Engineering Design Report

N7 Longview
Ballyvolane
Cork

June 2026

Document Control Sheet

Client	Longview Estates Ltd.
Project Title	Proposed Residential Development – N7 Longview
Project Location	N7 Longview, Ballyvolane, Cork
Document Title	Engineering Design Report
Document No.	24083HD-EDR-D01

Rev	Status	Author	Reviewed By	Approved By	Date
00	Internal Draft	K Manley			23th-Feb-'25
01	Client Issue Draft	K Manley			19th March 2025
02	Client Issue	K Manley	S Moriarty	K Manley	27th March 2025
03	Draft Issue Rev	A. Ozkan	S Moriarty	K Manley	26th August 2025
04	Draft Issue	A. Ozkan	S Moriarty	K Manley	10th December 2025
05	Draft Issue	A. Ozkan	S Moriarty	K Manley	5th June 2026
06	Client Issue	A. Ozkan	S Moriarty	K Manley	10th June 2026
07	Client Issue Rev	A. Ozkan	S Moriarty	K Manley	17th June 2026

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This report should be read in conjunction with the submitted Engineering and Architectural Design Drawings

1. INTRODUCTION

PROJECT: **N7 Longview, Ballyvolane, Cork**

CLIENT: **Longview Estates Ltd**

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

MHL Consulting Engineers have been engaged by Longview Estates Ltd to provide design consultancy services for the civil engineering and traffic elements associated with a proposed development of a residential scheme of a mix of Houses, Duplex Apartments and Apartments with an associated creche to be determined by way of the Large Scale Residential (LRD) process.

The application site comprises of a land parcel of 7.62 hectares and is highlighted in **Figure 1.1** below. The lands are zoned ZO-02 New Residential Neighbourhoods in the current Cork City Development Plan 2022-2028.

Figure 1.1: Site location

The lands are bounded to the north and west by the Longview Residential Scheme which was determined by way of an SHD application (ABP-306325-20) and Planning Application Number TP 23/42409.

The site was previously zoned for educational purposes but was changed as part of the 2022 Development Plan adoption process to residential use; the original educational use that was envisaged under the previous zoning, was moved to a different landholding area to the south west.

The site as a result, always seen as a standalone element of the site with access off the permitted distributor road which was also to serve lands to south and east (third party lands) which have since been de-zoned. The original application allowed for access, and servicing, of this site by means of delivered infrastructure.

The scheme layout has been developed by Wilson Architects in conjunction with the rest of the design team.

A density of 41.3 units/Ha has been achieved:

Type	*Unit No.*	*Percentage*
House	194	74.0%
Duplex	14	5.4%
Apartment	54	20.6%

2. ACCESS

PROJECT: **N7 Longview, Ballyvolane, Cork**

CLIENT: **Longview Estates Ltd**

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

Main Distributor Road

The Main Distributor Road links the site to the R614 Ballyhooly Road. This road was designed and delivered by Longview Estates Ltd as part of an advanced infrastructural package to facilitate the development of the granted scheme.

This was funded by HISCo; a Cork County Council / ISIF delivery solution. This road was intended to service the site and the school zoned lands. The school zoned lands would have accommodated 2 no schools (a Secondary School and Primary School). The relocation of the school zoned lands to an area adjoining the CMDNR reduces peak time volumes that could be expected on the local distributor road.

In addition, the scheme also included the delivery of cycle and pedestrian facilities along the R614 linking to the south, refer **Figure 2.2**. This infrastructure is now constructed. It will connect to the ***Ballyvolane Strategic Transport Corridor*** when constructed. Water rock View Ltd, a sister company to Longview Estates Ltd, has consented to their lands being CPO'd by the Council to facilitate the Council works in the area.

Figure 2.1: Main Distributor Road (Granted under Planning Ref. ABP-306325-20 & TP23/42409)

The constructed Distributor Road will provide access to the N7 lands.

Figure 2.2: Aerial Views of the developed cycle/footpath infrastructure

3. TRAFFIC AND TRANSPORT

PROJECT: **N7 Longview, Ballyvolane, Cork**

CLIENT: **Longview Estates Ltd**

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

EXISTING SITUATION

The R614 Ballyhooly Road is a single carriageway, two-way road, characterised by two distinct sections. The first section, more rural in nature has a posted speed limit of 80km/hr with no infrastructure for pedestrians or cyclists. The second section is to the immediate to south of the TLI Yard site (currently the subject of a planning application) and has a posted speed limit of 60 km/hr and also a new shared 4m wide footpath/cycle path which extends as far as Mervue Lawn.

TRAFFIC & TRANSPORTATION ASSESSMENT

A separate Traffic & Transportation Assessment is submitted as part of this planning application. The scope of this assessment has been agreed with the Traffic & Transportation Section of Cork City Council. 5 no. junctions in the vicinity of the proposed site have been analysed. These are as follows;

- J1: White's Cross (uncontrolled)
- J2: Junction of Upper Dublin Hill / Lower Dublin Hill (uncontrolled)
- J3: Junction of Lower Dublin Hill / Ballyhooly Road (uncontrolled)
- J4: Development Access Junction – Ballyhooly Road (uncontrolled)
- J5: Fox & Hound's Crossroads (fully signalised)

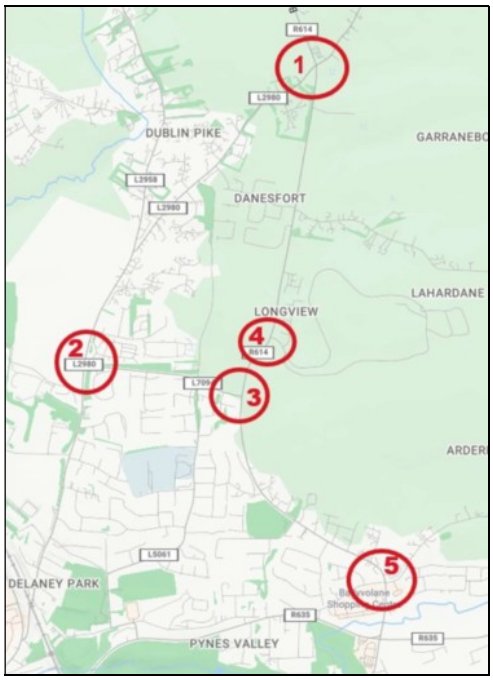


Figure 3.1: Junctions to be analysed

Peak hour traffic flows 07:30 – 09:30 & 16.30 - 18.30 were recorded in September 2023 at a number of existing junctions in the area by Tracsis Transportation Surveys. It has been agreed to utilise these existing counts whilst applying the appropriate growth factor in order to account for the fact that they were taken last year. After scrutinising the traffic count data it was determined that the AM peak hour occurred between 08:00 - 09:00 and the PM peak hour occurred between 17:00 - 18:00. This is as expected.

COMMITTED TRANSPORT PROPOSALS

There are a number of committed transport proposals in the vicinity which would cater for the proposed site. The ***Ballyvolane Strategic Transport Corridor*** will deliver enhanced facilities for all road users but with particular benefits for pedestrians, cyclists and public transport users while providing, in as much as possible, for the efficient movement of vehicular traffic within the study area which is shown in figure **Figure 3.2** below.

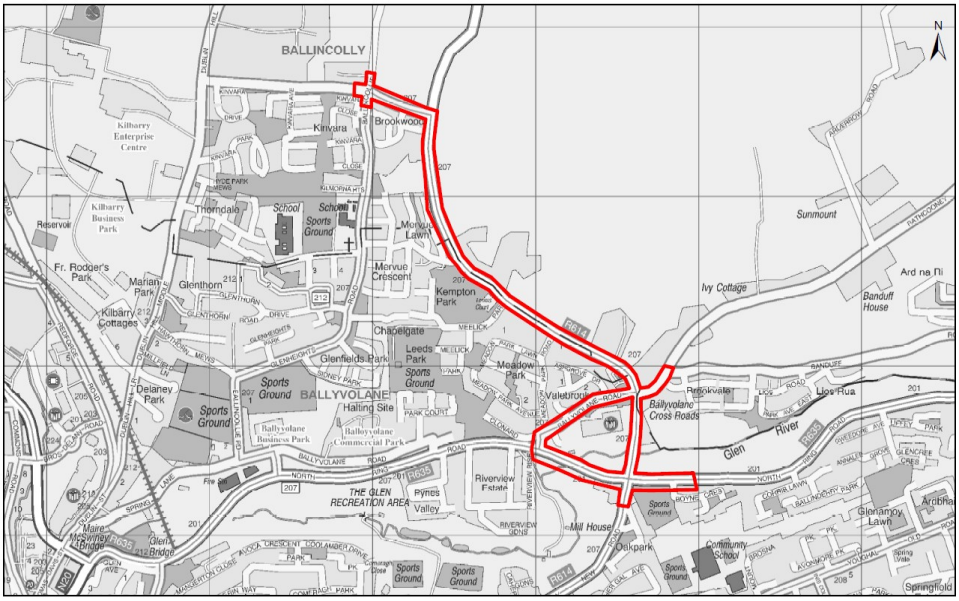


Figure 3.2: Ballyvolane Strategic Transport Corridor Study Area

The Cork Metropolitan Area Transport Strategy 2040 (CMATS has identified the importance of the Ballyvolane UEA in the delivery of the projected growth in population for Cork City into the future. In order to support this growth in terms of transportation, the strategy proposes a **Northern Distributor Road** (NDR) (now called Cork Northern Distributor Multi Modal Road (CNDMR)). An indicative route for which is shown in **Figure 3.3**.

The northern distributor road will provide for orbital movement for bus, pedestrian, cycle and some strategic and general traffic and reduce reliance on radial routes through the city centre. The proposed route is about 14km long and will provide active travel, public transport and vehicular linkages on the northside. The NDR is considered to be a critical enabler for Cork Metropolitan Area Transport Strategy, as it would create opportunities for sustainable development of existing landbanks in the northern Cork metropolitan area; facilitate the rollout of sustainable transport measures including public transport services for the north Cork metropolitan city area, as well as facilitating the introduction of a HGV ban within the city centre, among other things.

The **North Ring Road** has also been included within The Cork Metropolitan Area Transport Strategy. CMATS states that as part of the N/M20 Cork to Limerick Road Improvement Scheme, TII will examine the inclusion of the Cork North Ring Road (CNRR) linking the N20 to the M8. The NDP indicates that the CNRR is a complementary but independent scheme to the N/M20 corridor scheme. However, its requirements, scale (based on demand levels) and justification will be considered and assessed as part of the appraisal process for the overall M20 scheme.

The Northern Ring Road is seen as an important strategic infrastructural requirement to complete the existing road network around the city. The Northern Ring Road Scheme has been divided into a Northern Section; linking the N20 Cork to Mallow Road with the N8 Glanmire Bypass, and Western Section; linking the Ballincollig Bypass with the N20. With regard to this development, vehicular access may be further enhanced through the possible future linkage between the proposed North Ring Road and the Ballincrokig/Ballyvolane area. The CNRR can be seen overleaf in **Figure 3.3.**

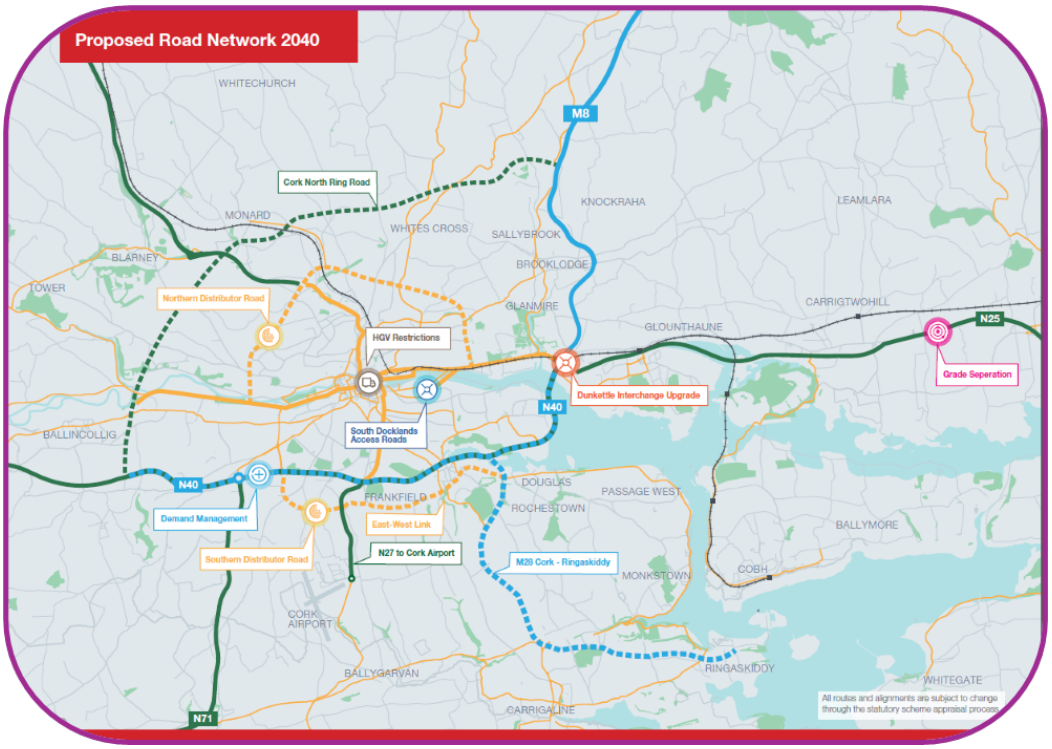


Figure 3.3: Extract from CMATS

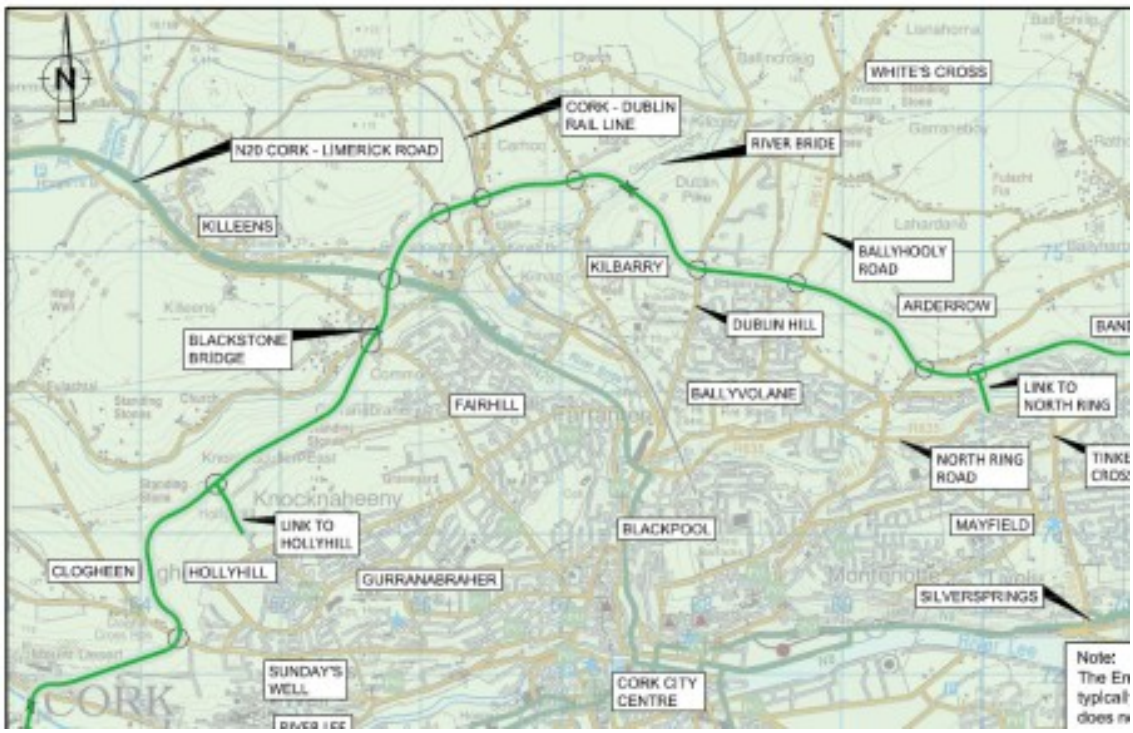


Figure 3.3a: Extract from CMATS

The new Cork Metropolitan Bus Network, part of BusConnects Cork, will involve the creation of new bus routes and improved bus frequencies to help transform the public transport network to meet anticipated growth and future demand in the region. As part of this new network, a new bus route 39 between Upper

Glanmire and Cork Bus Station via White's Cross, with six daily trips Monday-Saturday, is being created. This new route will supplement the existing bus routes in the vicinity. The 39 will run along the Ballyhooly Road and can be seen below in **Figure 3.4**, which is an extract from Bus Connects.

