Appendix 12.9

DLRCC Flood Zone Map No.9

(Not to scale at A4)

Mapping Notes

1. The lines of the flood Proposals shown are diagrammatic only and may be subject to change.
2. Wave Overtopping layer is relevant to the following maps only: Map No's 1, 2, 3, 4, 7, 10 & 14 unless noted other wise.
3. These flood maps contain Land Use Zoning & Flooding information only. Please refer to the Land Use Zoning maps for more detailed land use objectives.

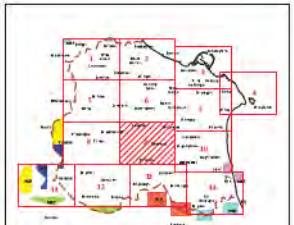
Flood Zone Map

COMHAIRLE CHONTAE DHÚN LAOGHAIRE-RÁTH AN DÚIN

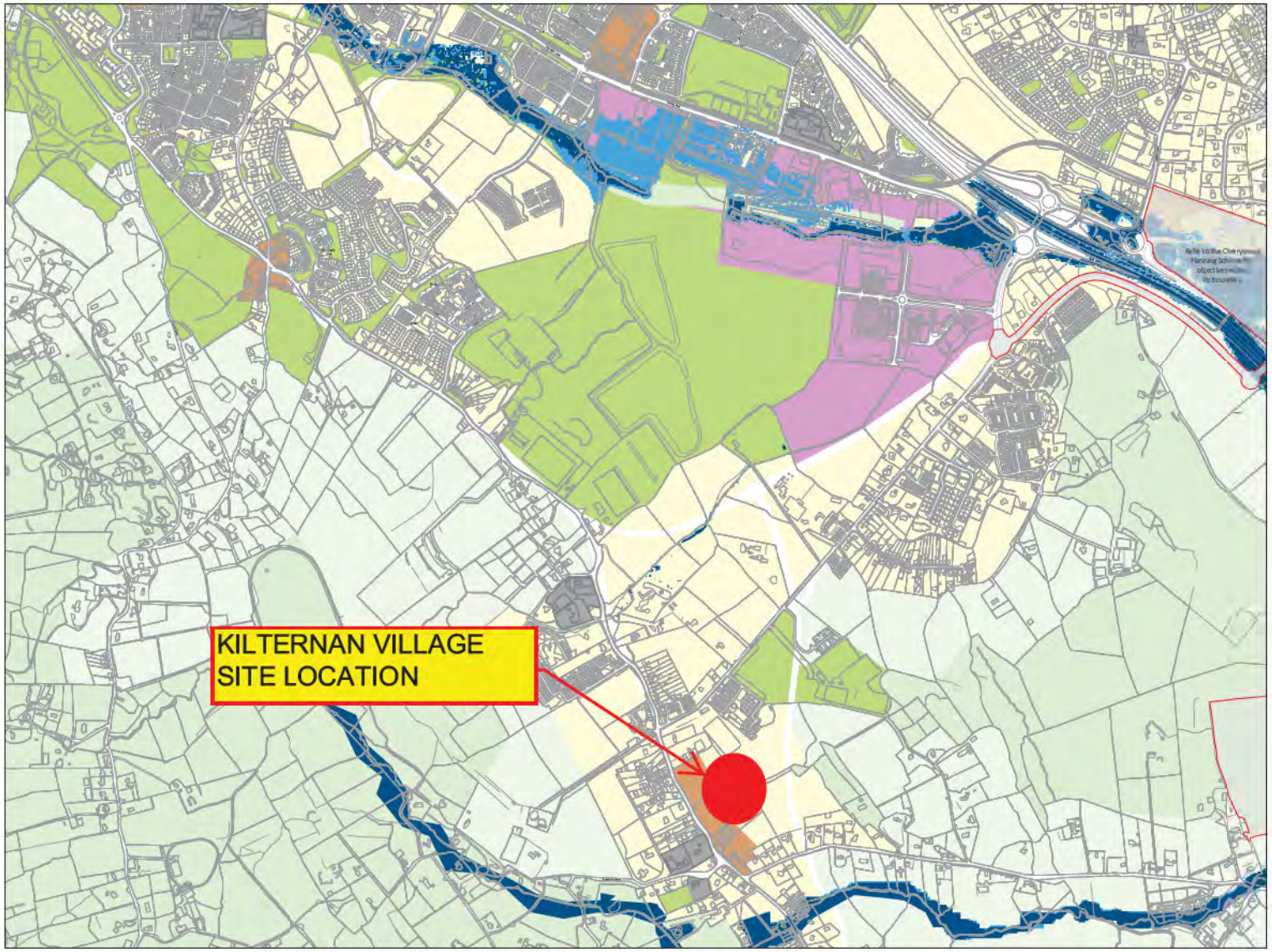
DÚN LAOGHAIRE-RATHDOWN COUNTY COUNCIL

COUNTY DEVELOPMENT PLAN 2022-2028

Adopted March 2022



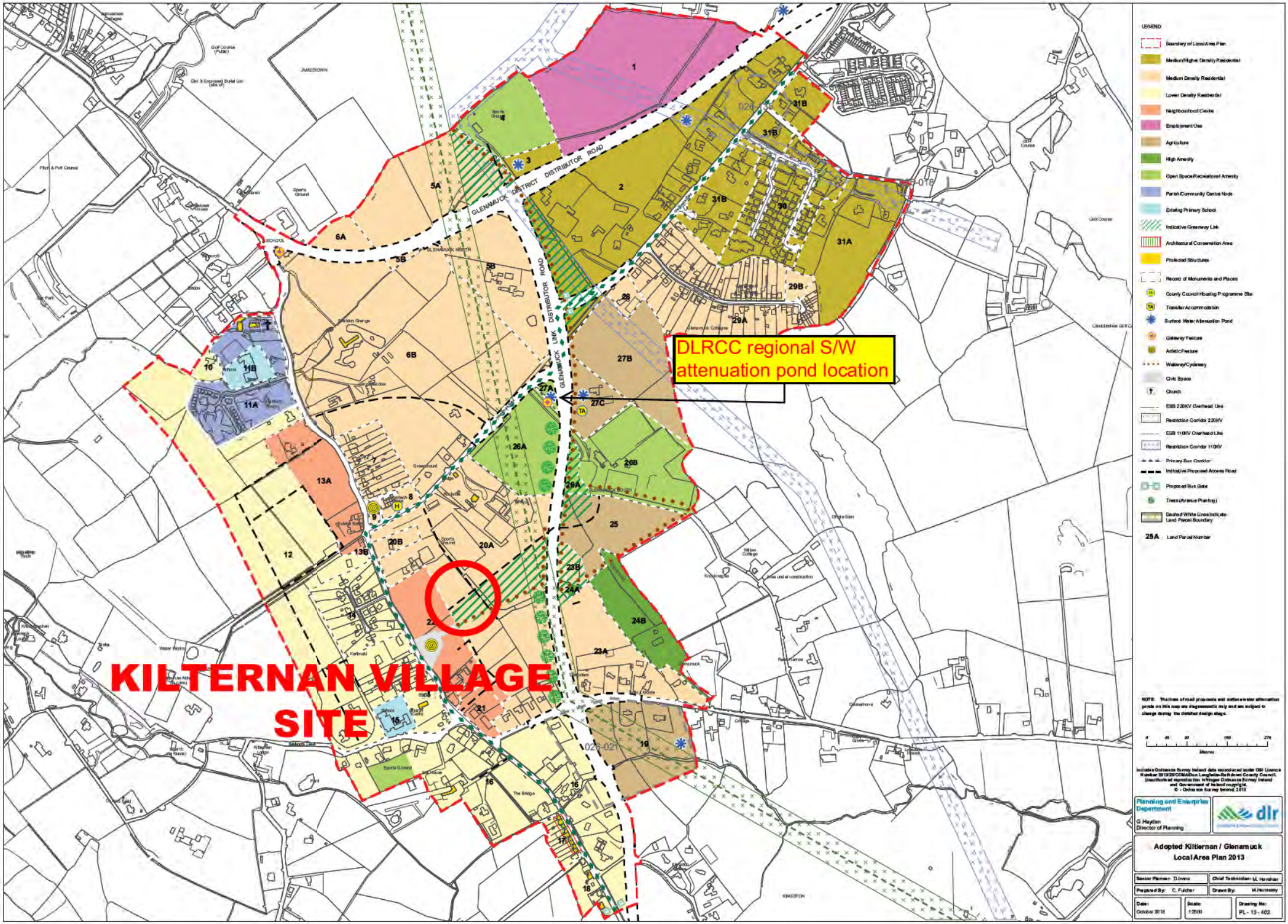
INDEX



Appendix 12.10

DLRCC LAP Map No.PL-13-402

(Not to scale at A4)


