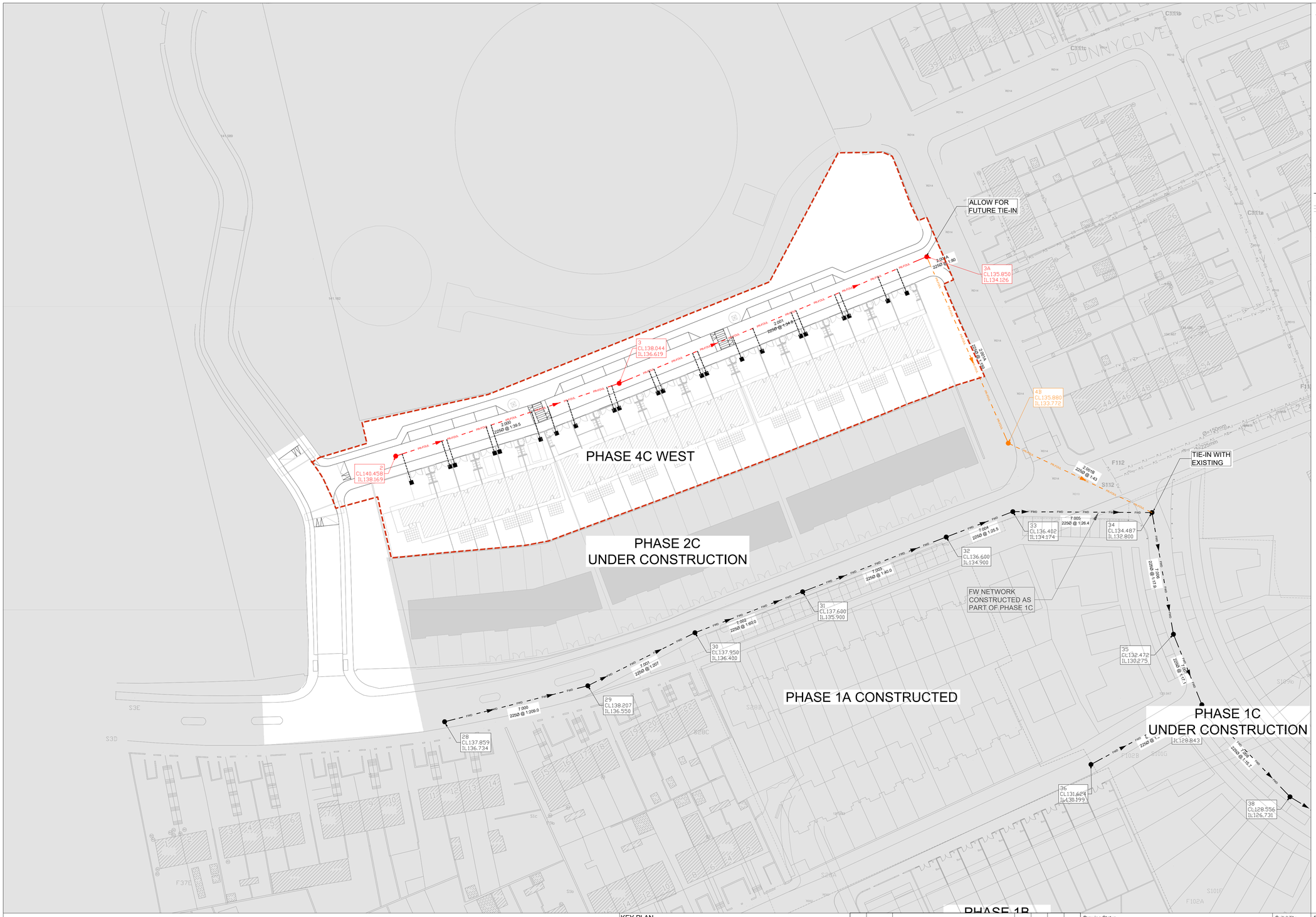
P:\ECKA\datastore\0125176\6 Dwgs-Graphics\61 AutoCad\P4CW-ZZZ-ZZZ-DR-ATK-CE-960500.dwg

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Millimetres 0 10 100



LEGEND:

- PHASE BOUNDARY LINE
- FOUL SEWER & MANHOLE - PROPOSED AS PART OF CURRENT PHASE
- FOUL SEWER & MANHOLE - TEMPORARY CONNECTION - PART OF CURRENT PHASE
- FOUL SEWER & MANHOLE - CONSTRUCTED
- 10.016 225Ø @ 1:228.6 — PROPOSED PIPE DETAILS SHOWING PIPE NUMBER, DIAMETER AND SLOPE PROPOSED
- S15A CL120.275 IL118.850 — PROPOSED MANHOLE DETAILS SHOWING MANHOLE NUMBER, COVER LEVEL AND INVERT LEVEL
- PROPOSED INSPECTION CHAMBER (MAX 7 RISERS PER INSPECTION CHAMBER)
- PROPOSED HOUSE CONNECTIONS 100mmØ
- EXISTING UNDERGROUND UTILITIES

SPECIAL NOTES:

ALL DRAINAGE WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS FOR WASTEWATER NETWORKS DRAWINGS STD-WW-01 TO STD-WW-40 AND IN ACCORDANCE WITH CCC DRAINAGE DEPARTMENT REQUIREMENTS.
ALL DRAINAGE WORKS SHALL COMPLY WITH CORK CITY COUNCIL'S MINIMUM ENGINEERING REQUIREMENTS FOR NEW DEVELOPMENTS.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
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4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
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Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST PROPOSED FOUL WATER DRAINAGE LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size	Date	Date	Date	Date
A1	13.03.26	13.03.26	13.03.26	13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-960520
Revision: C01

Atkins Project Number: 100119710

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Millimetres 0 10 100



LEGEND:

- PHASE BOUNDARY
- PERMEABLE PARKING SPACES
- BIORETENTION RAINGARDEN
- RESIDENTIAL GRASSED AREA
- PERMEABLE LANDSCAPING
- SUDS TREEPIT

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
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KEY PLAN

Rev.	Date	Description	By	Rev'd	Chk'd	App'd
C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	ROD	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST SUDS LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	ROD	MOS
Original Size: A1	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26	Date: 01.05.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-960580
Revision: C01

Atkins Project Number: 100125176

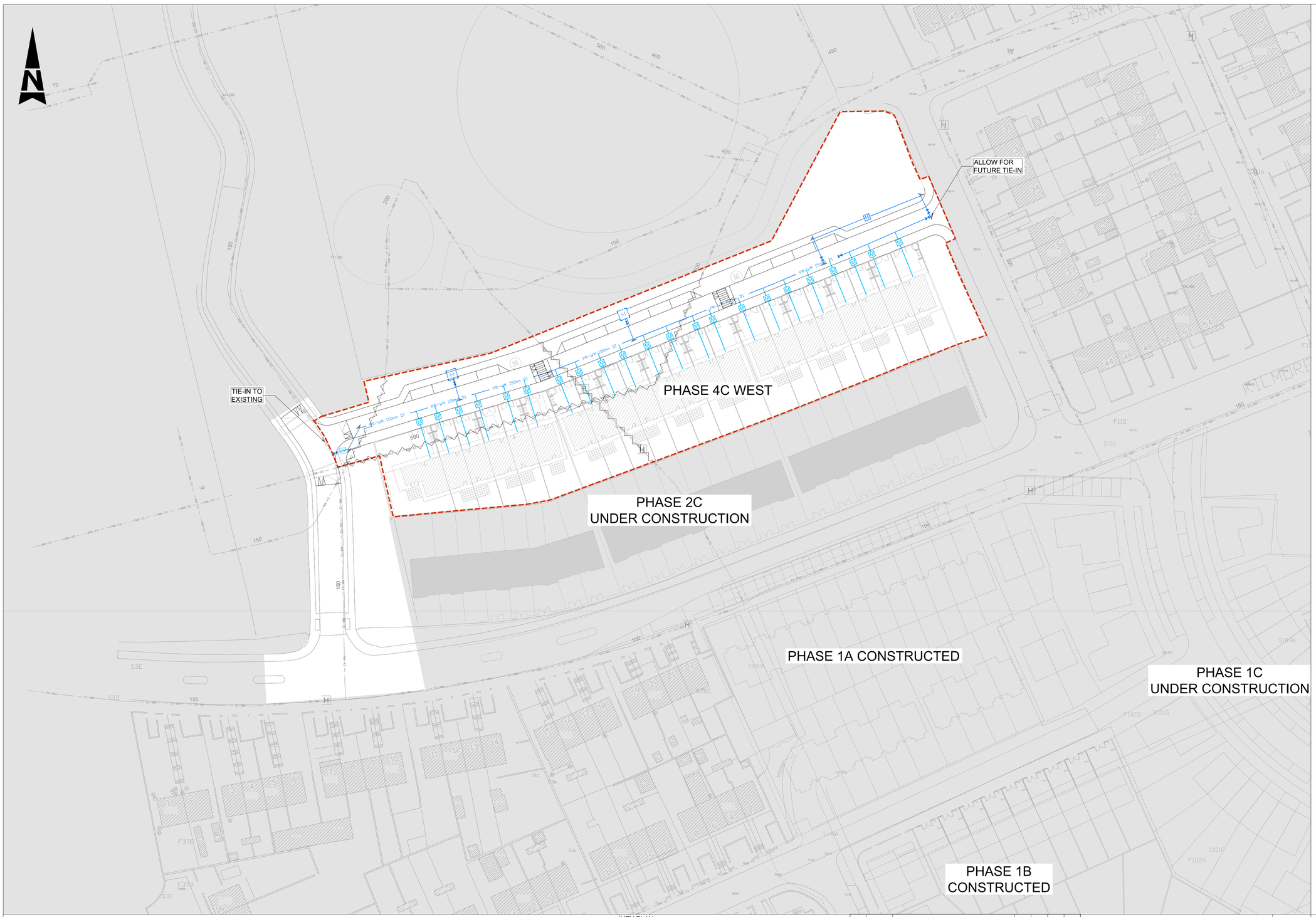
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Millimetres 0 10 100



LEGEND:

- SITE BOUNDARY LINE
- PROPOSED Ø150mm DI WATERMAIN
- PROPOSED SLUICE VALVE
- PROPOSED HYDRANT
- PROPOSED METER
- EXISTING WATERMAIN PIPE
- EXISTING WATER VALVE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- PROPOSED BULK METER
- EXISTING WATERMAIN PIPE TO BE REMOVED RQUIRED DIVERSIONS IN CCC SCOPE. DIVERSION TO BE KEPT OUTSIDE REDLINE BOUNDARY OF SITE

SPECIAL NOTES:

