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Kinsale Road LRD, Kinsale Road, Cork

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1 Introduction

This Engineering report was prepared for a proposed mixed-use development on a site located at Kinsale Road, Cork. The site location is shown in Figure 1-1 below.

The site of the proposed development is a brownfield site which was formerly owned by Vita Cortex and is approximately 1.2 hectares in area. The site has been disused since 2012. Planning permission was granted for the demolition of site structures under application reference no. 2140647, and separate planning permission (Ref. 2442868) was obtained for remediation works on the site. Remediation works involved the excavation and off-site disposal of impacted soils, the pumping and treatment of groundwater, and the importation of stone/soil for backfilling.

The site is bounded by residential and commercial properties to the north and north-east, Kinsale Road to the east, Virgin Media Park and a retail premises to the south and south-east, and Pearse road to the west. The overall topography of the site is relatively flat with a steep embankment located along the western boundary.

The site can currently be accessed via existing entrance off Pearse Road to the west and Kinsale Road to the east.

Figure 1-1: Site Location of the Proposed Development

1.1 Proposed Development

The proposed works are outlined in a series of architectural drawings prepared by BKD Architects and engineering drawings prepared by PUNCH Consulting Engineers and supplied to accompany this report.

The proposed development will consist of a Large-Scale Residential Development (LRD), comprising 170 no. residential units (158 no. apartments and 12 no. townhouse apartments, to include 51 no. 1-bed units, 84 no. 2-bed units, 35 no. 3-bed units) arranged in 4 no. blocks varying in height from four to nine storeys over ground. The proposed development also includes a crèche; café; management office; 4 no. retail units; car parking and cycle parking provided on surface and within an undercroft; the provision of private, communal and public open space and all associated site development, landscaping and drainage works on the site of the Former Vita Cortex Facility, Kinsale Road and Pearse Road, Cork.

Access to the proposed development will be from both Pearse Road and Kinsale Road. Two access points are proposed along Kinsale Road: a vehicular, cyclist and pedestrian entrance to the retail parking area, and a pedestrian and fire tender route that extends centrally through the site. Similarly, two access points are proposed along Pearse Road: one for vehicles and cyclists to access the undercroft parking area, and a dedicated pedestrian access that runs through the centre of the site.

The proposed layout for the development is detailed in the series of drawings by BKD Architects accompanying this report, and an extract is included in Figure 1-2.

Figure 1-2: Proposed Site Layout

2 Stormwater Drainage Design

2.1 Existing Stormwater Drainage

On-site inspections, utilities surveys and a review of record drawings provided by Cork City Council and Uisce Éireann indicate that the site does not discharge to a dedicated surface water sewer at present. It can be assumed that at present the surface water generated on site discharges to the combined sewers on the adjacent roads.

The closest dedicated surface water sewer is approximately 200m to the north, downstream of an existing Combined Sewer Overflow (CSO) which is located in the traffic island at the north side of the Pearse Road/Kinsale Road Junction. From this point there is a dedicated surface water sewer which conveys storm flows in an easterly direction towards the South Link Road (365m east).

An extract from Cork City Council and Uisce Éireann Record Drawings illustrating the existing stormwater drainage arrangement is shown in Figure 2-1 below.

Figure 2-1: Existing storm drainage adjacent to site (extract from IW records, site boundary outlined in red)

2.2 Proposed Stormwater Drainage

Consultation with Tony Donovan, Senior Executive Engineer in the Water Services (Drainage) Department of Cork City Council took place in February 2024 and March 2025 to define the scope of the proposed stormwater drainage for this project, which will be presented in the sections that follow.

2.2.1 Proposed Stormwater Drainage

The proposed surface water drainage system will be designed using Causeway Flow software in accordance with the Department of Environment and Local Government's guidance document "Recommendations for Site Development Works for Housing Areas", with guidance taken from the "Greater Dublin Strategic Drainage Study" (GDSDS) and the Cork City Development Plan.

Refer to Appendix C for detailed calculations. Table 2-1 describes the stormwater drainage design parameters which will be used in design. Please refer to Appendix D for greenfield runoff calculation and Appendix E for Met Eireann rainfall data.

Table 2-1: Stormwater Drainage Design Parameters

Description	Value
Site Area (Ha)	1.212 Ha
Return period target	Pipe Design 1 in 5-year. Network Design 1 in-30 year + CC. Check 1 in 100-year + CC for flooding.
Climate Change	20%
M5-60	17.300
Ratio R	0.208
SOIL type	2
Soil value	0.3
SAAR	1127mm
Flow reduction parameter	Qbar
Controlled Outflow	3.86l/s
Flow restriction method	Hydrobrake
Attenuation Storage Volume	1320m^3
Bioretention	101m^3 (Porosity = 0.67)
Permeable paving	275m^3 (Porosity = 0.3)
Blue roof	120m^3 (Porosity = 0.5)

2.2.2 Proposed Surface Water Drainage Network

A new surface water sewer network shall be provided for the proposed development which will be entirely separated from the foul water sewer network. All surface water run-off from roof areas and hardstanding areas are designed to be collected by a gravity pipe network.

It is noted in the Uisce Éireann Confirmation of Feasibility included within Appendix B, that surface water generated from the proposed site is not permitted to discharge into the Uisce Éireann network at this location. This will necessitate the construction of a dedicated surface water gravity main extending northbound along Kinsale Road which will connect into the existing 900mm diameter storm water network located 150m north of the proposed development. Please refer to Appendix F for the letter of consent from Cork City Council for discharging to this existing storm sewer.

A 375mm diameter dedicated surface water gravity main was initially proposed along Kinsale Road to serve the proposed development. However, following consultation with the Water Services (Drainage) Department of Cork City Council it was agreed with the that all existing surface water gullies along Kinsale Road (from the development site to the connection point to the 900mm diameter storm water to the north) that currently connect to the combined sewer will instead be picked up by the new dedicated surface water gravity main. It was further agreed that this new dedicated surface water gravity main would need to facilitate runoff from the road catchment further upstream from the junction between Kinsale Road and Tramore Road.

Subsequent drainage analysis, which accounted for these additional contributing areas, determined that a 450mm diameter surface water gravity main is required.

Should Uisce Éireann publish a Drainage Area Plan specifying a larger diameter dedicated surface water gravity main, it will be adopted during the detailed design phase for construction.

This is shown on the Drainage layout drawing which is included in Appendix A to this report.

The minimum diameter of the mainline surface water sewers is 225mm. The minimum horizontal and vertical separation distances between the proposed drainage and other services are as per the Uisce Éireann Code of Practice.

The surface water drainage network has been analysed for the risk of flooding for a 1 in 5-year flood event, 1 in 30- year rainfall event and a 1 in 100-year rainfall event by means of simulating such events in the drainage model with no flooding occurring. An increase of 20% in rainfall has been included to account for climate change. Please refer to Appendix B for detailed calculations.

All surface water manholes will be in line with the Uisce Éireann Code of Practice. An overview of the network is as follows

- It is proposed that the roof of Block 1, Block 2, Block 3, and Block 4 will be partially made up of a green roof with the surface water discharging from roof will discharge via a gravity piped system into Attenuation Tank 1 (560m^3) located in the public open space between Block 1 and Block 4. From here, it is proposed that the surface water is discharged via gravity piped system towards a hydro brake limiting forward flow to 3.5l/s into the downstream end of the proposed surface water drainage network. It is proposed that the surface water discharge from Attenuation Tank 1 (560m^3) is discharged via gravity piped system towards Attenuation Tank 2 (464m^3) before being discharged via gravity piped system towards a hydro brake limiting forward flow to 3.5l/s to the existing surface water drainage network.
- It is proposed that the surface water in the vicinity of Block 3 and Block 4 will be attenuated within Attenuation Tank 3 (296m^3).
- It is proposed that the basement podium will be made up of Green/Blue roof that provides 120m^3 storage for surface water. Pollutants are filtered by the green roof's vegetation and soil before being released slowly via the blue roof's control system. The blue roof stores excess water, which can be used by the green roof for plant irrigation, while still managing runoff and reducing flood risks. The Green/Blue roof is proposed to discharge into Attenuation Tank 1

(560m^3) from where it is proposed that the surface water is discharged via gravity piped system towards a hydro brake limiting forward flow to 3.5l/s into the downstream end of the proposed surface water drainage network.

- It is proposed that surface water from hard standing areas will be directed to drain through bioretention areas with overflows to the network upstream of the attenuation tanks.
- The car park area at ground floor level serving the retail units will be constructed using permeable paving buildup with a high-level overflow to the drainage network.
- It should be noted that a portion of the surface water pipe will be underslung to the soffit of the basement and the exact route is subject detailed design. They are indicatively indicated on the drainage layout.
- It is proposed that all runoff within the confines of the basement car park will be to be captured and directed through a petrol interceptor before being pumped to ground level for discharge into the gravity pipe network.
- It should be noted that the new surface water sewer network within the confines of the site will not be taken in charge by Cork City Council.

2.3 SUDs Proposals

The proposed development will be assessed in relation to Sustainable Urban Drainage Systems (SuDS). A variety of SuDS measures may be adopted to comply with Council recommendations. All SuDS measures will be implemented with reference to the UK SuDS Manual and Cork City Council drainage requirements. SUDS measures will be provided to ensure interception storage of the first 5 to 10mm of rainfall for all storm events.

Relatively small volumes of rainwater collected on the respective SuDS devices will enter the public sewer network during typical low intensity storms. SuDS measures will retain rainwater until it is either used via evapotranspiration in the green areas or discharged into the proposed surface water infrastructure network.

The SuDS processes will decrease the impact of the development on the receiving environment by providing amenity and biodiversity in many cases. Regular maintenance of the SuDS proposals will be required to ensure they are operating to their optimal level throughout their design life.

Table 2-2 demonstrates the selection process for SuDS measures.

Communications between PUNCH Consulting Engineers, BKD Architects, and Cunnane Stratton Reynolds Land Planning & Design, led to a sketched layout for SuDS. This section, along with Appendix A, will describe the SUDs proposals for the proposed development.

Table 2-2 SUDS Selection Hierarchy for Large Scale Development.

SuDS Measure	Measures to be used on site	Rational for selecting/ not selecting measure	Area of feature (m^2)	Attenuation volume feature (m^3)
Swales	No	Bioretention system addresses SuDs requirements	-	-
Integrated constructed tree pits	No	Bioretention system addresses SuDs requirements	-	-
Rainwater Butts	No	Considered unsuitable for proposed development.	-	-
Downpipe Planters	No	Downpipes connected to bioretention area	-	-
Rainwater Harvesting	No	Considered unsuitable for proposed development.	-	-
Soakaways	No	Bioretention system addresses SuDs requirements	-	-
Infiltration trenches	No	Bioretention system addresses SuDs requirements	-	-
Permeable pavement	Yes	Providing treatment and storage.	440	275
Green Roofs	Yes	Allowing for delayed release and reducing the immediate pressure on stormwater infrastructure.	2140	N/A
Green wall	No	Considered unsuitable for proposed development.	-	-
Filter Strips	No	Considered unsuitable for proposed development.	-	-
Bio-retention	Yes	Providing treatment, amenity, storage and biodiversity.	162	101

SuDS Measure	Measures to be used on site	Rational for selecting/ not selecting measure	Area of feature (m^2)	Attenuation volume feature (m^3)
Blue Roofs	Yes	Providing stormwater retention, filtration, and flow control.	1200	120-
Filter Drains	No	Considered unsuitable for proposed development.	-	-

2.3.1 Attenuation

It is proposed to attenuate surface water collected via Green Roof Infrastructure and Bio retention areas located on the roof of Block 1, Block 2, Block 3, and Block 4, the podium slab and all landscaped areas. The available storage within these SUDS features is not sufficient to attenuate the larger rainfall events, therefore a series of attenuation tanks are proposed. A total of 1320 m^3 storage will be provided within a geocellullar system. The geocellullar system will be made up of AquaCell Core-R type modular unit which has been designed for use in deep applications, subject to both regular and heavy traffic loadings, such as cars and HGV's.

The attenuation tank has been sized to attenuate the 1:100-year return period storm event, plus 20% climate change.

Bio-retention areas will incorporate drainage stone/subsoil and will provide a level of additional attenuation within the bio-retention areas. Bioretention systems allow the stormwater to filter downwards through a filter medium removing finer contaminants along the way. A high-level overflow to the drainage network within the build-up will accommodate removal of water.

CIRIA C753 (The SuDS Manual) Table 24.6 notes that regarding interception design of bio retention areas, pavements drained by bio retention areas can be considered to provide Interception, i.e. it can be assumed that there will be zero runoff from the first 5 mm rainfall for 80% of events during the summer and 50% in winter.

2.3.2 Petrol Interceptor

It is proposed that all surface water run-off from the development will outfall via a Class 1 Bypass Separator. This device will remove hydrocarbons and fine sediment particles from the site runoff and lower the risk of downstream contamination following an oil spillage on site.

Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

Class 1 devices are designed to achieve a concentration of less than 5mg/l of oil under standard test conditions. Petrol Interceptor with nominal size NSBP006 with a flow of 6l/s is recommended.

2.4 Pollution Hazard Indices Based on the Simple Index Approach

In accordance with the SuDS Manual CIRIA C753 the pollution prevention guidelines have been followed to ensure appropriate levels of treatment are provided before attenuated run-off from the site is discharged into the existing surface water sewers. The Pollution Hazard Indices, shown in Table 2-3 below, for the different proposed land uses have been derived from Table 26.2 of CIRIA C753.

Table 2-3: Pollution Hazard Indices for Different Land Uses

Land Use	TSS	Metals	Hydrocarbons
Residential roofs and basement podium	0.2	0.2	0.05
Residential Car Parks	0.5	0.4	0.4
Pedestrian areas	0.5	0.4	0.4

To ensure the proposed SuDS strategy will appropriately mitigate against the potential pollution derived from these areas the Pollution Mitigation Indices (PMI) in Table 26.3 and 26.15 of CIRIA C753 have been reviewed and laid out in Table 2-4 below.

Table 2-4: Indicative SuDS mitigation indices for the site

SuDS Measures	TSS (PMI)	Metals (PMI)	Hydrocarbons
Green Roof	0.8	0.7	0.9
Conventional gully and pipe drainage	1.0	1.0	1.0
Bioretention System	0.8	0.8	0.8

Table 2-5 below shows the calculations for the total pollution prevention for each type of hard standing on site. The following formula has been used to calculate the total mitigation in line with CIRIA C753. Total SuDS **Mitigation Index = Mitigation Index 1 + 0.5 (Mitigation Index 2).**

Table 2-5 Pollution Hazard Indices for different Land Uses

Land Use	Mitigation Method 1		
	TSS	Metals	H-C
Residential roofs and basement podium	Green Roof		
(Pollution Hazard Table 2-3- Mitigation Index Table 2-4)	0.2-0.8 = -0.6	0.2-0.7 = -0.5	0.05 - 0.9 = -0.85
Residential Car Parks	Conventional gully and pipe drainage		
(Pollution Hazard Table 2-3- Mitigation Index Table 2-4)	0.7 – 1.0 = -0.3	0.6 - 1.0 = -0.4	0.7 - 1.0 = -0.3

Pedestrian areas	Bioretention System		
(Pollution Hazard Table 2-3- Mitigation Index Table 2-4	0.5 - 0.8 = -0.3	0.4 - 0.8 = -0.4	0.4 - 0.8 = -0.4
Pedestrian areas	Conventional gully and pipe drainage		
(Pollution Hazard Table 2-3- Mitigation Index Table 2-4	0.5 – 1.0 = -0.5	0.4 - 1.0 = -0.6	0.4 - 1.0 = -0.6

A hydrobrake is proposed downstream from the Attenuation Tank 2 and Attenuation Tank 3 discharging to the existing surface water network. The SuDS measures outlined above demonstrate that enough treatment has been provided.

2.5 Maintenance

Maintenance of the bioretention is required to ensure the longevity, aesthetic and functionality are retained during operation. This is not only to guarantee its operational efficiency and extend its service life, but also to preserve its visual appeal and uphold its role in safeguarding the environment. Maintenance plan activities are listed below:

1. Regular Inspection - Regularly inspect the bioretention system for any signs of erosion, sediment accumulation, or standing water. These could indicate issues such as clogging or incorrect grading.
2. Vegetation Management - Maintain the vegetation within the system. This includes regular watering, weeding, and replacing any dead plants. Overcrowded vegetation should be thinned out to ensure proper water flow.
3. Trash and Debris Removal - Regularly remove any trash or debris that has accumulated within the system. This not only helps maintain the aesthetic value of the system but also ensures that the system functions properly.
4. Inlet and Outlet Maintenance - Check the inlets and outlets regularly for any blockages. Any blockages can lead to water bypassing the system or flooding.
5. Soil Media Maintenance - Monitor the soil media for any signs of inadequate pollutant removal. If necessary, replace the soil media.
6. Overflow System Maintenance - Regularly inspect the overflow system for any blockages or damage. Ensure that it is functioning properly to handle larger storm events.

Maintenance is to be carried out in accordance with table 18.3 (bioretention system) and table 21.3 (Attenuation tank) of the SuDS Manual CIRIA, see extract below:

TABLE 18.3 Operation and maintenance requirements for bioretention systems

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

Figure 2-2 Operation and Maintenance Requirements for Bioretention Systems. Extract from SuDS Manual.

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Figure 2-3 Operation and Maintenance Requirements for Bioretention Systems. Extract from SuDS Manual.

2.6 Exceedance and Overland Flow Routes

In the unlikely event that all/ part of the drainage system fails, surface water will follow the topography of the site along potential channels to the lowest point in the site. Figure 2-4 shows the overland flow path based on the topography of the site. The excess surface water will flow to the eastern edge of the site within its boundary. The eastern boundary of the site provides surface water to discharge directly onto Kinsale Road where it will be conveyed northbound towards an existing surface water culvert.

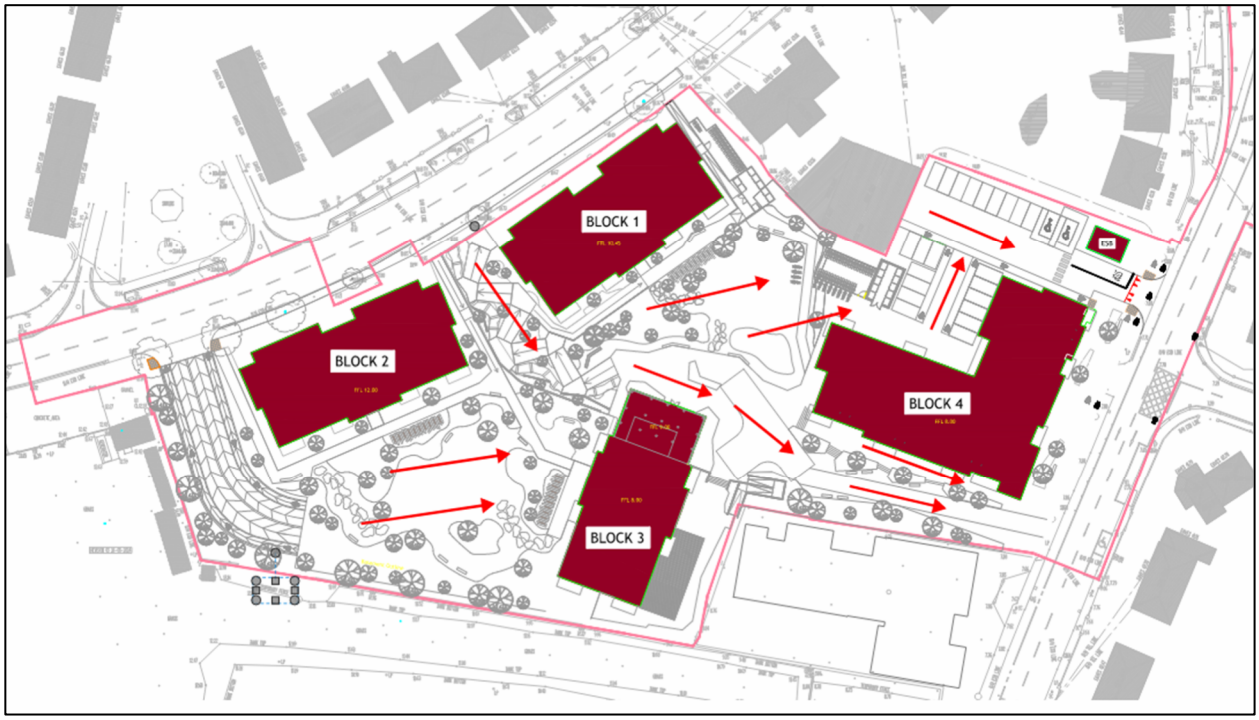


Figure 2-4 Exceedance Overland Flow Routes

2.7 Conclusion

Table 2-6 demonstrates how the 4no. pillars of SuDS have been achieved.

Table 2-6 Four Pillars of SuDS

SuDS Pillar	Green/Blue Roof	Bioretention Area	Green Roof
Water Quantity	Water retention and slow release through green and blue elements.	Captures, stores, and provides water retention	Retains water, reducing runoff and peak flows.
Water Quality	Filters pollutants through substrate and vegetation.	Filters and removes contaminants via soil and vegetation.	Traps pollutants in soil and plants, improving runoff quality.
Amenity	Creates green recreational spaces.	Enhances aesthetics in urban landscapes.	Adds aesthetic value and potential communal use of rooftops.
Biodiversity	Supports diverse plants and wildlife.	Provides habitat for local wildlife.	Offers habitat for insects, birds, and plants.

Table 2-7 summarises the drainage strategy proposed and demonstrates compliance with Cork City Development Plan.

Table 2-7 Drainage Strategy Summary

Drainage Impact Assessment	Measure Taken
1. Full Drainage details, drawings and calculations	Full drainage drawings, details and calculations have been provided.
2. SuDS statement	A full SuDS statement has been provided in section 2.3 to 2.6 of this report.
3. Demonstrating how the 4 Pillars of SuDS are achieved	The 4 pillars of SuDS have been achieved, refer to Table 2-6
4. Source control, interception storage, volumes defined, no runoff from site for events up to 5mm	Hardstanding areas have been designed to discharge to bioretention areas There will be zero runoff from the first 5 mm rainfall for 80% of events during the summer and 50% in winter.
5. Maintenance Plan for proposed scheme	Maintenance plan has been provided in section 2.5 of this report.
6. Climate change factor	Climate change factor of 20 % has been applied.
7. Overall surface water drainage layout	Overall drainage layout has been provided, refer to PUNCH drawing 214130-PUNCH-XX-XX-DR-C-0101
8. Report Detailing existing site conditions	This report details the existing conditions of the site
9. Longitudinal sections and details of proposed pipe runs.	Longitudinal Sections and details have been provided, refer to PUNCH drawing 214130-PUNCH-XX-XX-DR-C-0125.
10. Identify proposed location for discharge to public drainage.	Discharge location has been identified for the surface water
11. Discharge rate applied	Discharge has been restricted to greenfield Qbar, 3.89l/s
12. Attenuation storage	Attenuation Storage has been provided for excess runoff. 896m^3
13. Exceedance and overland flow routes	Exceedance and overland flow routes have been discussed in section 2.6 of this report.

3 Foul Water Drainage Design

3.1 Existing Foul Water Drainage

On-site inspections, utilities surveys and a review of record drawings provided by Cork City Council and Uisce Éireann indicate that the foul water generated on site discharges to combined sewers running along both Kinsale Road to the east and Pearse Road to the west.

Flows to the west are conveyed via a 750mm combined gravity sewer in a north-easterly direction along Pearse Road, towards the CSO located in the traffic island at the north side of the Pearse Road/Kinsale Road Junction. Flows to the east are conveyed via a 450mm gravity sewer in a northerly direction along Kinsale Road also towards the CSO. From this point there is a dedicated foul sewer which conveys foul flows northwards towards the city.

An extract from Cork City Council and Uisce Éireann Record Drawings illustrating the existing foul water drainage arrangement is shown in Figure 3-1 below.

Figure 3-1: Existing foul drainage adjacent to site (extract from IW records, site boundary outlined in red)

3.1 Proposed Foul Water Drainage

The proposed foul water sewers will be designed using Causeway Flow software in accordance with the DOE's "*Recommendations for Site Development Works for Housing Areas*". The foul loading will be calculated in accordance with "Code of Practice for Wastewater Infrastructure" (particularly clause 36, Appendix C and Appendix D) published by Uisce Éireann.

It is proposed that the foul sewer will discharge by gravity to the existing 450mm combined sewer which flows northwards along Kinsale Road to the east of the site. A new manhole will be constructed at the connection point along the existing sewer.

Table 3-1: Foul Water Drainage Design Parameters

Sector	Value
Residential Flow Rate	150 l/person/day
Persons per Dwelling	2.7
Infiltration	10% (New development)
Peaking Factor	6 (Residential)
Minimum Self Cleansing Velocity	0.75m/s
Minimum Pipe Diameter	150mm

3.1.1 Proposed Foul Water Flows

Table 3-2 summarises the proposed foul flows for the development. The daily foul loading for the proposed development has been calculated as 85.734m^3. The dry weather flow has been calculated as 0.992l/s. The sewers are designed for a peak flow of 6 times dry weather flow (6*DWF) -5.78 l/s.

Table 3-2 Existing Foul Water Drainage Calculations

Category	Quantity	Flow Rate (l/per/day)	Daily Flow (l/day) +10% infiltration	DWF (l/s)	Design Peak Flow (6 * DWF) (l/s)
Standard residential	170	150	75,735	0.876	5.259
Office / Factory without canteen	30	50	1,650	0.019	0.085
Creche	13 Staff 50 Children	50	3,465	0.040	0.180
Retail Units	16 Staff 100 Customers	90 - Staff 30 - Customers	4,884	0.057	0.254
Total			**85,734**	**0.992**	**5.780**

It is proposed that Surface Water generated from the basement area will be collected via a series of aco drains and gully pits before passing through a petrol interceptor and pumped to discharge to the sewer network as per best practice.

Referring to Appendix B, it is noted that the proposed connection to the external existing wastewater network is feasible without any infrastructure upgrade by Uisce Éireann.

The drainage layout was developed with input from Tony Donovan, Senior Executive Engineer in Cork City Council's Water Services (Drainage) Department, and in coordination with the NTA/Mott MacDonald to align with the proposed BusConnects corridor along Kinsale Road.

All relevant foul drainage information for the proposed development was included as part of a Design Submission for review by the Uisce Éireann Quality Assurance team. Following consultation with Niall O'Donnabháin, Director of Services with Cork City Council, it was agreed with Cork City Council that the planning submission could proceed prior to receiving the Statement of Design Acceptance from Uisce Éireann. It should be noted that the new foul network within the confines of the site will not be taken in charge by Uisce Éireann.

4 Watermain Design

4.1 Existing Watermain

Uisce Éireann record drawings indicate that there is an existing 101.6mm (4”) cast iron water distribution main and 203.2mm (8”) cast iron trunk watermain running along Pearse Road to the west of the site. A connection is taken from the 203.2mm (8”) trunk watermain with a 101.6mm (4”) pipeline entering the existing building to the west.

An extract from Cork City Council and Uisce Éireann Record Drawings illustrating the existing watermain arrangement in the area is shown in Figure 4-1 below.

Figure 4-1: Existing water network adjacent to site (extract from IW records, site boundary outlined in red)

4.2 Proposed Watermain

4.2.1 Design Criteria

It is generally accepted that the design loading for foul drainage can be used to evaluate an approximation of the water demand on the site. With reference to Uisce Éireann's Code of Practice for Water Infrastructure, the average daily flow is calculated as the number of persons multiplied by the flow rate per person. The average day peak week flow is taken to be 1.25 x the average flow, and the peak demand is taken to be the average day peak week flow multiplied by a peaking factor of 5.

Table 4-1 describes the watermain design parameters used.

Table 4-1: Watermain Design Parameters

Description	Value
Residential Flow Rate	150 l/per/day
Persons per Dwelling	2.7
Retail Flow Rate	180 l/per/day (staff) 30 l/per/day (customers)
Creche	50 l/ person/day
Average Demand	1.25 DWF
Peak Demand	5 DWF

Referring to Appendix B, it is noted that the proposed water connection to an external existing network is Feasible without infrastructure upgrade by Uisce Éireann.

4.2.2 Proposed Watermain Demand

The average day peak week flow is taken to be 1.25 x the average flow, and the peak demand is taken to be the average day peak week flow multiplied by a peaking factor of 5. Table 4-2 summarises the estimated existing water demand for the development. The estimated peak demand from the development is 5.638l/s with the average daily demand being 1.128l/s.

Table 4-2: Watermain Design Calculation

Category	Quantity	Flow Rate (l/per/day)	Daily Flow (l/day)	DWF (l/s)	Average Demand (1.25DWF) (l/s)	Peak Demand (5AD)(l/s)
Standard residential	170 Units	150	68,850	0.797	0.996	4.980
Office / Factory without canteen	30 Staff	50	1,500	0.017	0.022	0.109
Creche	13 Staff 50 Children	50	3,150	0.036	0.046	0.228
Retail Units	16 Staff 100 Children	90 Staff 30 Children	4,440	0.051	0.064	0.321
Total			**77,940**	**0.902**	**1.128**	**5.638**

It is proposed to construct 2 new watermains (2 no. 110mm diameter) to serve the proposed development. The proposed watermains will connect separately to existing mains on Pearse Road and Kinsale Road. Watermain sizing is in accordance with the Uisce Éireann Code of Practice for Water Infrastructure. The proposed layout is shown in the watermain drawing included in Appendix A of this report.

This feed will provide potable and firefighting water to the proposed development. A bulk water meter shall be provided at the site boundary at the location of the proposed connection to the existing watermain. The watermain layout will be designed in accordance with "Uisce Éireann Code of Practice for Water Infrastructure". All watermains are to be constructed in accordance with Uisce Éireann Code of Practice and the Local Authority's requirements. Fire coverage is to be reviewed and certified by the fire consultant.

To reduce the water demand on Local Authority water supplies and to reduce the foul discharge from the development, water conservation measures will be incorporated in the sanitary facilities throughout the development, e.g. dual flush toilets, monobloc low volume push taps and waterless urinals.

A Pre-Connection Enquiry Form has been issued to Uisce Éireann (UÉ) in relation to the proposed development. UÉ has provided a response, advising that water servicing is feasible without infrastructure upgrade by UÉ. Correspondence from UÉ is attached in Appendix B.

All relevant watermain information for the proposed development was included as part of a Design Submission for review by the Uisce Éireann Quality Assurance team. Following consultation with Niall O'Donnabháin, Director of Services with Cork City Council, it was agreed with Cork City Council that the planning submission could proceed prior to receiving the Statement of Design Acceptance from Uisce

Éireann. It should be noted that the new watermain network within the confines of the site will not be taken in charge by Uisce Éireann.

5 Flooding

The proposed development is located within Flood Zone C. This zone defines areas with a low probability of flooding. For river flooding it is defined as less than 0.1% probability or less than 1 in 1,000 years, also for coastal flooding less than 0.1% probability or less than 1 in 1,000 years.

Planning guidelines on flood risk and development have been published by the OPW and Department of Environment, Heritage and Local Government (DoEHLG). The below sections summarise how the development's design will be assessed in accordance with the main principles of the guidelines.

5.1 Sequential Approach

The sequential approach makes use of flood zones for river and coastal flooding, as described below:

Zone A – High probability. This zone defines areas with the highest risk of flooding. For river flooding it is defined as more than 1% probability or more than 1 in 100 year, and for coastal flooding it is defined as 0.5% probability or more than 1 in 200 year.

Zone B – Moderate probability. This zone defines areas with a moderate risk of flooding. For river flooding it is defined as 0.1% to 1% probability or between 1 in 100 and 1 in 1,000 years, and for coastal flooding 0.1% and 0.5% probability or between 1 in 200 and 1 in 1,000 years.

Zone C – Low probability. This zone defines areas with a low risk of flooding less than 0.1% probability or less than 1 in 1,000 years.

The flood zones are then to be looked at with the vulnerability of the building proposed;

Highly Vulnerable	– Hospitals, Garda stations, homes, motorways etc.
Less Vulnerable	– Commercial, retail, offices etc.
Water Compatible	– Marina's, green areas

A sequential approach is then taken to assess the most favourable location for the development based on its vulnerability.

Zone A - Water Compatible or Justification Test

Zone B - Less Vulnerable if no other lands are available or highly vulnerable with Justification Test

Zone C - Any development

5.2 Development Sequential Test

5.2.1 Coastal Flood Risk

Coastal flooding results from sea levels which are higher than normal and result in sea water overflowing onto the land. Coastal flooding is influenced by the following three factors which often work in combination: high tide level, storm surges and wave action.

There is no risk associated with coastal flooding for this site as general ground levels for the site are much higher than expected extreme coastal flood levels.

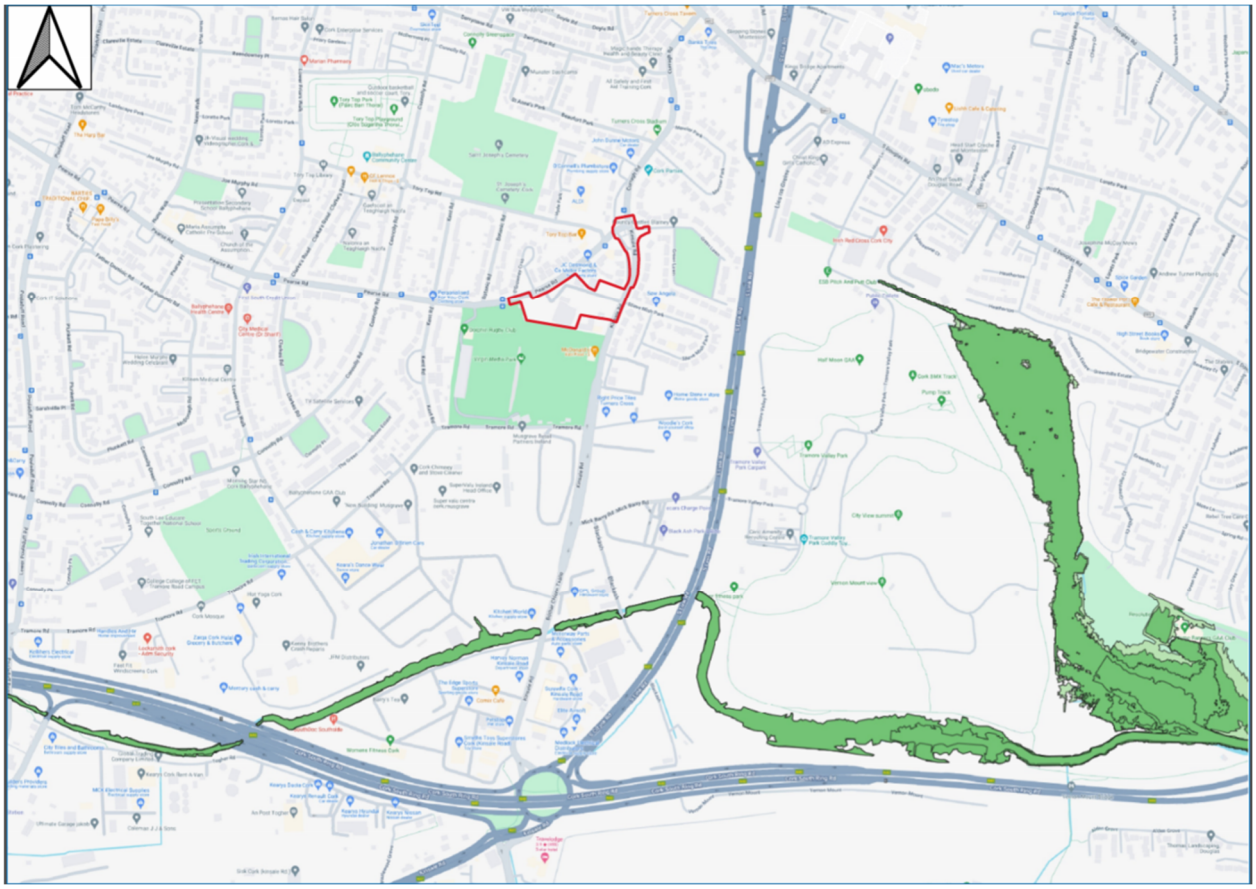


Figure 5-1: Coastal Flood Map (image taken from CFRAM)

5.2.2 Fluvial Flood Risk

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain.

CFRAM mapping for the general area surrounding the development indicate no fluvial flood risk to the proposed compound. Roads in the vicinity are also located in Flood Zone C, therefore access/egress from the development for emergency services during a flood event will not be compromised.

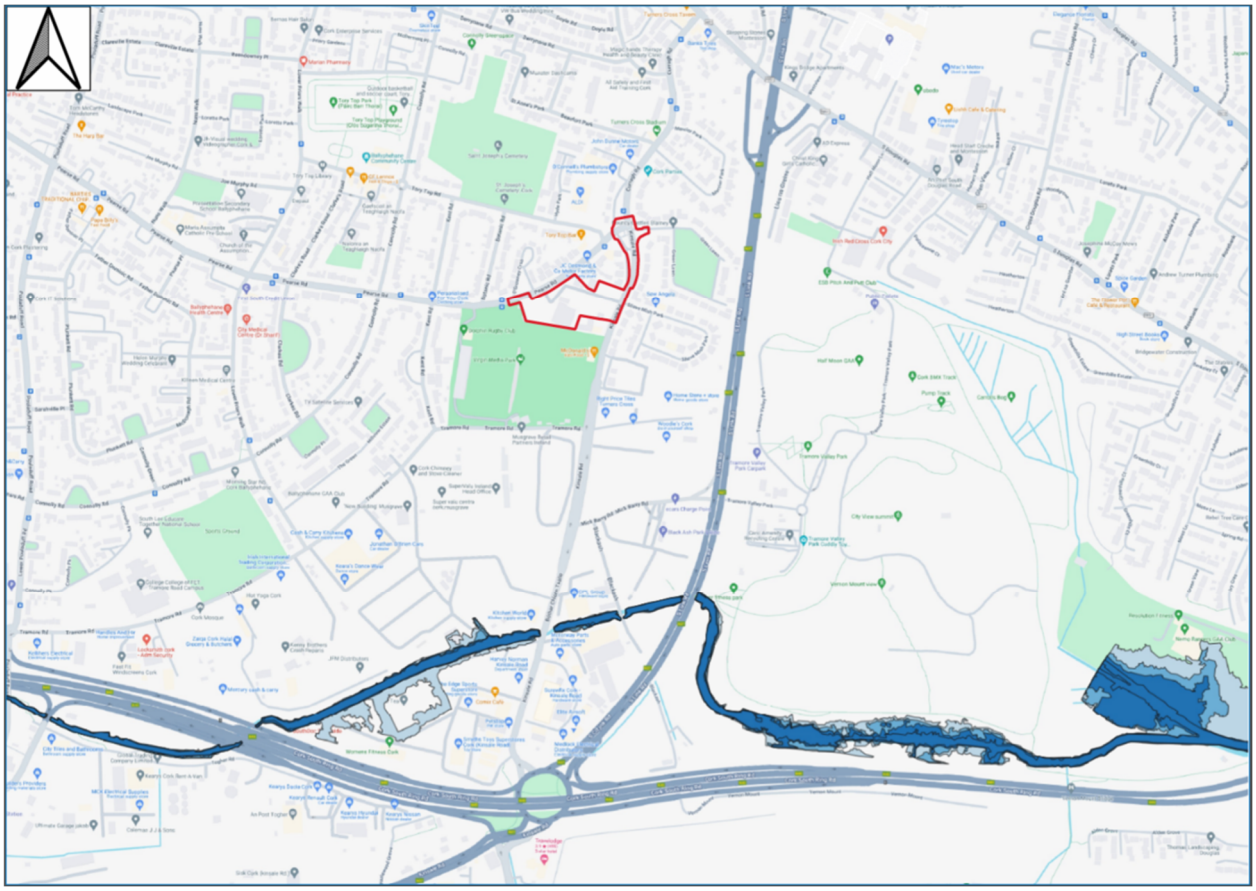


Figure 5-2: Fluvial Flood Map (image taken from CFRAM)

5.2.3 Pluvial Flood Risk

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall and typically occurs in the summer months. Pluvial flood risk has not been identified by the Preliminary Flood Risk Assessment (PFRA) mapping as being a risk to this site.

Additionally, the proposed drainage network will alleviate any concerns of pluvial flooding by catering for the 100-year return period plus 20% climate change allowance.

5.2.4 OPW Flood Maps

The OPW Flood Hazard Mapping Website is a record of historic flood events. This database indicates that there is no record of flooding incidents in the area of the proposed development.

5.3 Flood Risk Assessment Conclusions

The site has been assessed in accordance with the "The Planning System and Flood Risk Management" Guidelines. As part of the sequential test, the OPW flood hazard maps have been consulted, as have the Catchment Flood Risk Assessment Maps produced by the OPW.

In all cases it was found that the development is at low risk of flooding and the development is deemed appropriate within the proposed site location.

6 Roads and Access

6.1 Proposed Roads & Access

Public access to the site will be via a new entrance on Kinsale Road to the east and off Pearse Road to the north.

The proposed internal roads and parking layout have been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) and the Recommendations for Site Development Works. To ensure that the proposed development is complaint with DMURS, PUNCH Consulting Engineers produced a Statement of Compliance and is included as part of the planning application documentation.

The proposed entrances to the site were assessed by Roadplan Consulting as part of a Stage 1 Road Safety Audit. All observations highlighted by Roadplan Consulting were accepted, with the recommended measures adopted in the planning drawings. The final planning drawings are included in Appendix A with the Road Safety Audit report included in Appendix G.

6.2 Traffic Impact Statement

A Traffic & Transportation Assessment (TTA) has been completed by PUNCH Consulting Engineers and will be included as part of this planning application. A summary of the TTA scope of works is provided below.

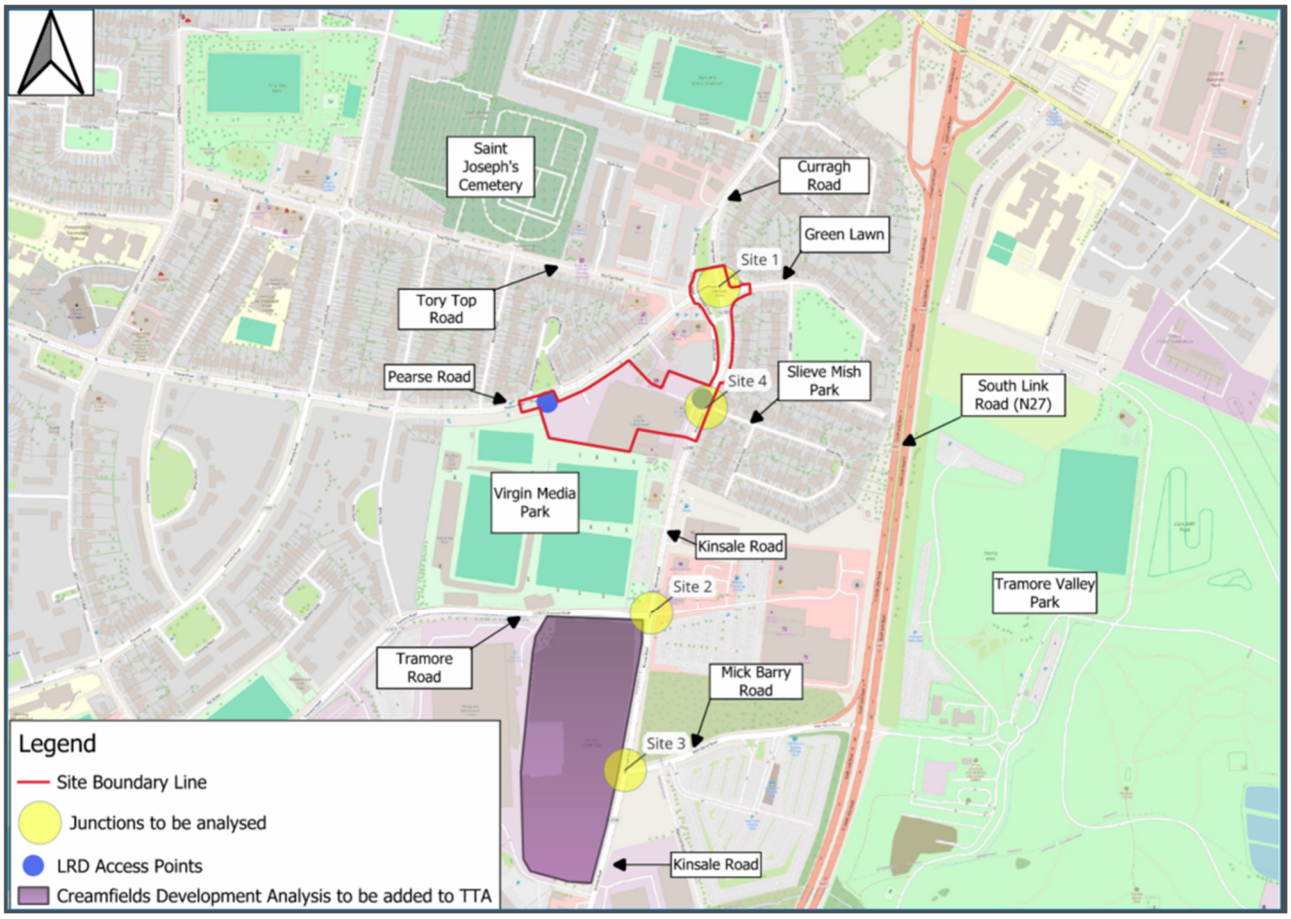


Figure 6-1 Proposed Junctions to be analysed

The purpose of the TTA report will be to assess the potential impact of the proposed development on the existing local transport network and to ensure that the proposed site access will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond. An assessment of the accessibility of the site for cyclists, pedestrians and public transport users will also be made.

This process will involve examining the projected traffic flows on the local road network both 'with' and 'without' the proposed development in place. The morning peak period and the evening peak period will be examined in order to assess the busiest case in terms of local traffic on the road network and traffic generated by the proposed development.

Capacity analysis will be carried out for the junctions listed below:

- Proposed Development Junction with Kinsale Road
- Proposed Development Junction with Pearse Road
- Existing Kinsale Road/Slieve Mish Park Junction
- Existing Pearse Road/Kinsale Road Junction (Signal timing provided by CCC)
- Existing Kinsale Road/Tramore Road Junction (Signal timing provided by CCC)
- Existing Kinsale Road/Mick Barry Road Junction (Signal timing provided by CCC)

The following development scenarios will be analysed with and without development for all junctions

1. Survey year
2. Opening year
3. Design year: opening year + 5 years
4. Design year: opening year + 15 years

6.3 Mobility Management Plan

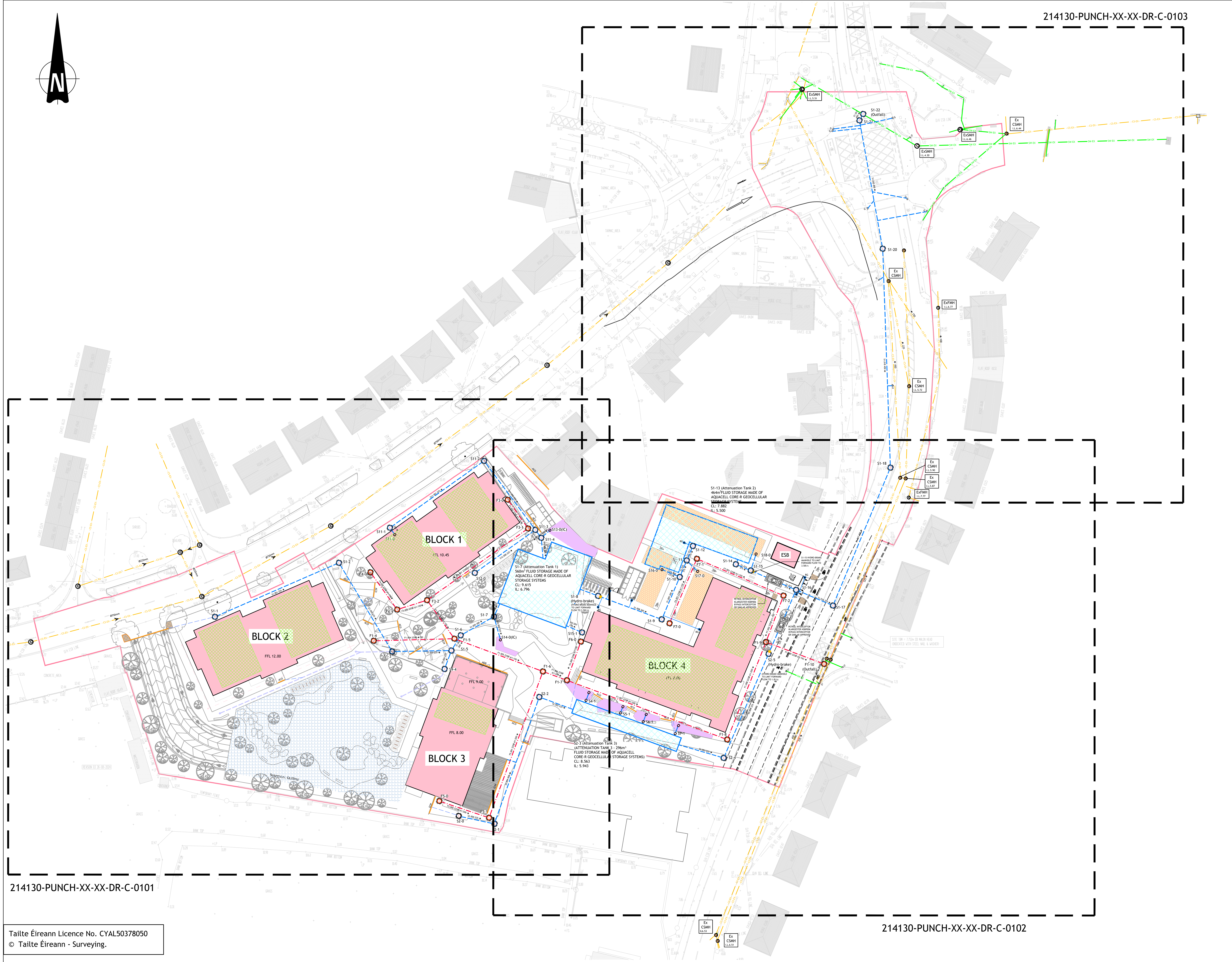
A Mobility Management Plan (MMP) has been completed by PUNCH Consulting Engineers and will be included as part of this planning application. The objectives of the Mobility Management Plan for the proposed development are as follows:

a) To encourage/increase the use of public transport, walking and cycling for residents and visitors for work-related travel and to facilitate travel by bicycle, bus and train.
b) To reduce the overall number of single occupant vehicles trips for journeys to work and work-related travel.
c) To integrate mobility management into the development decisions, policies and practices to work closely with governing bodies on means and use of transport services around the vicinity of the development site
d) To provide information and have resources readily available to increase awareness and continue education on sustainable modes of travel for both residents and visitors to the development
e) To increase car-pooling amongst residents.

7 Outline Construction Environmental Management Plan

The intention of an Outline Construction Environmental Management Plan (OCEMP) is to communicate key environmental obligations that apply to all contractor organisations, their sub-contractors and employees while carrying out any form of construction activity on the site. The OCEMP will include a section describing the Waste Management Plan for the proposed construction works. An OCEMP has been completed by PUNCH Consulting Engineers and is included as part of this planning application.

