Waterman Moylan
Engineering Consultants

Engineering Assessment Report, including DMURS: Statement of Consistency

Mixed-use Development at Mooretown Phase 3, Swords, Co. Dublin (SHD)

April 2022

Waterman Moylan Consulting Engineers Limited

Block S, East Point Business Park, Alfie Byrne Road, Dublin D03 H3F4
www.waterman-moylan.ie

Waterman Moylan
Engineering Consultants

Client Name: Gerard Gannon Properties
Document Reference: 21-011r.003 Engineering Assessment Report
Project Number: 21-011

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015 and BS EN ISO 14001: 2015)

Issue	Date	Prepared by	Checked by	Approved by
1	18 August 2021	Robert Walpole	Richard Miles	Mark Duignan
2	11 April 2022	Richard Miles	Mark Duignan	Mark Duignan

Comments

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1. Introduction

1.1 Background of Report

This report has been prepared by Waterman Moylan as part of the documentation in support of a planning application for Phase 3 of a proposed residential development at Mooretown, Swords, Co. Dublin, to be submitted to An Bord Pleanála for a proposed Strategic Housing Development (SHD).

The proposed planning application for Phase 3 of the development forms part of the Oldtown and Mooretown lands, northwest of Swords, which are subject to the Oldtown-Mooretown Local Area Plan (LAP) adopted by Fingal County Council in October 2010.

This report assesses the existing wastewater and surface water drainage, water supply infrastructure and the road and transportation network in the vicinity of the site, and details the criteria used to design and detail the proposed foul water drainage, surface water drainage, water supply and road network required to serve the development.

Accompanying this application for Mooretown 3, is a proposed Stormwater Storage Tank required on the Irish Water foul water network, draining to the Swords Wastewater Treatment Plant and serving the Oldtown / Mooretown and Holybanks catchment in Swords, Co. Dublin. The proposed tank will alleviate known constraints within the Irish Water foul water system (including the subject application site, Mooretown Phase 3), that occur during times of heavy or prolonged rainfall, resulting from surface water and foul water infiltration.

The proposed site for the Stormwater storage tank is located on the junction of the Glen Ellan Road and the Balheary Road, Swords, Co. Dublin. The site is 1.4km north of Swords, 1.1km west of the M1 motorway and 300m south of the Broadmeadow River. The site is owned by The Applicant and is locally referred to as the Celestica/Motorola site.

The storage tank has been designed in conjunction with Irish Water input on volumetric storage capacity and was lodged as a planning application to Fingal County Council by the subject applicant. The application was registered under planning Reg. Ref. F21A/0476 and is currently a live application at Additional Information stage which is due for decision in mid-April 2022 (current status at the time of writing this report). Thus, it was deemed appropriate to propose the tank and the associated works as part of this SHD application.

In this regard, we refer you to the accompanying additional Waterman Moylan Engineering Assessment (EAR Ref: 21-011r.008), Flood Risk Assessment (FRA Ref: 21-011r.009), Construction, Environmental Management Plan (CEMP Ref 21-011r.010) reports and associated drawings (P2001-P2010) prepared under separate cover for this tank, submitted and applied for as part of this SHD planning application.

1.2 Site Location and Description

The Phase 3 site is located at Mooretown, Swords, Co. Dublin, just south of the Rathbeale Road, as shown in *Figure 1* overleaf, and is part of the Oldtown-Mooretown LAP (2010-2016) lands as shown in *Figure 2*.

The Oldtown-Mooretown LAP lands are located at the western development edge of Swords, within the catchment of the Broadmeadow River. The LAP lands cover an area of approximately 111 hectares.

The Oldtown–Mooretown lands are divided by the Rathbeale Road, with Oldtown lands to the north (c. 50 Ha) and Mooretown to the south (c. 61 Ha). This subject Application, which forms Phase 3 of the Mooretown development, is located in the southern extent of the Moortown Lands.

The site is currently agricultural land (tillage), 18.378 ha gross area and is located 2km west of Swords town centre.

The subject site is bounded to the east, west and partially to the south by agricultural land, also to the south is the Abbeyvale residential development. To the north is the completed Mooretown School Campus, and future Mooretown Phase 2 (granted planning reference: F16A/0505).

The Mooretown School Access Road has been constructed, and completed, under planning reference number: F14A/0012. The northern portion of the Mooretown Distributor Road from the Rathbeale Road has been constructed under planning reference number F12A/0270. The Mooretown Distributor Road Extension as shown with a blue boundary also in *Figure 1*, has received a grant of planning permission, and has an application reference number of: F20A/0096. We also refer you to site layout drawing 21-011-P1000 accompanying this report.

The site generally tends to slope from southwest to northeast from a height of C.58m to a low of 37m.

Figure 1 | *Site location (Image: Google Earth)*

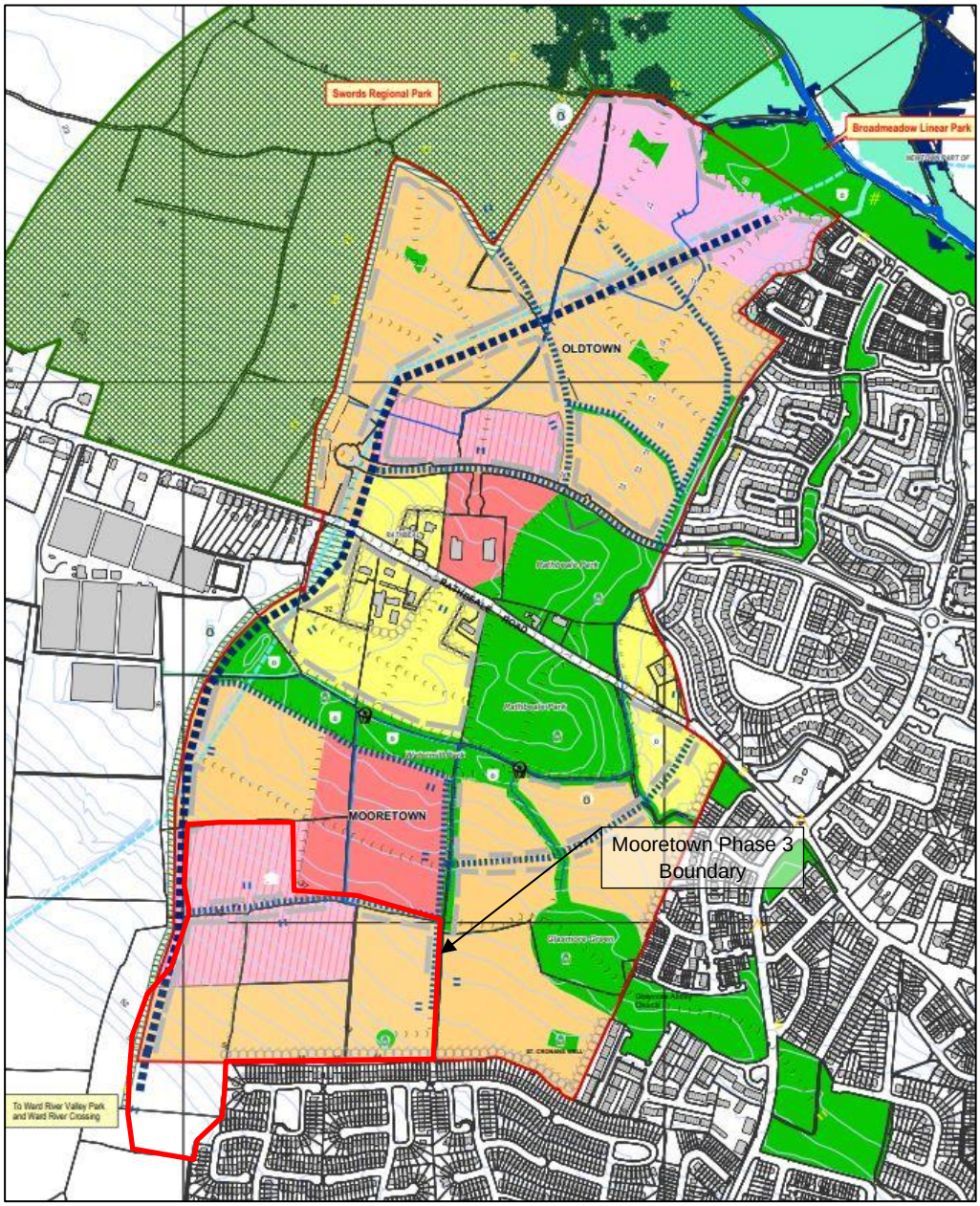


Figure 2 | *Image extracted from the Oldtown-Mooretown LAP 2010*

The site was visually surveyed in February 2021 and was found to be generally served by static ditches which convey flows internal to the site only, during heavy rainfall events. The exceptions to this are the ditch forming the western boundary, and the artificial grip ditch to the south of, and formed by construction of, the Mooretown School Access Road. These both had low steady flows.

1.3 Proposed Development

The proposed development will consist of 650 units, comprising of: 265 No. houses, 119 No. Duplex/Triplexes units, and 266 No. apartments, as summarised in Table 1 below.

Summary Residential Schedule of Accommodation			
Apartments			
1 Bed Units	76		11.69%
2 Bed Units	190		29.23%
Duplexes			
2 Bed Units	3		0.46%
3 Bed Units	110		16.92%
Triplex			
3 Bed Units	6		0.92%
Housetypes			
3 Bed Houses	240		36.92%
4 Bed Houses	25		3.85%
Total	**650**		100.00%

Table 1 | *Summary of Residential Accommodation Type*

A creche (519m²) and commercial spaces of retail and cafe (totalling 946m²) will also be constructed as part of the development.

The development is proposed to be accessed via 8 No. vehicular entrances, 2 No. from the Mooretown Distributor Road Extension and 6 No. from the Mooretown School Access Road which was granted planning under reg ref: F20A/0096. Of the 6 No. entrances on the Mooretown School Access Road, 2 No. of these entrances will serve the Mooretown Phase 3 lands to the north of this access road with the remaining 4 No. entrances serving the lands to the south.

The development includes all associated site works, boundary treatments, drainage and service connections.

2. FCC/ABP Planning Process Raised Issues

2.1 ABP Opinion Report – Response to Engineering Items - Transport

It is noted that Item 3 of the ABP opinion notes the following Transportation information request.

"A Traffic and Transport Assessment including, inter alia, a rationale for the proposed car parking provision should be prepared, to include details of car parking management, car share schemes and a mobility management plan."

In this regard, a full and comprehensive Traffic and Transport Assessment has been prepared and accompanies this submission. We refer you to Section 14 of this report with respect to car parking provision and rationale. We similarly refer you to the accompanying Travel Plan, which includes details of car parking management, car share schemes proposed and a mobility management plan for the development.

2.2 FCC Transportation Planning Section Stage 2 Report Items Raised

All items noted within the FCC Transportation planning section Stage 2 report have been noted and addressed. Meetings have been held after the Tripartite meeting with Fingal County Council Transportation Section (Linda Lally 04/03/22), and the Active travel section (Breen Doris 16/03/22) as required to facilitate appropriate closure on each raised item.

A summary of the FCC transportation report items and actions taken is supplied below:

- Parking –
  - Access arrangements to the podium parking and layouts for Blocks A & B, noted as being unclear. Following discussions held with Linda Lally of Fingal County Council Transportation Section, the accesses have been updated on plan to reflect clear priority to the pedestrian, creating a shared pedestrian crossing and maintaining concrete path finish at entry points to re-enforce this priority to the vulnerable road user (VRU).
  - Similarly, access arrangements to parking courts E has been updated on plan to reflect clear priority to the pedestrian, creating a shared pedestrian crossing and maintaining concrete path finish at entry points to re-enforce this priority to the vulnerable road user (VRU).
  - Parking Provision – A breakdown on parking provision and the standards applied has been supplied under section 13 of the Traffic and Transport Assessment.

- Road Hierarchy and Layout
  – FCC noted concerns with respect to Pedestrian Priority. A review of the layout has been undertaken and following discussions with both Linda Lally and Breen Doris of Fingal County Council Active Travel Section, the linemarking and signage, junction and entrance priorities have been adapted to ensure priority is with the vulnerable road users, as far as is practical throughout the Phase. In this regard, we refer you to the updated road layout, hierarchy and linemarking drawings accompanying the submission (P1100-P1104).
  - FCC noted particular concern the installed junction layouts to the 2-way cycle track connecting the school campus and the Western Distributor Link road. These junctions were installed by the applicant as part of planning permission F14A/0012. In this regard, as part of this submission these junction layouts have been revised is in keeping with the design details within the NTA's Cycle manual. We refer you to the updated road layout, hierarchy and linemarking drawings accompanying the submission (P1100-P1104) and typical example supplied on details drawing P1120. Cycle track and Footpath at these junctions shall continue through the junction at grade with vehicles required to ramp up to cross the VRU priority zone.

- Recommendation for further measures to enforce lower speeds. In this regard, a one-way system has been introduced along with raised ramp VRU priority tables at junctions, “slow zone” signage at development entry points and natural speed reducing features (curvature, 1-way proposals and junctions every 70-80m). Also included is on-street parking, which further re-enforces a slow speed environment, in accordance with the recommendations of DMURS. In this regard, we refer you to the updated road layout, hierarchy and linemarking drawings accompanying the submission. (P1100-P1104).
One way road layout proposals have been presented to Linda Lally of Fingal Transport and have been welcomed in principal 9 July 2021. Details surrounding self-regulation of speeds were taken on board and nodal points, transitional zones including ramps and shared surface homezone areas have been implemented to create a self-regulating speed environment.
- Road 1.1.1 – Following discussion agreements with Linda Lally, the layout has been revised such that the crossing of the east-west cycle track is very clearly vulnerable road user prioritised and that the vehicular crossings of this track are required to ramp up to this shared zone of VRU priority. In this regard, we refer you to the updated road layout, hierarchy and linemarking drawings accompanying the submission. (P1100&P1103).

- Bicycle Parking
  - Parking Provision – A breakdown on parking provision and the standards applied has been supplied under section 14 of the Traffic and Transport Assessment.
  - For bicycle locations and accessibility, we refer you to the accompanying architectural submission drawings, supplied under separate cover.

- School
  - Consideration of the adaptation of the constructed Main Street (constructed under F14A/0012) that serves the school campus into a school streets/safe street. In this regard, a meeting was held with Breen Doris of FCC active travel, and the items raised at this meeting have been incorporated into this planning submission to adapt Main Street into a safer and slower ‘School Street’. In this regard, we refer you to Section 6 of this report. We similarly refer you to the updated road layout, hierarchy and linemarking drawings (P1100&P1101) and details drawing P1120 accompanying the submission.