ALL WATERMAINS WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS FOR WATER NETWORKS DRAWINGS STD-W-01 TO STD-W-37.
ALL WATERMAINS WORKS SHALL COMPLY WITH CORK CITY COUNCIL'S MINIMUM ENGINEERING REQUIREMENTS FOR NEW DEVELOPMENTS. SUCH REQUIREMENTS INCLUDE (BUT ARE NOT EXCLUSIVE TO); ALL VALVE TO BE ANTICLOCKWISE CLOSING, ALL FITTINGS TO BE PUSH FIT, SLUICE VALVES SHALL BE PLACED ON ALL BRANCHES INCLUDING HYDRANTS, ALL ROAD AND FOOTWAY WATER FITTING COVERS SHALL BE MARKED TO INDICATE WHAT IS UNDERNEATH, MARKER PLATES SHALL BE INSTALLED FOR ALL EXISTING AND NEW WATER MAIN FITTINGS ON OR ADJOINING THE SITE TO THE SATISFACTION OF CCC WATER DEPARTMENT.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
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C01	30.09.26	ISSUED FOR PLANNING	KE	PP	MB	MOS
C00	06.08.26	ISSUED FOR PLANNING	KE	PP	MB	MOS

Drawing Status: FOR PLANNING
Suitability: A2

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Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: CORK CITY COUNCIL

Project Title: CNWQR - PHASE 4C WEST

Drawing Title: PHASE 4C WEST WATERMAIN LAYOUT

Scale	Drawn	Checked	Reviewed	Authorised
1:500	KE	PP	MB	MOS
Original Size: A1	Date: 13.03.26	Date: 13.03.26	Date: 13.03.26	Date: 13.03.26

Drawing Number: P4CW-ZZZ-ZZZ-DR-ATK-CE-962700
Revision: C01

Atkins Project Number: 100119710

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Appendix D.Stage 1 Road Safety Audit

AtkinsRéalis

Stage 1 Road Safety Audit (RSA)

Cork City Council

14 May 2026

PW4CW-XXX-XXX-RP-ATK-XX-000003

CNWQR - PHASE 4C WEST

Notice

This document and its contents have been prepared and are intended solely as information for Cork City Council and use in relation to CNWQR - Phase 4C West Stage 1 Road Safety Audit

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This document has 18 pages including the cover.

Document history

Document title: Stage 1 Road Safety Audit (RSA)

Document reference: PW4CW-XXX-XXX-RP-ATK-XX-000003

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	Final Report	EON	KB	EON	KB	25/06/2026

Client signoff

Client	Cork City Council
Project	CNWQR - PHASE 4C West
Job number	100125176
Client signature/date	

Contents

1. Introduction 5

1.1 Background 5

1.2 Site Inspection 6

1.3 The Team 6

1.4 Observers 6

1.5 Documents Provided to the Audit Team 6

1.6 Previous Audits 6

1.7 Road Safety Audit Compliance 6

1.7.1 Procedure and Scope 6

1.7.2 Compliance with Design Standards 7

1.7.3 Minimising Risk of Collision Occurrence 7

1.8 Road Safety Collision Analysis 7

2. Road Safety Issues Identified 8

2.1 Problem: Visibility at Junction with Dunmore Gardens 8

2.2 Problem: Visibility at Junction with Meadow Avenue 9

2.3 Problem: Location of Proposed Signage 10

2.4 Problem: Straight Alignment 11

3. Audit Team Statement 12

3.1 Certification 12

3.2 Sole Purpose 12

3.3 Implementation of RSA Recommendations 12

3.4 Audit Team's Independence to the Design Process 12

3.5 Road Safety Audit Team Sign-Off 12

4. Designer's Response 13

4.1 Preparing a Response to the Road Safety Audit 13

4.2 Returning the Feedback Form 13

4.3 Triggering the Need for an Exception Report 13

Appendix A. Auditor Approval 15

A.1 Audit Team Leader 15

A.2 Team Member 16

Appendix B. Road Safety Audit Feedback Form 17

Tables

Table 1-1 - Drawing List 6

Table 1-2 - Document List 6

Figures

Figure 1-1 - Site Location 5

Figure 1-2 - Road Safety Authority (RSA) Recorded Collision Statistics within 250m of the site 7

Figure 2-1 - Proposed access to Phase 4C from Dunmore Gardens 8

Figure 2-2 - Proposed Junction Location and Existing Alignment of Meadow Avenue 9

Figure 2-3 - Existing Landscaping on Meadow Avenue at Proposed Junction Location 9

Figure 2-4 - Layout of Proposed Parking for Phase 4CW 9

Figure 2-5 - Proposed Signage for Phase 4CW 10

1. Introduction

1.1 Background

This report describes the findings of a Stage 1 Road Safety Audit associated with the proposed Cork City Northwest Quarter Regeneration Programme Phase 4C Cork.

The scheme involves the provision of major, multi-unit housing and urban regeneration project in the Knocknaheeny and Hollyhill areas of Cork City, Ireland. This project involves the demolition of existing houses and the construction of over 600 new homes, along with social, economic, and environmental interventions. Phases 4C is part of the phased future development plans within this scheme.

The proposed extent of Phase 4C is shown in Figure 1-1 along with the status of the other phases that are planned, at design or construction stage or completed.

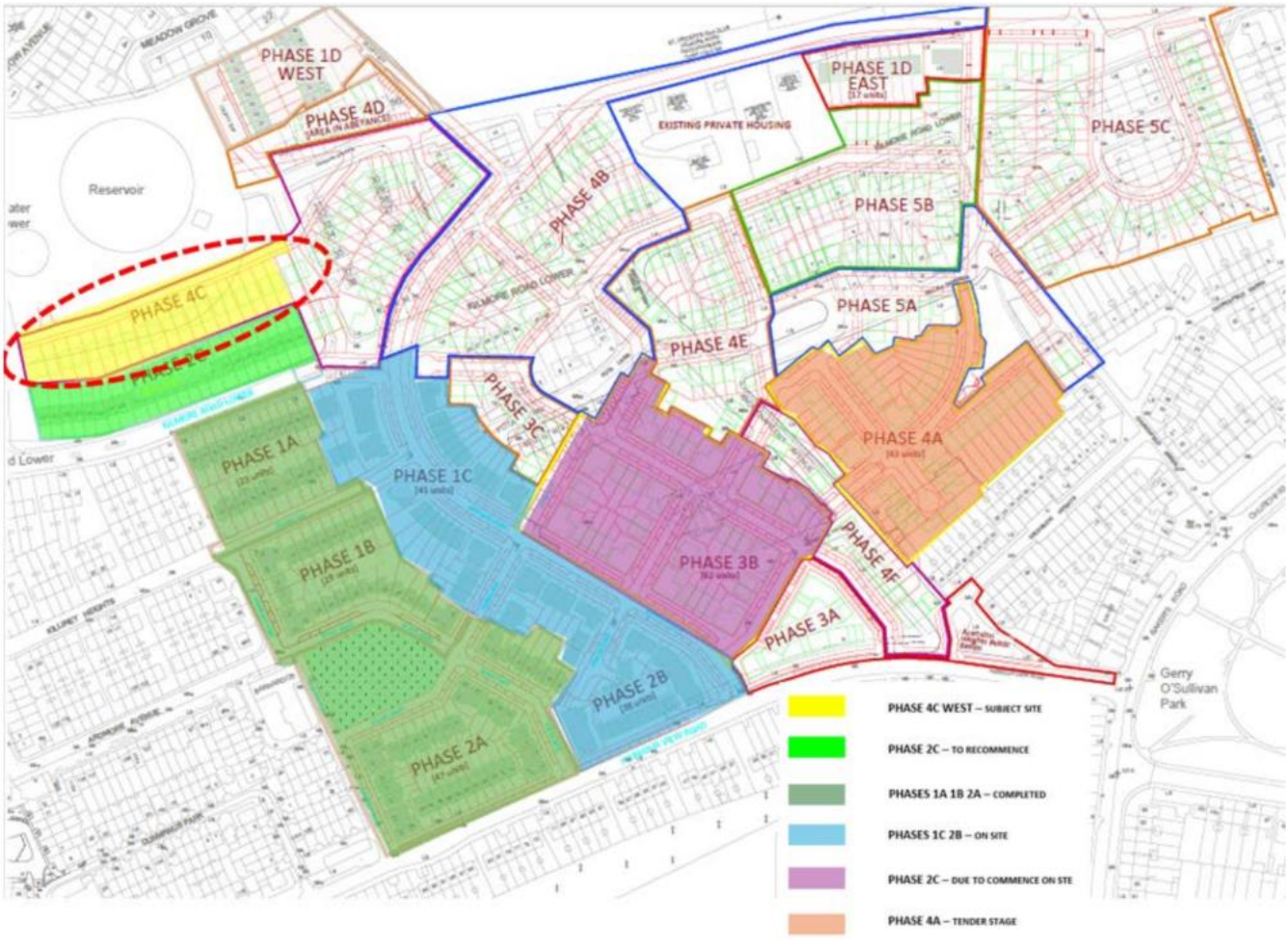


Figure 1-1 - Site Location

This Stage 1 Road Safety Audit was completed in May 2026 by an independent TII approved road safety team from within AtkinsRéalis and on behalf of Cork City Council.

1.2 Site Inspection

A site inspection was undertaken on the afternoon of the 1st of May 2026. The weather conditions at the time of the site inspection were dry and sunny.

1.3 The Team

The Road Safety Audit Team members were as follows:

Team Leader: Eileen O'Neill PCert (RSA) CEng MIEI

Team Member: Keith Barry BE (Hons) PCert (RSA) CEng FIEI

A copy of the TII auditor approval documentation for the audit team is included in Appendix A of this Report.

1.4 Observers

None

1.5 Documents Provided to the Audit Team

The following planning application drawings were examined as part of the Stage 1 Road Safety Audit Process:

Table 1-1 - Drawing List

Drawing No.	Drawing Title	Revision
P4CW-ZZZ-ZZZ-DR-ATK-CE-950700	PHASE 4C WEST PROPOSED ROAD PAVEMENT LAYOUT	P00
P4CW-ZZZ-ZZZ-DR-ATK-CE-951200	PHASE 4C WEST ROAD SIGNS AND TRAFFIC MARKINGS	P00

Table 1-2 - Document List

Document No.	Document Title	Revision
	Description of Services Project Brief – April 2025	

1.6 Previous Audits

There have been no previous road safety audits carried out on Phases 4C.

1.7 Road Safety Audit Compliance

1.7.1 Procedure and Scope

This Road Safety Audit has been carried out in accordance with the procedures and scope set out in TII publication number GE-STY-01024 – Road Safety Audit.

As part of the road safety audit process, the Audit Team have examined only those issues within the design which relate directly to road safety.

1.7.2 Compliance with Design Standards

The road safety audit process is not a design check, therefore verification or compliance with design standards has not formed part of the audit process.

1.7.3 Minimising Risk of Collision Occurrence

All problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise the risk of collision occurrence.

1.8 Road Safety Collision Analysis

The existing collision statistical information provided on the Road Safety Authority web site for the years 2020 to 2024 were analysed at this site location. The RSA site indicates that in the five years analysed by the audit team only one collision occurred close to the site. This collision involved a cyclist in June during the hours of 20.00 to 23.59 with no other information provided.