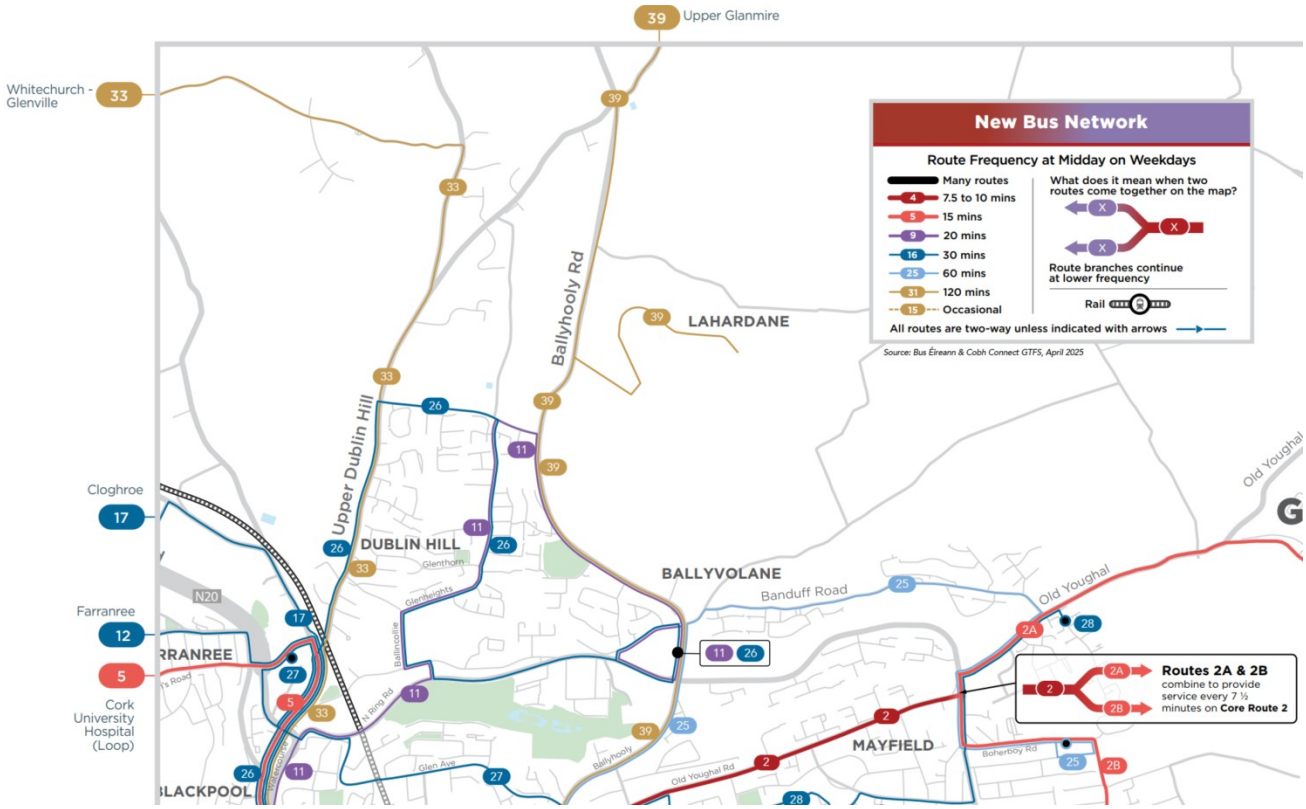


Figure 3.4: BusConnects Cork

The 2022 Census online SAP data was used to assess current modal shift patterns in the area with 12% of people saying they were commuting on foot, bike or using public transport. As agreed with the Traffic & Transport Department of Cork City Councill, an appropriate modal shift factor has been applied to the sustainable transport figure taken from the CSO data. This modal shift factor has been calculated using projected changes presented in the Cork Metropolitan Area Transport Study. CMATS gives modal shift factors of 34% for existing sustainable transport modes and 50.7% for future sustainable travel modes. This approach would suggest a future modal split by active and sustainable travel modes of 18% [12% +(12% x 50%)] which would result in a 6% reduction in the vehicular modal shift.

On completion of the Ballyhooly Transport Corridor works, an increase in modal shift of 34% would be expected to be delivered for the area for existing traffic patterns according to CMATS. This increase in modal shift will **not be applied** to existing traffic numbers when developing future year traffic models. In terms of modal split and national policies for the promotion of sustainable transport solutions, a reduction in car trips would be expected with improvement in pedestrian / cycle facilities as well as improvement to public transport.

Refer to the separate Traffic & Transport Assessment submitted as part of this application for full detail regarding the impact the proposed development will have on the surrounding roads network.

4. SITE INVESTIGATION

PROJECT: **N7 Longview, Ballyvolane, Cork**

CLIENT: **Longview Estates Ltd**

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

As part of the original planning application site investigations were carried out by Priority Geotechnical Ltd. on the green field site in 2017 & 2019. In total, site investigation consisted of 13 No. rotary core holes to measure the depth and strength of rock, 34 No. trial pits to measure the depth of soil and rock and 10 No. infiltration pits to measure the on-site infiltration rate. The investigation also included laboratory testing on samples taken from trial pits and core holes and crushing of rock samples taken from trial pits. The results of these tests indicate that the rock is ripable and can be reused on site.

Figure 4.1 below highlights the locations of the original site investigation

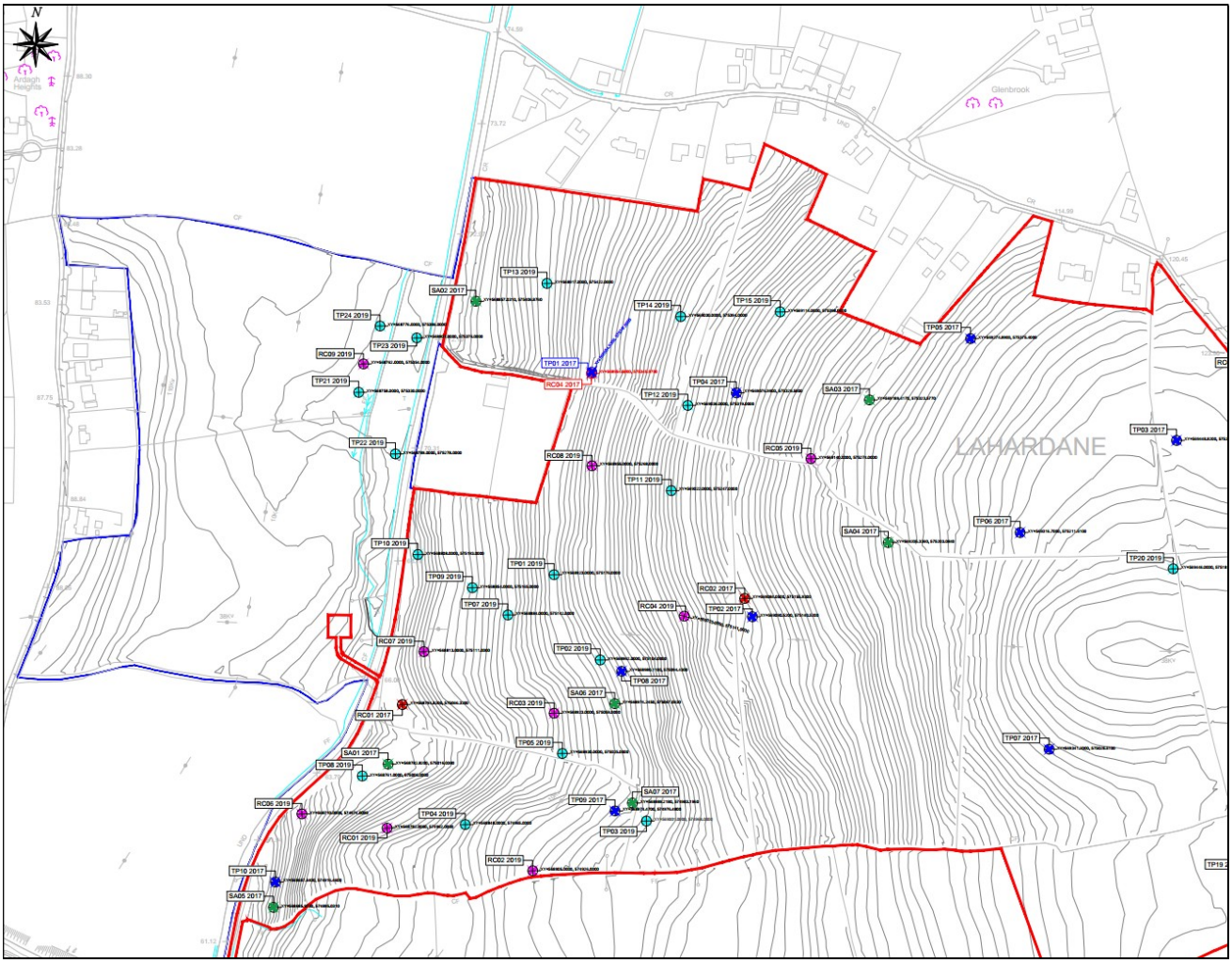


Figure 4.1: Site investigation locations undertaken 2017/2019

In August 2024 additional site investigation works were carried out by Priority Geotech to inform the construction stage design for N5 and also provide additional information for the planning stage of N7, the site the subject of this application. **Figure 4.2** shows the location of the additional trial pits and infiltration tests carried out at this time.

A full Site Investigation Factual and Interpretative Report is included as part this application (refer **Appendix A**).

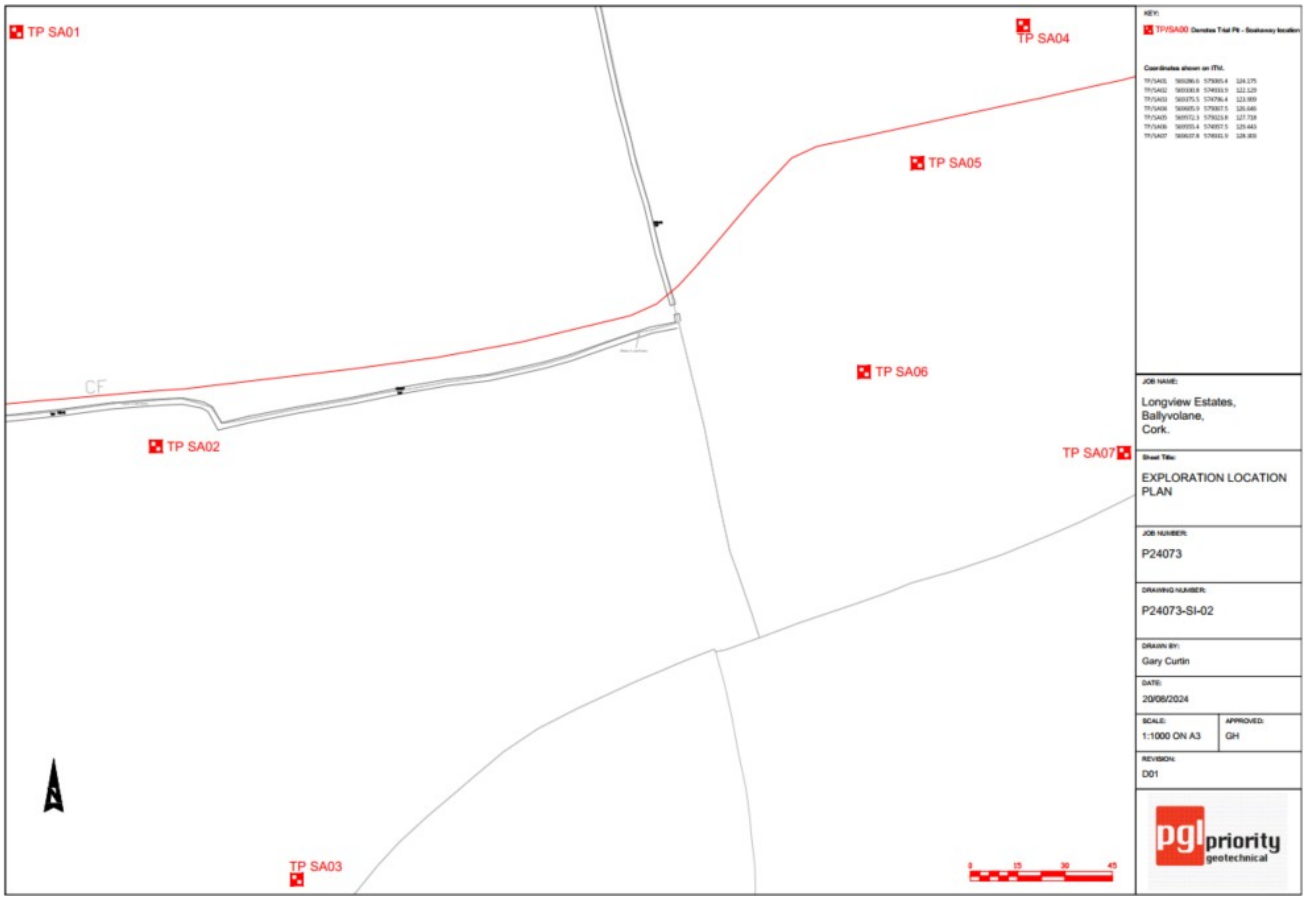


Figure 4.2: Site investigation locations undertaken in 2024

Logs and photographs of the August 2024 site investigation works completed within the proposed site lands, namely TP-SA01, TP-SA02, & TP-SA03, are included in **Appendix A** of this report.