- Traffic Impact Assessment –
  - Meetings have been held with FCC transportation section (Linda Lally 04/03/22), and the Active travel section (Breen Doris 16/03/22) where the importance of high-quality cycling and pedestrian linkages was discussed. In this regard, over and above the VRU priority focus discussed above, the cycle linkages to the wider network are developed in drawing P1005 accompanying the submission package.
  - We further note in this regard, that a Travel Plan has been prepared as part of this package submission and is supplied under separate cover. This Travel Plan presents how the proposed development will seek to reduce demand for and use of cars by increasing the attractiveness and practicality of other modes of transport.

- Taking-in-charge

  We refer you to the accompanying CCK taking in charge layout identifying all areas proposed to be taken in charge.

- Swept Path - We refer you to the refuse vehicle swept path layout drawing 21-011-P1110.

- EV Charging – We refer you to section 13 of the accompanying Traffic and Transport Report with respect to EV parking provision figures, and similarly the architectural submission supplied under separate cover, identifying the proposed EV charging locations.

  All residential house parking spaces shall include EV charging provision in the form of cable ducting and capacity on distribution boards, in accordance with current building regulation. Ducting and services provided as part of the proposed development shall be installed to facilitate non-disruptive retro fitting of EV charging points in accordance with the requirements of current Building regulation. It is proposed to supply 72 communal charging spaces, in excess of the 10% minimum identified in FCC's Stage 2 opinion.

- Oldtown Mooretown LAP, Phasing, and associated infrastructure requirements

  Extent and Delivery requirements of the Applicant to be agreed.

  In this regard, a meeting was held with Linda Lally of the Fingal County Council Transportation Department with respect to the wider transportation infrastructural works outlined within the expired Oldtown/Mooretown LAP, on the 4th of March 2022. We refer you to section 6 of this report, identifying:
  - Works complete to date by the applicant,
  - Works to be undertaken by the applicant, or
  - Works outside of the development boundary and remote from the site have been identified as not under the applicant's remit.

2.3 ABP Stage 2 Opinion Report Items Raised - Drainage

It is noted that the ABP opinion notes the following Drainage information request

"Further consideration and/or justification of the documents as they relate to the proposed treatment of the wastewater. In particular, the consideration/clarification should address the contents of the submission from Irish Water (dated 18th of October 2021) concerning the need to deliver a storage tank to facilitate an increase in the capacity of the wastewater infrastructure. Clarity is required at application stage as to what upgrade works are required, who is to deliver these works, when are the works to be delivered relative to the completion of the proposed housing development and whether such upgrade works are to be the subject of separate consent processes."

As noted below in Section 3.2, the proposed downstream tank to the wastewater network, forms part of this planning application. As a result of known constraints (due to stormwater ingress) within the existing Irish Water gravity foul network, Irish Water have modelled the catchment, and indicated that they require a storage tank of 2,250m3 volume to be located, ideally near the outfall sewer on the

Balheary Road. In this regard, it is proposed to provide a Stormwater storage tank and outfall utilising lands on the Celestica site to alleviate these constraints, as further developed within the accompanying “Additional Engineering Assessment Report” 21-011r.008, submitted under separate cover. These critical wastewater infrastructure works will be developer led through the planning process. Delivery/Construction of this critical piece of infrastructure will occur in advance of the subject proposed housing development, by either the Applicant or Irish Water, still to be determined. The planning submission for this infrastructure forms part of this subject (Mooretown Phase 3) planning application package.

2.4 FCC Water Services Planning Section Stage 2 Report Items Raised

The water services planning section report deemed the submission acceptable with respect to foul sewer, surface water and water proposals, subject to standard procedure and the downstream upgrade of the foul network required to facilitate connection. In this regard, we refer you to section 3.2 below

3. Foul Water Network

3.1 Existing Foul Water Network

Foul drainage records were obtained for the site, there are no foul drainage networks located within the site boundary in the greenfield areas. Networks have been constructed/will be constructed/are currently under construction as part of the Mooretown School Campus, Phase 1, Phase 2, Distributor Road & Distributor Road Extension projects.

The Mooretown foul drainage strategy envisages that all the Mooretown phases will drain in a northerly direction to the existing 500mmØ foul sewer that crosses the Rathbeale Road, constructed to facilitate the Mooretown Lands. This public sewer flows northwards through Oldtown, to the Glen Ellan Road, from where it flows in an easterly direction to Swords Wastewater Treatment Plant which has been upgraded in recent years to be able to cater for a P.E. (population equivalent) of 90,000.

3.2 Proposed Foul Water Network

It is proposed to drain wastewater in a north-easterly direction through a series of 150mm and 225mm sewers as can be seen on Drainage Layout drawing number: P1200. There are 7 No. connection points, 1 No. to the foul network in the Mooretown distributor road extension (planning permission granted F20A/0095) and 4 no. to the foul network in the Mooretown school access road (construction completed). The remaining 2 No. Connections will be for the Phase 3 lands north of the School Access Road, which will connect to the permitted phase 2 drainage network. The foul network in the Mooretown Distributor Road Extension will flow north and connect to the foul network in the Mooretown School Access Road which in turn flows easterly and then northerly along the eastern boundary of the School Campus. It then connects to the foul network in Mooretown Phase 1 (currently under construction) before outfalling to the 500mmØ foul sewer crossing the Rathbeale Road as discussed in Section 2.1.

A pre-connection enquiry was submitted to Irish Water. The subsequent confirmation of feasibility letter (CDS21002769) dated February 3rd, 2022, included as Appendix A, advises of the downstream constraints and the requirement of a storage tank.

The required storage tank has been designed in conjunction with Irish Water input on volumetric storage capacity and was lodged as a planning application to Fingal County Council by the subject applicant. The application was registered under planning Reg. Ref. F21A/0476 and is currently a live application at Additional Information stage which is due for decision in mid-April 2022 (current status at the time of writing this report). Thus, it was deemed appropriate to propose the tank and the associated works as part of this SHD application.

We refer you to the accompanying Waterman Engineering Assessment (EAR Ref: 21-011r.008), Flood Risk Assessment (FRA Ref: 21-011r.009), Construction, Environmental Management Plan (CEMP Ref 21-011r.010) reports and associated drawings (P2001-P2010) prepared for this tank, which is similarly submitted and applied for as part of this SHD planning application.

A Statement of Design Acceptance for the subject site has been received from Irish Water and is similarly appended in Appendix A.

3.3 Foul Water Drainage Calculations

The calculated foul water flows at the subject development are set out in the table overleaf. Domestic wastewater loads have been calculated based on 2.7 persons per unit with a daily per capita wastewater flow of 150 litres with a 10% unit consumption allowance, in line with Section 3.6 of the Irish Water Code of

Practice for Wastewater Infrastructure. A peak flow multiplier of 3 has been used, as per Section 2.2.5 of Appendix B of the Code of Practice.

It is estimated that the crèche will generate flow for 117 persons (102 children and up to 15 staff), with a wastewater volume of 90 litres per head per day, based on the figure for the most similar type of usage: a non-residential school with canteen facilities, also as per Appendix C of the Code of Practice.

The 946m² of commercial space has calculated for a "worst case scenario" waste flow production figure. This assumes that all commercial units will be "wet commercial" and a high usage factor of 42m³/ha/day as per Table 2.8 of the Irish Water Code of Practice has been applied.

Description	Total Population	Load per Capita	Daily Load	Total DWF	Peak Flow
	No. People	*l/day*	*l/day*	*l/s*	*l/s*
265 Houses	715.5	150	118,057	1.366	4.10
119 Duplex/triplex	321.3	150	53,015	0.614	1.842
266 Apartments	718.2	150	118,503	1.372	4.116
Commercial units	-		3,973	0.046	0.138
Crèche	117	90	11,583	0.134	0.402
Total	**1872**	**-**	**305,131**	**3.532**	**10.596**

Table 2 | *Calculation of Total Foul Water Flow from the Development*

The total dry weather flow from the development is 3.532 l/s, with a peak flow of 10.596l/s.

3.4 Foul Water Drainage – General

Foul water sewers will be constructed strictly in accordance with Irish Water requirements. No private drainage will be located within public areas.

Drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H.

4. Surface Water Network

4.1 Existing Surface Water Network

The subject site is predominantly greenfield in nature and slopes from a height of 58m in the southwest corner to 37m in the north-east. The site lies withing the catchment of the Broadmeadow River which outfalls to the Malahide estuary. The estuary is a Special Protection Area (SPA), a candidate Special Area of Conservation (cSAC) a proposed National heritage Area (pNHA) and a RAMSAR site.

The site is drained by surface ditches as shown in the figure below, which in turn flow to the Mooretown Mill Stream, on the eastern border of the Mooretown LAP lands. This Mill Stream flows north to the Rathbeale Road where it is culverted by 1200mmØ pipes which traverses the eastern boundary of the oldtown lands before ultimately discharging to the Broadmeadow River.

Neither the Oldtown/Mooretown Lands nor the adjacent Broadmeadow River are part of the SPA or SAC site, however, any development immediately upstream is required to maintain, or improve the quality of surface water to status objectives, as set out in the Water Framework Directive (WFD). These requirements are in place in order to protect and enhance the status of the aquatic ecosystems of the SAC or SPA site. This will require the implementation of SuDS, which are intended to be utilised as part of the development.

Figure 3 | *Existing Surface Water Drainage Network*

An inspection of the existing ditch system was undertaken on 26/02/2021 after rainfall and noted the following:

1. This ditch had a light steady flow south to north.
2. This ditch had a small amount of standing water but no evidence of any flow.
3. This ditch had no water present aside from a small build up at the northern end. No flow noted.
4. The rear of the adjacent units in Abbeyvale is heavily overgrown, there is no evidence of a ditch running west-east.
5. Artificial grip ditch created to cater for ditches connecting from the north, with light flow from west to east.
6. This ditch had extremely light flow, south to north.
7. No flow in this ditch however the invert was found to be damp, ditch ends at an infilled crossing point to adjacent field and resumes on the other side of the crossing.

In general, the existing ditch systems (2-7) appear to be static ditches and do not convey surface water from upstream lands or upstream development. Only ditch 1 conveys water from upstream lands as all other ditch systems have been severed by the adjacent development to the south.

4.2 Proposed Surface Water Network and SuDS Strategy

Mooretown Phase 1's parent planning permission (F15A/0183) and the adjacent Mooretown Road Extension (F14A/0012) were designed to accommodate the attenuation volumes for the entire Mooretown LAP lands including the subject application site: Mooretown Phase 3, within the Watermill Park and Mooretown Road detention basins and ponds, before discharging at restricted greenfield rates to the Mill Stream. The Mill Stream traverses the Mooretown site, west to east. In this regard, we refer you to the catchment drawing submitted and permitted as part of the Mooretown 1 parent planning permission, an extract of which is included as *Figure 4* overleaf, marked-up to show the Mooretown 3 lands. We also refer you to the proposed Mooretown 3 drainage layout and overall Mooretown drainage strategy layout drawings P1200 and P1210 respectively, identifying drainage routing within Phase 3 and the greater Mooretown area, in accordance with the overall drainage strategies outlined above.

As is identified in *Figure 4* overleaf, the western portion of Mooretown Phase 3 forms part of Mooretown **Catchment A1** and is attenuated within the attenuation pond in the north-western corner of Mooretown Lands, before discharging through Mooretown 1 at greenfield rates ultimately outfalling at the Mill Stream. The pond has been sufficiently sized to cater for the increased Mooretown 3 western catchment at the southern extent of Mooretown 3. The eastern portion of Mooretown Phase 3 forms part of **Catchment C** is attenuated in attenuation pond/basin C at the eastern end of the Mill Stream. It is not proposed to deviate from this permitted strategy. It is noted that the pond for **Catchment A1** has been constructed as part of the Mooretown Road and School Access Road works (F14A/0012) and the construction of pond/basin for **Catchment C**, will be constructed under Mooretown Phase 1, which has recently commenced.

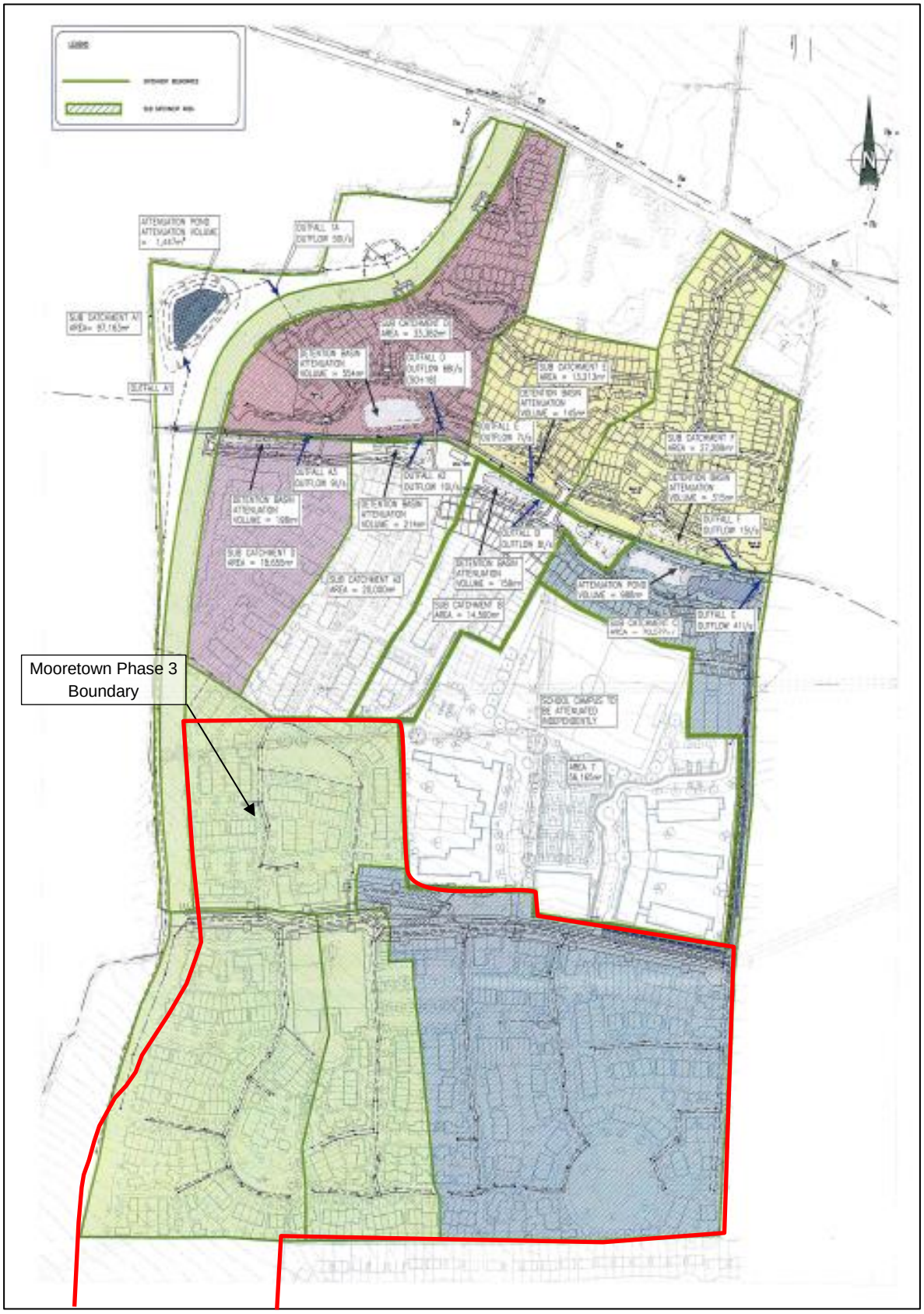


Figure 4 | *Permitted Overall Mooretown Catchment Strategy*

The local surface water piped network within Phase 3 will be designed to accommodate flows from the 1 in 5-year storm. As noted above, the 1 in 100 storm events (plus 20% to accommodate climate change) shall be catered for in the permitted Watermill Park and Mooretown Road detention basins and ponds constructed under parent planning permission F15A/0183 and the adjacent Mooretown Road planning permission F14/0012. In this regard, we again refer you to the surface water layout drawing P1200 & P1210 showing the network for surface water within Mooretown 3 and the connecting Mooretown surface drainage strategy to the respective catchment outfall ponds.