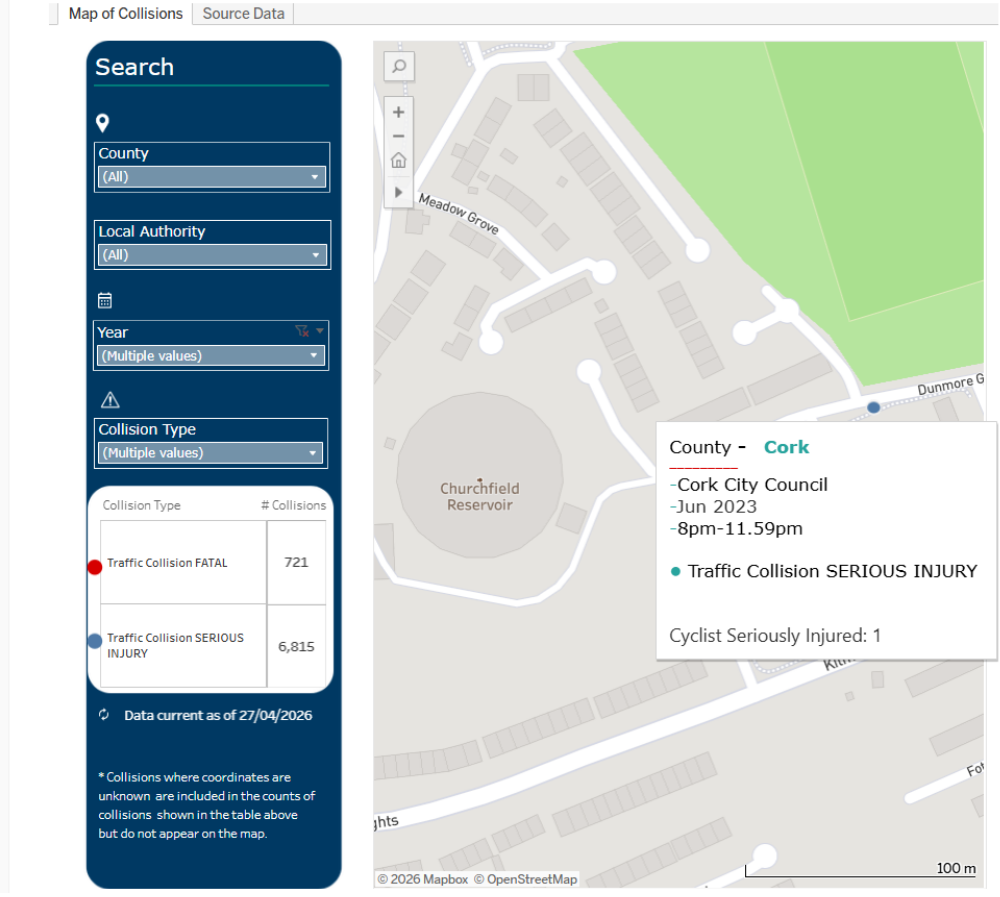


Figure 1-2 - Road Safety Authority (RSA) Recorded Collision Statistics within 250m of the site

Based on this information there is not an issue with collisions involving VRUs within 250m of the site with only one incident recorded in five years and no other types of collisions recorded.

2. Road Safety Issues Identified

2.1 Problem: Visibility at Junction with Dunmore Gardens

Location: Dunmore Gardens - Eastern side of Phase 4C

The proposed Phase 4C residential development includes a proposed junction with Dunmore Gardens. The audit team note that at this location it is close to the entrance to the water tower and a 90-degree bend on Dunmore Gardens to the north and the junction with Kilmore Road to the south and insufficient visibility at a junction may result in pedestrian/cycle/vehicle type collisions.

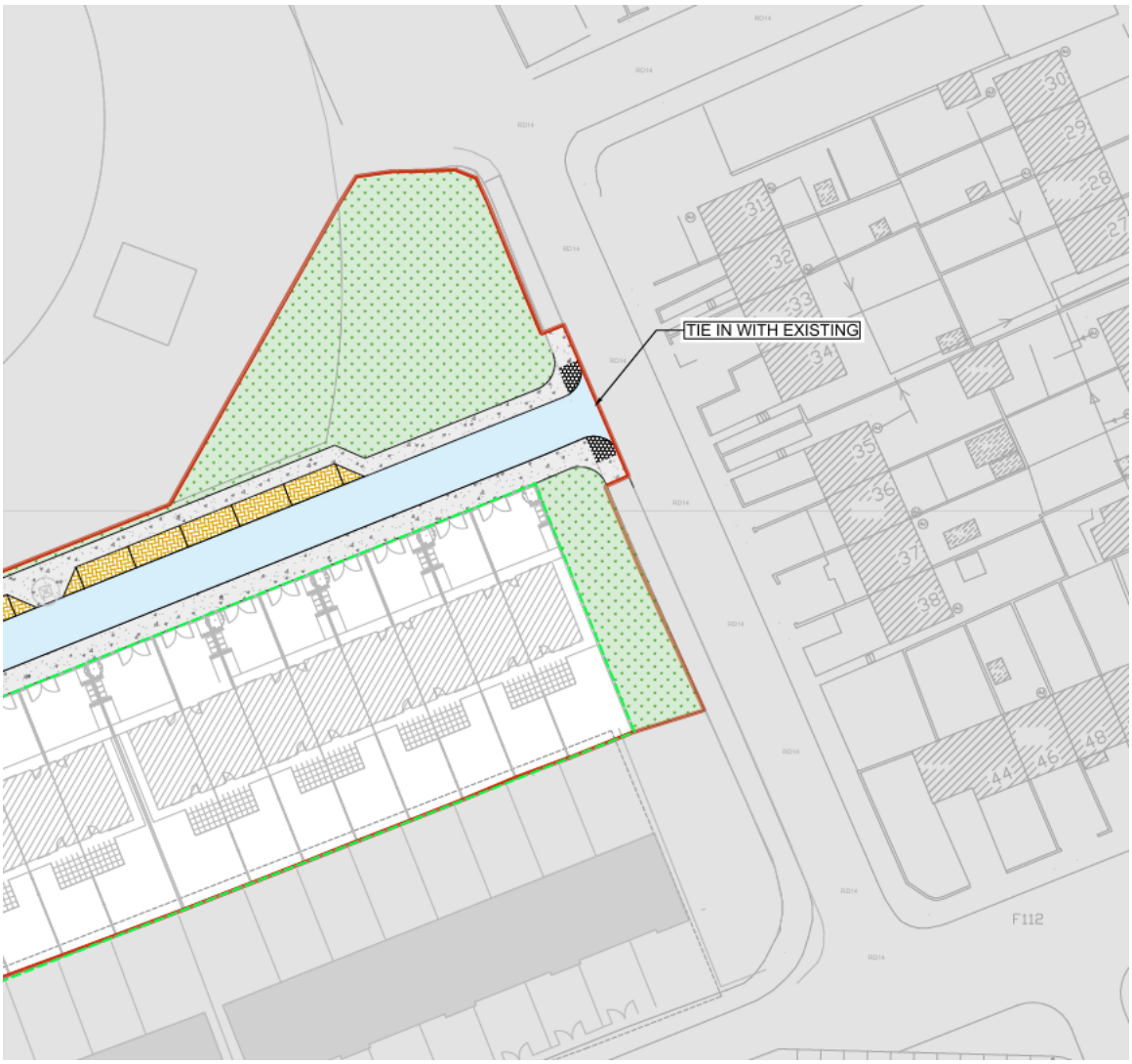


Figure 2-1 - Proposed access to Phase 4C from Dunmore Gardens

Recommendation

Road Safety Audit Team recommends that the design team ensure adequate visibility is provided at this junction.

2.2 Problem: Visibility at Junction with Meadow Avenue

Location: Meadow Avenue - Western side of Phase 4C

The proposed Phase 4C residential development includes a proposed junction with Meadow Avenue. The audit team note that the alignment of Meadow venue is not straight and the presence of existing landscaping which may impact visibility at this proposed junction. Insufficient visibility at a junction may result in pedestrian/cycle/vehicle type collisions.

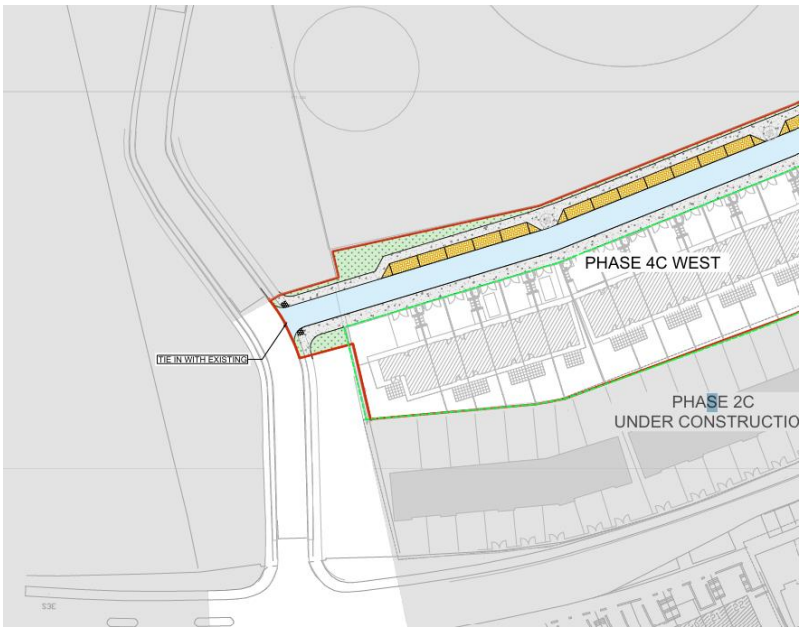


Figure 2-2 - Proposed Junction Location and Existing Alignment of Meadow Avenue



Figure 2-3 - Existing Landscaping on Meadow Avenue at Proposed Junction Location

Recommendation

Road Safety Audit Team recommends that the design team ensure adequate visibility is provided at this junction.

2.3 Problem: Location of Proposed Signage

Location: Along Phase 4CW

The proposed Phase 4C warning and regulatory signage is located within the footpath with no clear mounting height provided. Poles within the footpath may reduce the residual width for pedestrians and in particular VRUs and the height has to be sufficient for pedestrians. The positioning and height of the signs may result in pedestrian stepping into the carriageway and pedestrian/vehicle type collisions occurring.