Site Investigation – Summary of Findings

Location	Final depth, m bgl	Stratum Description	Groundwater Remarks
RC01	5.2	CLAY with cobble content. Rock MUDSTONE rock at 3.3m bgl	None encountered
RC02	8.3	Sandy CLAY. Rock SANDSTONE at 3.2m depth	None encountered
RC03	5.0	CLAY boulders, cobbles. Rock SANDSTONE at 2.2m bgl	None encountered
RC04	5.0	CLAY soft weathered rock. Rock SANDSTONE at 0.5m bgl	None encountered
TP01	4.0	Silty sandy GRAVEL. Rock SILTSTONE at 2.0m bgl	2.1m bgl, trickle flow
TP02	7.0	Silty sandy GRAVEL. Rock SILTSTONE at 2.7m bgl	2.8m bgl, trickle flow
TP03	4.0	Gravelly SILT. Rock SILTSTONE at 2.4m bgl	None encountered
TP04	4.0	Gravelly sandy SILT. Rock SILTSTONE at 1.5m bgl	None encountered
TP05	4.0	Gravelly sandy SILT. Rock SILTSTONE at 0.5m bgl	3.6m bgl, trickle flow
TP06	4.0	Gravelly sandy SILT. Rock SANDSTONE at 1.4m bgl	None encountered
TP07	4.0	Sandy Gravelly SILT. Rock SILTSTONE at 0.6m bgl	None encountered
TP08	4.0	Clayey sandy GRAVEL. Rock SANDSTONE at 3.8m bgl	None encountered
TP09	4.0	Gravelly sandy SILT. Rock SANDSTONE at 3.7m bgl	None encountered
TP10	4.0	Silty sandy GRAVEL. Rock SANDSTONE at 1.5m bgl	1.8m bgl, slow flow. 2.7m bgl, stready flow

Figure 4.3: August 2017 Site Investigation Results Summary (c: Priority Ltd.)

Location	Final depth, m bgl	Stratum Description	Groundwater Remarks
RC01	6.5	Sandy gravelly CLAY. Rock SILTSTONE at 1.3m bgl	1.3m bgl
RC02	6.8	Sandy gravelly CLAY. Rock SANDSTONE at 1.4m bgl	1.5m bgl
RC03	9.5	Sandy gravelly CLAY. Rock SANDSTONE at 4.3m bgl	4.3m bgl
RC04	6.7	Sandy gravelly CLAY. Rock SANDSTONE at 1.5m bgl	7.5m bgl
RC05	7.5	Sandy gravelly CLAY. Rock SANDSTONE at 1.3m bgl	3.3m bgl
RC06	3.3	Sandy gravelly CLAY. Rock SANDSTONE at 1.3m bgl	1.3m bgl
RC07	4.5	Sandy gravelly CLAY. Rock SANDSTONE at 1.5m bgl	3.0m bgl
RC08	3.5	Sandy gravelly CLAY. Rock SANDSTONE at 1.5m bgl	1.5m bgl
RC09	3.0	Sandy peaty CLAY. Sandy GRAVEL.	1.1m bgl
TP01	2.1	Silty sandy GRAVEL. Rock SILTSTONE at 1.2m bgl	None encountered
TP02	3.0	Sandy gravelly SILT. Rock SANDSTONE at 2.4m bgl	None encountered
TP03	3.4	Sandy clayey GRAVEL. Rock SILTSTONE at 2.8m bgl	None encountered
TP04	3.4	Very sandy GRAVEL. Rock SILTSTONE at 2.4m bgl	None encountered
TP05	2.9	Sandy gravelly CLAY. Cobbles and boulders at 1.8m bgl	None encountered
TP06	2.1	Gravelly SILT. Rock SILTSTONE at 0.9m bgl	None encountered
TP07	3.5	Clayey sandy GRAVEL. Rock SILTSTONE at 1.9m bgl	3.5m bgl, slow flow
TP08	1.8	Sandy gravelly SILT. Rock SANDSTONE at 1.1m bgl	1.8m bgl, slow flow
TP09	3.2	Sandy gravelly CLAY. Rock SILTSTONE at 2.9m bgl	1.8m bgl, trickling flow
TP10	3.6	Gravelly SILT. Rock SILTSTONE at 2.7m bgl	3.6m bgl, trickling flow
TP11	3.0	Sandy gravelly SILT. Cobbles and boulders at 0.9m bgl	None encountered
TP12	2.4	Silty GRAVEL. Sandy CLAY with boulder content	1.5m bgl, slow flow
TP13	2.5	Sandy gravelly CLAY. Rock SILTSTONE at 1.6m	None encountered
TP14	2.5	Clayey sandy GRAVEL. Cobbles and boulders.	None encountered
TP15	2.9	Sandy gravelly SILT. Cobbles mudstone/Siltstone. Rock at 2.7m bgl.	None encountered
TP16	2.4	Gravelly sandy SILT. Cobbles and boulders. Rock at 2.4m bgl	2.4m bgl, slow flow
TP17	2.7	Sandy gravelly CLAY. Cobbles. Rock at 2.7m bgl	2.7m bgl, slow flow
TP18	2.9	Rock recovered as Cobbles and boulders. Competent rock at 2.9m bgl	None encountered
TP19	1.9	Clayey sandy GRAVEL. Rock at 1.9m bgl	None encountered
TP20	2.5	Slightly sandy GRAVEL. Rock SILTSTONE at 2.5m bgl	None encountered
TP21	3.5	Very sandy GRAVEL. Very clayey SAND at 2.5m bgl	0.8m bgl, steady flow
TP22	3.6	Sandy GRAVEL. Rock at 3.6m bgl	2.5m bgl, steady flow
TP23	3.5	Sandy gravelly CLAY. Very sandy GRAVEL at 1.0m bgl	1.2m bgl, steady flow
TP24	3.5	Very sandy GRAVEL. Clayey gravelly SAND at 2.2m bgl	0.7m bgl – 2.2m bgl, steady flow

Figure 4.4: January 2019 Site Investigation Results Summary (c: Priority Ltd.)

Location	Final depth, m bgl	Stratum Description	Groundwater Remarks
TP-SA01	1.4	Fractured bedrock, SANDSTONE	None encountered
TP-SA02	1.8	Fractured bedrock, SILTSTONE	None encountered
TP-SA03	0.9	Fractured bedrock, SANDSTONE	None encountered
TP-SA04	2.3	Sandy, gravelly SILT, Very gravelly SAND.	None encountered
TP-SA05	3.3	Sandy gravelly SILT. Clayey, very gravelly SAND	None encountered
TP-SA06	2.6	Sandy gravelly SILT. Very gravelly SILT. Fractured bedrock SANSTONE at 0.6m bgl	None encountered
TP-SA07	3.1	Gravelly, very sandy SILT	None encountered

Figure 4.5: August 2024 Site Investigation Results Summary (c: Priority Ltd.)

Site Investigation - Storm design

With regards to the design of the storm water network, it was found that soil infiltration was possible across the site with varying rates being achieved.

Infiltration viability may be given full consideration where an infiltration coefficient of magnitude 10^{-5} ms^{-1} or greater exists (SUDS Manual C753, 2015). **Table 4.1** presents the criteria for the use of the different types of infiltration. The bulk of the site will fall into category Type B: partial infiltration. This will allow the use of SUDS (Sustainable Urban Drainage Systems) which will take the form of conveyance swales, tree pits and green roof systems.

TABLE 20.1 Guidance on selection of a pavement system type (after Interpave, 2010)

Ground characteristics		Type A: total infiltration	Type B: partial infiltration	Type C: no infiltration
Permeability of subgrade defined by coefficient of permeability k (m/s)	1×10^{-6} to 1×10^{-3}	✓	✓	✓
	1×10^{-8} to 1×10^{-6}	×	✓	✓
	1×10^{-10} to 1×10^{-8}	×	× (1)	✓
Highest expected water level within 1000 mm of formation level		×	×	✓
Pollutants present in subgrade		×	×	✓
Ground conditions such that infiltration of water is not recommended (solution features, old mine working etc, Chapter 8)		×	×	✓

Note

1 Partial infiltration systems may be used in soils with permeability less than 10^{-8} m/s but the infiltration of water is not allowed for in the storage design. This helps with the provision of Interception.

Table 4.1, Ciria (C753) SUDS Manual

The infiltration tests were carried out in accordance with BRE Digest 365 and would indicate that any SUDS measures proposed should be reinforced with a fully engineered storm management solution. Soak pits may be used to deal with back gardens where adequate depth of undisturbed subsoil is available.

Location	Depth, m bgl	Strata at base of excavation	Infiltration rate, ms^{-1}
TP-SA01	1.40	Fractured bedrock, SANDSTONE	2.6 E-04
TP-SA02	1.80	Fractured bedrock, SILTSTONE	4.5 E-06
TP-SA03	0.90	Fractured bedrock, SANDSTONE	2.7 E-07

Figure 4.6: August 2024 Site Investigation Infiltration Testing Results (c: Priority Ltd.)

Although the infiltration rates obtained from the infiltration testing indicate that the bulk of the site is suitable for category Type B: partial infiltration, it should be noted that the strata upon which the testing was completed was fractured bedrock. Indeed, the trial pits completed within the site extents note the general presence of shallow rock across the scheme. While infiltration rates were produced for the pits dug into the shallow rock, the potential exists for water infiltrating directly onto rock to emerge west of the proposed site within the existing Longview Estates development in the form of springs. The drainage design therefore proposes to only provide infiltration measures in non-fill areas with sufficient soil depth. See extract from infiltration test results in **Figure 4.8** and **Figure 4.9** below.

The scheme has been designed to utilise several attenuation tanks including on-line attenuation with a designed flow control of less than greenfield run-off (QBar). The construction materials of the attenuation tanks will be agreed with Cork City Council prior to construction, but it is anticipated that the tanks will be reinforced concrete in nature. **Figure 4.7** below presents a typical cross section for a reinforced concrete attenuation tank as may be used for this scheme.

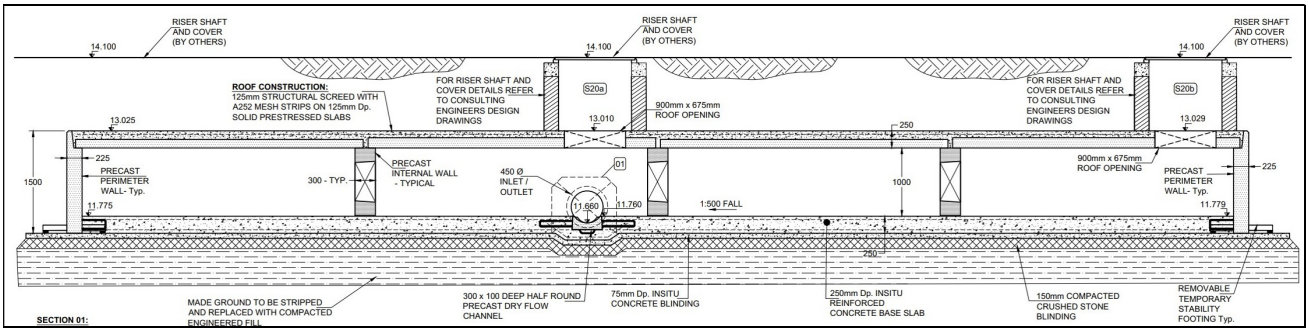


Figure 4.7: Attenuation RC tanks -typical cross section detail (Carlow Concrete)

P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 1 **TP-SA01**

l, m	**2.100**	b, m	**0.900**	d, m	**1.400**
l_base, m	**2.100**			d_eff, m	**0.700**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
12:17	0	0.700	0	0.70	0.00	0.000
	2	0.840	120	0.56	0.14	0.265
	3	0.930	180	0.47	0.23	0.435
	4	1.020	240	0.38	0.32	0.605
	5	1.120	300	0.28	0.42	0.794
	8	1.150	480	0.25	0.45	0.851
	11	1.170	660	0.23	0.47	0.888
	13	1.180	780	0.22	0.48	0.907
	14	1.190	840	0.21	0.49	0.926
	15	1.200	900	0.20	0.50	0.945
12:34	17	1.210	1020	0.19	0.51	0.964

Area	1.89 m^2	$V_{p75\text{-}25\ theory}$	volume	0.662	m^3
50% Area_eff, a_{p50}	3.99 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.482	m^3
50% Area_act, a_{p50}	3.42 m^2	$t_{p\ 75\text{-}25\ actual}$	time	168	s
		Infiltration Coefficient	*f*	8.39E-04	ms^-1

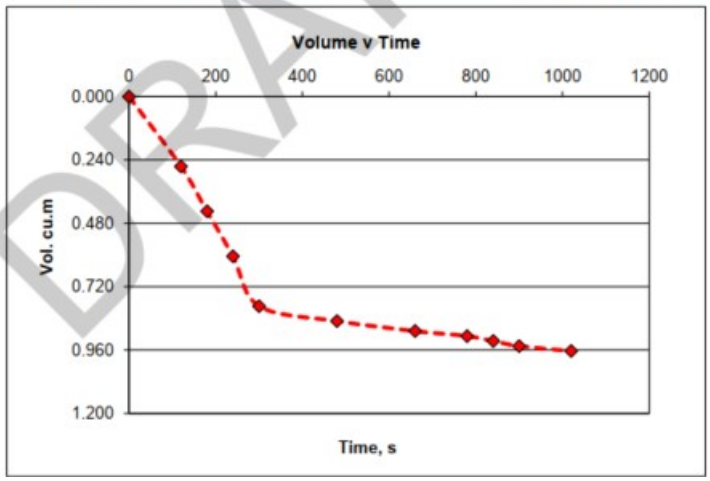


Figure 4.8: Infiltration test results – SA01

P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 2 **TP-SA03**

l, m	**2.300**	b, m	**0.900**	d, m	**0.900**
l_base, m	**1.300**			d_eff, m	**0.600**
l_eff, m	**1.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
14:30	0	0.300	0	0.60	0.00	0.000
	67	0.690	4020	0.21	0.39	0.456
16:34	124	0.900	7440	0.00	0.60	0.702

Area	1.17 m^2	$V_{p75\text{-}25\ theory}$	volume	0.351	m^3
50% Area_eff, a_{p50}	2.49 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.351	m^3
50% Area_act, a_{p50}	3.09 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	3538	s
		Infiltration Coefficient	*f*	3.21E-05	ms^-1

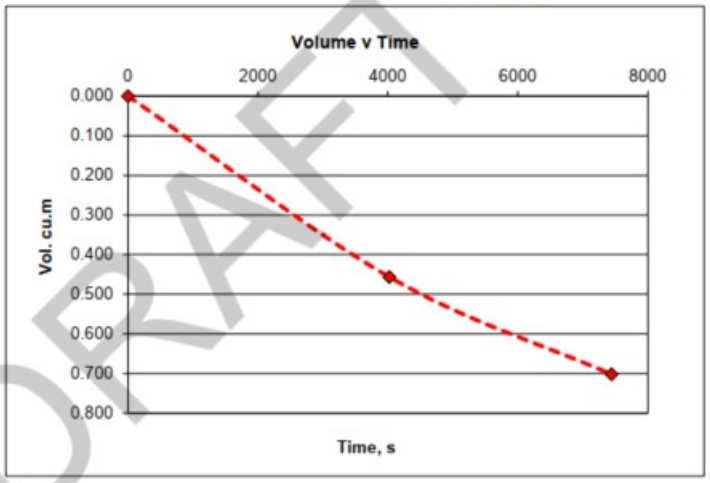


Figure 4.9: Infiltration test results – SA02

Site Investigation - Road design

An approximate volume of cut and fill material needed to construct the proposed development has been determined. The samples taken from each pit and borehole also went through a series of lab testing to examine the re-usability of the subsoil. The use of site-won material has been confirmed and is similar to the material currently being re-used as part of the adjoinig scheme.

