BLESSINGTON LRD

Infrastructure Design Report

230199-DBFL-XX-XX-RP-C-0001

INFRASTRUCTURE

October 2024

DBFL CONSULTING ENGINEERS

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1	25/04/24	First Issue	Seán Byrne	Brendan Manning	
2	04/10/24	Planning issue	Jack O'Callaghan	Seán Byrne	Brendan Manning

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1 Introduction

1.1 Background

DBFL have been instructed to prepare an Infrastructure Design Report (IDR) to support the planning application for a mixed-use development ranging in height from 1 No. to 5 No. storeys, principally comprising: 233 No. residential dwellings (24 No. 1-bed, 103 No. 2-bed, 94 No. 3-bed and 12 No. 4-bed); 36 No. 'later living' dwellings (12 No. 1-bed and 24 No. 2-bed); a medical centre; a pharmacy; and a café on a 6.05 Ha site at lands in Blessington, Co. Wicklow.

The proposed site layout is shown on Road Layout drawing 230199-X-04-Z00-DTM-DR-DBFL-CE-1201.

This IDR should be read in conjunction with DBFL's Site Specific Flood Risk Assessment (230199-DBFLXX-XX-RP-C-0002).

1.2 Objectives

This report provides information regarding the existing site and addresses the infrastructural demands of the proposed development including the following:

- Site Access and Road Layout
- Surface Water Drainage
- Flood Risk
- Foul Drainage
- Water Supply

1.3 Topography

From a high point in the Eastern corner of the site (+207.76) which extends towards the centre of the site, the sites falls towards its Southern, Western and Northern boundary.

Gradients along the transitional strip range from 1:17 to 1:50.

Existing topographic survey information is shown in the background of the Proposed Roads Layout Plan (refer to DBFL Drawing No. 230199-X-04-Z00-DTM-DR-DBFL-CE-1201).

1.4 Location

The proposed development is located in the townland of Blessington Demesne, Co. Wicklow along the Blessington Inner Relief Road. The site which is adjacent Blessington shopping centre is approximately 30 km from Dublin City Centre to the north-east and approximately 12km from Nass to the north-west.

Figure 1-1 Site Location - Main Site (Site Boundary Indicative Only)

1.5 Ground Conditions

IGSL have been commissioned to carry out ground investigations at the site in June 2024, and will carried out ground water monitoring between June 2024 and November 2024 (ground investigation will be made available prior to application).

A previous ground investigation was carried out by GII in January 2020. The SI report identified the following a Topsoil layer of between 100mm to 300mm over a layer of mad ground comprising of a slightly sandy gravelly Clay ranging in depth from 200mm to 800mm) above slightly gravelly slightly sandy clay.

No groundwater was noted during the investigation.

6 soakaway tests were conducted on site, infiltration rates indicated were between $9.65_{x10^{-5}}$,and $5.25_{x10^{-6}}$ respectively which should allow infiltration from SuDS features.

Ground water monitoring was carried out a three locations on site, results showed ground water levels varied from 1.5 m to 3.0 m below proposed levels.

Available ground investigation reports are available in Appendix A.

1.6 Proposed Development

The proposed development comprises of 233 No. residential dwellings and 36 No. “later living” dwellings and 3 non residential units (Medical centre, Café and Pharmacy) on a 6.05 Ha site (approx.). Refer to Architecture layout and Accommodation schedule for further detail.

The proposed development will also include the following associated engineering infrastructure:

- Provision of access points from the Blessington Inner Relief Road (along the site’s Western boundary) facilitating primary vehicle access.
- A secondary access point will also be provided to the Link Road along the sites South western boundary.
- This access point will also facilitate permeability for pedestrians and cyclists, and additional access points will be provided along the sites boundaries .
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure

2 SITE ACCESS AND STREET LAYOUT

2.1 Site Access

The primary access route for motorised vehicles to the development will be via a newly formed priority junction off the Blessington inner relief road (refer to roads layout drawing).

Secondary access point for motorised vehicles to the development will be along the link road in the South-West corner

The site layout facilitates high levels of cycle and pedestrian connectivity as noted below (also refer to Figure 2.1).

- The Pedestrian / Cycle facilities linkages are provided along its South-East, South-West and North West boundaries.
- There will be several links from the development to facilitate Pedestrian and cyclist permeability to the site.

Refer to DBFL Drawing No. 230199- X-04-Z00-DTM-DR-DBFL-CE-1201 for proposed site access as described above.

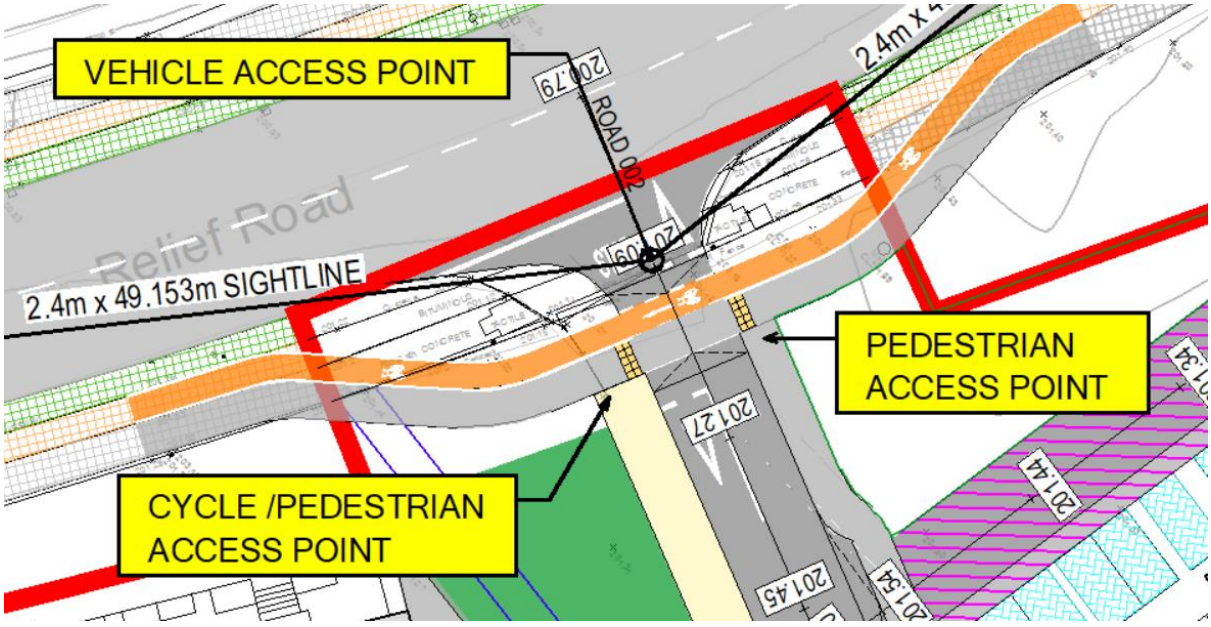

Figure 2-1 Primary Vehicle Access Points (Extract from Drawing 230199- X-04-Z00-DTM-DR-DBFL-CE-1201)