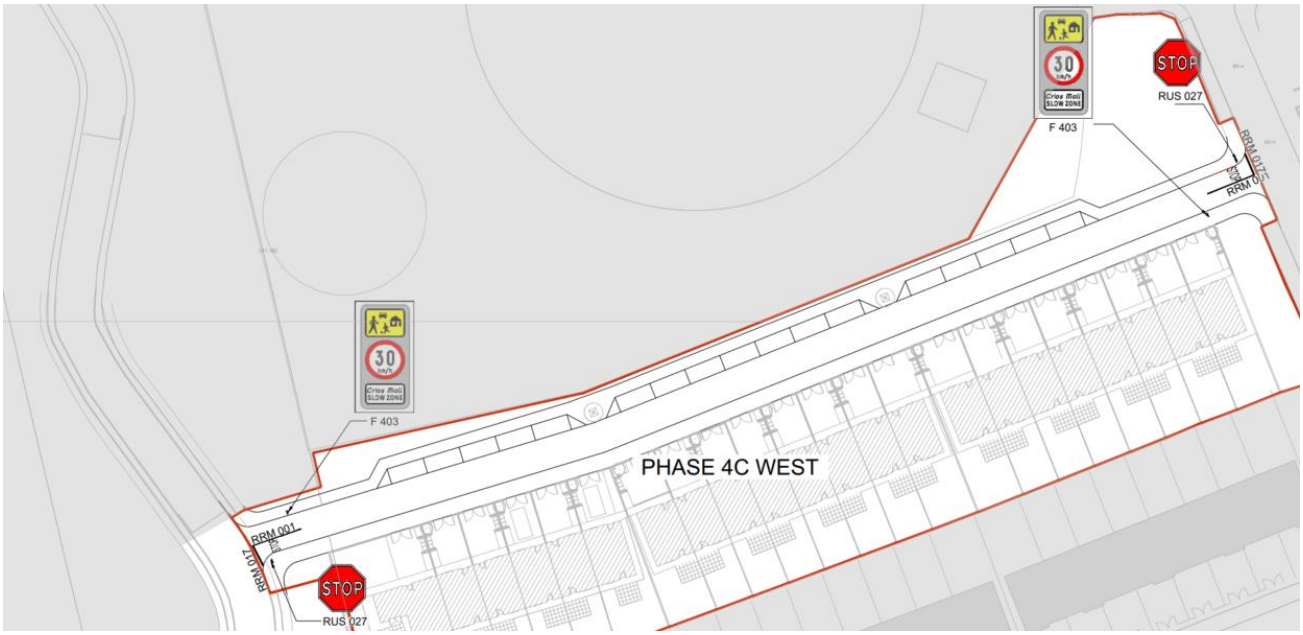


Figure 2-4 - Proposed Signage for Phase 4CW

Recommendation

Road Safety Audit Team recommends that the design team reviews the positioning of the signage to ensure the best location is provided to maximise residual space for pedestrians. The design team should consider the use of 'H' Frames for large multi-post signs and cranked poles for single pole signs.

2.4 Problem: Straight Alignment

Location: Along Phase 4CW

The proposed road through Phase 4C West development is straight and could encourage unsuitably high vehicle speeds through the development. This put s vulnerable road users and residents at increased risk of collision with passing vehicles. It is noted that adjacent roads in the vicinity have used speed reduction measures such as ramps and table-tops at junctions



Figure 2-5 – Road alignment through Phase 4CW

Recommendation

Road Safety Audit Team recommends that the design team considers speed control measures which are consistent with other roads in the CNWQR developments.

3. Audit Team Statement

3.1 Certification

We certify that we have examined the drawings and documents listed in Chapter 1 of this Report.

3.2 Sole Purpose

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design which could be removed or modified in order to improve the road safety aspects of the scheme.

3.3 Implementation of RSA Recommendations

The problems identified herein have been noted in the Report together with their associated recommendations for road safety improvements. We (the Audit Team) propose that these recommendations should be studied with a view to implementation.

3.4 Audit Team's Independence to the Design Process

No member of the Audit Team has been otherwise involved with the design of the measures audited.

3.5 Road Safety Audit Team Sign-Off

Eileen O'Neill
Audit Team Leader
Road Safety Engineering Team
AtkinsRéalis

Signed: 

Date: 14/05/2026

Keith Barry
Audit Team Member
Road Safety Engineering Team
AtkinsRéalis

Signed: 

Date: 15/05/2026

4. Designer's Response

4.1 Preparing a Response to the Road Safety Audit

The Designer should prepare an Audit Response for each of the recommendations using the Road Safety Audit Feedback Form attached in Appendix B.

When completed, this form should be signed by the Designer and returned to the Audit Team.

4.2 Returning the Feedback Form

Please return the completed Road Safety Audit Feedback Form attached in Appendix B of this Report to the following email or postal address:

Email address: Eileen.ONeill@atkinsrealis.com

Postal address: Road Safety Engineering Team

AtkinsRéalis

Unit 2B 2200,

Cork Airport Business Park,

Co. Cork

T12 R279

Tel.: +353 21 429 0317

The Audit Team will consider the Designers response and reply indicating acceptance or otherwise of the Designers response to each recommendation.

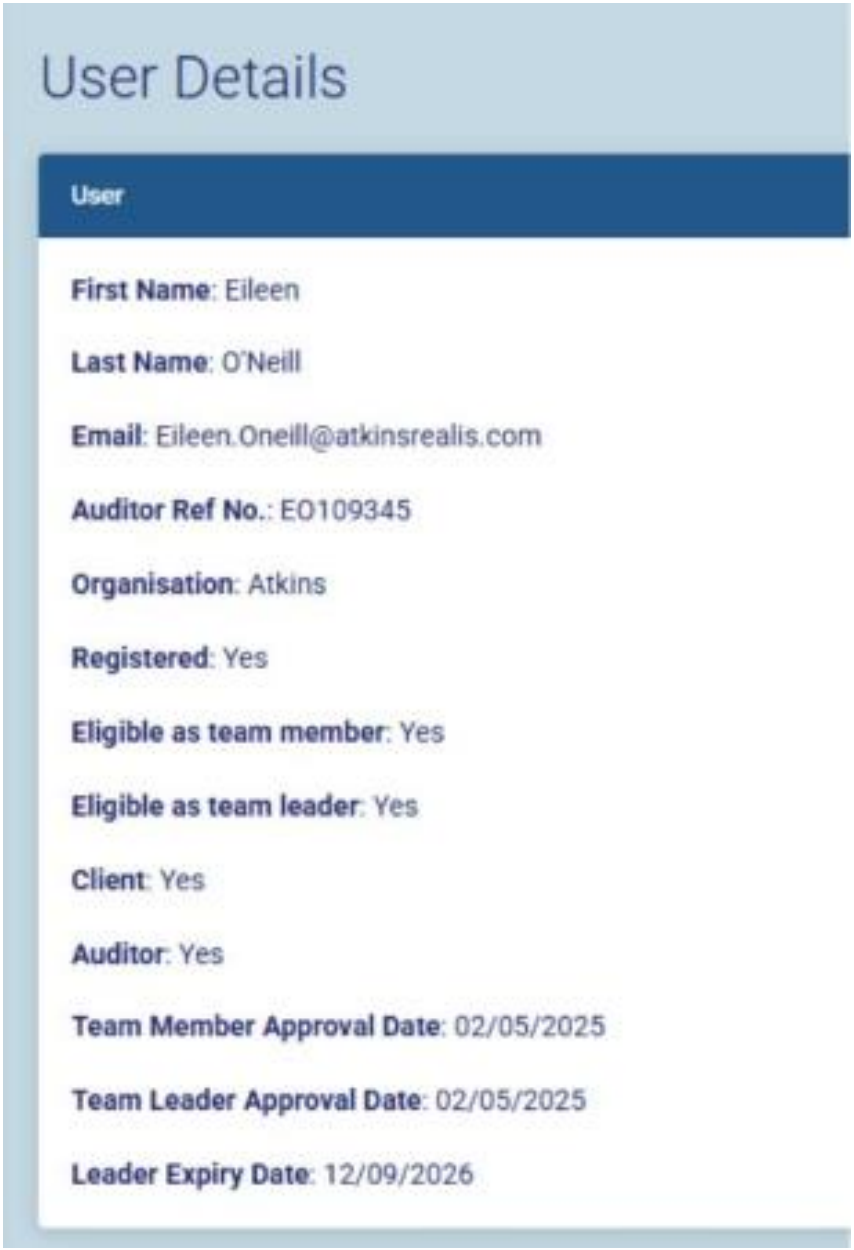
4.3 Triggering the Need for an Exception Report

Where the Designer and the Audit Team cannot agree on an appropriate means of addressing an underlying safety issue identified as part of the audit process, an Exception Report must be prepared by the Designer on each disputed item listed in the Audit Report.

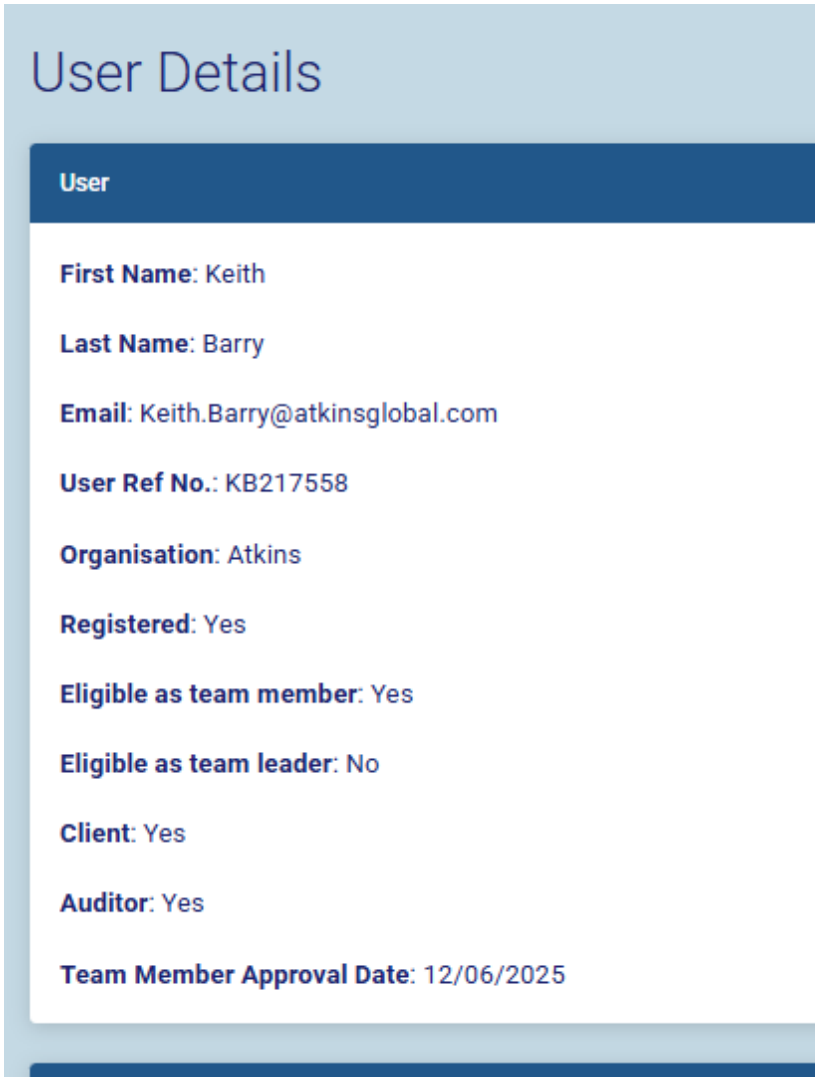
APPENDICES

Appendix A. Auditor Approval

A.1 Audit Team Leader



A.2 Team Member



Appendix B. Road Safety Audit Feedback Form

Scheme: CNWQR - Phase 4CW

Audit Stage: Stage 1 Road Safety Audit

Date Audit Completed: 23/06/2026

	To be completed by the Designer			To be completed by the Audit Team
Paragraph No. in Safety Audit Report	**Problem accepted (yes/no)**	**Recommended measure accepted (yes/no)**	**Alternative measures (describe)**	**Alternative Measures accepted by Auditors (yes/no)**
2.1	Yes	Yes		
2.2	Yes	Yes		
2.3	Yes	Yes		
2.4	Yes	Yes		