Similar to the approved Mooretown Phase 1 Strategy, Phase 3 will also incorporate similar SuDS features as an integral part of the surface water strategy and design process. This strategy is based upon recommendations in the Greater Dublin Strategic Drainage Study (GDSDS) and in the Ciria SuDS Manual. The approved Mooretown Phase 1 design incorporates a storm water management approach across the entire development through the use of various SuDS techniques. Typical proposed Mooretown SuDS details have been provided on accompanying drawing P1230.

FCC's SuDS checklist, required to be submitted as part of the planning application package, is included as Appendix D to this report.

Based on three key elements, Water Quantity, Water Quality and Amenity, the targets of the Mooretown SuDS Strategy are:-

- Water Quality Protection – in receiving watercourses and groundwater.
- Stream Regime Protection – minimisation of ecological/physical impacts on receiving streams.
- Level of Service Protection – protection of the site from flooding of the drainage system.
- Stream Flood Protection – minimising the risk of downstream flooding.
- Site Flood Protection – control of flooding of the site during extreme events.
- Amenity – Ponds/wetlands can be visually attractive & add to the character of developments.

A SUDS train concept has been implemented in the design of the storm water systems for the subject development as a whole:

- Source Control - Individual house or structure.
- Site Control - A site or phase within the subject lands.
- Regional Control – An entire catchment, i.e. Oldtown or Mooretown.

The SUDS train consists of a selection of the following drainage structures and features:-

<u>Source Control</u>

Filter Drains:

It is proposed to install 225mm diameter filter drains, consisting of perforated pipes surrounded in filter stone around the perimeter of each apartment block and in open areas adjacent to roads. The filter drains will provide infiltration, optimise the retention time, and provide quality improvement to the storm water runoff, in particular the first flush from hardstanding areas. The proposed perforated pipes connect to the proposed surface water sewer network.

Permeable Paving:

It is proposed to introduce permeable paving at all private driveways and parking courts throughout the development. Downpipes from the front of the houses and apartments will drain to filter drains beneath the permeable paving to facilitate maximum infiltration of surface water from driveways and roof areas.

The goal of permeable paving is to control stormwater at the source to reduce runoff. In addition to reducing surface runoff, permeable paving has the dual benefit of improving water quality by trapping suspended solids and filtering pollutants in the substrata layers.

Bio-retention Systems/Raingardens:

Bio-retention planted areas will be provided within the private domain around apartment blocks. Planted boxes will intercept down pipes from the apartment blocks.

Green / Sedum Roof:

It is proposed to introduce sedum roofing as a source control device. The sedum roofing is proposed to cover 60% of the roof area of all Apartment Blocks. The sedum roofing shall typically consist of 75mm substrate with a sedum blanket. This is in-line with FCC's document titled: Green/Blue Infrastructure for Development – Guidance notes, which stipulates that a green roof should be provided where a roof surface area exceeds 300m².

The substrate and the plant layers in a green roof absorb large amounts of rainwater and release it back into the atmosphere by transpiration and evaporation. They also filter water as it passes through the layers, so the run-off, when it is produced, has fewer pollutants. Rainfall not retained by green roofs is detained, effectively increasing the time to peak and slowing peak flows.

A sedum roof can reduce annual percentage runoff by between 40% and 80% through this retention and evapotranspiration, with the impact dependent on a range of factors including the depth of substrate, the saturation of substrate at the onset of a rain event, the angle of the roof, the range of vegetation growing, intensity of rainfall and the time of year.

A paper entitled *Green Roofs Over Dublin: A Green Roof Policy Guidance Paper for Dublin* was published in August 2008 with guidelines for Dublin City Council to develop planning directives for the incorporation of green roofs in new development. The below table is taken from this document and shows the percentage of total rainfall retention over a 14-month period for different green roof treatments.

Slope	**Media Depth**	**Light Rain** *<2mm*	**Medium Rain** *2mm-6mm*	**Heavy Rain** *>6mm*	**Overall**
2.0%	25mm	95.1%	82.9%	64.7%	69.8%
2.0%	40mm	97.1%	85.5%	65.1%	70.1%
6.5%	40mm	94.9%	83.1%	59.5%	65.9%
6.5%	60mm	95.8%	84.6%	62.0%	68.1%

Table 3 *| Percentage of Total Rainfall Retention Over a 14-Month Period (Aug 2002-Oct 2003)*

The proposed sedum roofing shall be on flat roofs with 2% slope with a media depth of 75mm, exceeding the depths shown above. Thus, the percentage of total rainfall retention can be expected to exceed the tabulated figures.

Site Control

Roadside Trees:

It is proposed to provide roadside trees throughout the development. Trees can help control storm water runoff because their leaves, stems, and roots slow rain from reaching the ground and capture and store rainfall to be released later. Trees help to attenuate flows, trap silts and pollutants, promote infiltration and prevent erosion. Incorporating tree planting offers multiple benefits, including attractive planting features, improved air quality and increased biodiversity whilst helping to ensure adaptation to climate change.

Bio-retention Systems/Raingardens:

Rain gardens are proposed at open spaces around the site. Rain gardens are gardens of native shrubs, perennials, and flowers planted in a small depression, designed to temporarily hold and soak in rainwater runoff that flows from roofs, driveways, patios, or lawns.

Regional Control – Residual permitted (F15A/0183) Mooretown Phase 1 Lands

Attenuation Pond:

Two attenuation ponds are proposed to attenuate and treat surface water runoff from future development in the southern half of the Mooretown lands, as approved under Reg. Ref. F14A/0012 and F15A/0183. These attenuation ponds have been sized to provide treatment storage within the permanent waterbody and attenuation for up to the 100-year rainfall event for their respective sub-catchments, as indicated in *Figure 4*. As outlined previously, the eastern portion of the subject lands is proposed to drain to the attenuation pond at the eastern end of Watermill Park, on the southern side of the Mill Stream. The western portion of Mooretown 3 is proposed to drain to the pond in the north-western corner of the Mooretown lands.

Dry Detention Basin:

Several dry detention basins have been provided to accommodate attenuation for up to the 100-year rainfall event. The detention basins are vegetated depressions along the Watermill Park either side of the Mooretown Stream and have been designed to cater for the respective catchments within Mooretown as indicated on the SW catchment drawing extracted to *Figure 4*, before discharging to the Mill Stream.

Petrol Interceptors:

Class 1 Light Liquid bypass Interceptors are proposed at each detention basin and attenuation pond outfall to the Mill Stream.

As previously mentioned, the above SUDS strategy was agreed and approved under Planning 01, Reg. Ref. F15A/0183.

4.3 Flood Risk Assessment

Both internal and external flooding have been assessed in the Flood Risk Assessment Report which accompanies this Engineering Assessment Report. The Flood Risk Assessment has been carried out in accordance with the *DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management* published in November 2009.

The assessment identifies the risk of both internal and external flooding at the site from various sources and sets out mitigation measures against the potential risks of flooding. The sources of possible flooding assessed in the report include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical errors.

As a result of the flood risk management and mitigation measures proposed, the residual risk of internal or external flooding for the 30-year and 100-year flood events is low, and accordingly all four of the above criteria have been met. Please refer to the accompanying Flood Risk Assessment report for the full analysis of the flood risk at the subject site.

4.4 Surface Water – General

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Fingal County Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Fingal County Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements of the Building Regulations, Technical Guidance Document H.

5. Water Supply

5.1 Existing Water Supply

As with the foul water in section 2, watermain records were obtained for the site. There are no networks internal to the site on the greenfield areas, however some networks are at various stages of construction as part of the Mooretown Phases 1 & 2, School Campus and Distributor Road projects.

The Mooretown Lands, including those of Phase 3 the subject of this application, will connect to the existing 300mmØ watermain that traverses the Rathbeale Road at the junction between the Rathbeale Road and Mooretown Distributor Road. This 300mm diameter main extends south along eastern side of Mooretown Distributor Road to the Mooretown 3 lands.

5.2 Proposed Water Supply

An application has been made to Irish Water, requesting a Confirmation of Feasibility letter. This application has a reference number of: CDS21002769 and the subsequent Confirmation of Feasibility Letter was issued dated 3rd February 2022. This letter is included as Appendix A. This letter does not note any local upgrades required but does request the location of 2 No. connection points to serve the Phase 3 development.

It is proposed to serve the site by utilising a series of 100mm and 150mm diameter mains. The network routing and connection points have been shown on water layout drawing P1300. As indicated on P1300, the internal Mooretown Phase 3 water network is proposed to connect to the adjacent 300mm diameter main within Mooretown Distributor Road Extension, to the 150mm diameter main within the Mooretown School Access Road, and also as specifically requested by Irish Water, to the 150mm diameter main within the Abbeyvale residential development.

A Statement of Design Acceptance has been received from Irish Water and is similarly appended in Appendix A.

5.3 Water Supply Calculations

The calculated water demand at the subject development is set out in the table overleaf. The average domestic demand has been established based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 150 litres and with a 10% allowance factor. The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the average day/peak week demand, as per Section 3.7.2 of the Irish Water Code of Practice for Water Infrastructure.

No information/data is available in order to calculate the consumption rates for the commercial units or creche, and as is standard, their consumption rates have been included in the table overleaf, to match those figures which are provided for the waste production rates, as discussed in Section 2.4.

Description	Total Population	Water Demand	Average Demand	Average Peak Demand	Peak Demand
	No. People	*l/day*	*l/s*	*l/s*	*l/s*
265 Houses	715.5	150	1.366	1.708	8.540
119 Duplex/triplex	321.3	150	0.614	0.768	3.840
266 Apartments	718.2	150	1.372	1.715	8.575
Commercial units	-	3,973	0.046	0.057	0.287
Crèche	117	11,583	0.134	0.168	0.840
Total	**1872**		**3.532**	**4.416**	**22.082**

Table 4 | *Calculation of Water Demand for the Development*

The average demand for the development is 4.4 l/s, with a peak demand of just over 22 l/s. This water demand will come online as the development is built out and occupied.

5.4 Water Supply – General

All watermains will be laid strictly in accordance with Irish Water requirements for taking in charge.

Valves, hydrants, scour and sluice valves and bulk water meters will be provided in accordance with the requirements of Irish Water and Fingal County Council Water Services Department.

6. Roads and Transport Network

This section provides an overview of the existing and proposed road and transportation network in the vicinity of the site. A comprehensive Traffic and Transport Assessment and Travel Plan have also been prepared by Waterman Moylan in accordance with the requirements of the Traffic and Transport Assessment Guidelines published by National Roads Authority in May 2014 and accompanies this submission under separate covers.

6.1 Existing Road Network

The site is to be accessed from the Rathbeale Road via the Mooretown Distributor Road, and then either via the Mooretown Distributor Road Extension or the Mooretown School Campus Access Road, as shown on *Figure 1* and accompanying drawing P1000.

The Rathbeale Road (R125), has recently undergone extensive upgrade works, completed in 2020, so as to ensure its suitability for the increase in usage due to additional residents and construction works being undertaken as part of the LAP. It has a posted speed limit of 50 km/hr and is comprised of a 5m wide, 2-lane carriageway, a 1.8m wide pedestrian footpath & 2.25m cycleway on the northern side and a 3.5m shared surface for pedestrians/cyclists on the southern side. The upgraded Rathbeale Road offers a vastly improved and safer connection for the Oldtown / Mooretown development LAP lands with the town of Swords and local schools in the area.

The junction of the Mooretown Distributor Road and the Rathbeale Road has been fully upgraded in advance of the proposed development of Mooretown Phases 1, 2 & 3. The junction is a signalised 4-way intersection. Pedestrian/cyclist crossings and right turn stacking lanes have been incorporated.

The Mooretown distributor road has been designed in accordance with the requirements of the LAP. It is envisaged that this road will later connect to the Brackenstown Road (L2030) to the south as part of future LAPs to neighbouring areas.

The Mooretown Road has been constructed to just south of the Mooretown School Access Road junction and has recently received a grant of planning by Fingal County Council for an extension to the southern ownership of the Applicants lands. It is anticipated that these works will commence in 2022. A pedestrian link from the Mooretown Road extension to Abbeyvale development, to the south of the Mooretown Lands has also received a grant of permission.

The nearest motorway is the M1, which can be joined at Junction 3, near Feltrim, is approximately 3.75km southeast of the site.