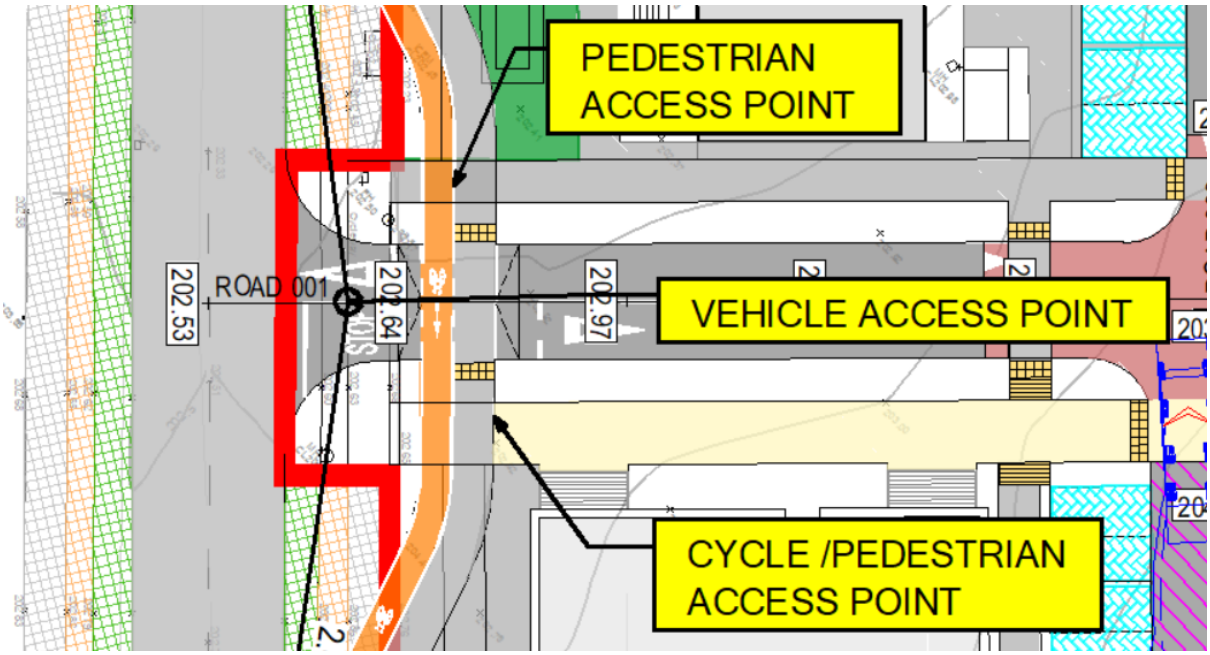

Figure 2-2 Secondary Vehicle Access Points (Extract from Drawing 230199- X-04-Z00-DTM-DR-DBFL-CE-1201)

2.2 Street Layout Design

The site's street layout is shown on DBFL Drawing 230199- X-04-Z00-DTM-DR-DBFL-CE-1201.

DMURS Street Design guidelines incorporated in the site's road layout are detailed within the traffic and transport assessment.

A design speed limit of 30 km/hour has been applied throughout the development in accordance with the Design Manual for Urban Roads and Streets (function – local road, context – neighbourhood, pedestrian priority).

2.3 Vehicle Tracking

The proposed street layout has been tracked to demonstrate that the site's proposed corner radii and turning heads will accommodate large vehicles such as refuse trucks and fire tenders (refer to DBFL Drawings No. 230199- X-04-Z00-DTM-DR-DBFL-CE-1201.

2.4 Pavement Design Standards

Local streets within the site are to be designed in accordance with WCC's Taken In Charge Policy.

Proposed road construction materials and thicknesses are to be based on an existing minimum subsoil CBR of 2.0% at road formation level.

Actual CBR values are to be confirmed by site specific investigations prior to road construction.

2.5 Traffic & Transportation

A separate Traffic and Transportation Assessment has been prepared as part of this planning application (refer to DBFL Report No. 230199-DBFL-XXXX-XX-RP-C01-0001).

3 SURFACE WATER DRAINAGE

3.1 Existing Surface Water Drainage

A small existing surface water channel can be found in the northern corner of the Site, which is culverted below the Blessington Inner relief Road by a 750mm concrete pipe. This channel travels approximately 2km to the south where it ultimately discharges to the Liffey.

An additional 225mm and 750mm surface water drainage line can also be found along the site's lower North-Western and South-Western Boundaries respectively.

See existing surface water drainage in Figure 3-1 below.