Signed by the Designer:  **Date: 24.06.2026**

Signed by the Audit Team Leader:  **Date: 24.06.2026**

Signed by the Client: **Date:**

AtkinsRéalis

Eileen O Neill
AtkinsRéalis Ireland Limited
Unit 2B
2200 Cork Airport Business Park
Cork
T12 R279

<contact info>

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Appendix E. Public Lighting Report

DATE:	**20 March 2026**
DESIGNER:	**AJ**
PROJECT No:	**100125176**
PROJECT NAME:	**CNWQR Cork Housing Estate P4C WEST**

LIGHTING REALITY

- Primary streets roads are designed in accordance with EN13201-2:2015 to category P2.
- Secondary streets roads are designed in accordance with EN13201-2:2015 to category P3.
- Footpaths are designed in accordance with EN13201-2:2015 to minimum category P4.

Maintenance factor 0.88.

Outdoor Lighting Report

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	564219.51	571991.38	253.23	175.89	1.50	1.49
2	Grid 2	564266.71	572047.41	171.38	21.02	1.49	1.40
3	Grid 3	564278.01	572019.39	170.15	28.92	1.49	1.45

Luminaires



Luminaire A Data

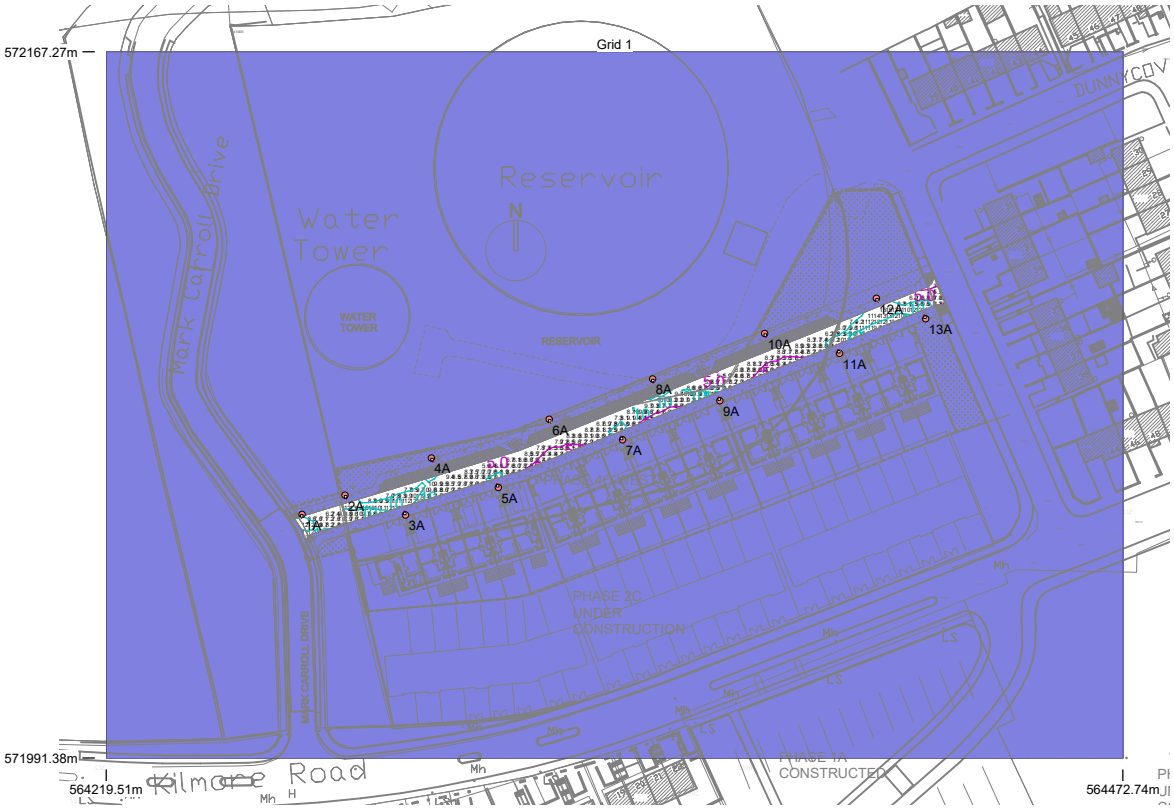
Supplier	C U Phosco
Type	E950-28-P6A-730-SD0275-13W
Lamp(s)	730SA
Lamp Flux (klm)	1.64
File Name	E950-28-P6A-730-SD0275-13W.ies
Maintenance Factor	0.88
Imax70,80,90(cd/klm)	803.0, 171.3, 0.0
No. in Project	13

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	564268.32	572052.11	6.00	258.00	0.00	0.00	0.40			
2	A	564279.00	572056.89	6.00	285.00	0.00	0.00	0.40			
3	A	564294.02	572051.93	6.00	105.00	0.00	0.00	0.40			
4	A	564300.49	572066.10	6.00	293.00	0.00	0.00	0.40			
5	A	564317.16	572058.82	6.00	113.00	0.00	0.00	0.40			
6	A	564329.86	572075.74	6.00	293.00	0.00	0.00	0.40			
7	A	564348.04	572070.65	6.00	117.00	0.00	0.00	0.40			
8	A	564355.59	572085.78	6.00	285.00	0.00	0.00	0.40			
9	A	564372.32	572080.40	6.00	110.00	0.00	0.00	0.40			
10	A	564383.51	572097.12	6.00	293.00	0.00	0.00	0.40			
11	A	564402.11	572092.21	6.00	111.00	0.00	0.00	0.40			
12	A	564411.31	572105.89	6.00	291.00	0.00	0.00	0.40			
13	A	564423.54	572100.81	6.00	112.00	0.00	0.00	0.40			

Horizontal Illuminance (lux)

Grid 1



Results

Eav	8.30
Emin	2.87
Emax	14.62
Emin/Emax	0.20
Emin/Eav	0.35

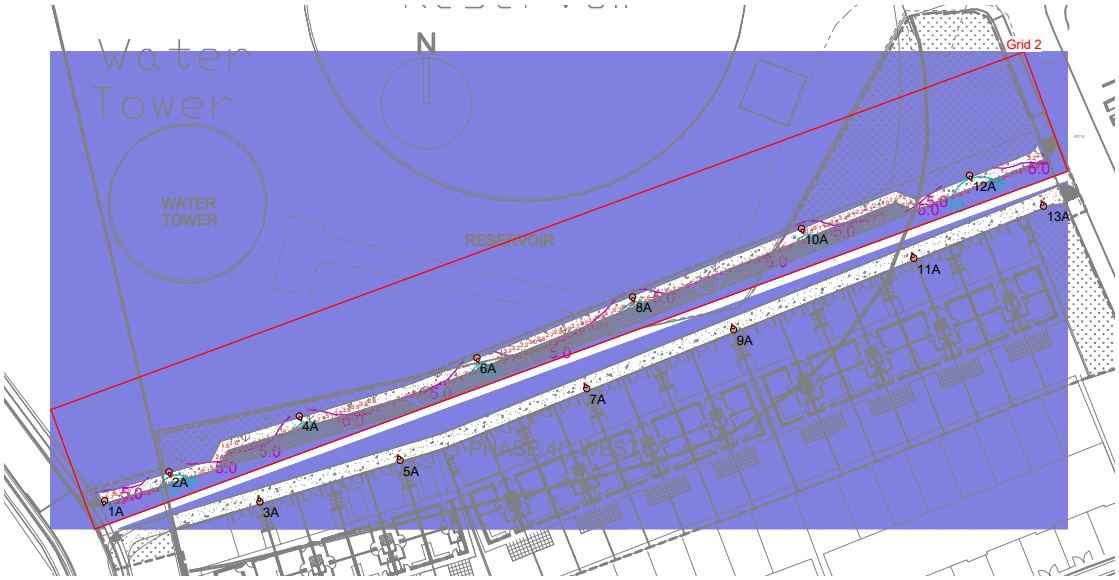
DATE: 20 March 2026 DESIGNER: AJ

PROJECT No: 100125176 PROJECT NAME: CNWQR Cork Housing Estate P4C

LIGHTING REALITY

Horizontal Illuminance (lux)

Grid 2



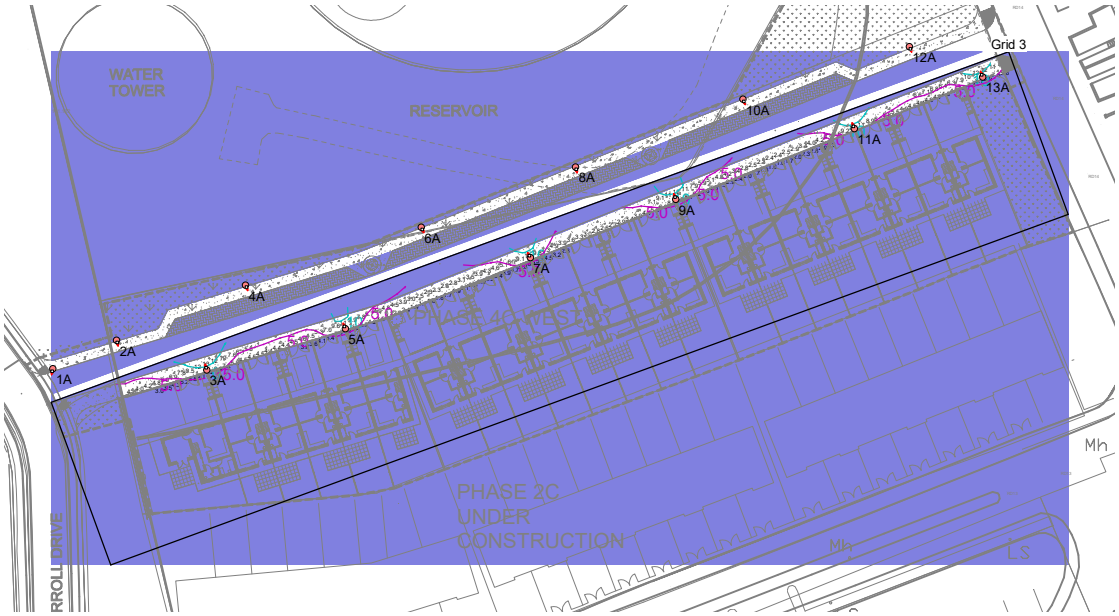
Results

Eav	5.03
Emin	1.54
Emax	13.17
Emin/Emax	0.12
Emin/Eav	0.31

9196933615

Horizontal Illuminance (lux)

Grid 3



Results

Eav	5.33
Emin	1.55
Emax	12.91
Emin/Emax	0.12
Emin/Eav	0.29

9196933615

Appendix F. Design report & Energy Statement (Part L Requirement)

AtkinsRéalis

Mechanical & Electrical
Part 8 Planning Report
Cork City Council

CORK NORTHWEST REGENERATION; PHASE 4C WEST

MEP Engineering Report & Energy Statement (Part L Requirement)

Cork City Council

07 August 2026

22 Units Housing Development & Associated Works

Notice

This document and its contents have been prepared and are intended solely as information for Cork City Council and use in relation to the project Cork northwest Regeneration Phase 4C West.