6.2 Proposed Road Layout

It is proposed to provide 8 No. site entrances from the existing and permitted road network adjacent to the Phase 3 development, the subject of this application. 6 No. of these entrances will be from the existing Mooretown School Access Road, 2 No. of which will serve the Phase 3 lands to the north of the School Access Road and the other 4 No., serving the lands to the south. The remaining 2 site entrances are proposed to be located on the permitted Mooretown Distributor Road Extension and will also serve the development lands south of the School Access Road.

All road design has been cognisant of the requirements of Road Safety Audit recommendations and the requirement of DMURS, typical of all other stages of the Oldtown/Mooretown development and as discussed in the following sections. We refer you to the accompanying Road Layout Drawing P1100, which also shows the road hierarchy, and the Road Layout Drawings P1101-P1104, supplied as part of this submission identifying the proposed road network within and around the Mooretown Phase 3 site. As noted above, the site is to be accessed from the Rathbeale Road via the Mooretown distributor road, and then by

either the Mooretown Distributor Road Extension or the Mooretown School Campus Access Road. Internal primary and secondary link roads as shown on drawing P1100 allow access to the development units.

The development's proposed internal road network will benefit from a one-way route designed to efficiently serve the residential units. This proposal has been discussed in detail, and approved in principle, by representatives of the FCC transportation department. Refer to Drawing Number: P1100, for details of this proposed one-way system. Further discussion has been held with Linda Lally (04/03/2022) to address items raised within the Stage 2 opinion, as noted above in section 2.0 and in this regard a full review has been undertaken on the proposed roads layout.

A Swept Path Analysis has been undertaken for the entirety of the site, refer to drawing number: P1110. This has not indicated any access issues for a refuse vehicle, which is greater in dimension than that of a typical fire tender which would attend residential units. A high reach fire tender, however, is greater in dimension than that of a refuse vehicle and would be required for any incidents at structures of 4 stories or higher. The adjacent road network for the proposed blocks of 4 stories have been designed in width and curvature to facilitate access of this larger emergency vehicle should the need arise.

6.3 Safe Schools/School Streets

A meeting was held with Linda Lally (04/03/22) of FCC Transport and Breen Doris (16/03/22) of FCC Active Travel, to address the FCC SHD Stage 2 opinion request to provide "consideration of a school street or safe schools" to constructed Main Street (constructed under F14A/0012). This Main Street traverses the northern portion of the subject development site and provides access to the Broadmeadow Community National School and Swords Community College.

In this regard, FCC Transport acknowledged the fact that this Main Street is already installed, as permitted under F14A/0012, and that this would be considered.

To change the environment of constructed Main Street into a "Safe School" street, it is proposed to:

- Introduce raised ramps along Main Street to facilitate pedestrian priority crossings, including at the entry point from the adjacent Western Distributor Link Road, reinforcing the low-speed environment
- Provide high quality tree planting along the route, as indicated in the accompanying Landscape Architecture submission package.
- Integrate pencil bollards adjacent the carriageway to highlight school zone environment
- Introduce linemarking to notify vehicles entering of school zone.

In this regard, we refer you to the updated road layout, hierarchy and linemarking drawings accompanying the submission, namely drawings P1100 and P1101 and detail drawing P1120, which shows pencil bollards proposed adjacent the carriageway.

6.4 Road Safety Audit

A Stage 1 & 2 Road Safety Audit was carried out by Bruton Consulting Engineers and the final report is included in full as Appendix B. The Road Safety Audit comprised an examination of draft planning drawings provided by Waterman Moylan and a site visit by the Audit Team, which was carried out on the 4th of August 2021. The findings of the report have been addressed as part of the revised submission package.

6.5 DMURS and Statement of Design Consistency

6.5.1 Background

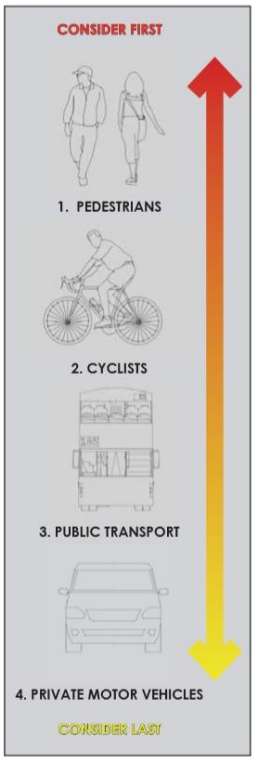
The stated objective of DMURS is to achieve better street design in urban areas. This will encourage more people to choose to walk, cycle or use public transport by making the experience safer and more pleasant. It will lower traffic speeds, reduce unnecessary car use, and create a built environment that promotes healthy lifestyles and responds more sympathetically to the distinctive nature of individual communities and places. The implementation of DMURS is intended to enhance how we go about our business, how we interact with each other, and have a positive impact on our enjoyment of the places to and through which we travel.

6.5.2 DMURS: Statement of Design Consistency

Waterman Moylan Consulting Engineers considers that the proposed road and street design is consistent with the principles and guidance outlined in the Design Manual for Urban Roads and Streets (DMURS). Outlined below are some of the specific design features that have been incorporated within the proposed scheme with the objective of delivering a design that is in compliance with DMURS.

6.5.3 Creating a Sense of Place

Four characteristics represent the basic measures that should be established in order to create people friendly streets that facilitate more sustainable neighbourhoods. These characteristics are connectivity, enclosure, active edges, and pedestrian activities/facilities.



Connectivity:

"The creation of vibrant and active places requires pedestrian activity. This in turn requires walkable street networks that can be easily navigated and are well connected."

In order of importance, DMURS prioritises pedestrians, cyclists, public transport and private cars. This is illustrated in the adjacent image extracted from DMURS.

The proposed development has been designed with pedestrians and cyclists taking precedence over other modes of transport. In this regard, footpaths are provided throughout the development with regular pedestrian crossings along anticipated desire lines. Footpaths within the development will generally by 2m wide, which is wide enough to allow 2 wheelchairs to pass each other without inconvenience.

Pedestrian crossings have been designed to allow pedestrians to cross the street at grade. Shared surface 'Home-zones' are proposed, which provide a safe space for residents, pedestrians, and cyclists with the dominance of cars reduced. These can be viewed on the Road General Arrangement drawing, 21-011-P1100 and the accompanying Landscape Architecture drawings submitted under separate cover. This drawing indicates the proposed home zones and also identifies the location of pedestrian crossings. The crossings will utilise tactile paving and drop kerbing to facilitate safe crossings at grade and have also been located on elevated road surfaces where possible, such as raised tables and home-zones. These elevated road surfaces can only be accessed by car via a ramp, which is one of many safety measures implemented throughout the development, and in line with the recommendations of DMURS, to reduce the speed of vehicles. These elevated road surfaces will be of a different colour, and potentially

texture, the exact composition of which is to be agreed with FCC, to further make motorists aware of the change of user priority, this being a change from a vehicle priority road to a pedestrian priority surface such as a home-zone or crossing etc. A visual example of the above design strategy as implemented has been extracted from the Proposed Road GA drawing and is shown in *Figure 5* below. This extract shows Street 4.2, with a different surface composition to that of the connecting street and is accessed by motorists via a ramp.

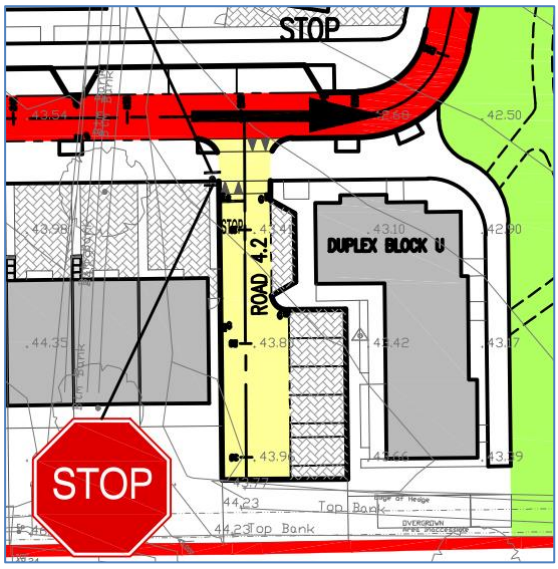


Figure 5 *| Extract from Drawing number: 21-011-P1100 Road General Arrangement*

DMURS notes that cul-de-sacs should not dominate residential layouts, and their use should be limited. In particular, the number of walkable/cyclable routes between destinations should be maximised. Section 3.3.2 of DMURS notes that cul-de-sacs may be used to serve a small number of dwellings, to enable more compact/efficient forms of development. The proposed development does include some cul-de-sacs however, the proposed layout facilitates pedestrian and cyclist movement. In this regard, we also refer you to the Landscape Architecture layout drawings that identify proposed pedestrian and cycle routes through the open spaces. The proposed cul-de-sacs are safe, with clear, open sightlines and passive surveillance, and have the potential to provide further pedestrian and cyclist connectivity to the adjacent pedestrian cycle route along the permitted Mooretown Distributor Road Extension to the west.

Enclosure:

"A sense of enclosure spatially defines streets and creates a more intimate and supervised environment. A sense of enclosure is achieved by orientating buildings towards the street and placing them along its edge. The use of street trees can also enhance the feeling of enclosure."

The proposed development has been designed with residential units overlooking streets and pedestrian routes throughout. High quality landscaping and tree planting are proposed throughout the scheme which creates a definitive sense of place. Road widths are generally 4.0m(1-way) & 5.5m(2-way) throughout the development and ensure that a strong sense of enclosure is achieved on residential roads.

Active Edge:

"An active frontage enlivens the edge of the street creating a more interesting and engaging environment. An active frontage is achieved with frequent entrances and openings that ensure the street is overlooked and generate pedestrian activity as people come and go from buildings."

As stated in Section 2.2.1 of DMURS, an active frontage enlivens the edge of the street, creating a more interesting and engaging environment. An active frontage is achieved with frequent entrances and openings. Section 3.4.1 of DMURS further notes that designers should avoid the creation of Dendritic networks, which place heavy restrictions on movement.

8 No. vehicular entrance have been provided and are well dispersed along the development. The provision of pedestrian crossings will encourage and facilitate pedestrian and cyclist activity. The proposal includes strategically placed raised tables, which will promote lower vehicular speeds while enabling pedestrians to cross the street at grade, in accordance with Section 4.4.7 of DMURS.

There are a number of advantages to more permeable networks in regard to the management of traffic and vehicle speeds. Drivers are more likely to maintain lower speeds over shorter distances than over longer ones. Since drivers are able to access individual properties more directly from Access/Link streets (where speeds are more moderate), they are more likely to comply with lower speed limits on Local streets, as stated in Section 3.4.1 of DMURS.

Section 4.4.7 of DMURS recommends the use of horizontal and vertical deflections on straights where there is more than 70m between junctions. The internal road network of the proposed development has been designed by the Civil Engineers in conjunction with the Architects so as to ensure that this distance of 70m has generally not been exceeded through the development, and that in cases where a reduction in straight length was not possible, that appropriate traffic calming measures such as raised tables (vertical deflections) and regular junctions or one-way narrow streets have been incorporated to the design.

On-street parking separates pedestrians from the vehicle carriageway and, as per DMURS Section 4.4.9, can calm traffic by increasing driver caution, contribute to pedestrian comfort by providing a buffer between the vehicular carriageway and footpath and provide good levels of passive security. On-street parking has been designed at selected locations throughout to implement the DMURS recommendation.

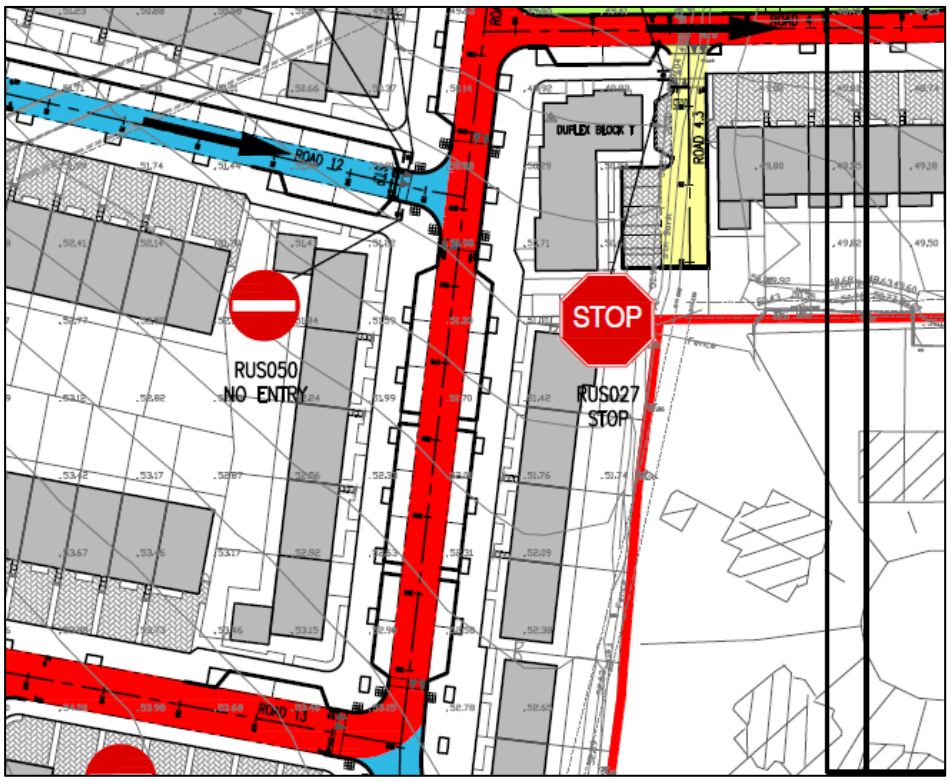


Figure 6 | *Example of parallel parking extracted from 21-011-P1100 Road General Arrangement*

Suitable sightlines have been provided throughout the development, ensuring that localised planting does not obscure visibility as cars make turning manoeuvres, improving the pedestrian safety at crossing points. Turning radii throughout the site are generally 4m, the access points from the Mooretown Distributor Road Extension are 6m, with radii for entrances to parking courts ranging from 1m-2.5m, which will induce lower vehicle speeds at these locations.

Pedestrian Activities/Facilities:

"The sense of intimacy, interest and overlooking that is created by a street that is enclosed and lined with active frontages enhances a pedestrian's feeling of security and well-being. Good pedestrian facilities (such as wide footpaths and well-designed crossings) also make walking a more convenient and pleasurable experience that will further encourage pedestrian activity."