Appendix A Planning Drawings



LEGEND

EXISTING SURFACE WATER SEWER	
EXISTING COMBINED SEWER	
PROPOSED SURFACE WATER SEWER	S1.001 150 →
PROPOSED SURFACE WATER MANHOLE	S1-0
PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE)	S8-0 RE
PROPOSED PETROL INTERCEPTOR	
PROPOSED ACO DRAINAGE CHANNEL	
PROPOSED ATTENUATION TANK	
PROPOSED BIO RETENTION AREAS	
PROPOSED BLUE GREEN ROOF	
PROPOSED GREEN ROOF	
PROPOSED PERMEABLE PAVING	
PROPOSED FOUL SEWER	225 →
PROPOSED FOUL MANHOLE	F1-0
PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE)	F1-1 RE
EXISTING FOUL MANHOLE	ExFMH
EXISTING COMBINED SEWER MANHOLE	Ex CSMH
SITE BOUNDARY	

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: PROPOSED DRAINAGE LAYOUT - GENERAL ARRANGMENT				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0100-0102		Drawing Status: A0 (Planning)	
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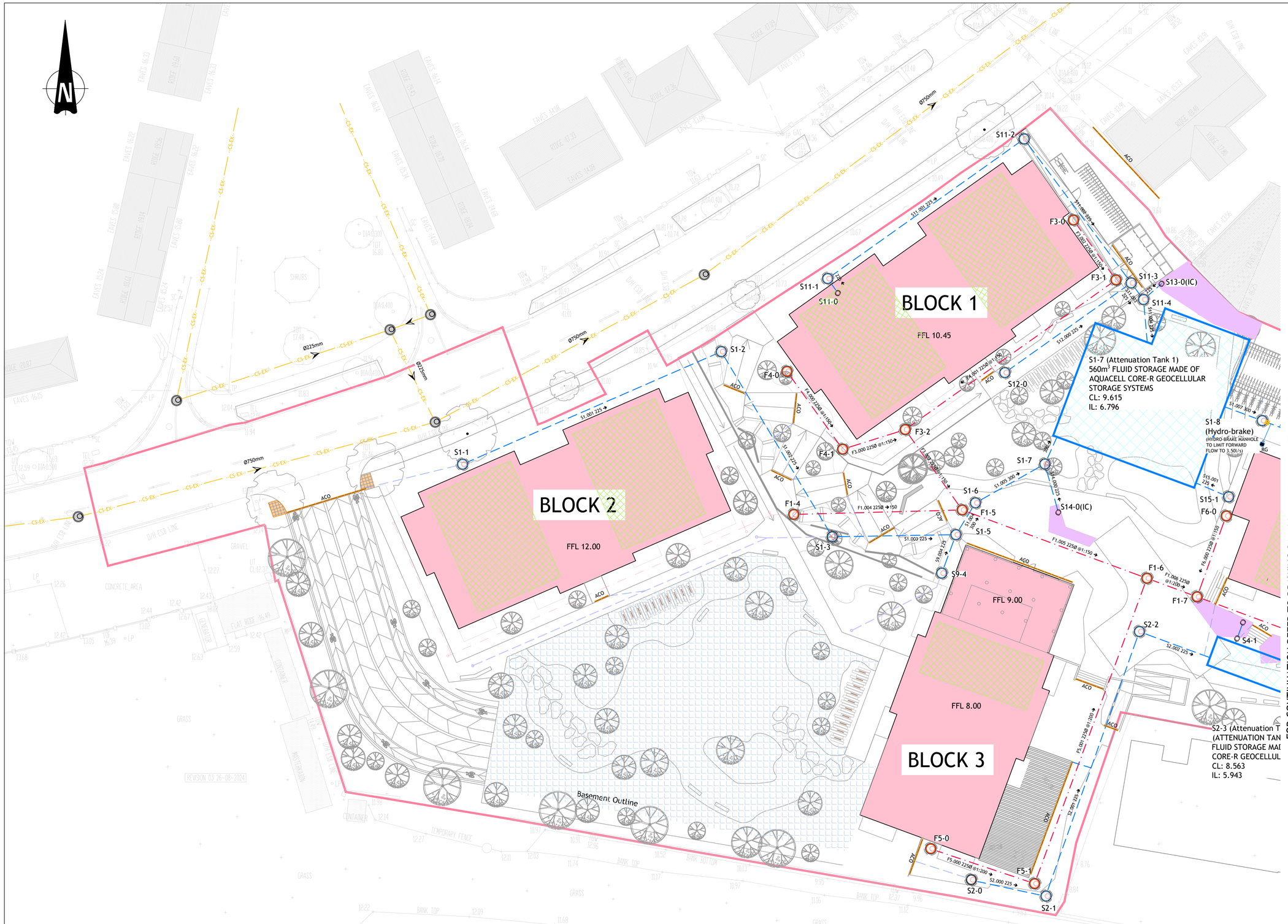

LEGEND

- EXISTING SURFACE WATER SEWER — SW-EX
- EXISTING COMBINED SEWER — CS-EX
- PROPOSED SURFACE WATER SEWER — S1.001 150 →
- PROPOSED SURFACE WATER MANHOLE — S1-0
- PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE) — S8-0 RE
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ACO DRAINAGE CHANNEL — ACO
- PROPOSED ATTENUATION TANK
- PROPOSED BIO RETENTION AREAS
- PROPOSED BLUE GREEN ROOF
- PROPOSED GREEN ROOF
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL SEWER — 225 →
- PROPOSED FOUL MANHOLE — F1-0
- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) — F1-1 RE
- EXISTING FOUL MANHOLE — ExFMH LL:4.30
- EXISTING COMBINED SEWER MANHOLE — Ex CSMH LL:5.87
- SITE BOUNDARY

NOTES:
1. FOR BASEMENT DRAINAGE REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0104
2. FOR DRAINAGE SCHEDULES REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0105
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C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING REVIEW	LL	14.04.2025				

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: PROPOSED DRAINAGE LAYOUT - SHEET 1 OF 3

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

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FOR CONTINUATION REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0101

FOR CONTINUATION REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0102

Ø750mm

S1-13 (Attenuation Tank 2)
464m³FLUID STORAGE MADE OF AQUACELL CORE-R GEOCELLULAR STORAGE SYSTEMS
CL: 7.882
IL: 5.500

S1-7 (Attenuation Tank 1)
560m³ FLUID STORAGE MADE OF AQUACELL CORE-R GEOCELLULAR STORAGE SYSTEMS
CL: 9.615
IL: 6.796

S2-3 (Attenuation Tank 3)
(ATTENUATION TANK 3 - 296m³
FLUID STORAGE MADE OF AQUACELL
CORE-R GEOCELLULAR STORAGE SYSTEMS)
CL: 8.563
IL: 5.943

S1-8 (Hydro-brake)
(HYDRO-BRAKE MANHOLE TO LIMIT FORWARD FLOW TO 3.50l/s)

S1-15 HYDRO-BRAKE MANHOLE TO LIMIT FORWARD FLOW TO 3.50l/s

S2-5 (Hydro-brake)
(HYDRO-BRAKE MANHOLE TO LIMIT FORWARD FLOW TO 1.0l/s)

F1-10 (Outfall)

PETROL INTERCEPTOR KLARGESTER NSBP006 BYPASS INTERCEPTOR OR SIMILAR APPROVED

SITE TBM = 7.752m OD MALIN HEAD (INDICATED WITH STEEL NAIL & WASHER)

BLOCK 4 FFL 8.00

BLOCK 1 FFL 10.45

BLOCK 3 FFL 8.00

FFL 9.00

ESB

Ex CSMH I.L.5.90

Ex CSMH I.L.5.87

ExFMH I.L.7.77

LEGEND

- EXISTING SURFACE WATER SEWER
- EXISTING COMBINED SEWER
- PROPOSED SURFACE WATER SEWER (S1.001 150 →)
- PROPOSED SURFACE WATER MANHOLE (S1-0)
- PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE) (S8-0 RE)
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ACO DRAINAGE CHANNEL
- PROPOSED ATTENUATION TANK
- PROPOSED BIO RETENTION AREAS
- PROPOSED BLUE GREEN ROOF
- PROPOSED GREEN ROOF
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL SEWER (225 →)
- PROPOSED FOUL MANHOLE (F1-0)
- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) (F1-1 RE)
- EXISTING FOUL MANHOLE (ExFMH I.L.4.30)
- EXISTING COMBINED SEWER MANHOLE (Ex CSMH I.L.5.87)
- SITE BOUNDARY

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: PROPOSED DRAINAGE LAYOUT - SHEET 2 OF 3

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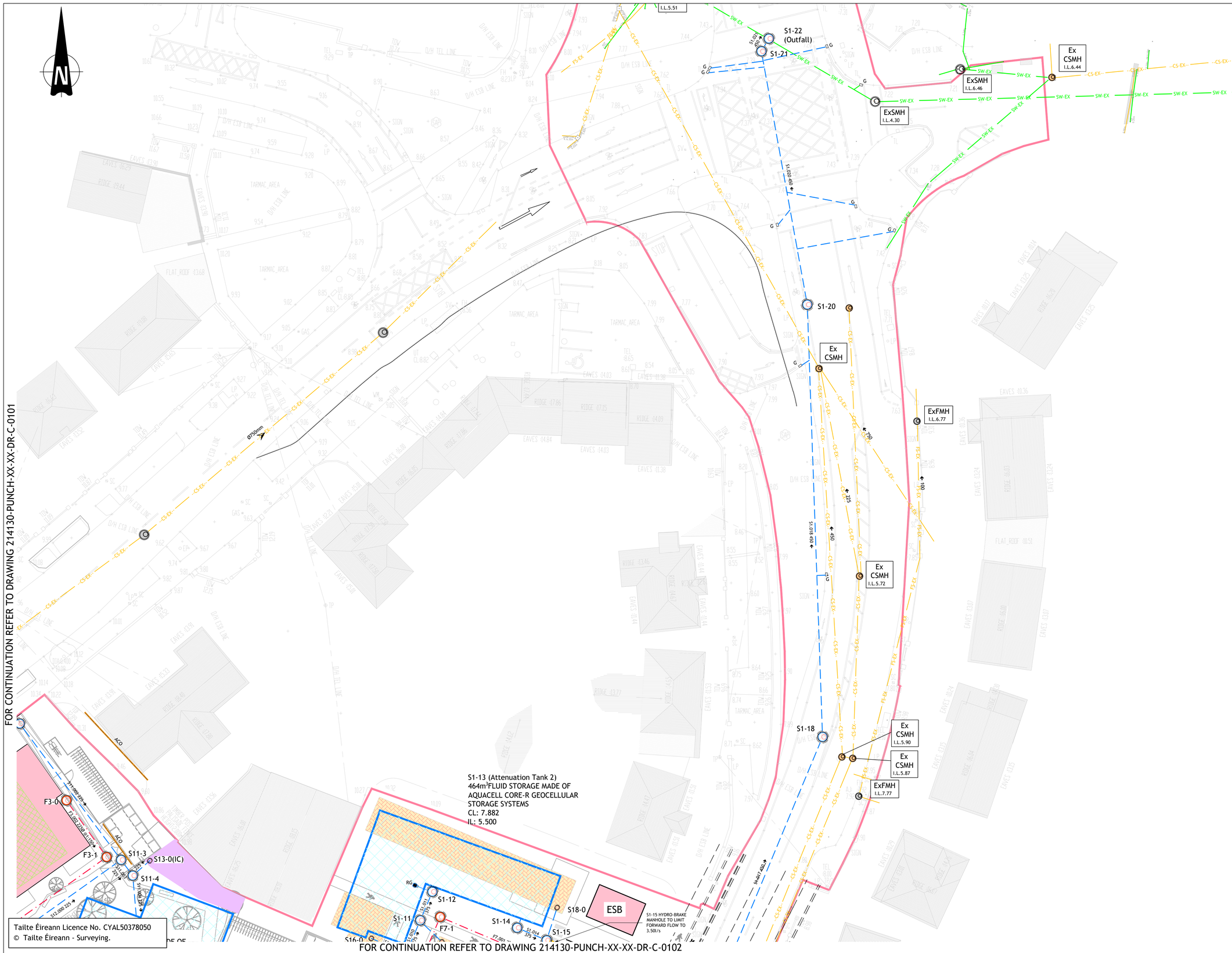

LEGEND

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- EXISTING COMBINED SEWER — CS-EX
- PROPOSED SURFACE WATER SEWER — S1.001 150
- PROPOSED SURFACE WATER MANHOLE — S1-0
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- PROPOSED GREEN ROOF
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- PROPOSED FOUL SEWER — 225
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- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) — F1-1 RE
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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: PROPOSED DRAINAGE LAYOUT - SHEET 3 OF 3

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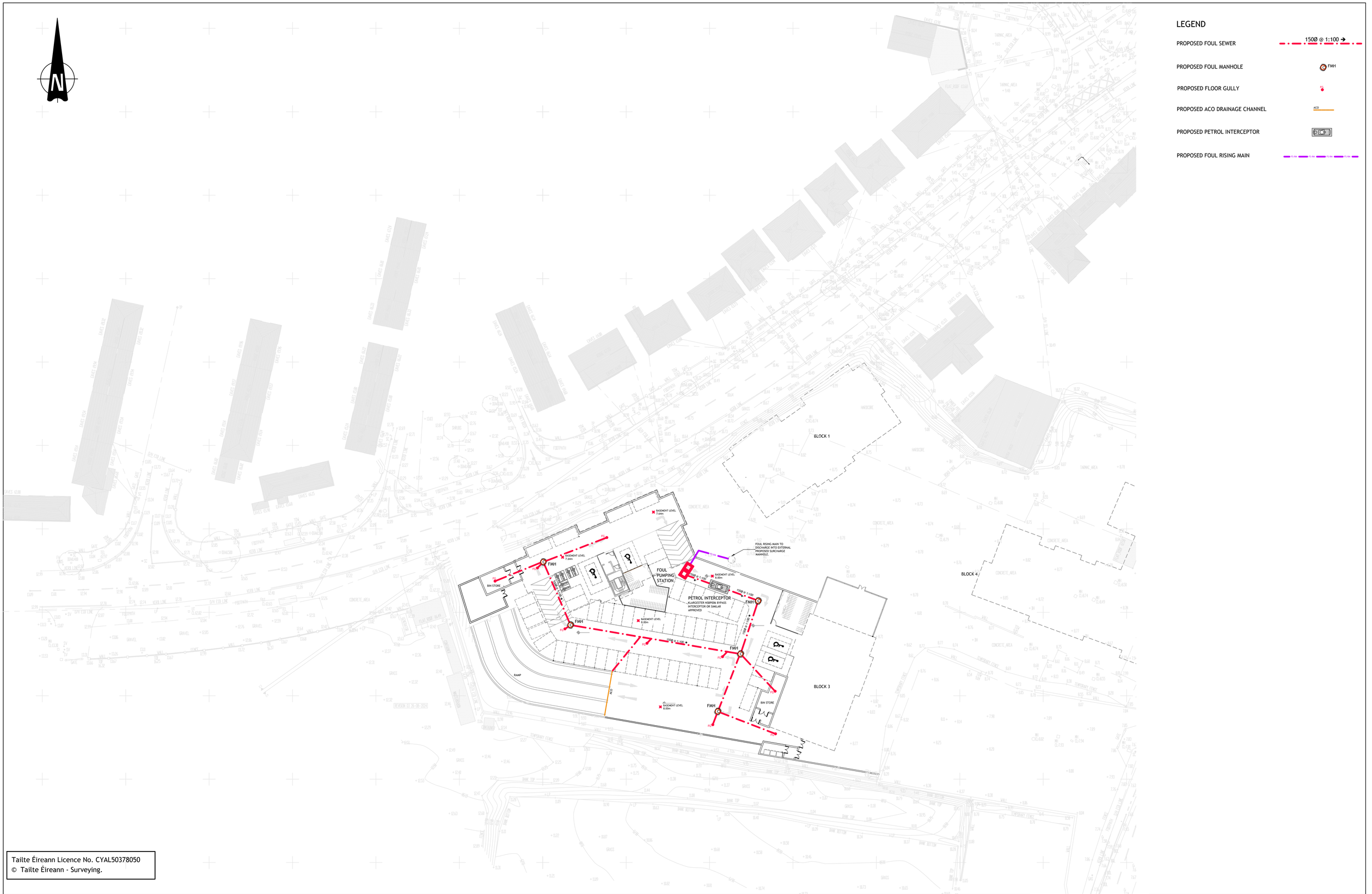
AS SHOWN	214130-PUNCH-XX-XX-DR-C-0103	C07

214130-PUNCH-XX-XX-DR-C-0101



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C03	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C05	ISSUED FOR PLANNING	LL	09.06.2025				

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: PROPOSED BASEMENT DRAINAGE LAYOUT

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model Ref:	Drawing Status:
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Scale @ A1:	Document No:	Revision No:
AS SHOWN	214130-PUNCH-XX-XX-DR-C-0104	C05

PROPOSED FOUL MANHOLE					
Name	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
F1-0	11.869	1200	567603.395	570100.374	1.019
F1-1	12.133	1200	567611.206	570082.574	1.413
F2-0	12.000	1200	567646.429	570108.337	1.150
F1-2	11.527	1200	567650.244	570099.531	1.091
F1-3	11.846	1200	567653.936	570101.134	3.396
F1-4	9.950	1200	567656.808	570101.210	1.519
F3-0	10.537	1200	567694.028	570140.385	1.537
F3-1	10.323	1200	567699.684	570132.421	1.388
F4-0	10.525	1200	567655.903	570120.243	1.747
F4-1	10.278	1200	567663.320	570109.883	1.585
F3-2	10.232	1200	567671.633	570112.497	2.482
F1-5	9.116	1200	567679.229	570101.802	1.453
F5-0	8.000	1200	567673.850	570057.112	1.000
F5-1	7.942	1200	567688.861	570052.075	1.021
F1-6	8.914	1200	567703.816	570092.708	2.209
F6-0	8.761	1200	567714.372	570101.009	1.511
F1-7	8.787	1200	567710.479	570090.247	2.118
F1-8	8.134	1200	567755.002	570073.804	1.702
F7-0	8.529	1200	567738.968	570106.060	1.479
F7-1	7.986	1200	567746.567	570123.996	1.066
F7-2	7.891	1200	567770.627	570113.762	1.145
F1-9	7.944	1200	567765.762	570100.868	1.658
F1-10 (Outfall)	7.656	1200	567781.906	570094.778	1.476

PROPOSED FOUL PIPES								
Name	US Node	US Node CL (m)	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)
F1.000	F1-0	11.869	F1-1	19.438	1.500	10.850	10.720	0.130
F1.001	F1-1	12.133	F1-2	42.562	1.500	10.720	10.436	0.284
F2.000	F2-0	12.000	F1-2	9.597	1.500	10.850	10.786	0.064
F1.002	F1-2	11.527	F1-3	4.025	1.500	10.436	10.409	0.027
F1.003	F1-3	11.846	F1-4	2.873	1.500	8.450	8.431	0.019
F1.004	F1-4	9.950	F1-5	22.429	1.500	8.431	8.281	0.150
F3.000	F3-0	10.537	F3-1	9.768	1.500	9.000	8.935	0.065
F3.002	F3-1	10.323	F3-2	34.407	1.500	8.935	8.706	0.229
F4.000	F4-0	10.525	F4-1	12.741	1.500	8.778	8.693	0.085
F4.001	F4-1	10.278	F3-2	8.714	1.500	8.693	8.635	0.058
F3.003	F3-2	10.232	F1-5	13.118	1.500	7.750	7.663	0.087
F1.005	F1-5	9.116	F1-6	26.215	1.500	7.663	7.488	0.175
F5.000	F5-0	8.000	F5-1	15.834	1.500	7.000	6.921	0.079
F5.001	F5-1	7.942	F1-6	43.298	1.500	6.921	6.705	0.216
F1.006	F1-6	8.914	F1-7	7.103	1.500	6.705	6.669	0.036
F6.000	F6-0	8.761	F1-7	11.444	1.500	7.250	7.174	0.076
F1.007	F1-7	8.787	F1-8	47.462	1.500	6.669	6.432	0.237
F1.008	F1-8	8.134	F1-9	29.125	1.500	6.432	6.286	0.146
F7.000	F7-0	8.529	F7-1	19.479	1.500	7.050	6.920	0.130
F7.001	F7-1	7.986	F7-2	26.146	1.500	6.920	6.746	0.174
F7.002	F7-2	7.891	F1-9	13.781	1.500	6.746	6.654	0.092
F1.009	F1-9	7.944	F1-10 (Outfall)	17.254	1.500	6.286	6.180	0.106

PROPOSED STORM MANHOLES				
Name	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)
S1-0 (Green Roof - Block 2)	24.675	1200	567613.534	570106.054
S1-1	11.857	1200	567612.735	570107.887
S1-2	10.980	1200	567647.163	570122.874
S8-0	12.127	1200	567614.099	570081.078
S8-1	11.821	1200	567653.255	570098.084
S1-3	9.680	1200	567661.935	570098.232
S9-0 (Blue Roof - Podium)	11.947	1200	567663.302	570082.862
S9-1	11.888	1200	567664.330	570085.661
S10-0 (Green Roof - Block 3)	37.125	1200	567676.257	570087.187
S10-1	11.670	1200	567675.009	570089.583
S9-3	11.584	1200	567675.807	570091.513
S9-4	9.000	1200	567676.500	570093.389
S1-4	9.006	1200	567678.392	570098.513
S1-5	9.151	1200	567680.984	570102.739
S14-0 (Bioretention Area)	8.995	1200	567692.016	570101.481
S1-6	9.107	1200	567690.224	570107.921
S11-0 (Green Roof - Block 1)	23.475	1200	567662.477	570130.971
S11-1	10.607	1200	567661.318	570132.602
S11-2	10.258	1200	567687.471	570151.182
S12-0	9.939	1200	567684.902	570120.082
S11-3	10.268	1200	567701.707	570132.019
S13-0 (Bioretention Area)	10.241	1200	567705.749	570131.911
S11-4	10.145	1200	567703.352	570129.806
S15-0 (Green Roof - Block 4)	27.525	1200	567720.650	570101.347
S15-1	8.778	1200	567715.313	570103.324
S1-7 (Attenuation Tank 1)	9.615	1200	567704.281	570119.181
S1-8 (Hydro-Brake)	8.837	1200	567719.143	570113.688
S1-9	8.588	1200	567736.806	570107.160
S16-0 (Permeable Paving)	8.422	1200	567738.054	570120.519
S1-10	8.204	1350	567741.809	570118.922
S17-0 (Permeable Paving)	8.012	1200	567747.373	570121.988
S1-11	8.054	1350	567743.766	570123.523
S1-12	8.004	1350	567745.474	570127.539
S1-13 (Attenuation Tank 2)	7.882	1350	567755.322	570126.487
S18-0 (Permeable Paving)	7.927	1200	567762.590	570124.482
S1-14	7.912	1350	567757.389	570122.471
S2-0	7.938	1200	567680.432	570052.587
S2-1	7.821	1200	567691.116	570051.002
S2-2	8.911	1200	567702.805	570085.619
S4-0 (Bioretention Area)	8.708	1200	567716.622	570086.898
S4-1 (Orifice)	8.728	1200	567715.587	570084.096
S7-0 (Bioretention Area)	8.367	1200	567741.407	570077.759
S7-1 (Orifice)	8.299	1350	567740.368	570074.945
S5-0 (Bioretention Area)	8.590	1200	567726.165	570083.388
S5-1 (Orifice)	8.663	1200	567725.126	570080.574
S6-0 (Bioretention Area)	8.590	1200	567732.553	570081.029
S6-1 (Orifice)	8.559	1350	567731.473	570078.230
S2-3 (Attenuation Tank 3)	8.563	1200	567727.952	570076.328
S2-4	7.864	1350	567754.020	570068.681
S2-5 (Hydro-Brake)	7.886	1350	567766.481	570097.599
S1-16	7.821	1350	567774.131	570115.352
S1-17	7.766	1350	567784.367	570110.996
S1-18	7.803	1350	567800.321	570149.307
S1-19	7.613	1350	567797.546	570197.985
S1-20	7.528	1350	567798.177	570210.092
S1-21	7.254	1350	567791.724	570245.717
S1-22 (Outfall)	7.238	1350	567792.767	570247.493
S1-15 (Hydro-Brake)	7.890	1350	567761.532	570120.721

PROPOSED STORM PIPES								
Name	US Node	US Node CL (m)	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)
S1.000	S1-0 (Green Roof - Block 2)	24.675	S1-1	2.000	0.600	24.000	10.600	13.400
S1.001	S1-1	11.857	S1-2	37.549	0.600	10.600	10.350	0.250
S1.002	S1-2	10.980	S1-3	28.730	0.600	9.350	9.158	0.192
S9.000	S8-0	12.127	S8-1	42.690	0.600	10.850	10.565	0.285
S8.001	S8-1	11.821	S1-3	8.681	0.600	10.565	8.381	2.184
S1.003	S1-3	9.680	S1-4	16.459	0.600	7.750	7.640	0.110
S9.000.	S9-0 (Blue Roof - Podium)	11.947	S9-1	2.982	0.600	11.447	11.427	0.020
S9.001	S9-1	11.888	S9-3	12.883	0.600	11.427	11.341	0.086
S10.000	S10-0 (Green Roof - Block 3)	37.125	S10-1	2.702	0.600	36.250	11.100	25.150
S10.001	S10-1	11.670	S9-3	2.088	0.600	11.100	11.086	0.014
S9.003	S9-3	11.584	S9-4	2.000	0.600	11.000	7.500	3.500
S9.004	S9-4	9.000	S1-4	5.462	0.600	7.500	7.464	0.036
S1.004	S1-4	9.006	S1-5	4.958	0.600	7.100	7.067	0.033
S1.005	S1-5	9.151	S1-6	10.594	0.600	7.067	6.996	0.071
S14.000	S14-0 (Bioretention Area)	8.995	S1-6	6.685	0.600	7.795	7.750	0.045
S1.006	S1-6	9.107	S1-7 (Attenuation Tank 1)	18.011	0.600	6.996	6.876	0.120
S11.000	S11-0 (Green Roof - Block 1)	23.475	S11-1	2.001	0.600	23.000	9.500	13.500
S11.001	S11-1	10.607	S11-2	32.081	0.600	9.500	9.286	0.214
S11.002	S11-2	10.258	S11-3	23.872	0.600	9.286	9.127	0.159
S12.000	S12-0	9.939	S11-3	20.613	0.600	8.514	8.308	0.206
S11.003	S11-3	10.268	S11-4	2.757	0.600	8.308	8.290	0.018
S13.000	S13-0 (Bioretention Area)	10.241	S11-4	3.190	0.600	8.816	8.784	0.032
S11.004	S11-4	10.145	S1-7 (Attenuation Tank 1)	10.666	0.600	7.650	7.579	0.071
S15.000	S15-0 (Green Roof - Block 4)	27.525	S15-1	5.691	0.600	27.000	7.000	20.000
S15.001	S15-1	8.778	S1-7 (Attenuation Tank 1)	19.317	0.600	7.000	6.871	0.129
S1.007	S1-7 (Attenuation Tank 1)	9.615	S1-8 (Hydro-Brake)	15.845	0.600	6.796	6.690	0.106
S1.008	S1-8 (Hydro-Brake)	8.837	S1-9	18.831	0.600	6.690	6.564	0.126
S1.009	S1-9	8.588	S1-10	12.782	0.600	6.564	6.479	0.085
S16.000	S16-0 (Permeable Paving)	8.422	S1-10	4.080	0.600	6.997	6.956	0.041
S1.010	S1-10	8.204	S1-11	5.000	0.600	6.404	6.371	0.033
S17.000	S17-0 (Permeable Paving)	8.012	S1-11	3.920	0.600	6.587	6.548	0.039
S1.011	S1-11	8.054	S1-12	4.364	0.600	6.371	6.342	0.029
S1.012	S1-12	8.004	S1-13 (Attenuation Tank 2)	9.904	0.600	5.566	5.500	0.066
S1.013	S1-13 (Attenuation Tank 2)	7.882	S1-14	4.517	0.600	5.500	5.470	0.030
S18.000	S18-0 (Permeable Paving)	7.927	S1-15 (Hydro-Brake)	3.907	0.600	6.500	6.474	0.026
S1.014	S1-14	7.912	S1-15 (Hydro-Brake)	4.497	0.600	5.470	5.440	0.030
S2.000	S2-0	7.938	S2-1	10.801	0.600	6.438	6.366	0.072
S2.001	S2-1	7.821	S2-2	36.537	0.600	6.366	6.122	0.244
S2.002	S2-2	8.911	S2-3 (Attenuation Tank 3)	26.808	0.600	6.122	5.943	0.179
S1.015	S1-15 (Hydro-Brake)	7.890	S1-16	13.695	0.600	5.440	5.349	0.091
S4.000	S4-0 (Bioretention Area)	8.708	S4-1 (Orifice)	2.987	0.600	7.283	7.263	0.020
S4.001	S4-1 (Orifice)	8.728	S2-3 (Attenuation Tank 3)	14.603	0.600	7.263	7.166	0.097
S7.000	S7-0 (Bioretention Area)	8.367	S7-1 (Orifice)	3.000	0.600	6.942	6.922	0.020
S7.001	S7-1 (Orifice)	8.299	S2-3 (Attenuation Tank 3)	12.493	0.600	6.922	6.839	0.083
S5.000	S5-0 (Bioretention Area)	8.590	S5-1 (Orifice)	3.000	0.600	7.165	7.145	0.020
S5.001	S5-1 (Orifice)	8.663	S2-3 (Attenuation Tank 3)	5.100	0.600	7.145	7.111	0.034
S6.000	S6-0 (Bioretention Area)	8.590	S6-1 (Orifice)	3.000	0.600	7.090	7.070	0.020
S6.001	S6-1 (Orifice)	8.559	S2-3 (Attenuation Tank 3)	4.002	0.600	7.070	7.043	0.027
S2.003	S2-3 (Attenuation Tank 3)	8.563	S2-4	27.166	0.600	5.943	5.762	0.181
S2.004	S2-4	7.864	S2-5 (Hydro-Brake)	31.489	0.600	5.762	5.605	0.157
S2.005	S2-5 (Hydro-Brake)	7.886	S1-16	19.331	0.600	5.605	5.508	0.097
S1.016	S1-16	7.821	S1-17	11.124	0.600	5.349	5.275	0.074
S1.017	S1-17	7.766	S1-18	41.500	0.600	5.200	4.923	0.277
S1.018	S1-18	7.803	S1-19	48.757	0.600	4.923	4.598	0.325
S1.019	S1-19	7.613	S1-20	12.123	0.600	4.598	4.517	0.081
S1-20	S1-20	7.528	S1-21	36.205	0.600	4.517	4.276	0.241
S1-21	S1-21	7.254	S1-22 (Outfall)	2.060	0.600	4.276	4.262	0.014

BUILDING INFORMATION MODELLING (BIM) - I.S. EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C04	ISSUED FOR PLANNING	LL	09.06.2025				

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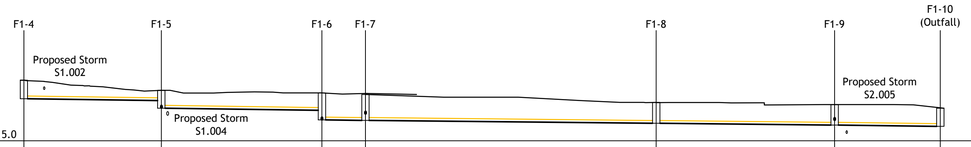
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: DRAINAGE TABLES

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model Ref:	Drawing Status:
214130	214130-PUNCH-XX-XX-M2-C-0105	A0 (Planning)

Scale @ A1:	Document No:	Revision No:
NTS	214130-PUNCH-XX-XX-DR-C-0105	C04



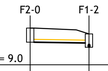
Vert exaggeration = 2.0

Datum = 5.0

Link Name		F1.004		F1.005		F1.006	F1.007		F1.008		F1.009		
Section Type		225mm		225mm		225mm	225mm		225mm		225mm		
Slope (1:X)		1:150.0		1:150.0		1:200.0	1:200.0		1:200.0		1:162.8		
Cover Level (m)		9.950		9.116		8.914	8.787		8.134	8.129	7.944		7.656
Invert Level (m)		8.431	8.281	7.663	7.488	6.705	6.669	6.669	6.432	6.432	6.286	6.286	6.180
Length (m)		22.429		26.215		7.103	47.462		29.125		17.254		

FOUL SEWER LONGITUDINAL SECTION F1-4 TO F1-10 (OUTFALL)

SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Datum = 9.0

Link Name		F2.000		
Section Type		225mm		
Slope (1:X)		1:150.0		
Cover Level (m)		12.000		11.527
Invert Level (m)		10.850	10.786	
Length (m)		9.597		

FOUL SEWER LONGITUDINAL SECTION F2-0 TO F1-2

SCALE 1:500(H) 1:100(V)

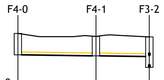
Vert exaggeration = 2.0

Datum = 6.0

Link Name		F3.000		F3.002			F3.003		
Section Type		225mm		225mm			225mm		
Slope (1:X)		1:150.0		1:150.0			1:150.0		
Cover Level (m)		10.537	10.323	10.351	10.166		10.232	9.105	9.116
Invert Level (m)		9.000	8.935	8.935			8.706	7.750	7.663
Length (m)		9.768		34.407			13.118		

FOUL SEWER LONGITUDINAL SECTION F3-0 TO F1-5

SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Datum = 6.0

Link Name		F4.000	F4.001		
Section Type		225mm	225mm		
Slope (1:X)		1:150.0	1:150.0		
Cover Level (m)		10.525	10.278	10.232	
Invert Level (m)		8.778	8.693	8.693	8.635
Length (m)		12.741	8.714		

FOUL SEWER LONGITUDINAL SECTION F4-0 TO F3-2

SCALE 1:500(H) 1:100(V)

BUILDING INFORMATION MODELLING (BIM)
I.S. EN ISO 19650-2:2018
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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

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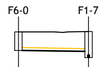
Project: KINSALE ROAD LRD, KINSALE ROAD , CORK			
Title: FOUL DRAINAGE LONGITUDINAL SECTIONS SHEET 1			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0175-177	Drawing Status: A0 (For Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0175	Revision No: C03	

Vert exaggeration = 2.0

Link Name		F5.000	F5.001	
Section Type		225mm	225mm	
Slope (1:X)		1:200.0	1:200.0	
Cover Level (m)		8.000	7.942 9.000	8.914
Invert Level (m)		7.000	6.921 6.921	6.705
Length (m)		15.834	43.298	

FOUL SEWER LONGITUDINAL SECTION F5-0 TO F1-6

SCALE 1:500(H) 1:100(V)

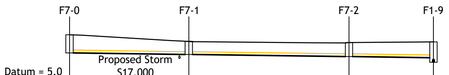


Vert exaggeration = 2.0

Link Name		F6.000	
Section Type		225mm	
Slope (1:X)		1:150.6	
Cover Level (m)		8.761	8.722 8.787
Invert Level (m)		7.250	7.174
Length (m)		11.444	

FOUL SEWER LONGITUDINAL SECTION F6-0 TO F1-7

SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		F7.000	F7.001	F7.002	
Section Type		225mm	225mm	225mm	
Slope (1:X)		1:150.0	1:150.0	1:150.0	
Cover Level (m)		8.529	7.986	7.891	7.944
Invert Level (m)		7.050	6.920 6.920	6.746 6.746	6.654
Length (m)		19.479	26.146	13.781	

FOUL SEWER LONGITUDINAL SECTION F7-0 TO F1-9

SCALE 1:500(H) 1:100(V)

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING	LL	09.06.2025

Rev	Amendment	By	Date

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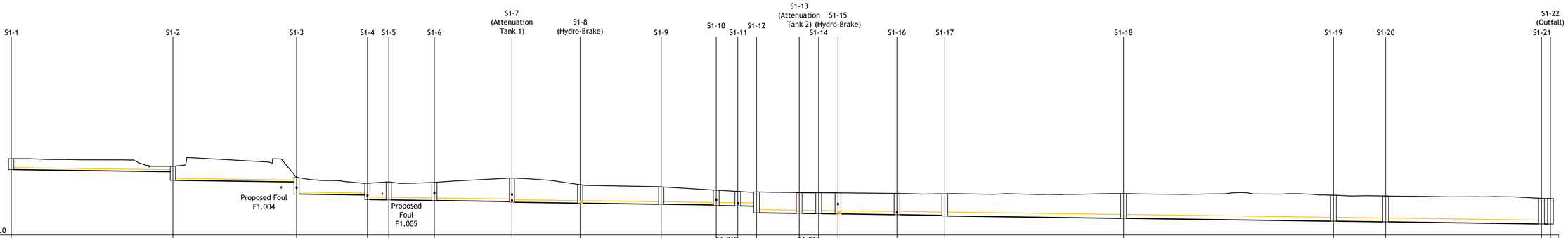
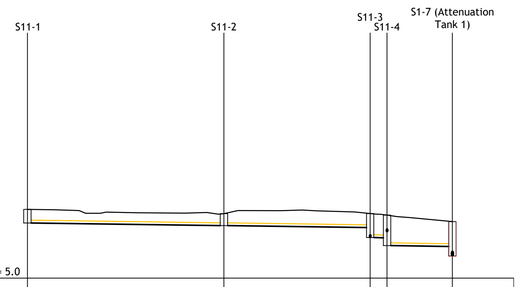
Project:	KINSALE ROAD LRD, KINSALE ROAD , CORK			
Title:	FOUL DRAINAGE LONGITUDINAL SECTIONS SHEET 2			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-MZ-C-0175-177		Drawing Status: A0 (For Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0176			Revision No: C03

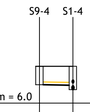


Vert exaggeration = 2.0 Datum = 3.0

Link Name		S1.001		S1.002		S1.003	S1.004	S1.005	S1.006	S1.007	S1.008	S1.009	S1.010	S1.011	S1.012	S1.013	S1.014	S1.015	S1.016	S1.017	S1.018	S1.019	S1-20	S1-21
Section Type		225mm		225mm		225mm	300mm	300mm	300mm	300mm	300mm	300mm	375mm	375mm	375mm	375mm	375mm	375mm	375mm	450mm	450mm	450mm	450mm	450mm
Slope (1:X)		1:150.0		1:150.0		1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0	1:150.0
Cover Level (m)		11.857	11.857	10.872	10.980	9.680	9.006	9.151	9.107	9.615	8.837	8.588	8.204	8.054	8.004	7.882	7.912	7.890	7.821	7.736	7.766	7.683	7.803	7.913	7.613	7.523	7.528	7.354	7.238
Invert Level (m)		10.600		10.350	9.350	9.158	7.640	7.100	7.067	7.067	6.996	6.996	6.876	6.796	6.690	6.690	6.564	6.564	6.479	6.404	6.371	6.342	5.566	5.500	5.500	5.470	5.470	5.440	5.440	5.349	5.349	5.275	5.200	4.923	4.923	4.598	4.598	4.517	4.517	4.276	4.188
Length (m)		37.549		28.730		16.459	4.958	10.594	18.011	15.845	18.831	12.782	5.000	4.364	9.904	4.517	4.497	13.695	11.124	41.500	48.757	12.123	36.205	2.060

SURFACE WATER SEWER LONGITUDINAL SECTION S1-1 TO S1-22 (Outfall)
SCALE 1:500(H) 1:100(V)





Vert exaggeration = 2.0 Datum = 6.0

Link Name		S9.004	
Section Type		225mm	
Slope (1:X)		1:150.0	
Cover Level (m)		9.000	9.006
Invert Level (m)		7.500	7.464
Length (m)		5.462	

SURFACE WATER SEWER LONGITUDINAL SECTION S9-4 TO S1-4
SCALE 1:500(H) 1:100(V)

Vert exaggeration = 2.0 Datum = 5.0

Link Name		S11.001	S11.002	S11.003	S11.004	
Section Type		225mm	225mm	225mm	225mm	
Slope (1:X)		1:150.0	1:150.0	1:150.0	1:150.0	
Cover Level (m)	10.607		10.258	10.550	10.268	10.145	9.615
Invert Level (m)	9.500		9.286	9.286	9.127	8.308 / 8.290	7.650	7.579
Length (m)		32.081		23.872	2.757	10.666	

SURFACE WATER SEWER LONGITUDINAL SECTION S11-1 TO S1-7
SCALE 1:500(H) 1:100(V)

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

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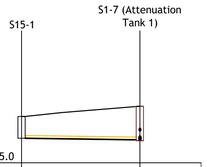
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: SURFACE WATER DRAINAGE LONGITUDINAL SECTIONS SHEET 1				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0200-202		Drawing Status: A0 (Planning)	
Scale @ A1: 1:500/1:100	Document No: 214130-PUNCH-XX-XX-DR-C-0200			Revision No: C04

Vert exaggeration = 2.0

Link Name		S12.000	
Section Type		225mm	
Slope (1:X)		1:100.0	
Cover Level (m)	9.939		10.268
Invert Level (m)	8.514		8.308
Length (m)		20.613	

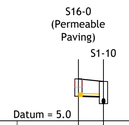
SURFACE WATER SEWER LONGITUDINAL SECTION S12-0 TO S11-3
SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		S15.001	
Section Type		225mm	
Slope (1:X)		1:150.0	
Cover Level (m)	8.778		9.615
Invert Level (m)	7.000		6.871
Length (m)		19.317	

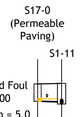
SURFACE WATER SEWER LONGITUDINAL SECTION S15-1 TO S1-7
SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		S16.000	
Section Type		225mm	
Slope (1:X)		1:100.0	
Cover Level (m)	8.422		8.204
Invert Level (m)	6.997		6.956
Length (m)		4.080	

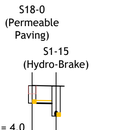
SURFACE WATER SEWER LONGITUDINAL SECTION S16-0 TO S1-10
SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		S17.000	
Section Type		225mm	
Slope (1:X)		1:100.0	
Cover Level (m)	8.012		8.054
Invert Level (m)	6.587		6.548
Length (m)		3.920	

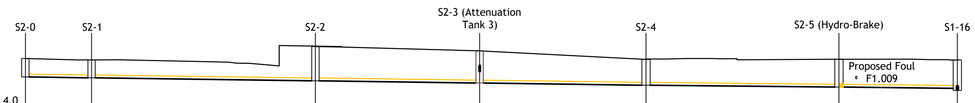
SURFACE WATER SEWER LONGITUDINAL SECTION S17-0 TO S1-11
SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		S18.000	
Section Type		225mm	
Slope (1:X)		1:150.0	
Cover Level (m)	7.927		7.890
Invert Level (m)	6.500		6.474
Length (m)		3.907	

SURFACE WATER SEWER LONGITUDINAL SECTION S18-0 TO S1-15
SCALE 1:500(H) 1:100(V)



Vert exaggeration = 2.0

Link Name		S2.000	S2.001		S2.002	S2.003	S2.004			S2.005		
Section Type		225mm	225mm		225mm	225mm	225mm			225mm		
Slope (1:X)		1:150.0	1:150.0		1:150.0	1:150.0	1:200.0			1:200.0		
Cover Level (m)	7.938	7.821		7.338 7.000	8.911	8.876	8.563	7.864	7.938	7.828	7.886	7.885	7.821
Invert Level (m)	6.438	6.366	6.366		6.122	6.122	5.943	5.943	5.762	5.762	5.605	5.605	5.508
Length (m)		10.801	36.537		26.808	27.166	31.489			19.331		

SURFACE WATER SEWER LONGITUDINAL SECTION S2-0 TO S1-16
SCALE 1:500(H) 1:100(V)

BUILDING INFORMATION MODELLING (BIM)
I.S. EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

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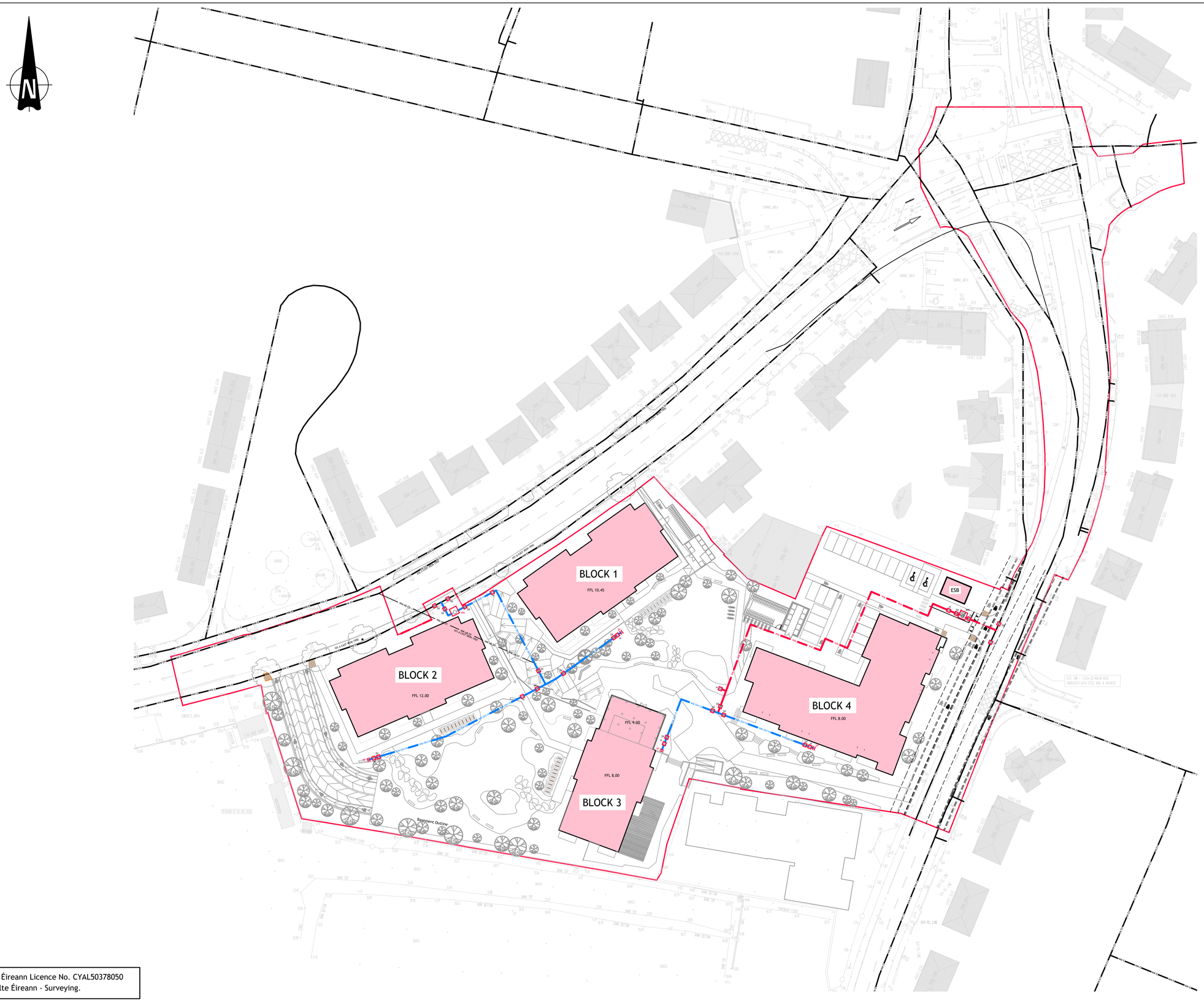
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: SURFACE WATER DRAINAGE LONGITUDINAL SECTIONS SHEET 2				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-MZ-C-0200-202	Drawing Status: A0 (Planning)		
Scale @ A1: 1:500/1:100	Document No: 214130-PUNCH-XX-XX-DR-C-0201	Revision No: C04		



WATERMAIN LEGEND

EXISTING WATERMAIN	WM EX
EXISTING WATERMAIN TO BE ABANDONED, DEMOLISHED & REMOVED	WM-AB-EX
PROPOSED WATERMAIN (160 OD PE80 SDR11 PIPE) MATERIALS MUST BE IN ACCORDANCE WITH UISCE EIREANN STANDARDS	WM
PROPOSED WATERMAIN (110 OD PE80 SDR11 PIPE) MATERIALS MUST BE IN ACCORDANCE WITH UISCE EIREANN STANDARDS	WM DN110
PROPOSED FIRE HYDRANT TO BE PROVIDED IN ACCORDANCE WITH UISCE ÉIREANN STANDARD DETAIL STD-W-16.	H
PROPOSED SLUICE VALVE TO BE PROVIDED IN ACCORDANCE WITH UISCE ÉIREANN STANDARD DETAIL STD-W-15	SV
PROPOSED MECHANICAL WATERMETER & CHAMBER TO IRISH WATER DETAIL STD-W-26A. KIOSK REQUIRED TO IW DETAIL STD-W-36.KIOSK LOCATION TO BE AGREED WITH ARCHITECT	WM
PROPOSED BLANK FLANGE	BF

GENERAL NOTES:

1. DO NOT SCALE. ALL DIMENSIONS ON DRAWINGS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE. USE FIGURED DIMENSIONS ONLY.
2. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE EXISTING PUMPHOUSE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING OF LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. BEFORE RELATED WORK COMMENCES THE CONTRACTOR SHALL SUBMIT A METHOD STATEMENT AND SEQUENCE OF WORK TO THE ENGINEER FOR APPROVAL.
3. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDUM. OTHER STANDARDS MAY ONLY BE CONSIDERED FOLLOWING PRIOR APPROVAL BY THE ENGINEER.
4. THE CONTRACTOR IS TO ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SUBCONTRACTORS DRAWINGS PRIOR TO CONSTRUCTION.
5. OPTIONS WHERE INDICATED ARE FOR CONTRACTORS CONVENIENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CHANGES NECESSARY IF HE CHOOSES AN OPTION AND HE SHALL COORDINATE ALL DETAILS.
6. ALL LEVELS ARE RELATED TO THE ORDNANCE DATUM (O.D.) - MALIN HEAD UNLESS NOTED OTHERWISE
7. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING ALL GROUND AND SURFACE WATER WITHIN THE SITE DURING THE CONSTRUCTION WORKS. AT NO POINT SHOULD ANY CONTAMINATED WATER FROM THE SITE BE DISCHARGED TO AN EXISTING DRAIN OR SEWER.
8. ANY PROPRIETARY PRODUCTS REFERENCED ON THE DRAWINGS CAN BE SUBSTITUTED WITH EQUIVALENT ALTERNATIVES, FOLLOWING APPROVAL BY EITHER THE ENGINEER.
9. PROPRIETARY PRODUCT NAMES, MANUFACTURERS NAMES, SUPPLIERS NAMES, NATIONAL STANDARDS. WHERE A SPECIFICATION OR A DESCRIPTION OF A PRODUCT OR ELEMENT OF WORK INCLUDES A SPECIFIC MAKE OR SOURCE SUCH AS A PRODUCT NAME OR MANUFACTURERS NAME OR A SUPPLIERS NAME, OR A NATIONAL STANDARD, THE SPECIFICATION OR DESCRIPTION SHALL BE DEEMED TO BE ACCOMPANIED BY THE WORDS "OR EQUIVALENT" NOTWITHSTANDING THAT THOSE EXACT WORDS MAY NOT IN FACT ACCOMPANY THE NAME OR STANDARD. THIS ALSO APPLIES WHERE THE NAME OR STANDARD IS ACCOMPANIED BY OTHER WORDS SUCH AS "OR EQUAL APPROVED" OR SUCHLIKE PHRASES.

WATERMAIN:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS & MANUFACTURERS DRAWINGS & SPECIFICATIONS.
2. ALL PIPE DIAMETERS ARE NOMINAL.
3. WHERE CONNECTION IS REQUIRED TO AN EXISTING PUBLIC WATERMAIN, THE CONTRACTOR MUST ISSUE DETAILED DOCUMENTATION FOR APPROVAL TO THE RELEVANT LOCAL AUTHORITY AND UISCE EIREANN. THIS DOCUMENTATION MUST BE ISSUED AT LEAST 40 WORKING DAYS IN ADVANCE OF THE PLANNED WORKS OR AS AGREED WITH THE LOCAL AUTHORITY AND UISCE EIREANN.
4. ALL THRUST BLOCKS MUST BE CAST AGAINST UNDISTURBED GROUND. FLEXIBLE PIPES SHOULD BE WRAPPED IN ONE LAYER OF 1000 GAUGE POLYTHENE TO AVOID DIRECT CONTACT WITH THE CONCRETE.
   MARKER POSTS AND PLATES TO BE PROVIDED FOR ALL VALVES, METERS AND HYDRANTS.
5. CHLORINATION AND BACTERIOLOGICAL TESTS TO BE UNDERTAKEN BY EXTERNAL TESTER AND TEST CERTIFICATION TO BE SUBMITTED TO ENGINEER.
6. MARKER POSTS AND PLATES TO BE PROVIDED FOR ALL VALVES.
7. IN ADVANCE OF TESTING OF THE WATERMAINS, THE CONTRACTOR MUST PRESENT TO THE ENGINEER A CALIBRATION CERTIFICATE FOR THE APPARATUS TO BE USED IN THE TEST.
8. ALL EXISTING WATERMAINS TO BE ADEQUATELY PROTECTED. ANY WATERMAINS DAMAGED DURING THE COURSE OF CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR AT THEIR COST.
9. ALL ROCKER PIPES SHALL BE NO MORE THAN 150mm FROM THEIR ASSOCIATED CHAMBER
10. PROVIDE ANCHOR/THRUST BLOCKS ON ALL BENDS EQUAL TO OR IN EXCESS OF 22.5° , DEAD ENDS AND TEES ON ALL PIPES
11. TRENCHES IN EXISTING SURFACES TO BE SAW CUT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING OUT WATERMAINS & SLUICE VALVES TO ENSURE NO CLASHES WITH SERVICE DUCTS OR PIPES.