AtkinsRéalis Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 20 pages including the cover.

Document history

Document title: Mechanical & Electrical Part 8 Planning Report

Document reference: P4CW-ZZZ-XXX-RP-ATK-EE-000002

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
P00	Part 8 Planning	AM	MB	GK	MOS	07/08/26

Client signoff

Client	Cork City Council
Project	Cork Northwest Regeneration; Phase 4C West
Job number	100125176
Client signature/date	

Contents

1. Public Lighting Design 4

1.1 Public Lighting Design Standards 4

1.2 Health & Safety 4

1.3 General Public Lighting Design Requirement 5

1.3.1 Obtrusive Lighting 6

1.4 Lighting Classes 6

1.4.1 The Residential Areas 6

1.4.2 Car Parks 6

1.4.3 Pedestrian Crossings 6

1.4.4 Cycleways 6

1.5 Trees & Arboriculture 7

1.6 Public Lighting Layout 7

1.7 Access Chambers 7

2. Existing Utility Infrastructure 8

2.1 Identification of Utilities 8

3. Proposed Utilities 8

3.1 Standards 8

3.2 Electrical Infrastructure Preliminary Information (Phase 4C West) 9

3.2.1 Primary Electrical Services 9

3.3 Gas Infrastructure (Phase 4C West) 10

3.3.1 Standards 10

3.3.2 Preliminary Total Estimated Gas Load 10

3.3.3 Meter Strategy 10

4. Energy Statement/Nearly Zero Energy Building (NZEB) 11

4.1 Energy Statement 11

4.2 E-Car Charging Provision 12

5. Outdoor lighting report 14

1. Public Lighting Design

This section outlines the proposed public lighting schemes for the proposed residential housing development for City Northwest Quarter Regeneration (CNWQR) Phase 4C West.
The public lighting system will be a very high quality, energy efficiency and future proofed road lighting for housing development in compliance with Cork City Council (CCC) requirements.

1.1 Public Lighting Design Standards

Each category of roads, footpath, cycle track of the site development will be designed to its own specific requirements, illuminance level and uniformity to meet the lighting class for each area. All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of:

- BS EN 13201 part 2 – Road Lighting Performance requirements.
- BS EN 13201 Part 3 – Road Lighting Details calculation of performance.
- BS EN 13201 Part 4 – Details methods of measuring light performance.
- The Current British Standards for Road Lighting are BS 5489 and BS EN 13201.
- Cork City Council Exterior Lighting Design Requirement
- BS EN 60529 - Specification for Degrees of Protection for enclosures.
- BS EN 60598-2-3 - Luminaires for Road and Street Lighting.
- BS 5489 -1 - Code of Practice for the design of road lighting.
- BS EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.
- IS EN 40-1 – Lighting Columns (Definitions and terms).
- IS EN 40-2- Lighting Columns (General requirements and dimensions).
- IS EN 40-3 - Lighting Columns (Design and verification and Verification by testing).
- IS EN 40-5 - Lighting Columns (Requirements for steel lighting columns).
- Roads Act, 1993. Road Traffic Act, 1994.
- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- Building Control Act 2007.
- Road Traffic (Control of Traffic) Regulations 2006.
- I.S. 10101:2020+AC2:2025 National Rules for Electrical Installation

Where a design standard has been revised, the latest edition will apply to all new lighting design / and installation.

1.2 Health & Safety

The attention of the Designer / Developer will be drawn to the obligations arising under the Safety, Health and Welfare at Work Act 2005 or latest approved version such as:

- Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2012 or latest approved version.

- Safety, Health and Welfare at Work (Construction) regulations 2013 or latest approved version. Account will be taken of any traffic management measures that may be required during the installation

of public lighting schemes including compliance with Chapter 8 of the Traffic Signals Manual published by the Department of Transport.

1.3 General Public Lighting Design Requirement

The site development public lighting installations will be designed by a competent public lighting engineer who has successfully completed the Institution of Lighting Professionals (ILP) Diploma in Exterior Lighting and is an active member of the Institution of Lighting Professionals, and as accepted by CCC public lighting department, to ensure that best practice is applied in the external lighting design of this residential development. This will include the requirement that public lighting schemes considers from junctions and traffic (both Pedestrian and Vehicular) conflict areas back i.e. T-junctions, pedestrian crossings, public and private car parking, as appropriate.

All new systems of public lighting of a new development will be designed and installed in accordance with the requirements and as accepted by CCC public lighting department.

The overall lighting requirements for a specific area will be identified within the British and European design code. This will then be expanded and refined to take account of an area's unique character and needs in terms of vehicular/ pedestrian activity, location of local amenities, etc by the design brief. However, generally the requirements of the specific design code as stated above in Public Lighting Standards will be met.

As a general rule, new luminaires will be of LED technology source although consideration to alternative light sources (particularly for the purposes of floodlighting) will be given where appropriate. Whether there may be situations in popular locations used heavily at night a higher level of illumination will be anticipated. For particularly sensitive vicinity locations it will be recommended to arrange for trial installations to demonstrate the effectiveness of the lighting and its impact on surrounding areas. All luminaires will be manufactured to a minimum of IP66 to BS EN 60590 for the lamp containment area and should be manufactured from vandal-resistant material. Lanterns will be designed and tested to provide a minimum normal operating life of 25years.

Construction of lighting columns and luminaire specifications shall comply with the CCC Public Lighting Manual and Product Specification 2021, the installation of schemes in residential areas guideline document. Lighting control and installation details shall also comply with the above document.

In determining levels of illumination, lighting positions and styles, the design brief will consider pedestrian and vehicular uses/needs in relation to the following:

▪ Areas of activity - Shops, School entrances, Creche entrance, Gym, bus stops (as appropriate), paths, etc and areas of conflict (junctions, etc).

▪ Building heights.

▪ Street features - crossing points, sitting areas, tree planting, pinch-points, materials / colours, etc.

▪ Ground form levels (important to people with disabilities), hazards, etc. Local knowledge, incidence of vandalism, accident black spots, etc.

1.3.1 Obtrusive Lighting

Considerations will be given to the restriction of obtrusive light by:

▪ The control of the type of light source Restricting the level of light emitted by the luminaire at high angles usually between 70 and 90 degrees.

▪ The use of full horizontal cut off luminaires for mounting heights above 6m will have a substantial effect on restricting obtrusive light. Similarly, the use of shallow bowl luminaires for mounting heights of 6m or less will help to reduce the overall level of obtrusive light produced by road lighting installations, but may add to the numbers of lighting units required

▪ Careful consideration will be given to the design, installation, and maintenance of any lighting systems adjacent to the site to reduce the risk of damaging the night sight of the transport operators or reducing the visibility of signalling equipment.

1.4 Lighting Classes

The lighting classes assigned to the various locations within the development are outlined below and detailed in the public lighting report provided in Appendix A.

1.4.1 The Residential Areas

Residential areas will be designed using an ‘P4’ illuminance class derived from BS EN 13201. General street lighting will be installed on 6m columns and 8m where required.

1.4.2 Car Parks

Car parks are to be lit in accordance with BS5489-1:2013, recommendation as outlined in the CIBSE Lighting Guide and ‘Secure by Design’ guidance. The maintained illuminance level for the Car Park is proposed 20 lux. Car park luminaires will be installed on 6m columns and 8m where required. Group switching of car park lighting will be facilitated via an astro-timer and photocell and a suitably rated contactor located within a dedicated feeder pillar.

1.4.3 Pedestrian Crossings

Pedestrian crossings will be lit in accordance with BS5489-1:2013 and ILP Technical Report 12.

The maintained illuminance level for the pedestrian crossing is proposed as follows:

▪ Average vertical illuminance on this axis of pedestrian crossing at a height of 1m: Ev ≥ 40 lux
▪ Uniformity of vertical illuminance on lane in front of the driver (Ev min/Ev av): 0.20
▪ Average horizontal illuminance on pedestrian crossing at ground level: Eh ≥ 80 lux
▪ Uniformity of horizontal illuminance (Eh min/Eh av): 0.30
Traffic route lighting and lighting of residential estates will be powered by local mini-pillars.

1.4.4 Cycleways

Cycleways will be lit in accordance with BS5489-1:2013 and BSEN 13201-2. Lighting columns positioned on cycleways will be set back a minimum of 0.5m to avoid contact with handlebars. Where the cycleway cannot be accessed by an elevated platform, raising and lowering columns will be

installed. Raising and lowering columns shall be orientated so that the lantern head can be lowered safely without obstruction and, when in its collapsed position, shall not cause an obstruction to road users and pedestrians.

1.5 Trees & Arboriculture

Trees and other vegetation will not impede the functions of public lighting units. A separation of 5 metres between the lighting column and the outside of the crown will be allowed for the lighting to work as designed. Trees or vegetation will not be planted within 7 metres of a public light column.

The design will take into consideration the layout of the proposed public lighting column locations and the proposed landscape design. Both layouts will be coordinated to achieve the 7 metres separation between all trees and public lighting columns.

1.6 Public Lighting Layout

The public lighting layout is detailed in the public lighting report provided in Appendix A and on drawing number: P4CW-ZZZ-XXX-DR-ATK-EE-000001.

1.7 Access Chambers

Where appropriate, the access chambers for the site will be selected as per the table below standards and as appropriate.

Table – Chamber Type Description

Item	Chamber Type	Chamber Description
01	Large Inspection Chambers	All access chamber covers on the footpath to cater for a change of direction are proposed to be ductile iron with galvanized steel frame with frame opening 615mm x 615 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt
02	Medium Inspection Chambers	Access chamber covers on the footpath for straight through services are proposed to be ductile iron with galvanized steel frame with frame opening 720mm x 260 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt.