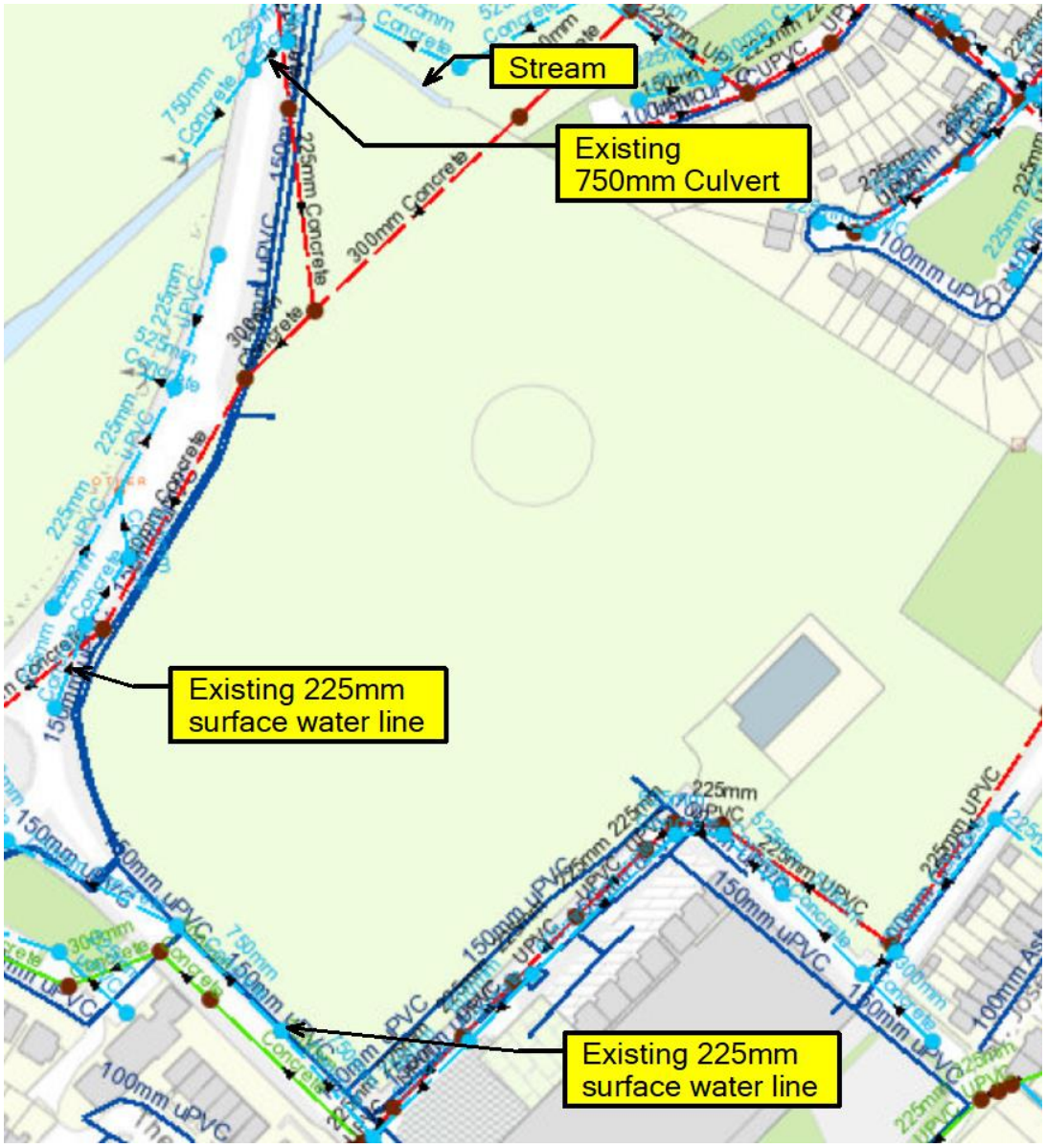

Figure 3-1 Existing Surface Water Drainage

3.2 Basis of Design

3.2.1 General Description of Surface Water Design

The existing surface water channel and 750mm culvert (as described above in Section 3.1) is expected to provide a suitable surface water discharge point for the proposed majority of the development, while a portion of the site will discharge to the existing 225mm surface water line in the sites western corner.

Refer to DBFL Drawing No. 230199-X-05-Z00-DTM-DR-DBFL-CE-1301 for proposed surface water outfall location.

The site will be divided into 3 separate surface water catchments catchment. Each catchment will incorporate its own attenuation and flow control.

The surface water drainage network has been developed to heavily incorporate SuDS features across the site providing a treatment train which mimics the natural regime of the site, in addition to providing amenity and increasing Biodiversity.

The proposed surface water drainage network will collect surface water runoff from onsite SuDS features via a piped network prior to discharging through the Proposed infiltration basin, flow control and separator. Where possible open channels and swales will be used to convey water at surface level.

Surface water runoff from the roads and footpaths within the development will be directed towards tree pits, swales and bioretention areas (with high level overflow) before entering the proposed pipe network via the filter drain beneath the SuDS feature.

Only in limited areas where connection to SuDS features can not be facilitated due to level issues will surface water be directed towards road gullies, but instances of this have been limited across the development.

Surface water runoff from on street parking within the development will be captured by permeable paving before entering the surface water network.

Surface water runoff from house and duplex roofs will be routed through the porous aggregates beneath permeable parking before entering the proposed surface water pipe network.

Discharge from the proposed development will be controlled by a Flow control (15.0L/Sec) and the separator which will be installed down stream of the proposed infiltration basins.

All practical SuDS features have been incorporated within the development, treatment train from all sources provides both treatment and retention with amenity and biodiversity being provided where possible.

3.2.2 Compliance with Surface Water Drainage Policy

The site's surface water management infrastructure has been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS).

The GDSDS (Vol. 2, Chapter 6.3.4) requires that the following design criteria are applied to all sites:

- Criterion 1:

River Water Quality Protection – Satisfied by providing interception storage and treatment of surface water run-off by SUDS features such as permeable paving of driveways, underground attenuation tanks and full retention fuel / oil separators at surface water discharge points.

- Criterion 2:

River Regime Protection – Satisfied by attenuating surface water run-off in association with flow control devices prior to discharge off site at greenfield runoff rate. Site critical duration storm used to assess attenuation volume.

- Criterion 3:

Level of Service (Flooding) for the Site – Satisfied by reviewing available flood hazard information (e.g. Eastern CFRAM Study) relating to the site's proximity to fluvial flood plains (up to 1 in 100-year flood event).

Also refer to DBFL Report No. 230199-DBFL-XX-XX-RP-C-0002 (Site Specific Flood Risk Assessment).

- Criterion 4:

River Flood Protection – Satisfied by attenuating surface water discharge to greenfield runoff rates, addressing pluvial flood risk associated with the 1 in 100 year storm and avoiding development in flood plains.

3.2.2.1 SuDS Treatment Train

The SuDS Treatment Train has been developed to consider and best utilise the four Pillars of SuDS (Quantity, Amenity, Quality and Biodiversity).

Quantity: managing flows and volumes to match the rainfall characteristics before development, in order to prevent flooding from outside the development, within the site and downstream of the development.

Amenity: enhancing people's quality of life through an integrated design that provides useful and attractive multifunctional spaces.

Quality: preventing and treating pollution to ensure that clean water is available as soon as possible to provide amenity and biodiversity benefits within the development, as well as protecting watercourses, groundwater and the sea.

Biodiversity: maximising the potential for wildlife through design and management of SuDS.

A holistic approach was applied across the site so that all SuDS elements within the treatment train work together as a singular system, to achieve the optimum system under the four pillars.

As indicated above the following systems have been employed within the combined SuDS system providing both interception and storage.

60m3 of storage provided by 265 m of swales,

95m3 of storage provided by 318m2 of Bioretention rain gardens,

16m3 of storage provided by 40 Tree Pits,

720m3 of storage provided by 4800m2 of permeable parking providing also intercepting 12000m2 of roof area,

1241m3 attenuation systems

The above listed features provide 891m^3 of informal storage and 1241m^3 of formal storage.

3.2.3 Proposed Runoff Coefficients & Factored Impermeable Areas

Noted below are the proposed reduction factors for the proposed development.

Proposed Runoff Coefficients and Factored Impermeable Areas are noted below in Table 3.1.

- Impermeable Roads and footpaths Draining to swales, Tree pits and Bioretention / rain gardens – Runoff Coefficient 0.80

  Typically, road surface discharges towards swales, tree pits and Bioretention / rain gardens (with high level overflow to the piped surface water network). Also takes account of run-off stored within the micro and macro texture of the surfacing (i.e. runoff not collected by piped network).