It was found that the volume of subsoil (incl. rock) to be excavated is approx. 39,760m^3 with the volume of fill required being similar at approx. 36,450m^3. All excavated subsoil will be considered for suitability to be used as fill on site.

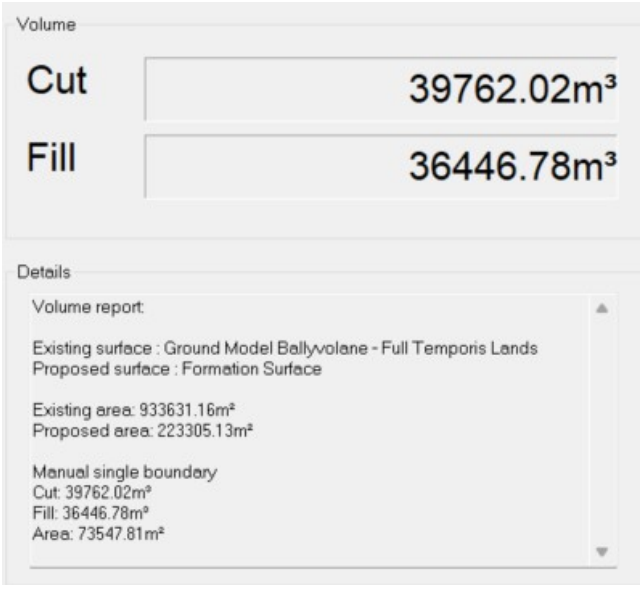


Figure 4.10: Estimated Cut/Fill Volumes

It is proposed that excavated material generated on site shall be treated as necessary for use as general fill around the site or removed / managed in accordance with the CEMP.

5. ROADS DESIGN

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

The internal estate roads have been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS). In general, a maximum gradient of 5.0% and minimum gradient of 0.7% was used for all internal estate roads.

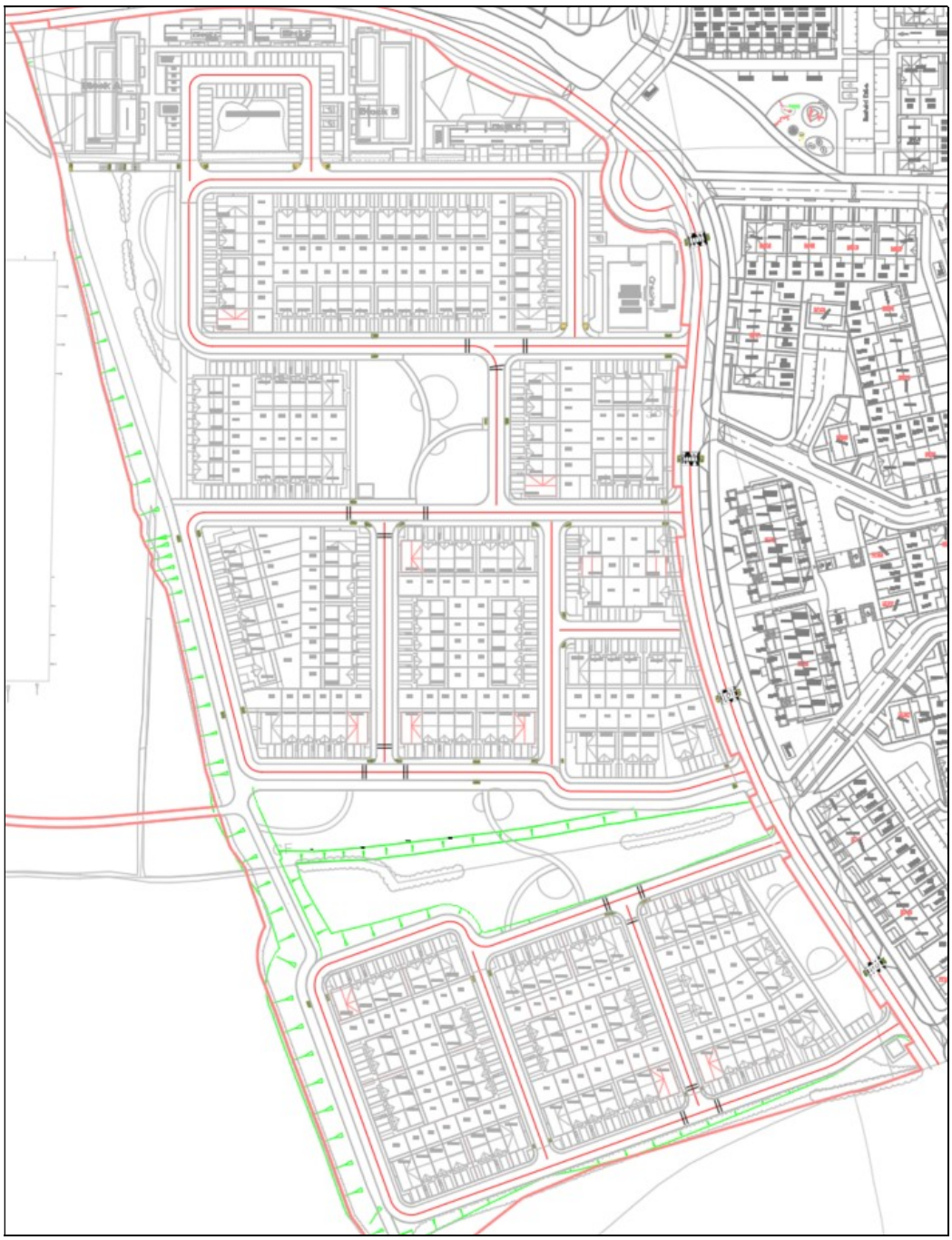


Figure 5.1: Overall proposed estate roads with earthwork lines

The parameters for a design speed of 20km/h were used to produce the horizontal and vertical alignments in accordance with the standards set out in Design Manual for Urbans Roads and Streets (DMURS). Table 4.3 in DMURS outlines the minimum requirement for horizontal and vertical curvature for a 20km/h road. The minimum value used for horizontal curvature is 4.6m. To produce a robust design regarding the vertical alignment it is prudent to use minimum K-values relating to a 40km/h road, 4.1 for a crest curve and 2.6 for a sag curve. **Figure 5.1** highlights each of the internal roads and corresponds with **Table 5.1** which presents the maximum and minimum design parameters used.

Estate Roads Design	Max Gradient	Min Gradient	Max K	Min K	Junction Approach Gradient	Junction Approach Length
N7 Road 3	3.3%	0.8%	95.91	12.48	0.8%/2.4%	164m/19m
N7 Road 4	2.2%	0.7%	55.36	23.11	0.8%/2.2%	106m/22m
N7 Road 5	1.0%	0.7%	23.56	23.56	0.7%/1.0%	76m
N7 Road 6	5.0%	3.1%	7.32	7.32	5.0%/3.1%	84m
N7 Road 7	5.0%	1.9%	53.78	6.99	1.9%/2.4%	46m/46m
N7 Road 8	0.8%	0.8%	-	-	0.8%/0.8%	7m/59m
N7 Road 9	4.7%	0.7%	120.25	4.21	0.7%/4.2%	78m/6m
N7 Road 10	5.0%	3.0%	2.67	2.67	5.0%/3.0%	32m/29m
N7 Road 13	0.7%	0.7%	-	-	0.7%	73m
Reference Document: ➢ Design Manual for Urban Roads and Streets 2019						

Table 5.1: Internal Estate Roads Design

6. STORM WATER NETWORK

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

A separate Drainage Impact Assessment (DIA) has been prepared and submitted along with this application.

The proposed surface water management system is designed, as much as is feasible, in accordance with the principles of Sustainable Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The stormwater management plan for this particular development incorporates a range of measures, including both soft and hard solutions. The use of Sustainable Drainage Systems (SUDS) and tank systems has been proposed where applicable.

All surface water runoff from the paved development will be directed away from the site. The attenuation tanks are specifically designed to handle a 100-year storm event. Moreover, the maximum discharge from the attenuation tanks will be restricted to the calculated permissible runoff (QBAR) for the site.

Given the proposed changes in the development design, there will be alterations to the land surface. Consequently, this anticipated modification will result in a corresponding increase in the peak rate of surface runoff from the site during periods of heavy rainfall.

As previously stated in Section 4, the existing ground conditions on site are primarily exposed rock with areas of hard surfacing. This is a brownfield site with no current attenuation. The ground conditions lend to high levels of rainwater runoff onto to Ballyhooly Road during storm events.

The HR Wallingford Greenfield Runoff Estimation online tool was used to assess current runoff from the site. A print off from the online tool can be found in **Appendix B** of this report. The area of the site is approximately 7.62 hectares with an estimated greenfield runoff rate for Qbar of 38.8 l/s calculated for the development. This is a per hectare equivalent of 5.1 l/s/ha. It has been agreed with the Drainage Department of Cork City Council that a lower runoff rate than the Qbar rate will be applied for designing the proposed developments stormwater drainage network. The runoff rate from a 1 in 1 year storm event has been agreed upon as the maximum allowable runoff from the site. This is 33.0 l/s for the site with a per hectare equivalent of 4.3 l/s.

The Greenfield Runoff Rate for the site can be seen in **Figure 6.1** and a summary of the design values output by the HR Wallingford Greenfield Runoff Estimation online tool is also shown in **Figure 6.2**.

GREENFIELD RUNOFF			
Item	**Area (ha)**	**QBar (l/s)**	**1 in 1 yr (l/s)**
Proposed Site	7.62	38.8	33.0
Per ha	1	5.1	4.3

Figure 6.1: Summary of design values for Greenfield Runoff Estimation

Soil Type	3
SPR	0.37
SAAR	1141
Hydrological Region	13

Figure 6.2: Summary of design values for Greenfield Runoff Estimation

Collection:

Surface water will be collected on the building roofs which will discharge via down pipes and underground pipes to either private soak pits located within the back gardens or into the public stormwater network which will discharge to attenuation tanks.

Surface water runoff from paved surfaces will be collected separately by drainage channels, road gullies and underground pipes. The surface water drainage system for the proposed development will be separate to the foul water system.

Treatment:

Surface water from half the roof (back roof) will be drained by gravity directly to private soak pits located with the garden areas where feasible. These soak pits will be suitably sized using infiltration results. The remainder of runoff from the roof as well as the paved areas, roads etc will discharge to attenuation systems via a bypass interceptor or similar approved.

Discharge:

Runoff from the soak pits will discharge directly into the ground. It is proposed to discharge the attenuated surface water flow by gravity to the constructed storm sewer network located in the Distributor Road (total outfall rate of 26 l/s). This outflow will then continue downstream to the existing attenuation tank (AT-D) located to the west of the site which was constructed as part of the Distributor Rd works. The discharge rate from AT-D will be increased from 20.1 l/s to 24.5 l/s to cater for the discharge from the proposed site. Further attenuation tanks located downstream of tank AT-D catering for the granted Longview Estates scheme and the AT-D outflow will not require any alterations to their design flow.

Pipe Design:

Pipes carrying surface water within the site are suitably sized to cater for a rainfall intensity of 50mm per hour applied to all external impermeable areas and roofs. Surface water runoff from impermeable areas is calculated using the Modified Rational Method.

Design Details:

It is proposed to attenuate to 3 no. tanks, providing sufficient capacity (m^3) which is greater than the storage requirement for the 100-year return period. Regarding limiting outflow from the storm network, hydro-brakes (or similar approved) flow control devices are to be fitted at their outlets.

The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each period analysed as follows:

- 1 in 30-year return period events were used to ensure no flooding occurs within the site.
- 1 in 100-year return period events were used to ensure that attenuation tanks were sufficiently sized with no flooding occurring. Areas were risk of localised overland flooding present to be managed within the development.

It should be noted that climate change has been accounted in the design. The GDSDS recommend a factor of 20% which has been incorporated into the design.