03	Small Inspection Chambers	Access chamber covers on the footpath for column connections shall be ductile iron with galvanized steel frame with frame opening 385mm x 260 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt or similar approved

2. Existing Utility Infrastructure

2.1 Identification of Utilities

A desk study of records from various utility companies was undertaken and the following utility holders were contacted, and records obtained / converted into digital format:

- Irish Water (Foul and Watermain)
- ESB Networks
- Gas Networks Ireland (Transmission)
- Gas Networks Ireland (Distribution)
- Virgin Media
- BT
- Eir
- eNet

During the construction phases of the project, realignment, upgrade and replacement of services and utilities will be required in conjunction with and to accommodate the proposed works. These works will include:

- Minor utility diversions in the region of the proposed junction as required
- Provision of new services to provide connections to the proposed development as per the overall masterplan designs

3. Proposed Utilities

This section outlines the proposed MEP utilities schemes for the proposed residential development on lands at City Northwest Quarter Regeneration (CNWQR) Phase 4C. The Gas, Electricity and IT communications system will be designed and installed to the current guidelines.

3.1 Standards

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of:

- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- I.S. 10101:2020+AC2:2025 National Rules for Electrical Installation
- Code of Practice for Customer Interface, current edition published by ESB Networks (ESBN).

▪ ELECTRICAL SERVICES GUIDEBOOK – Housing Schemes, current edition published by ESB Networks.
▪ The Building Regulations published by the Department of Environment, Heritage and Local Government (DOEHLG).
▪ Code of Practice for Avoiding Danger from Underground Services published by the Health and Safety Authority (H.S.A.).
▪ Criteria document Cer/08/071 and any other requirements specified by the Commission for Energy Regulation (CER).

3.2 Electrical Infrastructure Preliminary Information (Phase 4C West)

3.2.1 Primary Electrical Services

The total site electrical load is to be supplied by ESB Networks with a maximum estimated demand load of in the range of 277kVA (approximately).

The main ESB power cable will be buried in ducts or direct buried and specified as multicore XLPE/SWA/PVC. The electricity supply to each dwelling via standard ESB Networks standard LV mini-pillars scattered around the site.

Clarification:

The total estimated power electrical load for the phase 4C development have been based on BSRIA / Rules of Thumb Guidelines for building services (5th Edition) - CIBSE / Energy Benchmarks.

▪ A figure of 84(W/m²) is allowed for landlord areas. The figure is expressed in W/m² NIA, based on a net to gross ratio of 80% and mechanical power for plantrooms requirements (Rules of thumbs 5th edition / Energy Benchmarks).

▪ Predicting Electrical Future Load Growth - 10% power load growth factor is considered regarding future power expansion for the building associated with Building expansion and function of the building or facilities and Equipment technology within the building.

▪ Renewable Energy - Based on the Heat pumps systems.

▪ Rule of Thumb - Flats / Apartments 80(w/m2) electrical load. Note, Flat or apartment 7.5kw is employed with all electrical cooking and heating via heat pumps.

▪ Every house which has a parking space on curtilage to be allow for a possible charging point. 20% of visitor spaces to allow for a possible charging point. Within the apartment Blocks, 20% of spaces to allow for a possible charging point with capacity to bring this up to 50%.

▪ The target efficiency for the apartment Blocks is 75% gross to net.

▪ Houses and Apartment Blocks heating and domestic hot water production will be achieved with individual heat pumps.

▪ Apartments can be assumed as 60sqm for 1-bed, 85 sqm for 2-beds and 110 sqm for 3 beds.

▪ Allowances to be made for EV charging points for future proofing and based on a minimum charging power per active charging station.

3.3 Gas Infrastructure (Phase 4C West)

This section outlines the proposed Gas utilities schemes for the proposed residential development on lands at City Northwest Quarter Regeneration (CNWQR) Phase 4C West. The gas system will be designed and installed in accordance with the current guidelines, standards and industry regulations.

3.3.1 Standards

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of:

General

▪ Safety, Health and Welfare at Work Act 2005.
▪ Safety, Health and Welfare at Work Construction Regulations 2013.

For gas and main services

▪ Code of Practise for Gas Distribution Mains I.S. 329
▪ Installation of Gas Service Pipes I.S. 265
▪ Gas Infrastructure – Pipelines for maximum operating pressure up to and including 16 bar SR 12007-5
▪ Gas Supply Systems – Natural Gas Measuring Stations I.S. EN 1776
▪ Gas Pressure Testing, Commissioning and Decommissioning Procedures I.S. EN 12327#
▪ Gas infrastructure - Gas installation pipework I.S./ EN15001-2
▪ Gas Pressure Regulating Stations for Distribution I.S 821

For downstream of the meter

▪ Non-Domestic Gas Installations I.S. 820

3.3.2 Preliminary Total Estimated Gas Load

The total estimated gas load for the development were based: -

▪ BSRIA / Rules of Thumb Guidelines for building services (5th Edition) - CIBSE / Energy Benchmarks are used to determine estimated total electrical load requirements.

3.3.3 Meter Strategy

Single Occupancy Dwellings - The meters supplying the dwelling will be located outside the building

4. Energy Statement/Nearly Zero Energy Building (NZEB)

The NZEB standard will apply to all buildings owned and occupied as refer to Department of Housing, Planning and Local Government and as per the building regulations and DEAP methodology. This will be equivalent to a 25% improvement in energy performance on the 2011 Building Regulations.

The key to Part L for NZEB compliance will include a Maximum Energy Performance Coefficient of 0.3, a Maximum Carbon Performance of 0.35 and a renewable Energy Ratio of 20%.

The cost optimal level is a primary energy performance of less than 125 kWh/m2/yr, when calculated using DEAP or upgrade of roof insulation and heating system. The nearly zero or very low amount of energy required will be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

Proposed minimum threshold level compliance achieved with TGD L Dwellings as indicated below Fig 1:

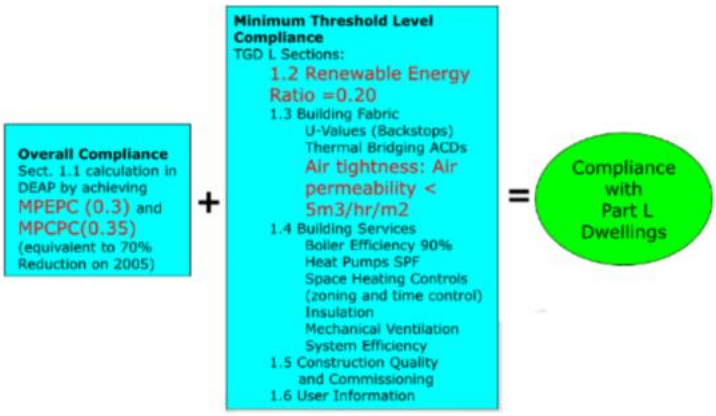


Figure 1 – Minimum Threshold Level Compliance

The design for the dwellings and apartments will include:
- LED lighting accounted for in DEAP (A+ bulbs, 94 lumen/cW, 4 W/m²)
- Efficient hot water uses in showers/taps accounted for in DEAP (125 l/p/d and 6l/min flow restrictor)
- Individual heat pumps for space heating and hot water production
- Mechanical ventilation for houses and apartment

4.1 Energy Statement

The proposed design strategy will ensure sustainable energy efficiency to ensure low running cost of use and consideration of green energy.

Some of considerations are listed below:

- Most of houses have been designed to have a compact and efficient form, such as semidetached building formations limiting the heat loss and, where appropriate, availing of the heat gains through the fabric of the building

▪ Highly insulated external building façade

▪ Materials with long time life expectancy and low embodied energy.

▪ Consideration of water saving measures including water saving devices and controls and limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air.

▪ Providing energy efficient space heating and cooling systems, heating and cooling equipment, water heating systems, and ventilation systems, with effective controls.

▪ Providing energy efficient artificial lighting systems (LED) and adequate control of public and internal lighting systems.

▪ The guidance of the MEP design in compliance with Building Regulations Part L recommendations for conservation of fuel and energy setting of minimum energy performance requirements for building to achieve the Nearly Zero Energy Building, providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related Carbon Dioxide (CO2) emissions as is reasonably practicable.

▪ Limitation of Carbon Dioxide (CO2) emissions to a Nearly Zero Energy Building level insofar as is reasonably practicable of for Landlord areas/ and Non-domestic buildings using the Non-domestic Energy Assessment Procedure (NEAP) published by Sustainable Energy Authority of Ireland.

▪ Ensuring that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, and the energy performance of the building element meets minimum energy performance requirements, functionally and economically feasible.

▪ The energy performance of each house/ and apartment will comply with the requirement of Part L building regulations and achieving no lower than a BER of A2.

▪ System design that provides to the building owner or occupants sufficient information about the building, the fixed building services, controls and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable.

4.2 E-Car Charging Provision

If required Electrical Car (E-Car) charging points will be provided in accordance with CCC Development Plan 2016-2022.

APPENDICES

5. Outdoor lighting report

DATE:	**20 March 2026**
DESIGNER:	**AJ**
PROJECT No:	**100125176**
PROJECT NAME:	**CNWQR Cork Housing Estate P4C WEST**

LIGHTING REALITY

- Primary streets roads are designed in accordance with EN13201-2:2015 to category P2.
- Secondary streets roads are designed in accordance with EN13201-2:2015 to category P3.
- Footpaths are designed in accordance with EN13201-2:2015 to minimum category P4.

Maintenance factor 0.88.