As outlined in the items above, the proposed development has been designed to provide excellent pedestrian connectivity, with footpaths providing permeability throughout the site.

Throughout the site, pedestrian routes are generally 2m wide or greater which, as mentioned previously, provides adequate space for two wheelchairs to pass one another. DMURS identifies a 1.8m wide footpath as being suitable for areas of low pedestrian activity and a 2.5m footpath as being suitable for low to moderate pedestrian activity. In order to create pedestrian friendly environment, wider footpaths have been considered throughout, and adopted along the spine routes wherever possible, ranging in size from 3.2 to 4.7m, encouraging a pedestrian focused network.

6.5.4 Key Design Principles

DMURS sets out four core design principles which designers must have regard to when designing roads and streets. These four core principles are set out below together with a commentary establishing how these design principles have been incorporated into the design of the proposed development.

Design Principle 1: Pedestrian Activity/Facilities:

"To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users and in particular more sustainable forms of transport."

Streets have been designed in accordance with the alignment and curvature recommendations set out in DMURS Section 4.4.6. The road layout is generally orthogonal. Section 3.3.1 of DMURS notes that street networks that are generally orthogonal in nature are the most effective in terms of permeability (and legibility). Staggered junctions along with raised pedestrian tables/crossings at main pedestrian desire lines will encourage reduced driving speeds, and wide footpaths will encourage safe and integrated pedestrian facility.

Design Principle 2: Multi-Functional Streets:

"The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment."

The road hierarchy comprises Local Access roads and home-zone / shared surfaces. The local access streets comprise of 4.0 (1-way) - 5.5m(2-way) wide carriageways with a self-regulating 1-way and 2-way system in operation as identified on General Arrangement drawing 21-011-P1100. Footpaths range in size from 2m to 4.7m, balancing the needs of vehicles and vulnerable road users within the proposed development.

The proposed home-zones are streets designed primarily to meet the needs of pedestrians, cyclists, children and residents, where the speeds and dominance of cars is reduced. They are shared surface streets, comprising of a shared-surface carriageway allowing for pedestrian refuge separated from the

carriageway by a flush kerb or linear gully. These home-zones help to create intimate housing clusters of between 5 and 15 units, and to inform a clear hierarchy within the public realm.

It is proposed to utilise a buff-coloured chipping / macadam or similar approved surfacing at home-zones, subject to Fingal County Council Roads and Transportation approval – FCC Roads and Transportation are currently preparing a Taking-in-Charge manual specifying allowable surface materials. Use of a shared-surface buff coloured chipping/macadam and flush kerb indicates to both drivers and pedestrians/cyclists that the road is a shared space. As stated in Section 4.4.2 of DMURS, paving materials combined with embedded kerbs can encourage a low vehicle speed shared environment.

Entry treatment to home-zones is provided in the form of a ramp up, which helps announce that a driver is entering into a home-zone. The ramp up and narrowing of the road width is to be in accordance with Figure 4.44 in Section 4.3.3 of DMURS.

It is stated in Section 4.3.4 of DMURS that shared surface streets and junctions are highly desirable where movement priorities are low and there is a high place value in promoting more liveable streets (i.e. home-zones), such as on Local streets within Neighbourhood and Suburbs.

Design Principle 3: Pedestrian Focus:

"The quality of the street is measured by the quality of the pedestrian environment."

The design of the scheme has placed a particular focus on the pedestrian. Connectivity throughout the scheme is heavily weighted towards the pedestrian. There are excellent pedestrian links to the Mooretown Distributor Road Extension, to the School Access Road (now proposed to be a Safe Schools Street, as discussed in section 6.3), and subsequently to the Rathbeale Road and its associated public transport services and amenities, for residents of the development.

Raised tables are provided at the internal junctions, which allow pedestrians and cyclists to continue at grade. The raised tables also promote lower vehicle speeds. Stop signs and road markings will provided prior to the raised table, to give pedestrians priority. Wider footpaths throughout the phase ensure there is a clear pedestrian focus and priority.

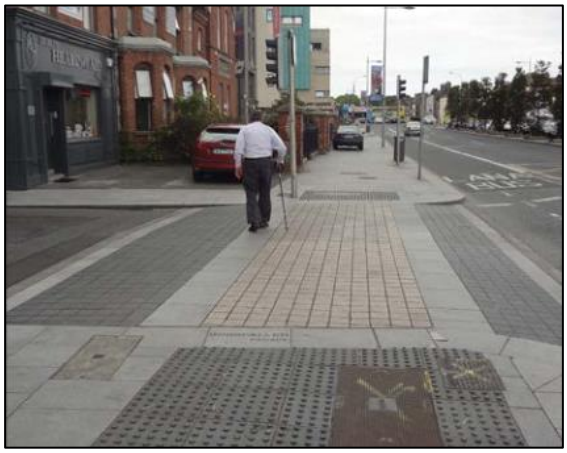


Figure 7 | *Extract from DMURS Figure 4.69*

Design Principle 4: Multi-Disciplinary Approach:

"Greater communication and co-operation between design professionals through promotion plan led multidisciplinary approach to design."

The design of the proposed scheme has been developed through the design team working closely together. The proposed development design is led by CCK Architects working together with multiple disciplines

including Waterman Moylan Consulting Engineers, Downey Planning Consultants and Doyle-O'Troithigh Landscape Architecture.

Public areas fronting and within the proposed development have been designed by a multidisciplinary design team to accommodate pedestrians and cyclists in accordance with the appropriate principles and guidelines set out in DMURS. In particular the vehicular access and public footways within the remit of the development will incorporate the relevant DMURS requirements and guidelines as set out above.

6.5.5 Oldtown / Mooretown LAP 2010-2016 (Expired) Road Upgrade Works

This subject application, referred to as Mooretown 3, is one of several development phases in the expired Oldtown / Mooretown LAP lands, generally as follows:

Description		No. of Residential Units	Status
Oldtown	Phase 1	231	Constructed and occupied
	Phase 2	234	Construction commenced in 2021
	Phase 3	230	Constructed and occupied
	Phase 4	295	Constructed and occupied
	Phase 5	377	Planning Stage
Mooretown	Phase 1	283	Under construction
	Phase 2	238	Planning granted
	Phase 3	650	Subject application

Table 5 | *Oldtown / Mooretown Development Phases*

A meeting was held with Linda Lally of the Fingal County Council Transportation Department with respect to the wider transportation infrastructural works outlined within the expired Oldtown/Mooretown LAP, and further noted within the Transportation Departments Stage 2 report. This meeting was held on the 4th of March 2022.

As agreed with Linda Lally at the above referenced meeting, it is considered that Gannon Homes have either completed or are in the process of completion of the LAP identified infrastructural works that are deemed appropriate to be undertaken by the applicant.

We refer you in this regard to the summary tables provided to and agreed in principle with FCC Transport, in Appendix C of this report. The summary tables detail the LAP transport infrastructure requirements and indicate the following :

- Works complete to date by the applicant,
- Works to be undertaken by the applicant, or
- Works outside of the development boundary and remote from the site have been identified as not under the applicant's remit.

All the road network improvements required as part of the Oldtown-Mooretown Local Area Plan, both within and outside the LAP boundaries, have been summarised in Appendix C of this report and presented in Section 2.2 of the accompanying TTA, supplied under separate cover. These road network improvements include:

- Development of a number of new roads/road links – in particular provision of the Swords Western Distributor Road (SWDR) and the Inner Ward River Valley Crossing;
- Enhancement of existing junctions and roads external to the lands;
- Redesign of Glen Ellan Road as a main urban street within the lands and design of a main street within Mooretown lands;
- Provision of a quality bus route to transport those living in northwest Swords into the Town Centre;

- Provision of pedestrian and cyclist networks, associated with green corridors both within and into adjoining areas

At the time of writing this report, the SWDR is substantially complete within the Oldtown lands. These development works were undertaken as part of the previous phases of Oldtown. The SWDR is further constructed 800m south into Mooretown, supplying access to the Mooretown Secondary School. The completion of the SWDR to the extent of the applicants' lands (~400m) in Mooretown has received a grant of planning and is anticipated to commence in the 2022.

The road upgrades along the R125 Rathbeale Road, both within and outside the LAP boundaries, were subject to a Part 8 planning application by FCC. This planning application received approval in 2017. Works were approved for LIHAF funding and are now complete and open to the public.

The works included a new signalised junction at the Rathbeale Road / Mooretown Western Distributor Road intersection, widening and upgrading of 1,150m of the Rathbeale Road, a new signalised toucan crossing to the Archaeology Park to the north and signalisation and upgrading of the Rathbeale Road/Murrough Road junction. The new road includes two-way cycle lanes along the northern side of the carriageway, a pedestrian footpath north of the cycle lanes, and a shared pedestrian/cycle surface along the southern side of the carriageway. In this regard, we also refer you to the wider cycling linkage drawing that form part of this planning application (21-011-P1005), demonstrating the high-quality provision of cyclist linkages throughout the development and to the wider local catchment.

The Glen Ellan Road Extension works are complete as part of the previous phases of Oldtown.

6.6 Traffic and Transport Assessment

As noted above, a comprehensive Traffic and Transport Assessment and Travel Plan have also been prepared by Waterman Moylan and accompanies this submission under separate covers.

Appendices

A. Irish Water Confirmation of Feasibility Letter & Statement of Design Acceptance

Robert Walpole

East Point Business Park
Alfie Byrne Road,
East Wall,
Dublin 3
D03H3F4

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

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

www.water.ie

3 February 2022

Re: CDS21002769 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 743 units at Mooretown, Swords, Co. Dublin

Dear Sir/Madam,

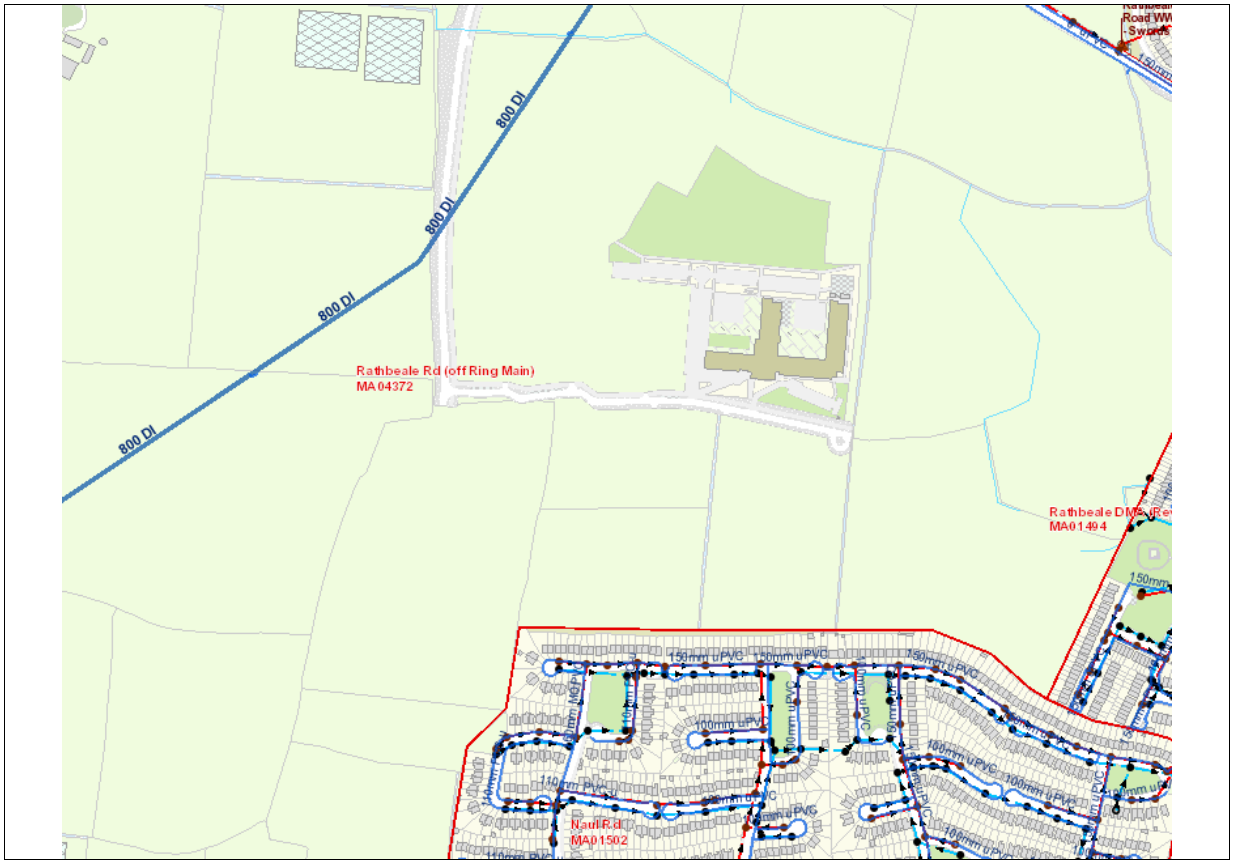
Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Mooretown, Swords, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish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

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible Subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	The connection to the Irish Water network is feasible without upgrades. The connection must be taken from two points, connected with 250mmID main as spine main through the development. The connection to the Irish Water network via the existing 300mm main to the north east of the site and to the 250mm main in the Glen Allen Road to the south.
Wastewater Connection	In order to accommodate the proposed connection to the Irish Water network at the premises a storage tank will be required to manage the impacts of excessive rain fall in the sewer network downstream of the development. Irish Water does not currently have investment plans to carry out the works required to provide this storage as part of the upgrade. As part of a future connection agreement for this site, you will be requested to provide a contribution towards the costs for the required upgrade in conjunction with other developments in this contributing area.

	Alternatively, the Applicant has the option to wait for the results of the overall DAP in the area, currently at Stage 4. The DAP is scheduled for completion Q3 2022, subject to change.

The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.

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



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

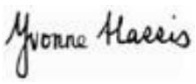
Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish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

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Tinus Walt from the design team at twalt@water.ie
For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Richard Miles
Block S, EastPoint Business Park
Alfie Byrne Road, East Wall
Dublin 3, Dublin D03H3F4

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

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

www.water.ie

7 April 2022

Re: Design Submission for Mooretown, Swords, Co. Dublin (the "Development") (the "Design Submission") / Connection Reference No: CDS21002769

Dear Richard Miles,

Many thanks for your recent Design Submission.