- Permeable paving – Runoff Coefficient 0.5

  Reduction of velocity as the aggregate/filter material used in the SuDS feature (permeable paving) slows the run-off at source ultimately reduce the peak inflow for attenuation calculations.

- Conventional Roofs Draining Via SuDS (permeable paving) – Runoff Coefficient 0.5

  Reduction of velocity as the aggregate/filter material used in the SuDS feature (permeable paving) slows the run-off at source ultimately reduce the peak inflow for attenuation calculations.

- Soft Landscaped / Grassed Areas – Runoff Coefficient 0.15

  Grassed / Landscaped areas slows the run-off at source ultimately reduce the peak inflow for attenuation calculations.

		Catchment 1		Catchment 2		Catchment 3		Total (m2)	
	Runoff Coefficients	Gross Areas (m2)	Factored Areas (m2)	Gross Areas (m2)	Factored Areas (m2)	Gross Areas (m2)	Factored Areas (m2)	Gross Area (m2)	Factored Areas (m2)
Roof	0.50	2,679	1,340	4,948	2,474	5,033	2,517	12,660	6,330
Roads & Footpaths	0.80	2,407	1,926	5,658	4,526	5,755	4,604	13,820	11,056
Paved Areas- Draining to SUDS (Permeable Parking)	0.50	837	419	1,967	984	2,001	1,001	4,805	2,403
		5,923	3,684	12,573	7,984	12,789	8,121	31,285	19,789

Table 3-1 Proposed Runoff Coefficients and Factored Impermeable Areas

Note: Refer to DBFL Drawing 230199-X-05-Z00-DTM-DR-DBFL-CE-1301 for the location Suds features.

3.2.4 Allowable Greenfield Runoff Rate

Q-bar has been assessed based on GDSDS requirements (Institute of Hydrology Report No. 124, Flood Estimation for Small Catchments)

i.e. Q-bar (m3/s)=0.00108x(Area)0.89(SAAR)1.17(SOIL)2.17

- Area – 5.467 Ha (main site being drained to SW network)
- SAAR – 995 mm (based on local information from Met Eireann), also refer to GDSDS Section 6.7.3.
- SOIL – Soil Type 2 / SPR Value 0.3 (see Table 3.2 below for assessment of Soil Type).
- Q-bar = 15.035 l/sec (equivalent to 2.75 l/sec/Ha).

Assessment of Soil Type (also refer to Table 3.2)

- Drainage Group 2
- Depth to Impermeable Layer 3 (>80cm) i.e. topsoil depth 300mm to 400mm
- Slope 1 (0 – 2 deg), existing surface gradients are >1:1500, also refer to GDSDS Section 6.7.3 "*the rate and amount of runoff from the greenfield site is going to be influenced to some degree by slope*"
- Permeability Group 3 (Slow), percolation testing was carried out at several locations on the site and Infiltration was not observed at any of the test locations

Table 4.4 Classification of soil factors.

Property		Classes
A	Drainage group	1 Rarely waterlogged within 60 cm at any time (well and moderately well drained) 2 Commonly waterlogged within 60 cm during winter (imperfect and poor) 3 Commonly waterlogged within 60 cm during winter and summer (very poorly drained)
B	Depth to 'impermeable' layers	1 >80 cm 2 80–40 cm 3 <40 cm
C	Permeability group (above 'impermeable' layers or to 80 cm)	1 Rapid 2 Medium 3 Slow
D	Slope	1 0–2° 2 2–8° 3 >8°

Having decided all four parameters, Table 4.5 was used to reach the index of 'winter rain acceptance'.

Table 4.5 The classification of soils by winter rain acceptance rate from soil survey data.

Drainage class Group	Depth to impermeable layer (cm)	Slope classes								
		0 - 2°			2 - 8°			>8°		
		Permeability rates above impermeable layers								
		(1) Rapid	(2) Medium	(3) Slow	(1) Rapid	(2) Medium	(3) Slow	(1) Rapid	(2) Medium	(3) Slow
1	>80	1			1			1	2	3
	40 - 80				2			3		4
	<40	—	—	—	—	—	—	—	—	—
2	>80	2		3		4		—		
	40 - 80									
	<40	3								
3	>80					5		—		
	40 - 80							—		
	<40									

Winter rain acceptance indices: 1, very high; 2, high; 3, moderate; 4, low; 5, very low.
Upland peat and peaty soils are in Class 5. Urban areas are unclassified.

Table 3-2 Classification of Soils Type (by winter rain acceptance rate from soil survey data)

3.2.5 Design Standards

Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

Design Criteria:

- Return period for pipe work design 5 years
- Return period for attenuation design 100 years
- Soil Type 2
- Allowable Outflow 15.2 l/sec

(Based on allowable outflow of 38 l/sec from "lands Under the applicant's ownership" south of Stocking Avenue as permitted under SD10A/0441)

- Time of entry 4 minutes
- M5 - 60 18.3 mm
- Ratio "r" 0.233
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity (based on pipe flowing full) 1.0 m/s
- Rainfall Depth Factored for Climate Change (as per GDSDS) 20%

  (in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

Refer to Appendix B for Source Control Calculations

Surface water calculations have been carried out using Microdrainage WinDes analysis software.

3.2.6 SuDS

The following methodologies are being implemented as part of a SuDS treatment train approach:

- Permeable parking and permeable surfaces in amenity areas.
- Road surfaces draining to swales, tree pits and Bioretention/ Rain gardens (with high level overflow to the piped surface water network).
- Below ground attenuation storage tanks in catchments 1 and 2 sized for return period storms up to 1 in 100 year.
- Above infiltration basin and Below ground attenuation storage tanks in catchments 3 sized for return period storms up to 1 in 100 year.
- Surface water runoff from house and duplex roofs will be routed to the proposed surface water pipe network via the stone reservoir beneath the permeable paved. Note, this detail does not rely on infiltration, the stone reservoir is intended to provide an additional element of attenuation storage.
- Installation of a vortex flow control device (Hydrobrake or equivalent).
- Surface water discharge will also pass via a bypass separator.

3.2.7 Attenuation Calculation

The volume for the proposed attenuation structures (3 below ground storage tanks and 1 infiltration basin) have been calculated based on an allowable Q-Bar 6.0L/sec for catchment 1 (which discharges independent of the other 2 catchment), Q-Bar 4.0L/sec for catchment 2 (which cascades into catchment 3) and Q-Bar 9.0 l/sec for catchment 3 (this serves as the primary discharge point for the site).

Run-off from the proposed development will be controlled / attenuated using vortex type flow control devices (Hydrobrake or equivalent).