NOTES FOR CONNECTION TO UISCE EIREANN SERVICES

1. CONTRACTOR TO LIAISE WITH UISCE EIREANN PRIOR TO MOBILISATION ON SITE TO DETERMINE THE DURATION OF THE APPROVAL PROCESS AND WHAT DOCUMENTATION AND FEES ARE REQUIRED BY UISCE EIREANN AND THE LOCAL AUTHORITY AND PROGRAM THIS INTO THE CONSTRUCTION PROGRAM. CONTRACTOR TO CONFIRM EXTENT OF NOTICE REQUIRED BY UISCE EIREANN TO INSPECT WORKS AND ALSO PROGRAM INTO THE CONSTRUCTION PROGRAM.
2. UISCE EIREANN TO BE CONTACTED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WATERMAIN WORKS. ALL DETAILS TO BE AGREED WITH UISCE EIREANN. UISCE EIREANN TO BE GIVEN 40 WORKING DAYS NOTICE FOR ALL FOUL SEWER AND WATERMAIN CONNECTION WORKS.
3. EXACT LOCATION AND DEPTH OF THE EXISTING WATERMAINS SHOULD BE ESTABLISHED BY THE CONTRACTOR IN ADVANCE OF THE MAIN EXCAVATION FOR THE WORKS SO AS TO AVOID THE POSSIBILITY OF DAMAGE TO THE EXISTING WATERMAIN DURING CONSTRUCTION WORKS. 3 NO. SLIT TRENCHES TO BE UNDERTAKEN TO VERIFY LOCATION.
4. THE CONTRACTOR SHALL APPLY FOR A ROAD OPENING LICENSE AND PAY THE REQUIRED ROAD OPENING LICENSE FEE FOR WORKS THAT ARE REQUIRED ON THE PUBLIC ROAD. THIS FEE IS A NON-NEGOTIABLE AND NON-REFUNDABLE FIGURE. THE CONTRACTOR SHALL BE DEEMED TO HAVE INCLUDED IN HIS TENDER PRICE FOR ALL REQUIREMENTS SUCH AS CONTRIBUTION FOR CONNECTIONS TO PUBLIC INFRASTRUCTURE, LICENSE APPLICATION, PAYMENT OF FEE(S), STATUTORY TIME PERIODS, TRAFFIC MANAGEMENT PLANS AND APPLICATION, REINSTATEMENT, ETC.

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018 NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.02.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONVILLE LTD

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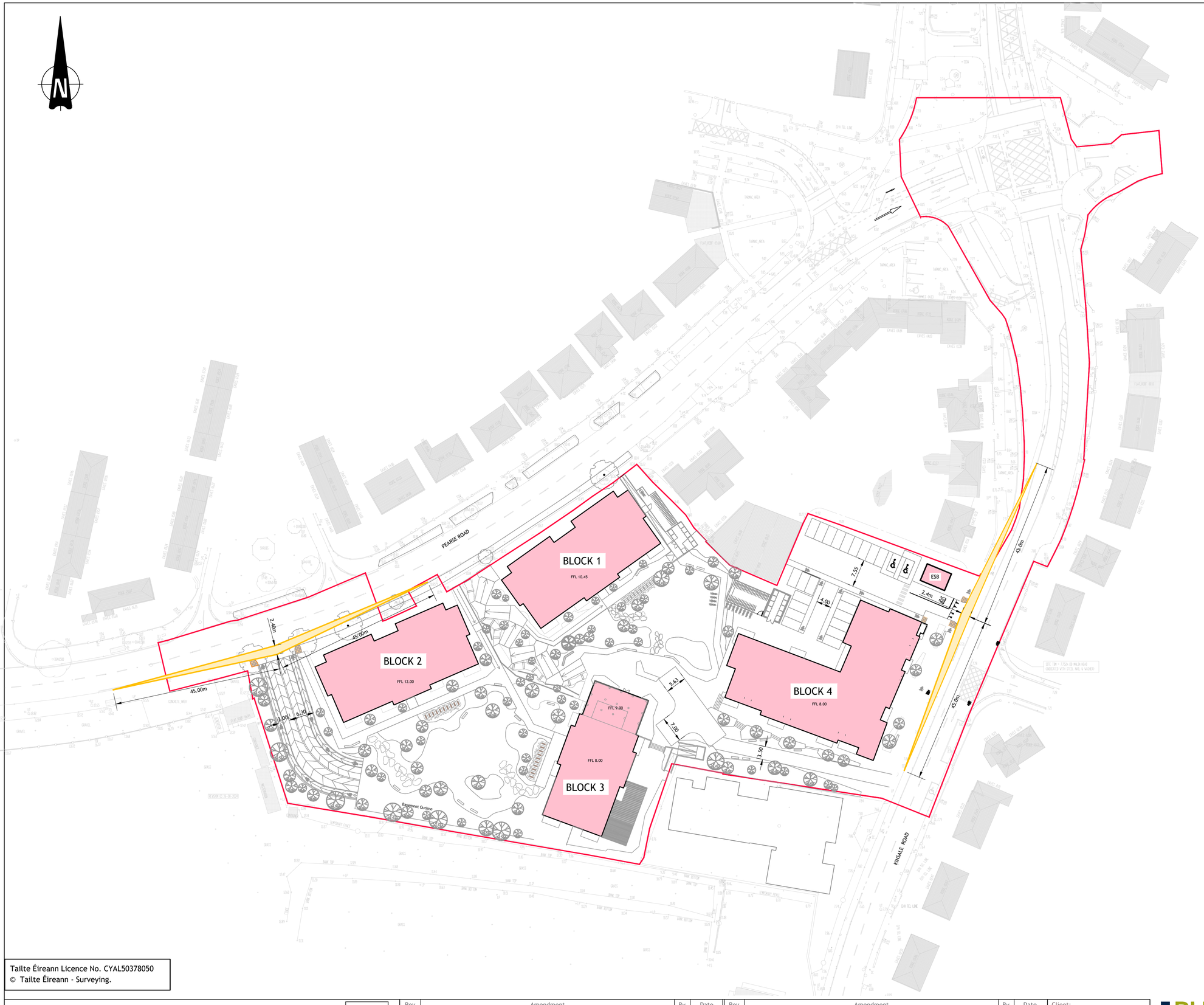
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: PROPOSED WATERMAIN LAYOUT				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0300		Drawing Status: A0 (Planning)	
Scale @ A1: 1:500	Document No: 214130-PUNCH-XX-XX-DR-C-0300			Revision No: C06



SIGHT VISIBILITY LEGEND:

SIGHT VISIBILITY SPLAY

SIGHT VISIBILITY CRITERIA USED (DMURS)	
DESIGN SPEED (km/hr)	SSD STANDARD (metres)
50	45

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BUILDING INFORMATION MODELLING (BIM)
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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONVILLE LTD

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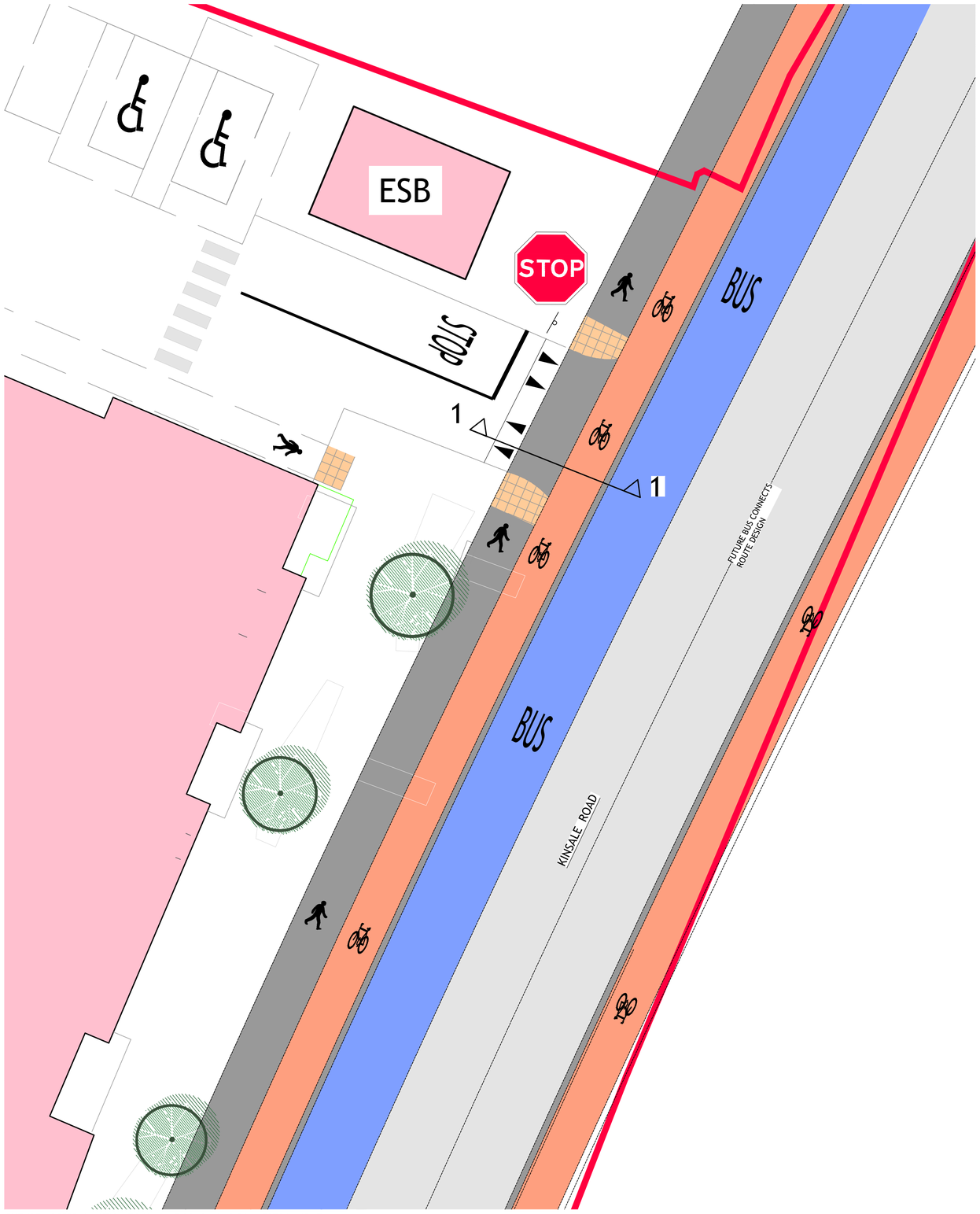
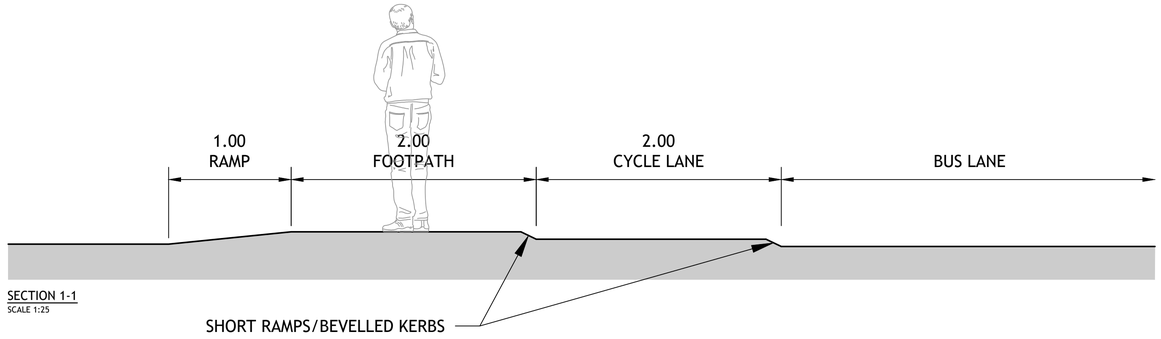
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK			
Title: PROPOSED ROADS LAYOUT			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0400		Drawing Status: A0 (Planning)	
Scale @ A1: 1:500	Document No: 214130-PUNCH-XX-XX-DR-C-0400			Revision No: C06



FUTURE ACCESS JUNCTION TO KINSALE ROAD - BUS CONNECTS LAYOUT
SCALE 1:100



SECTION 1-1
SCALE 1:25

LEGEND:

- PROPOSED ROADWAY
- PROPOSED FOOTPATH
- PROPOSED CYCLE LANE
- PROPOSED BUS LANE
- PROPOSED TACTILE PAVING (BUFF COLOUR)

BUILDING INFORMATION MODELLING (BIM)
I.S. EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	04.03.2025				
C03	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	29.05.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONVILLE LTD

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: FUTURE JUNCTION LAYOUT TO KINSALE ROAD - BUS CONNECTS				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0401		Drawing Status: A0 (Planning)	
Scale @ A1: 1:500	Document No: 214130-PUNCH-XX-XX-DR-C-0401			Revision No: C06

LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	10.000

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONTVILLE LTD

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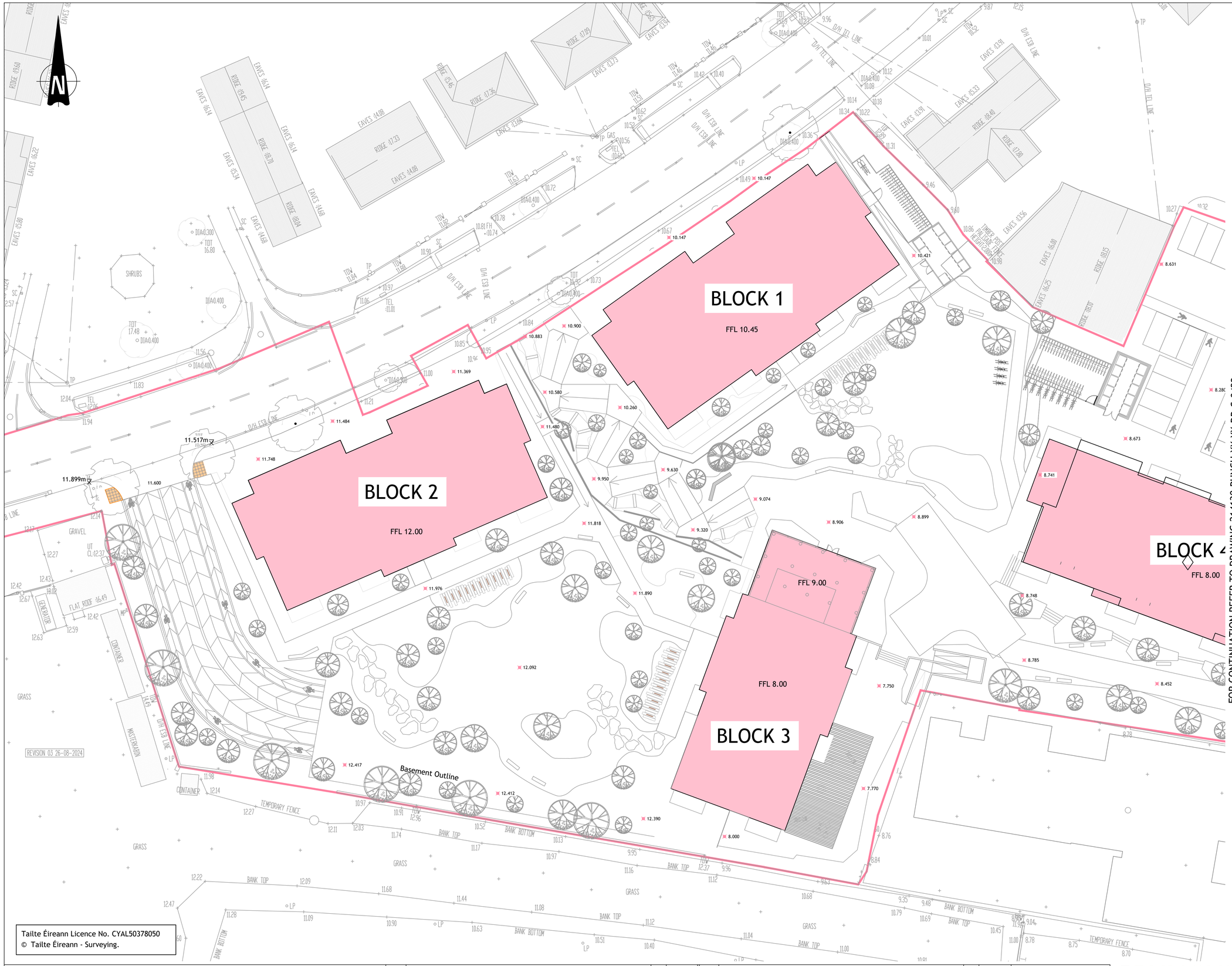
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: SITE LEVELS LAYOUT - GENERAL ARRANGMENT				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model No: 214130-PUNCH-XX-XX-M2-C-0420-422		Drawing Status: A0 (Planning)	
Scale @ A1: 1:500	Document No: 214130-PUNCH-XX-XX-DR-C-0420			Revision No: C06



LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	10.000

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONTVILLE LTD

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: SITE LEVELS LAYOUT - SHEET 1 OF 2				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0420-422	Drawing Status: A0 (Planning)		
Scale @ A1: 1:250	Document No: 214130-PUNCH-XX-XX-DR-C-0421			Revision No: C06

FOR CONTINUATION REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0421

LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	10.000

BLOCK 4

FFL 8.00

ESB

FUTURE BUS CONNECTS ROUTES SHOWN DASHED

FUTURE BUS CONNECTS ROUTES SHOWN DASHED

SITE TBM = 7.752m OD MALIN HEAD (INDICATED WITH STEEL NAIL & WASHER)

TIMBER POST PALISADE FENCE HEIGHT=2.000m

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

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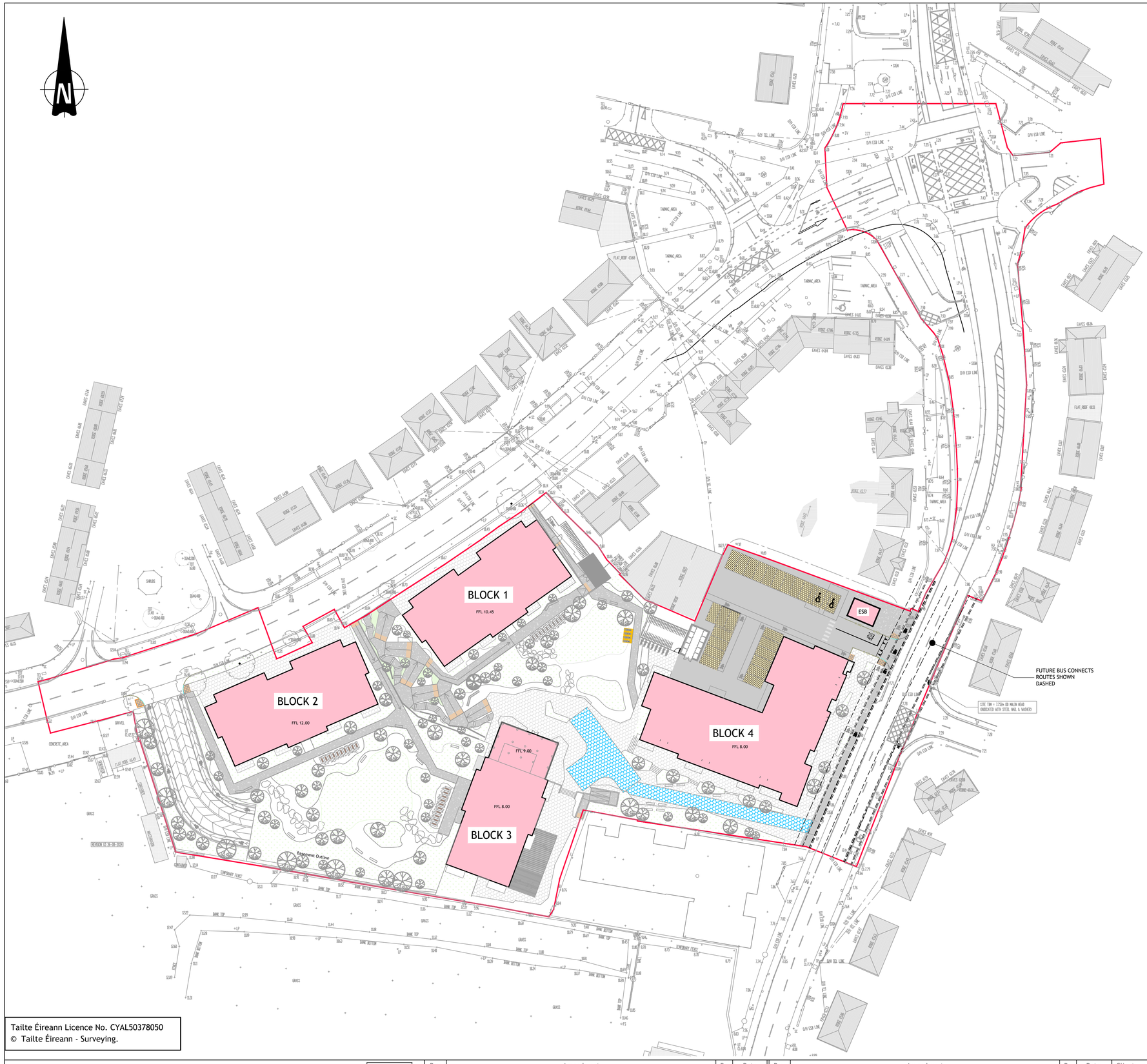
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK			
Title: SITE LEVELS LAYOUT - SHEET 2 OF 2			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model No: 214130-PUNCH-XX-XX-M2-C-0420-422	Drawing Status: A0 (Planning)	
Scale @ A1: 1:250	Document No: 214130-PUNCH-XX-XX-DR-C-0422	Revision No: C06	



LEGEND:

- PROPOSED BUILDING
- PROPOSED ASPHALT ROAD
- PROPOSED CONCRETE FOOTPATH
- PROPOSED NON-TRAFFICKED PAVING TO ARCHITECT'S SPECIFICATION
- PROPOSED TRAFFICKED PAVING TO ARCHITECT'S SPECIFICATION
- PROPOSED PERMEABLE PAVING
- PROPOSED CONCRETE PLINTH
- PROPOSED TACTILE PAVING (BUFF COLOUR)
- PROPOSED CORDURY PAVING
- 6mm HIGH KERB
- 125mm HIGH KERB

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018 NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024	C07	ISSUED FOR PLANNING	LL	09.06.2025
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				
C04	ISSUED FOR PLANNING	LL	21.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C06	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				

Client: FRONVILLE LTD

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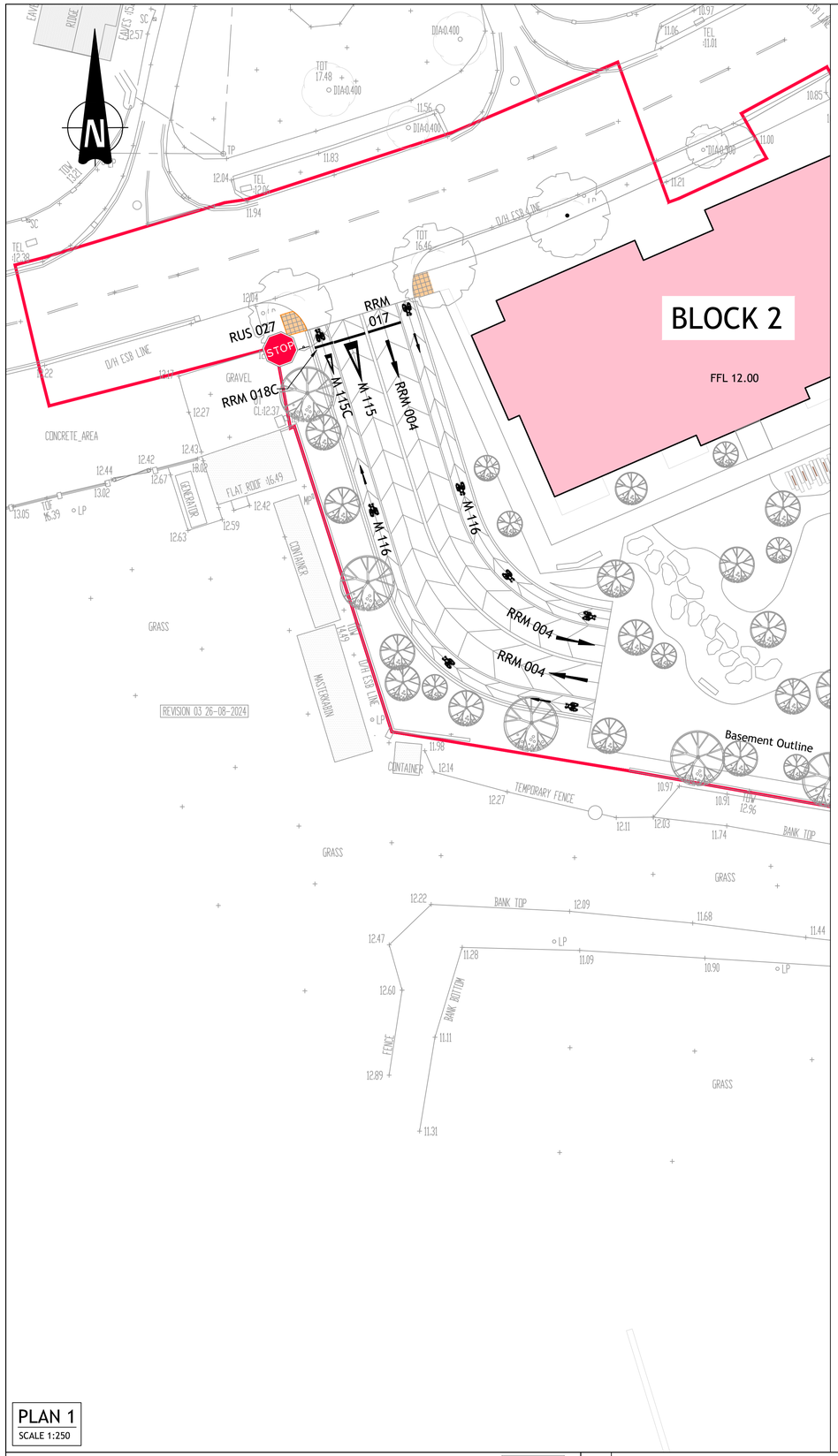
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: PAVEMENT FINISHES LAYOUT

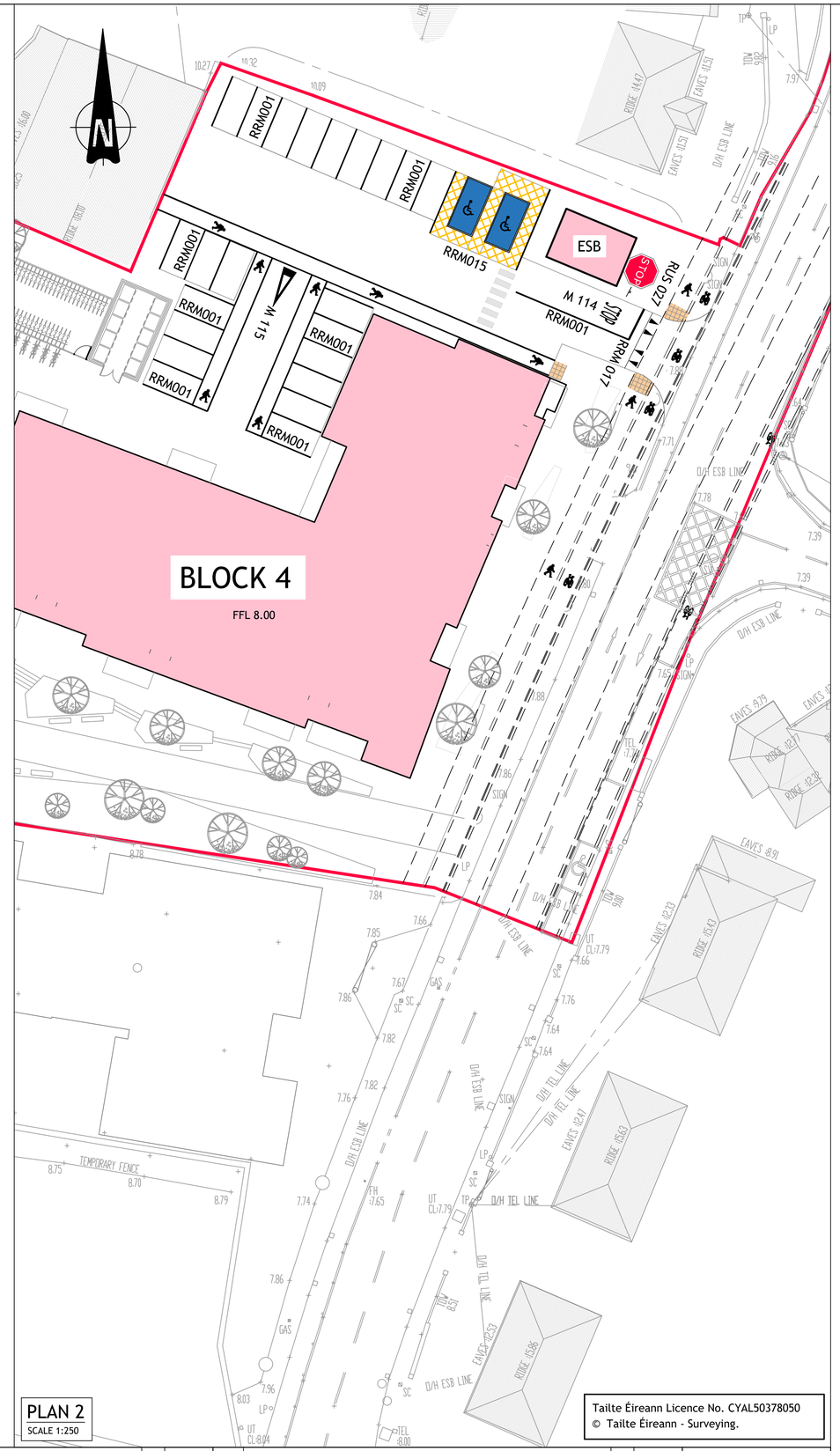
Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model No:	Drawing Status:
214130	214130-PUNCH-XX-XX-M2-C-0440-0442	A0(Planning)

Scale @ A1:	Document No:	Revision No:
1:500	214130-PUNCH-XX-XX-DR-C-0440	C07



PLAN 1
SCALE 1:250

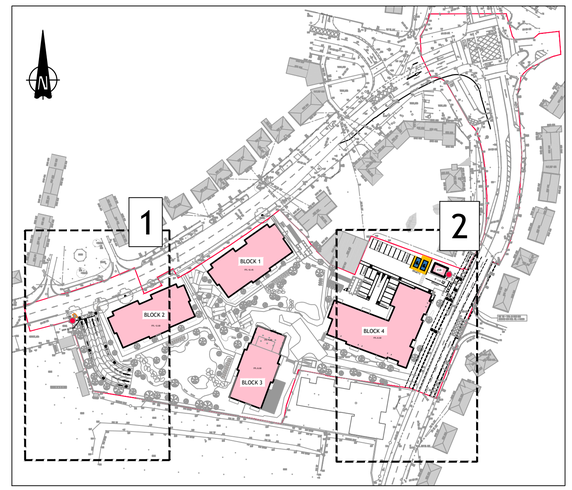


PLAN 2
SCALE 1:250

ROAD MARKING AND SIGNAGE LEGEND

DESCRIPTION	*DTTSM REF
100mm WIDE CONTINUOUS WHITE LINE	RRM 001
100mm WIDE WHITE EDGE LINE	RRM 022
200mm WIDE STOP LINE	RRM 017
STOP ROAD MARKING	M 114
150mm WIDE BROKEN YIELD LINE	RRM 018
YIELD ROAD MARKING	M 115
CYCLE TRACK YIELD LINE	RRM 018C
CYCLE TRACK YIELD ROAD MARKING	M 115C
CYCLE SYMBOL	M 116
100mm WIDE CONTINUOUS WHITE CYCLE TRACK EDGE LINE	RRM 022
100mm WIDE BROKEN WHITE CYCLE TRACK EDGE LINE	RRM 023
RUS 027 - STOP SIGN	RUS 027

*DTTSM: DEPARTMENT OF TRANSPORT TRAFFIC SIGNS MANUAL



KEY PLAN
NOT TO SCALE

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018 NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	03.03.2025				
C03	ISSUED FOR PLANNING	LL	19.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

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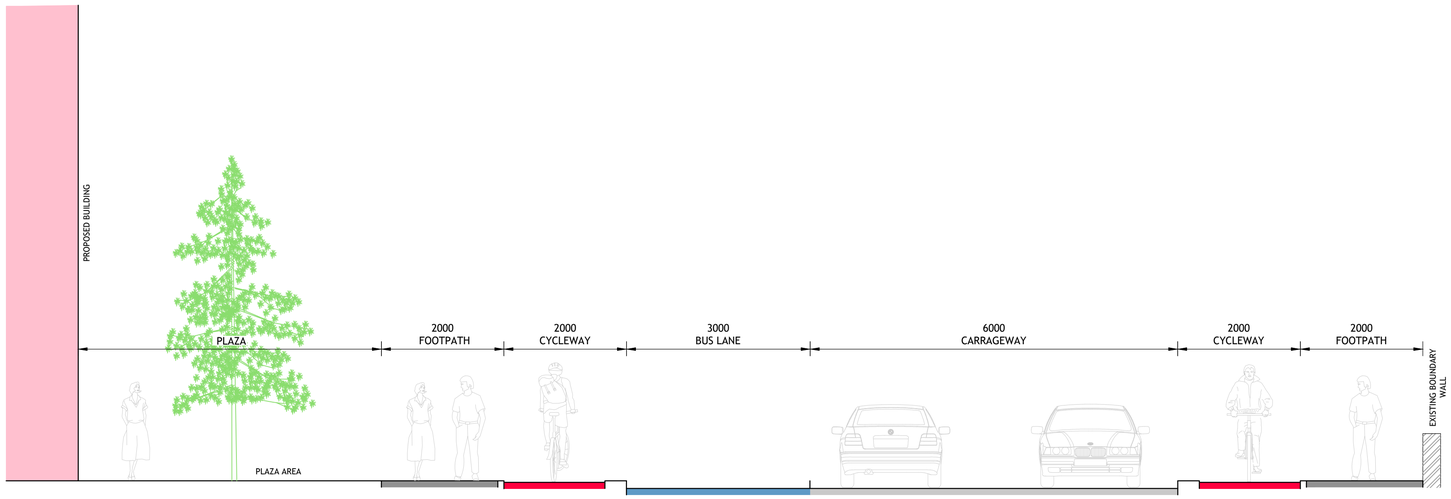
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: ROAD MARKINGS AND SIGNAGE

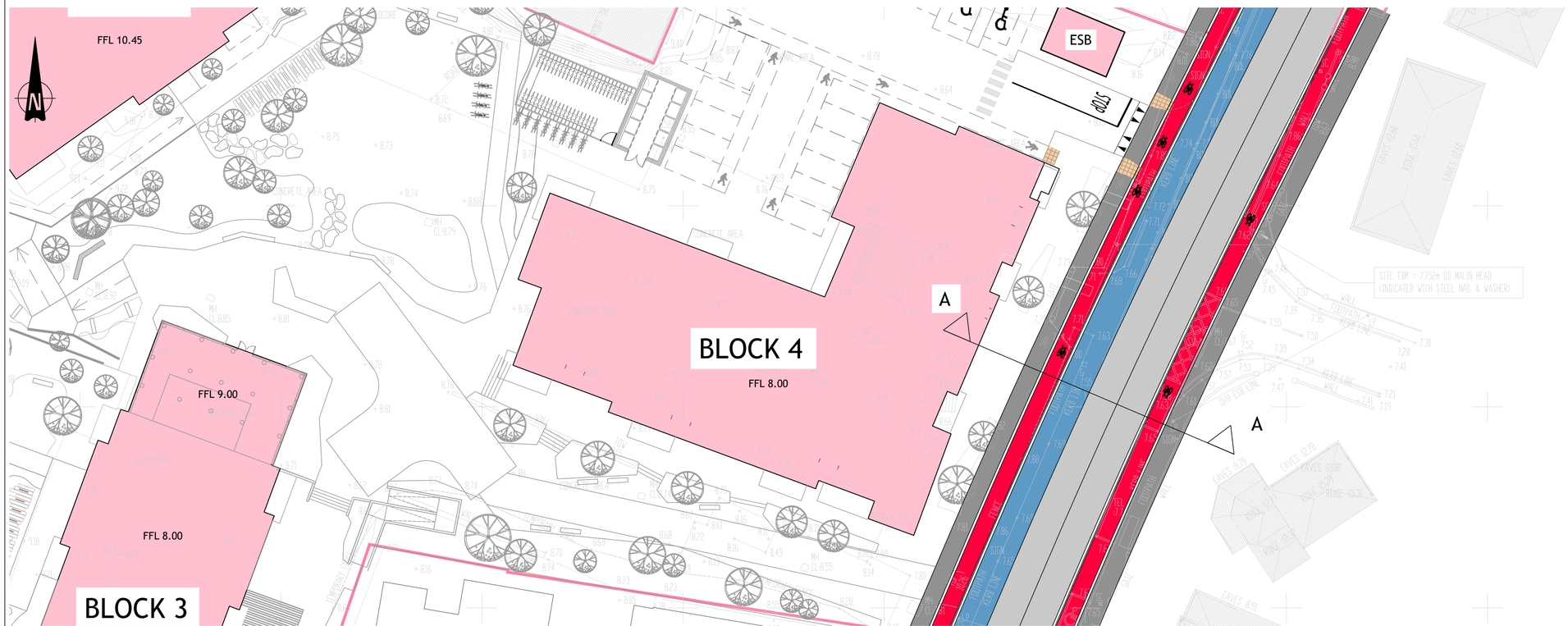
Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	September 2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model File:	Drawing Status:
214130	214130-PUNCH-XX-XX-M2-C-0460	A0 (Planning)

Scale @ A1:	Document No:	Revision No:
AS SHOWN	214130-PUNCH-XX-XX-DR-C-0460	C06



SECTION A-A
PROPOSED SECTION THROUGH KINSALE ROAD
SCALE 1:50



SITE LAYOUT
SCALE 1:250

BUILDING INFORMATION MODELLING (BIM)
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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C02	ISSUED FOR PLANNING REVIEW	LL	29.05.2025				
C03	ISSUED FOR PLANNING	LL	09.06.2025				

Client: FRONVILLE LTD

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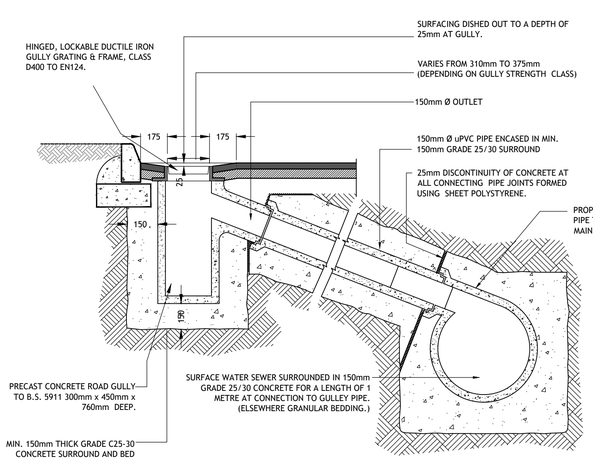
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: KINSALE ROAD SECTION				
Drawn: Liam Lonergan	Date drawn: 08.04.2025	Technician Check: Liam Lonergan	Engineer Check: Simeon Salomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0461		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0461			Revision No: C03

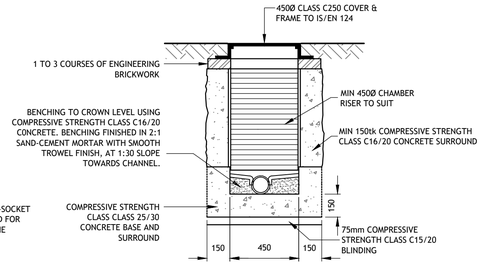


FOR STRENGTH CLASS OF GULLY REFER TO EN 124 : 2015, CLAUSE 5

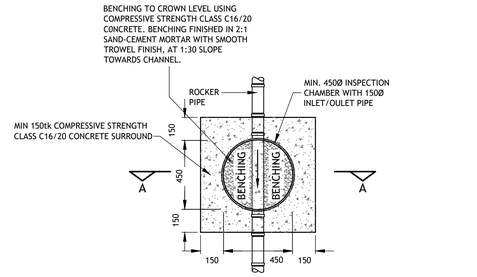
NOTE 1 : PLACE OF INSTALLATION & FIGURES 9A AND 9B PROPRIETARY FITTINGS TO BE USED ON ALL PIPEWORK CONNECTIONS

NOTE 2 :
GROUP 1 - MIN. CLASS A15 GROUP 4 - MIN. CLASS D400
GROUP 2 - MIN. CLASS B125 GROUP 5 - MIN. CLASS E600
GROUP 3 - MIN. CLASS C250 GROUP 6 - MIN. CLASS F900

PRECAST CONCRETE GULLY IN MACADAM AREA
SCALE 1:20

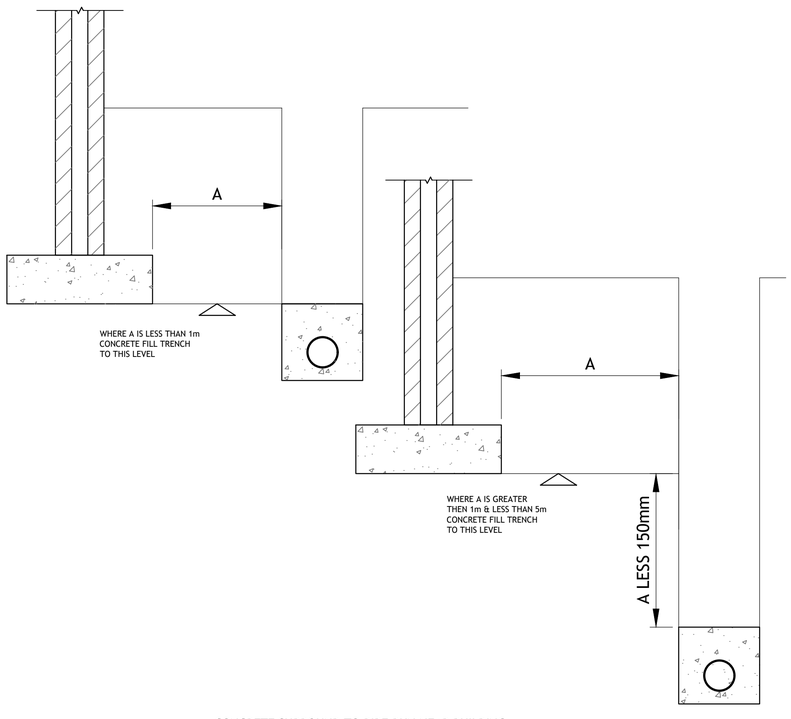


SECTION A-A



BASE PLAN

INSPECTION CHAMBER UP TO 1.0m DEEP
SCALE 1:20



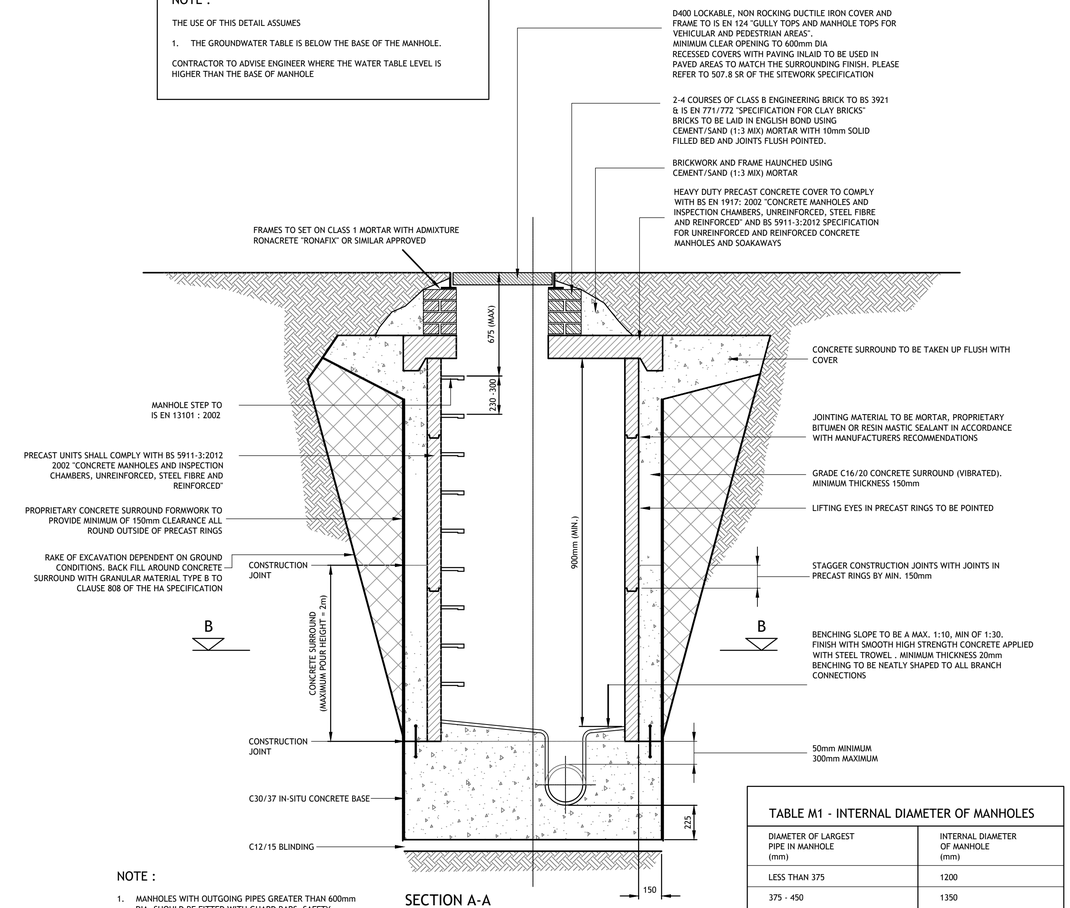
CONCRETE SURROUND TO PIPE RUN NEAR BUILDING
SCALE 1:25

NOTE :

THE USE OF THIS DETAIL ASSUMES

1. THE GROUNDWATER TABLE IS BELOW THE BASE OF THE MANHOLE.

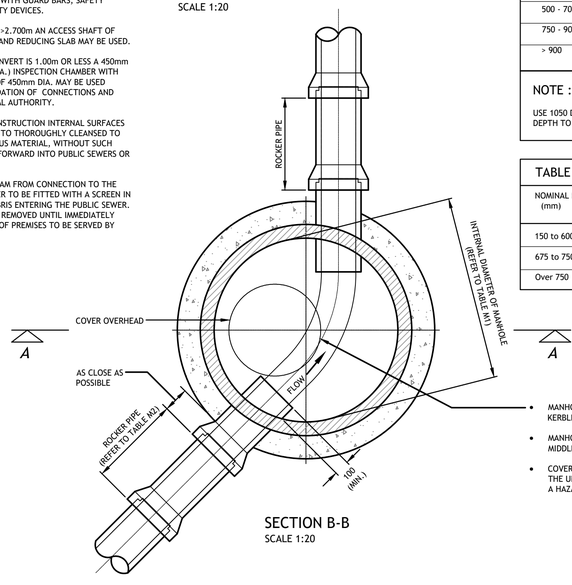
CONTRACTOR TO ADVISE ENGINEER WHERE THE WATER TABLE LEVEL IS HIGHER THAN THE BASE OF MANHOLE



SECTION A-A
SCALE 1:20

NOTE :

1. MANHOLES WITH OUTGOING PIPES GREATER THAN 600mm DIA. SHOULD BE FITTED WITH GUARD BARS, SAFETY CHAINS OR OTHER SAFETY DEVICES.
2. FOR DEPTHS TO INVERT >2.700m AN ACCESS SHAFT OF MIN. 900mm DIAMETER AND REDUCING SLAB MAY BE USED.
3. WHERE THE DEPTH TO INVERT IS 1.00m OR LESS A 450mm x 450mm (OR 450mm DIA.) INSPECTION CHAMBER WITH MINIMUM COVER SIZES OF 450mm DIA. MAY BE USED SUBJECT TO ACCOMMODATION OF CONNECTIONS AND APPROVAL OF THE LOCAL AUTHORITY.
4. ON COMPLETION OF CONSTRUCTION INTERNAL SURFACES OF MANHOLE & SEWERS TO THOROUGHLY CLEANSED TO REMOVE ALL DELETERIOUS MATERIAL, WITHOUT SUCH MATTER BEING PASSED FORWARD INTO PUBLIC SEWERS OR WATERCOURSES
5. FIRST MANHOLE UPSTREAM FROM CONNECTION TO THE (EXISTING) PUBLIC SEWER TO BE FITTED WITH A SCREEN IN ORDER TO PREVENT DEBRIS ENTERING THE PUBLIC SEWER. THE SCREEN NOT TO BE REMOVED UNTIL IMMEDIATELY PRIOR TO OCCUPATION OF PREMISES TO BE SERVED BY SEWER.