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

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

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

If you have any further questions, please contact your Irish Water representative:
Name: James O'Sullivan
Phone: 02252269
Email: jameosull@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

P1200 - Drainage General Arrangement
P1201 - Drainage Layout, Sheet 1 of 4
P1202 - Drainage Layout, Sheet 2 of 4
P1203 - Drainage Layout, Sheet 3 of 4
P1204 - Drainage Layout, Sheet 4 of 4
Long Section Section 1
Long Section Section 2
Long Section Section 3
Long Section Section 4
Long Section Section 5
Long Section Section 6
Long Section North
P1300 - Watermain General Arrangement
P1301 - Watermain Layout, Sheet 1 of 4
P1302 - Watermain Layout, Sheet 2 of 4
P1303 - Watermain Layout, Sheet 3 of 4
P1304 - Watermain Layout, Sheet 4 of 4

Additional Comments
The design submission will be subject to further technical review at connection application stage

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

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

B. Road Safety Audit

Title: **STAGE 1&2 ROAD SAFETY AUDIT**

For;

Mooretown Phase 3 Development, Swords, Co. Dublin.

Client: **Waterman Moylan/Gannon Properties**

Date: **August 2021**

Report reference: **1122R01**

VERSION: **FINAL**

Prepared By:

Bruton Consulting Engineers Ltd

Glaspistol
Clogherhead
Drogheda
Co. Louth.

Tel: 041 9881456
Mob: 086 8067075
E: admin@brutonceng.ie
W: www.brutonceng.ie

CONTENTS SHEET

Contents

1.0 Introduction

This report was prepared in response to a request from Mr. Richard Miles, Waterman Moylan Consulting Engineers, for a Stage 1&2 Road Safety Audit of the proposed Mooretown Phase 3 development in Swords, Co. Dublin.

The Road Safety Audit Team comprised of;

Team Leader:	**Norman Bruton**, BE CEng FIEI, Cert Comp RSA.
	TII approval number: NB 168446
Team Member:	**Owen O'Reilly,** B.SC. Eng Dip Struct. Eng NCEA Civil Dip Civil. Eng CEng MIEI
	TII approval number: OO 1291756

The Road Safety Audit comprised an examination of the information provided and a site visit by the Audit Team, together, on the 4th August 2021.

The weather at the time of the site visit was dry and the road surface was also dry.

This Stage 1&2 Road Safety Audit has been carried out in accordance with the requirements of TII Publication Number GE-STY-01024, dated December 2017.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety. It has not been examined or verified for compliance with any other standards or criteria.

The problems identified in this report are considered to require action in order to improve the safety of the scheme for road users.

If any of the recommendations within this safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observation are intended to be for information only. Written responses to Observations are not required.

The information supplied is listed in **Appendix A.**

A problem Location map is contained in **Appendix B**

The Feedback Form is contained in **Appendix C**

2.0 Background

It is proposed to apply for planning for Phase 3 of the Mooretown development in Swords. Phase 3 is located North of the existing Abbeyvale and Berwick developments and extends to the North of the Main Street to Phase 2 (Road 1 and Road 15 connect with the Phase 2 road network) and to the boundary of the Mooretown School Campus (Broadmeadow Community National School, opened recently).
The development would be accessed via the Mooretwon Road/Western Distributor Link Road (WDLR) which connects with the R125 Rathbeale Road.
A footpath/cycle track link to the Abbeyvale residential area is to be provided.

There is a distinct street hierarchy within the proposed residential development.

The site location map is shown below.

Site Location Map – image courtesy of openstreetmap.org

The Road Safety Authority's website (http://www.rsa.ie/RSA/Road-Safety/Our-Research/Collision-Statistics/Ireland-Road-Collisions/) indicates that between the years 2005 and 2016 the road environment has changed in presence and layout since then and is therefore not valid for this audit.

3.0 Issues Raised in This Road Safety Audit.

3.1 Problem

LOCATION

Drawing 21-011 P1100 Rev – General Issue

PROBLEM

It is proposed to use a combination of yield and stop control throughout the development. Yield control can lead to high turning speeds which in turn led to higher severity injury severity if a vulnerable road users is struck.

RECOMMENDATION

It is recommended that stop control be used throughout the development.

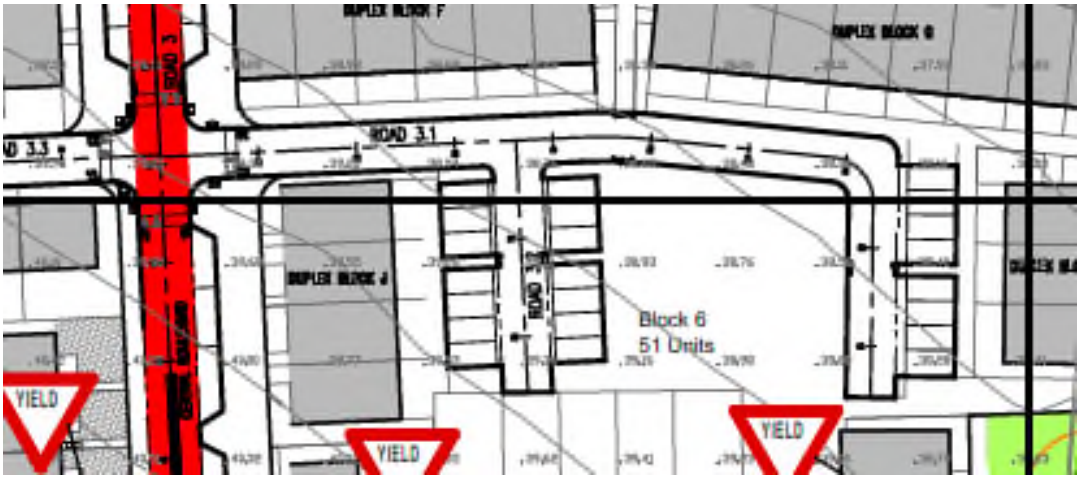
3.2 Problem

LOCATION

Drawing 21-011 P1100 Rev – General Issue

PROBLEM

It is unclear how the home zone streets will be distinguishable from the other streets that will not be shared use. Without an obvious change in character/surface colour drivers and vulnerable road users may not realise that they are on a shared street and may not behave accordingly thereby increasing the risk of collisions.



Example Street 3.1

RECOMMENDATION

It is recommended that each home zone street be clearly distinguishable from other streets.

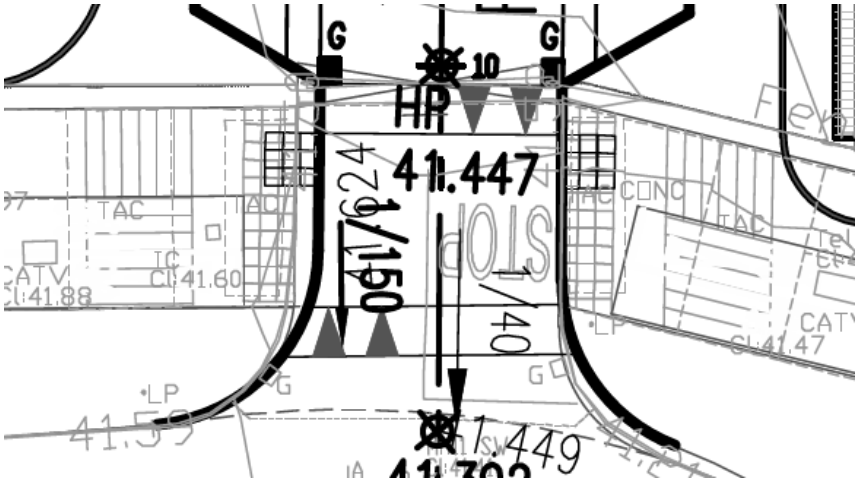
3.3 Problem

LOCATION

Drawing 21-011 P1101 Rev – Sheet 1 of 4, Road 1 (North of Main Road)

PROBLEM

The taper of the raised table at Road 1 is partially on the pedestrian crossing of the Main Road. The sloped surface could lead pedestrians to lose balance and fall.



RECOMMENDATION

It is recommended that the raised portion of the ramp extend over the entire crossing area.

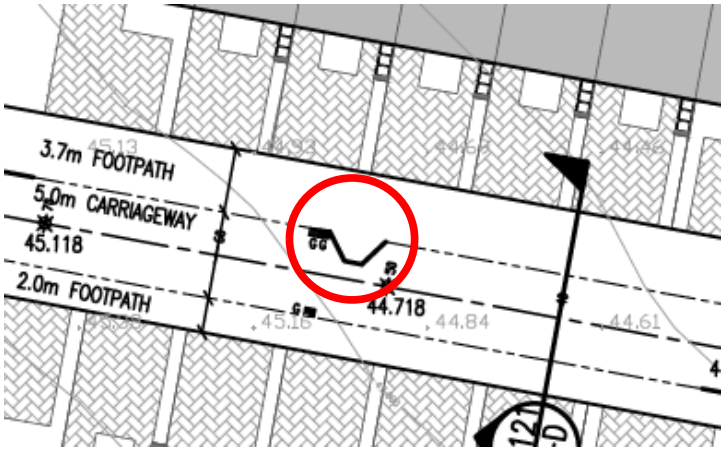
3.4 Problem

LOCATION

Drawing 21-011 P1101 Rev – Sheet 1 of 4, Road 9

PROBLEM

It is proposed to provide a buildout to provide traffic calming along Road 9. Drivers reversing out of the parking spaces of the residential units on the northern side of Road 9 may damage their vehicles as they cross the buildout.



RECOMMENDATION

It is recommended that alternative means of traffic calming be provided.

3.5 Problem

LOCATION

Drawing 21-011 P1101 Rev – Sheet 1 of 4, Road 9

PROBLEM

There will be a pedestrian and cyclist desire line from Road 9 to the pedestrian and cyclists facilities along Mooretown Road. Without a suitable link an informal track may be established by users which could lead to slips and falls particularly in wet conditions.

RECOMMENDATION

It is recommended that a formal pedestrian and cyclist link be provided.

3.6 Problem

LOCATION

Drawing 21-011 P1101 Rev – Sheet 1 of 4, Central Park.

PROBLEM

There will be pedestrian desire lines/continuation lines along the edges of Central Park however no footpaths have been provided apart from tactile paving provision. Without suitable hardstanding pedestrians may slip and fall, particularly in wet conditions.

RECOMMENDATION

It is recommended that footpaths be provided along the outside of central park.

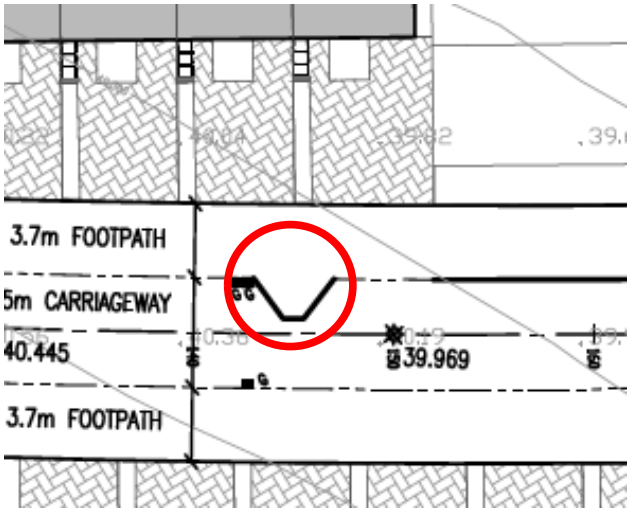
3.7 Problem

LOCATION

Drawing 21-011 P1101 Rev – Sheet 1 of 4, Road 2

PROBLEM

It is proposed to provide a buildout to provide traffic calming along Road 2. Drivers reversing out of the parking spaces of the residential units on the northern side of Road 2 may damage their vehicles as they cross the buildout.



RECOMMENDATION

It is recommended that alternative means of traffic calming be provided.

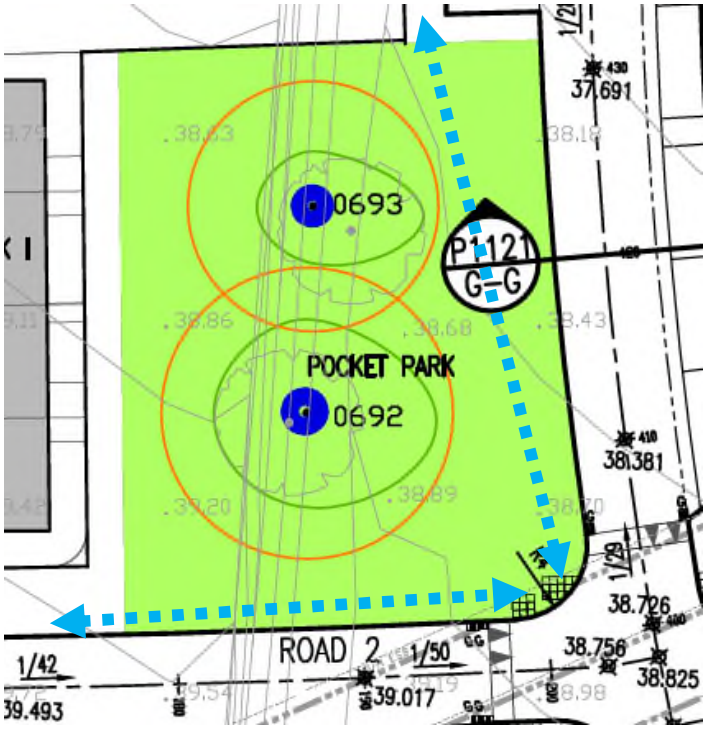
3.8 Problem

LOCATION

Drawing 21-011 P1102 Rev – Sheet 2 of 4, Pocket Park.

PROBLEM

There will be pedestrian desire lines/continuation lines along the edges of the Pocket Park between Road 2 and Road 4 however no footpaths have been provided apart for tactile paving provision. Without suitable hardstanding pedestrians may slip and fall, particularly in wet conditions.



RECOMMENDATION

It is recommended that footpaths be provided along the outside of central park.