The resultant storage system types, discharge limits and storage volumes are detailed in Table 3.3.

Catchment	Storage Type	Q-Bar	Volume Provided
1	Stormtech (Below Ground Attenuation)	6L/Sec	380m^3
2	Stormtech (Below Ground Attenuation)	4L/Sec	465 m^3
3-A	Stormtech (Below Ground Attenuation)	9L/Sec	411 m^3
3-B	Infiltration Basin		63 m^3

Refer to Appendix B for Source Control Calculations and Appendix C for Network model details.

The network and Attenuation features have been calculated using Microdrainage WinDes analysis software taking account of the rainfall data depth and type of attenuation system and network configuration.

In total 1241m^3 of storm-water storage is provided in the 4 infiltration Systems.

Supplementing to this storage volume is a further 891m^3 of storage within the SUDS treatment train.

The location of proposed attenuation systems is shown on DBFL Drawing 230199-X-05-Z00-DTM-DR-DBFL-CE-1301.

3.2.8 Interception Volume

The GDSDS (Vol. 2, Table 6.3) requires interception storage to be incorporated into surface water drainage design in order to limit discharge of sediment and pollutants into the downstream surface water drainage network and receiving water courses.

This interception storage is designed to capture surface water run-off from rainfall depths of 5mm (and up to 10mm if possible).

The SuDS features included in the development (refer to Section 3.2.6) will provide the necessary interception volume required by the GDSDS (within stone reservoirs beneath permeable paved driveways and within the Stormtech Attenuation Chambers).

3.3 Flood Risk

A separate Site Specific Flood Risk Assessment has been prepared as part of this planning application (refer to DBFL Report No. 230199-DBFL-XX-XX-RP-C-0002).

This flood risk assessment has been undertaken by reviewing information from the Office of Public Works (OPW) National Flood Hazard Mapping (www.floods.ie) and the Eastern CFRAM Study and has been carried out in accordance with the OPW's Guidelines for Planning Authorities – The Planning System and Flood Risk Management (November 2009).

3.4 Surface Water Quality Impact

Run-off rates from the site are controlled by flow control devices.

Surface water management proposals for the development also incorporate the following impact reduction measures;

- Surface water network designed in accordance with GDSDS requirements
- Incorporates SUDS features e.g. permeable paving in the higher risk parking areas at the front of houses (i.e. treatment / filtration provided within the stone reservoir beneath permeable paved driveways)
- Surface water attenuation (i.e. treatment / filtration provided within the granular surround of the Stormtech Chambers) in conjunction with a final Class 1 fuel / oil separator prior to discharge to the downstream surface water network.

4 FOUL DRAINAGE

4.1 Existing Surface Water Drainage

An existing 300mm Foul sewer crosses the northern corner of the site and then follows along Blessington Inner Relief Road, which ultimately leads to the Blessington Waste Water treatment Plant.

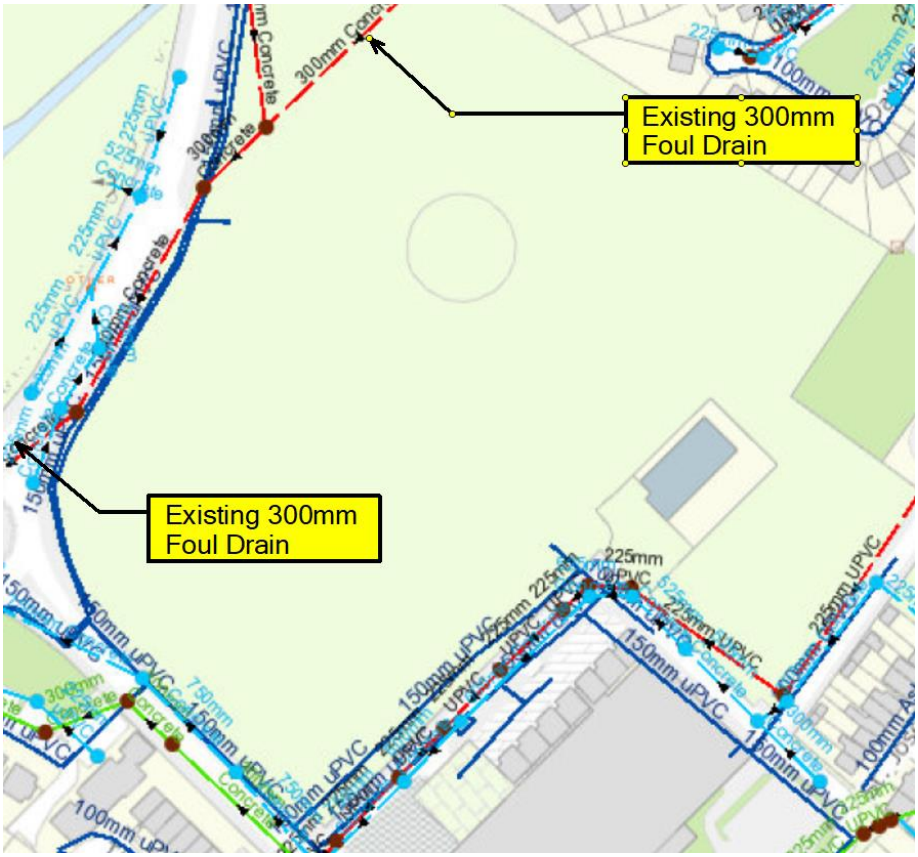

Figure 4-1 Existing Foul infrastructure

4.2 Foul Drainage Strategy

The proposed foul drainage network within the development comprises of a series of 225mm diameter pipes discharging by gravity to the foul drainage network described above (refer to DBFL Drawing 230199-X-05-Z00-DTM-DR-DBFL-CE-1301 for the proposed foul drainage layout). Houses and Duplex units will be serviced by individual 100mm diameter connections.

The existing 300mm diameter foul drain which crosses the site's Northern corner will be diverted and incorporated within the site network, before reconnecting onto the 300mm Foul sewer on Blessington Inner Relief Road.

Foul drainage network design has been carried out using Microstation WinDes analysis software (refer to Appendix D for foul drainage network calculations).

4.3 Irish water correspondence

4.3.1 Pre-Connection Feedback from Irish Water

Pre-connection enquiry feedback has been received from Uisce Eireann (included in Appendix E). Irish Water have advised as follows:

- New connection to the existing network is feasible without upgrade

4.3.2 Statement of Design Acceptance

The proposed foul drainage network has been submitted to Uisce Eireann for review, and A Statement of Design Acceptance has been issued in October 2024 (included in Appendix E).