DLRCC regional S/W attenuation pond location
KILTERNAN VILLAGE SITE
GLENAMUCK DISTRICT DISTRIBUTOR ROAD
GLENAMUCK LINK DISTRIBUTOR ROAD
GLENAMUCK NORTH
JAMESTOWN
KINGSTOWN
LEGEND
Boundary of Local Area Plan
Medium/Higher Density Residential
Medium Density Residential
Lower Density Residential
Neighbourhood Centre
Employment Use
Agriculture
High Amenity
Open Space/Recreational Amenity
Parish/Community Centre Node
Existing Primary School
Indicative Greenway Link
Architectural Conservation Area
Protected Structures
Record of Monuments and Places
County Council Housing Programme Site
Traveller Accommodation
Surface Water Attenuation Pond
Gateway Feature
Artistic Feature
Walkway/Cycleway
Civic Space
Church
ESB 220KV Overhead Line
Restriction Corridor 220KV
ESB 110KV Overhead Line
Restriction Corridor 110KV
Primary Bus Corridor
Indicative Proposed Access Road
Proposed Bus Gate
Trees (Avenue Planting)
Dashed White Lines Indicate Land Parcel Boundary
25A Land Parcel Number
NOTE: The lines of road proposals and surface water attenuation ponds on this map are diagrammatic only and are subject to change during the detailed design stage.
Planning and Enterprise Department
G. Hayden
Director of Planning
dlr
Adopted Kilternan / Glenamuck Local Area Plan 2013
Senior Planner: D.Irvine
Chief Technician: M. Hanahan
Prepared By: C. Fulcher
Drawn By: M.Hennessy
Date: October 2013
Scale: 1:2500
Drawing No: PL - 13 - 402

Appendix 12.11

IW/DLRCC Drainage Records drawings

Glenamuck Rd upper 2

July 11, 2017

Legend

Stormwater Gravity Mains (Irish Water Owned)
- Surface

Stormwater Gravity Mains (Non-Irish Water Owned)
- Surface

Storm Manholes
- Cascade
- Catchpit
- Hatchbox
- Lamphole
- Standard
- Other; Unknown

Storm Inlets
- Gully
- Standard
- Other; Unknown

Storm Fittings
- Vent/Col
- Other; Unknown

Storm Discharge Points
- Outfall
- Overflow
- Soakaway
- Other; Unknown

- Storm Culverts
- Storm Clean Outs

Sewer Gravity Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Gravity Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Glenamuck Rd upper

July 11, 2017

Legend

Stormwater Gravity Mains (Irish Water Owned)
- Surface

Stormwater Gravity Mains (Non-Irish Water Owned)
- Surface

Storm Manholes
- Cascade
- Catchpit
- Hatchbox
- Lamphole
- Standard
- Other; Unknown

Storm Inlets
- Gully
- Standard
- Other; Unknown

Storm Fittings
- Vent/Col
- Other; Unknown

Storm Discharge Points
- Outfall
- Overflow
- Soakaway
- Other; Unknown

Storm Culverts

Storm Clean Outs

Sewer Gravity Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Gravity Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland. It should not be relied upon in the event of excavations or other works being carried out in the vicinity of the network. The onus is on the parties carrying out the works to ensure the exact location of the network is identified prior to mechanical works being carried out. Service pipes are not generally shown but their presence should be anticipated. © Irish Water

UISCE ÉIREANN : IRISH WATER

"Gas Networks Ireland (GNI), their affiliates and assigns, accept no responsibility for any information contained in this document concerning location and technical designation of the gas distribution and transmission network ("the Information"). Any representations and warranties express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation, direct, indirect, special, incidental, punitive or consequential loss including loss of profits, arising out of or in connection with the use of the information (including maps or mapping data). NOTE: DIAL BEFORE YOU DIG Phone 1850 427 747 or e-mail dig@gasnetworks.ie – The actual position of the gas/electricity distribution and transmission network must be verified on site before any mechanical excavating takes place. If any mechanical excavation is proposed, hard copy maps must be requested from GNI re gas. All work in the vicinity of the gas distribution and transmission network must be completed in accordance with the current edition of the Health & Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 28 93 89) or can be downloaded free of charge at www.hsa.ie."

Kilternan Village

5/29/2018 9:45:34 AM

Legend

Stormwater Gravity Mains (Irish Water Owned)
- Surface

Stormwater Gravity Mains (Non-Irish Water Owned)
- Surface

Storm Manholes
- Cascade
- Catchpit
- Hatchbox
- Lamphole
- Standard
- Other; Unknown

Storm Inlets
- Gully
- Standard
- Other; Unknown

Storm Fittings
- Vent/Col
- Other; Unknown

Storm Discharge Points
- Outfall
- Overflow
- Soakaway
- Other; Unknown
- Storm Culverts
- Storm Clean Outs

Sewer Gravity Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Pressurized Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Gravity Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Pressurized Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Appendix 12.12

OPW Flood Hazard Report

OPW National Flood Hazard Mapping

Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 206 223

Map Scale 1:10,112

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

7 Results

1. Shanganagh Carrickmines Nov 2002
Start Date: 26/Nov/2002
County: Dublin
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

2. Shanganagh Carrickmines Dec 1997
Start Date: 18/Dec/1997
County: Dublin
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

3. Shanganagh Carrickmines May 1993
Start Date: 26/May/1993
County: Dublin
Flood Quality Code:1
Additional Information: Photos (3) Reports (4) More Mapped Information

4. Shanganagh Carrickmines Nov 1982
Start Date: 06/Nov/1982
County: Dublin
Flood Quality Code:3
Additional Information: Reports (3) More Mapped Information

5. Kilternan Glencullen Road Nov 1982
Start Date: 05/Nov/1982
County: Dublin
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

6. Glenamuck Stream Glenamuck Road Recurring

Start Date:

County: Dublin

Flood Quality Code: 4

Additional Information: Reports (2) More Mapped Information

---

7. Enniskerry Road Recurring

Start Date:

County: Dublin

Flood Quality Code: 4

Additional Information: Reports (2) More Mapped Information

Appendix 12.13

Green Roofs Information

MOY TOTAL EXTENSIVE GREEN ROOF SYSTEM.