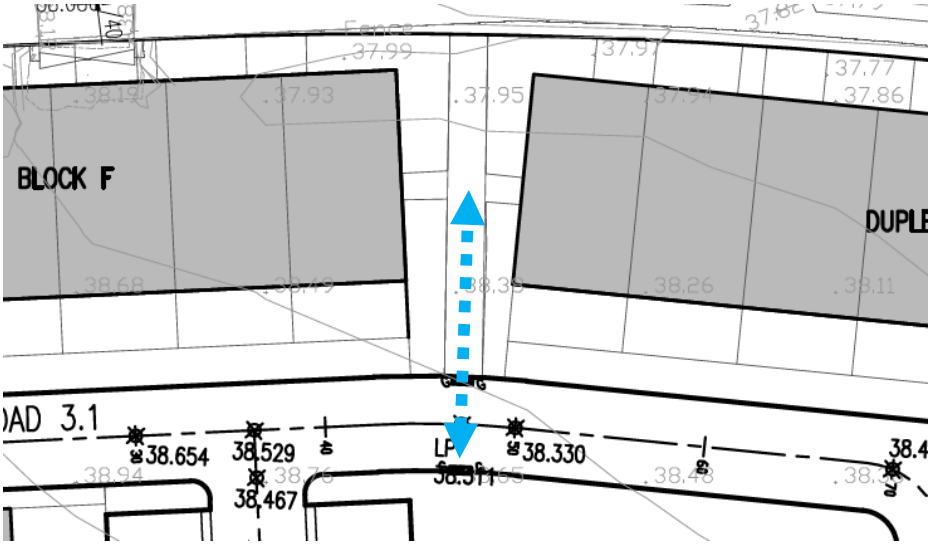
3.9 Problem

LOCATION

Drawing 21-011 P1102 Rev – Sheet 2 of 4, Pedestrian Link between Block F and Block G.

PROBLEM

There will be a pedestrian link between Block F and Block G. It is proposed to have gullies where the link meets Road 3.1 This could lead to trips and falls if narrow heels get caught in the gully gratings. In addition, there is no warning for blind or partially sighted pedestrians that they are entering a carriageway.



RECOMMENDATION

It is recommended that the gullies be relocated outside the footpath merge point and that a dropped kerb and tactile paving is provided.

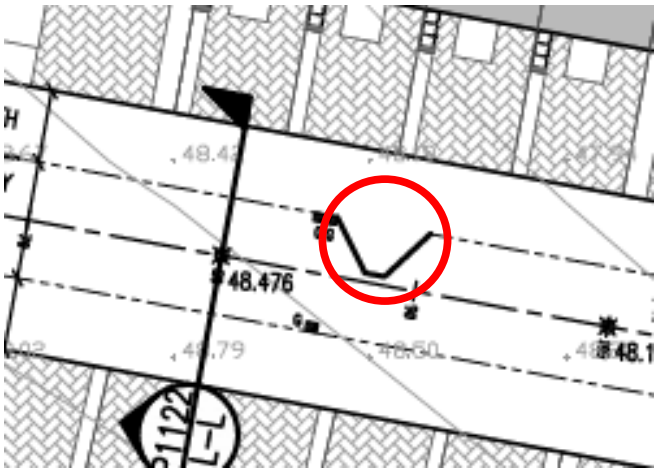
3.10 Problem

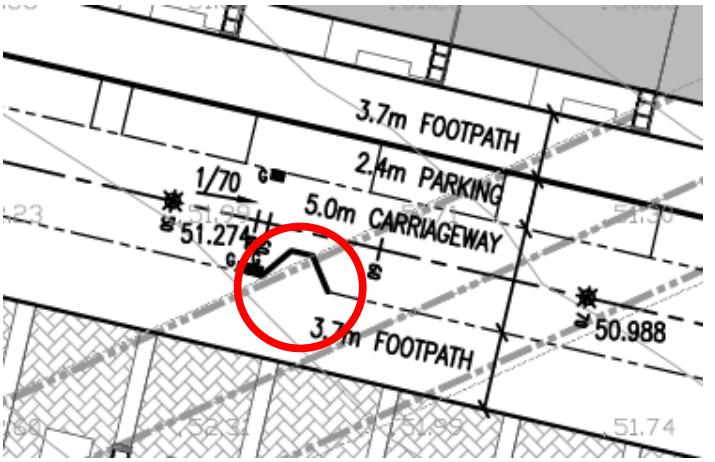
LOCATION

Drawing 21-011 P1103 Rev – Sheet 3 of 4, Road 10 & 12

PROBLEM

It is proposed to provide a buildout to provide traffic calming along Road 10 & Road 12. Drivers reversing out of the parking spaces of the residential units of Road 10 & 12 may damage their vehicles as they cross the buildout.





RECOMMENDATION

It is recommended that alternative means of traffic calming be provided.

3.11 Problem

LOCATION

Drawing 21-011 P1103 Rev – Sheet 3 of 4, Central Park

PROBLEM

The indicative path through the park area does not align with the proposed pedestrian crossing point. This could lead to pedestrians crossing where drivers do not expect and where there are high kerbs which could lead to trips and falls.

RECOMMENDATION

It is recommended that the path through the park aligns with the pedestrian crossing point.

3.12 Problem

LOCATION

Drawing 21-011 P1103 Rev – Sheet 3 of 4, Road 1.

PROBLEM

The parallel parking space South of the junction of Road 10 and Road 1 may lead to a lack of visibility for a northbound driver on Road 1 to a child about to cross at the uncontrolled pedestrian crossing if the space is occupied by a high vehicle. This could lead to a collisions with the vulnerable road users.

RECOMMENDATION

It is recommended that the parking space be relocated outside of the visibility envelope for the pedestrian crossing.

3.13 Problem

LOCATION

Drawing 21-011 P1103 Rev – Sheet 3 of 4, Road 1.1.1

PROBLEM

It is unclear how the second vehicle parking at the most southerly residential unit on Road 1.1.1 will be able to access/egress from the space. A lack of space to manoeuvre could lead to material damage of the vehicle.

RECOMMENDATION

It is recommended that sufficient space be provided for vehicles to access/egress from the space.

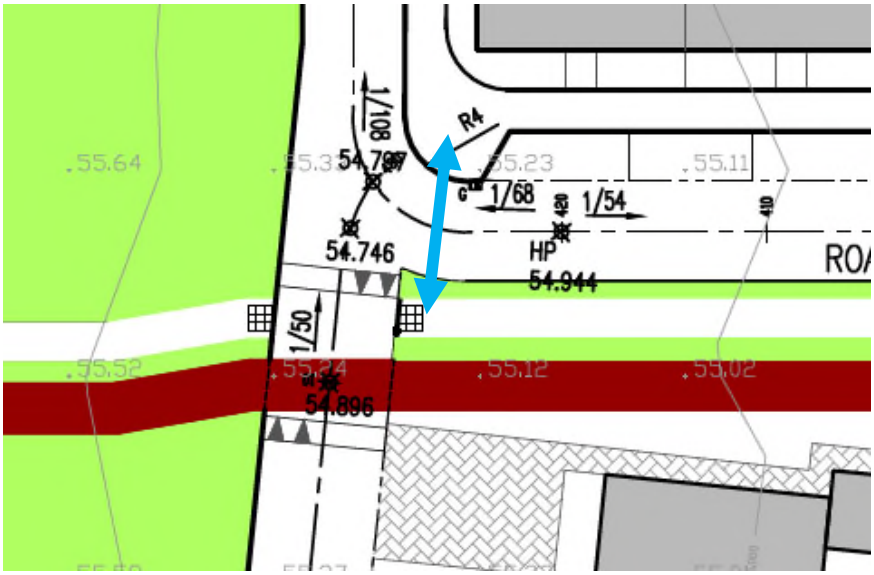
3.14 Problem

LOCATION

Drawing 21-011 P1103 Rev – Sheet 3 of 4, Road 1.

PROBLEM

There will be a desire line for pedestrian to cross Road 1 to access the footpath link to Mooretown Road. If pedestrians have to cross high kerbs and a grassed area this could lead to slips and falls.



RECOMMENDATION

It is recommended that an uncontrolled pedestrian crossing be provided with suitable intervisibility between drivers and crossing pedestrians.

3.15 Problem

LOCATION

Drawing 21-011 P1104 Rev – Sheet 4 of 4, Woodland Trail, Road 4.

PROBLEM

There is a risk of slips and falls as pedestrians access the woodland trail from the pedestrian crossing points on Road 4.

RECOMMENDATION

It is recommended that links be provided to the trail from the crossing points.

4.0 Observations

4.1 Observation

The swept path analysis of refuse or emergency vehicles have not been provided to the Audit Team.

4.2 Observation

It is unclear what height the proposed raised tables will be and the proposed kerb heights. It is assumed that a 50mm min kerb will be shown at corner radii of junctions.

4.3 Observation

It is assumed that wheel stops will be provided at perpendicular parking spaces to prevent overhang of the footpaths and the reduction of their effective width.

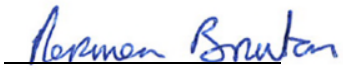
4.4 Observation

It is assumed that trees with suitable stem heights, girths and canopies will be chosen to ensure that trees do not block visibility for drivers.

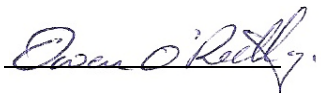
5.0 Audit Statement

We certify that we have examined the information provided and the site on the 4th August 2021. The examination has been carried out with the sole purpose of identifying any features of the design which could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions which we would recommend should be studied for implementation. The audit has been carried out by the persons named below who have not been involved in any design work on this scheme as a member of the Design Team.

Norman Bruton **Signed:** 

(Audit Team Leader) **Dated: 5/8/2021**

Owen O'Reilly **Signed:** 

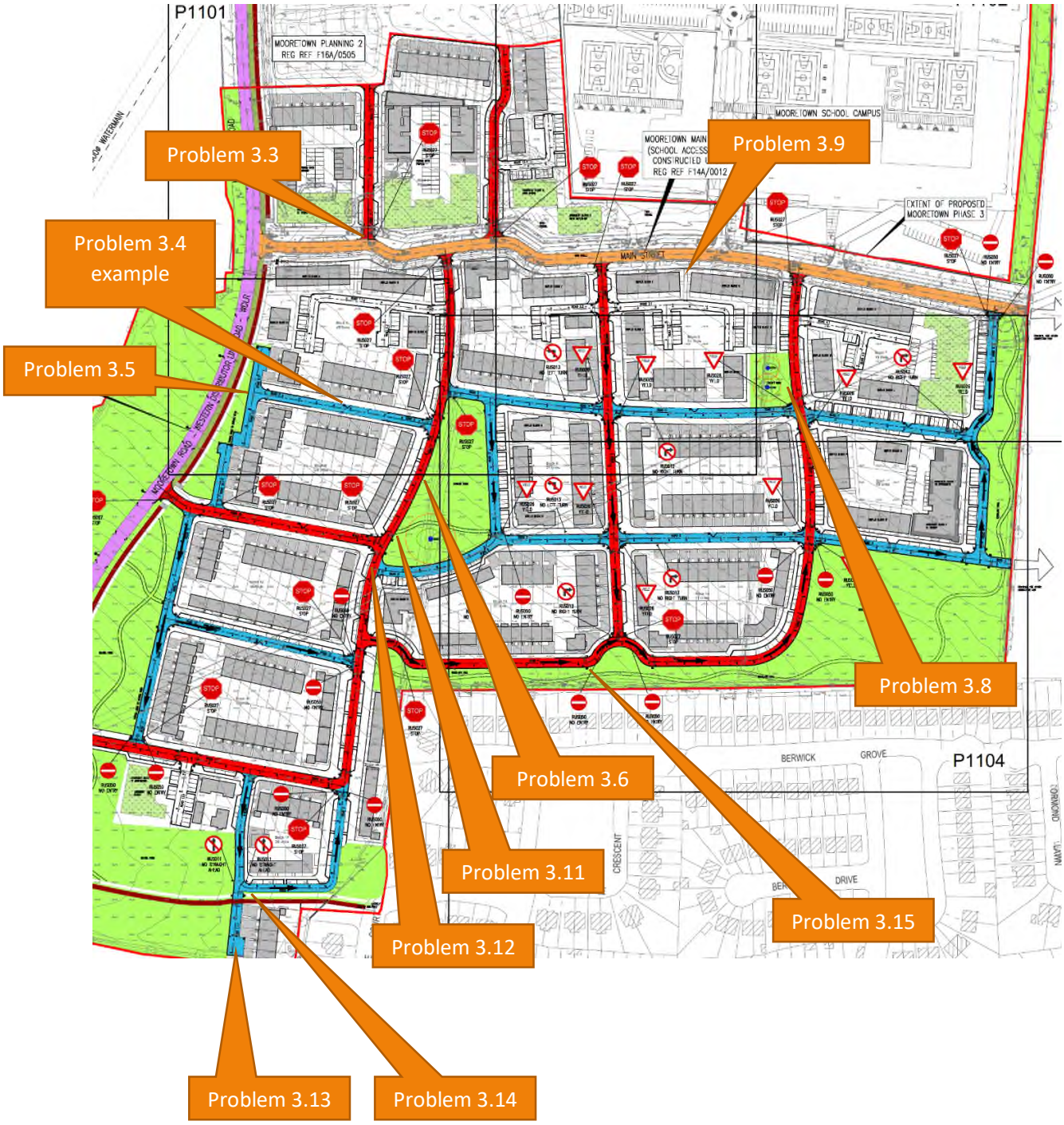
(Audit Team Member) **Dated: 5/8/2021**

Appendix A

List of Material Supplied for this Stage 1&2 Road Safety Audit;

- Drawing 21-011 P1100 Rev –
- Drawing 21-011 P1101Rev –
- Drawing 21-011 P1102 Rev –
- Drawing 21-011 P1103 Rev –
- Drawing 21-011 P1104 Rev –
- Drawing 21-011 P1121 Rev –
- Drawing 21-011 P1122 Rev –
- Site Layout sketch

Appendix B Problem Location Map



Appendix C

Feedback Form

SAFETY AUDIT FORM – FEEDBACK ON AUDIT REPORT

Scheme: Mooretown Phase 3
Stage: 1&2 Road Safety Audit.
Date Audit (Site visit) Completed: 4th August 2021

Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.1	Yes	Yes		
3.2	Yes	Yes	Homezone areas to be distinguishable in final layout	Yes
3.3	Yes	Yes		
3.4	Yes	Yes	Alternative proposal to be considered, pending agreement with Local Authority Roads Dept	Yes
3.5	Yes	Yes	Interconnection of cycle/ped desire lines through open spaces to be co-ordinated with LArch/Architect	Yes
3.6	Yes	Yes	Interconnection of ped desire lines through open spaces to be co-ordinated with LArch/Architect	Yes
3.7	Yes	Yes	Alternative proposal to be considered, pending agreement with Local Authority Roads Dept	Yes
3.8	Yes	Yes	Interconnection of ped desire lines through open spaces to be fully co-ordinated with LArch/Architect	Yes
3.9	Yes	Yes	Internal parking courtyard pedestrian proposals to be fully co-ordinated with LArch/Arch	Yes
3.10	Yes	Yes	Alternative proposal to be considered, pending agreement with Local Authority Roads Dept	Yes
3.11	Yes	Yes	Interconnection of ped desire lines through open spaces to be fully co-ordinated with LArch/Architect	Yes

Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.12	Yes	Yes		
3.13	Yes	Yes	Road extension required to facilitate safe entry	Yes
3.14	Yes	Yes	Ped x-ing to be facilitated here.	Yes
3.15	Yes	Yes	Interconnection of ped desire lines through open spaces to be fully co-ordinated with LArch/Architect	Yes

Signed……Richard Miles…
Design Team Leader

Date ……05/08/21…….