4.4 Design Calculations

The foul drainage network for the proposed development has been designed in accordance with the following guidelines:

- Irish Water Code of Practice for Wastewater Infrastructure
- Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal"
- BS EN 752: 2008 Drain and Sewer Systems Outside Buildings
- IS EN 12056: Part 2 (2000) Gravity Drainage Systems Inside Buildings

Design Criteria:

Demand	446 l/dwelling/day
Discharge units	14 units per house (as BS8301)
Pipe Friction (Ks)	1.5 mm
Minimum Velocity	0.75 m/s (self-cleansing velocity)
Maximum Velocity	3.0 m/s (1:18 maximum pipe gradient)

Frequency Factor	0.5 for domestic use
Manhole Depths	< 4.0m

4.5 Foul Drainage – Environmental Impacts

Residential

Waste Water Discharge Calculation

(as outlined in Irish Water's Pre-Connection Enquiry Application Form)

No. of Housing Units	233
No. of Later Living units	36
Post Development Average Discharge	1.39 l/sec
Post Development Peak Discharge	8.33 l/sec
Daily Foul Discharge Volume (446l per dwelling)	119,974 l/Day

Medical centre, Café and Pharmacy

Waste Water Discharge Calculation

(as outlined in Irish Water's Pre-Connection Enquiry Application Form)

Assumed occupancy (persons)	40
Flow Rate / Person / Day (litres) (Based on IW Flow Rate for Design non-residential school without canteen)	50
Post Development Average Discharge (based on 8 hour occupancy)	0.023 l/sec
Post Development Peak Discharge (6 X DWF)	0.138 l/sec
Daily Foul Discharge Volume (50l per person)	2,000 l/Day

5 WATER SUPPLY AND DISTRIBUTION

5.1 Existing Public Watermains

Irish Water Records indicate that there is a 150mm Watermain running along the site's North-Western and South-western boundaries.

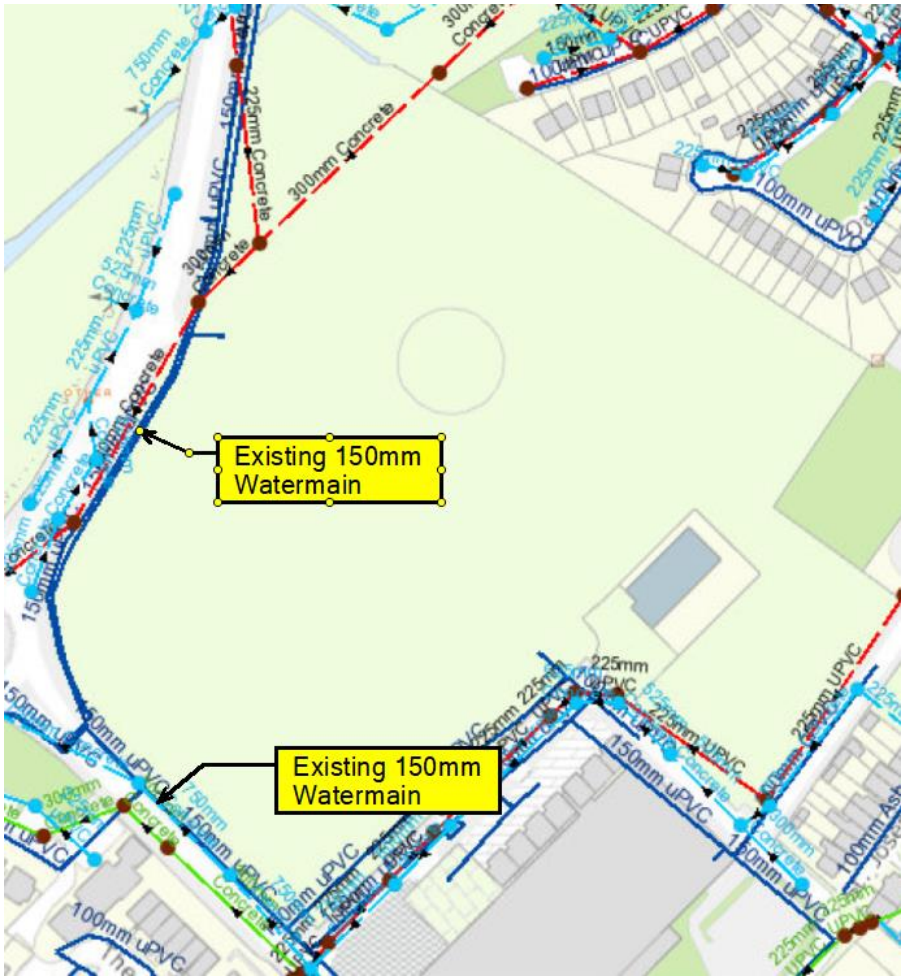

Figure 5-1 Existing Watermain Infrastructure

5.2 Correspondence with Uisce Eireann

5.2.1 Pre-Connection Feedback from Irish Water

Pre-connection enquiry feedback has been received from Irish Water (included in Appendix E). Irish Water have advised as follows:

- Provision of a water connection is "feasible subject to upgrade".
- To connect this development to the UE water network significant upgrades are required. These include the upsizing of approx. 300m of existing 150mm watermain to 250mm. The applicant will be responsible for the full cost of these upgrades.

5.2.2 Statement of Design Acceptance

The proposed watermain layout has been submitted to Uisce Eireann for review, and A Statement of Design Acceptance has been issued in October 2024 (included in Appendix E).

5.3 Proposed Watermain Layout

The site's proposed water main layout is shown on DBFL Drawing 230199-X-05-Z00-DTM-DR-DBFL-CE-1331.

A 150mm diameter looped water main will be provided within the development.

The proposed water main layout and connections to the public water mains have been designed in accordance with Irish Water Standard Detail STD-W-02.

House and Duplex units will have individual connections (25mm O.D. PE pipe) to distribution water mains via service connections and meter / boundary boxes. Individual connections are to be installed in accordance with Irish Water Standard Detail STD-W-03. Block A (Mixed use building) will be serviced an individual metered connection, for each unit commercial unit and a single meter for the residential units.

5.4 Hydrants

The proposed water main layout is arranged such that all buildings are a maximum of 46.0m from a hydrant in accordance with the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety".

Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Irish Water's Code of Practice and Standard Details

5.5 Materials

Proposed water mains are to be HDPE 100 SDR17.