Outdoor Lighting Report

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	564219.51	571991.38	253.23	175.89	1.50	1.49
2	Grid 2	564266.71	572047.41	171.38	21.02	1.49	1.40
3	Grid 3	564278.01	572019.39	170.15	28.92	1.49	1.45

Luminaires



Luminaire A Data

Supplier	C U Phosco
Type	E950-28-P6A-730-SD0275-13W
Lamp(s)	730SA
Lamp Flux (klm)	1.64
File Name	E950-28-P6A-730-SD0275-13W.ies
Maintenance Factor	0.88
Imax70,80,90(cd/klm)	803.0, 171.3, 0.0
No. in Project	13

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	564268.32	572052.11	6.00	258.00	0.00	0.00	0.40			
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8	A	564355.59	572085.78	6.00	285.00	0.00	0.00	0.40			
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10	A	564383.51	572097.12	6.00	293.00	0.00	0.00	0.40			
11	A	564402.11	572092.21	6.00	111.00	0.00	0.00	0.40			
12	A	564411.31	572105.89	6.00	291.00	0.00	0.00	0.40			
13	A	564423.54	572100.81	6.00	112.00	0.00	0.00	0.40			

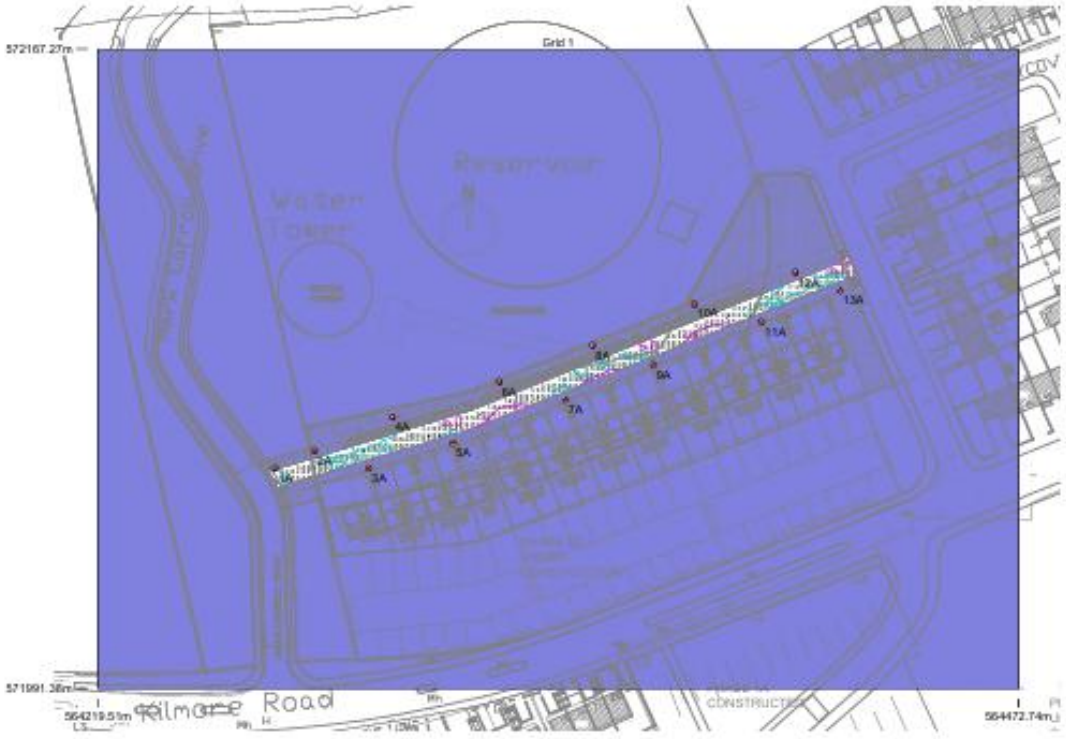
DATE: 20 March 2026 DESIGNER: AJ

PROJECT No: 100125176 PROJECT NAME: CNWQR Cork Housing Estate P4C

LIGHTING REALITY

Horizontal Illuminance (lux)

Grid 1



Results

Eav	8.30
Emin	2.87
Emax	14.62
Emin/Emax	0.20
Emin/Eav	0.35

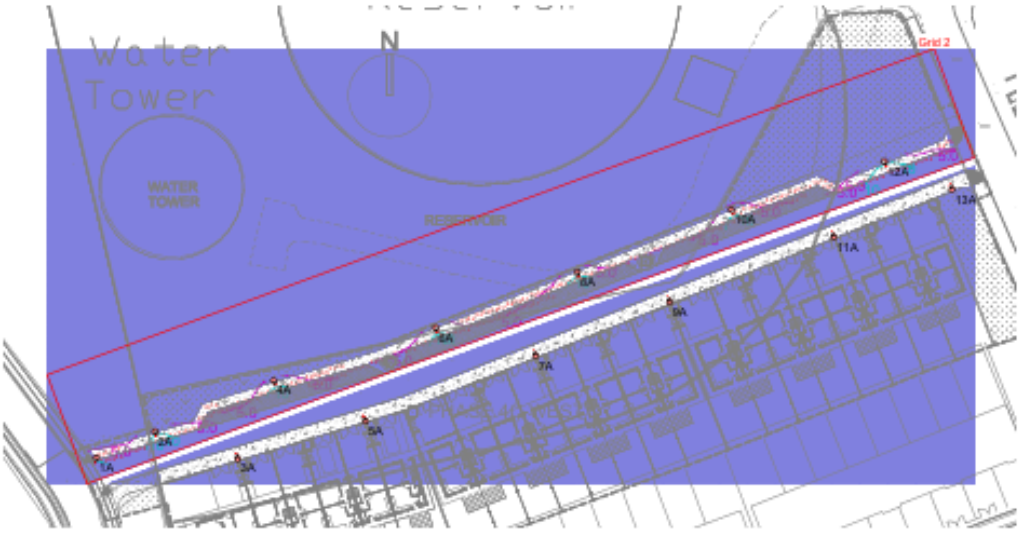
DATE: 20 March 2026 DESIGNER: AJ

PROJECT No: 100125176 PROJECT NAME: CNWQR Cork Housing Estate P4C

LIGHTING REALITY

Horizontal Illuminance (lux)

Grid 2

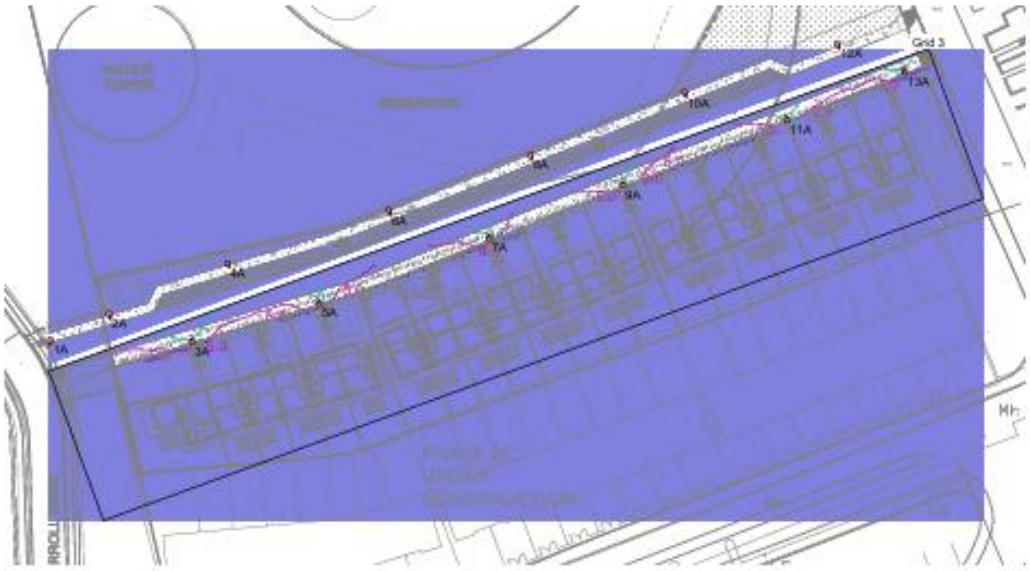


Results

Eav	5.03
Emin	1.54
Emax	13.17
Emin/Emax	0.12
Emin/Eav	0.31

Horizontal Illuminance (lux)

Grid 3



Results

Eav	5.33
Emin	1.55
Emax	12.91
Emin/Emax	0.12
Emin/Eav	0.29

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Appendix G. Irish Water Confirmation of Feasibility Letter for Potable Water and Wastewater

CONFIRMATION OF FEASIBILITY

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

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Karl English

1st Floor
Technology House
Parkmore Technology Park
Galway
Co. Galway
H91 NXY4

26 February 2026

Our Ref: CDS26001502 Pre-Connection Enquiry
Knochnaheeny Avenue, Cork, Co. Cork

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 22 unit(s) at Knochnaheeny Avenue, Cork, Co. Cork **(the Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann:

  Please note that according to our records there is an existing trunk main running through this site (see Section B). It will not be permitted to build over any Uisce Éireann infrastructure. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce Éireann infrastructure and any structures on site. Alternatively you may enter into a diversion agreement and divert the pipe to accommodate your development. If you wish to proceed with this option, please make contact with Uisce Éireann Diversions team at Diversions@water.ie. It will be necessary to provide a wayleave over this pipe to the benefit of Uisce Éireann and ensure that it is accessible for maintenance.

- **Wastewater Connection** - Feasible Subject to upgrades:

  In order to facilitate the proposed connection at the Development, the Uisce Éireann sewer network will have to be extended by approximately 40m. Uisce Éireann currently does not have any

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Gerard Britchfield, Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh..
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363

plans to extend its network in this area. These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,

Dermot Phelan

Dermot Phelan
Connections and Developer Services

Section A - What is important to know?

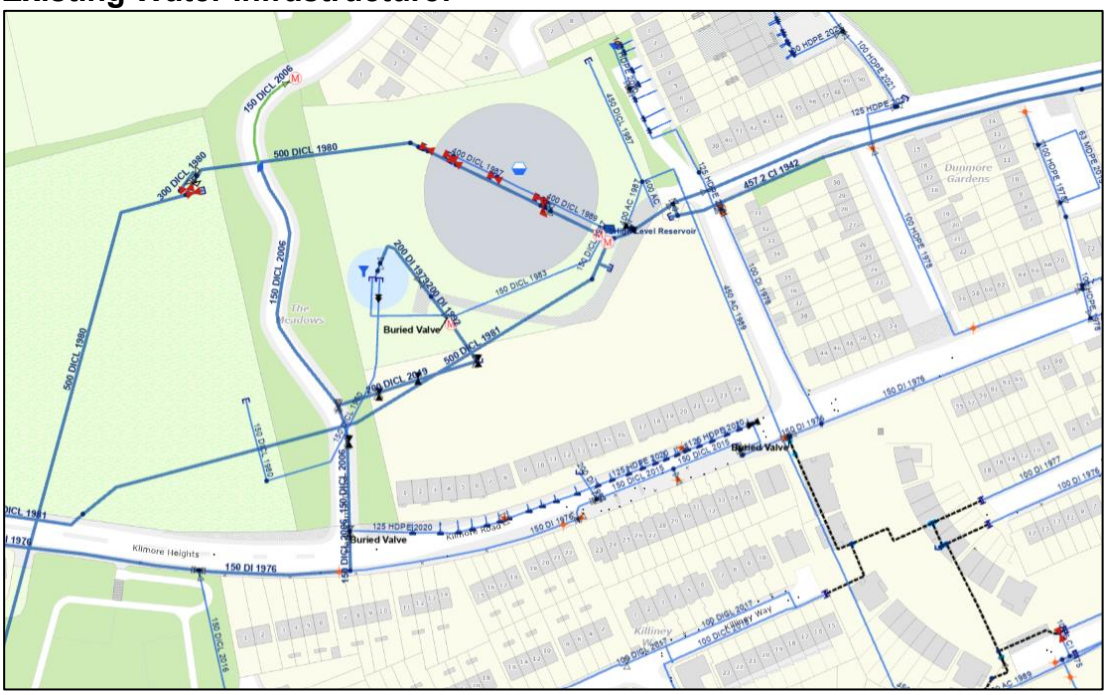
What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie

Existing Water Infrastructure:



Existing Wastewater Infrastructure:



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Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) 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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