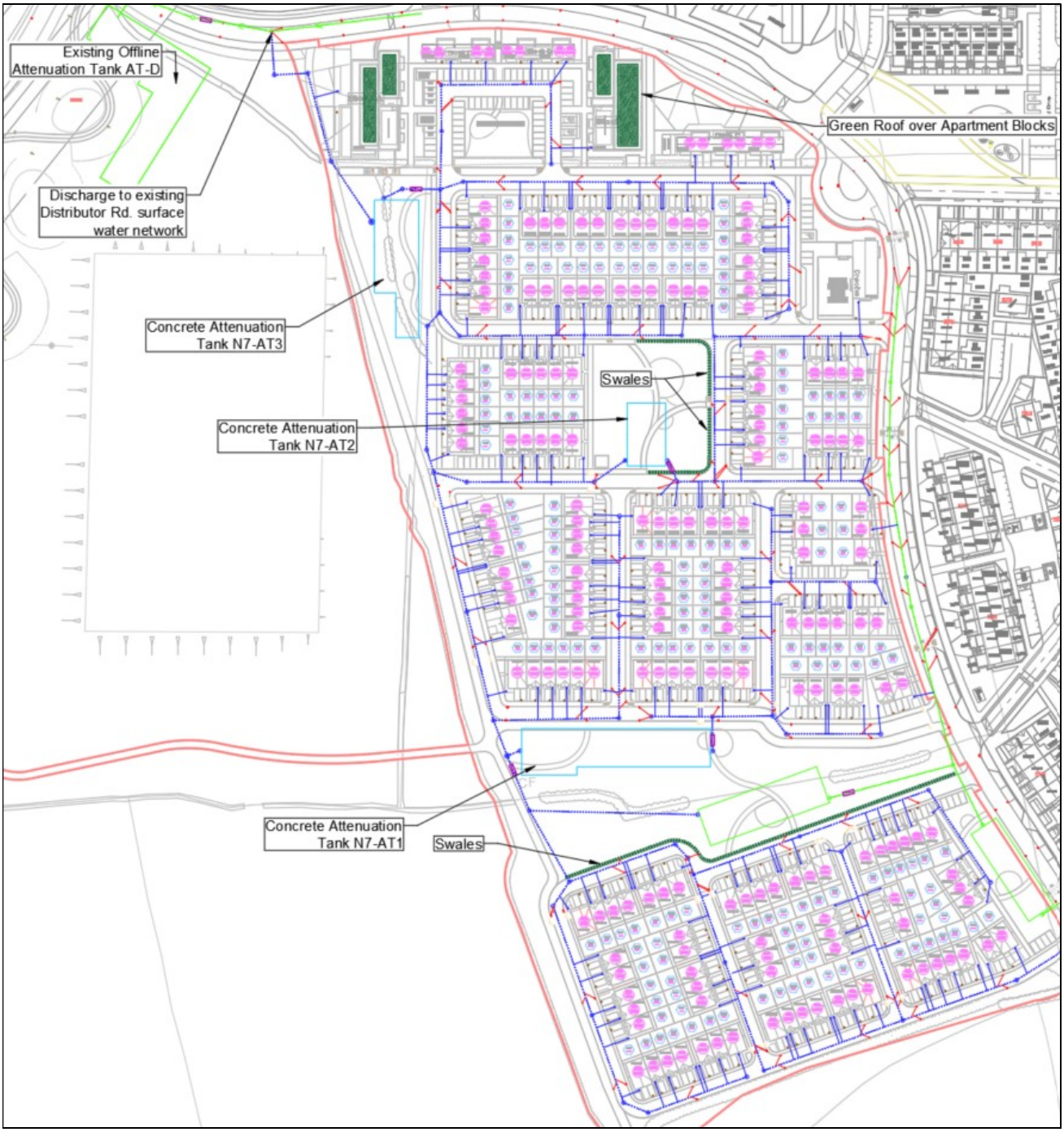


Figure 6.3: Overview of proposed storm network with attenuation tanks

The storm attenuation system is proposed to accommodate for existing flood storage potential within the site during a 100-year storm event. The construction of the storm sewer pipe network shall be in accordance with BS EN 752:2008 - drain and sewer systems outside buildings. Apart from the previously mentioned goals, the replication of a natural drainage system requires the implementation of a 'Management Train.' This hierarchy of Sustainable Drainage System (SuDS) techniques follows a sequence:

- Prevention: Aims to prevent both runoff and pollution.
- Source Control: Focuses on controlling runoff at or close to its source.
- Site Control: Involves managing surface water within the site or local area.
- Regional Control: Encompasses the collective management of surface water from multiple sites.

Different SUDS components align with these objectives and are better suited for specific stages of the Management Train. The fundamental principle is to locally manage surface water in smaller sub-catchments, reducing the reliance on conveyance to larger systems downstream.

The new drainage system provided for the proposed development will be entirely separated from the wastewater sewer network. Noting this methodology, the site is to be split into separate sub catchment zones for attenuation purposes.

The site's impervious areas are proposed to be attenuated by SUDs methods coupled with tanking solutions. The SUDs design philosophy will incorporate multiple controls to ensure the water management train is developed throughout the site.

The following SuDS features have been identified as applicable and will be provided within the proposed scheme:

- Tree Pits: Tree pits will be used where feasible across the development to provide interception storage and will contain engineered soil-filled tree boxes with drainage pipes beneath.

- Swales: Swales will run alongside road edges where practical and will receive runoff from the development's roads and footpaths. The swales will be a shallow landscaped depression at the surface with a drainage layer beneath and will be utilised to convey surface water flows. As previously outlined initial site investigation indicates that a level of infiltration will be possible which will further reduce the anticipated outflow from the site.

- Concrete Attenuation Tanks: will be required to manage the volume of runoff expected.

- Private Soak Ways will be located in private gardens and used to take half roof area where feasible.

SUDSSELECTIONHIERARCHYSHEETFORLARGE-SCALE DEVELOPMENT AND AGRICULTURAL DEVELOPMENT				
Suds Measures	**Measures to be used on site**	**Rational for selecting / not selecting measure**	**Area of feature (m^2)**	**Attenuation volume of feature (m^3) (see No. 8)**
Source Control Providing storage at source				
Swales	YES	Site geometry/ SI findings	As per submitted layouts	Infiltration is allowed in normal rain conditions. Omitted from attenuation calcs due to SI findings.
Integrated constructed tree pits	YES	Site geometry/ SI findings	As per submitted layouts	Infiltration is allowed in normal rain conditions. Omitted from attenuation calcs due to SI findings
Rainwater Butts	NO	Site geometry/ SI findings		
Soak ways	YES	Site geometry/ SI findings	Will be used only where feasible in private gardens.	Omitted from attenuation calcs to ensure robust analysis.
Infiltration trenches	NO	Site geometry/ SI findings		
Permeable pavement (Grass Crete, Block Paving, Porous Asphalt etc.)	NO	Site geometry/ SI findings		
Green Roofs	YES	Site geometry/ SI findings	As per submitted layouts	To be used on roofs of apartment blocks only. Omitted from attenuation calcs to ensure robust analysis.
Green wall	NO	Site geometry/ SI findings		
Filter strips	NO	Site geometry/ SI findings		
Bio-retention systems/Raingardens	NO	Site geometry/ SI findings		

Site Control				
Detention Basins	NO	Site geometry/ SI findings		
Retention basins	NO	Site geometry/ SI findings		
Regional Control				
Ponds	NO	Site geometry/ SI findings		
Wetlands	NO	Site geometry/ SI findings		
Other				
Petrol/Oil interceptor/Grit Trap	YES	Site geometry/ SI findings	As per submitted layouts	As per submitted layout proposals
Attenuation tank –	YES	Site geometry/ SI findings	As per submitted layouts	As per submitted layout proposals
Oversized pipes– only as a last resort where other measures are not feasible	NO	Site geometry/ SI findings		
Other	NO	Site geometry/ SI findings		

Figure 6.4: Suds Audit.

7. FOUL WATER NETWORK

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

Each person is assumed to consume 150 litres of water per day.
Dry Weather Flow (DWF) = 450 litres/dwelling/day (2.7 persons per dwelling with a 10%-unit consumption allowance).
Design for Peak Flow (6 X DWF) = 2,700 litres/dwelling/day (to account for surges in the consumption at peak times leading to surcharges in the pipe network).

The foul sewer network will connect initially to the foul network under construction as part of the Longview Estates neighbourhood 5 works before ultimately connecting to the existing constructed network on the Distributor Road. **Figure 7.1** presents the proposed network shown in brown with the pipeline to be constructed as part of the Longview Neighbourhood 5 works shown in pink.

Figure 7.1: Overview of Foul Network

For each pipe run, the accumulative number of households contributing to that section of pipework is used to calculate the design flow. Contributions from the creche were also determined and included in the design.

The construction of the foul sewer pipe network shall be in accordance with Uisce Eireann Code of Practice for Wastewater Infrastructure Doc UE-CDS-5030-03 and will connect to a proposed foul sewer pump station.

A Statement of Design Acceptance has been received from Uisce Eireann for the proposed works (refer to **Appendix C**).

8. WATER DESIGN

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

A 150mm diameter HDPE watermain is proposed to supply potable water to all units and fire hydrants within the development. Branches from this main will be 100mm diameter HDPE. The proposed pipe network has no dead ends with loops serving a minimum of 4 units in accordance with Uisce Eireann Code of Practice for Water Infrastructure Doc UE-CDS-5020-03.

The construction of the water supply pipe network shall be in accordance with Uisce Eireann Code of Practice for Water Infrastructure Doc UE-CDS-5020-03. Service layout distances to comply with Uisce Eireann Detail STD-W-11.

A Statement of Design Acceptance has been received from Uisce Eireann for the proposed layout (refer to **Appendix C**).

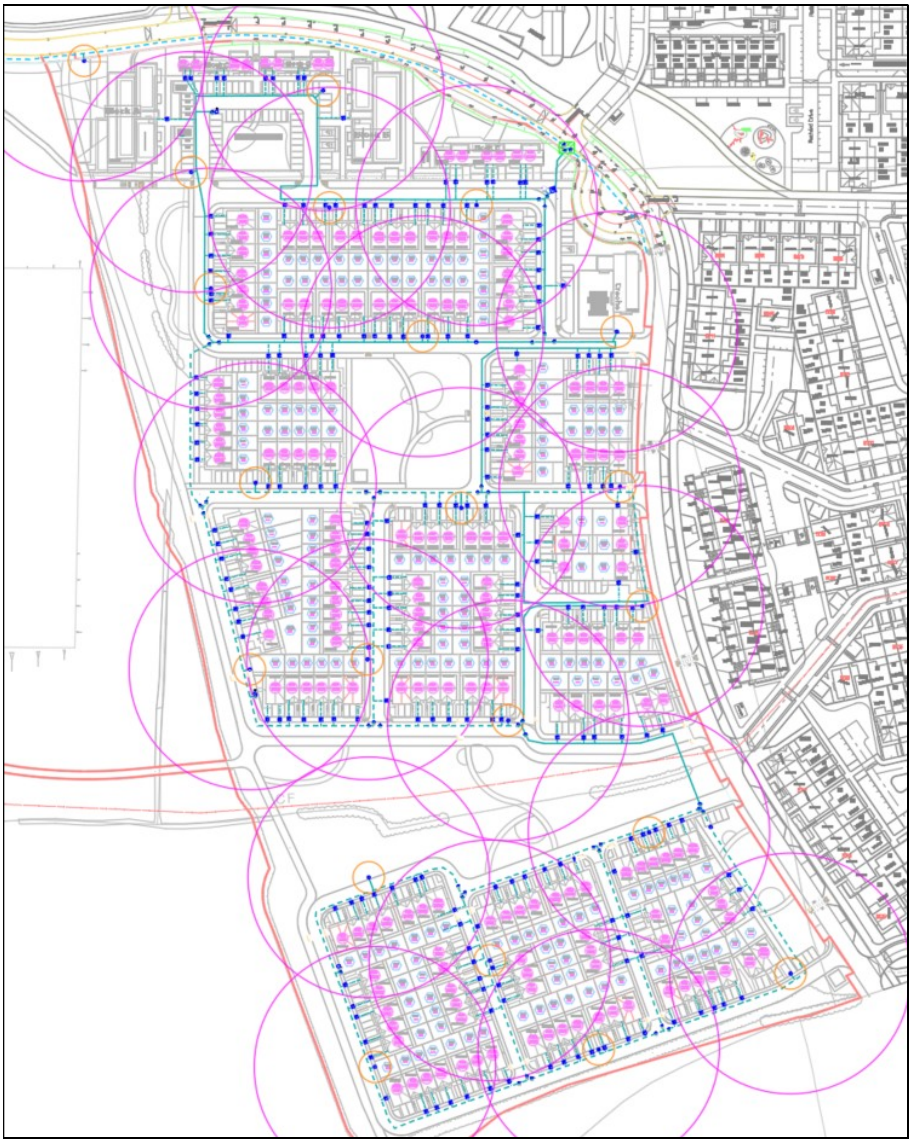


Figure 8.1: Overview of Watermain Network

9. PUBLIC LIGHTING

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

A separate public lighting design report is included as part of the application documentation.

The public road lighting is designed to BS5489 & EN13201 utilising the “Lighting Reality Pro” software package. This design package is used to select an appropriate lantern type and to optimise the lighting design. Lanterns should comply with BS EN 60598-2-3 and columns shall be manufactured to BS EN 40-3-1:2013.

Columns are to have a double locked framed door and should be multisided galvanised to Cork City Council specification. All columns shall have a duct chamber with cover at their base. The public lighting shall be fed from new power supply connections.

All Lanterns are proposed to be Warm White 2700°K with a peak wavelength greater than 550nm.

10. FLOOD RISK ASSESSMENT

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

Planning guidelines on flood risk and development have been published by the OPW and Department of Environment, Heritage and Local Government (DoEHLG). The below sections summarise how the developments design will be assessed in accordance with the main principals of the guidelines. A separate Floor Risk Assessment document has been completed and is submitted as part of this application.

SEQUENTIAL APPROACH

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

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

Zone B Moderate probability. This zone defines areas with a moderate risk of flooding. For river flooding it is defined as 0.1% to 1% probability or between 1 in 100 and 1 in 1000 years, and for coastal flooding 0.1% and 0.5% probability or between 1 in 200 and 1 in 1000 years.

Zone C Low probability. This zone defines areas with a low risk of flooding less than 0.1% probability or less than 1 in 1000.

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

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

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

Zone A Water Compatible or Justification Test
Zone B Less Vulnerable if no other lands are available or highly vulnerable with Justification Test
Zone C Any development

DEVELOPMENT SEQUENTIAL TEST

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

There is no risk associated with coastal flooding for this site as general ground levels for the site (circa 70.00m – 120.00m OD) are much higher than expected extreme coastal flood levels.

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

Myplan.ie map incorporates many different sets of spatial information, including OPW Flood Mapping data (fluvial, pluvial, coastal flooding data and groundwater flood extents).

Figure 10.1 is an extract from www.myplan.ie and indicates that there is no fluvial flooding threat to the site of the proposed development.

Figure 10.1: Fluvial flood map in the vicinity of the proposed site

Pluvial Flooding

The OPW Flood Hazard Mapping Website is a record of historic flood events and this database indicates that there was one reported incident of flooding in the area further downhill in The Glen, see **Figure 10.2** below.