5.6 Proposed Watermain Layout

Water Demand has been calculated in accordance with the guidelines outlined in Irish Water's Pre-Connection Enquiry Application Form:

- No. of Housing Units 233
- No. of Later Living Units 36
- Average Occupancy Ration (Persons Per Dwelling) 2.7
- Per-Capita Consumption (l/person/day) 150
- Average Domestic Daily Demand (l/sec) 1.26
- Post Development Average Hour Water Demand (l/sec) 1.58
- (1.25 x Average Domestic Daily Demand)
- Post Development Peak Hour Water Demand (l/sec) 7.88
- (5.0 x Post Development Average Hour Water Demand)

Appendix A : Ground Investigation Report

GROUND INVESTIGATIONS IRELAND
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Ground Investigations Ireland

Blessington, Co. Wicklow

DBFL Consulting Engineers

Ground Investigation Report

January 2020

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DOCUMENT CONTROL SHEET

Project Title	Blessington, Co. Wicklow
Engineer	DBFL Consulting Engineers
Project No	9359-01-20
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A	Final	P. Cochran	J. Duggan	A. McDonnell	Dublin	11 February 2020

Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

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CONTENTS

APPENDICES

1.0 Preamble

On the instructions of DBFL Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., in January 2020 at the site of the proposed residential development in Blessington, Co. Wicklow.

2.0 Overview

2.1. Background

It is proposed to construct a new residential development with associated services, access roads and car parking at the proposed site. The site is currently greenfield and is situated in Blessington, Co. Wicklow. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 6 No. Trial Pits to a maximum depth of 3.00m BGL
- Carry out 6 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Report with recommendations

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

3.2. Trial Pits

The trial pits were excavated using a 3T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

3.3. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 3 of this Report.

3.4. Surveying

The exploratory hole locations have been recorded using a Trimble R10 GNSS System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were variable across the site and are generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits
- Granular Deposits

TOPSOIL: Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.30m BGL.

MADE GROUND: Made Ground deposits were encountered in TP01, TP02 and TP04 beneath the Topsoil and was present to a relatively consistent depth of between 0.40m and 0.80m BGL. These deposits were described generally as *grey sandy clayey angular to subrounded fine to coarse Gravel* or *greyish brown slightly sandy gravelly Clay with occasional cobbles and boulders and contained occasional fragments of ceramic and plastic.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Made Ground or Topsoil and were described typically as *brown* or *grey sandy gravelly CLAY with occasional cobbles*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. These deposits had occasional, some or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANULAR DEPOSITS: Granular deposits described as *greyish brown sandy subangular to subrounded fine to coarse GRAVEL* were encountered at the base of the cohesive deposits with lenses of *brown gravelly clayey fine to coarse SAND* encountered occasionally within the cohesive deposits. The secondary silt/clay constituents varied across the site and with depth while occasional, some or frequent cobble and boulder content also present where noted on the exploratory hole logs.

It should be noted that many of the trial pits where granular deposits or groundwater were encountered, experienced instability. This was described either as side wall spalling or as side wall collapse in the remarks section at the base of the trial pit logs.

4.2. Groundwater

No groundwater was noted during the investigation however we would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall, nearby construction and other factors.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Soakaway Design

Infiltration rates of $f=5.25 \times 10^{-6}$ m/s, $f=2.81 \times 10^{-5}$ m/s, $f=9.65 \times 10^{-5}$ m/s and $f=1.72 \times 10^{-5}$ m/s respectively were calculated for the soakaway locations IT03, IT04, IT05 and IT06. At the locations of IT01 and IT02 the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

APPENDIX 1 - Site Location Plan

Client:

Project Code:
9359-01-20

Project Title:
Blessington, Co. Wicklow

Drawing Title:
Figure 1 Site Location

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
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0 15 30 m

Drawn By:	Date:
PC	03/02/2020

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd
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Site Blessington, Co. Galway			**Trial Pit Number** TP01
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 2.50m (L) x 0.70m (W) x 3.00m (D)	**Ground Level (mOD)** 201.17	**Client**	**Job Number** 9359-01-20
	Location 697946.4 E 714833.8 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				201.07	(0.10) 0.10	Brown slightly gravelly sandy TOPSOIL		
0.50	B				(0.70)	MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional subangular cobbles. Gravel is subangular to subrounded fine to coarse		
				200.37	0.80	Stiff grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse		
1.50	B				(2.20)			
2.50	B							
				198.17	3.00	Complete at 3.00m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 3.00m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.TP01

Ground Investigations Ireland Ltd
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Site Blessington, Co. Galway			**Trial Pit Number** TP02
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 2.20m (L) x 0.70m (W) x 2.70m (D)	**Ground Level (mOD)** 201.43	**Client**	**Job Number** 9359-01-20
	Location 697926.7 E 714775.8 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly gravelly sandy TOPSOIL		
				201.23	0.20	MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional subangular cobbles and occasional plastic fragments. Gravel is subangular to subrounded fine to coarse		
					(0.50)			
				200.73	0.70	Stiff grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse		
1.00	B							
					(2.00)			
2.00	B							
				198.73	2.70	Complete at 2.70m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 2.70m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.TP02

Ground Investigations Ireland Ltd
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Site Blessington, Co. Galway			**Trial Pit Number** TP03
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.90m (L) x 0.70m (W) x 2.70m (D)	**Ground Level (mOD)** 201.92	**Client**	**Job Number** 9359-01-20
	Location 697933.4 E 714626.1 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly gravelly sandy TOPSOIL		
				201.62	0.30			
					(0.80)	Brown gravelly clayey fine to coarse SAND with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse		
1.00	B			200.82	1.10			
					(1.10)	Firm brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
2.00	B			199.72	2.20			
					(0.50)	Greyish brown sandy subangular to subrounded fine to coarse GRAVEL with occasional subangular to subrounded cobbles		
				199.22	2.70			
						Complete at 2.70m		

Plan

Remarks

Trial Pit unstable noted as side wall spalling
No groundwater encountered during excavation
Trial Pit terminated at 2.70m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT03

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Site Blessington, Co. Galway			**Trial Pit Number** TP04
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.80m (L) x 0.65m (W) x 2.80m (D)	**Ground Level (mOD)** 204.85	**Client**	**Job Number** 9359-01-20
	Location 698053.9 E 714653.3 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly gravelly sandy TOPSOIL		
				204.65	0.20			
					(0.20)	MADE GROUND: Grey sandy clayey angular to subrounded fine to coarse Gravel		
				204.45	0.40			
0.50	B				(0.30)	Soft brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
				204.15	0.70			
					(0.40)	Light brown gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse		
				203.75	1.10			
1.50	B				(0.70)	Firm greyish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
				203.05	1.80			
					(1.00)	Greyish brown sandy subangular to subrounded fine to coarse GRAVEL with some subangular to subrounded cobbles		
2.50	B							
				202.05	2.80	Complete at 2.80m		

Plan

Remarks

Trial Pit unstable noted as side wall spalling
No groundwater encountered during excavation
Trial Pit terminated at 2.80m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.TP04