Intended Use.

The Moy Total Extensive Green Roof System is a robust waterproofing assembly finished with a native Irish Sedum mix species extensive green roof assembly, designed to provide a self-sustaining low maintenance green roof which provides substantial rainwater attenuation benefits and provides habitat for bees and invertebrates. The Moy Extensive Green roof may be installed in "Blue Roof" configuration, whereby drainage of the roof is delayed, or may be installed on roofs where free drainage takes place.

Green Roof Assembly and Key Data.

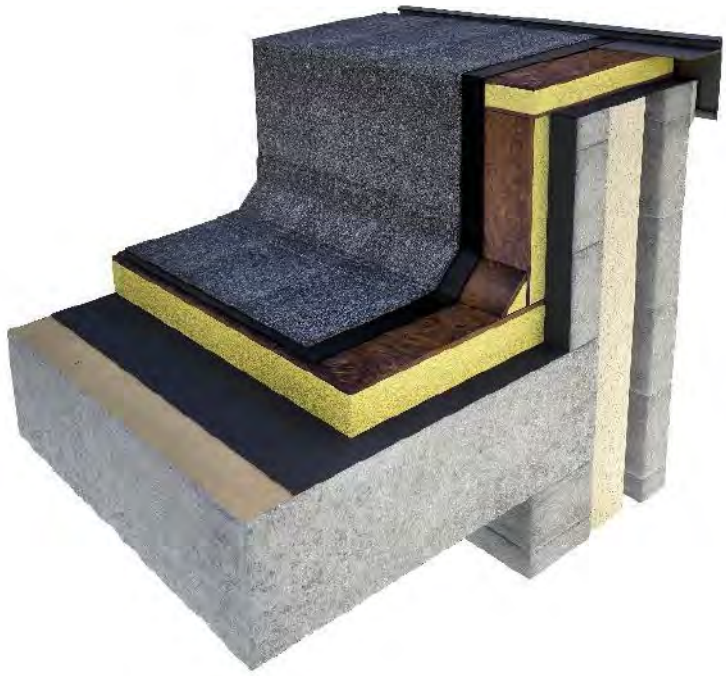
Element	Key Characteristics	Notes
Moy Sedum Mix Blanket	30mm Thickness	Native Irish Species Mix.
Moy Growing Media	50mmThickness	Recycled Brick & Organic Materials
Filtration Fleece VLF150	1mm Thickness	Recycled fibres.
DE25H Reservoir Layer	25mm Thickness	Recycled Plastics.
Protection Fleece VLU300	2mm Thickness	Recycled fibres.
System PH Value	PH 7.1	-

Weight & Water Attenuation Data.

Total Mass per M2 – Dry Condition.	C. 70 Kg / M2.
Total Mass per M2 – Saturated Condition	C. 125 Kg / M2.
Rainwater Attenuation Capacity	C. 44 litres / M2. (Dynamic Value).

Moy Extensive Green Roofs provide a substantial rainwater attenuation capacity and may be incorporated in site specific SUDs Design.

Moy Warm Roof Waterproofing & Insulation Assembly.



Paralon System Assembly.

1. Vapour Controlling Layer, Parabase modified bitumen.

2. Thermal Insulation, Paratherm T, PIR foam core by Kingspan Insulation, available as a flat or tapered layer. High Efficiency of 0.024 W/mK.

3. Paralon TOP/S polyester reinforced base layer, modified bitumen, torch applied membrane.

4. Paralon NT4 polyester reinforced cap layer, root resistant, modified bitumen, torch applied membrane.

Approvals, Compliance & Certification.

- BBA Certified Certificate No. 09/4688 (Life Expectancy in Excess of 40 Years).
- FM Global Insurance Corporation Approved.
- Compliant with FLL (Germany) and GRO (UK) Green Roof Design Guidelines.

LEED & BREEAM CREDITS.

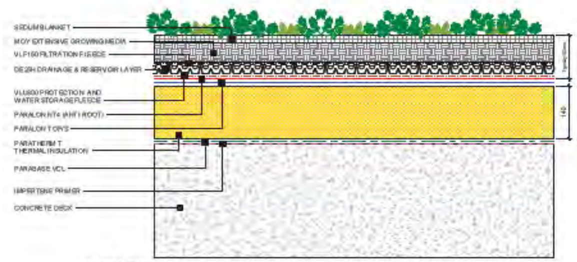
Moy Extensive Green Roofs are locally sourced where possible, with over 80% of the bulk mass material being produced or grown in Ireland, reducing the carbon footprint and promoting sustainability.