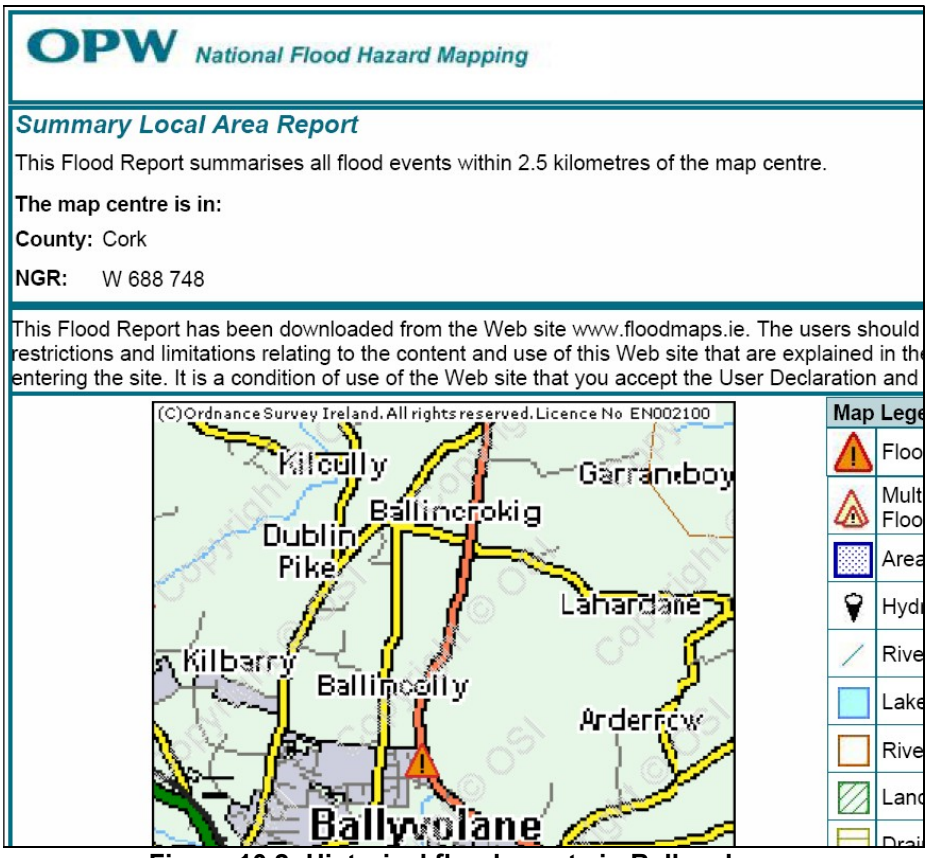


Figure 10.2: Historical flood events in Ballyvolane

Nine of the ten flood events occurred in the Blackpool area of the city. The flooding on the Ballyhooly Rd was from the Glen Stream in 1988. Flooding occurred due to blocked gullies.

It is noted the site of the proposed development was not affected by the flooding.

Development Drainage

The proposed surface water drainage on site will be designed to cater for the 100 year return period plus 20% climate change allowance. No expected flooding will occur on site for storms up to this return period.

Flood Risk Assessment Conclusions

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

Other sources of flood risk have been investigated including development drainage. In all cases it was found that the development is at low risk of flooding and the development of residential units is deemed appropriate in the site location.

11. NZEB COMPLIANCE

PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

PROPOSED DEVELOPMENT: 262 residential units and associated creche.

This document provides an overview of the developments energy strategy and relates to the sustainability and energy targets proposed for the project. The development must approach the energy design in an efficient manner that reduces energy demand initially through passive strategies such as an efficient envelope which in turn reduces the energy demands relating to items such as the heating system. This initial approach in reducing the energy demand significantly aids the project in obtaining the required energy goals. Performance criteria relating to the development's envelope are set out in the following document.

The energy systems design must also focus on specifying energy efficient equipment to ensure the day to day running of the energy systems are optimised to further enhance energy savings and the related energy cost. Specifications relating to efficient heating, lighting and auxiliary equipment are set out in the document.

The report sets out to demonstrate a number of methodologies in Energy Efficiency, Conservation and Renewable Technologies that will be employed in part or in combination with each other for this development. These techniques will be employed to achieve compliance with the building regulations Part L and NZEB standards currently in public consultation.

BUILDING ENERGY RATING

As of 2006 all domestic buildings that were newly built and existing buildings that are for sale or rent require a BER (Building Energy Rating) certificate. The actual building energy rating is based on the primary energy used for one year and is classified on a scale of A1 to G with A1 being the most energy efficient. It also gives the anticipated carbon emissions for a year's occupation based on the type of fuel that the systems use. In order to identify Primary energy consumption of the building, the BER assesses energy consumed under the following headings:

- Building type (house, apartment etc)
- Building orientation
- Thermal envelope (insulation levels of the façade, roofs, ground floor etc)
- Air Permeability (how much air infiltrates into the building through the façade)
- Heating systems (what type of heat source is used and how efficient)
- Ventilation (what form of ventilation is used. Natural vent, mixed mode mechanical ventilation)
- Fan and pump efficiency (how efficient are the pumps and fans)
- Domestic hot water generation (is a high efficiency boiler used)
- Lighting systems (how efficient is the lighting in the building

Through the specification of an energy efficient façade and HVAC systems, the energy consumption of the building will be reduced compared to a set baseline. This ensures the environmental and economic impact of the operation of the building is reduced. The key philosophy of this plan is to reduce energy consumption by firstly limiting the energy needed by improving the buildings insulation. The second step is to utilise energy in the most efficient way through the selection and installation of energy efficient plant and equipment. The final step is to introduce energy from renewable sources to reduce the burden on Fossil Fuels.

BUILDING SERVICES (M&E) OVERVIEW

Heating & Ventilation systems

Various options for heating of residential units will be considered including include possible gas boilers, heat pumps or exhaust air heat pumps.

Air source heat pumps utilize low grade heat from external ambient air and transfer heat to heating system pipework. These systems operate with very high efficiencies (>400%) which provides significant carbon reductions in comparison to a traditional boiler system.

Gas heating options would comprise a high efficiency gas boiler for provision of heating and hot water. Photovoltaic panels would be installed in conjunction with the gas boiler option to achieve the Part L renewable energy requirements.

Exhaust air heat pumps utilise an exhaust air heat pump type system for heating, hot water and ventilation of the individual units. This will re-cycle the heat from your house's ventilation system. These machines are ideal for more compact air-tight low energy or passive homes. Air is drawn through ducts to the heat pump from the bathrooms, utility and kitchen areas. The cold waste air is discharged to outside through another duct, and condensation to a drain. Additional heat generated internally from lighting, people and domestic appliances is also utilised through heat recovery.

For every unit of electricity used to operate the heat pump, up to four to five units of heat are generated. Therefore, for every unit of electricity used to generate heat, 4-5 (400-500%) units of heat are produced. Efficiencies in order of 600% may also be achieved depending on ambient conditions.

Photovoltaic panels are best suited to sites which have an unobstructed southerly and south-easterly elevations. PV is particularly suitable due where there is a simultaneous requirement for heating, hot water and electrical demand. The on-site generation of electricity can supplement the electrical requirement for lighting, motors, etc & reduce the electrical demand and from the grid.

Applying this to each dwelling would considerably reduce the demand from the grid and consequently reduce losses and emissions from power stations. Such is the benefit of on site or distributed generation, the DEAP model determines that each kWh offset from PV equates to circa 2.5 times the thermal equivalent and reduces CO2 emissions by some 0.47Kg/kWh generated.

Lighting

All lighting to be energy efficient with provision made for low energy lamps such as Compact Fluorescent Lamps (CFLs)/LED's which use 80% less electricity and last up to 10 times longer than ordinary light bulbs in the dwellings.

12. FIRE SAFETY

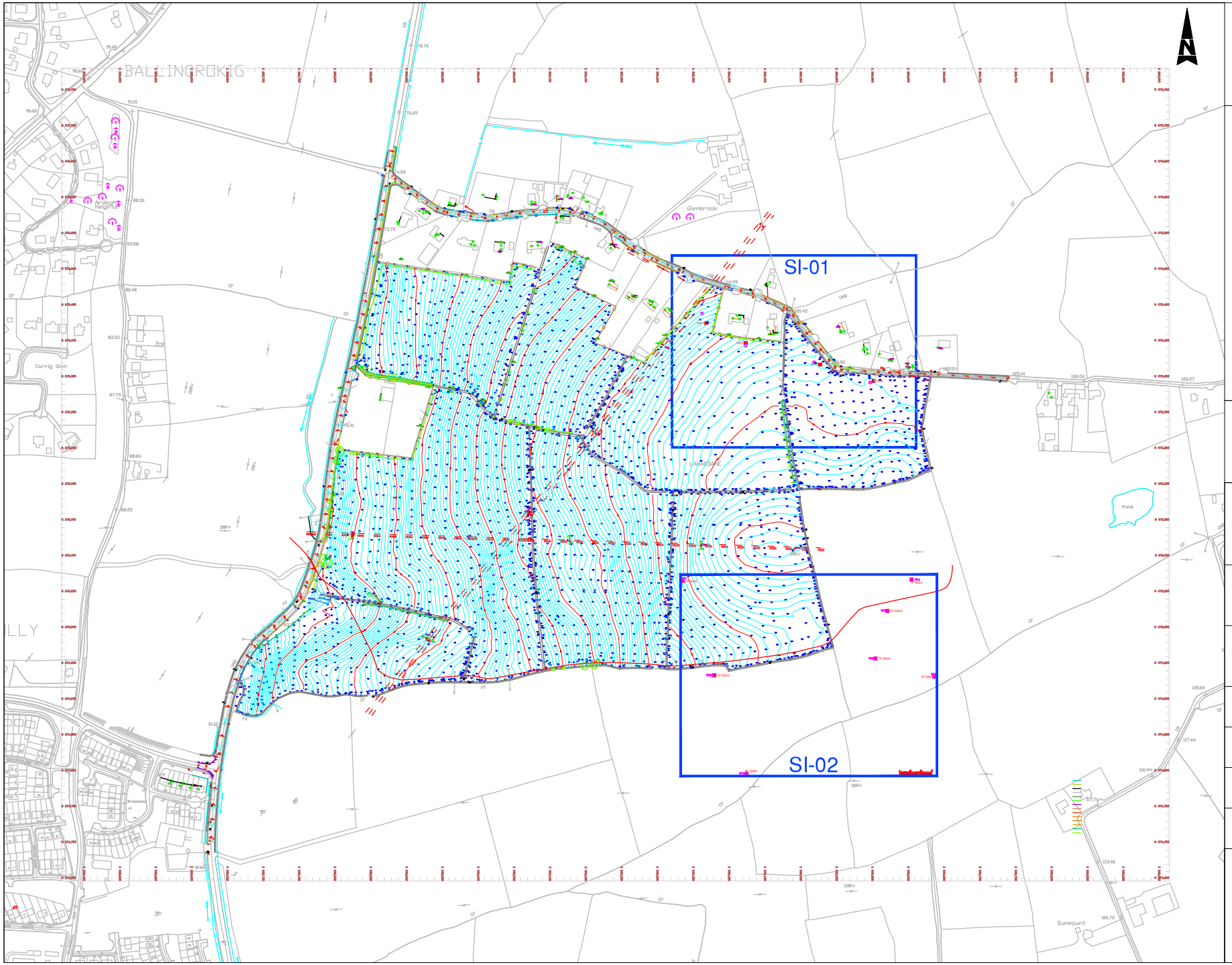
PROJECT: N7 Longview, Ballyvolane, Cork

CLIENT: Longview Estates Ltd

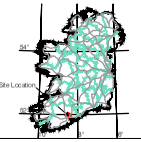
PROPOSED DEVELOPMENT: 262 residential units and associated creche.

The scheme will be designed in compliance with Technical Guidance Document B of the Building Regulations. The various design drawings and documents have been developed to align with these requirements. Detail design changes may be needed at FSC stage depending on Fire Officer / FSC Requirements.

Appendix A:
Site Investigation Logs – August 2024



Priority Geotechnical Site



JOB NAME:

Longview Estates,
Ballyvolane,
Cork.

Sheet Title:

Exploratory Location Layout

JOB NUMBER:

P24073

DRAWING NUMBER:

P24073-SI-A

DRAWN BY:

Gary Curtin

DATE:

20/08/2024

SCALE:	APPROVED:
1:5000 ON A3	GH

REVISION:

D01

pgl priority geotechnical

KEY:

TP/SA00 Denotes Trial Pit - Soakaway location

Coordinates shown on ITM.

TP/SA01	569286.6	575065.4	124.175
TP/SA02	569330.8	574933.9	122.129
TP/SA03	569375.5	574796.4	123.909
TP/SA04	569605.9	575067.5	126.646
TP/SA05	569572.3	575023.8	127.718
TP/SA06	569555.4	574957.5	129.443
TP/SA07	569637.8	574931.9	128.303

JOB NAME:

Longview Estates,
Ballyvolane,
Cork.

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P24073

DRAWING NUMBER:

P24073-SI-02

DRAWN BY:

Gary Curtin

DATE:

20/08/2024

SCALE:

1:1000 ON A3

APPROVED:

GH

REVISION:

D01

pgl priority geotechnical

KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

GENERAL

m	Meter
mm	Millimetres
BGL	Below existing ground level
mOD	Level to OD Malin
TP	Trial Pit
ST	Slit Trench
CP	Cable Percussion Borehole
RC	Rotary Cored Borehole
IP	Inspection Pit
FP	Foundation Pit
DP	Dynamic Probe
Geobore S	Geobore S Borehole

SAMPLES

B	Bulk disturbed sample
D	Small disturbed sample
U	Undisturbed sample
WS	Dynamic sample/ window sample
ENV	Environmental sample
SPLTLS	Split spoon sample
CBR	California Bearing Ratio mould sample

RECOVERY AND ROCK QUALITY

TCR %	Total Core Recovery (% of Core Run)
SCR %	Solid Core Recovery (length of core having at least one full diameter as % of core run) RQD
RQD %	Rock Quality Designation (length of solid core greater than 100mm as % of core run)
FI	Fracture Index (Measured over length of core run)
NI	Non intact
AVG	Average distance between fractures
MAX	Maximum distance between fractures
MIN	Minimum distance between fractures

GROUNDWATER

Strike	
Level after standing	

IN-SITU TESTING

N	Standard Penetration Test - Blows required to drive 300mm after seating drive
C	Standard Penetration Test - 60Cone
S	Standard Penetration Test – Split Spoon

Soil and rock descriptions are based on the guidance in BS5930:2015, The Code of Practice for Site Investigation

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TPSA01
Sheet 1 of 1

Project Name: Longview, Neighbourhood 2	**Project No.** P24073	**Co-ords:** 569287E - 575065N **Level:** 124.18m OD	**Date** 20/08/2024
Location: Ballyvolane, Cork	**Dimensions (m):** 2.10 × 0.90 **Depth:** 1.40m BGL		**Scale** 1:25
Client: Longview Estates Ltd.			**Logged** DOC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	123.88		Reddish brown, sandy, gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded. *Organic matter present (rootlets).*
	0.50	B					Fractured, weathered bedrock. Bedrock is red SANDSTONE. *Areas of sand due to rock degradation. Sand is fine to coarse.*
	1.40	B		1.40	122.78		End of Pit at 1.400m

1
2
3
4
5

Stability: Good
Plant: 13 track machine
Backfill: Arisings

Groundwater: None encountered.