SECTION B-B
SCALE 1:20

- MANHOLE COVER TO BE HINGED AT RIGHT ANGLES TO KERBLINE SO THAT THEY CLOSE IN DIRECTION OF TRAFFIC.
- MANHOLE COVERS ON ROADS SHOULD BE LOCATED IN THE MIDDLE OF TRAFFICKED LANES INSIDE WHEEL TRACKS
- COVER AND FRAME TO BE INSTALLED SO THAT NO PART OF THE UNIT IS RAISED OR SUNKEN IN A WAY THAT COULD CAUSE A HAZARD TO PEDESTRIAN OR VEHICULAR TRAFFIC

TABLE M1 - INTERNAL DIAMETER OF MANHOLES

DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
> 900	CONSULT LOCAL AUTHORITY

NOTE :

USE 1050 DIAMETER RINGS FOR PIPES LESS THAN 375mm DIAMETER WHERE DEPTH TO SOFFIT IS 1.35 - 1.5m

TABLE M2 - ROCKER PIPE LENGTH

NOMINAL PIPE DIAMETER (mm)	EFFECTIVE LENGTH (M)
150 to 600	0.6
675 to 750	1.0
Over 750	1.2

PRECAST MANHOLE DETAIL
SCALE 1:20

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 1				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0500		Drawing Status: A0 (For Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0500			Revision No: C04

UISCE EIREANN - WASTEWATER STANDARD DETAILS	
Detail No.	**Detail Title**
STD-WW-03	Drain & service connection pipework
STD-WW-04	Typical sewer / service pipe connection
STD-WW-05	Typical service layout indicating separation distances
STD-WW-05A	Wastewater service connection vertical separation distances
STD-WW-06	Restrictions on wastewater infrastructure works adjacent to trees
STD-WW-06A	Restrictions on new trees/shrubs planting adjacent to sewers
STD-WW-07	Trench backfill & bedding
STD-WW-08	Concrete protection slab, bed, haunch & surround to wastewater pipes
STD-WW-09	Blockwork manhole (<450mm dia.)
STD-WW-10	Pre-cast concrete manhole with cast in-situ base
STD-WW-10A	Pre-cast concrete manhole with pre-cast base
STD-WW-11	In-situ concrete manhole
STD-WW-12	Backdrop and cascade manholes
STD-WW-13	Private side inspection chamber
STD-WW-19	Duct chamber
STD-WW-28	Cast in-situ Indicative submersible pumping station
STD-WW-34	Vent stack

	UISCE EIREANN - WATER STANDARD DETAILS
Detail No.	**Detail Title**
STD-W-01	Water service connection responsibility
STD-W-02	Typical layout for watermains within developments
STD-W-03	Customer connection and boundary box (25mm OD pipe)
STD-W-04	General pipe connections (Sheet 1 of 7)
STD-W-05	General pipe connections (Sheet 2 of 7)
STD-W-06	General pipe connections (Sheet 3 of 7)
STD-W-07	General pipe connections (Sheet 4 of 7)
STD-W-08	General pipe connections (Sheet 5 of 7)
STD-W-09	General pipe connections (Sheet 6 of 7)
STD-W-10	General pipe connections (Sheet 7 of 7)
STD-W-11	Typical service layout indicating separation distances
STD-W-12	Restrictions on Water Infrastructure works adjacent to existing trees
STD-W-12A	Restrictions on new trees / shrubs planting adjacent to Water mains
STD-W-13	Trench Backfill / bedding & reduced cover protection slab detail
STD-W-14	Sluice valve for ductile iron (D.I.) pipe (<350mm dia.) (Sheet 1 of 2)
STD-W-15	Sluice valve for polyethylene (P.E.) pipe (<350mm dia.) (Sheet 2 of 2)
STD-W-16	On-line hydrant for ductile iron (D.I.) pipe (Sheet 1 of 4)
STD-W-17	Off-line hydrant for ductile iron (D.I.) pipe (Sheet 2 of 4)
STD-W-18	On-line hydrant for polyethylene (P.E.) pipe (Sheet 3 of 4)
STD-W-19	Off-line hydrant for polyethylene (P.E.) pipe (Sheet 4 of 4)
STD-W-20	On-line air valve for ductile iron (D.I.) pipe (Sheet 1 of 4)
STD-W-21	Off-line air valve for ductile iron (D.I.) pipe (Sheet 2 of 4)
STD-W-15	Sluice valve for polyethylene (P.E.) pipe (<350mm dia.) (Sheet 2 of 2)
STD-W-23	Off-line air valve for polyethylene (P.E.) pipe (Sheet 4 of 4)
STD-W-26	Electromagnetic meter chamber (dn80 - dn250mm Dia.)
STD-W-26A	Chamber for flanged mech. meter without strainer (dn40 - dn250mm Dia.)
STD-W-26G	Flow meter chamber (25-32mm O.D. Dia.)
STD-W-27	Marker posts / plates
STD-W-28	Water main thrust and support blocks
STD-W-29	Duct chamber
STD-W-30A	Washout hydrant
STD-W-30B	Scour chamber to storm sewer arrangements
STD-W-36	Flow meter kiosk
STD-W-38	Watermain loop detail ductile iron option
STD-W-39	Watermain loop detail polyethylene option

BUILDING INFORMATION MODELLING (BIM)
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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Rev	Amendment	By	Date

Client: FRONTVILLE LTD

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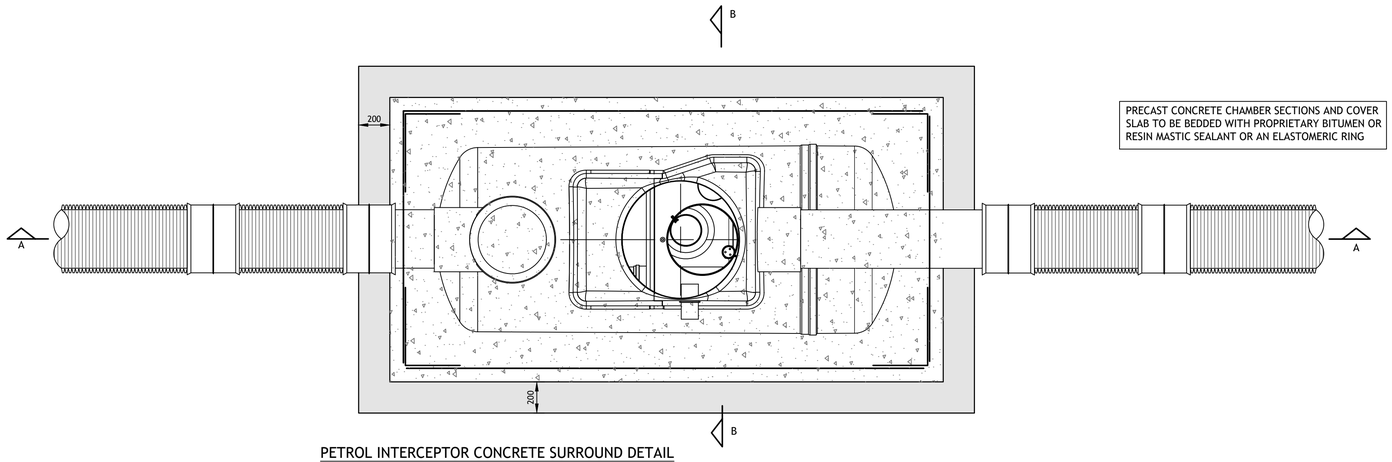
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK
Title: CONSTRUCTION DETAILS - UISCE EIREANN

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0501		Drawing Status: A0 (For Planning)	
Scale @ A1: NTS	Document No: 214130-PUNCH-XX-XX-DR-C-0501			Revision No: C04

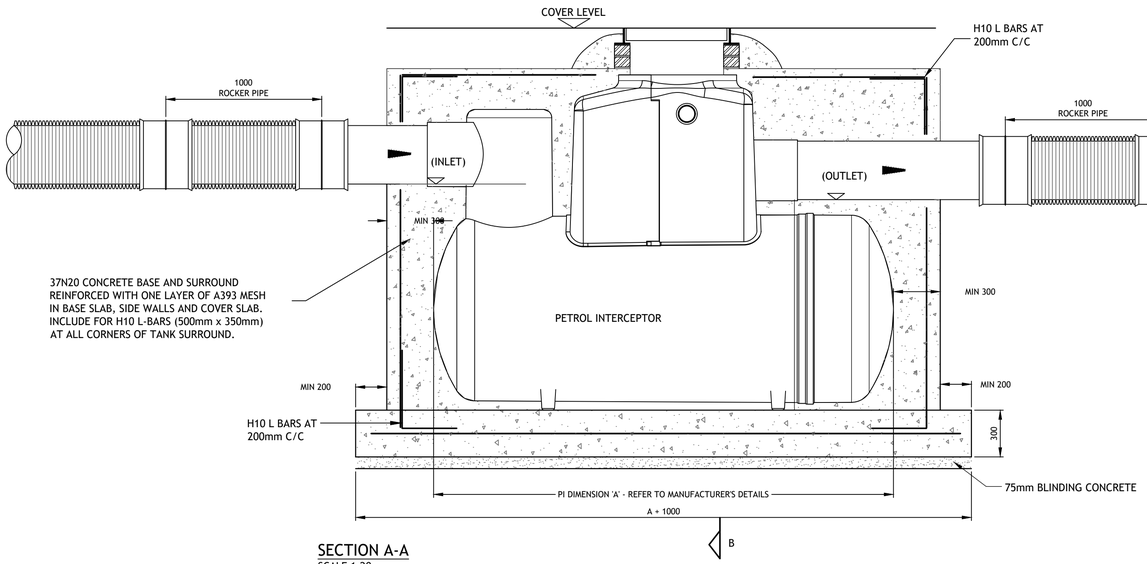
GENERAL NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & SPECIFICATIONS. DO NOT SCALE USE FIGURED DIMENSIONS ONLY.
2. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.
3. FOR DETAILS OF SETTING OUT OF RWP, SVP, WVP AND ALL OPENINGS SEE THE RELEVANT ARCHITECTS DRAWINGS.
4. FOR INSULATION DETAILS REFER TO ARCHITECTS DRAWINGS.
5. TO BE READ IN CONJUNCTION WITH IRISH WATER DETAILS.



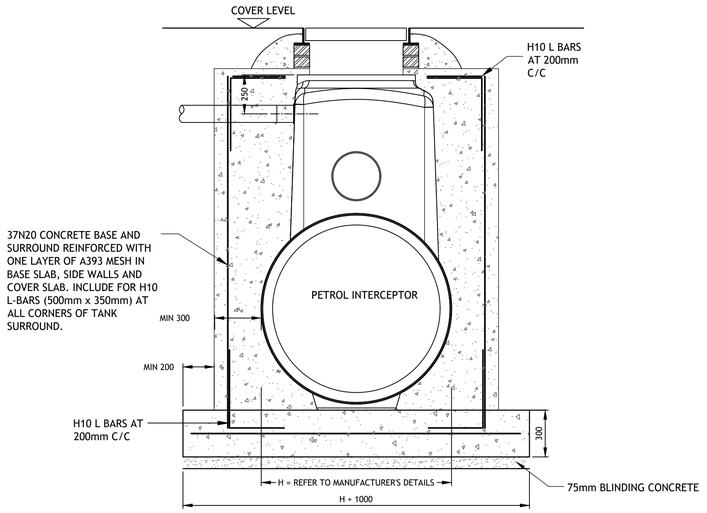
PRECAST CONCRETE CHAMBER SECTIONS AND COVER SLAB TO BE BEDDED WITH PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT OR AN ELASTOMERIC RING

PETROL INTERCEPTOR CONCRETE SURROUND DETAIL
PLAN
SCALE 1:20



SECTION A-A
SCALE 1:20

BACKFILL MATERIAL TO BE GRANULAR MATERIAL TYPE B TO CL 808 OF THE NRA SPECIFICATION FOR ROADWORKS



SECTION B-B
SCALE 1:20 @ A1

SIZING FOR KLARGESTER CLASS 1 BYPASS PETROL INTERCEPTOR TO BE AS PER TABLE BELOW.EQUIVALENT PETROL INTERCEPTOR PROPOSED BY THE CONTRACTOR TO CATER FOR DRAINAGE AREA BEING SERVED BY THE PETROL INTERCEPTOR ENSURING PETROL INTERCEPTOR CAN ACCOMODATE PEAK FLOW RATE.

Product code	Flow (l/s)	Peak Flow Rate (l/s)	Drainage area (m 2)	Storage Capacity (Ltrs)	Storage Capacity (Ltrs)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)
-	-	-	-	Silt	Oil	-	-	-	-	-	-	-	-
NSBP003	3	30	1670	300	45	1700	1350	600	1760	1660	100	500	315
NSBP004	4.5	45	2500	450	60	1700	1350	600	1760	1660	100	500	315
NSBP006	6	60	3335	600	90	1700	1350	600	1760	1660	100	500	315
NSBE010	10	100	5560	1000	150	2072	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2950	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3896	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3576	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4266	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

BUILDING INFORMATION MODELLING (BIM)
I.S. EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

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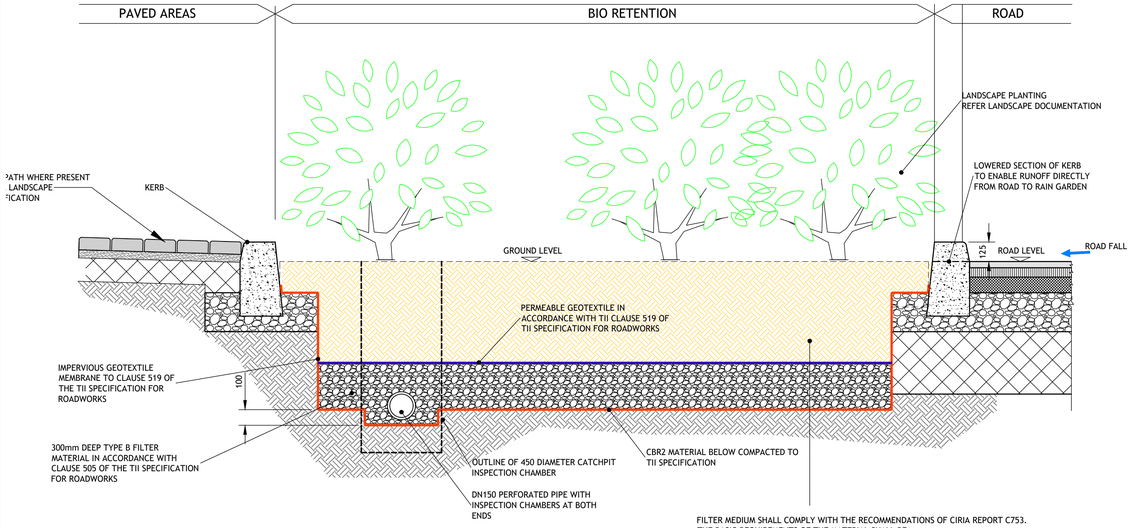
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 3				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0502		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0502			Revision No: C04



BIO RETENTION - TYPICAL SECTION

SCALE 1:20

FILTER MEDIUM SHALL COMPLY WITH THE RECOMMENDATIONS OF CIRIA REPORT C753.
THE BASIC REQUIREMENTS OF THE MATERIAL SHALL BE:

SATURATED HYDRAULIC CONDUCTIVITY TO BE BETWEEN 100mm/h - 300mm/h - TESTED IN-SITU USING THE SINGLE RING INFILTRATION TEST - EN ISO 22282-5:2012

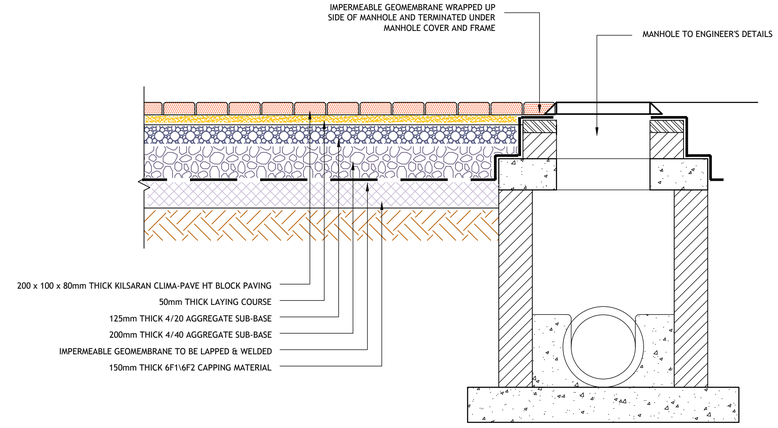
POROSITY > 30% (WHEN TESTED IN ACCORDANCE WITH BS 1377-2:1990)

PARTICLE SIZE DISTRIBUTION

6mm	100% PASSING
2mm	90-100% PASSING
0.6mm	40-70% PASSING
0.2mm	5-20% PASSING
0.063mm	<5% PASSING

ORGANIC MATER CONTENT - 3-5% (w/w)

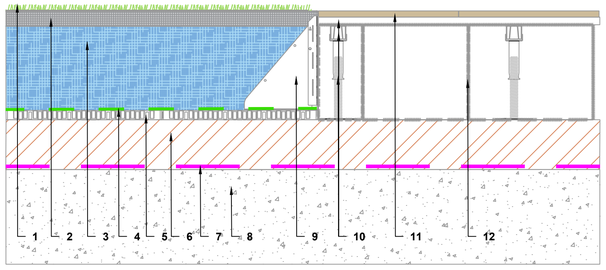
SOILS SHALL BE ASSESSED BY HORTICULTURIST TO ENSURE THAT IT WILL SUPPORT HEALTHY VEGETATION COMMUNITY. ANY COMPONENT FOUND TO CONTAIN HIGH LEVELS OF SALT, CLAY OR SILT PARTICLES OR OTHER EXTREMES WHICH MAY BE CONSIDERED RETARDENT TO PLANT GROWTH SHALL BE REJECTED. THE FILTER MEDIUM LAYER MATERIAL SHALL NOT BE COMPACTED WHEN PLACED. DEPTH TO LANDSCAPE SPECIFICATION, MAXIMUM 1.2M DEEP



PERMEABLE PAVING/MANHOLE JUNCTION DETAIL- TYPICAL SECTION

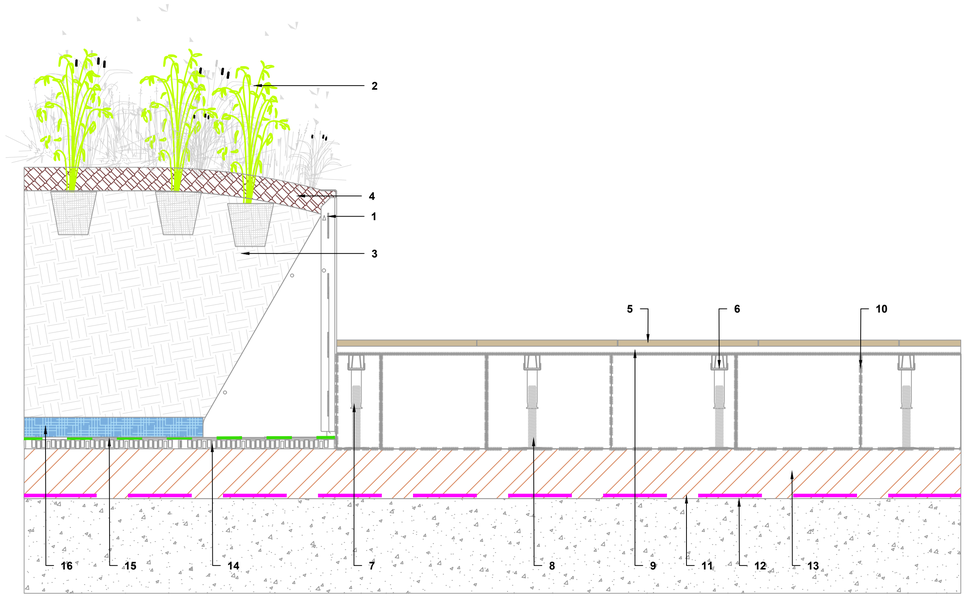
SCALE 1:20

1. 20mm FIRE-R ARTIFICIAL GRASS, COLOUR: GREEN.
2. SHOCKPAD, AS PER PLAY SPECIALIST SPECIFICATION.
3. VOID FORMER BLOCK
4. GEOTEXTILE
5. DRAINAGE SYSTEM.
6. INSULATION (AS PER APPOINTED ARCHITECT'S SPECIFICATIONS).
7. WATER PROOFING MEMBRANE AND PROTECTION BOARD LAYER (AS PER ARCHITECT'S SPECIFICATIONS)
8. PODIUM SLAB
9. RETAINING WALL. VISIBLE FACES FINISH TO BE POLYESTER POWDER COATED, COLOUR: TBC.
10. CLASS A FIRE-RATED NON-COMBUSTIBLE PAVING SUPPORT RAIL SYSTEM: ALUMINIUM TOP RAIL, ALUMINUM LOWER JOIST AND WITH ADJUSTABLE HEIGHT SUPPORT PEDESTALS, PROVIDED WITH T-SHAPED PAVING SPACERS AND PAVING STOPS. WORKS TO BE CARRIED OUT WITH PAVERAIL NON-COMBUSTIBLE PAVING SYSTEM, AS SUPPLIED BY STONEPAVE OR SIMILAR AND APPROVED. ADJUSTABLE NON-COMBUSTIBLE SUPPORT PEDESTAL - AS SUPPLIED BY STONEPAVE OR SIMILAR AND APPROVED. ALUMINIUM LOWER JOIST - AS SUPPLIED BY STONEPAVE OR SIMILAR AND APPROVED, SECURELY BOLTED TO SUPPORT PEDESTAL. ALUMINIUM TOP RAIL - AS SUPPLIED BY STONEPAVE OR SIMILAR AND APPROVED, SECURELY BOLTED TO ALUMINIUM LOWER JOIST.
11. PORCELAIN FLAGS, DIM. 900X 450X20MM, COLOUR: GREY AND DARK GREY, LAYING PATTERN: 90° STRETCHER BOND PATTERN.
12. ACOUSTIC FELT, 2MM THICK, ON TOP OF QUINN LITE CONCRETE BLOCK. 400X215MM. TO APPROVED DETAIL.



ARTIFICIAL GRASS OVER BLUE ROOF TYPICAL SECTION

SCALE 1:10



1. RETAINING WALL MODULE.VISIBLE FACES FINISH TO BE POLYESTER POWDER COATED, COLOUR: TBC.
2. SHRUB PLANTING
3. LIGHTWEIGHT GROWING MEDIUM TO BS 3882
4. BARK MULCH TO 75MM DEPTH.
5. PORCELAIN FLAGS, DIM. 900X 450X20MM, COLOUR: GREY AND DARK GREY, LAYING PATTERN: 90° STRETCHER BOND PATTERN.
6. CLASS A FIRE-RATED NON-COMBUSTIBLE PAVING SUPPORT RAIL SYSTEM: ALUMINIUM TOP RAIL, ALUMINUM LOWER JOIST AND WITH ADJUSTABLE HEIGHT SUPPORT PEDESTALS, PROVIDED WITH T-SHAPED PAVING SPACERS AND PAVING STOPS. WORKS TO BE CARRIED OUT WITH PAVERAIL NON-COMBUSTIBLE PAVING SYSTEM.
7. ADJUSTABLE NON-COMBUSTIBLE SUPPORT PEDESTAL.
8. ALUMINIUM LOWER JOIST ,SECURELY BOLTED TO SUPPORT PEDESTAL.
9. ALUMINIUM TOP RAIL, SECURELY BOLTED TO ALUMINIUM LOWER JOIST.
10. ACOUSTIC FELT, 2MM THICK, ON TOP OF QUINN LITE CONCRETE BLOCK. 400X215MM.
11. WATER PROOFING MEMBRANE AND PROTECTION BOARD LAYER (AS PER ARCHITECT'S SPECIFICATIONS.)
12. PODIUM SLAB.
13. INSULATION (AS PER APPOINTED ARCHITECT'S SPECIFICATIONS).
14. DRAINAGE SYSTEM.
15. GEOTEXTILE
16. VOID FORMER BLOCK

EXTENSIVE GREEN ROOF TYPICAL SECTION

SCALE 1:10

BUILDING INFORMATION MODELLING (BIM)
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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
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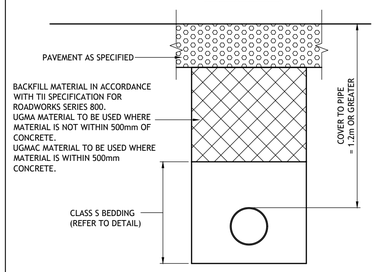
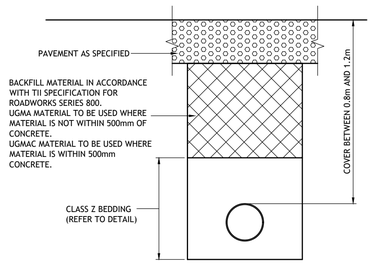
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK			
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 4			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons / Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0503	Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0503	Revision No: C04	

DETAIL A



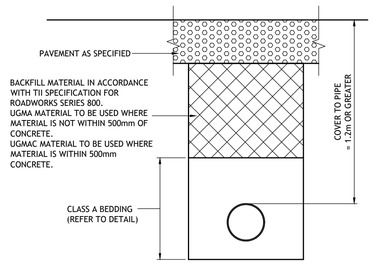
PERMANENT REINSTATEMENT OF LONGITUDINAL TRENCH IN ROADWAYS AND PATHS WITH MINIMUM 1.2m COVER (FLEXIBLE PIPES)

DETAIL B



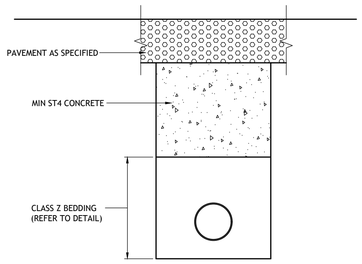
PERMANENT REINSTATEMENT OF LONGITUDINAL TRENCH IN ROADWAYS AND PATHS WITH COVER BETWEEN 0.8m and 1.2m

DETAIL C



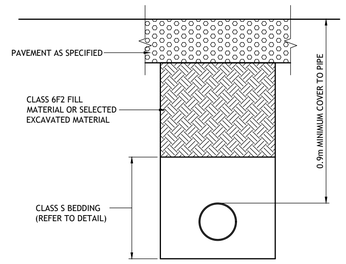
PERMANENT REINSTATEMENT OF LONGITUDINAL TRENCH IN ROADWAYS AND PATHS WITH MINIMUM 1.2m COVER (RIGID PIPES)

DETAIL D



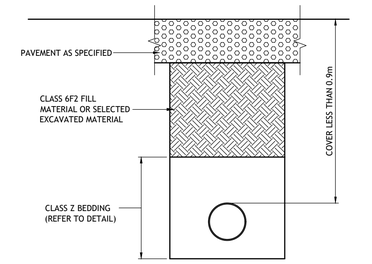
IMMEDIATE PERMANENT REINSTATEMENT OF TRENCH (INCLUDING ALL TRANSVERSE ROAD CROSSINGS) (ALL PIPE MATERIALS)

DETAIL E



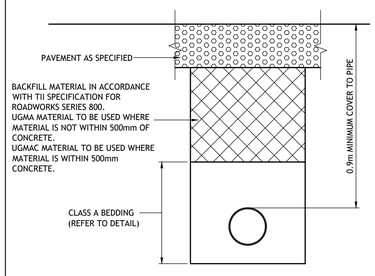
PERMANENT REINSTATEMENT OF TRENCH IN OPEN SPACES & FOOTPATHS NOT ADJACENT TO ROADS WITH MINIMUM 0.9m COVER (FLEXIBLE PIPES)

DETAIL F



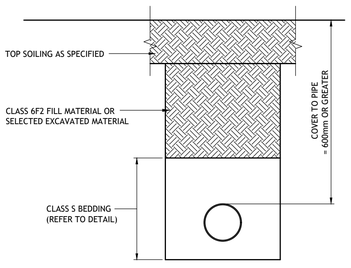
PERMANENT REINSTATEMENT OF TRENCH IN OPEN SPACES & FOOTPATHS NOT ADJACENT TO ROADS WITH LESS THAN 0.9m COVER (ALL PIPE MATERIALS)

DETAIL G



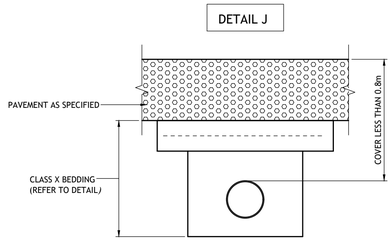
PERMANENT REINSTATEMENT OF TRENCH IN OPEN SPACES & FOOTPATHS NOT ADJACENT TO ROADS WITH MINIMUM 0.9m COVER (RIGID PIPES)

DETAIL H



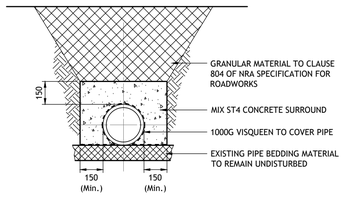
PERMANENT REINSTATEMENT OF TRENCH IN GARDENS OR LANDSCAPED AREAS WITH MINIMUM 0.6m COVER

DETAIL J

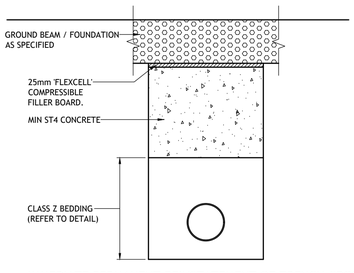


PERMANENT REINSTATEMENT OF LONGITUDINAL TRENCH IN ROADWAYS AND PATHS WITH LESS THAN 0.8m COVER (ALL PIPE MATERIALS)

DETAIL K



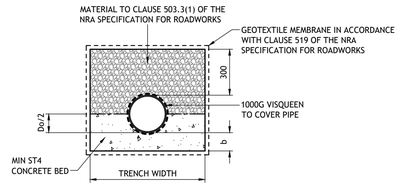
CONCRETE SURROUND PROTECTION TO EXISTING SEWER



IMMEDIATE PERMANENT REINSTATEMENT OF TRENCH CROSSING UNDER BUILDING FOUNDATION (ALL PIPE MATERIALS)

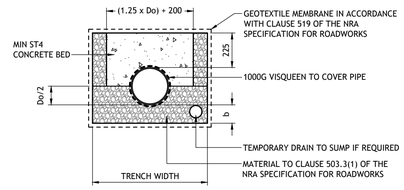
ALTERNATIVE EQUIVALENT DESIGN MIX	
STANDARD PRESCRIBED MIX	ALTERNATIVE EQUIVALENT MIX IF SUPPLIED FROM A THIRD PARTY ACCREDITED READYMIX CONCRETE SUPPLIER N/mm²
ST1	C12/15
ST2	C12/15
ST3	C12/15
ST4	C16/20

TABLE 3



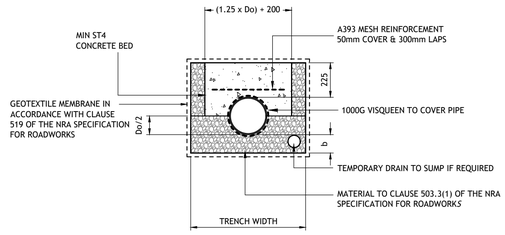
CLASS A BEDDING
(CONCRETE BED AND GRANULAR SURROUND)
SCALE 1:20

NOTE:
CLASS A BEDDING FOR USE WITH RIGID PIPES ONLY

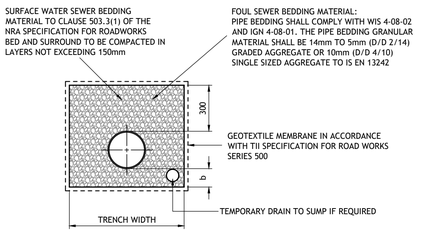


CLASS B BEDDING
(CONCRETE ARCH TO PIPELINES)
SCALE 1:20

NOTE:
CLASS B BEDDING FOR USE WITH RIGID PIPES ONLY

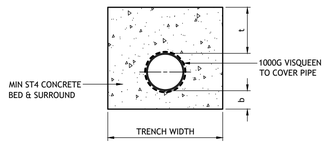


CLASS C BEDDING
(REINFORCED CONCRETE ARCH TO PIPELINES)
SCALE 1:20

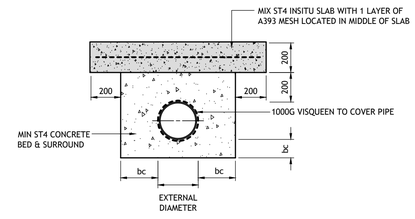


CLASS S BEDDING
(GRANULAR BED AND SURROUND)
SCALE 1:20

NOTE:
CLASS S BEDDING FOR USE WITH FLEXIBLE PIPES ONLY



CLASS Z BEDDING
(CONCRETE BED AND SURROUND)
SCALE 1:20



CLASS X BEDDING
(CONCRETE BED AND SURROUND)
(WITH REINFORCED CONCRETE SLAB)
SCALE 1:20

TRENCH WIDTHS AND DIMENSIONS FOR FOUL AND SURFACE WATER DRAINS				
PIPE DIAMETER (mm)	"Do" (mm)	"b" (mm)	"t" (mm)	TRENCH WIDTH (mm)
100	150	150	150	600
150	210	150	150	700
225	300	150	150	750
300	400	150	150	850
375	480	150	150	950
450	560	150	150	1000
525	650	150	150	1100
600	735	150	150	1200
675	850	200	200	1350
750	910	200	200	1450
900	1080	200	200	1650

TABLE 1

DIMENSION-bc

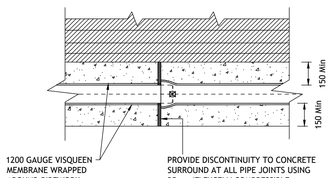
NOMINAL PIPE DIAMETER (mm)	100-450 incl.	525-600 incl.	750	900	1050	1200
bc (mm)	100	150	200	225	250	300

TABLE 2

NOTES (PIPE BEDDING)

1. CLAY PUDDLE SHALL BE INCORPORATED IN THE PIPE BED & SURROUND AND TRENCH BACKFILL MATERIAL IN ACCORDANCE WITH THE SPECIFICATION AT 50m INTERVALS
2. IN ROCK OR MIXED SOILS CONTAINING BOULDERS OR HARD SPOTS INCREASE PIPE BEDDING DEPTH BY 100mm
3. THE EMPLOYER'S REPRESENTATIVE MAY INSTRUCT THAT SPECIFIC PROVISION FOR DRAINAGE ALONG THE PIPE TRENCH BE MADE BY MEANS OF CONCRETE OR OTHER LAND DRAINAGE PIPES WHERE THE WATER TABLE LEVEL SO REQUIRES.
4. FOR DIMENSIONS "b" , "Do/2" AND TRENCH WIDTH REFER TO TABLE 1
5. FOR DIMENSIONS "bc" REFER TO TABLE 2
6. Do = PIPE OUTER DIAMETER

PIPE BEDDING DETAILS



CONCRETE SURROUND TO PIPELINES DETAIL
SCALE 1:20 @ A1

BUILDING INFORMATION MODELLING (BIM) I.S EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

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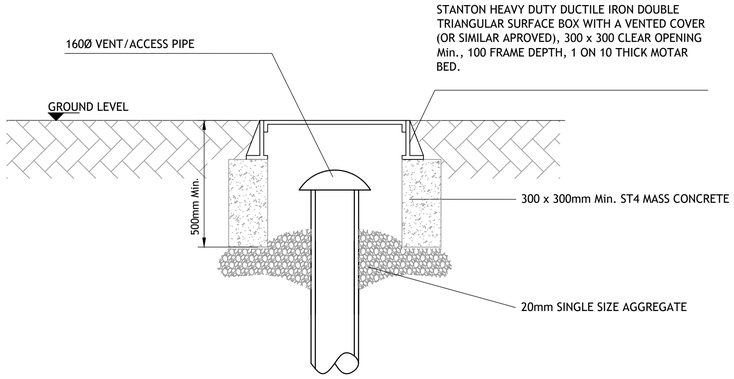
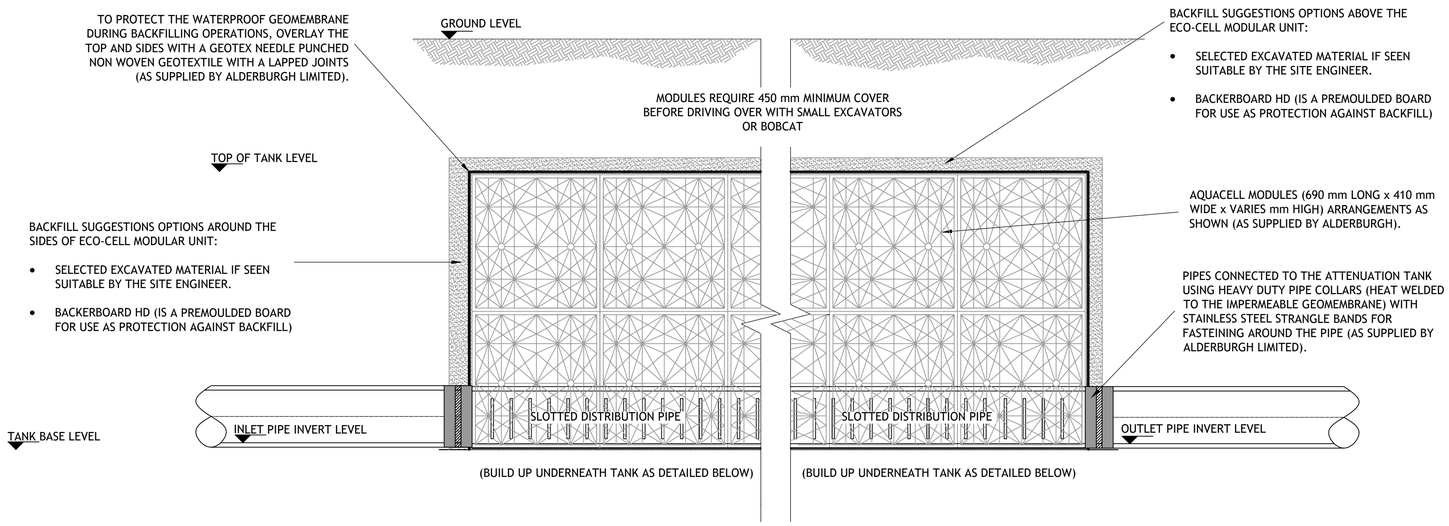
t +353 21 462 4000 | w punchconsulting.com

Project: KINSALE ROAD LRD, KINSALE ROAD, CORK			
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 5			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0504	Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0504	Revision No: C04	



VENTILATION BOX DETAIL



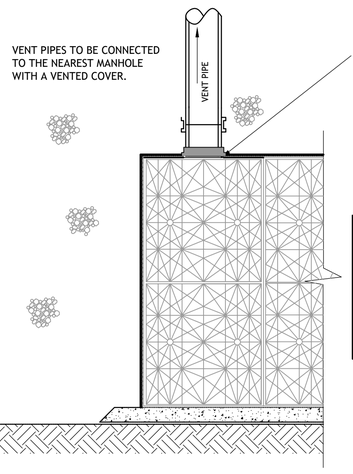
TYPICAL INLET PIPE CONNECTION

TYPICAL OUTLET PIPE CONNECTION

TYPICAL DETAILS OF ATTENUATION TANK USING AQUACELL MODULAR UNITS (SIDE VIEW)

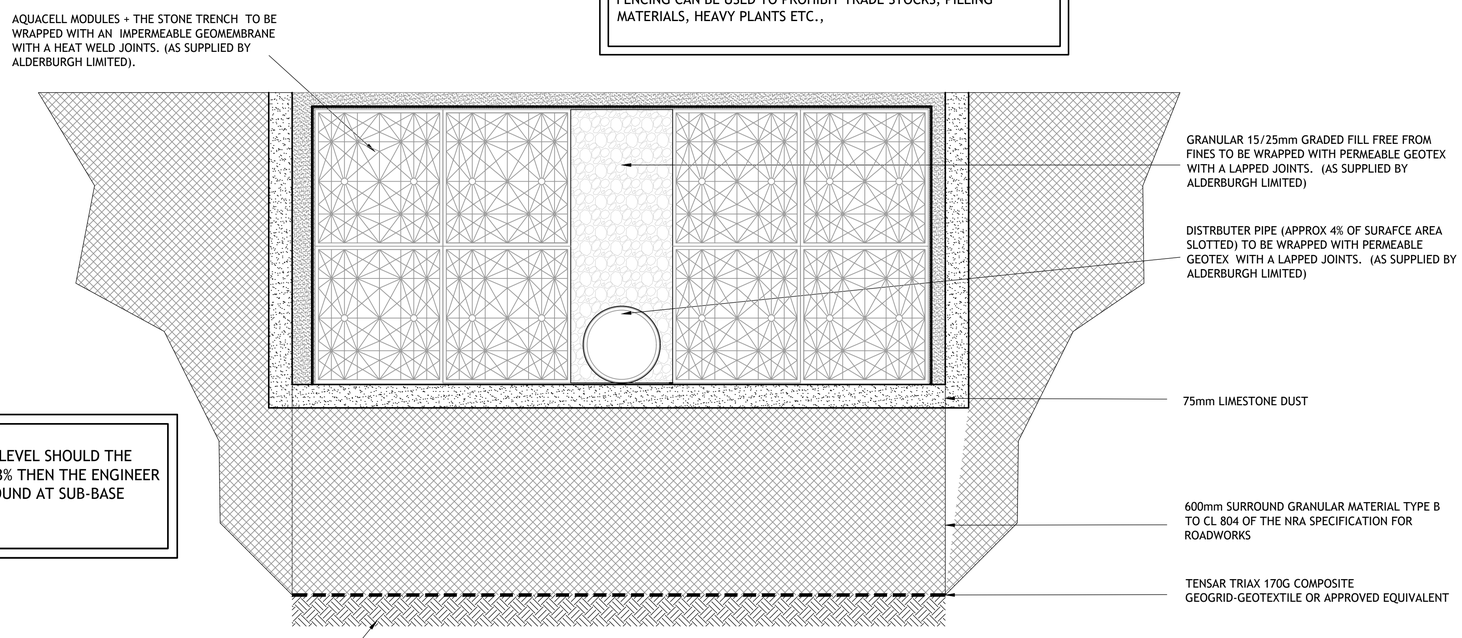
INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.,



A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN THE ENGINEER SHALL BE NOTIFIED. ALSO, ANY SOFT SPOTS FOUND AT SUB-BASE LEVEL SHALL BE REPORTED TO THE ENGINEER

TYPICAL 160Ø VENT/ACCESS PIPE CONNECTION



TYPICAL DETAILS OF ATTENUATION TANK USING AQUACELL MODULAR UNITS (FRONT VIEW)

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018
NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

PUNCH consulting engineers
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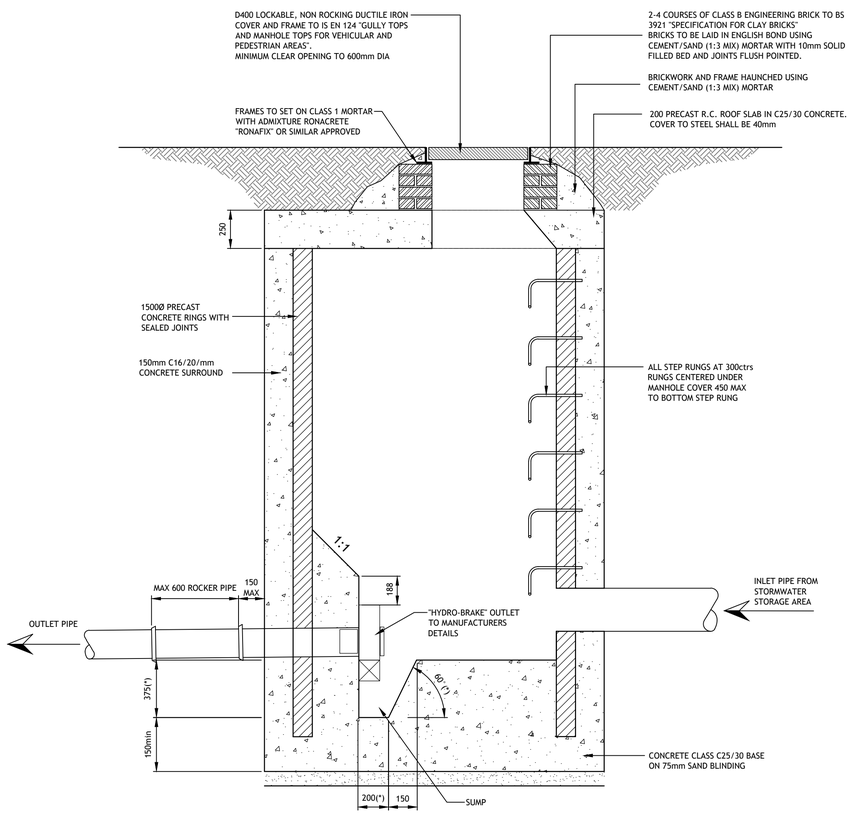
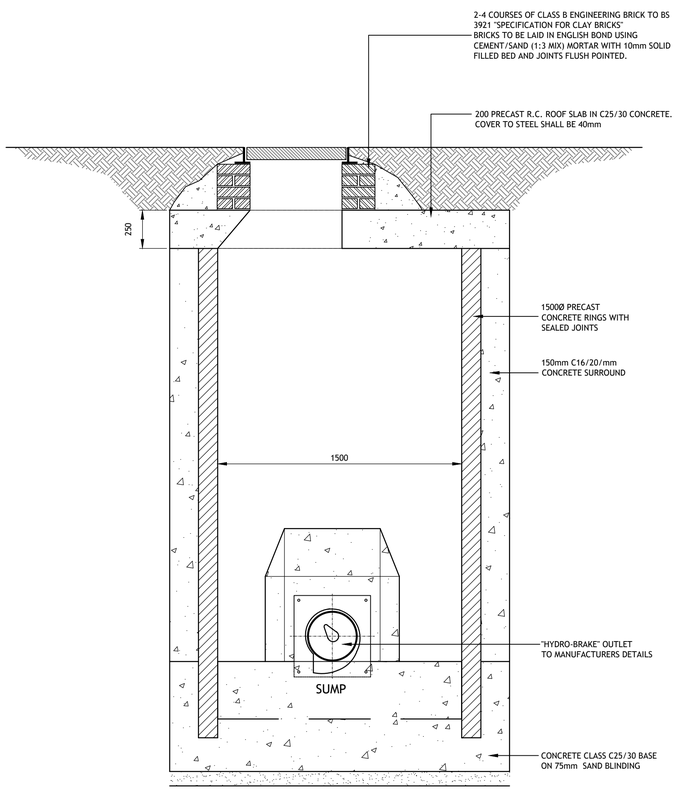
Elm Court, Boreenmanna Road, Cork, T12 HHW2
t +353 21 462 4000 | w punchconsulting.com

Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 6				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0505		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0505			Revision No: C04

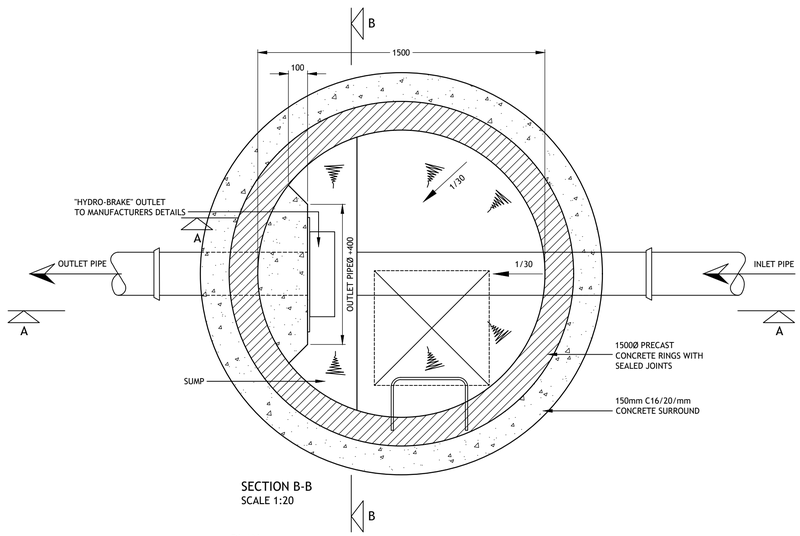


(*) DIMENSION TO BE APPROVED BY HYDRO-BRAKE" SUPPLIERS

SECTION A-A
SCALE 1:20



SECTION B-B
SCALE 1:20

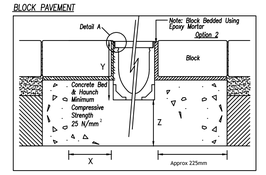


SECTION B-B
SCALE 1:20

PLAN
SCALE 1:20

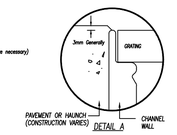
TYPICAL "HYDROBRAKE" MANHOLE DETAIL
SCALE 1:20

BLOCK PAVEMENT



7.0 Minimum Dimensions of Concrete Surround

Load Class		D400*
Minimum Dimensions (mm)	X	200
	Y	Full Channel Height (Less Y2 where necessary)
	Z	200
Maximum Dimensions (mm)	Y1	35
	Y2	60

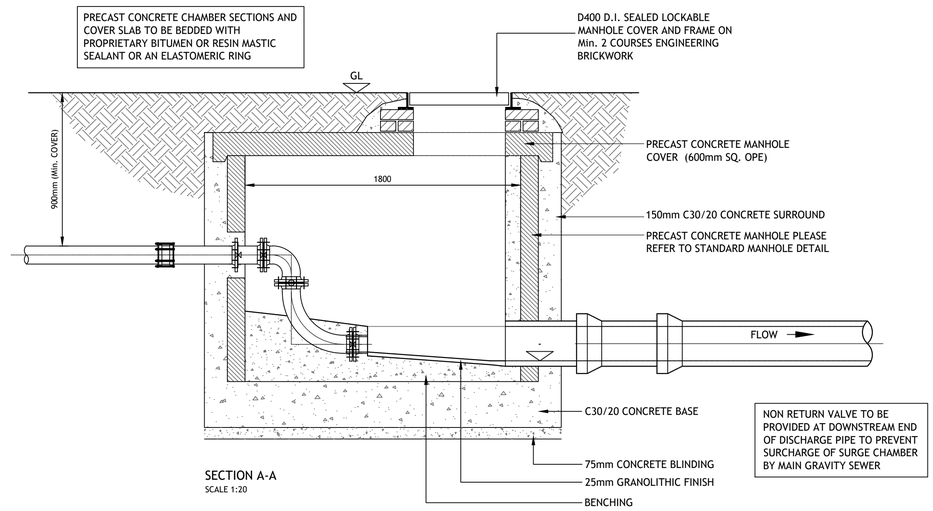


ACO CHANNEL - IN PAVED AREAS
SCALE 1:20

NOTES :

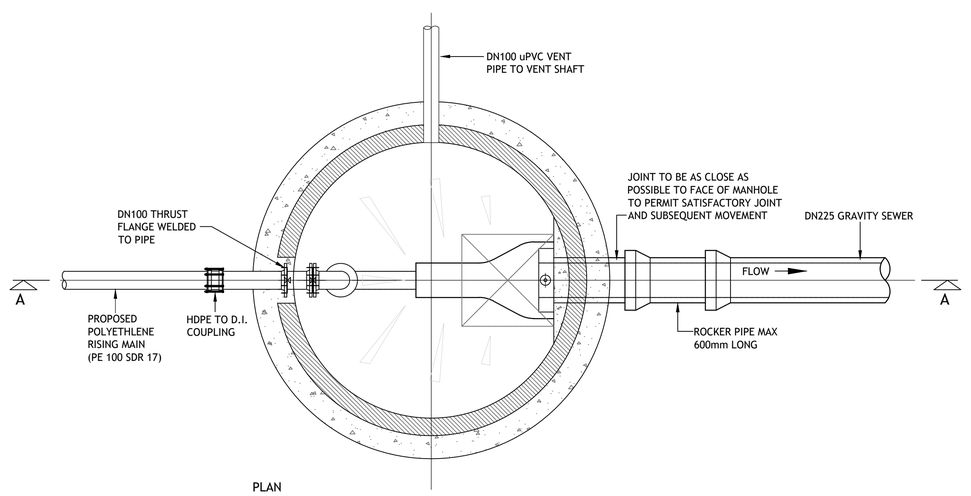
1. THE CHANNEL MUST BE SUPPORTED AND THEREFORE BLOCKS MUST BE RESTRAINED FROM LATERALLY MOVEMENT BY BEDDING SECURELY. E.G. BY USING AN EPOXY OR POLYMER MODIFIED MORTAR FOR BED AND PERPENDICULAR JOINTS. (FOR EXAMPLE RONAFIX MORTAR MIX C OR SIMILAR: FROM RONACRETE TEL ENGINEERING ADVICE MAY BE REQUIRED. 01279 638700).
2. JOINT SEALANT: ACO DRAIN CHANNEL JOINTS AND FITTINGS ARE TO BE SEALED WITH FLEXIBLE SEALENT
3. SURFACE PROTECTION: IN ASPHALT PAVEMENTS AVOID CONTACT BETWEEN COMPACTION EQUIPMENT AND CHANNEL/GRATING. THIS MAY BE ACHIEVED BY ENSURING THAT THE FINISHED SURFACE LEVEL LIES ABOVE THE GRATING LEVEL (BY AT LEAST 3mm). STONES SHOULD BE REMOVED FROM GRATING PRIOR TO LAYING/ROLLING WEARING COURSE.