IRELAND
Unit K, South City Business Park
Whitestown Way, Tallaght, Dublin 24
T 01 463 3900 E info@moymaterials.com

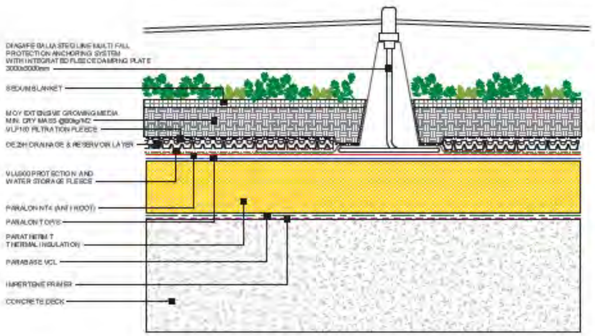
ENGLAND
Victoria House (4th Floor)
Victoria Road, Chelmsford, CM1 1JR
T 01245 707 449 E info@moymaterials.co.uk

SCOTLAND
6 Mackean Street
Paisley, Glasgow, PA3 1QP
T 0141 8404660 E enquiries@moymaterials.co.uk

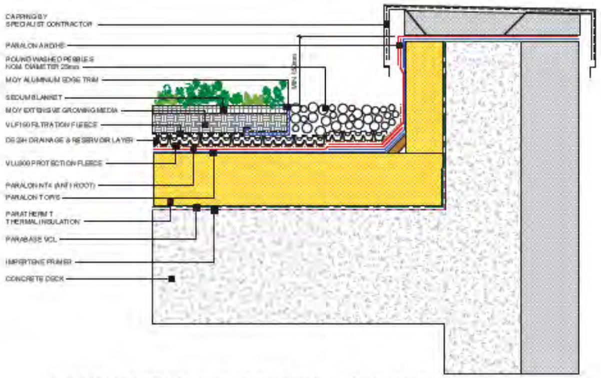
Ver. April 2020.



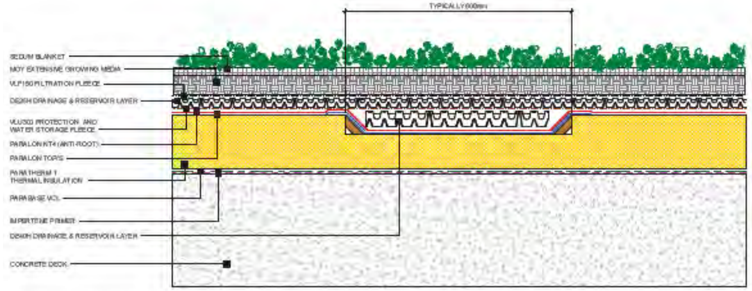
MOY EXTENSIVE GREEN ROOF SYSTEM (CONCRETE DECK)
1 1 : 5



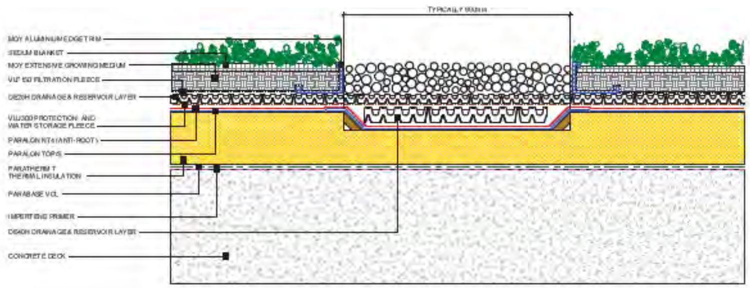
MOY EXTENSIVE GREEN ROOF SYSTEM - PROTECTION ANCHORING SYSTEM DETAIL
2 1 : 5



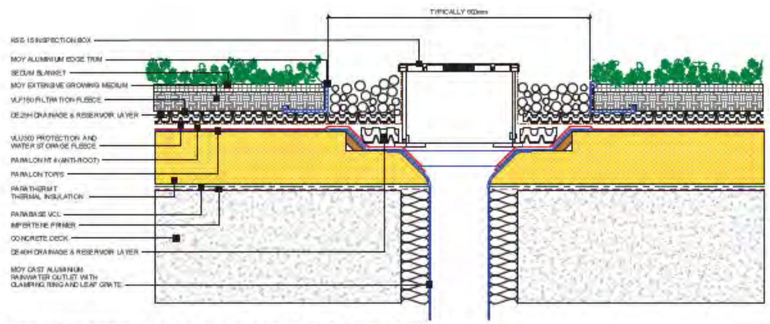
MOY EXTENSIVE GREEN ROOF - PARAPET DETAIL
3 1 : 5