Remarks: Trial excavation terminated at 1.40m bgl. SANDSTONE. Soakaway test carried out.

Photographic Record

Number:	**TPSA01**	**Project**	Longview Ballyvolane	
		Project No	P24073	
		Engineer	M.H.L	

Photographic Record

Number:	**TPSA01**	**Project**	Longview Ballyvolane	
		Project No	P24073	
		Engineer	M.H.L	

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TPSA02
Sheet 1 of 1

Project Name: Longview, Neighbourhood 2	**Project No.** P24073	**Co-ords:** 569331E - 574934N **Level:** 122.13m OD	**Date** 20/08/2024
Location: Ballyvolane, Cork	**Dimensions (m):** 2.20 × 1.20		**Scale** 1:25
Client: Longview Estates Ltd.	**Depth:** 1.80m BGL		**Logged** DOC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	0.50	B		0.60	121.53		Brown, sandy, very gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded. *Organic matter present (rootlets).*
	1.50	B		1.80	120.33		Fractured, weathered bedrock. Green SILTSTONE.
							End of Pit at 1.800m

Stability: Good
Plant: 13t track machine
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial excavation terminated at 1.80m bgl. SILTSTONE. Soakaway test carried out.

Photographic Record

Number:	**TPSA02**	**Project**	Longview Ballyvolane	
		Project No	P24073	
		Engineer	M.H.L	

Photographic Record

Number:	**TPSA02**	**Project**	Longview Ballyvolane	
		Project No	P24073	
		Engineer	M.H.L	

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TPSA03
Sheet 1 of 1

Project Name: Longview, Neighbourhood 2	**Project No.** P24073	**Co-ords:** 569375E - 574796N **Level:** 123.91m OD	**Date** 20/08/2024
Location: Ballyvolane, Cork	**Dimensions (m):** 2.30 × 0.90 **Depth:** 0.90m BGL		**Scale** 1:25
Client: Longview Estates Ltd.			**Logged** DOC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.00	123.91		Brown, sandy, very gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded.
	0.40	B		0.40	123.51		Orange/brown, silty, very gravelly SAND with low cobble content. Gravel is fine to coarse and angular to sub-rounded. Sand is fine to coarse. Cobbles are angular to sub-angular, sandstone lithology and 63-100mm in diameter.
	0.70	B		0.70	123.21		Fractured, weathered bedrock. Red SANDSTONE.
				0.90	123.01		End of Pit at 0.900m

Stability: Good
Plant: 13t track machine
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial excavation terminated at 0.90m bgl. SANDSTONE. Soakaway test carried out.

Photographic Record

Number:	**TPSA03**	**Project**	Longview Ballyvolane	
		Project No	P24073	
		Engineer	M.H.L	

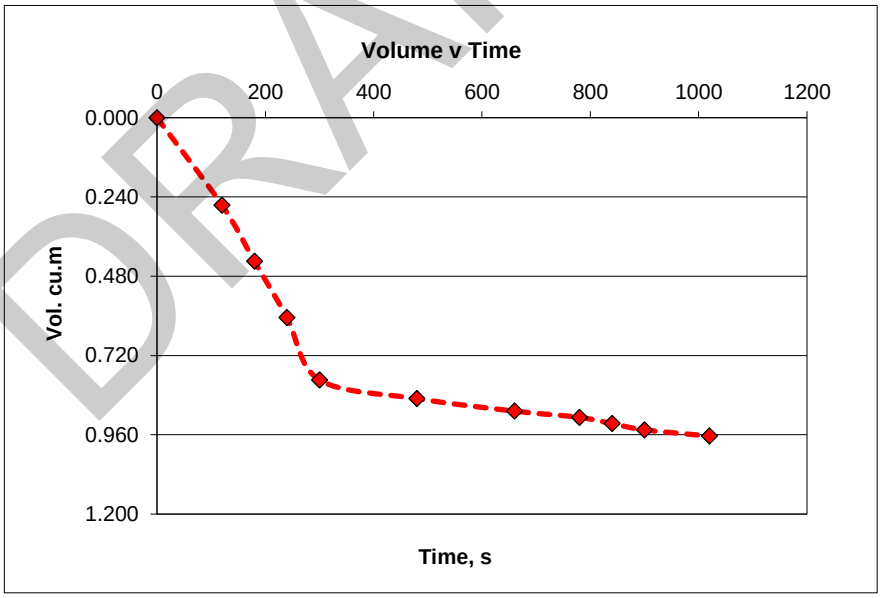
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 1 **TP-SA01**

l, m	**2.100**	b, m	**0.900**	d, m	**1.400**
l_base, m	**2.100**			d_eff, m	**0.700**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
12:17	0	0.700	0	0.70	0.00	0.000
	2	0.840	120	0.56	0.14	0.265
	3	0.930	180	0.47	0.23	0.435
	4	1.020	240	0.38	0.32	0.605
	5	1.120	300	0.28	0.42	0.794
	8	1.150	480	0.25	0.45	0.851
	11	1.170	660	0.23	0.47	0.888
	13	1.180	780	0.22	0.48	0.907
	14	1.190	840	0.21	0.49	0.926
	15	1.200	900	0.20	0.50	0.945
12:34	17	1.210	1020	0.19	0.51	0.964

Area	1.89 m^2	$V_{p75\text{-}25\ theory}$	volume	0.662	m^3
50% Area_eff, a_{p50}	3.99 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.482	m^3
50% Area_act, a_{p50}	3.42 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	168	s
		Infiltration Coefficient	*f*	8.39E-04	ms^-1



NOTES:

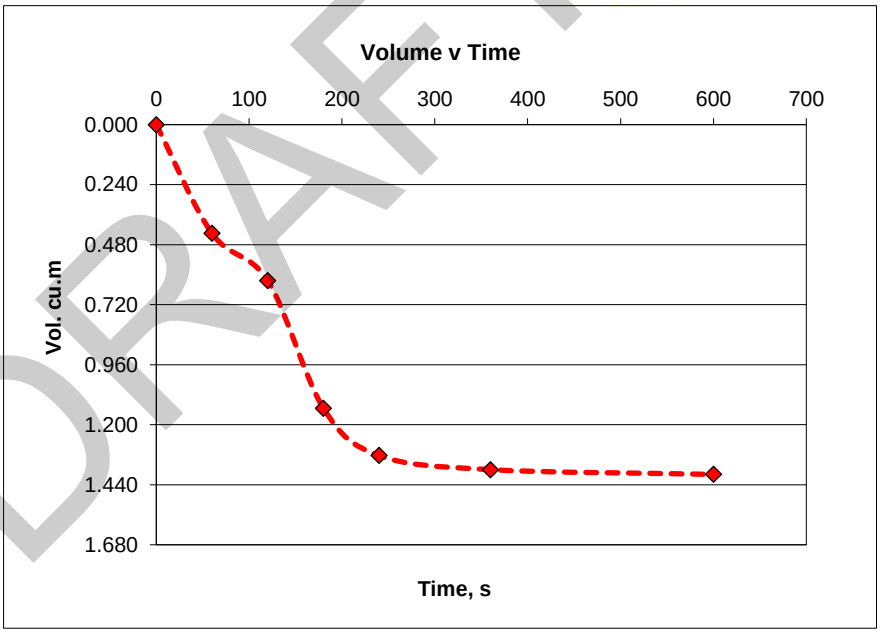
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 2 **TP-SA01**

l, m	**2.100**	b, m	**0.900**	d, m	**1.200**
l_base, m	**2.100**			d_eff, m	**0.790**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
14:52	0	0.410	0	0.79	0.00	0.000
	1	0.640	60	0.56	0.23	0.435
	2	0.740	120	0.46	0.33	0.624
	3	1.010	180	0.19	0.60	1.134
	4	1.110	240	0.09	0.70	1.323
	6	1.140	360	0.06	0.73	1.380
13:02	10	1.150	600	0.05	0.74	1.399

Area	1.89 m^2	$V_{p75\text{-}25\ theory}$	volume	0.747	m^3
50% Area_eff, a_{p50}	4.26 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.699	m^3
50% Area_act, a_{p50}	4.11 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	119	s
		Infiltration Coefficient	*f*	1.43E-03	ms^-1



NOTES:

P24073 **Longview Est, Ballyvolane** **20/08/2024**

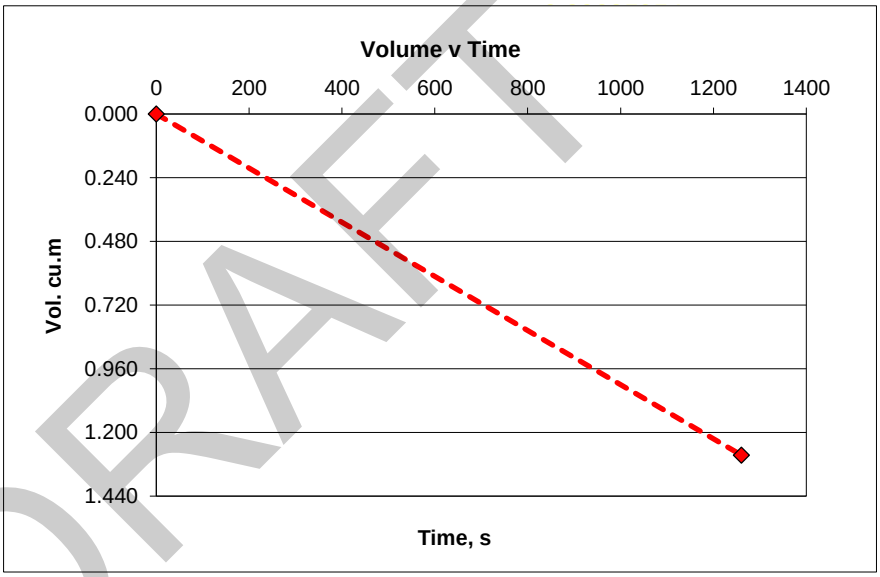
Test 3 **TP-SA01**

l, m	**2.100**	b, m	**0.900**	d, m	**1.150**
l_base, m	**2.100**			d_eff, m	**0.680**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
15:04	0	0.470	0	0.68	0.00	0.000
15:25	21	1.150	1260	0.00	0.68	1.285

Area

50% Area_eff, a_{p50}	1.89 m^2	$V_{p75\text{-}25\ theory}$	volume	0.643	m^3
50% Area_act, a_{p50}	3.93 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.643	m^3
	3.93 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	630	s
		Infiltration Coefficient	*f*	2.60E-04	ms^-1



NOTES:

P24073 **Longview Est, Ballyvolane** **20/08/2024**

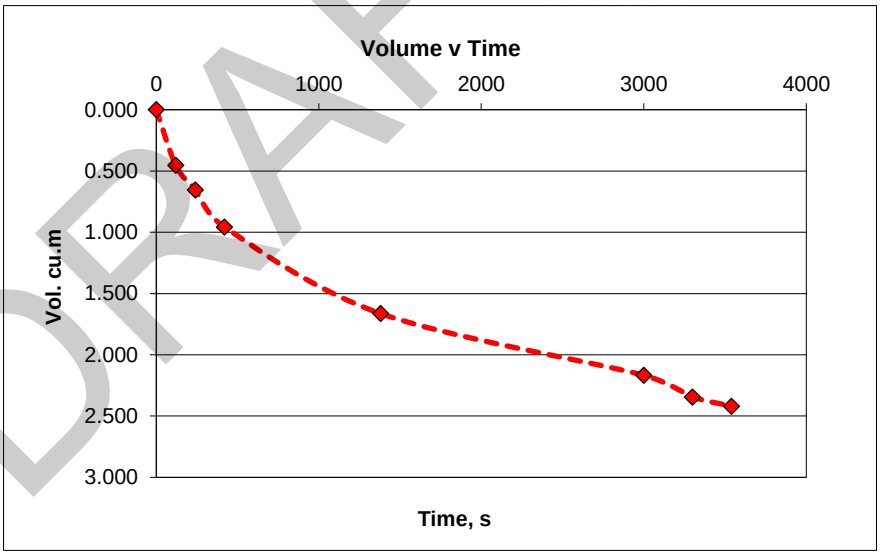
Test 1 **TP-SA02**

l, m	**2.200**	b, m	**1.200**	d, m	**1.800**
l_base, m	**2.100**			d_eff, m	**1.050**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
11:43	0	0.750	0	1.05	0.00	0.000
	2	0.930	120	0.87	0.18	0.454
	4	1.010	240	0.79	0.26	0.655
	7	1.130	420	0.67	0.38	0.958
	23	1.410	1380	0.39	0.66	1.663
	50	1.610	3000	0.19	0.86	2.167
	55	1.680	3300	0.12	0.93	2.344
12:42	59	1.710	3540	0.09	0.96	2.419

Area

50% Area_eff, a_{p50}	2.52 m^2	$V_{p75\text{-}25\ theory}$	volume	1.323	m^3
50% Area_act, a_{p50}	5.99 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	1.210	m^3
	5.78 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	2256	s
		Infiltration Coefficient	*f*	9.27E-05	ms^-1



NOTES:

P24073 **Longview Est, Ballyvolane** **20/08/2024**

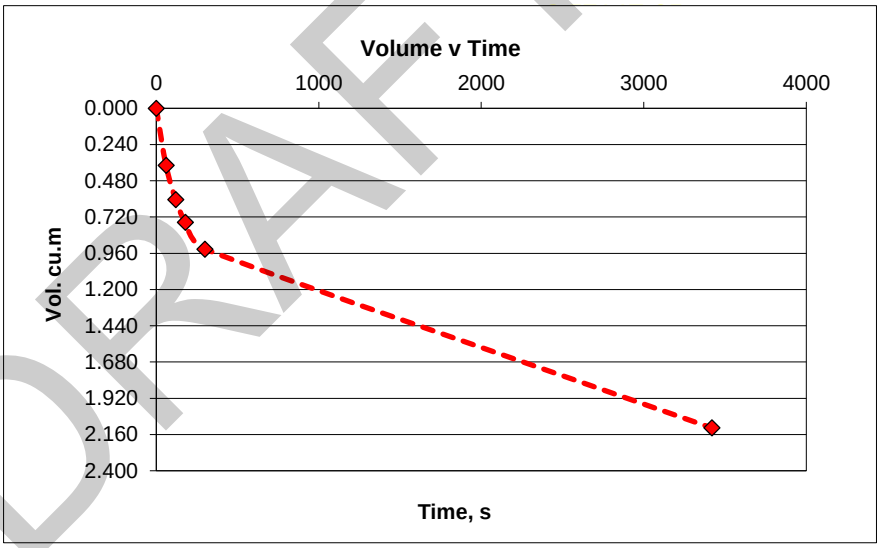
Test 2 **TP-SA02**

l, m	**2.200**	b, m	**1.200**	d, m	**1.700**
l_base, m	**2.100**			d_eff, m	**1.130**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
14:37	0	0.570	0	1.13	0.00	0.000
	1	0.720	60	0.98	0.15	0.378
	2	0.810	120	0.89	0.24	0.605
	3	0.870	180	0.83	0.30	0.756
	5	0.940	300	0.76	0.37	0.932
15:34	57	1.410	3420	0.29	0.84	2.117