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Site Blessington, Co. Galway			**Trial Pit Number** TP05
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.95m (L) x 0.65m (W) x 2.20m (D)	**Ground Level (mOD)** 205.75	**Client**	**Job Number** 9359-01-20
	Location 698115.6 E 714714.3 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly gravelly sandy TOPSOIL		
				205.55	0.20			
						Firm brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
0.50	B				(0.60)			
				204.95	0.80			
						Greyish brown sandy subangular to subrounded fine to coarse GRAVEL with some subangular to subrounded cobbles		
					(1.40)			
2.00	B							
				203.55	2.20			
						Complete at 2.20m		

Plan

Remarks

Trial Pit unstable; side wall collapse
No groundwater encountered during excavation
Trial Pit terminated at 2.20m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.TP05

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Site Blessington, Co. Galway			**Trial Pit Number** TP06
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.80m (L) x 0.70m (W) x 2.40m (D)	**Ground Level (mOD)** 205.88	**Client**	**Job Number** 9359-01-20
	Location 698036.4 E 714792.1 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly gravelly sandy TOPSOIL		
				205.68	0.20			
					(0.30)	Soft brown slightly gravelly sandy CLAY with occasional rootlets		
				205.38	0.50			
					(0.20)	Light brown gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse		
				205.18	0.70			
						Greyish brown sandy subrounded to subangular fine to coarse GRAVEL with occasional subangular to subrounded cobbles		
					(1.50)			
1.50	B							
				203.68	2.20			
					(0.20)	Brown clayey fine to coarse SAND		
2.30	B			203.48	2.40			
						Complete at 2.40m		

Plan

Remarks

Trial Pit unstable; side wall collapse
No groundwater encountered during excavation
Trial Pit terminated at 2.40m BGL
Trial Pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.TP06

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Site Blessington, Co. Galway			**Trial Pit Number** IT01
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.80m (L) x 0.40m (W) x 1.80m (D)	**Ground Level (mOD)** 201.13	**Client**	**Job Number** 9359-01-20
	Location 697948.2 E 714838.1 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				201.03	(0.10) 0.10	Brown slightly gravelly sandy TOPSOIL		
						MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional subangular cobbles. Gravel is subangular to subrounded fine to coarse		
					(0.50)			
				200.53	0.60	Stiff grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse		
					(1.20)			
				199.33	1.80	Trial Pit terminated to conduct soakaway		
						Complete at 1.80m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.80m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT01

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Site Blessington, Co. Galway			**Trial Pit Number** IT02
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.70m (L) x 0.40m (W) x 1.50m (D)	**Ground Level (mOD)** 201.47	**Client**	**Job Number** 9359-01-20
	Location 697932.1 E 714776.4 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	Brown slightly gravelly sandy TOPSOIL		
				201.32	0.15	MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional subangular cobbles. Gravel is subangular to subrounded fine to coarse		
					(0.65)			
				200.67	0.80	Stiff grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse		
					(0.70)			
				199.97	1.50	Trial Pit terminated to conduct soakaway		
						Complete at 1.50m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.50m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT02

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Site Blessington, Co. Galway			**Trial Pit Number** IT03
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.60m (L) x 0.40m (W) x 1.60m (D)	**Ground Level (mOD)** 201.94	**Client**	**Job Number** 9359-01-20
	Location 697936.4 E 714621.2 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly gravelly sandy TOPSOIL		
				201.64	0.30			
					(0.30)	Reddish brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse		
				201.34	0.60			
					(0.70)	Brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse		
				200.64	1.30			
					(0.30)	Soft to firm brown slightly gravelly sandy CLAY		
				200.34	1.60	Trial Pit terminated to conduct soakaway		
						Complete at 1.60m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.60m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT03

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Site Blessington, Co. Galway			**Trial Pit Number** IT04
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.80m (L) x 0.45m (W) x 1.70m (D)	**Ground Level (mOD)** 204.97	**Client**	**Job Number** 9359-01-20
	Location 698059.1 E 714649.3 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				204.87	(0.10) 0.10	Brown slightly gravelly sandy TOPSOIL		
					(0.70)	MADE GROUND: Greyish brown slightly sandy gravelly Clay with frequent subangular cobbles and occasional rootlets, ceramic and plastic fragments. Gravel is subangular to subrounded fine to coarse		
				204.17	0.80	Soft brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. Possible Made Ground		
				203.87	(0.30) 1.10	Firm greyish brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is subangular to subrounded fine to coarse		
				203.47	(0.40) 1.50	Greyish brown slightly clayey sandy subangular to subrounded fine to coarse GRAVEL with frequent subangular to subrounded cobbles		
				203.27	(0.20) 1.70	Trial Pit terminated to conduct soakaway		
						Complete at 1.70m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.70m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT04

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Site Blessington, Co. Galway			**Trial Pit Number** IT05
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.60m (L) x 0.40m (W) x 1.50m (D)	**Ground Level (mOD)** 205.79	**Client**	**Job Number** 9359-01-20
	Location 698119.4 E 714712.8 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly gravelly sandy TOPSOIL		
				205.49	0.30	Firm brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
					(0.50)			
				204.99	0.80	Greyish brown sandy subangular to subrounded fine to coarse GRAVEL with some subangular to subrounded cobbles		
					(0.70)			
				204.29	1.50	Trial Pit terminated to conduct soakaway Complete at 1.50m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.50m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT05

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Site Blessington, Co. Galway			**Trial Pit Number** IT06
Machine : 3T Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.65m (L) x 0.40m (W) x 1.50m (D)	**Ground Level (mOD)** 205.90	**Client**	**Job Number** 9359-01-20
	Location 698039.6 E 714795.5 N	**Dates** 30/01/2020	**Engineer** DBFL Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly gravelly sandy TOPSOIL		
				205.60	0.30			
					(0.30)	Soft brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse		
				205.30	0.60			
					(0.25)	Light brown gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse		
				205.05	0.85			
					(0.65)	Dark brown slightly clayey sandy subangular to rounded fine to coarse GRAVEL with some subangular to subrounded cobbles		
				204.40	1.50	Trial Pit terminated to conduct soakaway		
						Complete at 1.50m		

Plan

Remarks

Trial Pit stable
No groundwater encountered during excavation
Trial Pit terminated at 1.50m BGL to conduct soakaway
Trial Pit backfilled upon completion of soakaway

Scale (approx)	Logged By	Figure No.
1:25	PC	9359-01-20.IT06

Blessington, Co. Wicklow – Trial Pit Photographs

TP01

Blessington, Co. Wicklow – Trial Pit Photographs

TP01

Blessington, Co. Wicklow – Trial Pit Photographs

TP02

Blessington, Co. Wicklow – Trial Pit Photographs

TP02

Blessington, Co. Wicklow – Trial Pit Photographs

TP03

Blessington, Co. Wicklow – Trial Pit Photographs

TP03