PRECAST CONCRETE CHAMBER SECTIONS AND COVER SLAB TO BE BEDDED WITH PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT OR AN ELASTOMERIC RING



NON RETURN VALVE TO BE PROVIDED AT DOWNSTREAM END OF DISCHARGE PIPE TO PREVENT SURCHARGE OF SURGE CHAMBER BY MAIN GRAVITY SEWER

SECTION A-A
SCALE 1:20



PLAN
SCALE 1:20

SURGE CHAMBER
SCALE 1:20

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C01	ISSUED FOR PLANNING	LL	03.10.2024
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Client: FRONVILLE LTD

PUNCH consulting engineers
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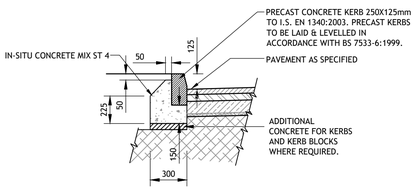
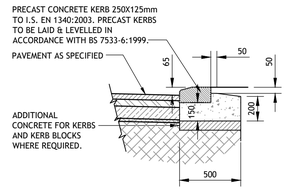
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: DRAINAGE CONSTRUCTION DETAILS - SHEET 1				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0506		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0506			Revision No: C04



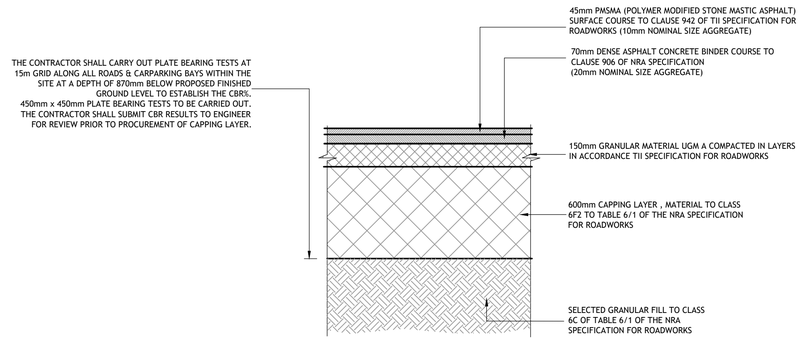
STANDARD KERB DETAIL

SCALE 1:25



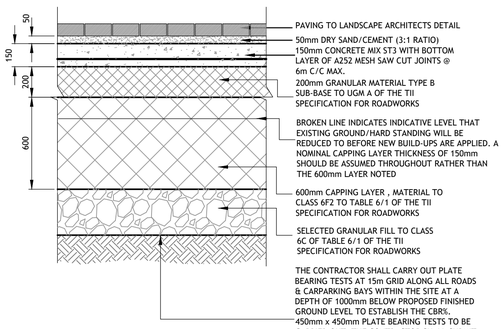
MOUNTABLE KERB DETAIL

TYPICAL DETAIL AT ENTRANCES TO PRIVATE DWELLINGS
SCALE 1:25



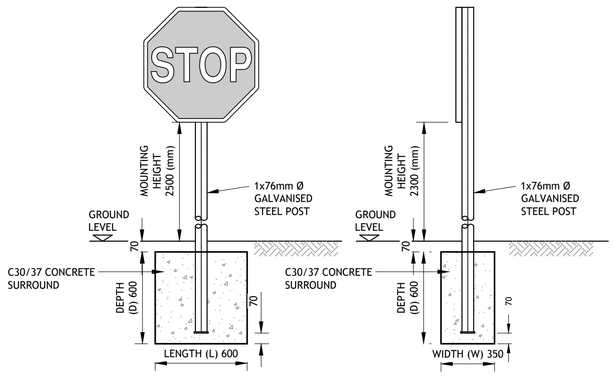
ACCESS ROAD BUILD-UP
SCALE 1:20

NOTE:
BUILD UP DETAILS SUITABLE FOR LOCATIONS
WHERE CBR TEST RESULTS = 2% OR GREATER

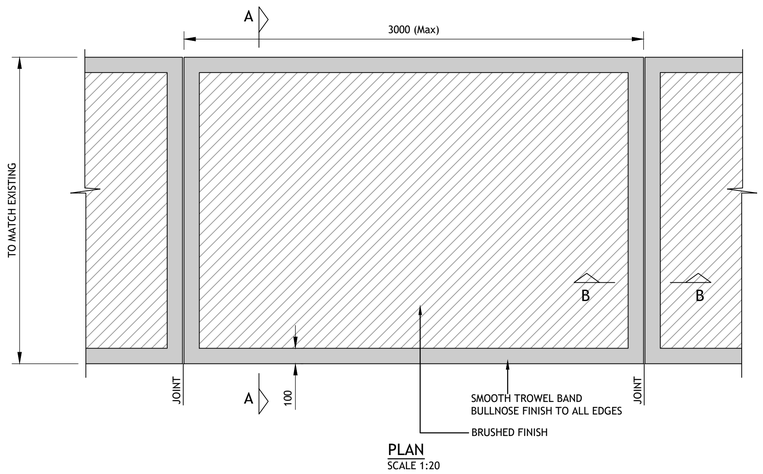


TRAFFICKED AREAS WITH PAVING
SCALE 1:20

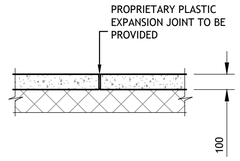
NOTES:
ALL SIGNS TO BE FITTED WITH LOCKABLE
SLEEVE CAST INTO FOUNDATIONS FOR
EASE OF REMOVAL/REPLACEMENT



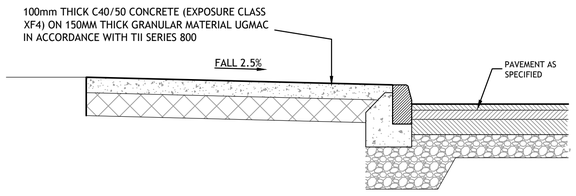
TYPICAL SINGLE POST SIGN DETAIL
Scale 1:20



PLAN
SCALE 1:20



SECTION B-B (JOINT DETAIL)
SCALE NTS



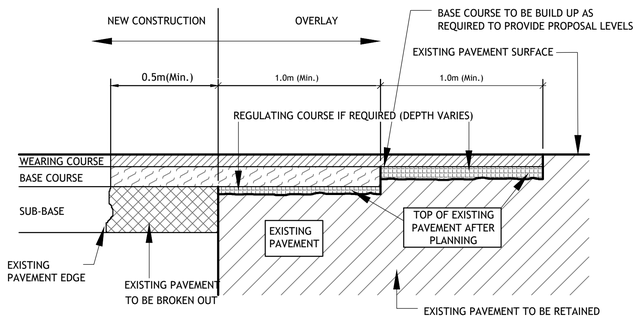
SECTION A-A
SCALE 1:20

IN-SITU CONCRETE FOOTPATH & KERB

SCALE 1:20

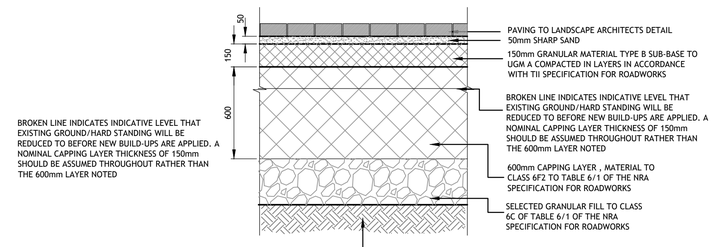
NOTES :

1. AT VEHICULAR ACCESS POINTS CONCRETE SLAB THICKNESS TO BE 150mm REINFORCED WITH A393 MESH TOP & BOTTOM.
2. ALL CONCRETE EDGES AND JOINTS SHALL HAVE BULLNOSED TROWEL FINISH.



TRANSVERSE JOINT BETWEEN PROPOSED FLEXIBLE PAVEMENT & EXISTING ROAD
NTS

AS AN ALTERNATIVE TO DEWATERING DEEP EXCAVATIONS BELOW THE WATER TABLE TII CLASS 6A FILL MATERIAL CAN BE USED AS FILL BELOW STANDING WATER TABLE IN LIEU OF CLASS 6C



NON-TRAFFICKED AREAS WITH PAVING
SCALE 1:20

BUILDING INFORMATION MODELLING (BIM)
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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C03	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C04	ISSUED FOR PLANNING	LL	09.06.2025

Rev	Amendment	By	Date

Client: FRONVILLE LTD

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Elm Court, Boreenmanna Road, Cork, T12 HHW2
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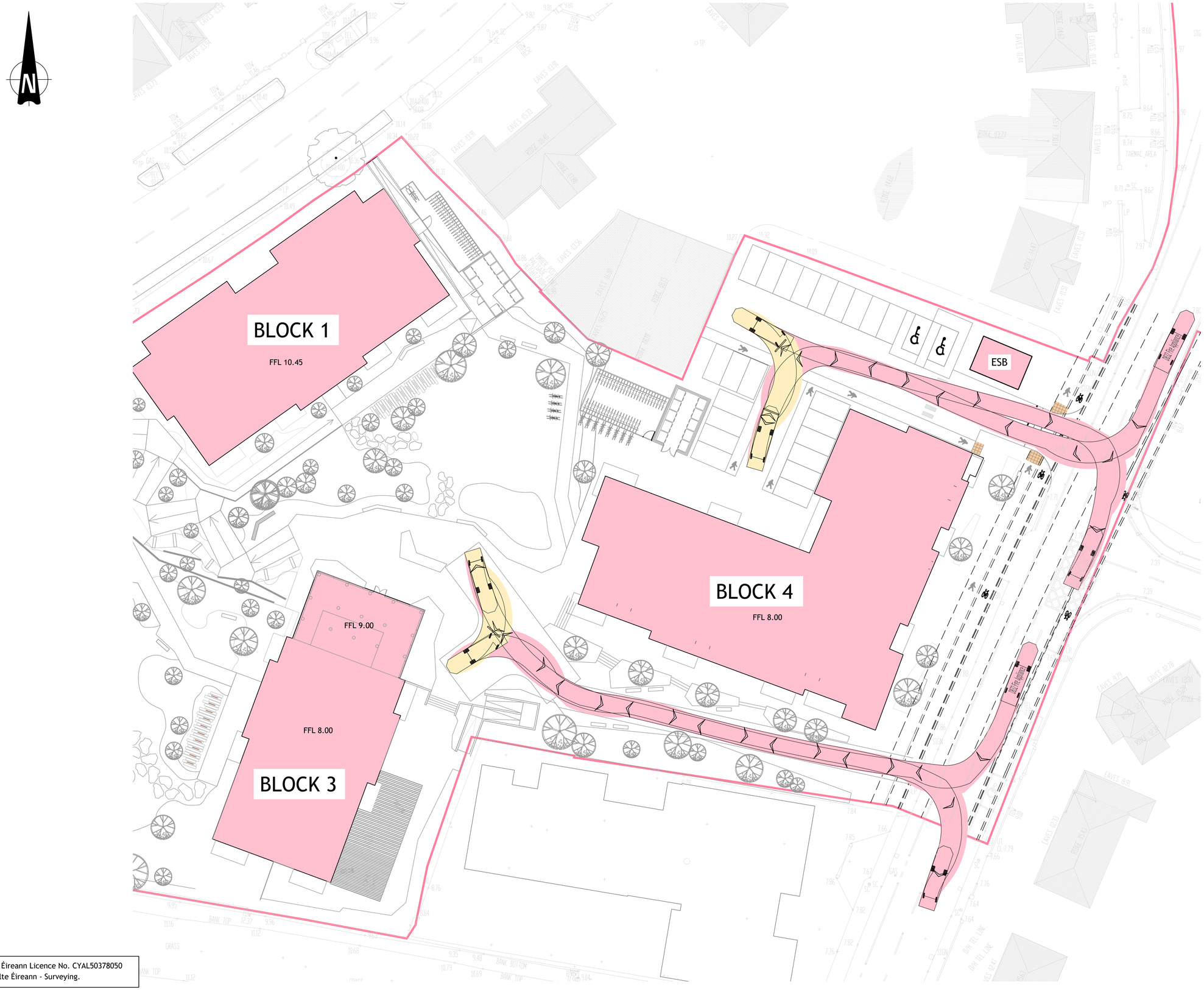
Project: KINSALE ROAD LRD, KINSALE ROAD, CORK			
Title: CONSTRUCTION DETAILS - SHEET 1			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0550	Drawing Status: A0(Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0550	Revision No: C04	



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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	04.03.2025				
C03	ISSUED FOR PLANNING	LL	21.03.2025				
C04	ISSUED FOR PLANNING REVIEW	LL	26.03.2025				
C05	ISSUED FOR PLANNING REVIEW	LL	08.04.2025				
C06	ISSUED FOR PLANNING	LL	09.06.2025				

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PUNCH consulting engineers
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Elm Court, Boreenmanna Road, Cork, T12 HHW2
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Project: KINSALE ROAD LRD, KINSALE ROAD, CORK				
Title: AUTOTRACK ANALYSIS - FIRE TENDER				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0600		Drawing Status: A0 (Planning)	
Scale @ A1: 1:250	Document No: 214130-PUNCH-XX-XX-DR-C-0600			Revision No: C06

BLOCK 1

FFL 10.45

BLOCK 2

FFL 12.00

BLOCK 3

FFL 9.00

FFL 8.00

BLOCK 4

FFL 8.00

ESB

BIN STORE IN BASEMENT

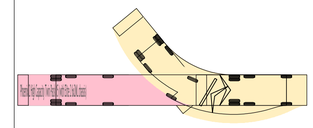
BIN STORE IN BASEMENT

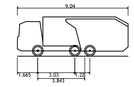
Basement Outline

AUTOTRACK LEGEND

VEHICLE MOVING FORWARD

VEHICLE IN REVERSE





Phoenix 2 High Capacity Twin Pack 15 (with Elite 2 6x2ML chassis)

Overall Length	9.040m
Overall Width	2.500m
Overall Body Height	3.205m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.800m

LEGEND

PROPOSED WASTE STORAGE AREAS

Tailte Éireann Licence No. CYAL50378050
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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	27.09.2024
C02	ISSUED FOR PLANNING	LL	23.10.2024
C03	ISSUED FOR PLANNING	LL	04.03.2025
C04	ISSUED FOR PLANNING	LL	21.03.2025
C05	ISSUED FOR PLANNING REVIEW	LL	26.03.2025
C06	ISSUED FOR PLANNING REVIEW	LL	08.04.2025
C07	ISSUED FOR PLANNING	LL	09.06.2025

Client: FRONVILLE LTD

PUNCH consulting engineers
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t +353 21 462 4000 | w punchconsulting.com

Project: KINSALE ROAD LRD, KINSALE ROAD, CORK

Title: AUTOTRACK ANALYSIS - REFUSE TRUCK

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model Ref:	Drawing Status:
214130	214130-PUNCH-XX-XX-M2-C-0601	A0 (Planning)

Scale @ A1:	Document No:	Revision No:
1:250	214130-PUNCH-XX-XX-DR-C-0601	C07

Appendix B Uisce Éireann Pre-connection Correspondence

CONFIRMATION OF FEASIBILITY

Andrew McCarthy

Elm Court
Boreenmanna Road
Cork
Co. Cork
T12 HHW2

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

9 May 2024

Our Ref: CDS24001801 Pre-Connection Enquiry
Former Vita Cortex Site, Kinsale Road, 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 Multi/Mixed Use Development of 167 unit(s) at Former Vita Cortex Site, Kinsale Road, 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
- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann:

  Please note that discharge of storm water to the Uisce Éireann network at this location will not be permitted. The Applicant should investigate suitable Sustainable Urban Drainage Systems (SUDS) measures within the Development to manage storm runoff on-site, or alternatively discharge runoff into the existing 900mm dia storm water network that does not discharge to an Uisce Éireann combined/foul sewer, located approximately 150m north of the development. Please refer to Section 1.5 of the Uisce Éireann Wastewater Code of Practice for further details.

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/

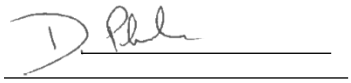
Where can you find more information?

- **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
Connections Delivery Manager

Section A - What is important to know?

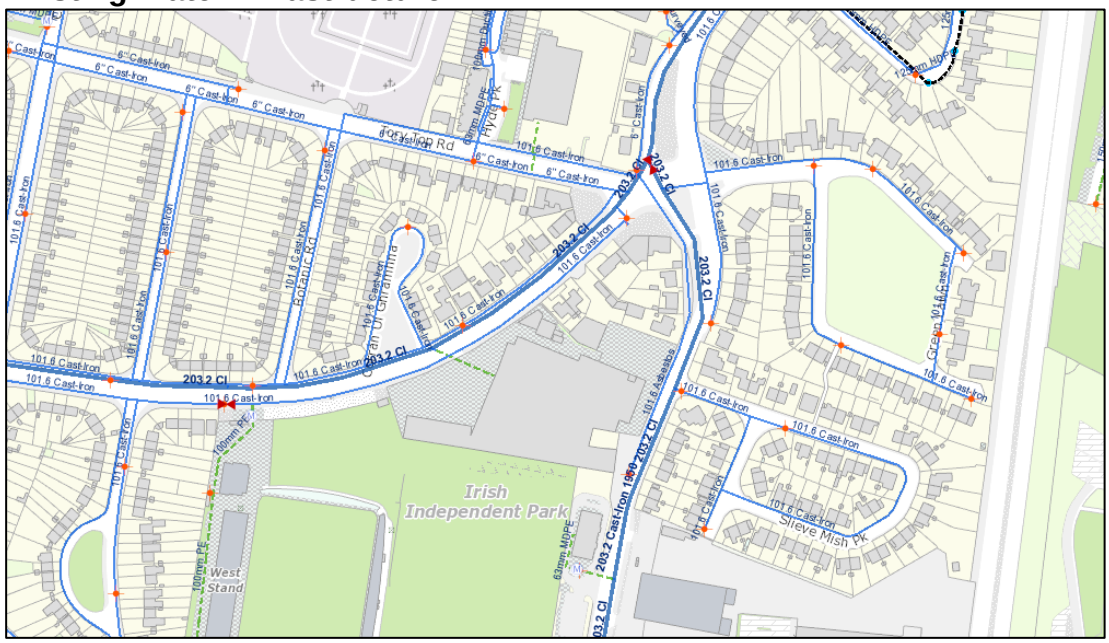
What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce 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)

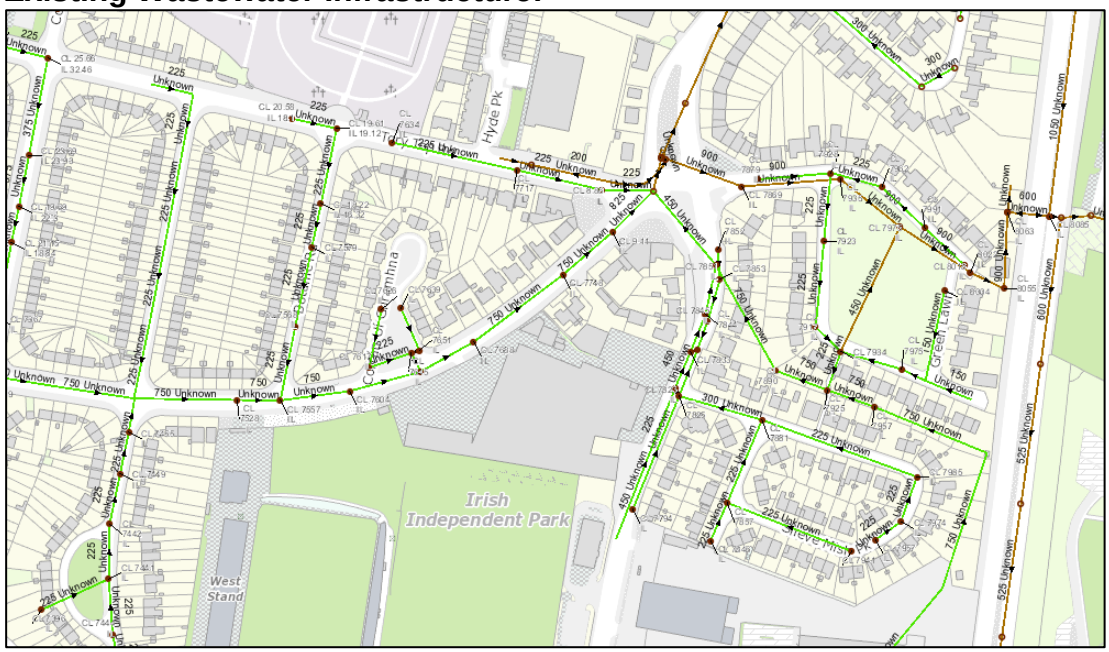
Section B – Details of Uisce Éireann's Network(s)

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:



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.

Appendix C Causeway Surface Water Drainage and Foul Sewer Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	17.300	Minimum Backdrop Height (m)	0.200
Ratio-R	0.208	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1-0 (Green Roof - Block 2)	0.080	5.00	24.675	1200	567613.534	570106.054	0.675
S1-1			11.857	1200	567612.735	570107.887	1.257
S1-2	0.020	5.00	10.980	1200	567647.163	570122.874	1.630
S8-0	0.020	5.00	12.127	1200	567614.099	570081.078	1.277
S8-1	0.040	5.00	11.821	1200	567653.255	570098.084	1.256
S1-3			9.680	1200	567661.935	570098.232	1.930
S9-0 (Blue Roof - Podium)	0.125	8.50	11.947	1200	567663.302	570082.862	0.500
S9-1			11.888	1200	567664.330	570085.661	0.461
S10-0 (Green Roof - Block 3)	0.051	8.50	37.125	1200	567676.257	570087.187	0.875
S10-1			11.670	1200	567675.009	570089.583	0.570
S9-3			11.584	1200	567675.807	570091.513	0.584
S9-4			9.000	1200	567676.500	570093.389	1.500
S1-4	0.100	5.00	9.006	1200	567678.392	570098.513	1.906
S1-5			9.151	1200	567680.984	570102.739	2.084
S14-0 (Bioretention Area)	0.002	5.00	8.995	1200	567692.016	570101.481	1.200
S1-6			9.107	1200	567690.224	570107.921	2.111
S11-0 (Green Roof - Block 1)	0.080	8.50	23.475	1200	567662.477	570130.971	0.475
S11-1	0.010	5.00	10.607	1200	567661.318	570132.602	1.107
S11-2	0.010	5.00	10.258	1200	567687.471	570151.182	0.972
S12-0	0.020	5.00	9.939	1200	567684.902	570120.082	1.425
S11-3	0.030	5.00	10.268	1200	567701.707	570132.019	1.960
S13-0 (Bioretention Area)	0.010	8.50	10.241	1200	567705.749	570131.911	1.425
S11-4			10.145	1200	567703.352	570129.806	2.495
S15-0 (Green Roof - Block 4)	0.110	8.50	27.525	1200	567720.650	570101.347	0.525
S15-1			8.778	1200	567715.313	570103.324	1.778
S1-7 (Attenuation Tank 1)			9.615	1200	567704.281	570119.181	2.819
S1-8 (Hydro-Brake)			8.837	1200	567719.143	570113.688	2.147
S1-9	0.045	5.00	8.588	1200	567736.806	570107.160	2.024
S16-0 (Permeable Paving)	0.015	5.00	8.422	1200	567738.054	570120.519	1.425
S1-10	0.050	5.00	8.204	1350	567741.809	570118.922	1.800
S17-0 (Permeable Paving)	0.010	5.00	8.012	1200	567747.373	570121.988	1.425
S1-11			8.054	1350	567743.766	570123.523	1.683
S1-12	0.000	5.00	8.004	1350	567745.474	570127.539	2.438
S1-13 (Attenuation Tank 2)			7.882	1350	567755.322	570126.487	2.382
S18-0 (Permeable Paving)	0.015	5.00	7.927	1200	567762.590	570124.482	1.427
S1-14	0.100	5.00	7.912	1350	567757.389	570122.471	2.442
S2-0	0.000	5.00	7.938	1200	567680.432	570052.587	1.500
S2-1	0.075	5.00	7.821	1200	567691.116	570051.002	1.455
S2-2			8.911	1200	567702.805	570085.619	2.789
S4-0 (Bioretention Area)	0.003	8.50	8.708	1200	567716.622	570086.898	1.425
S4-1 (Orifice)			8.728	1200	567715.587	570084.096	1.465

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S7-0 (Bioretention Area)	0.003	8.50	8.367	1200	567741.407	570077.759	1.425
S7-1 (Orifice)			8.299	1350	567740.368	570074.945	1.377
S5-0 (Bioretention Area)		5.00	8.590	1200	567726.165	570083.388	1.425
S5-1 (Orifice)			8.663	1200	567725.126	570080.574	1.518
S6-0 (Bioretention Area)	0.003	8.50	8.590	1200	567732.553	570081.029	1.500
S6-1 (Orifice)			8.559	1350	567731.473	570078.230	1.489
S2-3 (Attenuation Tank 3)			8.563	1200	567727.952	570076.328	2.620
S2-4	0.110	5.00	7.864	1350	567754.020	570068.681	2.102
S2-5 (Hydro-Brake)	0.030	5.00	7.886	1350	567766.481	570097.599	2.281
S1-16			7.821	1350	567774.131	570115.352	2.472
S1-17			7.766	1350	567784.367	570110.996	2.566
S1-18			7.803	1350	567800.321	570149.307	2.880
S1-19			7.613	1350	567797.546	570197.985	3.015
S1-20			7.528	1350	567798.177	570210.092	3.011
S1-21			7.254	1350	567791.724	570245.717	2.978
S1-22 (Outfall)			7.238	1350	567792.767	570247.493	2.976
S1-15 (Hydro-Brake)			7.890	1350	567761.532	570120.721	2.450

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
S1.000	S1-0 (Green Roof - Block 2)	S1-1	2.000	0.600	24.000	10.600	13.400	0.1	225	5.00	50.0
S1.001	S1-1	S1-2	37.549	0.600	10.600	10.350	0.250	150.0	225	5.59	50.0
S1.002	S1-2	S1-3	28.730	0.600	9.350	9.158	0.192	150.0	225	6.04	50.0
S9.000	S8-0	S8-1	42.690	0.600	10.850	10.565	0.285	150.0	225	5.67	50.0
S8.001	S8-1	S1-3	8.681	0.600	10.565	8.381	2.184	4.0	225	5.69	50.0
S1.003	S1-3	S1-4	16.459	0.600	7.750	7.640	0.110	150.0	225	6.30	50.0
S9.000.	S9-0 (Blue Roof - Podium)	S9-1	2.982	0.600	11.447	11.427	0.020	150.0	225	8.55	46.2
S9.001	S9-1	S9-3	12.883	0.600	11.427	11.341	0.086	150.0	225	8.75	45.8
S10.000	S10-0 (Green Roof - Block 3)	S10-1	2.702	0.600	36.250	11.100	25.150	0.1	225	8.50	46.3
S10.001	S10-1	S9-3	2.088	0.600	11.100	11.086	0.014	150.0	225	8.53	46.2
S9.003	S9-3	S9-4	2.000	0.600	11.000	7.500	3.500	0.6	225	8.75	45.8
S9.004	S9-4	S1-4	5.462	0.600	7.500	7.464	0.036	150.0	225	8.84	45.6
S1.004	S1-4	S1-5	4.958	0.600	7.100	7.067	0.033	150.0	300	8.90	45.6

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.000	34.162	1358.3	10.8	0.450	1.032	0.080	0.0	15	10.484
S1.001	1.065	42.3	10.8	1.032	0.405	0.080	0.0	78	0.896
S1.002	1.065	42.3	13.6	1.405	0.297	0.100	0.0	87	0.950
S9.000	1.065	42.3	2.7	1.052	1.031	0.020	0.0	38	0.599
S8.001	6.608	262.8	8.1	1.031	1.074	0.060	0.0	27	3.009
S1.003	1.065	42.3	21.7	1.705	1.141	0.160	0.0	114	1.070
S9.000.	1.065	42.3	15.7	0.275	0.236	0.125	0.0	94	0.986
S9.001	1.065	42.3	15.5	0.236	0.018	0.125	0.0	94	0.986
S10.000	40.267	1601.1	6.4	0.650	0.345	0.051	0.0	10	9.694
S10.001	1.065	42.3	6.4	0.345	0.273	0.051	0.0	58	0.768
S9.003	17.451	693.9	21.8	0.359	1.275	0.176	0.0	27	7.957
S9.004	1.065	42.3	21.8	1.275	1.317	0.176	0.0	115	1.073
S1.004	1.281	90.6	53.7	1.606	1.784	0.436	0.0	167	1.334

Links

me	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rai (mm
005	S1-5	S1-6	10.594	0.600	7.067	6.996	0.071	150.0	300	9.04	4
.000	S14-0 (Bioretention Area)	S1-6	6.685	0.600	7.795	7.750	0.045	150.0	225	5.10	5
006	S1-6	S1-7 (Attenuation Tank 1)	18.011	0.600	6.996	6.876	0.120	150.0	300	9.27	4
.000	S11-0 (Green Roof - Block 1)	S11-1	2.001	0.600	23.000	9.500	13.500	0.1	225	8.50	4
.001	S11-1	S11-2	32.081	0.600	9.500	9.286	0.214	150.0	225	9.00	4
.002	S11-2	S11-3	23.872	0.600	9.286	9.127	0.159	150.0	225	9.38	4
.000	S12-0	S11-3	20.613	0.600	8.514	8.308	0.206	100.0	225	5.26	5
.003	S11-3	S11-4	2.757	0.600	8.308	8.290	0.018	150.0	225	9.42	4
.000	S13-0 (Bioretention Area)	S11-4	3.190	0.600	8.816	8.784	0.032	100.0	225	8.54	4
.004	S11-4	S1-7 (Attenuation Tank 1)	10.666	0.600	7.650	7.579	0.071	150.0	225	9.59	4
.000	S15-0 (Green Roof - Block 4)	S15-1	5.691	0.600	27.000	7.000	20.000	0.3	225	8.50	4
.001	S15-1	S1-7 (Attenuation Tank 1)	19.317	0.600	7.000	6.871	0.129	150.0	225	8.81	4
007	S1-7 (Attenuation Tank 1)	S1-8 (Hydro-Brake)	15.845	0.600	6.796	6.690	0.106	150.0	300	9.79	4
008	S1-8 (Hydro-Brake)	S1-9	18.831	0.600	6.690	6.564	0.126	150.0	300	10.04	4
009	S1-9	S1-10	12.782	0.600	6.564	6.479	0.085	150.0	300	10.20	4
.000	S16-0 (Permeable Paving)	S1-10	4.080	0.600	6.997	6.956	0.041	100.0	225	5.05	5
010	S1-10	S1-11	5.000	0.600	6.404	6.371	0.033	150.0	375	10.26	4
.000	S17-0 (Permeable Paving)	S1-11	3.920	0.600	6.587	6.548	0.039	100.0	225	5.05	5
011	S1-11	S1-12	4.364	0.600	6.371	6.342	0.029	150.0	375	10.31	4
012	S1-12	S1-13 (Attenuation Tank 2)	9.904	0.600	5.566	5.500	0.066	150.0	375	10.42	4
013	S1-13 (Attenuation Tank 2)	S1-14	4.517	0.600	5.500	5.470	0.030	150.0	375	10.47	4
.000	S18-0 (Permeable Paving)	S1-15 (Hydro-Brake)	3.907	0.600	6.500	6.474	0.026	150.0	225	5.06	5
014	S1-14	S1-15 (Hydro-Brake)	4.497	0.600	5.470	5.440	0.030	150.0	375	10.52	4
000	S2-0	S2-1	10.801	0.600	6.438	6.366	0.072	150.0	225	5.17	5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.005	1.281	90.6	53.4	1.784	1.811	0.436	0.0	166	1.333
S14.000	1.065	42.3	0.3	0.975	1.132	0.002	0.0	13	0.292
S1.006	1.281	90.6	53.1	1.811	2.439	0.438	0.0	166	1.331
S11.000	34.279	1362.9	10.0	0.250	0.882	0.080	0.0	14	10.091
S11.001	1.065	42.3	11.0	0.882	0.747	0.090	0.0	78	0.896
S11.002	1.065	42.3	12.0	0.747	0.916	0.100	0.0	82	0.922
S12.000	1.307	52.0	2.7	1.200	1.735	0.020	0.0	35	0.694
S11.003	1.065	42.3	18.0	1.735	1.630	0.150	0.0	102	1.023
S13.000	1.307	52.0	1.3	1.200	1.136	0.010	0.0	24	0.552
S11.004	1.065	42.3	19.1	2.270	1.811	0.160	0.0	106	1.038
S15.000	24.735	983.5	13.8	0.300	1.553	0.110	0.0	19	9.027
S15.001	1.065	42.3	13.6	1.553	2.519	0.110	0.0	87	0.950
S1.007	1.281	90.6	83.9	2.519	1.847	0.708	0.0	229	1.447
S1.008	1.281	90.6	83.1	1.847	1.724	0.708	0.0	227	1.446
S1.009	1.281	90.6	87.7	1.724	1.425	0.753	0.0	239	1.452
S16.000	1.307	52.0	2.0	1.200	1.023	0.015	0.0	30	0.638
S1.010	1.477	163.1	95.1	1.425	1.308	0.818	0.0	206	1.532
S17.000	1.307	52.0	1.4	1.200	1.281	0.010	0.0	25	0.565
S1.011	1.477	163.1	96.1	1.308	1.287	0.828	0.0	207	1.534
S1.012	1.477	163.1	95.6	2.063	2.007	0.828	0.0	207	1.534
S1.013	1.477	163.1	95.4	2.007	2.067	0.828	0.0	206	1.532
S18.000	1.065	42.3	2.0	1.202	1.191	0.015	0.0	34	0.555
S1.014	1.477	163.1	106.8	2.067	2.075	0.928	0.0	222	1.570
S2.000	1.065	42.3	0.0	1.275	1.230	0.000	0.0	0	0.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
S2.001	S2-1	S2-2	36.537	0.600	6.366	6.122	0.244	150.0	225	5.74	50.0
S2.002	S2-2	S2-3 (Attenuation Tank 3)	26.808	0.600	6.122	5.943	0.179	150.0	225	6.16	50.0
S1.015	S1-15 (Hydro-Brake)	S1-16	13.695	0.600	5.440	5.349	0.091	150.0	375	10.68	42.2
S4.000	S4-0 (Bioretention Area)	S4-1 (Orifice)	2.987	0.600	7.283	7.263	0.020	150.0	225	8.55	46.2
S4.001	S4-1 (Orifice)	S2-3 (Attenuation Tank 3)	14.603	0.600	7.263	7.166	0.097	150.0	225	8.78	45.7
S7.000	S7-0 (Bioretention Area)	S7-1 (Orifice)	3.000	0.600	6.942	6.922	0.020	150.0	225	8.55	46.2
S7.001	S7-1 (Orifice)	S2-3 (Attenuation Tank 3)	12.493	0.600	6.922	6.839	0.083	150.0	225	8.74	45.8
S5.000	S5-0 (Bioretention Area)	S5-1 (Orifice)	3.000	0.600	7.165	7.145	0.020	150.0	225	5.05	50.0
S5.001	S5-1 (Orifice)	S2-3 (Attenuation Tank 3)	5.100	0.600	7.145	7.111	0.034	150.0	225	5.13	50.0
S6.000	S6-0 (Bioretention Area)	S6-1 (Orifice)	3.000	0.600	7.090	7.070	0.020	150.0	225	8.55	46.2
S6.001	S6-1 (Orifice)	S2-3 (Attenuation Tank 3)	4.002	0.600	7.070	7.043	0.027	150.0	225	8.61	46.1
S2.003	S2-3 (Attenuation Tank 3)	S2-4	27.166	0.600	5.943	5.762	0.181	150.0	225	9.20	44.9
S2.004	S2-4	S2-5 (Hydro-Brake)	31.489	0.600	5.762	5.605	0.157	200.0	225	9.77	43.8
S2.005	S2-5 (Hydro-Brake)	S1-16	19.331	0.600	5.605	5.508	0.097	200.0	225	10.12	43.1
S1.016	S1-16	S1-17	11.124	0.600	5.349	5.275	0.074	150.0	375	10.80	42.0
S1.017	S1-17	S1-18	41.500	0.600	5.200	4.923	0.277	150.0	450	11.22	41.3
S1.018	S1-18	S1-19	48.757	0.600	4.923	4.598	0.325	150.0	450	11.71	40.6
S1.019	S1-19	S1-20	12.123	0.600	4.598	4.517	0.081	150.0	450	11.83	40.4
S1-20	S1-20	S1-21	36.205	0.600	4.517	4.276	0.241	150.0	450	12.20	39.9
S1-21	S1-21	S1-22 (Outfall)	2.060	0.600	4.276	4.262	0.014	150.0	450	12.22	39.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S2.001	1.065	42.3	10.2	1.230	2.564	0.075	0.0	75	0.880
S2.002	1.065	42.3	10.2	2.564	2.395	0.075	0.0	75	0.880
S1.015	1.477	163.1	107.8	2.075	2.097	0.943	0.0	223	1.574
S4.000	1.065	42.3	0.4	1.200	1.240	0.003	0.0	15	0.332
S4.001	1.065	42.3	0.4	1.240	1.172	0.003	0.0	15	0.332
S7.000	1.065	42.3	0.4	1.200	1.152	0.003	0.0	16	0.345
S7.001	1.065	42.3	0.4	1.152	1.499	0.003	0.0	16	0.345
S5.000	1.065	42.3	0.0	1.200	1.293	0.000	0.0	0	0.000
S5.001	1.065	42.3	0.0	1.293	1.227	0.000	0.0	0	0.000
S6.000	1.065	42.3	0.3	1.275	1.264	0.003	0.0	15	0.319
S6.001	1.065	42.3	0.3	1.264	1.295	0.003	0.0	14	0.305
S2.003	1.065	42.3	10.2	2.395	1.877	0.084	0.0	75	0.880
S2.004	0.921	36.6	23.0	1.877	2.056	0.194	0.0	130	0.972
S2.005	0.921	36.6	26.2	2.056	2.088	0.224	0.0	141	0.999
S1.016	1.477	163.1	132.8	2.097	2.116	1.167	0.0	258	1.638
S1.017	1.657	263.6	130.7	2.116	2.430	1.167	0.0	224	1.653
S1.018	1.657	263.6	128.3	2.430	2.565	1.167	0.0	221	1.646
S1.019	1.657	263.6	127.7	2.565	2.561	1.167	0.0	221	1.646
S1-20	1.657	263.6	126.1	2.561	2.528	1.167	0.0	219	1.640
S1-21	1.657	263.6	126.0	2.528	2.526	1.167	0.0	219	1.640

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S1.000	2.000	0.1	225	Circular	24.675	24.000	0.450	11.857	10.600	1.032
S1.001	37.549	150.0	225	Circular	11.857	10.600	1.032	10.980	10.350	0.405
S1.002	28.730	150.0	225	Circular	10.980	9.350	1.405	9.680	9.158	0.297
S9.000	42.690	150.0	225	Circular	12.127	10.850	1.052	11.821	10.565	1.031
S8.001	8.681	4.0	225	Circular	11.821	10.565	1.031	9.680	8.381	1.074
S1.003	16.459	150.0	225	Circular	9.680	7.750	1.705	9.006	7.640	1.141
S9.000.	2.982	150.0	225	Circular	11.947	11.447	0.275	11.888	11.427	0.236
S9.001	12.883	150.0	225	Circular	11.888	11.427	0.236	11.584	11.341	0.018
S10.000	2.702	0.1	225	Circular	37.125	36.250	0.650	11.670	11.100	0.345
S10.001	2.088	150.0	225	Circular	11.670	11.100	0.345	11.584	11.086	0.273
S9.003	2.000	0.6	225	Circular	11.584	11.000	0.359	9.000	7.500	1.275
S9.004	5.462	150.0	225	Circular	9.000	7.500	1.275	9.006	7.464	1.317
S1.004	4.958	150.0	300	Circular	9.006	7.100	1.606	9.151	7.067	1.784
S1.005	10.594	150.0	300	Circular	9.151	7.067	1.784	9.107	6.996	1.811
S14.000	6.685	150.0	225	Circular	8.995	7.795	0.975	9.107	7.750	1.132
S1.006	18.011	150.0	300	Circular	9.107	6.996	1.811	9.615	6.876	2.439
S11.000	2.001	0.1	225	Circular	23.475	23.000	0.250	10.607	9.500	0.882
S11.001	32.081	150.0	225	Circular	10.607	9.500	0.882	10.258	9.286	0.747
S11.002	23.872	150.0	225	Circular	10.258	9.286	0.747	10.268	9.127	0.916
S12.000	20.613	100.0	225	Circular	9.939	8.514	1.200	10.268	8.308	1.735
S11.003	2.757	150.0	225	Circular	10.268	8.308	1.735	10.145	8.290	1.630
S13.000	3.190	100.0	225	Circular	10.241	8.816	1.200	10.145	8.784	1.136
S11.004	10.666	150.0	225	Circular	10.145	7.650	2.270	9.615	7.579	1.811
S15.000	5.691	0.3	225	Circular	27.525	27.000	0.300	8.778	7.000	1.553
S15.001	19.317	150.0	225	Circular	8.778	7.000	1.553	9.615	6.871	2.519

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.000	S1-0 (Green Roof - Block 2)	1200	Manhole	Adoptable	S1-1	1200	Manhole	Adoptable
S1.001	S1-1	1200	Manhole	Adoptable	S1-2	1200	Manhole	Adoptable
S1.002	S1-2	1200	Manhole	Adoptable	S1-3	1200	Manhole	Adoptable
S9.000	S8-0	1200	Manhole	Adoptable	S8-1	1200	Manhole	Adoptable
S8.001	S8-1	1200	Manhole	Adoptable	S1-3	1200	Manhole	Adoptable
S1.003	S1-3	1200	Manhole	Adoptable	S1-4	1200	Manhole	Adoptable
S9.000.	S9-0 (Blue Roof - Podium)	1200	Manhole	Adoptable	S9-1	1200	Manhole	Adoptable
S9.001	S9-1	1200	Manhole	Adoptable	S9-3	1200	Manhole	Adoptable
S10.000	S10-0 (Green Roof - Block 3)	1200	Manhole	Adoptable	S10-1	1200	Manhole	Adoptable
S10.001	S10-1	1200	Manhole	Adoptable	S9-3	1200	Manhole	Adoptable
S9.003	S9-3	1200	Manhole	Adoptable	S9-4	1200	Manhole	Adoptable
S9.004	S9-4	1200	Manhole	Adoptable	S1-4	1200	Manhole	Adoptable
S1.004	S1-4	1200	Manhole	Adoptable	S1-5	1200	Manhole	Adoptable
S1.005	S1-5	1200	Manhole	Adoptable	S1-6	1200	Manhole	Adoptable
S14.000	S14-0 (Bioretention Area)	1200	Manhole	Adoptable	S1-6	1200	Manhole	Adoptable
S1.006	S1-6	1200	Manhole	Adoptable	S1-7 (Attenuation Tank 1)	1200	Manhole	Adoptable
S11.000	S11-0 (Green Roof - Block 1)	1200	Manhole	Adoptable	S11-1	1200	Manhole	Adoptable
S11.001	S11-1	1200	Manhole	Adoptable	S11-2	1200	Manhole	Adoptable
S11.002	S11-2	1200	Manhole	Adoptable	S11-3	1200	Manhole	Adoptable
S12.000	S12-0	1200	Manhole	Adoptable	S11-3	1200	Manhole	Adoptable
S11.003	S11-3	1200	Manhole	Adoptable	S11-4	1200	Manhole	Adoptable
S13.000	S13-0 (Bioretention Area)	1200	Manhole	Adoptable	S11-4	1200	Manhole	Adoptable
S11.004	S11-4	1200	Manhole	Adoptable	S1-7 (Attenuation Tank 1)	1200	Manhole	Adoptable
S15.000	S15-0 (Green Roof - Block 4)	1200	Manhole	Adoptable	S15-1	1200	Manhole	Adoptable
S15.001	S15-1	1200	Manhole	Adoptable	S1-7 (Attenuation Tank 1)	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S1.007	15.845	150.0	300	Circular	9.615	6.796	2.519	8.837	6.690	1.847
S1.008	18.831	150.0	300	Circular	8.837	6.690	1.847	8.588	6.564	1.724
S1.009	12.782	150.0	300	Circular	8.588	6.564	1.724	8.204	6.479	1.425
S16.000	4.080	100.0	225	Circular	8.422	6.997	1.200	8.204	6.956	1.023
S1.010	5.000	150.0	375	Circular	8.204	6.404	1.425	8.054	6.371	1.308
S17.000	3.920	100.0	225	Circular	8.012	6.587	1.200	8.054	6.548	1.281
S1.011	4.364	150.0	375	Circular	8.054	6.371	1.308	8.004	6.342	1.287
S1.012	9.904	150.0	375	Circular	8.004	5.566	2.063	7.882	5.500	2.007
S1.013	4.517	150.0	375	Circular	7.882	5.500	2.007	7.912	5.470	2.067
S18.000	3.907	150.0	225	Circular	7.927	6.500	1.202	7.890	6.474	1.191
S1.014	4.497	150.0	375	Circular	7.912	5.470	2.067	7.890	5.440	2.075
S2.000	10.801	150.0	225	Circular	7.938	6.438	1.275	7.821	6.366	1.230
S2.001	36.537	150.0	225	Circular	7.821	6.366	1.230	8.911	6.122	2.564
S2.002	26.808	150.0	225	Circular	8.911	6.122	2.564	8.563	5.943	2.395
S1.015	13.695	150.0	375	Circular	7.890	5.440	2.075	7.821	5.349	2.097
S4.000	2.987	150.0	225	Circular	8.708	7.283	1.200	8.728	7.263	1.240
S4.001	14.603	150.0	225	Circular	8.728	7.263	1.240	8.563	7.166	1.172
S7.000	3.000	150.0	225	Circular	8.367	6.942	1.200	8.299	6.922	1.152
S7.001	12.493	150.0	225	Circular	8.299	6.922	1.152	8.563	6.839	1.499
S5.000	3.000	150.0	225	Circular	8.590	7.165	1.200	8.663	7.145	1.293
S5.001	5.100	150.0	225	Circular	8.663	7.145	1.293	8.563	7.111	1.227
S6.000	3.000	150.0	225	Circular	8.590	7.090	1.275	8.559	7.070	1.264
S6.001	4.002	150.0	225	Circular	8.559	7.070	1.264	8.563	7.043	1.295
S2.003	27.166	150.0	225	Circular	8.563	5.943	2.395	7.864	5.762	1.877
S2.004	31.489	200.0	225	Circular	7.864	5.762	1.877	7.886	5.605	2.056

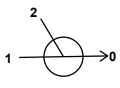
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.007	S1-7 (Attenuation Tank 1)	1200	Manhole	Adoptable	S1-8 (Hydro-Brake)	1200	Manhole	Adoptable
S1.008	S1-8 (Hydro-Brake)	1200	Manhole	Adoptable	S1-9	1200	Manhole	Adoptable
S1.009	S1-9	1200	Manhole	Adoptable	S1-10	1350	Manhole	Adoptable
S16.000	S16-0 (Permeable Paving)	1200	Manhole	Adoptable	S1-10	1350	Manhole	Adoptable
S1.010	S1-10	1350	Manhole	Adoptable	S1-11	1350	Manhole	Adoptable
S17.000	S17-0 (Permeable Paving)	1200	Manhole	Adoptable	S1-11	1350	Manhole	Adoptable
S1.011	S1-11	1350	Manhole	Adoptable	S1-12	1350	Manhole	Adoptable
S1.012	S1-12	1350	Manhole	Adoptable	S1-13 (Attenuation Tank 2)	1350	Manhole	Adoptable
S1.013	S1-13 (Attenuation Tank 2)	1350	Manhole	Adoptable	S1-14	1350	Manhole	Adoptable
S18.000	S18-0 (Permeable Paving)	1200	Manhole	Adoptable	S1-15 (Hydro-Brake)	1350	Manhole	Adoptable
S1.014	S1-14	1350	Manhole	Adoptable	S1-15 (Hydro-Brake)	1350	Manhole	Adoptable
S2.000	S2-0	1200	Manhole	Adoptable	S2-1	1200	Manhole	Adoptable
S2.001	S2-1	1200	Manhole	Adoptable	S2-2	1200	Manhole	Adoptable
S2.002	S2-2	1200	Manhole	Adoptable	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable
S1.015	S1-15 (Hydro-Brake)	1350	Manhole	Adoptable	S1-16	1350	Manhole	Adoptable
S4.000	S4-0 (Bioretention Area)	1200	Manhole	Adoptable	S4-1 (Orifice)	1200	Manhole	Adoptable
S4.001	S4-1 (Orifice)	1200	Manhole	Adoptable	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable
S7.000	S7-0 (Bioretention Area)	1200	Manhole	Adoptable	S7-1 (Orifice)	1350	Manhole	Adoptable
S7.001	S7-1 (Orifice)	1350	Manhole	Adoptable	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable
S5.000	S5-0 (Bioretention Area)	1200	Manhole	Adoptable	S5-1 (Orifice)	1200	Manhole	Adoptable
S5.001	S5-1 (Orifice)	1200	Manhole	Adoptable	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable
S6.000	S6-0 (Bioretention Area)	1200	Manhole	Adoptable	S6-1 (Orifice)	1350	Manhole	Adoptable
S6.001	S6-1 (Orifice)	1350	Manhole	Adoptable	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable
S2.003	S2-3 (Attenuation Tank 3)	1200	Manhole	Adoptable	S2-4	1350	Manhole	Adoptable
S2.004	S2-4	1350	Manhole	Adoptable	S2-5 (Hydro-Brake)	1350	Manhole	Adoptable

Pipeline Schedule

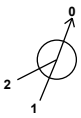
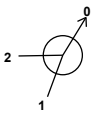
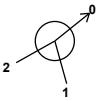
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S2.005	19.331	200.0	225	Circular	7.886	5.605	2.056	7.821	5.508	2.088
S1.016	11.124	150.0	375	Circular	7.821	5.349	2.097	7.766	5.275	2.116
S1.017	41.500	150.0	450	Circular	7.766	5.200	2.116	7.803	4.923	2.430
S1.018	48.757	150.0	450	Circular	7.803	4.923	2.430	7.613	4.598	2.565
S1.019	12.123	150.0	450	Circular	7.613	4.598	2.565	7.528	4.517	2.561
S1-20	36.205	150.0	450	Circular	7.528	4.517	2.561	7.254	4.276	2.528
S1-21	2.060	150.0	450	Circular	7.254	4.276	2.528	7.238	4.262	2.526

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S2.005	S2-5 (Hydro-Brake)	1350	Manhole	Adoptable	S1-16	1350	Manhole	Adoptable
S1.016	S1-16	1350	Manhole	Adoptable	S1-17	1350	Manhole	Adoptable
S1.017	S1-17	1350	Manhole	Adoptable	S1-18	1350	Manhole	Adoptable
S1.018	S1-18	1350	Manhole	Adoptable	S1-19	1350	Manhole	Adoptable
S1.019	S1-19	1350	Manhole	Adoptable	S1-20	1350	Manhole	Adoptable
S1-20	S1-20	1350	Manhole	Adoptable	S1-21	1350	Manhole	Adoptable
S1-21	S1-21	1350	Manhole	Adoptable	S1-22 (Outfall)	1350	Manhole	Adoptable

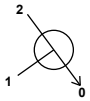
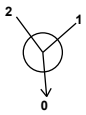
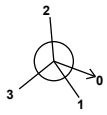
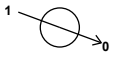
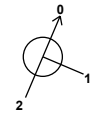
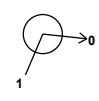
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1-0 (Green Roof - Block 2)	567613.534	570106.054	24.675	0.675	1200		0 S1.000	24.000	225
S1-1	567612.735	570107.887	11.857	1.257	1200	1 	1 S1.000	10.600	225
							0 S1.001	10.600	225
S1-2	567647.163	570122.874	10.980	1.630	1200	1 	1 S1.001	10.350	225
							0 S1.002	9.350	225
S8-0	567614.099	570081.078	12.127	1.277	1200		0 S9.000	10.850	225
S8-1	567653.255	570098.084	11.821	1.256	1200	1 	1 S9.000	10.565	225
							0 S8.001	10.565	225
S1-3	567661.935	570098.232	9.680	1.930	1200	2 1 	1 S8.001	8.381	225
							2 S1.002	9.158	225
							0 S1.003	7.750	225
S9-0 (Blue Roof - Podium)	567663.302	570082.862	11.947	0.500	1200		0 S9.000.	11.447	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S9-1	567664.330	570085.661	11.888	0.461	1200	1	S9.000.	11.427	225
									
						0	S9.001	11.427	225
S10-0 (Green Roof - Block 3)	567676.257	570087.187	37.125	0.875	1200				
						0	S10.000	36.250	225
S10-1	567675.009	570089.583	11.670	0.570	1200	1	S10.000	11.100	225
									
						0	S10.001	11.100	225
S9-3	567675.807	570091.513	11.584	0.584	1200	1	S10.001	11.086	225
						2	S9.001	11.341	225
									
						0	S9.003	11.000	225
S9-4	567676.500	570093.389	9.000	1.500	1200	1	S9.003	7.500	225
									
						0	S9.004	7.500	225
S1-4	567678.392	570098.513	9.006	1.906	1200	1	S9.004	7.464	225
						2	S1.003	7.640	225
									
						0	S1.004	7.100	300
S1-5	567680.984	570102.739	9.151	2.084	1200	1	S1.004	7.067	300
									
						0	S1.005	7.067	300
S14-0 (Bioretention Area)	567692.016	570101.481	8.995	1.200	1200				
						0	S14.000	7.795	225
S1-6	567690.224	570107.921	9.107	2.111	1200	1	S14.000	7.750	225
						2	S1.005	6.996	300
									
						0	S1.006	6.996	300
S11-0 (Green Roof - Block 1)	567662.477	570130.971	23.475	0.475	1200				
						0	S11.000	23.000	225
S11-1	567661.318	570132.602	10.607	1.107	1200	1	S11.000	9.500	225
									