Area

50% Area_eff, a_{p50}	2.52 m^2	$V_{p75\text{-}25\ theory}$	volume	1.424	m^3
50% Area_act, a_{p50}	6.25 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	1.058	m^3
	5.38 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	1976	s
		Infiltration Coefficient	*f*	9.96E-05	ms^-1



NOTES:

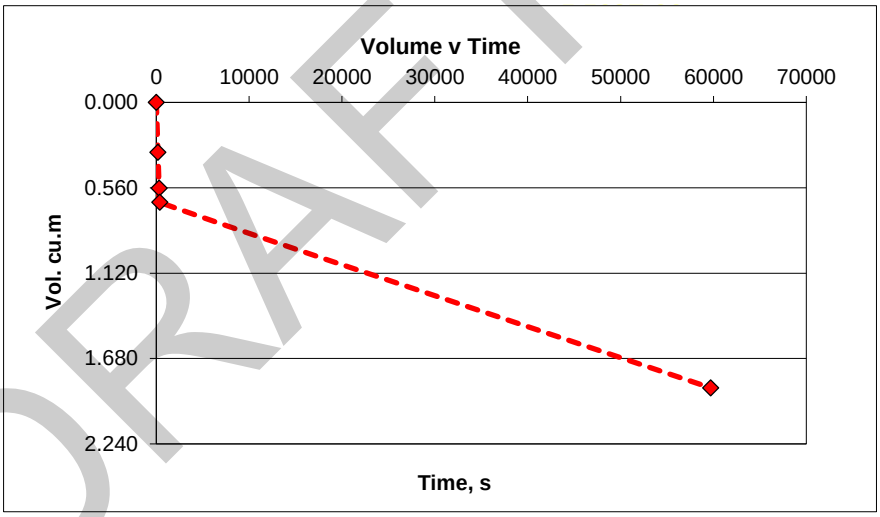
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 3 **TP-SA02**

l, m	**2.200**	b, m	**1.200**	d, m	**1.700**
l_base, m	**1.300**			d_eff, m	**1.200**
l_eff, m	**1.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
16:45	0	0.500	0	1.20	0.00	0.000
	3	0.710	180	0.99	0.21	0.328
	5	0.860	300	0.84	0.36	0.562
	6	0.920	360	0.78	0.42	0.655
09:20	995	1.700	59700	0.00	1.20	1.872

Area	1.56 m^2	$V_{p75\text{-}25\ theory}$	volume	0.936	m^3
50% Area_eff, a_{p50}	4.56 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.936	m^3
50% Area_act, a_{p50}	5.64 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	36898	s
		Infiltration Coefficient	*f*	4.50E-06	ms^-1



NOTES:

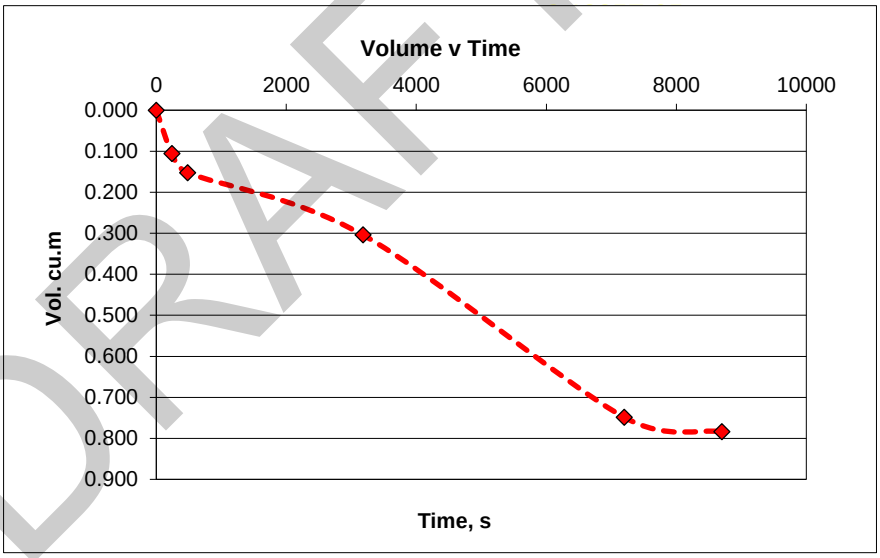
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 1 **TP-SA03**

l, m	**2.300**	b, m	**0.900**	d, m	**0.900**
l_base, m	**1.300**			d_eff, m	**0.670**
l_eff, m	**1.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
11:55	0	0.230	0	0.67	0.00	0.000
	4	0.320	240	0.58	0.09	0.105
	8	0.360	480	0.54	0.13	0.152
	53	0.490	3180	0.41	0.26	0.304
	120	0.870	7200	0.03	0.64	0.749
02:20	145	0.900	8700	0.00	0.67	0.784

Area	1.17 m^2	$V_{p75\text{-}25\ theory}$	volume	0.392	m^3
50% Area_eff, a_{p50}	2.64 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.392	m^3
50% Area_act, a_{p50}	3.31 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	4746	s
		Infiltration Coefficient	*f*	2.49E-05	ms^-1



NOTES:

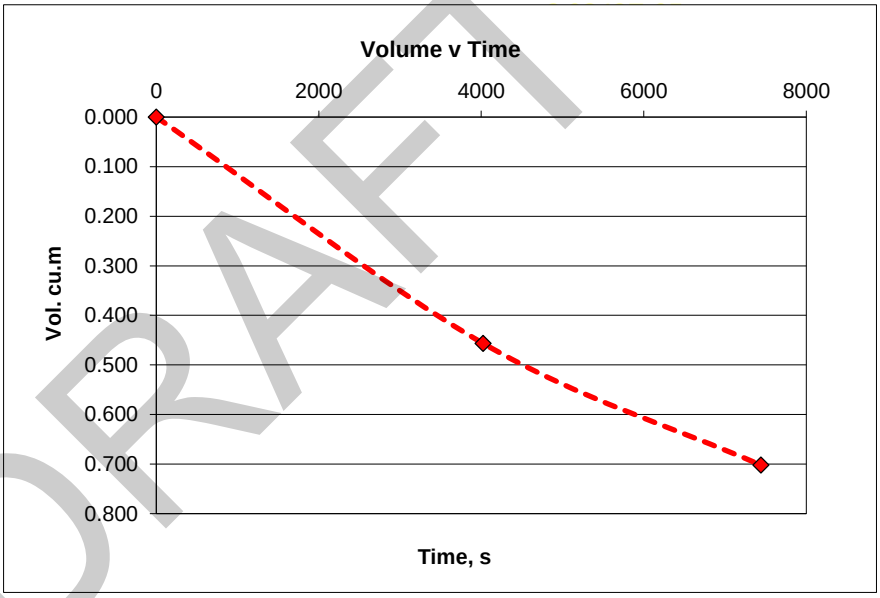
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 2 **TP-SA03**

l, m	**2.300**	b, m	**0.900**	d, m	**0.900**
l_base, m	**1.300**			d_eff, m	**0.600**
l_eff, m	**1.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
14:30	0	0.300	0	0.60	0.00	0.000
	67	0.690	4020	0.21	0.39	0.456
16:34	124	0.900	7440	0.00	0.60	0.702

Area	1.17 m^2	$V_{p75\text{-}25\ theory}$	volume	0.351	m^3
50% Area_eff, a_{p50}	2.49 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.351	m^3
50% Area_act, a_{p50}	3.09 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	3538	s
		Infiltration Coefficient	*f*	3.21E-05	ms^-1



NOTES:

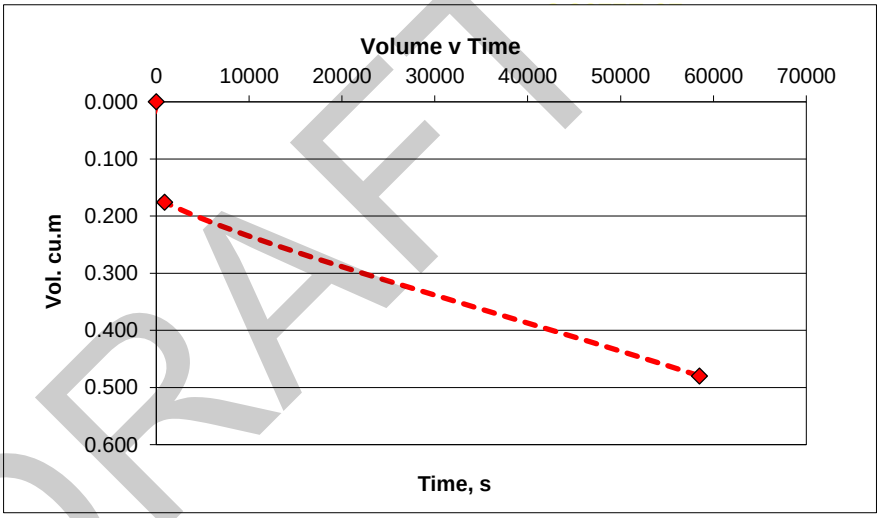
P24073 **Longview Est, Ballyvolane** **20/08/2024**

Test 3 **TP-SA03**

l, m	**2.300**	b, m	**0.900**	d, m	**0.710**
l_base, m	**1.300**			d_eff, m	**0.410**
l_eff, m	**1.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
17:00	0	0.300	0	0.41	0.00	0.000
	15	0.450	900	0.26	0.15	0.176
09:15	975	0.710	58500	0.00	0.41	0.480

Area	1.17 m^2	$V_{p75\text{-}25\ theory}$	volume	0.240	m^3
50% Area_eff, a_{p50}	2.07 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.240	m^3
50% Area_act, a_{p50}	2.48 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	354244	s
		Infiltration Coefficient	*f*	2.73E-07	ms^-1



NOTES:

Appendix B:
HR Wallingford Greenfield Runoff

Greenfield runoff rate estimation tool

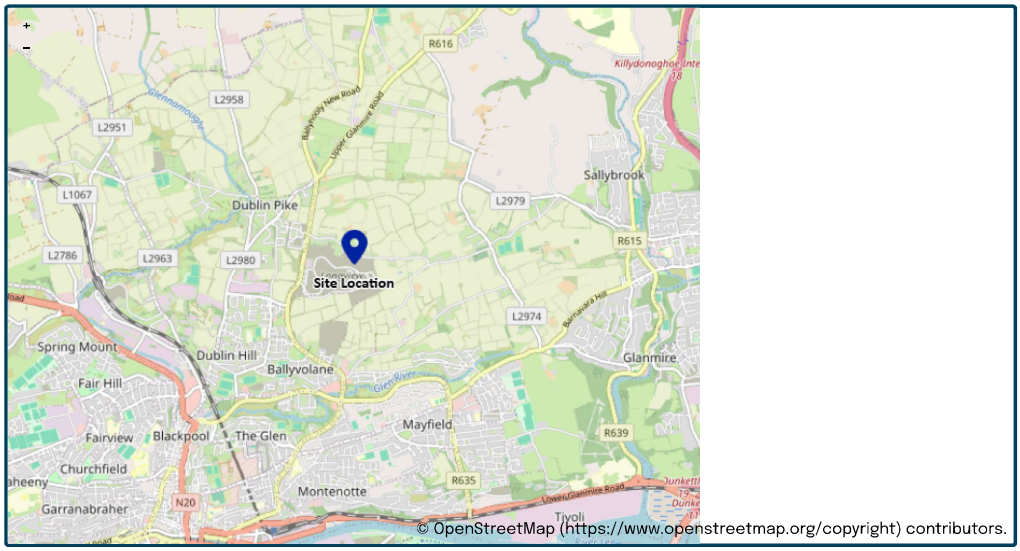
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	05/06/2026
Calculated by	Shane Moriarty
Reference	Longview N7 Planning
Model version	2.2.3

Location

Site name	Longview N7
Site location	Ballyvolane



Site easting (Irish Grid)	169435
Site northing (Irish Grid)	75050
Site easting (Irish Transverse Mercator)	569392
Site northing (Irish Transverse Mercator)	575112

Site details

Total site area (ha)	7.62 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1141 mm		1141
How should SPR be derived?	WRAP soil type		
WRAP soil type	3		4
SPR	0.37		
QBar (IH124) (l/s)	38.8 l/s		

Growth curve factors

	My value		Map value
Hydrological region	13		13
1 year growth factor	0.85		
2 year growth factor	0.95		
10 year growth factor	1.4		
30 year growth factor	1.65		
100 year growth factor	1.95		
200 year growth factor	2.15		

Results

Method	IH124
Flow rate 1 year (l/s)	33.0 l/s
Flow rate 2 year (l/s)	36.8 l/s
Flow rate 10 years (l/s)	54.3 l/s
Flow rate 30 years (l/s)	64.0 l/s
Flow rate 100 years (l/s)	75.6 l/s
Flow rate 200 years (l/s)	83.4 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

Appendix C:
Uisce Éireann Statement of Design Acceptance

Shane Moriarty
MHL & Associates Ltd
Unit 1b, The Atrium
Blackpool
Cork, Co. Cork t23t2vy

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

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

5 December 2025

Re: Design Submission for Longview Lahardane LRD, Lahardane, Ballyvolane, Cork (the "Development") (the "Design Submission") / Connection Reference No: CDS25003416

Dear Shane Moriarty,

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, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann'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 Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Janynne Abreu
Email: janynne.abreu@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- [24083HD-WL7-P01] MHL_N7_Watermain Layout_1_20250815
- [24083HD-WL7-P02] MHL_N7_Watermain Layout_2_20250815
- [24083HD-DL7-P01] MHL_N7_Drainage Layout_1_20250815
- [24083HD-DL7-P02] MHL_N7_Drainage Layout_2_20250815
- [24083HD-DLS7-P01] MHL_N7_Foul Longsection_1_20250815
- [24083HD-DLS7-P02] MHL_N7_Foul Longsection_2_20250815
- [24083HD-DLS7-P03] MHL_N7_Foul Longsection_3_20250815
- [24083HD-DLS7-P04] MHL_N7_Foul Longsection_4_20250815
- [24083HD-DLS7-P05] MHL_N7_Foul Longsection_5_20250815

*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 Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

OFFICES:

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