Signed……  ……
Audit Team Leader

Date: ……5/8/2021……

C. Phasing of Oldtown/Mooretown LAP Road Upgrade Works

March 2022
Oldtown / Mooretown LAP Phase 1 Transportation Network Improvement Works

Table 1: LAP Phase 1 Transportation Network Improvements

Item	Description	Notes
1	Western Distributor Link Road: 0.3 km of new single carriageway distributor road from Rathbeale Road to Glen Ellan Road Extension.	This section of road has been constructed as part of the Phase 1 works.
2	Western Distributor Link Road: A signal controlled junction including a pedestrian and cyclist crossing at the junction with Glen Ellan Road Extension.	This Junction serves Oldtown Planning 02 area and is substantially complete by Applicant as part of the Glen Ellen Road Extension works.
3	Western Distributor Link Road: A roundabout junction on the Rathbeale Road at western edge of Oldtown- Mooretown lands.	It was agreed with FCC to replace the roundabout with a signalised junction. The junction serves Mooretown and the Oldtown Planning 02 area and was subject to a Part 8 planning application by FCC. These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding This planning application received approval in 2017. Works are now complete.
4	Western Distributor Link Road: A signal controlled toucan crossing for pedestrians and cyclists on the Rathbeale Road a short distance east of the new roundabout with provision for connection northward and southward along Swords Western Distributor Link Road.	This pedestrian crossing was required in the event that the junction at this location was to be a roundabout. The crossing has now been incorporated into the WDLR / Rathbeale Road junction. As noted above, works were approved for LIHAF funding and are complete.
5	R125 Rathbeale Road Upgrade: R125 Rathbeale Road shall be upgraded to urban road standard with footpaths and cycle lanes from the new junction with the Swords Western Distributor Link Road to the Cianlea estate.	These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding This planning application received approval in 2017. Works are now complete.

Item	Description	Notes
6	R125 Rathbeale Access to Mooretown: A signal controlled junction with right-turn lanes shall be provided at a new access into the Mooretown lands at the north-eastern corner.	An entrance into the Mooretown lands has now been incorporated into the Rathbeale Road upgrade works. Works are now substantially complete
7	R125 Rathbeale Road Access Oldtown (FCC): A priority controlled junction with right-turn lane at a new access into the Oldtown lands at the south-eastern corner shall be provided.	This access is required as part of an approved FCC housing estate. These lands are not connected to the main body of the LAP. These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding Works are now complete.
8	R125 Rathbeale Road Access to Mooretown: A signal controlled junction with right-turn lanes at a new access into the north-western portion of the Mooretown lands shall be provided. This will provide pedestrian and cycle access from the Mooretown lands to the school site located in the Oldtown lands immediately north of the Rathbeale Road.	Decision to grant has been supplied under Reg. Ref. F15A/0183 for a second access into the Mooretown lands to serve the Mooretown Planning 01 development. These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding Works are now complete.
9	R125 Rathbeale Road Improvements: A signal controlled toucan crossing for pedestrians and cyclists between the two public park areas on either side of Rathbeale Road approximately midway along the frontage of the LAP lands shall be provided.	These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding Works are now complete.
10	Glen Ellan Road Extension/Street: Upgrade of Glen Ellan Road Extension to a Street, providing footpaths and off-road cycle tracks through local center and verges, footpaths and off-road cycle tracks elsewhere. Provide signal controlled toucan crossing for pedestrians and cyclists at 3 locations along Glen Ellan Street to cater for pedestrians and cyclists.	These works are within Planning 1 and 2 and is substantially complete by Applicant as part of the Glen Ellen Road Extension works.
11	Off-Site: Rathbeale Road/Murrough Road Junction.	These road upgrade works were subject to a Part 8 planning application by FCC which is subject to LIHAF funding Works are now complete.

Item	Description	Notes
12	Off-Site: Castlegrange Junction.	*Not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022*

Table 1: LAP Phase 2 Transportation Network Improvements

Item	Description	Notes
1	Western Distributor Link Road: Development of Western Distributor Link Road from Rathbeale Road southwards to Brackenstown Road shall be developed, including provisions for cyclists and pedestrians.	Works to the WDLR from Rathbeale Road southwards to Brackenstown Road have commenced under planning reference F12A/0270 and an 800m section of the WDLR has been substantially complete. A further planning submission for further circa 400m extension of this road towards Brackenstown Rd was submitted at the end of 2019 and granted planning in May 2021
2	Western Distributor Link Road: Upgrade of Brackenstown Road from Swords Manor to the R108 Naul Road junction to urban single carriageway road standard with footpaths and cycle tracks.	*The applicant considers that these Brakenstown Road works are remote from their development and that the upgrade works are not under their remit to undertake as part of their development works Agreed with LLally 04/03/2022*
3	Western Distributor Link Road: Provision of a pedestrian and cycle link along the eastern side of the R108 Naul Road from the junction with Brackenstown Road southward to the Knocksedan housing estate.	*The applicant considers that these Naul Road works are remote from the development and that the proposed works are not under their remit to undertake as part of their development works. Agreed with LLally 04/03/2022*
4	Internal Road Network Local access roads and pedestrians/cyclist links shall be provided to open up the LAP lands to development as per plan layout.	The internal road network and pedestrian / cycle links are being provided as the development progresses. Pedestrian / cycle tracks are being provided as part of Phase 1 along Glen Ellan Road, Oldtown Avenue, Mooretown Avenue and Rathbeale Road as for as the archaeological park. This will continue through Phase 2.
5	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Upgrade 3 roundabouts on Glen Ellan Road to cyclist friendly roundabouts.	*The applicant considers that these works are remote from site. It is noted that crossings on the westmost roundabout (closest to the Gannon development) has been recently upgraded to include improved pedestrian/cycle crossing*

		points. The remaining two roundabouts are remote from the development, and it is not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022
6	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Major upgrade and realignment of the junction of Glen Ellan Road with Balheary Road.	*These works are remote from the site and a design for which is under review we understand as part of residential development works closer to the site. It is not anticipated that these works are to be undertaken by the applicant, however FCC to review as to whether some form of contribution towards these works may be sought by FCC from the applicant. FCC Transport to review and revert to the applicant. Agreed with LLally 04/03/2022*
Item	**Description**	**Notes**
7	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Widen Balheary Road to 4 lanes between Glen Ellan Road and Castlegrange junctions over 300m length. This will encroach on public park area to the east.	*These works are remote from the site It is not anticipated that these works are to be undertaken by the applicant . Agreed with LLally 04/03/2022*
8	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Widen link road to 4 lanes between Castlegrange and R132 Estuary junctions.	*These works are remote from the site It is not anticipated that these works are to be undertaken by the applicant . Agreed with LLally 04/03/2022*
9	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Major capacity improvement at the R132 Estuary junction (unless previously delivered by Metro North project).	*These works are remote from the site It is not anticipated that these works are to be undertaken by the applicant . Agreed with LLally 04/03/2022*
10	Swords Western Quality Bus Corridor	

	Bus priority measures within Oldtown LAP area and via Glen Ellan Road to Rathbeale Road Junction.	*Road upgrade works, including agreed bus stop provision supplied as part of the Rathbeale Road upgrade works project within the LAP lands. These works are now complete. Further Glen Ellan road bus measures are remote from the development. It is not anticipated that further bus network improvement works are to be undertaken by the applicant.* *Agreed with LLally 04/03/2022*
11	<u>Swords Western Quality Bus Corridor</u> Bus lanes over 150m length on the northern approach to the junction of Rathbeale Road and Murrough Road.	*These works are remote from the site. It is not anticipated that these works are to be undertaken by the applicant.* *Agreed with LLally 04/03/2022*

Table 1: LAP Phase 3 Transportation Network Improvements

Item	Description	Notes
1	Western Distributor Link Road: Northern extension of road through lands at Oldtown adjoining this phase of development.	Road works substantially complete as part of Oldtown North LAP Development works
2	Western Distributor Link Road: Undertake remaining road network improvements/ connections to complete Western Distributor Link Road south of Brackenstown/ Naul Road junction, including it's connection to Forrest Road.	*These works are remote from the site. It is not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022*
3	Internal Road Network Local access roads and pedestrians/cyclist links shall be provided to open up the LAP lands to development as per plan layout.	The internal road network and pedestrian / cycle links are being provided as the development progresses. Pedestrian / cycle tracks are currently being provided as part of Phase 1 along Glen Ellan Road, Oldtown Avenue, Mooretown Avenue and Rathbeale Road as well as the archaeological park. This will continue through Phase 3.
4	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Capacity improvement at the junction of R125 Rathbeale Road with Watery Lane shall be carried out.	*These works are remote from the site. It is not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022*
5	Road Network Improvements Which Shall be Provided Outside of Plan Lands: Capacity improvement at the junction of Watery Lane with Balheary Road shall be carried out.	*These works are remote from the site. It is not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022*
6	Swords Western Quality Bus Corridor	

	The main elements of the 6km long QBC shall be developed during this phase.	*Road upgrade works, including agreed bus stop provision supplied as part of the Rathbeale Road upgrade works project within the LAP lands. These works are now complete. Further glen ellan road bus measures are remote from the development. It is not anticipated that further bus network improvement works are to be undertaken by the applicant Agreed with LLally 04/03/2022*
7	<u>Swords Western Quality Bus Corridor</u> A new link road from Brackenstown to Dublin Road at Swords Town Centre (Lord Mayor Link Road) shall be delivered in conjunction with the third phase of development.	*These works are remote from the site. It is not anticipated that these works are to be undertaken by the applicant. Agreed with LLally 04/03/2022*

Table 1: LAP Phase 4 Transportation Network Improvements

Item	Description	Notes
1	<u>Western Distributor Link Road:</u> Northern extension of road through lands at Oldtown to the edge of the Broadmeadow Linear Park shall be provided (with provision in design for future extension into the Lissenhall development lands and for connection to the Swords Western Ring Road).	Road works substantially complete as part of Oldtown North LAP Development works
2	<u>Internal Road Network</u> Local access roads and pedestrians/cyclist links shall be provided to open up the LAP lands to development as per plan layout.	The internal road network and pedestrian / cycle links are being provided as the development progresses. Pedestrian / cycle tracks are currently being provided as part of Phase 1 along Glen Ellan Road, Oldtown Avenue, Mooretown Avenue and Rathbeale Road as well as the archaeological park. This will continue through Phase 4

D. FCC SuDS Selection Checklist

SUDS/Green Infrastructure selection checklist –To be submitted in planning submission

Suds Measures	Measures to be used on this site	Rationale for selecting/not selecting measure	Checklist submitted? See no. 8 below
Source Control			
Swales			
Tree Pits	✓	Roadside tree pits are to be provided throughout the development. Trees help to attenuate flows, trap silts and pollutants, promote infiltration and prevent erosion.	
Rainwater Butts			
Rainwater harvesting			
Soakaways			
Infiltration trenches			
Permeable pavement (Grasscrete, Block paving, Porous Asphalt etc.)	✓	All private driveways and private parking bays are to be permeable paving with underlying filter drains. Downpipes from the front of the houses will also drain to the filter drain under the permeable paving to facilitate maximum infiltration of surface water from driveways and roof areas. Access road to pumping station to be Grasscrete	
Green Roofs	✓	60% minimum of the roof area of the apartment blocks to be green roof, in line with FCC document: Green/Blue infrastructure for development – Guidance note.	
Filter strips	✓	Roadside filter strips are to be provided along the edge of the open spaces to capture adjacent road gullies. Filter drains help to attenuate flows, trap silts and pollutants, promote infiltration and prevent erosion.	
Bio-retention systems/Raingardens	✓	Rain gardens are proposed at open spaces around the site. Rain gardens are gardens of native shrubs, perennials, and flowers planted in a small depression, designed to temporarily hold and soak in rainwater runoff that flows from roofs, driveways, patios or lawns.	
Blue Roofs			
Filter Drain	✓	Filter drains are to be incorporated underneath permeable paving utilised on all parking bays to facilitate infiltration of surface water.	
Site Control			
Detention Basins	✓	Detention Ponds are already constructed as part of the Mooretown Phase 1 Development to the north and have been sized to accommodate volumes from the subject Planning application.	
Retention's basins			
Regional Control			
Ponds	✓	Attenuation Ponds are already constructed as part of the Mooretown Phase 1 Development to the north and have been	

		sized to accommodate volumes from the subject Planning application.	
Wetlands			
Other			
Petrol/Oil interceptor	✓	Class 1 petrol interceptor have been provided as part of construction of the attenuation ponds and basins in the Watermill Park, as part of the overall Mooretown development.	
Attenuation tank – only as a last resort where other measures are not feasible			
Oversized pipes– only as a last resort where other measures are not feasible			

Note:

1. Fingal has a preference for above ground Green Infrastructure rather than tanks or oversized pipes. Above ground flows through swales, basins etc are encouraged.
2. Demonstrate SUDS system will have sufficient Pollutant removal efficiency in accordance with Ciria Suds Manual C753
3. Basins sides should be no steeper than 1:4 and no deeper than 1.2m in the 1%AEP
4. Culverting shall be avoided where possible
5. De-culverting is encouraged.
6. Please submit evidence of infiltration rates
7. To account for climate change in the design of the drainage system rainfall intensities should be factored up by 20%
8. The Applicant must provide Suds checklists in accordance with the Appendix B of the Ciria Suds manual C753

Appendix	**Name**
B3	Full planning
B4	Scheme design
B5	Health and safety
B6	Infiltration assessment
B7	Proprietary treatment
B9	filter strip
B11	filter drain
B13	swale
B15	bioretention
B16	pervious pavement
B17	attenuation tank
B19	basin
B21	pond wetland

UK and Ireland Office Locations