						0	S11.001	9.500	225
S11-2	567687.471	570151.182	10.258	0.972	1200	1	S11.001	9.286	225
									
						0	S11.002	9.286	225
S12-0	567684.902	570120.082	9.939	1.425	1200				
						0	S12.000	8.514	225

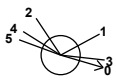
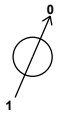
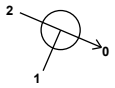
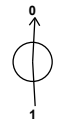
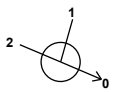
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S11-3	567701.707	570132.019	10.268	1.960	1200		1 S12.000	8.308	225
							2 S11.002	9.127	225
							0 S11.003	8.308	225
S13-0 (Bioretention Area)	567705.749	570131.911	10.241	1.425	1200		0 S13.000	8.816	225
S11-4	567703.352	570129.806	10.145	2.495	1200		1 S13.000	8.784	225
							2 S11.003	8.290	225
							0 S11.004	7.650	225
S15-0 (Green Roof - Block 4)	567720.650	570101.347	27.525	0.525	1200		0 S15.000	27.000	225
S15-1	567715.313	570103.324	8.778	1.778	1200		1 S15.000	7.000	225
							0 S15.001	7.000	225
S1-7 (Attenuation Tank 1)	567704.281	570119.181	9.615	2.819	1200		1 S15.001	6.871	225
							2 S11.004	7.579	225
							3 S1.006	6.876	300
							0 S1.007	6.796	300
S1-8 (Hydro-Brake)	567719.143	570113.688	8.837	2.147	1200		1 S1.007	6.690	300
							0 S1.008	6.690	300
S1-9	567736.806	570107.160	8.588	2.024	1200		1 S1.008	6.564	300
							0 S1.009	6.564	300
S16-0 (Permeable Paving)	567738.054	570120.519	8.422	1.425	1200		0 S16.000	6.997	225
S1-10	567741.809	570118.922	8.204	1.800	1350		1 S16.000	6.956	225
							2 S1.009	6.479	300
							0 S1.010	6.404	375
S17-0 (Permeable Paving)	567747.373	570121.988	8.012	1.425	1200		0 S17.000	6.587	225
S1-11	567743.766	570123.523	8.054	1.683	1350		1 S17.000	6.548	225
							2 S1.010	6.371	375
							0 S1.011	6.371	375
S1-12	567745.474	570127.539	8.004	2.438	1350		1 S1.011	6.342	375
							0 S1.012	5.566	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1-13 (Attenuation Tank 2)	567755.322	570126.487	7.882	2.382	1350	1  0	S1.012 S1.013	5.500 5.500	375 375
S18-0 (Permeable Paving)	567762.590	570124.482	7.927	1.427	1200	 0	S18.000	6.500	225
S1-14	567757.389	570122.471	7.912	2.442	1350	1  0	S1.013 S1.014	5.470 5.470	375 375
S2-0	567680.432	570052.587	7.938	1.500	1200	 0	S2.000	6.438	225
S2-1	567691.116	570051.002	7.821	1.455	1200	 1 0	S2.000 S2.001	6.366 6.366	225 225
S2-2	567702.805	570085.619	8.911	2.789	1200	1  0	S2.001 S2.002	6.122 6.122	225 225
S4-0 (Bioretention Area)	567716.622	570086.898	8.708	1.425	1200	 0	S4.000	7.283	225
S4-1 (Orifice)	567715.587	570084.096	8.728	1.465	1200	1  0	S4.000 S4.001	7.263 7.263	225 225
S7-0 (Bioretention Area)	567741.407	570077.759	8.367	1.425	1200	 0	S7.000	6.942	225
S7-1 (Orifice)	567740.368	570074.945	8.299	1.377	1350	1  0	S7.000 S7.001	6.922 6.922	225 225
S5-0 (Bioretention Area)	567726.165	570083.388	8.590	1.425	1200	 0	S5.000	7.165	225
S5-1 (Orifice)	567725.126	570080.574	8.663	1.518	1200	1  0	S5.000 S5.001	7.145 7.145	225 225
S6-0 (Bioretention Area)	567732.553	570081.029	8.590	1.500	1200	 0	S6.000	7.090	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S6-1 (Orifice)	567731.473	570078.230	8.559	1.489	1350		1	S6.000	7.070	225
							0	S6.001	7.070	225
S2-3 (Attenuation Tank 3)	567727.952	570076.328	8.563	2.620	1200		1	S6.001	7.043	225
							2	S5.001	7.111	225
							3	S7.001	6.839	225
							4	S4.001	7.166	225
							5	S2.002	5.943	225
							0	S2.003	5.943	225
S2-4	567754.020	570068.681	7.864	2.102	1350		1	S2.003	5.762	225
							0	S2.004	5.762	225
S2-5 (Hydro-Brake)	567766.481	570097.599	7.886	2.281	1350		1	S2.004	5.605	225
							0	S2.005	5.605	225
S1-16	567774.131	570115.352	7.821	2.472	1350		1	S2.005	5.508	225
							2	S1.015	5.349	375
							0	S1.016	5.349	375
S1-17	567784.367	570110.996	7.766	2.566	1350		1	S1.016	5.275	375
							0	S1.017	5.200	450
S1-18	567800.321	570149.307	7.803	2.880	1350		1	S1.017	4.923	450
							0	S1.018	4.923	450
S1-19	567797.546	570197.985	7.613	3.015	1350		1	S1.018	4.598	450
							0	S1.019	4.598	450
S1-20	567798.177	570210.092	7.528	3.011	1350		1	S1.019	4.517	450
							0	S1-20	4.517	450
S1-21	567791.724	570245.717	7.254	2.978	1350		1	S1-20	4.276	450
							0	S1-21	4.276	450
S1-22 (Outfall)	567792.767	570247.493	7.238	2.976	1350		1	S1-21	4.262	450
S1-15 (Hydro-Brake)	567761.532	570120.721	7.890	2.450	1350		1	S18.000	6.474	225
							2	S1.014	5.440	375
							0	S1.015	5.440	375

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	Scotland and Ireland	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.300	Starting Level (m)	
Ratio-R	0.208	Check Discharge Rate(s)	x
Summer CV	0.750	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	20	0	0
30	20	0	0
100	20	0	0

Node S1-15 (Hydro-Brake) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	5.440	Product Number	CTL-SHE-0080-3500-1660-3500
Design Depth (m)	1.660	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node S9-1 Online Depth/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 11.427

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)
0.010	1.400	0.050	3.900	0.090	4.900	0.130	5.600	0.170	6.300
0.020	3.000	0.060	4.200	0.100	5.100	0.140	5.800	0.180	6.500
0.030	3.400	0.070	4.400	0.110	5.300	0.150	6.000	0.190	6.700
0.040	3.700	0.080	4.600	0.120	5.500	0.160	6.100	0.200	6.800

Node S1-8 (Hydro-Brake) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	6.690	Product Number	CTL-SHE-0079-3500-1706-3500
Design Depth (m)	1.706	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node S13-0 (Bioretention Area) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	8.816	Diameter (m)	0.019		

Node S14-0 (Bioretention Area) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	7.795	Diameter (m)	0.019		

Node S4-1 (Orifice) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	7.263	Diameter (m)	0.026		

Node S5-1 (Orifice) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	7.145	Diameter (m)	0.026		

Node S6-1 (Orifice) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	7.070	Diameter (m)	0.026		

Node S7-1 (Orifice) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	6.922	Diameter (m)	0.026		

Node S16-0 (Permeable Paving) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	6.997	Diameter (m)	0.019		

Node S17-0 (Permeable Paving) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	6.587	Diameter (m)	0.019		

Node S18-0 (Permeable Paving) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	6.500	Diameter (m)	0.019		

Node S2-5 (Hydro-Brake) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	5.605	Product Number	CTL-SHE-0040-1000-1950-1000
Design Depth (m)	1.950	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S1-7 (Attenuation Tank 1) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	6.796
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	350.0	0.0	1.600	350.0	0.0	1.601	0.0	0.0

Node S9-0 (Blue Roof - Podium) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	11.447
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.50	Time to half empty (mins)	88

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1200.0	0.0	0.100	1200.0	0.0	0.101	0.0	0.0

Node S13-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	9.591
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.67	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	60.0	0.0	0.500	60.0	0.0	0.501	0.0	0.0

Node S2-3 (Attenuation Tank 3) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	5.943
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	960

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	185.0	0.0	1.600	185.0	0.0	1.601	0.0	0.0

Node S14-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	7.795
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	600

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	0.500	15.0	0.0	0.501	0.0	0.0

Node S4-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	8.058
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.67	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	32.0	0.0	0.500	32.0	0.0	0.501	0.0	0.0

Node S5-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	7.947
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.67	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	35.0	0.0	0.500	35.0	0.0	0.501	0.0	0.0

Node S6-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	7.940
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.67	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	25.0	0.0	0.500	25.0	0.0	0.501	0.0	0.0

Node S7-0 (Bioretention Area) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	7.717
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.67	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	34.0	0.0	0.500	34.0	0.0	0.501	0.0	0.0

Node S18-0 (Permeable Paving) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.284	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.500
Safety Factor	1.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	30.000		

Node S16-0 (Permeable Paving) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.772	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.500
Safety Factor	1.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node S17-0 (Permeable Paving) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.362	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.500
Safety Factor	1.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node S1-13 (Attenuation Tank 2) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	5.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	290.0	0.0	1.600	290.0	0.0	1.601	0.0	0.0

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m^3)	
Full Bore Velocity	✓		

Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1-0 (Green Roof - Block 2)	10	24.017	0.017	15.1	0.0589	0.0000	OK
15 minute summer	S1-1	10	10.693	0.093	15.1	0.1055	0.0000	OK
15 minute summer	S1-2	11	9.457	0.107	18.3	0.1475	0.0000	OK
30 minute summer	S8-0	18	10.897	0.047	3.7	0.0681	0.0000	OK
15 minute summer	S8-1	10	10.598	0.033	11.2	0.0580	0.0000	OK
15 minute summer	S1-3	11	7.898	0.148	29.4	0.1673	0.0000	OK
480 minute summer	S9-0 (Blue Roof - Podium)	288	11.490	0.043	6.3	25.8854	0.0000	OK
480 minute summer	S9-1	288	11.449	0.022	3.1	0.0246	0.0000	OK
30 minute summer	S10-0 (Green Roof - Block 3)	20	36.261	0.011	7.3	0.0256	0.0000	OK
30 minute summer	S10-1	20	11.171	0.071	7.3	0.0803	0.0000	OK
30 minute summer	S9-3	20	11.017	0.017	7.5	0.0187	0.0000	OK
30 minute summer	S9-4	20	7.569	0.069	7.4	0.0782	0.0000	OK
4320 minute summer	S1-4	2940	7.529	0.429	6.0	0.9355	0.0000	SURCHARGED
4320 minute summer	S1-5	2880	7.530	0.463	6.0	0.5240	0.0000	SURCHARGED
960 minute summer	S14-0 (Bioretention Area)	525	7.814	0.019	0.1	0.2987	0.0000	OK
4320 minute summer	S1-6	2940	7.529	0.533	5.9	0.6025	0.0000	SURCHARGED
30 minute summer	S11-0 (Green Roof - Block 1)	20	23.015	0.015	11.4	0.0667	0.0000	OK
30 minute summer	S11-1	19	9.587	0.087	13.0	0.1131	0.0000	OK
30 minute summer	S11-2	19	9.380	0.094	14.6	0.1254	0.0000	OK
15 minute summer	S12-0	10	8.555	0.041	3.8	0.0574	0.0000	OK
30 minute summer	S11-3	19	8.444	0.136	22.9	0.1953	0.0000	OK
60 minute summer	S13-0 (Bioretention Area)	43	9.357	0.541	1.3	0.6875	0.0000	SURCHARGED
30 minute summer	S11-4	19	7.780	0.130	23.4	0.1465	0.0000	OK
30 minute summer	S15-0 (Green Roof - Block 4)	20	27.020	0.020	15.7	0.1060	0.0000	OK
4320 minute summer	S15-1	2880	7.529	0.529	1.6	0.5980	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Dischar Vol (m
minute summer	S1-0 (Green Roof - Block 2)	S1.000	S1-1	15.1	2.638	0.011	0.0169	
minute summer	S1-1	S1.001	S1-2	14.7	0.965	0.348	0.5731	
minute summer	S1-2	S1.002	S1-3	18.5	1.017	0.436	0.5217	
minute summer	S8-0	S9.000	S8-1	3.7	0.775	0.087	0.2044	
minute summer	S8-1	S8.001	S1-3	11.1	3.225	0.042	0.0300	
minute summer	S1-3	S1.003	S1-4	29.5	1.115	0.696	0.4351	
0 minute summer	S9-0 (Blue Roof - Podium)	S9.000.	S9-1	3.1	0.904	0.073	0.0107	
0 minute summer	S9-1	Depth/Flow	S9-3	3.1				
minute summer	S10-0 (Green Roof - Block 3)	S10.000	S10-1	7.3	1.483	0.005	0.0155	
minute summer	S10-1	S10.001	S9-3	7.3	0.741	0.172	0.0206	
minute summer	S9-3	S9.003	S9-4	7.4	1.419	0.011	0.0116	
minute summer	S9-4	S9.004	S1-4	7.4	0.763	0.176	0.0533	
20 minute summer	S1-4	S1.004	S1-5	6.0	0.696	0.066	0.3491	
20 minute summer	S1-5	S1.005	S1-6	5.9	0.690	0.065	0.7460	
0 minute summer	S14-0 (Bioretention Area)	Orifice	S1-6	0.1				
20 minute summer	S1-6	S1.006	S1-7 (Attenuation Tank 1)	5.8	0.619	0.064	1.2683	
minute summer	S11-0 (Green Roof - Block 1)	S11.000	S11-1	11.4	2.032	0.008	0.0152	
minute summer	S11-1	S11.001	S11-2	12.9	0.870	0.305	0.4766	
minute summer	S11-2	S11.002	S11-3	14.4	0.951	0.341	0.3632	
minute summer	S12-0	S12.000	S11-3	3.7	0.287	0.072	0.3036	
minute summer	S11-3	S11.003	S11-4	23.0	0.998	0.543	0.0635	
minute summer	S13-0 (Bioretention Area)	Orifice	S11-4	0.5				
minute summer	S11-4	S11.004	S1-7 (Attenuation Tank 1)	23.4	1.045	0.553	0.2389	
minute summer	S15-0 (Green Roof - Block 4)	S15.000	S15-1	15.7	1.887	0.016	0.0526	
20 minute summer	S15-1	S15.001	S1-7 (Attenuation Tank 1)	1.5	0.416	0.036	0.7683	

Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute summer	S1-7 (Attenuation Tank 1)	2880	7.529	0.733	9.5	244.4555	0.0000	SURCHARGED
4320 minute summer	S1-8 (Hydro-Brake)	2880	7.529	0.839	5.2	0.9484	0.0000	SURCHARGED
30 minute summer	S1-9	18	6.638	0.074	11.0	0.1166	0.0000	OK
120 minute summer	S16-0 (Permeable Paving)	76	7.802	0.805	1.6	1.2129	0.0000	SURCHARGED
30 minute summer	S1-10	18	6.509	0.105	20.8	0.2081	0.0000	OK
60 minute summer	S17-0 (Permeable Paving)	40	7.150	0.563	1.5	0.7160	0.0000	SURCHARGED
30 minute summer	S1-11	18	6.473	0.102	21.2	0.1458	0.0000	OK
10080 minute summer	S1-12	8160	6.367	0.801	3.9	1.1457	0.0000	SURCHARGED
10080 minute summer	S1-13 (Attenuation Tank 2)	8160	6.367	0.867	4.0	239.9918	0.0000	SURCHARGED
120 minute summer	S18-0 (Permeable Paving)	76	7.312	0.812	1.6	1.2113	0.0000	SURCHARGED
10080 minute summer	S1-14	8160	6.363	0.893	5.2	2.0104	0.0000	SURCHARGED
30 minute summer	S2-0	18	6.455	0.017	0.3	0.0193	0.0000	OK
30 minute summer	S2-1	18	6.455	0.089	13.8	0.1928	0.0000	OK
7200 minute summer	S2-2	4560	6.429	0.307	0.8	0.3473	0.0000	SURCHARGED
60 minute summer	S4-0 (Bioretention Area)	39	7.321	0.038	0.4	0.0446	0.0000	OK
60 minute summer	S4-1 (Orifice)	40	7.321	0.058	0.4	0.0656	0.0000	OK
30 minute summer	S7-0 (Bioretention Area)	24	6.981	0.039	0.5	0.0463	0.0000	OK
30 minute summer	S7-1 (Orifice)	24	6.982	0.060	0.5	0.0855	0.0000	OK
15 minute summer	S5-0 (Bioretention Area)	1	7.165	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S5-1 (Orifice)	1	7.145	0.000	0.0	0.0000	0.0000	OK
30 minute summer	S6-0 (Bioretention Area)	23	7.116	0.026	0.4	0.0306	0.0000	OK
30 minute summer	S6-1 (Orifice)	23	7.117	0.047	0.4	0.0668	0.0000	OK
7200 minute summer	S2-3 (Attenuation Tank 3)	4560	6.429	0.486	1.6	85.9784	0.0000	SURCHARGED
7200 minute summer	S2-4	4560	6.429	0.667	1.2	1.6530	0.0000	SURCHARGED
7200 minute summer	S2-5 (Hydro-Brake)	4560	6.429	0.824	0.7	1.3959	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Disch Vol (m
0 minute summer	S1-7 (Attenuation Tank 1)	S1.007	S1-8 (Hydro-Brake)	5.2	0.242	0.057	1.1158	
0 minute summer	S1-8 (Hydro-Brake)	Hydro-Brake®	S1-9	2.9				
inute summer	S1-9	S1.009	S1-10	11.0	0.850	0.122	0.1660	
minute summer	S16-0 (Permeable Paving)	Orifice	S1-10	0.7				
inute summer	S1-10	S1.010	S1-11	20.8	0.842	0.127	0.1232	
inute summer	S17-0 (Permeable Paving)	Orifice	S1-11	0.6				
inute summer	S1-11	S1.011	S1-12	21.2	0.952	0.130	0.0970	
30 minute summer	S1-12	S1.012	S1-13 (Attenuation Tank 2)	3.9	0.504	0.024	1.0924	
30 minute summer	S1-13 (Attenuation Tank 2)	S1.013	S1-14	5.1	0.382	0.031	0.4982	
minute summer	S18-0 (Permeable Paving)	Orifice	S1-15 (Hydro-Brake)	0.7				
30 minute summer	S1-14	S1.014	S1-15 (Hydro-Brake)	5.0	0.191	0.031	0.4960	
inute summer	S2-0	S2.000	S2-1	-0.3	-0.062	-0.008	0.0863	
inute summer	S2-1	S2.001	S2-2	13.7	0.889	0.325	0.5651	
0 minute summer	S2-2	S2.002	S2-3 (Attenuation Tank 3)	0.7	0.387	0.017	1.0662	
inute summer	S4-0 (Bioretention Area)	S4.000	S4-1 (Orifice)	0.4	0.299	0.009	0.0186	
inute summer	S4-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.3				
inute summer	S7-0 (Bioretention Area)	S7.000	S7-1 (Orifice)	0.5	0.321	0.011	0.0196	
inute summer	S7-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.3				
inute summer	S5-0 (Bioretention Area)	S5.000	S5-1 (Orifice)	0.0	0.000	0.000	0.0000	
inute summer	S5-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.0				
inute summer	S6-0 (Bioretention Area)	S6.000	S6-1 (Orifice)	0.4	0.321	0.008	0.0128	
inute summer	S6-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.3				
0 minute summer	S2-3 (Attenuation Tank 3)	S2.003	S2-4	-0.9	0.182	-0.021	1.0804	
0 minute summer	S2-4	S2.004	S2-5 (Hydro-Brake)	0.7	0.123	0.018	1.2524	
0 minute summer	S2-5 (Hydro-Brake)	Hydro-Brake®	S1-16	0.7				

Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	S1-16	630	5.388	0.039	3.6	0.0564	0.0000	OK
720 minute summer	S1-17	630	5.237	0.037	3.6	0.0526	0.0000	OK
720 minute summer	S1-18	630	4.960	0.037	3.6	0.0523	0.0000	OK
720 minute summer	S1-19	645	4.635	0.037	3.6	0.0536	0.0000	OK
720 minute summer	S1-20	645	4.553	0.036	3.6	0.0522	0.0000	OK
720 minute summer	S1-21	645	4.316	0.040	3.6	0.0571	0.0000	OK
720 minute summer	S1-22 (Outfall)	645	4.298	0.036	3.6	0.0000	0.0000	OK
10080 minute summer	S1-15 (Hydro-Brake)	8160	6.365	0.925	5.0	1.3234	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	S1-16	S1.016	S1-17	3.6	0.600	0.022	0.0666	
720 minute summer	S1-17	S1.017	S1-18	3.6	0.594	0.014	0.2510	
720 minute summer	S1-18	S1.018	S1-19	3.6	0.586	0.014	0.2990	
720 minute summer	S1-19	S1.019	S1-20	3.6	0.587	0.014	0.0742	
720 minute summer	S1-20	S1-20	S1-21	3.6	0.560	0.014	0.2322	
720 minute summer	S1-21	S1-21	S1-22 (Outfall)	3.6	0.562	0.014	0.0132	176.6
10080 minute summer	S1-15 (Hydro-Brake)	Hydro-Brake®	S1-16	3.0				

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1-0 (Green Roof - Block 2)	10	24.020	0.020	22.1	0.0703	0.0000	OK
30 minute summer	S1-1	18	10.717	0.117	21.8	0.1329	0.0000	OK
15 minute summer	S1-2	11	9.486	0.136	26.9	0.1873	0.0000	OK
30 minute summer	S8-0	18	10.908	0.058	5.5	0.0831	0.0000	OK
30 minute summer	S8-1	18	10.605	0.040	16.4	0.0706	0.0000	OK
15 minute summer	S1-3	11	7.959	0.209	43.1	0.2368	0.0000	OK
360 minute summer	S9-0 (Blue Roof - Podium)	224	11.502	0.055	10.1	33.5313	0.0000	OK
360 minute summer	S9-1	224	11.486	0.059	4.2	0.0666	0.0000	OK
30 minute summer	S10-0 (Green Roof - Block 3)	20	36.263	0.013	10.7	0.0305	0.0000	OK
30 minute summer	S10-1	20	11.187	0.087	10.7	0.0989	0.0000	OK
30 minute summer	S9-3	20	11.020	0.020	11.1	0.0225	0.0000	OK
2880 minute summer	S9-4	2040	7.855	0.355	3.8	0.4015	0.0000	SURCHARGED
2880 minute summer	S1-4	2040	7.854	0.754	9.8	1.6441	0.0000	SURCHARGED
2880 minute summer	S1-5	2040	7.857	0.790	9.7	0.8930	0.0000	SURCHARGED
2880 minute summer	S14-0 (Bioretention Area)	2040	7.854	0.059	0.1	0.9154	0.0000	OK
2880 minute summer	S1-6	2040	7.854	0.858	9.6	0.9703	0.0000	SURCHARGED
30 minute summer	S11-0 (Green Roof - Block 1)	20	23.018	0.018	16.8	0.0794	0.0000	OK
30 minute summer	S11-1	19	9.609	0.109	19.2	0.1422	0.0000	OK
30 minute summer	S11-2	19	9.405	0.119	21.6	0.1585	0.0000	OK
30 minute summer	S12-0	18	8.563	0.049	5.5	0.0694	0.0000	OK
30 minute summer	S11-3	19	8.489	0.181	34.2	0.2608	0.0000	OK
120 minute summer	S13-0 (Bioretention Area)	78	9.595	0.779	1.5	1.1531	0.0000	SURCHARGED
2880 minute summer	S11-4	2040	7.855	0.205	3.6	0.2314	0.0000	OK
30 minute summer	S15-0 (Green Roof - Block 4)	20	27.024	0.024	23.2	0.1274	0.0000	OK
2880 minute summer	S15-1	2040	7.855	0.855	2.5	0.9665	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Dischar Vol (m
minute summer	S1-0 (Green Roof - Block 2)	S1.000	S1-1	22.1	2.649	0.016	0.0226	
minute summer	S1-1	S1.001	S1-2	21.7	1.061	0.513	0.7685	
minute summer	S1-2	S1.002	S1-3	27.1	1.112	0.640	0.6997	
minute summer	S8-0	S9.000	S8-1	5.5	0.868	0.129	0.2717	
minute summer	S8-1	S8.001	S1-3	16.4	3.592	0.062	0.0396	
minute summer	S1-3	S1.003	S1-4	43.1	1.196	1.017	0.5878	
0 minute summer	S9-0 (Blue Roof - Podium)	S9.000.	S9-1	4.2	0.903	0.098	0.0236	
0 minute summer	S9-1	Depth/Flow	S9-3	4.2				
minute summer	S10-0 (Green Roof - Block 3)	S10.000	S10-1	10.7	1.621	0.007	0.0205	
minute summer	S10-1	S10.001	S9-3	10.7	0.820	0.253	0.0273	
minute summer	S9-3	S9.003	S9-4	11.1	1.559	0.016	0.0156	
80 minute summer	S9-4	S9.004	S1-4	3.8	0.635	0.089	0.2172	
80 minute summer	S1-4	S1.004	S1-5	9.7	0.751	0.107	0.3491	
80 minute summer	S1-5	S1.005	S1-6	9.6	0.723	0.106	0.7460	
80 minute summer	S14-0 (Bioretention Area)	Orifice	S1-6	0.0				
80 minute summer	S1-6	S1.006	S1-7 (Attenuation Tank 1)	9.6	0.642	0.106	1.2683	
minute summer	S11-0 (Green Roof - Block 1)	S11.000	S11-1	16.8	1.886	0.012	0.0204	
minute summer	S11-1	S11.001	S11-2	19.1	0.952	0.452	0.6447	
minute summer	S11-2	S11.002	S11-3	21.5	1.048	0.507	0.4894	
minute summer	S12-0	S12.000	S11-3	5.5	0.293	0.106	0.4165	
minute summer	S11-3	S11.003	S11-4	34.2	1.082	0.807	0.0868	
0 minute summer	S13-0 (Bioretention Area)	Orifice	S11-4	0.7				
80 minute summer	S11-4	S11.004	S1-7 (Attenuation Tank 1)	3.6	0.641	0.085	0.4144	
minute summer	S15-0 (Green Roof - Block 4)	S15.000	S15-1	23.2	2.101	0.024	0.0710	
80 minute summer	S15-1	S15.001	S1-7 (Attenuation Tank 1)	2.4	0.431	0.058	0.7683	

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	S1-7 (Attenuation Tank 1)	2040	7.855	1.059	15.6	353.1666	0.0000	SURCHARGED
2880 minute summer	S1-8 (Hydro-Brake)	2040	7.854	1.164	7.9	1.3169	0.0000	SURCHARGED
30 minute summer	S1-9	18	6.651	0.087	15.0	0.1375	0.0000	OK
120 minute summer	S16-0 (Permeable Paving)	80	7.863	0.866	2.4	2.1589	0.0000	SURCHARGED
30 minute summer	S1-10	18	6.532	0.128	29.3	0.2536	0.0000	OK
60 minute summer	S17-0 (Permeable Paving)	41	7.392	0.805	2.2	1.1641	0.0000	SURCHARGED
8640 minute summer	S1-11	8580	6.518	0.147	4.2	0.2099	0.0000	OK
8640 minute summer	S1-12	8580	6.518	0.952	4.2	1.3618	0.0000	SURCHARGED
8640 minute summer	S1-13 (Attenuation Tank 2)	8580	6.518	1.018	4.2	281.8053	0.0000	SURCHARGED
120 minute summer	S18-0 (Permeable Paving)	80	7.365	0.865	2.4	2.1571	0.0000	SURCHARGED
8640 minute summer	S1-14	8580	6.514	1.044	7.0	2.3496	0.0000	SURCHARGED
4320 minute summer	S2-0	2940	6.641	0.203	0.0	0.2295	0.0000	OK
4320 minute summer	S2-1	2940	6.641	0.275	1.3	0.5943	0.0000	SURCHARGED
4320 minute summer	S2-2	2940	6.641	0.519	1.3	0.5868	0.0000	SURCHARGED
60 minute summer	S4-0 (Bioretention Area)	40	7.351	0.068	0.6	0.0801	0.0000	OK
60 minute summer	S4-1 (Orifice)	40	7.351	0.088	0.5	0.0999	0.0000	OK
60 minute summer	S7-0 (Bioretention Area)	41	7.014	0.072	0.7	0.0844	0.0000	OK
60 minute summer	S7-1 (Orifice)	41	7.014	0.092	0.6	0.1311	0.0000	OK
15 minute summer	S5-0 (Bioretention Area)	1	7.165	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S5-1 (Orifice)	1	7.145	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S6-0 (Bioretention Area)	40	7.138	0.048	0.5	0.0555	0.0000	OK
60 minute summer	S6-1 (Orifice)	40	7.138	0.068	0.4	0.0969	0.0000	OK
4320 minute summer	S2-3 (Attenuation Tank 3)	2940	6.641	0.698	3.2	123.4384	0.0000	SURCHARGED
4320 minute summer	S2-4	2940	6.641	0.879	2.0	2.1778	0.0000	SURCHARGED
4320 minute summer	S2-5 (Hydro-Brake)	2940	6.641	1.036	0.8	1.7546	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discha Vol (m
30 minute summer	S1-7 (Attenuation Tank 1)	S1.007	S1-8 (Hydro-Brake)	7.9	0.320	0.087	1.1158	
30 minute summer	S1-8 (Hydro-Brake)	Hydro-Brake®	S1-9	2.9				
minute summer	S1-9	S1.009	S1-10	15.1	0.925	0.166	0.2083	
minute summer	S16-0 (Permeable Paving)	Orifice	S1-10	0.7				
minute summer	S1-10	S1.010	S1-11	29.4	0.912	0.180	0.1610	
minute summer	S17-0 (Permeable Paving)	Orifice	S1-11	0.7				
40 minute summer	S1-11	S1.011	S1-12	4.2	0.612	0.026	0.1976	
40 minute summer	S1-12	S1.012	S1-13 (Attenuation Tank 2)	4.2	0.503	0.026	1.0924	
40 minute summer	S1-13 (Attenuation Tank 2)	S1.013	S1-14	6.1	0.384	0.038	0.4982	
minute summer	S18-0 (Permeable Paving)	Orifice	S1-15 (Hydro-Brake)	0.7				
40 minute summer	S1-14	S1.014	S1-15 (Hydro-Brake)	5.0	0.191	0.031	0.4960	
20 minute summer	S2-0	S2.000	S2-1	0.0	-0.003	-0.001	0.4185	
20 minute summer	S2-1	S2.001	S2-2	1.3	0.433	0.031	1.4531	
20 minute summer	S2-2	S2.002	S2-3 (Attenuation Tank 3)	1.2	0.387	0.029	1.0662	
minute summer	S4-0 (Bioretention Area)	S4.000	S4-1 (Orifice)	0.5	0.299	0.011	0.0367	
minute summer	S4-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.4				
minute summer	S7-0 (Bioretention Area)	S7.000	S7-1 (Orifice)	0.6	0.321	0.013	0.0390	
minute summer	S7-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.4				
minute summer	S5-0 (Bioretention Area)	S5.000	S5-1 (Orifice)	0.0	0.000	0.000	0.0000	
minute summer	S5-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.0				
minute summer	S6-0 (Bioretention Area)	S6.000	S6-1 (Orifice)	0.4	0.320	0.010	0.0242	
minute summer	S6-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.3				
20 minute summer	S2-3 (Attenuation Tank 3)	S2.003	S2-4	-1.8	0.194	-0.042	1.0804	
20 minute summer	S2-4	S2.004	S2-5 (Hydro-Brake)	0.7	0.121	0.020	1.2524	
20 minute summer	S2-5 (Hydro-Brake)	Hydro-Brake®	S1-16	0.8				

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	S1-16	264	5.389	0.040	3.6	0.0566	0.0000	OK
360 minute summer	S1-17	264	5.237	0.037	3.6	0.0527	0.0000	OK
360 minute summer	S1-18	264	4.960	0.037	3.6	0.0525	0.0000	OK
360 minute summer	S1-19	264	4.636	0.038	3.6	0.0538	0.0000	OK
360 minute summer	S1-20	264	4.554	0.037	3.6	0.0523	0.0000	OK
360 minute summer	S1-21	272	4.316	0.040	3.6	0.0572	0.0000	OK
360 minute summer	S1-22 (Outfall)	272	4.298	0.036	3.6	0.0000	0.0000	OK
8640 minute summer	S1-15 (Hydro-Brake)	8580	6.516	1.076	5.1	1.5393	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	S1-16	S1.016	S1-17	3.6	0.601	0.022	0.0669	
360 minute summer	S1-17	S1.017	S1-18	3.6	0.595	0.014	0.2520	
360 minute summer	S1-18	S1.018	S1-19	3.6	0.587	0.014	0.3002	
360 minute summer	S1-19	S1.019	S1-20	3.6	0.588	0.014	0.0745	
360 minute summer	S1-20	S1-20	S1-21	3.6	0.561	0.014	0.2333	
360 minute summer	S1-21	S1-21	S1-22 (Outfall)	3.6	0.563	0.014	0.0132	114.8
8640 minute summer	S1-15 (Hydro-Brake)	Hydro-Brake®	S1-16	3.0				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1-0 (Green Roof - Block 2)	10	24.023	0.023	28.6	0.0794	0.0000	OK
30 minute summer	S1-1	18	10.740	0.140	28.5	0.1579	0.0000	OK
30 minute summer	S1-2	18	9.515	0.165	35.5	0.2271	0.0000	OK
30 minute summer	S8-0	18	10.915	0.065	7.1	0.0945	0.0000	OK
30 minute summer	S8-1	18	10.611	0.046	21.3	0.0808	0.0000	OK
2880 minute summer	S1-3	2040	8.126	0.376	4.3	0.4249	0.0000	SURCHARGED
360 minute summer	S9-0 (Blue Roof - Podium)	232	11.516	0.069	12.6	41.5268	0.0000	OK
360 minute summer	S9-1	232	11.512	0.085	4.7	0.0959	0.0000	OK
30 minute summer	S10-0 (Green Roof - Block 3)	20	36.265	0.015	14.0	0.0347	0.0000	OK
30 minute summer	S10-1	20	11.202	0.102	14.0	0.1149	0.0000	OK
30 minute summer	S9-3	20	11.023	0.023	14.7	0.0258	0.0000	OK
2880 minute summer	S9-4	2040	8.126	0.626	4.6	0.7078	0.0000	SURCHARGED
2880 minute summer	S1-4	2040	8.125	1.025	11.5	2.2336	0.0000	SURCHARGED
2880 minute summer	S1-5	2040	8.127	1.060	11.4	1.1993	0.0000	SURCHARGED
2880 minute summer	S14-0 (Bioretention Area)	2100	8.125	0.330	0.2	5.0858	0.0000	SURCHARGED
2880 minute summer	S1-6	2040	8.124	1.128	11.4	1.2760	0.0000	SURCHARGED
30 minute summer	S11-0 (Green Roof - Block 1)	20	23.020	0.020	22.0	0.0901	0.0000	OK
30 minute summer	S11-1	19	9.629	0.129	25.2	0.1683	0.0000	OK
30 minute summer	S11-2	19	9.427	0.141	28.3	0.1886	0.0000	OK
15 minute summer	S12-0	10	8.570	0.056	7.2	0.0789	0.0000	OK
30 minute summer	S11-3	19	8.534	0.226	44.8	0.3250	0.0000	SURCHARGED
60 minute summer	S13-0 (Bioretention Area)	45	9.607	0.791	2.5	1.6525	0.0000	SURCHARGED
2880 minute summer	S11-4	2040	8.125	0.475	4.4	0.5376	0.0000	SURCHARGED
30 minute summer	S15-0 (Green Roof - Block 4)	20	27.027	0.027	30.2	0.1442	0.0000	OK
2880 minute summer	S15-1	2040	8.125	1.125	3.0	1.2727	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Dischar Vol (m
minute summer	S1-0 (Green Roof - Block 2)	S1.000	S1-1	28.6	2.629	0.021	0.0276	
minute summer	S1-1	S1.001	S1-2	28.4	1.128	0.671	0.9459	
minute summer	S1-2	S1.002	S1-3	35.1	1.170	0.828	0.8641	
minute summer	S8-0	S9.000	S8-1	7.1	0.931	0.167	0.3274	
minute summer	S8-1	S8.001	S1-3	21.3	3.864	0.081	0.0478	
80 minute summer	S1-3	S1.003	S1-4	4.3	0.680	0.102	0.6546	
0 minute summer	S9-0 (Blue Roof - Podium)	S9.000.	S9-1	4.7	0.899	0.112	0.0356	
0 minute summer	S9-1	Depth/Flow	S9-3	4.7				
minute summer	S10-0 (Green Roof - Block 3)	S10.000	S10-1	14.0	1.721	0.009	0.0250	
minute summer	S10-1	S10.001	S9-3	14.0	0.881	0.331	0.0332	
minute summer	S9-3	S9.003	S9-4	14.7	1.661	0.021	0.0219	
80 minute summer	S9-4	S9.004	S1-4	4.5	0.652	0.107	0.2172	
80 minute summer	S1-4	S1.004	S1-5	11.4	0.745	0.126	0.3491	
80 minute summer	S1-5	S1.005	S1-6	11.3	0.719	0.125	0.7460	
80 minute summer	S14-0 (Bioretention Area)	Orifice	S1-6	0.1				
80 minute summer	S1-6	S1.006	S1-7 (Attenuation Tank 1)	11.4	0.641	0.125	1.2683	
minute summer	S11-0 (Green Roof - Block 1)	S11.000	S11-1	22.0	1.977	0.016	0.0252	
minute summer	S11-1	S11.001	S11-2	25.1	1.009	0.592	0.7968	
minute summer	S11-2	S11.002	S11-3	28.1	1.114	0.664	0.6028	
minute summer	S12-0	S12.000	S11-3	7.1	0.327	0.137	0.4831	
minute summer	S11-3	S11.003	S11-4	44.7	1.190	1.054	0.1009	
minute summer	S13-0 (Bioretention Area)	Orifice	S11-4	0.7				
80 minute summer	S11-4	S11.004	S1-7 (Attenuation Tank 1)	4.4	0.678	0.104	0.4242	
minute summer	S15-0 (Green Roof - Block 4)	S15.000	S15-1	30.2	2.130	0.031	0.0890	
80 minute summer	S15-1	S15.001	S1-7 (Attenuation Tank 1)	2.9	0.431	0.069	0.7683	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	S1-7 (Attenuation Tank 1)	2040	8.125	1.329	18.7	443.4939	0.0000	SURCHARGED
2880 minute summer	S1-8 (Hydro-Brake)	2040	8.125	1.435	7.4	1.6231	0.0000	SURCHARGED
8640 minute summer	S1-9	6900	6.693	0.129	3.4	0.2035	0.0000	OK
120 minute summer	S16-0 (Permeable Paving)	84	7.914	0.917	3.0	2.9943	0.0000	SURCHARGED
8640 minute summer	S1-10	7140	6.692	0.288	5.2	0.5725	0.0000	OK
60 minute summer	S17-0 (Permeable Paving)	43	7.424	0.837	2.9	1.6511	0.0000	SURCHARGED
8640 minute summer	S1-11	7140	6.694	0.323	5.6	0.4615	0.0000	OK
8640 minute summer	S1-12	7020	6.692	1.126	7.1	1.6111	0.0000	SURCHARGED
8640 minute summer	S1-13 (Attenuation Tank 2)	7140	6.690	1.190	7.1	329.4589	0.0000	SURCHARGED
120 minute summer	S18-0 (Permeable Paving)	84	7.393	0.893	3.0	3.0005	0.0000	SURCHARGED
8640 minute summer	S1-14	7140	6.686	1.216	5.3	2.7370	0.0000	SURCHARGED
2880 minute summer	S2-0	2160	6.828	0.390	0.1	0.4408	0.0000	SURCHARGED
2880 minute summer	S2-1	2160	6.828	0.462	2.0	0.9984	0.0000	SURCHARGED
2880 minute summer	S2-2	2160	6.828	0.706	2.0	0.7982	0.0000	SURCHARGED
30 minute summer	S4-0 (Bioretention Area)	25	7.381	0.098	0.9	0.1156	0.0000	OK
60 minute summer	S4-1 (Orifice)	40	7.381	0.118	0.6	0.1339	0.0000	OK
60 minute summer	S7-0 (Bioretention Area)	41	7.042	0.100	0.9	0.1184	0.0000	OK
60 minute summer	S7-1 (Orifice)	41	7.042	0.120	0.7	0.1724	0.0000	OK
15 minute summer	S5-0 (Bioretention Area)	1	7.165	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S5-1 (Orifice)	1	7.145	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S6-0 (Bioretention Area)	41	7.162	0.072	0.7	0.0833	0.0000	OK
60 minute summer	S6-1 (Orifice)	41	7.162	0.092	0.5	0.1311	0.0000	OK
2880 minute summer	S2-3 (Attenuation Tank 3)	2160	6.828	0.885	5.2	156.4892	0.0000	SURCHARGED
2880 minute summer	S2-4	2160	6.828	1.066	3.1	2.6408	0.0000	SURCHARGED
2880 minute summer	S2-5 (Hydro-Brake)	2160	6.828	1.223	0.8	2.0711	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discha Vol (m
30 minute summer	S1-7 (Attenuation Tank 1)	S1.007	S1-8 (Hydro-Brake)	7.4	0.217	0.081	1.1158	
30 minute summer	S1-8 (Hydro-Brake)	Hydro-Brake®	S1-9	3.2				
40 minute summer	S1-9	S1.009	S1-10	5.1	0.611	0.057	0.5259	
minute summer	S16-0 (Permeable Paving)	Orifice	S1-10	0.7				
40 minute summer	S1-10	S1.010	S1-11	5.6	0.573	0.034	0.4783	
minute summer	S17-0 (Permeable Paving)	Orifice	S1-11	0.7				
40 minute summer	S1-11	S1.011	S1-12	7.1	0.613	0.044	0.4527	
40 minute summer	S1-12	S1.012	S1-13 (Attenuation Tank 2)	7.1	0.502	0.044	1.0924	
40 minute summer	S1-13 (Attenuation Tank 2)	S1.013	S1-14	5.3	0.383	0.033	0.4982	
minute summer	S18-0 (Permeable Paving)	Orifice	S1-15 (Hydro-Brake)	0.7				
40 minute summer	S1-14	S1.014	S1-15 (Hydro-Brake)	5.4	0.191	0.033	0.4960	
30 minute summer	S2-0	S2.000	S2-1	-0.1	-0.006	-0.001	0.4296	
30 minute summer	S2-1	S2.001	S2-2	2.0	0.460	0.047	1.4531	
30 minute summer	S2-2	S2.002	S2-3 (Attenuation Tank 3)	1.9	0.440	0.045	1.0662	
minute summer	S4-0 (Bioretention Area)	S4.000	S4-1 (Orifice)	0.7	0.299	0.016	0.0565	
minute summer	S4-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.5				
minute summer	S7-0 (Bioretention Area)	S7.000	S7-1 (Orifice)	0.7	0.321	0.016	0.0581	
minute summer	S7-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.5				
minute summer	S5-0 (Bioretention Area)	S5.000	S5-1 (Orifice)	0.0	0.000	0.000	0.0000	
minute summer	S5-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.0				
minute summer	S6-0 (Bioretention Area)	S6.000	S6-1 (Orifice)	0.5	0.321	0.013	0.0390	
minute summer	S6-1 (Orifice)	Orifice	S2-3 (Attenuation Tank 3)	0.4				
30 minute summer	S2-3 (Attenuation Tank 3)	S2.003	S2-4	-3.0	0.180	-0.071	1.0804	
30 minute summer	S2-4	S2.004	S2-5 (Hydro-Brake)	0.8	0.087	0.022	1.2524	
30 minute summer	S2-5 (Hydro-Brake)	Hydro-Brake®	S1-16	0.8				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute summer	S1-16	6660	5.390	0.041	3.8	0.0583	0.0000	OK
8640 minute summer	S1-17	6660	5.238	0.038	3.8	0.0543	0.0000	OK
8640 minute summer	S1-18	6660	4.961	0.038	3.8	0.0540	0.0000	OK
8640 minute summer	S1-19	6660	4.637	0.039	3.8	0.0553	0.0000	OK
8640 minute summer	S1-20	6660	4.555	0.038	3.8	0.0538	0.0000	OK
8640 minute summer	S1-21	6660	4.317	0.041	3.8	0.0590	0.0000	OK
8640 minute summer	S1-22 (Outfall)	6660	4.299	0.037	3.8	0.0000	0.0000	OK
8640 minute summer	S1-15 (Hydro-Brake)	7140	6.688	1.248	5.6	1.7856	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute summer	S1-16	S1.016	S1-17	3.8	0.612	0.024	0.0698	
8640 minute summer	S1-17	S1.017	S1-18	3.8	0.606	0.015	0.2625	
8640 minute summer	S1-18	S1.018	S1-19	3.8	0.598	0.015	0.3128	
8640 minute summer	S1-19	S1.019	S1-20	3.8	0.599	0.015	0.0776	
8640 minute summer	S1-20	S1-20	S1-21	3.8	0.572	0.015	0.2436	
8640 minute summer	S1-21	S1-21	S1-22 (Outfall)	3.8	0.574	0.015	0.0138	1544.0
8640 minute summer	S1-15 (Hydro-Brake)	Hydro-Brake®	S1-16	3.1				

Design Settings

Frequency of use (kDU)	0.00	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	446	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.000
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	0.000
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
F1-0	11.869	1200	567603.395	570100.374	1.019
F1-1	12.133	1200	567611.206	570082.574	1.413
F2-0	12.000	1200	567646.429	570108.337	1.150
F1-2	11.527	1200	567650.244	570099.531	1.091
F1-3	11.846	1200	567653.936	570101.134	3.396
F1-4	9.950	1200	567656.808	570101.210	1.519
F3-0	10.537	1200	567694.028	570140.385	1.537
F3-1	10.323	1200	567699.684	570132.421	1.388
F4-0	10.525	1200	567655.903	570120.243	1.747
F4-1	10.278	1200	567663.320	570109.883	1.585
F3-2	10.232	1200	567671.633	570112.497	2.482
F1-5	9.116	1200	567679.229	570101.802	1.453
F5-0	8.000	1200	567673.850	570057.112	1.000
F5-1	7.942	1200	567688.861	570052.075	1.021
F1-6	8.914	1200	567703.816	570092.708	2.209
F6-0	8.761	1200	567714.372	570101.009	1.511
F1-7	8.787	1200	567710.479	570090.247	2.118
F1-8	8.134	1200	567755.002	570073.804	1.702
F7-0	8.529	1200	567738.968	570106.060	1.479
F7-1	7.986	1200	567746.567	570123.996	1.066
F7-2	7.891	1200	567770.627	570113.762	1.145
F1-9	7.944	1200	567765.762	570100.868	1.658
F1-10 (Outfall)	7.656	1200	567781.906	570094.778	1.476

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
F1.000	F1-0	F1-1	19.438	1.500	10.850	10.720	0.130	150.0	225
F1.001	F1-1	F1-2	42.562	1.500	10.720	10.436	0.284	150.0	225
F2.000	F2-0	F1-2	9.597	1.500	10.850	10.786	0.064	150.0	225
F1.002	F1-2	F1-3	4.025	1.500	10.436	10.409	0.027	150.0	225
F1.003	F1-3	F1-4	2.873	1.500	8.450	8.431	0.019	150.0	225
F1.004	F1-4	F1-5	22.429	1.500	8.431	8.281	0.150	150.0	225

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
F1.000	0.000	0.936	37.2	0.0	0.794	1.188	0.000	0	0.0	0.0	0	0.000
F1.001	0.000	0.936	37.2	0.0	1.188	0.866	0.000	0	0.0	0.0	0	0.000
F2.000	0.000	0.936	37.2	0.0	0.925	0.516	0.000	0	0.0	0.0	0	0.000
F1.002	0.000	0.936	37.2	0.0	0.866	1.212	0.000	0	0.0	0.0	0	0.000
F1.003	0.000	0.936	37.2	0.0	3.171	1.294	0.000	0	0.0	0.0	0	0.000
F1.004	0.000	0.936	37.2	0.0	1.294	0.610	0.000	0	0.0	0.0	0	0.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
F3.000	F3-0	F3-1	9.768	1.500	9.000	8.935	0.065	150.0	225
F3.002	F3-1	F3-2	34.407	1.500	8.935	8.706	0.229	150.0	225
F4.000	F4-0	F4-1	12.741	1.500	8.778	8.693	0.085	150.0	225
F4.001	F4-1	F3-2	8.714	1.500	8.693	8.635	0.058	150.0	225
F3.003	F3-2	F1-5	13.118	1.500	7.750	7.663	0.087	150.0	225
F1.005	F1-5	F1-6	26.215	1.500	7.663	7.488	0.175	150.0	225
F5.000	F5-0	F5-1	15.834	1.500	7.000	6.921	0.079	200.0	225
F5.001	F5-1	F1-6	43.298	1.500	6.921	6.705	0.216	200.0	225
F1.006	F1-6	F1-7	7.103	1.500	6.705	6.669	0.036	200.0	225
F6.000	F6-0	F1-7	11.444	1.500	7.250	7.174	0.076	150.6	225
F1.007	F1-7	F1-8	47.462	1.500	6.669	6.432	0.237	200.0	225
F1.008	F1-8	F1-9	29.125	1.500	6.432	6.286	0.146	200.0	225
F7.000	F7-0	F7-1	19.479	1.500	7.050	6.920	0.130	150.0	225
F7.001	F7-1	F7-2	26.146	1.500	6.920	6.746	0.174	150.0	225
F7.002	F7-2	F1-9	13.781	1.500	6.746	6.654	0.092	150.0	225
F1.009	F1-9	F1-10 (Outfall)	17.254	1.500	6.286	6.180	0.106	162.8	225

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
F3.000	0.000	0.936	37.2	0.0	1.312	1.163	0.000	0	0.0	0.0	0	0.000
F3.002	0.000	0.936	37.2	0.0	1.163	1.301	0.000	0	0.0	0.0	0	0.000
F4.000	0.000	0.936	37.2	0.0	1.522	1.360	0.000	0	0.0	0.0	0	0.000
F4.001	0.000	0.936	37.2	0.0	1.360	1.372	0.000	0	0.0	0.0	0	0.000
F3.003	0.000	0.936	37.2	0.0	2.257	1.228	0.000	0	0.0	0.0	0	0.000
F1.005	0.000	0.936	37.2	0.0	1.228	1.201	0.000	0	0.0	0.0	0	0.000
F5.000	0.000	0.810	32.2	0.0	0.775	0.796	0.000	0	0.0	0.0	0	0.000
F5.001	0.000	0.810	32.2	0.0	0.796	1.984	0.000	0	0.0	0.0	0	0.000
F1.006	0.000	0.810	32.2	0.0	1.984	1.893	0.000	0	0.0	0.0	0	0.000
F6.000	0.000	0.934	37.1	0.0	1.286	1.388	0.000	0	0.0	0.0	0	0.000
F1.007	0.000	0.810	32.2	0.0	1.893	1.477	0.000	0	0.0	0.0	0	0.000
F1.008	0.000	0.810	32.2	0.0	1.477	1.433	0.000	0	0.0	0.0	0	0.000
F7.000	0.000	0.936	37.2	0.0	1.254	0.841	0.000	0	0.0	0.0	0	0.000
F7.001	0.000	0.936	37.2	0.0	0.841	0.920	0.000	0	0.0	0.0	0	0.000
F7.002	0.000	0.936	37.2	0.0	0.920	1.065	0.000	0	0.0	0.0	0	0.000
F1.009	0.000	0.898	35.7	0.0	1.433	1.251	0.000	0	0.0	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
F1.000	19.438	150.0	225	Circular	11.869	10.850	0.794	12.133	10.720	1.188
F1.001	42.562	150.0	225	Circular	12.133	10.720	1.188	11.527	10.436	0.866
F2.000	9.597	150.0	225	Circular	12.000	10.850	0.925	11.527	10.786	0.516
F1.002	4.025	150.0	225	Circular	11.527	10.436	0.866	11.846	10.409	1.212

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
F1.000	F1-0	1200	Manhole	Adoptable	F1-1	1200	Manhole	Adoptable
F1.001	F1-1	1200	Manhole	Adoptable	F1-2	1200	Manhole	Adoptable
F2.000	F2-0	1200	Manhole	Adoptable	F1-2	1200	Manhole	Adoptable
F1.002	F1-2	1200	Manhole	Adoptable	F1-3	1200	Manhole	Adoptable