MOY EXTENSIVE GREEN ROOF SYSTEM - GUTTER CHANNEL WITH SEDUM COVERING DETAIL
4 1 : 5



MOY EXTENSIVE GREEN ROOF SYSTEM - GUTTER CHANNEL WITH PEBBLES DETAIL
5 1 : 5



MOY EXTENSIVE GREEN ROOF SYSTEM - RAINWATER OUTLET INSPECTION BOX DETAIL
6 1 : 5

Detail: EXTENSIVE GREEN ROOF TYPICAL DETAILS	
System Ref:	DWG. NO: GR-E-01
Scale: 1 : 5	Date: MAY 2021

MOY

DUBLIN - LONDON - GLASGOW - FRANKFURT
WWW.MOYMATERIALS.COM
INFO@MOYMATERIALS.COM

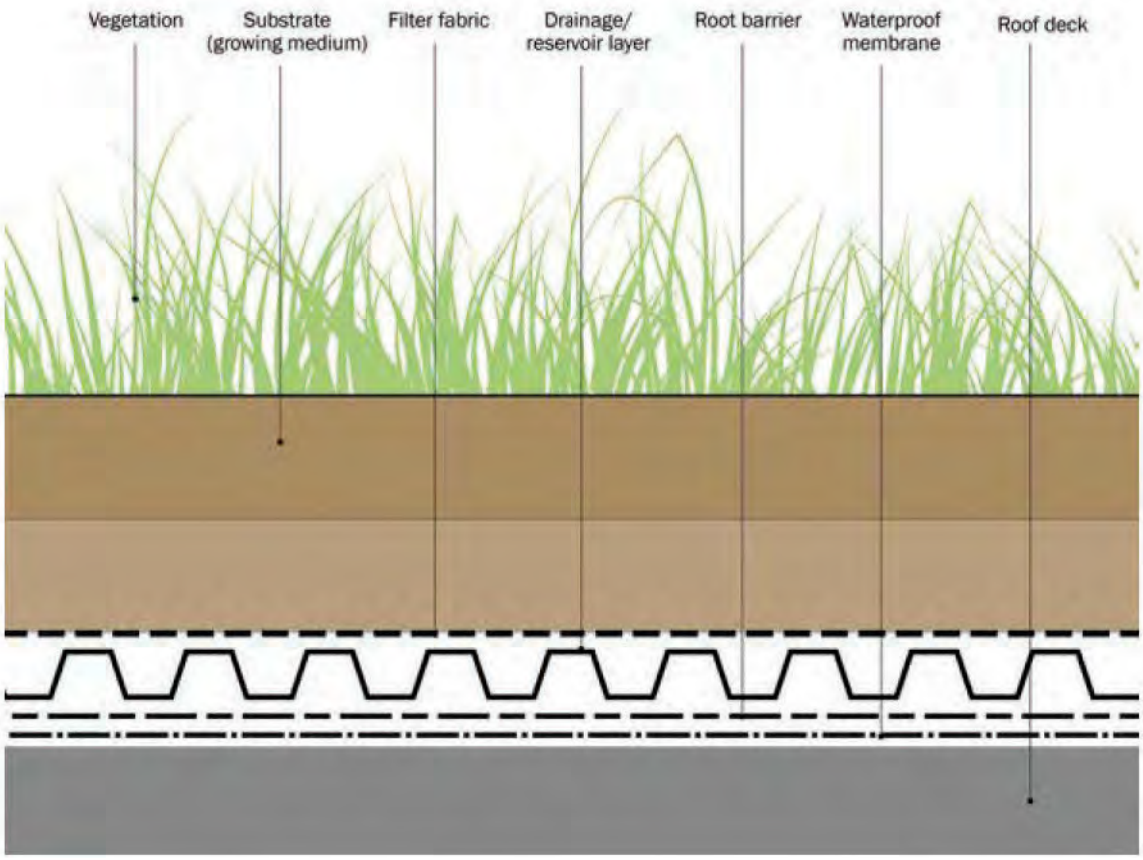


Figure 12.1 Section showing typical extensive green roof components

As mentioned earlier, there are two main types of green roof:

Extensive green roofs – These systems cover the entire roof area with hardy, slow growing, drought tolerant, low maintenance plants (eg mosses, succulents, herbs, grasses) often enhanced with wildflowers. Planting often establishes more slowly, but the long-term biodiversity can be of high value. They are only accessed for maintenance and can be flat or sloping. Extensive green roofs typically comprise a 20–150 mm thick growing medium and can be further divided into "single-layer" systems (which consist of a single medium designed to be free-draining and support plant growth), and "multi-layer" systems that include both a growing medium layer and a separate underlying drainage layer. They are lightweight and low cost to maintain, and can be used in a wide variety of locations with minimal intervention. They are often suitable for retrofit on existing structures due to their light weight. Biodiverse extensive green roofs are often planted with a mix of species supported by a range of soil depths.

Intensive green roofs (or roof gardens) – These are designed to sustain more complex landscaped environments that can provide high amenity or biodiversity benefits. They are planted with a range of plants including grasses, shrubs and/or trees, either as ground cover or within planters, and may also include water features and storage of rainwater for irrigation (ie blue roof elements). They are usually easily accessible, as they normally require a fairly high level of regular maintenance, and in some cases they are made accessible to the public. Intensive roofs have a deeper substrate, with >150 mm growing medium, and therefore impose greater loads on the roof structure.

Green roofs with substrate depths of 100–200 mm tend to be semi-intensive roofs, and can include characteristics of both extensive and intensive roofs, with plants that include shrubs and woody plants. Irrigation and maintenance requirements of this type of roof will be dependent upon the plant species chosen for the roof. There are also various combinations of green roof that combine both types in a single roof system.

A comparison of the main differences between extensive and intensive green roof systems is given in **Table 12.1**.

Extensive Green Roof

Blackdown extensive green roofs provide a lightweight, drought tolerant and low maintenance planting solution. They are suitable for lightweight roof decks, inaccessible roofs, flat or sloping roofs. Ongoing maintenance will keep extensive green roofs looking healthy and attractive

Vegetation
Extensive green roofs rely on hardy, drought tolerant sedum plants to form the majority of the planting. The sedums that Blackdown select and grow at the nursery in Somerset represent years of experience and horticultural knowledge.

There are three planting options to choose from – sedum NatureMat®, plugs or hydroplant (sedum cuttings).

Key Features

Substrate
Blackdown extensive substrates are made from carefully selected organic and inorganic materials. These materials are then blended to very specific proportions which enables plant material to establish as quickly as possible.

Waterproofing
Typical waterproofing options include suitable root-resistant bituminous membranes from the Derbigum and Euroroof ranges along with standing seam metal roofing.

Warranty
Warranties are available for the Alumasc waterproofing system used in the green roof build-up.

Build-up height	100mm
Drainage layer	25mm
Saturated weight	95-100 kg per m²
Plant coverage at installation	<5 to 90%
Maximum pitch	45 degrees
Irrigation requirements	Not required once plant material is established
Maintenance requirements	Twice a year

Appendix 12.14

Met Eireann Data

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 320619, Northing: 222316,

	Interval		Years									
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.4,	3.5,	4.1,	5.0,	5.7,	6.1,	7.8,	9.6,	10.9,	12.6,	14.2,	15.5,	16.3,
10 mins	3.4,	4.9,	5.7,	7.0,	7.9,	8.6,	10.8,	13.4,	15.2,	17.6,	19.8,	21.6,	22.8,
15 mins	4.0,	5.8,	6.8,	8.3,	9.3,	10.1,	12.7,	15.8,	17.8,	20.7,	23.3,	25.4,	26.8,
30 mins	5.3,	7.5,	8.8,	10.6,	11.9,	12.9,	16.1,	19.8,	22.3,	25.8,	28.9,	31.4,	33.0,
1 hours	7.0,	9.8,	11.4,	13.7,	15.2,	16.5,	20.4,	25.0,	27.9,	32.2,	35.9,	38.8,	40.8,
2 hours	9.2,	12.8,	14.7,	17.6,	19.5,	21.0,	25.9,	31.4,	35.0,	40.0,	44.5,	48.0,	50.3,
3 hours	10.8,	15.0,	17.2,	20.4,	22.6,	24.3,	29.8,	35.9,	39.9,	45.5,	50.5,	54.3,	56.9,
4 hours	12.2,	16.7,	19.1,	22.7,	25.1,	26.9,	32.8,	39.5,	43.8,	49.9,	55.2,	59.3,	62.1,
6 hours	14.3,	19.5,	22.3,	26.3,	29.0,	31.1,	37.7,	45.2,	50.0,	56.7,	62.6,	67.1,	70.2,
9 hours	16.9,	22.8,	25.9,	30.5,	33.5,	35.8,	43.3,	51.6,	57.0,	64.5,	71.0,	76.0,	79.4,
12 hours	18.9,	25.5,	28.9,	33.8,	37.2,	39.7,	47.8,	56.8,	62.6,	70.6,	77.6,	83.0,	86.6,
18 hours	22.3,	29.7,	33.6,	39.2,	43.0,	45.8,	54.9,	65.0,	71.4,	80.3,	88.1,	94.0,	97.9,
24 hours	25.0,	33.2,	37.4,	43.6,	47.6,	50.7,	60.6,	71.4,	78.4,	88.0,	96.3,	102.6,	106.9,
2 days	31.2,	40.4,	45.1,	51.8,	56.2,	59.5,	70.0,	81.4,	88.6,	98.4,	106.9,	113.3,	117.6,
3 days	36.4,	46.5,	51.5,	58.8,	63.5,	67.0,	78.2,	90.1,	97.6,	107.8,	116.6,	123.2,	127.6,
4 days	41.1,	51.9,	57.3,	65.1,	70.0,	73.8,	85.5,	98.0,	105.8,	116.4,	125.5,	132.3,	136.8,
6 days	49.5,	61.7,	67.8,	76.3,	81.7,	85.9,	98.6,	112.1,	120.5,	131.8,	141.4,	148.6,	153.4,
8 days	57.2,	70.6,	77.1,	86.4,	92.3,	96.7,	110.4,	124.7,	133.6,	145.6,	155.7,	163.3,	168.2,
10 days	64.4,	78.8,	85.9,	95.8,	102.1,	106.8,	121.3,	136.4,	145.8,	158.3,	168.9,	176.8,	182.0,
12 days	71.3,	86.7,	94.2,	104.6,	111.3,	116.3,	131.5,	147.4,	157.2,	170.2,	181.3,	189.5,	194.8,
16 days	84.2,	101.4,	109.7,	121.3,	128.6,	134.0,	150.7,	167.8,	178.4,	192.4,	204.2,	213.0,	218.7,
20 days	96.5,	115.3,	124.4,	136.9,	144.8,	150.6,	168.5,	186.9,	198.1,	213.0,	225.5,	234.8,	240.8,
25 days	111.3,	131.9,	141.8,	155.4,	163.9,	170.3,	189.6,	209.2,	221.3,	237.2,	250.5,	260.3,	266.7,