Pipeline Schedule

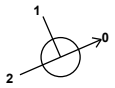
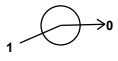
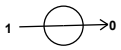
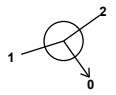
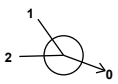
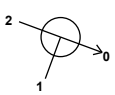
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
F1.003	2.873	150.0	225	Circular	11.846	8.450	3.171	9.950	8.431	1.294
F1.004	22.429	150.0	225	Circular	9.950	8.431	1.294	9.116	8.281	0.610
F3.000	9.768	150.0	225	Circular	10.537	9.000	1.312	10.323	8.935	1.163
F3.002	34.407	150.0	225	Circular	10.323	8.935	1.163	10.232	8.706	1.301
F4.000	12.741	150.0	225	Circular	10.525	8.778	1.522	10.278	8.693	1.360
F4.001	8.714	150.0	225	Circular	10.278	8.693	1.360	10.232	8.635	1.372
F3.003	13.118	150.0	225	Circular	10.232	7.750	2.257	9.116	7.663	1.228
F1.005	26.215	150.0	225	Circular	9.116	7.663	1.228	8.914	7.488	1.201
F5.000	15.834	200.0	225	Circular	8.000	7.000	0.775	7.942	6.921	0.796
F5.001	43.298	200.0	225	Circular	7.942	6.921	0.796	8.914	6.705	1.984
F1.006	7.103	200.0	225	Circular	8.914	6.705	1.984	8.787	6.669	1.893
F6.000	11.444	150.6	225	Circular	8.761	7.250	1.286	8.787	7.174	1.388
F1.007	47.462	200.0	225	Circular	8.787	6.669	1.893	8.134	6.432	1.477
F1.008	29.125	200.0	225	Circular	8.134	6.432	1.477	7.944	6.286	1.433
F7.000	19.479	150.0	225	Circular	8.529	7.050	1.254	7.986	6.920	0.841
F7.001	26.146	150.0	225	Circular	7.986	6.920	0.841	7.891	6.746	0.920
F7.002	13.781	150.0	225	Circular	7.891	6.746	0.920	7.944	6.654	1.065
F1.009	17.254	162.8	225	Circular	7.944	6.286	1.433	7.656	6.180	1.251

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
F1.003	F1-3	1200	Manhole	Adoptable	F1-4	1200	Manhole	Adoptable
F1.004	F1-4	1200	Manhole	Adoptable	F1-5	1200	Manhole	Adoptable
F3.000	F3-0	1200	Manhole	Adoptable	F3-1	1200	Manhole	Adoptable
F3.002	F3-1	1200	Manhole	Adoptable	F3-2	1200	Manhole	Adoptable
F4.000	F4-0	1200	Manhole	Adoptable	F4-1	1200	Manhole	Adoptable
F4.001	F4-1	1200	Manhole	Adoptable	F3-2	1200	Manhole	Adoptable
F3.003	F3-2	1200	Manhole	Adoptable	F1-5	1200	Manhole	Adoptable
F1.005	F1-5	1200	Manhole	Adoptable	F1-6	1200	Manhole	Adoptable
F5.000	F5-0	1200	Manhole	Adoptable	F5-1	1200	Manhole	Adoptable
F5.001	F5-1	1200	Manhole	Adoptable	F1-6	1200	Manhole	Adoptable
F1.006	F1-6	1200	Manhole	Adoptable	F1-7	1200	Manhole	Adoptable
F6.000	F6-0	1200	Manhole	Adoptable	F1-7	1200	Manhole	Adoptable
F1.007	F1-7	1200	Manhole	Adoptable	F1-8	1200	Manhole	Adoptable
F1.008	F1-8	1200	Manhole	Adoptable	F1-9	1200	Manhole	Adoptable
F7.000	F7-0	1200	Manhole	Adoptable	F7-1	1200	Manhole	Adoptable
F7.001	F7-1	1200	Manhole	Adoptable	F7-2	1200	Manhole	Adoptable
F7.002	F7-2	1200	Manhole	Adoptable	F1-9	1200	Manhole	Adoptable
F1.009	F1-9	1200	Manhole	Adoptable	F1-10 (Outfall)	1200	Manhole	Adoptable

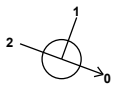
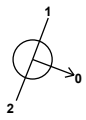
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F1-0	567603.395	570100.374	11.869	1.019	1200	 0	F1.000	10.850	225
F1-1	567611.206	570082.574	12.133	1.413	1200	 1	F1.000	10.720	225
						0	F1.001	10.720	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F2-0	567646.429	570108.337	12.000	1.150	1200				
						0	F2.000	10.850	225
F1-2	567650.244	570099.531	11.527	1.091	1200				
						1	F2.000	10.786	225
						2	F1.001	10.436	225
						0	F1.002	10.436	225
F1-3	567653.936	570101.134	11.846	3.396	1200				
						1	F1.002	10.409	225
						0	F1.003	8.450	225
F1-4	567656.808	570101.210	9.950	1.519	1200				
						1	F1.003	8.431	225
						0	F1.004	8.431	225
F3-0	567694.028	570140.385	10.537	1.537	1200				
						0	F3.000	9.000	225
F3-1	567699.684	570132.421	10.323	1.388	1200				
						1	F3.000	8.935	225
						0	F3.002	8.935	225
F4-0	567655.903	570120.243	10.525	1.747	1200				
						0	F4.000	8.778	225
F4-1	567663.320	570109.883	10.278	1.585	1200				
						1	F4.000	8.693	225
						0	F4.001	8.693	225
F3-2	567671.633	570112.497	10.232	2.482	1200				
						1	F4.001	8.635	225
						2	F3.002	8.706	225
						0	F3.003	7.750	225
F1-5	567679.229	570101.802	9.116	1.453	1200				
						1	F3.003	7.663	225
						2	F1.004	8.281	225
						0	F1.005	7.663	225
F5-0	567673.850	570057.112	8.000	1.000	1200				
						0	F5.000	7.000	225
F5-1	567688.861	570052.075	7.942	1.021	1200				
						1	F5.000	6.921	225
						0	F5.001	6.921	225
F1-6	567703.816	570092.708	8.914	2.209	1200				
						1	F5.001	6.705	225
						2	F1.005	7.488	225
						0	F1.006	6.705	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F6-0	567714.372	570101.009	8.761	1.511	1200				
						0	F6.000	7.250	225
F1-7	567710.479	570090.247	8.787	2.118	1200				
						1	F6.000	7.174	225
						2	F1.006	6.669	225
						0	F1.007	6.669	225
F1-8	567755.002	570073.804	8.134	1.702	1200				
						1	F1.007	6.432	225
						0	F1.008	6.432	225
F7-0	567738.968	570106.060	8.529	1.479	1200				
						0	F7.000	7.050	225
F7-1	567746.567	570123.996	7.986	1.066	1200				
						1	F7.000	6.920	225
						0	F7.001	6.920	225
F7-2	567770.627	570113.762	7.891	1.145	1200				
						1	F7.001	6.746	225
						0	F7.002	6.746	225
F1-9	567765.762	570100.868	7.944	1.658	1200				
						1	F7.002	6.654	225
						2	F1.008	6.286	225
						0	F1.009	6.286	225
F1-10 (Outfall)	567781.906	570094.778	7.656	1.476	1200				
						1	F1.009	6.180	225

Appendix D Greenfield Runoff Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Simeon Solomons
Site name:	Kinsale Road Residential Development (Old Vita Cortex Site))
Site location:	Ballyphehane, Cork City

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.88204° N
Longitude:	8.4691° W
Reference:	4029047035
Date:	Apr 19 2024 10:50

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	1.212

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	1127	1127
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.86	3.86
1 in 1 year (l/s):	3.28	3.28
1 in 30 years (l/s):	6.36	6.36
1 in 100 year (l/s):	7.52	7.52
1 in 200 years (l/s):	8.29	8.29

Appendix E Met Éireann Data

Met Eireann
Return Period Rainfall Depths for sliding Durations
Location - Kinsale_Road - Irish Grid: Easting: 167742, Northing: 70055,

	Interval		Years										
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	3.3,	4.1,	4.6,	5.2,	5.5,	5.8,	6.7,	7.7,	8.3,	9.1,	9.8,	10.3,	10.6,
10 mins	4.6,	5.8,	6.4,	7.2,	7.7,	8.1,	9.4,	10.7,	11.5,	12.6,	13.6,	14.3,	14.8,
15 mins	5.4,	6.8,	7.5,	8.4,	9.1,	9.5,	11.0,	12.6,	13.5,	14.9,	16.0,	16.8,	17.4,
30 mins	7.3,	9.1,	10.1,	11.4,	12.2,	12.8,	14.8,	16.9,	18.2,	20.0,	21.5,	22.6,	23.4,
1 hours	9.8,	12.3,	13.5,	15.3,	16.4,	17.3,	19.9,	22.7,	24.5,	26.9,	28.9,	30.4,	31.4,
2 hours	13.2,	16.6,	18.2,	20.6,	22.1,	23.2,	26.8,	30.6,	32.9,	36.1,	38.8,	40.9,	42.2,
3 hours	15.7,	19.7,	21.7,	24.5,	26.3,	27.7,	31.9,	36.4,	39.2,	42.9,	46.2,	48.6,	50.2,
4 hours	17.8,	22.3,	24.5,	27.7,	29.7,	31.3,	36.1,	41.1,	44.3,	48.6,	52.2,	54.9,	56.7,
6 hours	21.2,	26.5,	29.2,	32.9,	35.4,	37.2,	42.9,	48.9,	52.7,	57.7,	62.1,	65.3,	67.5,
9 hours	25.2,	31.6,	34.7,	39.2,	42.1,	44.3,	51.0,	58.1,	62.6,	68.6,	73.8,	77.6,	80.2,
12 hours	28.5,	35.7,	39.3,	44.3,	47.6,	50.1,	57.7,	65.8,	70.8,	77.6,	83.4,	87.8,	90.7,
18 hours	33.9,	42.5,	46.7,	52.8,	56.6,	59.5,	68.6,	78.2,	84.2,	92.3,	99.2,	104.4,	107.8,
24 hours	38.4,	48.1,	52.9,	59.7,	64.1,	67.4,	77.6,	88.4,	95.2,	104.4,	112.2,	118.0,	121.9,
2 days	49.9,	61.2,	66.7,	74.5,	79.4,	83.2,	94.6,	106.5,	113.9,	123.8,	132.2,	138.5,	142.6,
3 days	59.4,	72.0,	78.2,	86.7,	92.1,	96.2,	108.6,	121.4,	129.4,	139.9,	148.8,	155.5,	159.8,
4 days	68.0,	81.7,	88.3,	97.5,	103.4,	107.7,	121.0,	134.6,	143.0,	154.1,	163.5,	170.5,	175.0,
6 days	83.3,	99.0,	106.5,	116.8,	123.3,	128.1,	142.8,	157.8,	167.0,	179.2,	189.3,	196.8,	201.7,
8 days	97.2,	114.5,	122.7,	134.1,	141.1,	146.4,	162.3,	178.5,	188.4,	201.3,	212.2,	220.2,	225.4,
10 days	110.2,	129.0,	137.9,	150.0,	157.6,	163.3,	180.3,	197.5,	207.9,	221.7,	233.1,	241.6,	247.0,
12 days	122.6,	142.7,	152.1,	165.1,	173.2,	179.1,	197.1,	215.3,	226.3,	240.7,	252.7,	261.5,	267.3,
16 days	145.9,	168.4,	179.0,	193.3,	202.2,	208.8,	228.5,	248.4,	260.3,	276.0,	288.9,	298.4,	304.6,
20 days	168.0,	192.7,	204.1,	219.7,	229.4,	236.5,	257.8,	279.1,	291.9,	308.6,	322.4,	332.5,	339.1,
25 days	194.4,	221.5,	234.0,	251.0,	261.5,	269.2,	292.2,	315.1,	328.9,	346.8,	361.6,	372.4,	379.4,

NOTES:
These values are derived from a Depth Duration Frequency (DDF) Model update 2023
For details refer to:
'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',
Available for download at:
http://hdl.handle.net/2262/102417

Appendix F Cork City Council Letter of Consent

Comhairle Cathrach Chorcaí
Cork City Council

Corporate Affairs and International Relations Directorate
Cork City Council, City Hall, Anglesea Street, Cork, T12 T997 Tel: +353 21 4924000
www.corkcity.ie

BML Duffy Property Group Ltd,
c/o Aiden O'Neill,
Coakley O'Neill Town Planning,
NSC Campus,
Mahon,
Cork.

05/06/2025

WITHOUT PREDJUDICE

Re: Consent to include land in Cork City Council control and/or ownership in a proposed planning application at the Former Vita Cortex site, Kinsale Road and Pearse Road, Cork.

Dear Aiden,

I refer to your proposed planning application on behalf of BML Duffy Property Group Limited for a Large-Scale Residential development at the former Vita Cortex site, Kinsale Road and Pearse Road, Cork.

The proposed development is to include a new surface water sewer on Kinsale Road to connect the proposed development to the existing surface water network at the location within the red line boundary area.

I confirm that Cork City Council hereby consents to you including land in its control and/or ownership including the works proposed in your planning application.

As the proposed works for the development have yet to be agreed by the issuing date of this letter, I would like to note that this letter is being issued without prejudice to the actual proposed works which themselves are not required to be agreed prior to the issuing of this letter.

This consent is being issued solely to facilitate this application for planning permission only for the above- mentioned proposed development. Please also note that it is being issued strictly subject and without prejudice to the following:

(i) Consideration of the said planning application Cork City Council or on appeal by An Bord Pleanála,
(ii) Adherence to and compliance with all planning conditions, bonds and planning contributions that may apply to the final grant of permission.

It should also be noted that any disposal of lands owned or interest held by Cork City Council, if relevant, will be subject to agreement on price, terms and conditions, title, approval of the Chief

Comhairle Cathrach Chorcaí
Cork City Council

Corporate Affairs and International Relations Directorate
Cork City Council, City Hall, Anglesea Street, Cork, T12 T997 Tel: +353 21 4924000
www.corkcity.ie

Executive and the approval of the elected Council under section 183 of the Local Government Act, 2001 where required. Subject thereto, any disposal would be subject to the execution of formal contracts and compliance with the conditions thereof including compliance with the conditions of all relevant planning permissions as required.

Finally, please note that I have no authority expressed or implied to bind Cork City Council and this letter shall not constitute a note or memorandum for the purposes of the provisions of section 51 of the *Land and Conveyancing Law Reform Act, 2009*.

P.P. Michael Noyle

Stephen Fox MRICS
Senior Executive Estates Officer
Corporate and External Affairs
Cork City Council

Appendix G Road Safety Audit Report

25035-01-001

PROPOSED RESIDENTIAL DEVELOPMENT AT KINSALE ROAD, CO. CORK

Road Safety Audit Stage 1

for

Punch Consulting Engineers

JUNE 2025

ROADPLAN CONSULTING

7, Ormonde Road
Kilkenny.
R95 N4FE

Tel: 056 7795800
info@roadplan.ie
www.roadplan.ie

DOCUMENT CONTROL SHEET

Project Title	Proposed Residential Development at Kinsale Road, Co. Cork
Project No.	25035-01
Client	Punch Consulting Engineers
Document Title	Road Safety Audit Stage 1
Document No.	25035-01-001

Status	Author(s)	Reviewed By	Approved By	Issue Date
Draft 1	JPZ	GF	GF	14/3/2025
Final	JPZ	GF	GF	6/6/2025

TABLE OF CONTENTS

1. INTRODUCTION

1.1 This report describes a Stage 1 Road Safety Audit carried out at the proposed Residential Development at Kinsale Road, Co. Cork. The audit was carried out on 11th of March 2025 in the offices of Roadplan Consulting, Kilkenny.

1.2 The audit team members were as follows:

- George Frisby, BE CEng MIEI
  Auditor Number GF51255

- Jince Philip Zachariah, PhD MIEI
  Auditor Number JP792076

1.3 Both audit team members visited the site on the 5th March 2025. The audit comprised of an examination of the drawings relating to the scheme supplied by Punch Consulting Engineers and an examination of the site.

1.4 The speed limit at the proposed works location is 50 km/h.

1.5 This Stage 1 Audit has been carried out in accordance with the relevant sections of TII GE-STY-01024. The team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.

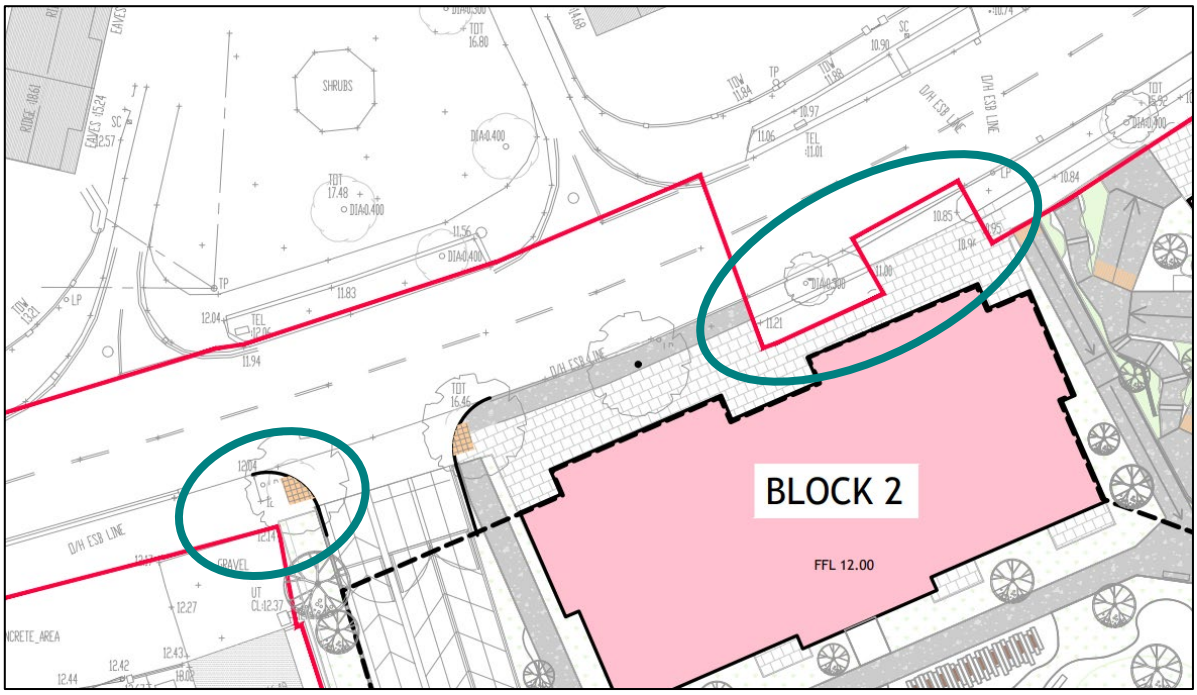
1.6 All problems described in this report are considered by the audit team to require action in order to improve the safety of the scheme and minimise accident occurrence.

1.7 Appendix A contains copies of the audited drawings.

2. STAGE 1 AUDIT

2.1 **Problem:**

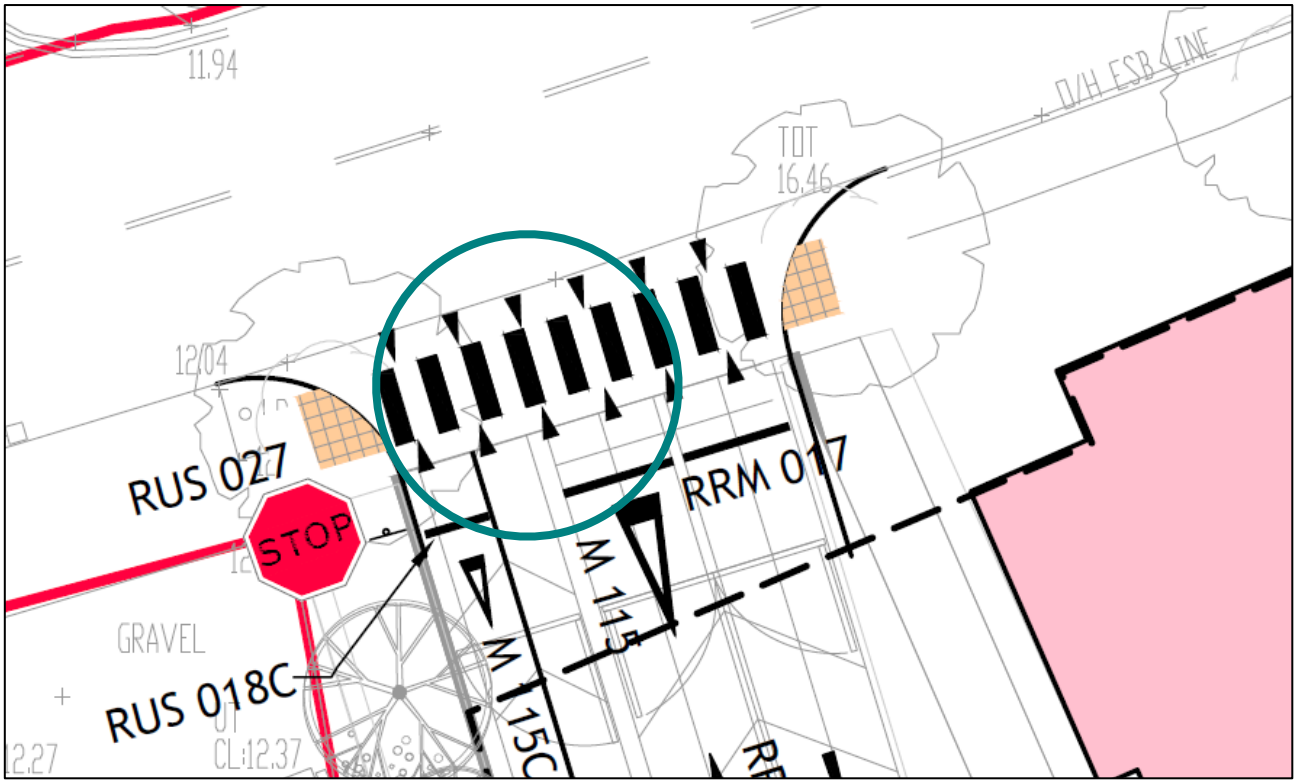
It is unclear how the proposed footpaths at the northern entrance to the development from Pearse Road ties in with the existing footpaths. Pedestrians, particularly visually impaired pedestrians, travelling to and from the proposed development may travel where their presence is not anticipated or move on carriageway where they would be at an increased risk of being struck by a passing vehicle.



Recommendation: Provide safe connections from the proposed footpaths to tie in with existing network.

2.2 **Problem:**

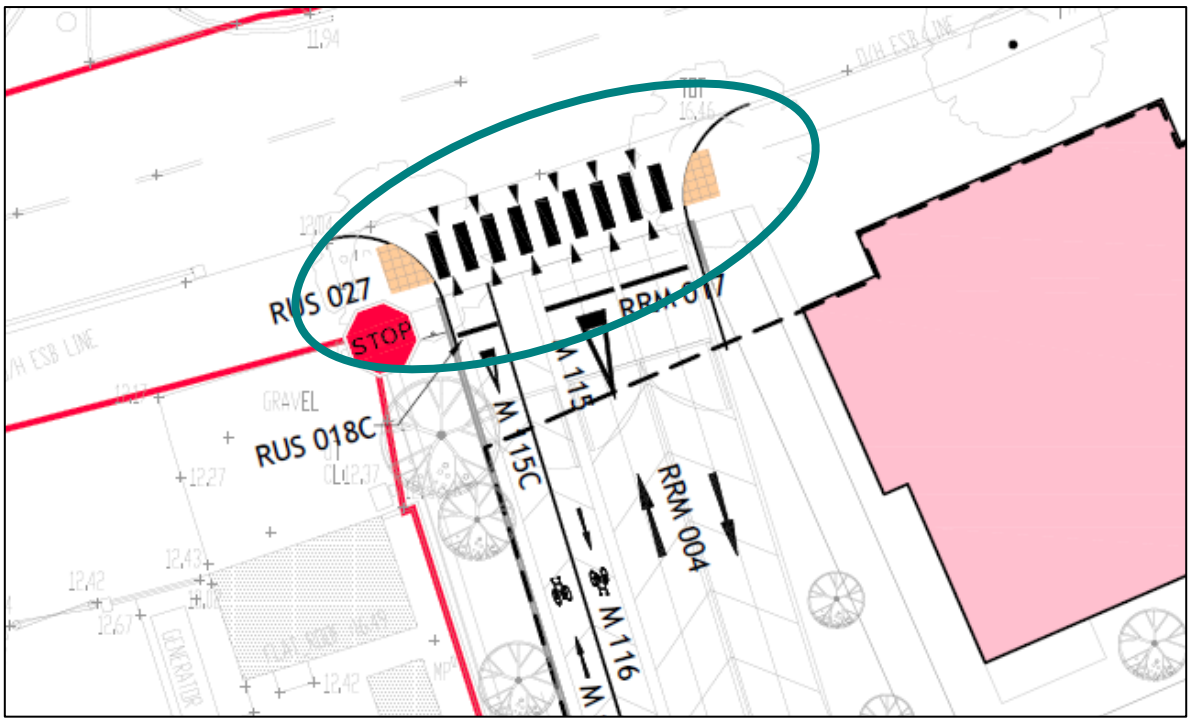
The proposed layout of the two-way cycle facility on one side of the access road to the underground car park at its junction with Pearse Road may increase the risk of conflicts between cyclists turning into the access road and motorists exiting the access road.



Recommendation: Revise the layout at this location to reduce the risk of conflicts between cyclists and motorists at this location.

2.3 **Problem:**

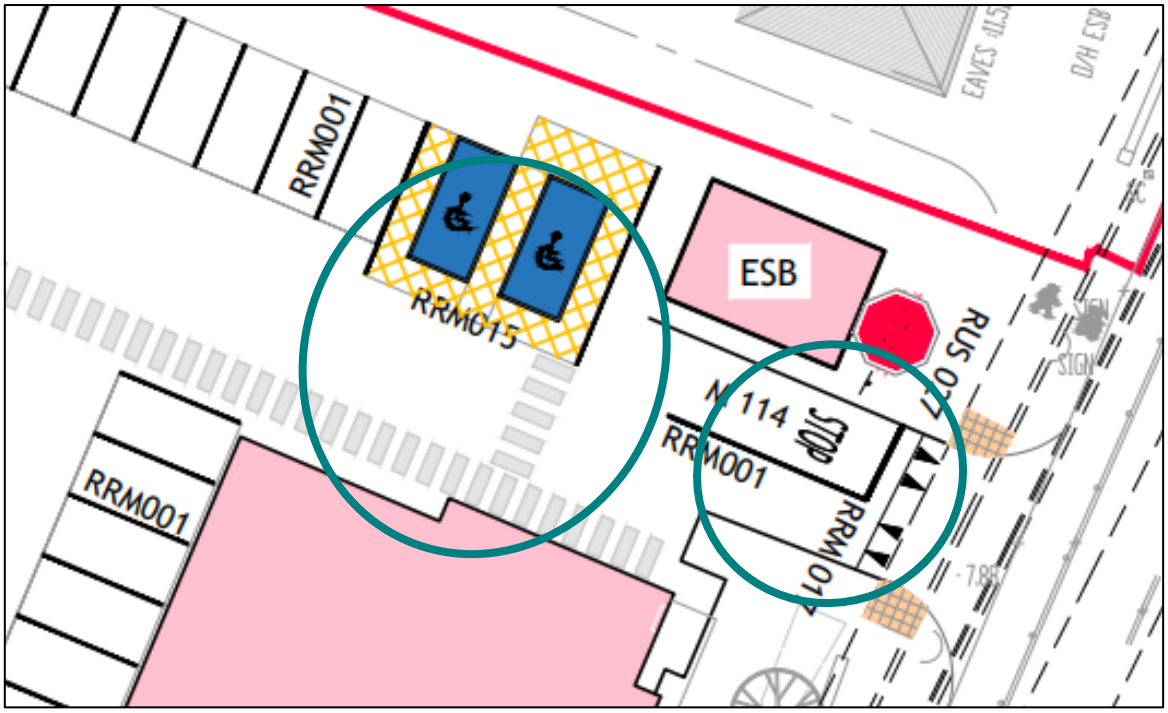
Zebra bar markings are proposed across the junction mouth at the Pearse Road access to the proposed development. However, no signs or belisha beacons are proposed while the tactile paving proposed is for an uncontrolled crossing. Such a layout may confuse both motorists and pedestrians as to who has priority at the crossing which could contribute to a pedestrian collision at this location. The provision of a zebra crossing at this location may also increase the risk of a rear end collision with a following vehicle, if a driver turning left from Pearse Road has to give way to a pedestrian on the crossing, as the following driver may not expect the vehicle ahead to stop on Pearse Road.



Recommendation: Provide all appropriate measures for the intended pedestrian crossing type. If a zebra crossing is being provided, set-back the crossing at least one car length within the mouth of the junction to allow vehicles to exit Pearse Road before giving way to pedestrians on the crossing.

2.4 **Problem:**

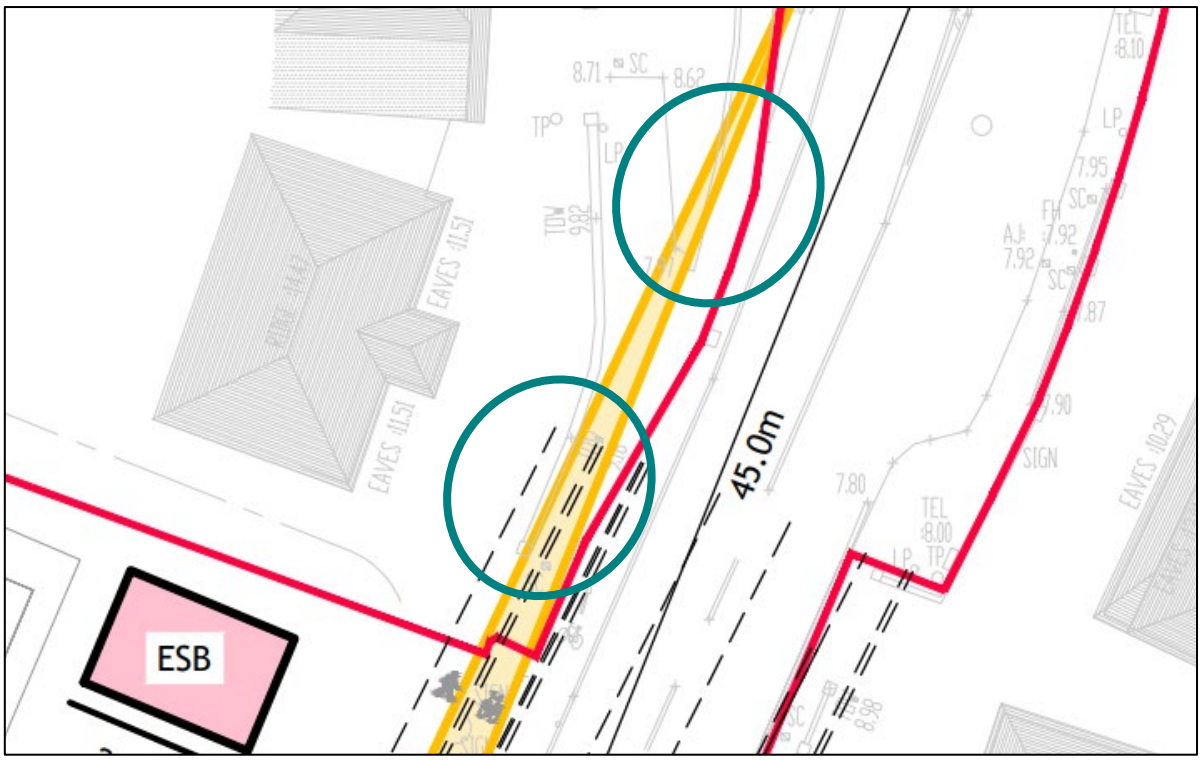
The width of the access road immediately inside the access onto the Kinsale Road appears to be narrow. In addition, the proposed internal access road changes direction abruptly immediately downstream of this location in order to facilitate parking spaces along the north side of the access road. The layout of the access road at this location may contribute to side swipe collisions with opposing vehicles or pedestrian collision with VRUs using the disabled parking spaces or pedestrian walkway.



Recommendation: Ensure that the access road is of sufficient width and alignment to cater for two-way traffic at this location.

2.5 **Problem:**

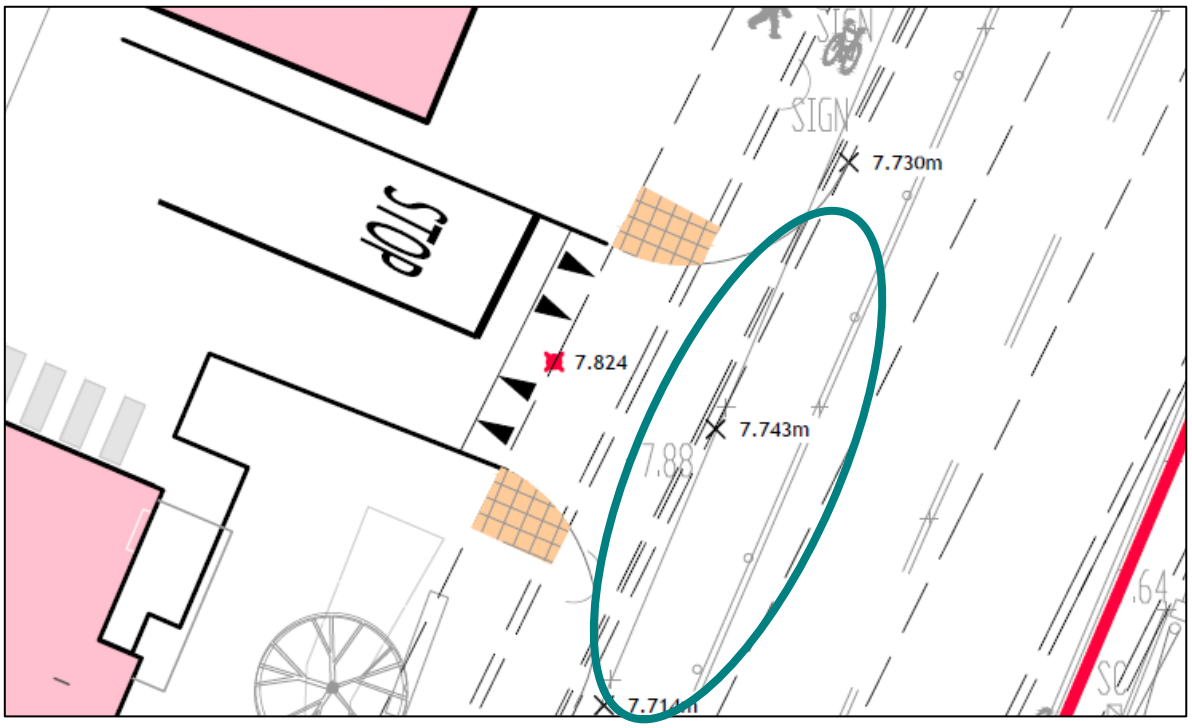
The visibility splays to the left from the proposed eastern access from the development appears to be obstructed by existing boundary walls. Road safety risk is increased in situations where inter-visibility between drivers turning out of an access and drivers approaching on the mainline is restricted. Lack of adequate visibility may increase the likelihood of a collision at the access.



Recommendation: Adequate visibility splays should be provided at the proposed access from the development.

2.6 **Problem:**

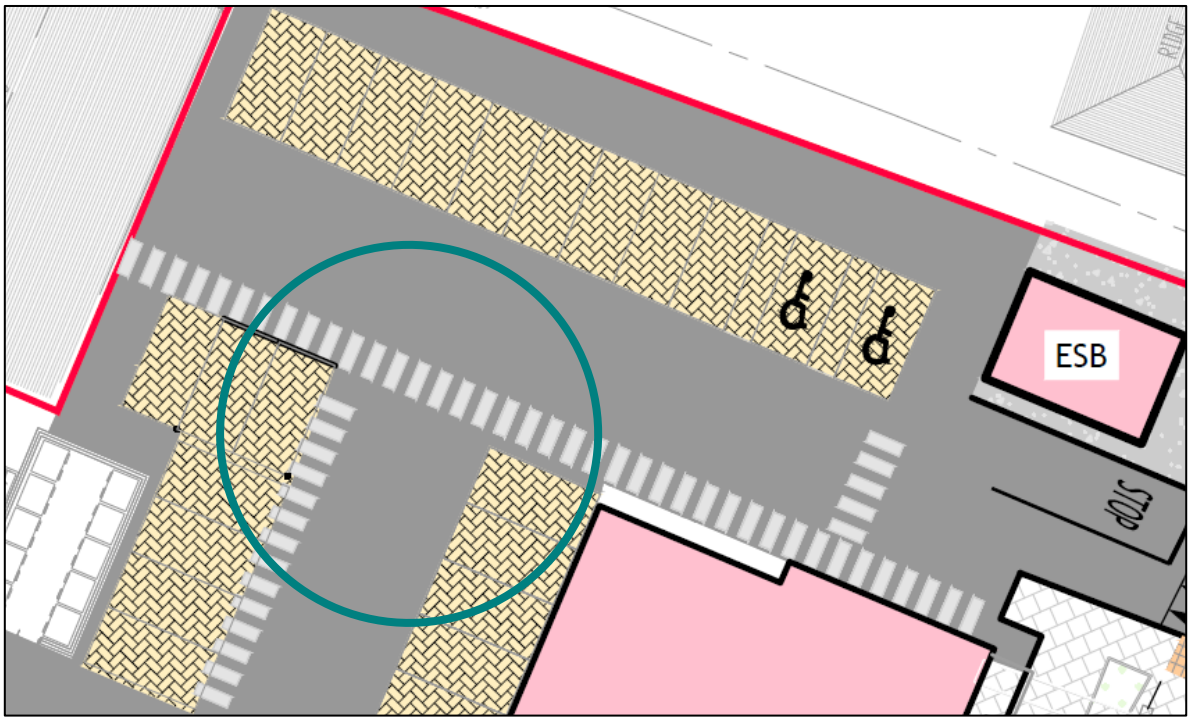
Priority between cyclist using the existing cycle lane and motorist turning at the Kinsale Road access may be unclear in advance of the future junction layout being implemented. A lack of clear priority at this location may contribute to a cycle collision at this location.



Recommendation: Ensure that the Kinsale Road access caters for the existing cycle lane and that clear priority is provided between cyclists and motorist turning at the junction.

2.7 **Problem:**

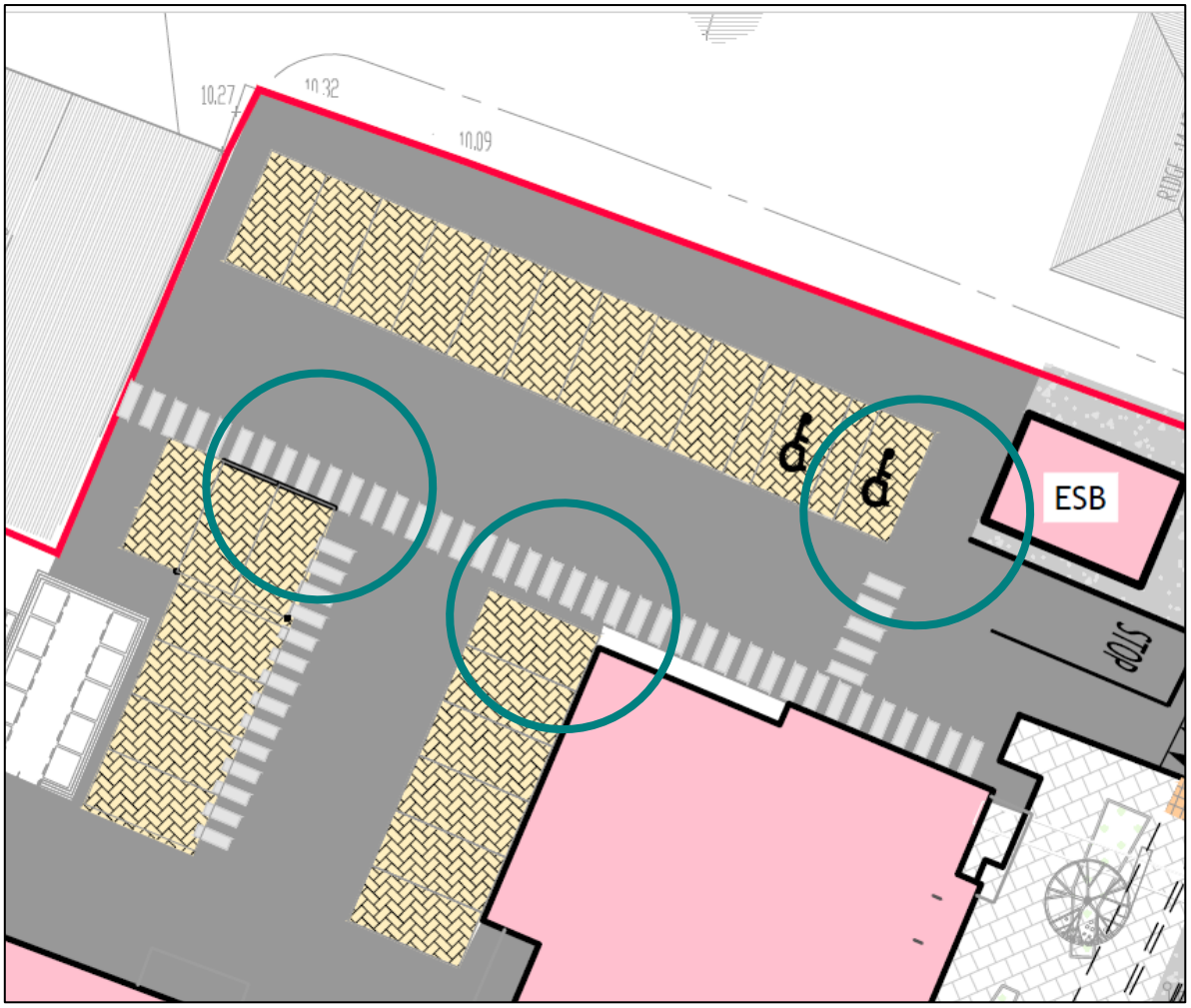
Road markings or traffic signs to indicate junction priority are not shown to be provided at the proposed internal junctions. This may lead to turning collisions if priority at the junctions is unclear to drivers.



Recommendation: Provide adequate junction control (STOP road markings or similar) to clearly define vehicular priority at all junctions.

2.8 **Problem:**

Intervisibility between pedestrians crossing pedestrian crossings at the locations shown below and drivers of vehicles approaching the crossings may be restricted by vehicles parked in the adjacent parking spaces. A lack of adequate intervisibility may contribute to a collision at these locations.



Recommendation: Ensure adequate intervisibility is provided between pedestrians and drivers of vehicles approaching all pedestrian crossing locations.

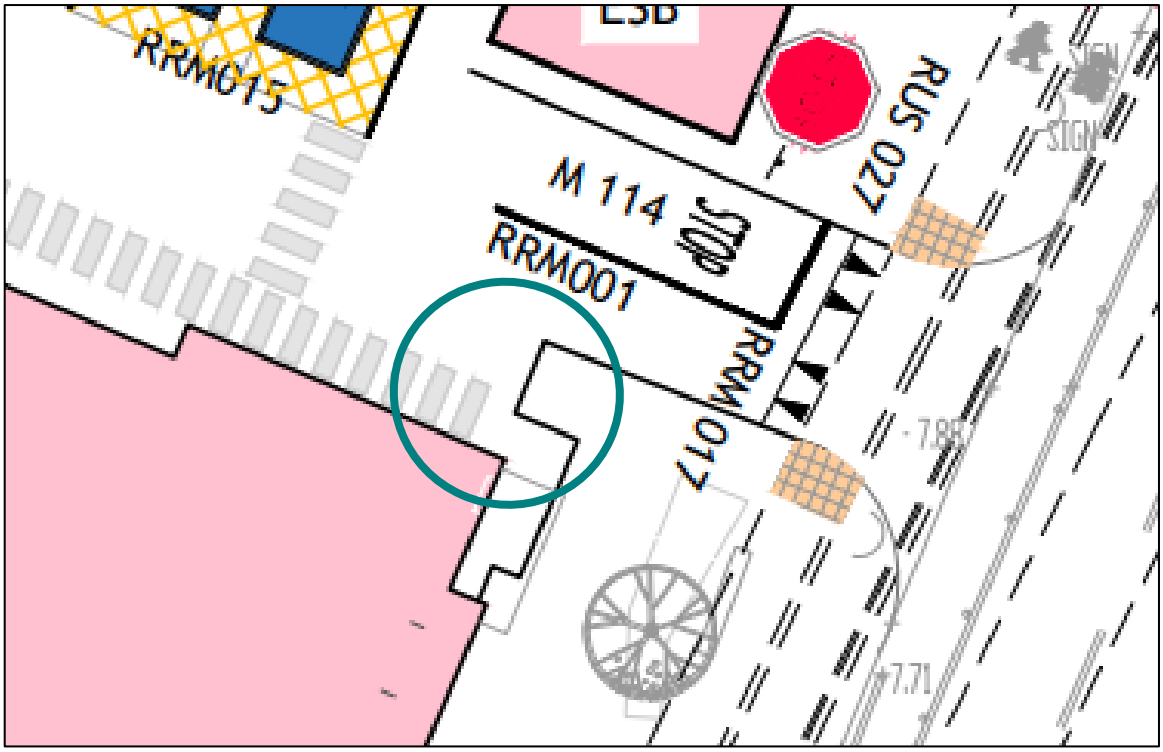
2.9 **Problem:**

Ramps are indicated along the footpaths and cycle tracks at a number of locations. However, the slopes are not identified. Excessive slopes may be difficult for pedestrians, especially those with mobility aids, to navigate and may lead to trips, slips and falls.

Recommendation: Ensure that appropriate slopes are provided throughout.

2.10 **Problem:**

It is unclear how pedestrians access the proposed footpaths from the marked walkway within the proposed car park. A lack of an appropriate connection including dropped kerbs may result in pedestrians travelling along the carriageway where they would be at an increased risk of being struck by a passing vehicle.



Recommendation: Ensure that an adequate pedestrian link is provided at this location.

3. AUDIT TEAM STATEMENT

3.1 We certify that we have examined the drawings listed in Appendix A and have inspected the site. This examination has been carried out with the sole purpose of identifying any features of the scheme that could be removed or modified to improve the safety of the scheme.

Signed……  …… George Frisby

Date .....12th March 2025…...…...

Signed….  ..... Jince Philip Zachariah

Date ..... 12th March 2025…...…...

4. SAFETY AUDIT FEEDBACK FORM

Scheme: Proposed Residential Development at Kinsale Road, Co. Cork

Document Number: 25035-01-001

Audit Stage: Stage 1 RSA

Date Audit Completed: 12th March 2025

Paragraph No. in Safety Audit Report	To Be Completed By Designer			To Be Completed by Audit Team Leader
	Problem accepted (yes/no)	Recommended measure Accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.	Alternative measures or reasons accepted by auditors (yes/no)
2.1	Yes	Yes	----------	----------
2.2	Yes	Yes	----------	----------
2.3	Yes	Yes	----------	----------
2.4	Yes	Yes	----------	----------
2.5	Yes	Yes	----------	----------
2.6	Yes	Yes	----------	----------
2.7	Yes	Yes	----------	----------
2.8	Yes	Yes	----------	----------
2.9	Yes	Yes	----------	----------
2.10	Yes	Yes	----------	----------

Safety Audit Signed off Andrew McCarthy **Design Team Leader**

Print Name Andrew Mc Carthy **Date 25/03/2025**

Safety Audit Signed Niamh Cronin **Employer**

Print Name Niamh Cronin **Date 25/03/2025**

Safety Audit

Signed off …… George Frisby **……. Audit Team Leader**

Print Name ……George Frisby …… **Date …6/6/2025……**

Please complete and return to:

Roadplan Consulting,
7, Ormonde Road
Kilkenny
E-mail: info@roadplan.ie

APPENDIX A

List of Drawings Examined

The following drawings have been provided electronically in PDF format by Punch Consulting Engineers and are appended here.

Drawing Number	Rev	Drawing Title
214130-PUNCH-XX-XX-DR-C-0100	C02	Proposed Drainage Layout - General Arrangement
214130-PUNCH-XX-XX-DR-C-0101	C03	Proposed Drainage Layout Sheet 1 of 3
214130-PUNCH-XX-XX-DR-C-0102	C04	Proposed Drainage Layout Sheet 2 of 3
214130-PUNCH-XX-XX-DR-C-0103	C02	Proposed Drainage Layout Sheet 3 of 3
214130-PUNCH-XX-XX-DR-C-0400	C03	Proposed Road Layout
214130-PUNCH-XX-XX-DR-C-0401	C01	Future Junction Layout to Kinsale Road - Bus Connects
214130-PUNCH-XX-XX-DR-C-0420	C03	Site Levels Layout - General Arrangement
214130-PUNCH-XX-XX-DR-C-0421	C03	Site Levels Layout - Sheet 1 Of 2
214130-PUNCH-XX-XX-DR-C-0422	C02	Site Levels Layout - Sheet 2 Of 2
214130-PUNCH-XX-XX-DR-C-0440	C03	Pavement Finishes Layout
214130-PUNCH-XX-XX-DR-C-0460	C02	Road Markings and Signage
214130-PUNCH-XX-XX-DR-C-0600	C02	Autotrack Analysis - Fire Tender
214130-PUNCH-XX-XX-DR-C-0601	C03	Autotrack Analysis - Refuse Truck
C25001-EDC-XX-00-DR-E-3000	P03	Public Lighting Layout

214130-PUNCH-XX-XX-DR-C-0103

214130-PUNCH-XX-XX-DR-C-0101

214130-PUNCH-XX-XX-DR-C-0102

LEGEND

- EXISTING SURFACE WATER SEWER
- EXISTING COMBINED SEWER
- PROPOSED SURFACE WATER SEWER — S1.001 150 →
- PROPOSED SURFACE WATER MANHOLE — S1-0
- PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE) — S8-0 RE
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ACO DRAINAGE CHANNEL
- PROPOSED ATTENUATION TANK
- PROPOSED BIO RETENTION AREAS
- PROPOSED BLUE GREEN ROOF
- PROPOSED GREEN ROOF
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL SEWER — 225 →
- PROPOSED FOUL MANHOLE — F1-0
- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) — F1-1 RE
- EXISTING FOUL MANHOLE — ExFMH
- EXISTING COMBINED SEWER MANHOLE — Ex CSMH
- SITE BOUNDARY

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018
NSAI Certified

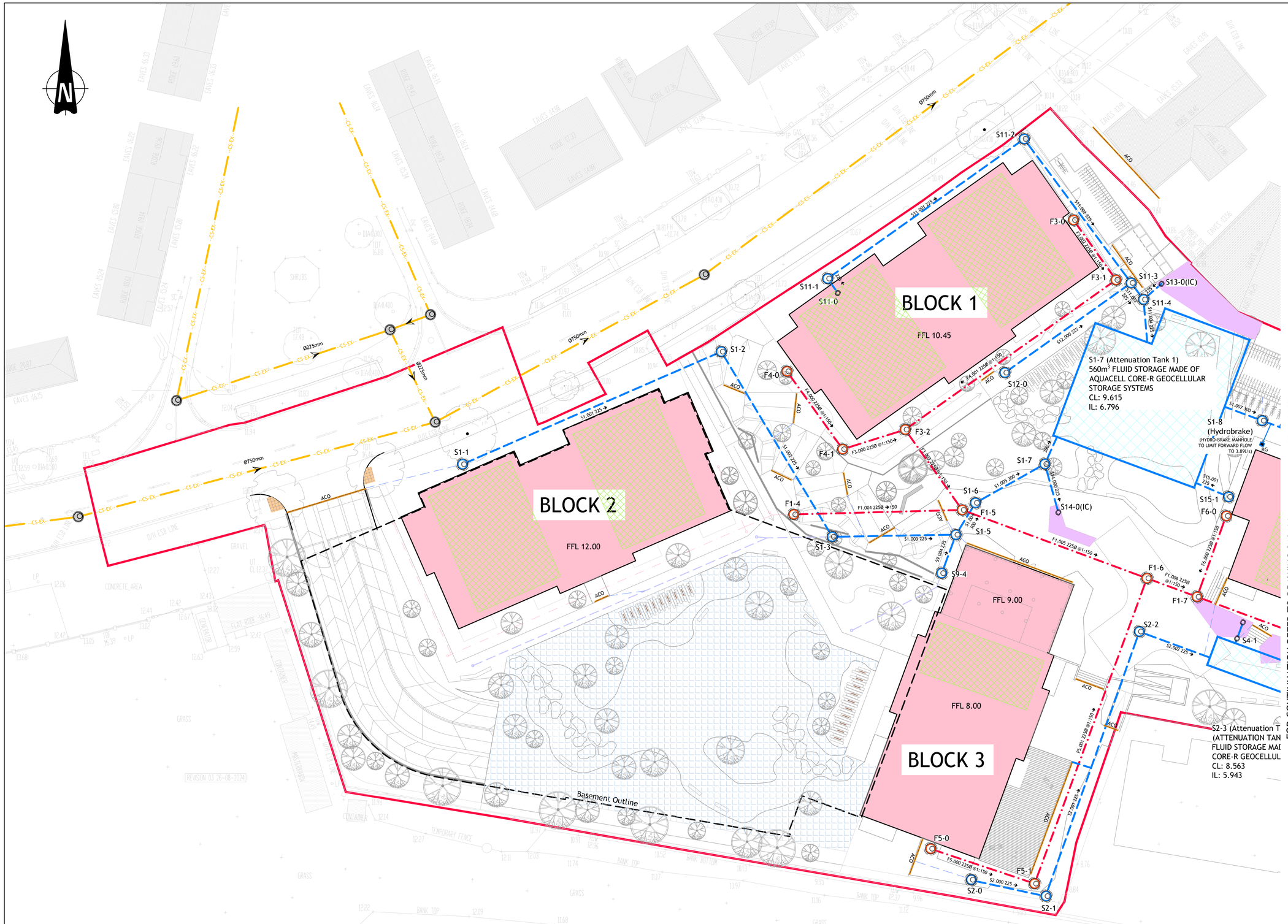
Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	23.10.2024
C03	ISSUED FOR PLANNING	LL	04.03.2025

Rev	Amendment	By	Date

Client: FRONVILLE LTD

PUNCH consulting engineers
Dublin | Limerick | Cork | Galway | Glasgow
Elm Court, Boreenmanna Road, Cork, T12 HHW2
t +353 21 462 4000 | w punchconsulting.com

Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK			
Title: PROPOSED DRAINAGE LAYOUT - GENERAL ARRANGMENT			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 234202	Model File: 214130-PUNCH-XX-XX-M2-C-0100-0102		Drawing Status: A2(For Planning)	
Scale @ A1: 1:500	Document No: 213130-PUNCH-XX-XX-DR-C-0100			Revision No: C02



LEGEND

- EXISTING SURFACE WATER SEWER
- EXISTING COMBINED SEWER
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE)
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ACO DRAINAGE CHANNEL
- PROPOSED ATTENUATION TANK
- PROPOSED BIO RETENTION AREAS
- PROPOSED BLUE GREEN ROOF
- PROPOSED GREEN ROOF
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL SEWER
- PROPOSED FOUL MANHOLE
- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE)
- EXISTING FOUL MANHOLE
- EXISTING COMBINED SEWER MANHOLE
- SITE BOUNDARY

NOTES:

1. FOR BASEMENT DRAINAGE REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0104
2. FOR DRAINAGE SCHEDULES REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0105
3. SLUNG DRAINAGE ONLY SHOWN INDICATIVELY. SLUNG DRAINAGE DESIGN M&E DETAILS

BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018 NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				

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Elm Court, Boreenmanna Road, Cork, T12 HHW2
t +353 21 462 4000 | w punchconsulting.com

Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK
Title: PROPOSED DRAINAGE LAYOUT - SHEET 1 OF 3

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin
Project No:	Model Ref:		Drawing Status:	
234202	214130-PUNCH-XX-XX-M2-C-0100-0102		A2(For Planning)	
Scale @ A1:	Document No:			Revision No:
AS SHOWN	213130-PUNCH-XX-XX-DR-C-0101			C03

FOR CONTINUATION REFER TO DRAWING 213130-PUNCH-XX-XX-DR-C-0103

FOR CONTINUATION REFER TO DRAWING 213130-PUNCH-XX-XX-DR-C-0101

FOR CONTINUATION REFER TO DRAWING 213130-PUNCH-XX-XX-DR-C-0102

Ø750mm

BLOCK 1
FFL 10.45

BLOCK 4
FFL 8.00

BLOCK 3
FFL 9.00
FFL 8.00

S1-7 (Attenuation Tank 1)
560m³ FLUID STORAGE MADE OF AQUACELL CORE-R GEOCELLULAR STORAGE SYSTEMS
CL: 9.615
IL: 6.796

S1-13 (Attenuation Tank 2)
464m³FLUID STORAGE MADE OF AQUACELL CORE-R GEOCELLULAR STORAGE SYSTEMS
CL: 7.882
IL: 5.500

S2-3 (Attenuation Tank 3)
(ATTENUATION TANK 3 - 296m³
FLUID STORAGE MADE OF AQUACELL CORE-R GEOCELLULAR STORAGE SYSTEMS)
CL: 8.563
IL: 5.943

S1-8 (Hydrobrake)
(HYDRO-BRAKE MANHOLE TO LIMIT FORWARD FLOW TO 3.89l/s)

S1-16 HYDROBRAKE MANHOLE TO LIMIT FORWARD FLOW TO 3.89l/s

ESB

PETROL INTERCEPTOR KLARGESTER NSBP006 BYPASS INTERCEPTOR OR SIMILAR APPROVED

PETROL INTERCEPTOR KLARGESTER NSBP006 BYPASS INTERCEPTOR OR SIMILAR APPROVED

Ex CSMH I.L.5.90

Ex CSMH I.L.5.87

ExFMH I.L.7.77

SITE TBM = 7.752m OD MALIN HEAD (INDICATED WITH STEEL NAIL & WASHER)

LEGEND

- EXISTING SURFACE WATER SEWER
- EXISTING COMBINED SEWER
- PROPOSED SURFACE WATER SEWER (S1.001 150 →)
- PROPOSED SURFACE WATER MANHOLE (S1-0)
- PROPOSED SURFACE WATER RODDING EYE (SLUNG DRAINAGE) (S8-0 RE)
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- PROPOSED ACO DRAINAGE CHANNEL
- PROPOSED ATTENUATION TANK
- PROPOSED BIO RETENTION AREAS
- PROPOSED BLUE GREEN ROOF
- PROPOSED GREEN ROOF
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL SEWER (225 →)
- PROPOSED FOUL MANHOLE (F1-0)
- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) (F1-1 RE)
- EXISTING FOUL MANHOLE (ExFMH I.L.4.30)
- EXISTING COMBINED SEWER MANHOLE (Ex CSMH I.L.5.87)
- SITE BOUNDARY

NOTES:
1. FOR BASEMENT DRAINAGE REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0104
2. FOR DRAINAGE SCHEDULES REFER TO DRAWING 214130-PUNCH-XX-XX-DR-C-0105
3. SLUNG DRAINAGE ONLY SHOWN INDICATIVELY. SLUNG DRAINAGE DESIGN M&E DETAILS

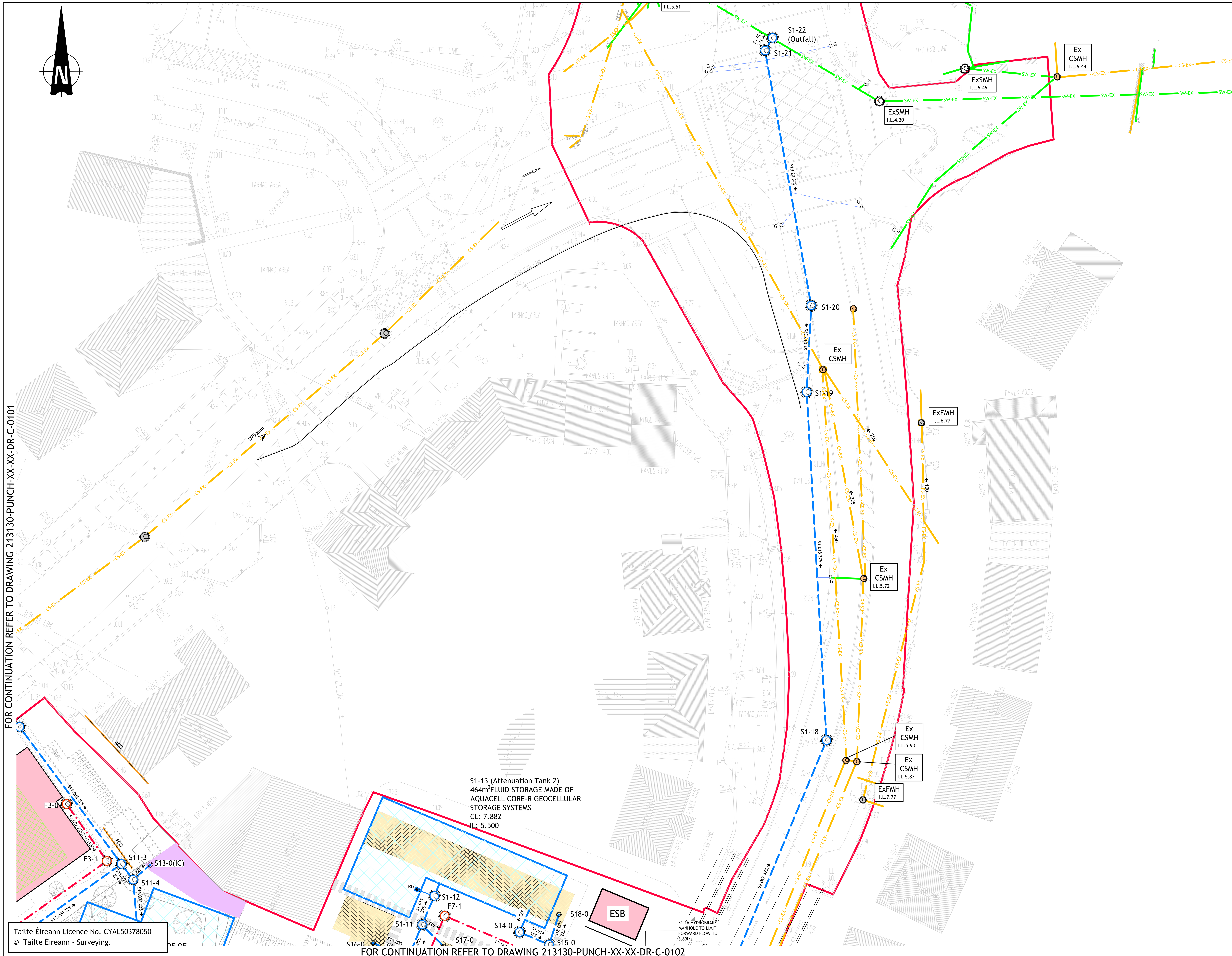
BUILDING INFORMATION MODELLING (BIM) I.S. EN ISO 19650-2:2018 NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	23.10.2024
C03	ISSUED FOR PLANNING	LL	04.03.2025

Client: FRONVILLE LTD

PUNCH consulting engineers
Dublin | Limerick | Cork | Galway | Glasgow
Elm Court, Boreenmanna Road, Cork, T12 HHW2
t +353 21 462 4000 | w punchconsulting.com

Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK				
Title: PROPOSED DRAINAGE LAYOUT - SHEET 2 OF 3				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 234202	Model Ref: 214130-PUNCH-XX-XX-M2-C-0100-0102		Drawing Status: A2(For Planning)	
Scale @ A1: AS SHOWN	Document No: 213130-PUNCH-XX-XX-DR-C-0102			Revision No: C04



LEGEND

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- EXISTING COMBINED SEWER
- PROPOSED SURFACE WATER SEWER — S1.001 150 →
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- PROPOSED FOUL SEWER — 225 →
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- PROPOSED FOUL RODDING EYE (SLUNG DRAINAGE) — F1-1 RE
- EXISTING FOUL MANHOLE
- EXISTING COMBINED SEWER MANHOLE
- SITE BOUNDARY

NOTES:

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	04.03.2025

Client: FRONVILLE LTD

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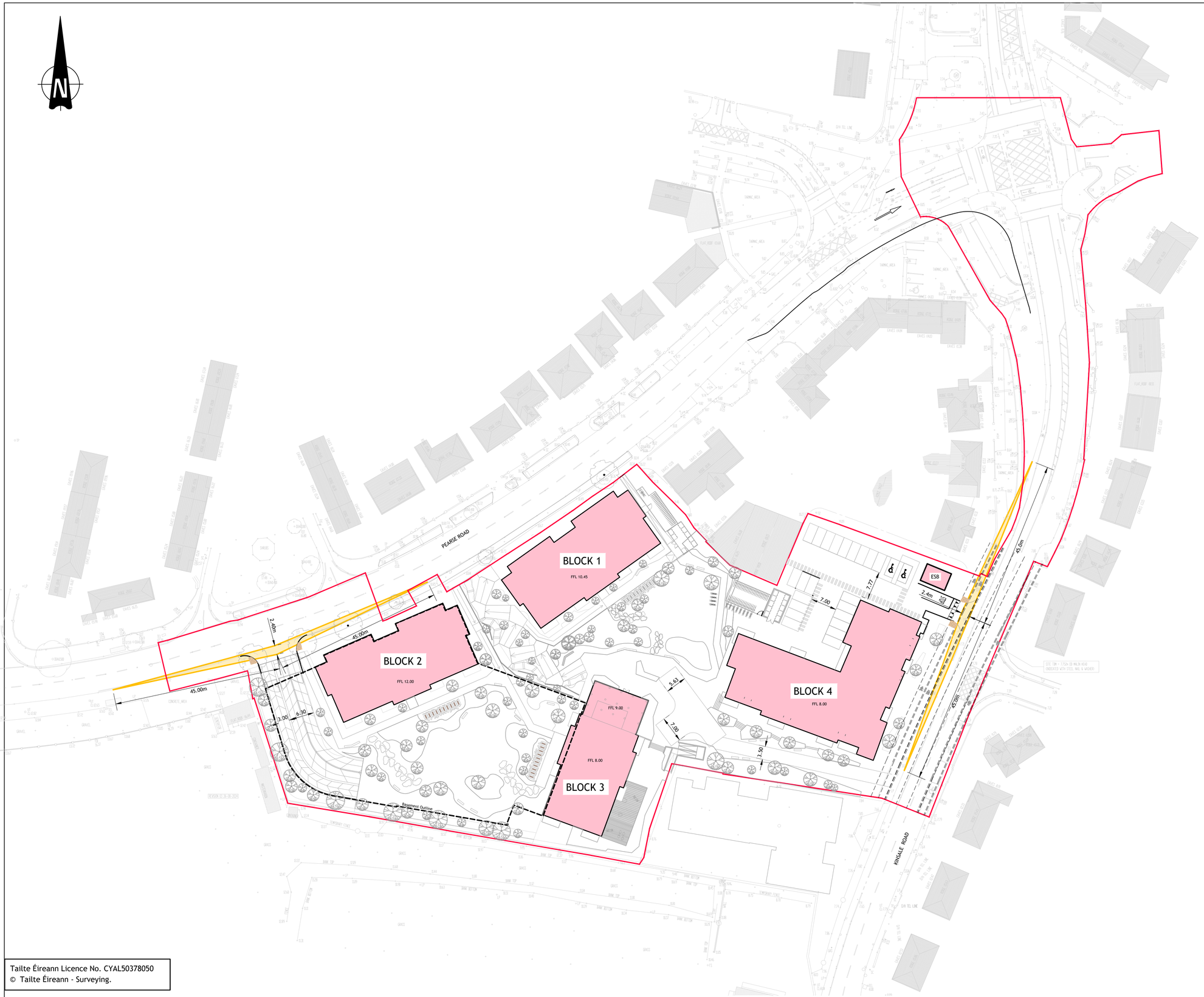
Elm Court, Boreenmanna Road, Cork, T12 HHW2
t +353 21 462 4000 | w punchconsulting.com

Project:	MIXED USE DEVELOPMENT, KINSALE ROAD , CORK
Title:	PROPOSED DRAINAGE LAYOUT - SHEET 3 OF 3
Drawn:	Liam Lonergan
Date drawn:	10.09.2024
Technician Check:	Liam Lonergan
Engineer Check:	Simeon Solomons
Approved:	Niamh Cronin
Project No:	234202
Model Ref:	214130-PUNCH-XX-XX-M2-C-0100-0102
Drawing Status:	A2(For Planning)
Scale @ A1:	AS SHOWN
Document No:	213130-PUNCH-XX-XX-DR-C-0103
Revision No:	C02



SIGHT VISIBILITY LEGEND:

SIGHT VISIBILITY SPLAY

SIGHT VISIBILITY CRITERIA USED (DMURS)	
DESIGN SPEED (km/hr)	SSD STANDARD (metres)
50	45

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NSAI Certified

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				

Client: FRONVILLE LTD

PUNCH consulting engineers
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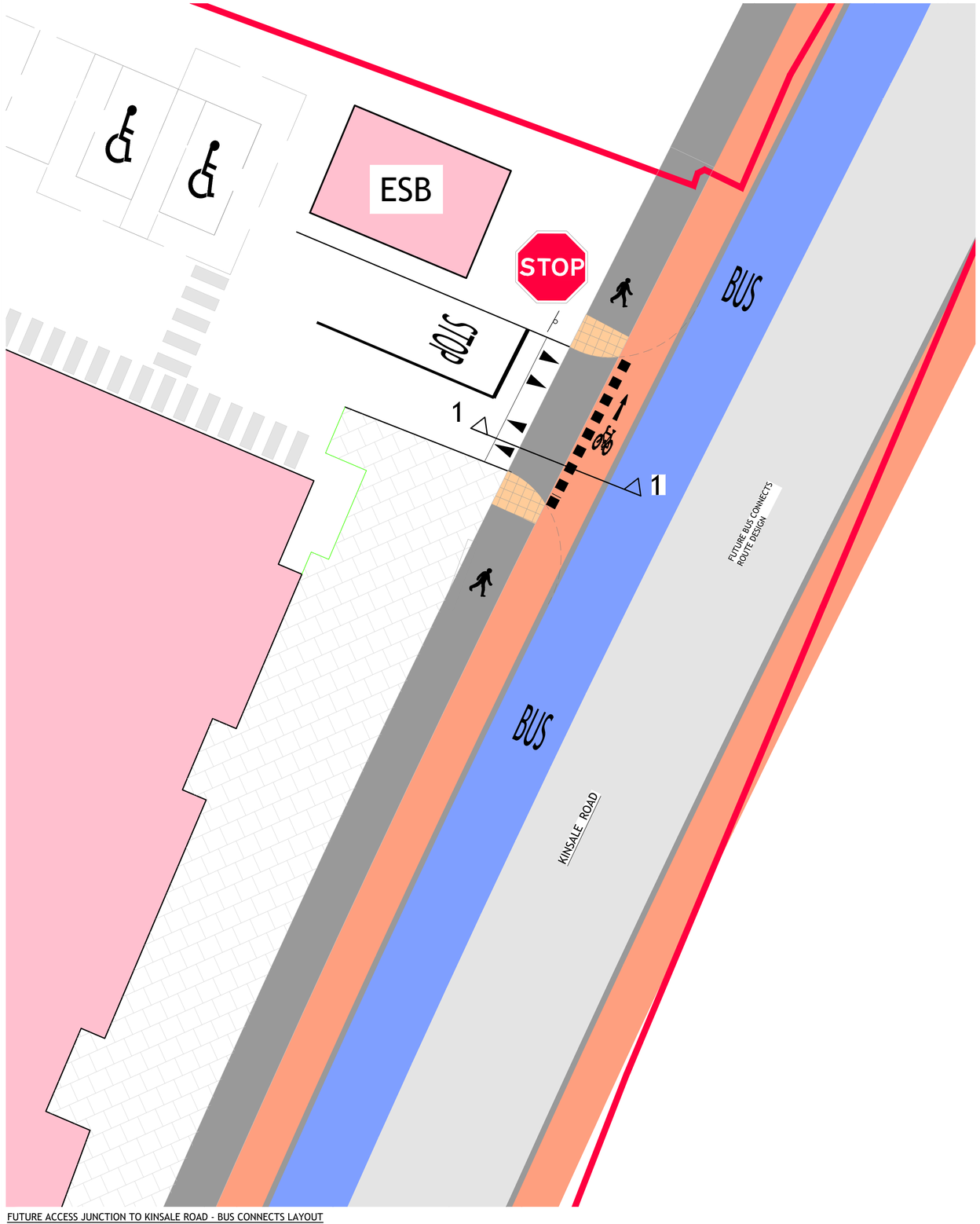
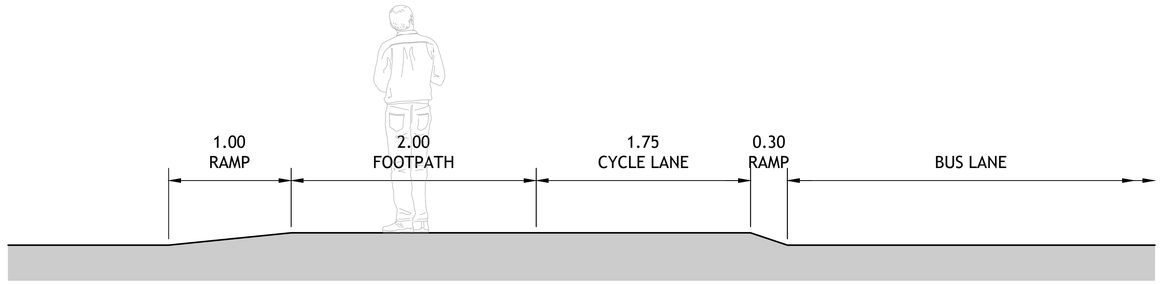
t +353 21 462 4000 | w punchconsulting.com

Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK				
Title: PROPOSED ROADS LAYOUT				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 234202	Model Ref: 214130-PUNCH-XX-XX-M2-C-0400		Drawing Status: A2(Planning)	
Scale @ A1: 1:500	Documents No: 213130-PUNCH-XX-XX-DR-C-0400			Revision No: C03



FUTURE ACCESS JUNCTION TO KINSALE ROAD - BUS CONNECTS LAYOUT
SCALE 1:100



SECTION 1-1
SCALE 1:25

LEGEND:

- PROPOSED ROADWAY
- PROPOSED FOOTPATH
- PROPOSED CYCLE LANE
- PROPOSED BUS LANE
- PROPOSED TACTILE PAVING (BUFF COLOUR)

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	04.03.2025				

Client: FRONVILLE LTD

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Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK			
Title: FUTURE JUNCTION LAYOUT TO KINSALE ROAD - BUS CONNECTS			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 234202	Model Ref: 214130-PUNCH-XX-XX-MZ-C-0401	Drawing Status: A2(Planning)	
Scale @ A1: 1:500	Document No: 213130-PUNCH-XX-XX-DR-C-0401	Revision No: C01	

LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	10.000

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				

Client: FRONTVILLE LTD

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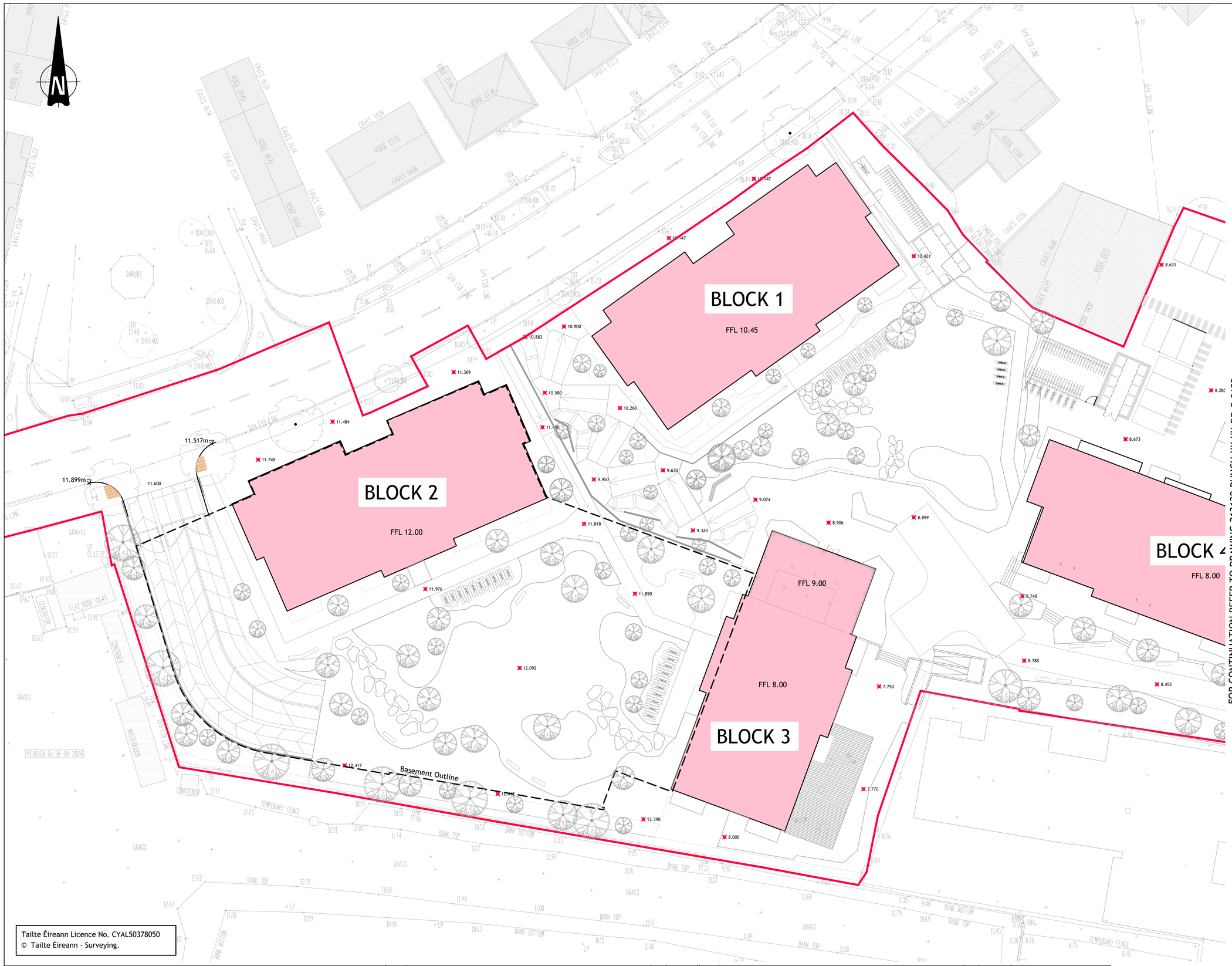
Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK				
Title: SITE LEVELS LAYOUT - GENERAL ARRANGMENT				
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 234202	Model Ref: 214130-PUNCH-XX-XX-M2-C-0420-422		Drawing Status: A2(For Planning)	
Scale @ A1: 1:500	Document No: 213130-PUNCH-XX-XX-DR-C-0420			Revision No: C03



LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	×10.000

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	23.09.2024
C03	ISSUED FOR PLANNING	LL	04.03.2025

Client:

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Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK
Title: SITE LEVELS LAYOUT - SHEET 1 OF 2

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model No:	Drawing Status:
234202	214130-PUNCH-XX-XX-M2-C-0420-422	A2(For Planning)

Scale @ A1:	Document No:	Revision No:
1:250	213130-PUNCH-XX-XX-DR-C-0421	C03

FOR CONTINUATION REFER TO DRAWING 213130-PUNCH-XX-XX-DR-C-0151

LEGEND:

FINISHED FLOOR LEVEL	FFL:12.000
PROPOSED SLOPE	1:100
PROPOSED ROAD / PATH LEVEL	10.000
EXISTING LEVEL	10.000

BLOCK 4

FFL 8.00

ESB

FUTURE BUS CONNECTS ROUTES SHOWN DASHED

FUTURE BUS CONNECTS ROUTES SHOWN DASHED

SITE TBM = 7.752m OD MALIN HEAD (INDICATED WITH STEEL NAIL & WASHER)

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	04.03.2025

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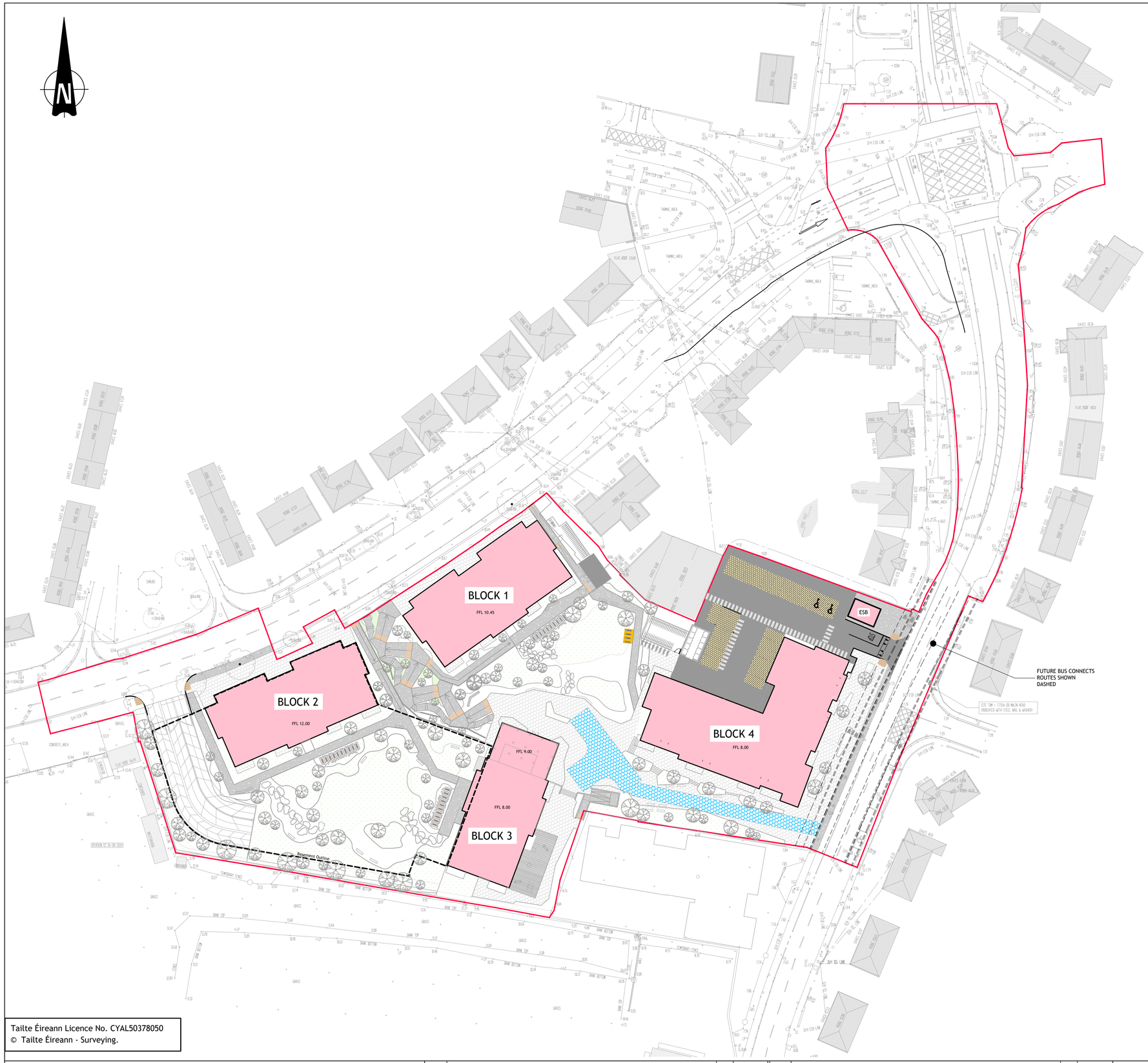
Client: FRONTVILLE LTD

Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK			
Title: SITE LEVELS LAYOUT - SHEET 2 OF 2			
Drawn: Liam Lonergan	Date drawn: 10.09.2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons / Approved: Niamh Cronin
Project No: 234202	Model No: 214130-PUNCH-XX-XX-M2-C-0420-422	Drawing Status: A2(For Planning)	
Scale @ A1: 1:250	Document No: 213130-PUNCH-XX-XX-DR-C-0422	Revision No: C02	



LEGEND:

- PROPOSED BUILDING
- PROPOSED ASPHALT ROAD
- PROPOSED CONCRETE FOOTPATH
- PROPOSED NON-TRAFFICKED PAVING TO ARCHITECT'S SPECIFICATION
- PROPOSED TRAFFICKED PAVING TO ARCHITECT'S SPECIFICATION
- PROPOSED PERMEABLE PAVING
- PROPOSED CONCRETE PLINTH
- PROPOSED TACTILE PAVING (BUFF COLOUR)
- PROPOSED CORDURY PAVING

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	23.10.2024
C03	ISSUED FOR PLANNING	LL	04.03.2025

Client: FRONVILLE LTD

PUNCH consulting engineers
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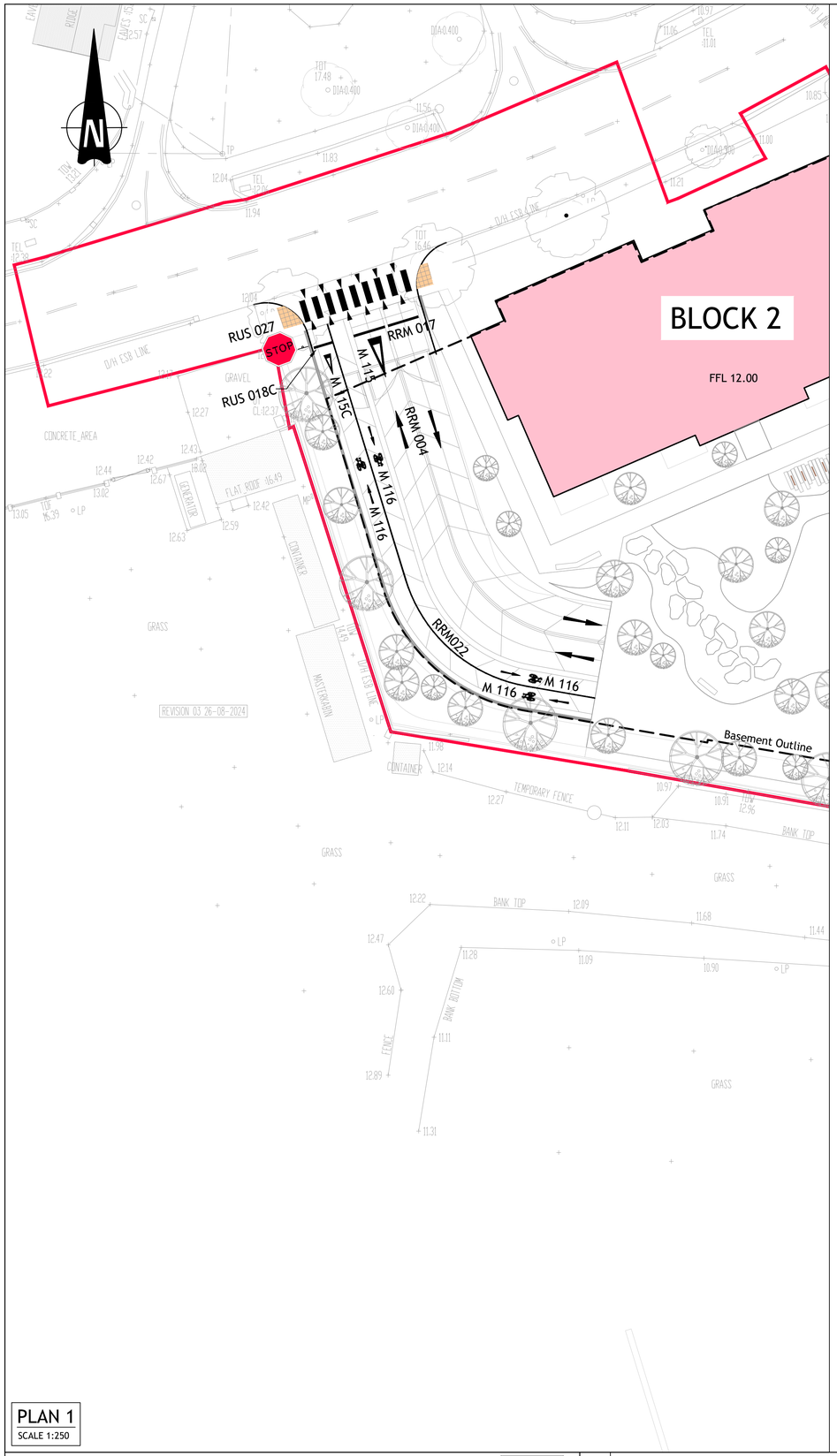
Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK
Title: PAVEMENT FINISHES LAYOUT

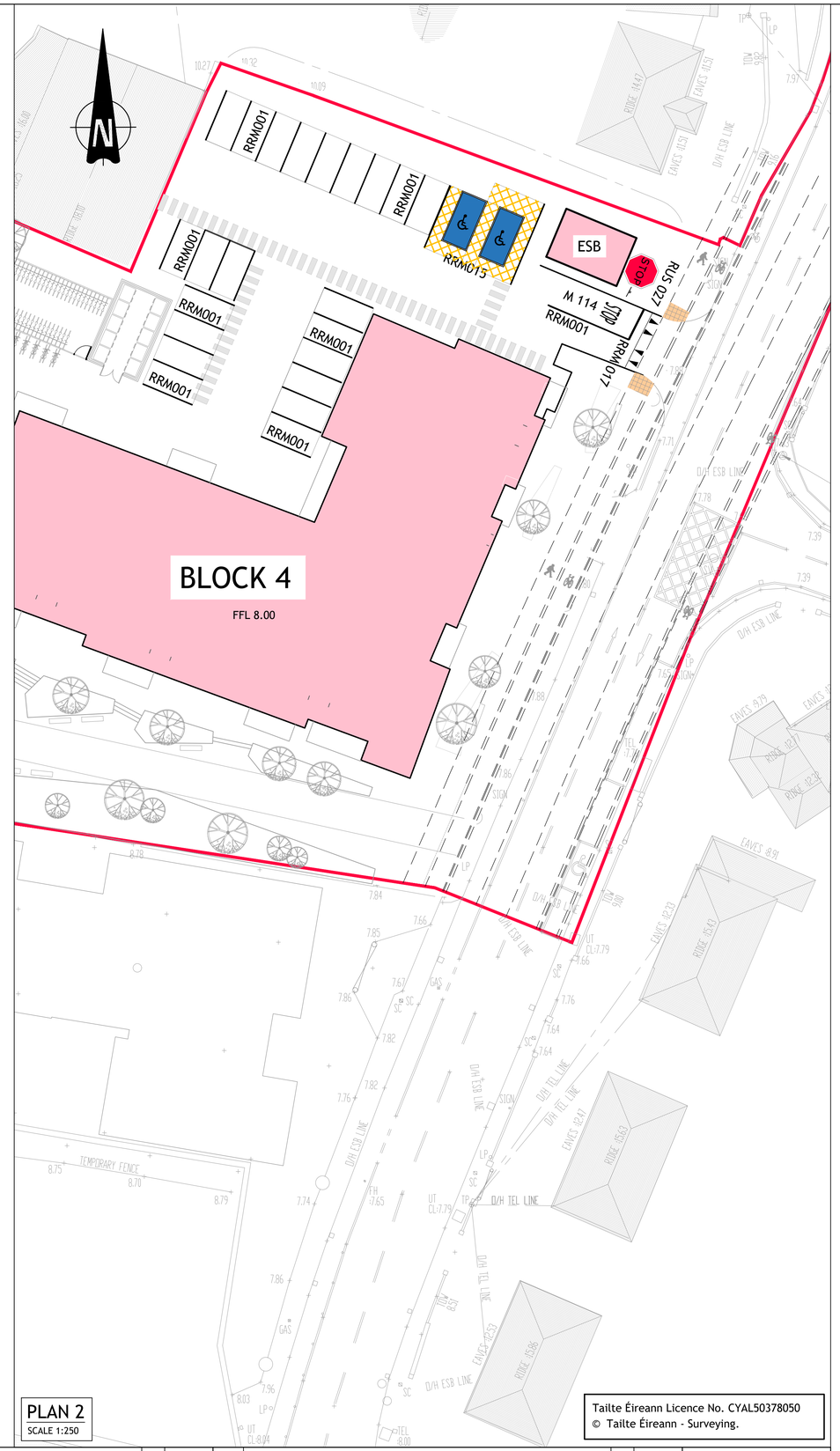
Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model File:	Drawing Status:
234202	214130-PUNCH-XX-XX-M2-C-0440-0442	A2(For Planning)

Scale @ A1:	Document No:	Revision No:
1:500	213130-PUNCH-XX-XX-DR-C-0440	C03



PLAN 1
SCALE 1:250



PLAN 2
SCALE 1:250

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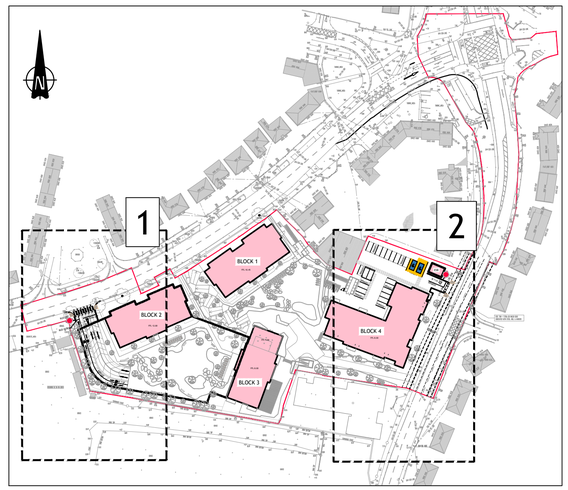
ROAD MARKING AND SIGNAGE LEGEND

DESCRIPTION	*DTTSM REF
100mm WIDE CONTINUOUS WHITE LINE	RRM 001
100mm WIDE WHITE EDGE LINE	RRM 022
200mm WIDE STOP LINE	RRM 017
STOP ROAD MARKING	M 114
150mm WIDE BROKEN YIELD LINE	RRM 018
YIELD ROAD MARKING	M 115
CYCLE TRACK YIELD LINE	RRM 018C
CYCLE TRACK YIELD ROAD MARKING	M 115C
CYCLE SYMBOL	M 116
100mm WIDE CONTINUOUS WHITE CYCLE TRACK EDGE LINE	RRM 022
100mm WIDE BROKEN WHITE CYCLE TRACK EDGE LINE	RRM 023
RUS 027 - STOP SIGN	STOP RUS 027

*DTTSM: DEPARTMENT OF TRANSPORT TRAFFIC SIGNS MANUAL



KEY PLAN
NOT TO SCALE

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024				
C02	ISSUED FOR PLANNING	LL	03.03.2025				

Client: FRONVILLE LTD

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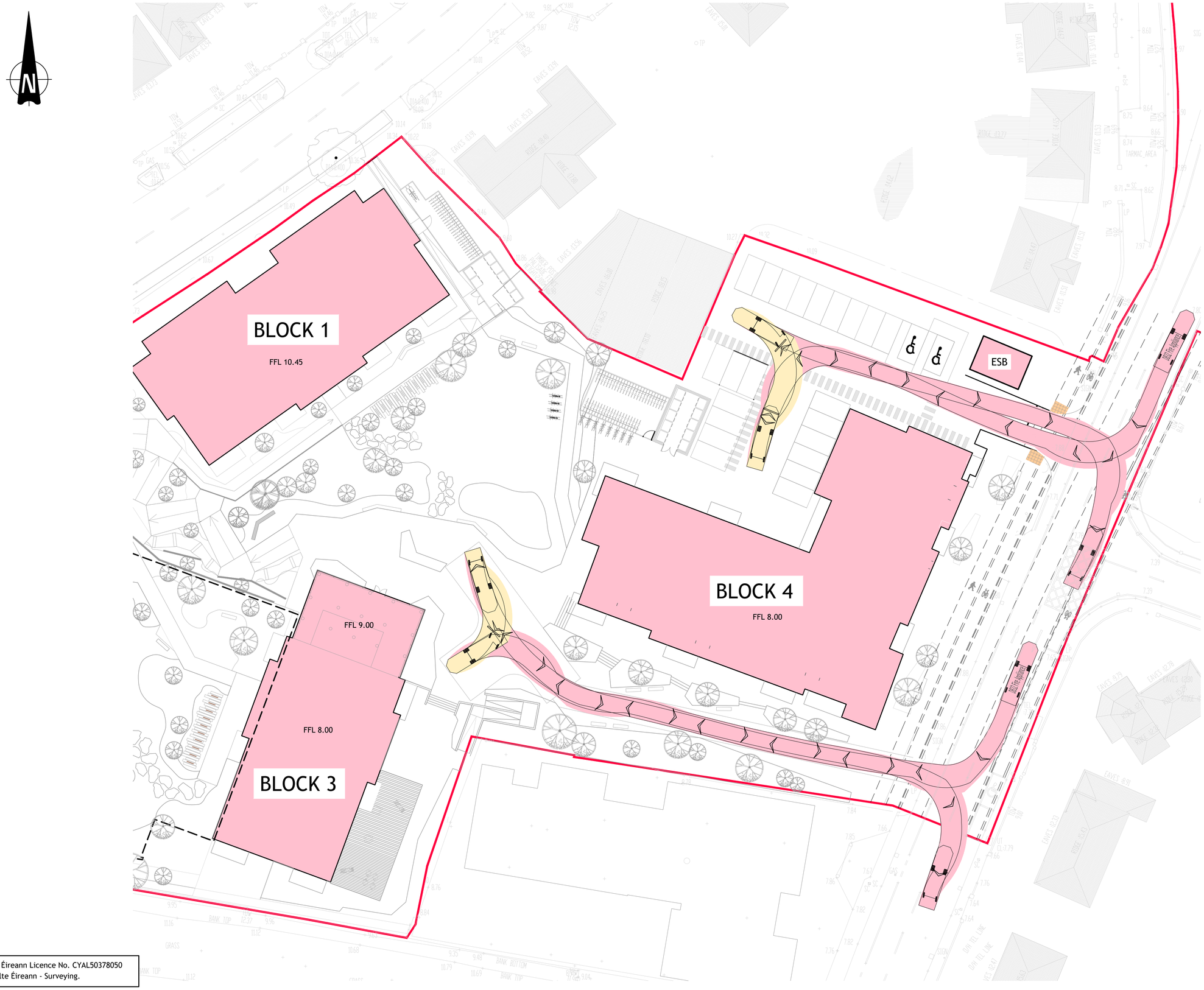
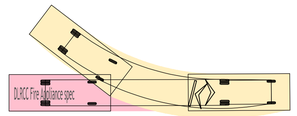
Project: MIXED USED DEVELOPMENT, KINSALE ROAD, CORK				
Title: ROAD MARKINGS AND SIGNAGE				
Drawn: Liam Lonergan	Date drawn: September 2024	Technician Check: Liam Lonergan	Engineer Check: Simeon Solomons	Approved: Niamh Cronin
Project No: 214130	Model Ref: 214130-PUNCH-XX-XX-M2-C-0460		Drawing Status: A2 (For Planning)	
Scale @ A1: AS SHOWN	Document No: 214130-PUNCH-XX-XX-DR-C-0460			Revision No: C02

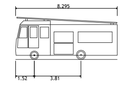


AUTOTRACK LEGEND

VEHICLE MOVING FORWARD

VEHICLE IN REVERSE





DLRCC Fire Appliance spec	
Overall Length	8.295m
Overall Width (Inc. mirrors)	2.990m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	7.910m

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Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	03.10.2024
C02	ISSUED FOR PLANNING	LL	04.03.2025

Client: FRONVILLE LTD

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Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK
Title: AUTOTRACK ANALYSIS - FIRE TENDER

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Aproved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin
Project No: 234202	Model Ref: 214130-PUNCH-XX-XX-M2-C-0600		Drawing Status: A2(Planning)	
Scale @ A1: 1:250	Document No: 213130-PUNCH-XX-XX-DR-C-0600			Revision No: C02

BLOCK 1

FFL 10.45

BLOCK 2

FFL 12.00

BIN STORE IN BASEMENT

BLOCK 3

FFL 9.00

FFL 8.00

BIN STORE IN BASEMENT

BIN STORE IN BASEMENT

Basement Outline

BLOCK 4

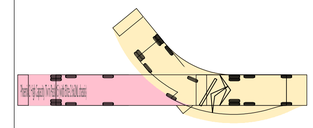
FFL 8.00

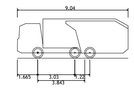
ESB

AUTOTRACK LEGEND

VEHICLE MOVING FORWARD

VEHICLE IN REVERSE





Phoenix 2 High Capacity Twin Pack 15 (with Elite 2 6x2ML chassis)

Overall Length	9.040m
Overall Width	2.550m
Overall Body Height	3.205m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.800m

LEGEND

PROPOSED WASTE STORAGE AREAS

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Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	LL	27.09.2024				
C02	ISSUED FOR PLANNING	LL	23.10.2024				
C03	ISSUED FOR PLANNING	LL	04.03.2025				

Client: FRONVILLE LTD

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Project: MIXED USE DEVELOPMENT, KINSALE ROAD , CORK

Title: AUTOTRACK ANALYSIS - REFUSE TRUCK

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
Liam Lonergan	10.09.2024	Liam Lonergan	Simeon Solomons	Niamh Cronin

Project No:	Model Ref:	Drawing Status:
234202	214130-PUNCH-XX-XX-M2-C-0601	A2(Planning)

Scale @ A1:	Document No:	Revision No:
1:250	213130-PUNCH-XX-XX-DR-C-0601	C03

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH PROJECT SPECIFICATION(S) & ALL OTHER CONTRACT DOCUMENTATION & DRAWINGS AS ISSUED BY THE ARCHITECT, STRUCTURAL ENGINEER & CONSULTING ENGINEERS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
3. THE CONTRACTOR SHALL NOTE THAT THIS DRAWING IS INDICATIVE AND ILLUSTRATES DESIGN INTENT ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED DESIGN AND COORDINATION WITH THE STRUCTURE AND OTHER SERVICES.
4. ANY DISCREPANCIES, ERRORS OR OMISSIONS ARE TO BE CLARIFIED WITH THE RELEVANT ENGINEER AT THE EARLIEST OPPORTUNITY.
5. ALL WORKS TO BE IN ACCORDANCE WITH THE CURRENT RELEVANT REGULATIONS PRACTICE & TRADE ASSOCIATION REQUIREMENTS.
6. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORTS AND MOUNTING ACCESSORIES.
7. ALL ELECTRICAL INSTALLATIONS SHALL COMPLY WITH THE CURRENT I.S.10101 WIRING REGULATIONS.

LEGEND

PUBLIC LIGHTING

- LUMINAIRE A: iGUZZINI UFO RESIDENTIAL OPTIC - 3.64 KLM - 6M COLUMN - 3000K - DIMMED TO 50%
- LUMINAIRE B: iGUZZINI TWILIGHT COPENHAGEN - SYMMETRIC OPTIC - 3.41KLM - 6M COLUMN - 3000K - DIMMED TO 50%
- LUMINAIRE C: iGUZZINI TWILIGHT COPENHAGEN - ASYMMETRIC OPTIC - 5.47 KLM- 8M COLUMN - 3000K - DIMMED TO 33%

Carpark Entrance
Results – Horizontal Illuminance (lux)
Eav= 8.79
Emin= 1.83
Emax= 12.92
Emin/Emax= 0.14
Emin/Eav= 0.21
Emax/Eav= 1.47

General Work Area
Results – Horizontal Illuminance (lux)
Eav= 6.11
Emin= 1.23
Emax= 13.18
Emin/Emax= 0.09
Emin/Eav= 0.20
Emax/Eav= 2.16

Rev	Date	Description	Orig	App
P03	05.03.25	ISSUED FOR INFORMATION	MOC	MOS
P02	26.02.25	ISSUED FOR INFORMATION	MOC	MOS
P01	12.02.25	ISSUED FOR INFORMATION	RU	MOS

Client: DUFFY PROPERTY GROUP

Project: KINSALE LIGHTING DESIGN

Title: PUBLIC LIGHTING LAYOUT

Drawing No: C25001-EDC-XX-00-DR-E-3000

RIBA Work Stage	Status Code	Revision
STAGE 3	S3	P03

Scale @ A1	Model Manager	Project Manager
1:200	MOS	MOS

Mechanical & Electrical Consulting Engineers

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