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

Kilternan Village
320619E 222316N
SAAR = 1003mm
M5/60 = 16.5
r= 0.277

Appendix 12.15

Surface Cover Type

All Stormwater Audits must include the following table completed by the scheme designers.

Surface Cover Type	Area (m^2)
Wetland or open water (semi-natural; not chlorinated) maintained or established on site.	
Semi-natural vegetation (e.g. trees, woodland, species-rich grassland) maintained or established on site. 30sqm per tree	10,591sqm
Standard trees planted in connected tree pits with a minimum soil volume equivalent to at least two thirds of the projected canopy area of the mature tree. *20sqm per tree	
Standard trees planted in pits with soil volumes less than two thirds of the projected canopy area of the mature tree.	1386sqm
Intensive green roof or vegetation over structure. Substrate minimum settled depth of 150mm.	
Extensive green roof with substrate of minimum settled depth of 80mm (or 60mm beneath vegetation blanket)	5125sqm
Extensive green roof of sedum mat or other lightweight systems	
Green wall –modular system or climbers rooted in soil.	
Rain gardens and other vegetated sustainable drainage elements.	380sqm
Flower-rich perennial planting.	18,742sqm
Hedges (line of mature shrubs one or two shrubs wide).	2224sqm
Groundcover planting. *30% of flower rich perennuals	4637sqm
Amenity grassland (species-poor, regularly mown lawn). *additional ph1=14,229sqm in rear private gardens	5,886sqm
Water features (chlorinated) or unplanted detention basins.	
Permeable paving.	10,640sqm
Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone). *includes 66,4500sqm to SuDS features	71,804sqm

Any assumptions (e.g. how expected tree canopy has been calculated) and which features (e.g. the type of semi-natural habitat) have been included should be noted.

Appendix 12.16

Irish Water Confirmation Of Feasibility (CoF) Letter

CONFIRMATION OF FEASIBILITY

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

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Neil Durkan

Liscove Ltd
1st Floor, Maple House
Lower Kilmacud Road
Stillorgan
Co. Dublin
A94 E3F2

14 June 2024

Our Ref: CDS24004528 Pre-Connection Enquiry
Kilternan Village, Enniskerry Road, Kilternan, Dublin

phillip.assaf@durkan.ie
Dear Applicant/Agent,

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

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 492 unit(s) at Kilternan Village, Enniskerry Road, Kilternan, Dublin, (the **Development)**.

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

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

- There are 4 proposed connections for the Development:
  • 300mm DI in Enniskerry Road (PRV required to reduce spine pressure)
  • 250mm HDPE in Glenmamuck Road South
  • 2 connections from new 280mm OD watermain as part of DLRCC Glenamuck District Roads scheme. The private main has to be completed, connected to Uisce Éireann infrastructure and in operation, prior the connection.
- Please note that only one primary connection is allowed post completion of all phases and other connections are to be made secondary which should be closed at normal operation time. Internal main size must be designed accordingly, considering the location of primary connection.

- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann

- New sewer, as part of DLRCC Glenamuck District Roads scheme, has to be completed, connected to Uisce Éireann infrastructure and in operation, prior the connection.
- The Developer is responsible for all necessary consents and permissions required to connect to any private infrastructure. The status and capacity of the infrastructure requires verification, prior to submission of a connection application.

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

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

Where can you find more information?

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

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

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

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

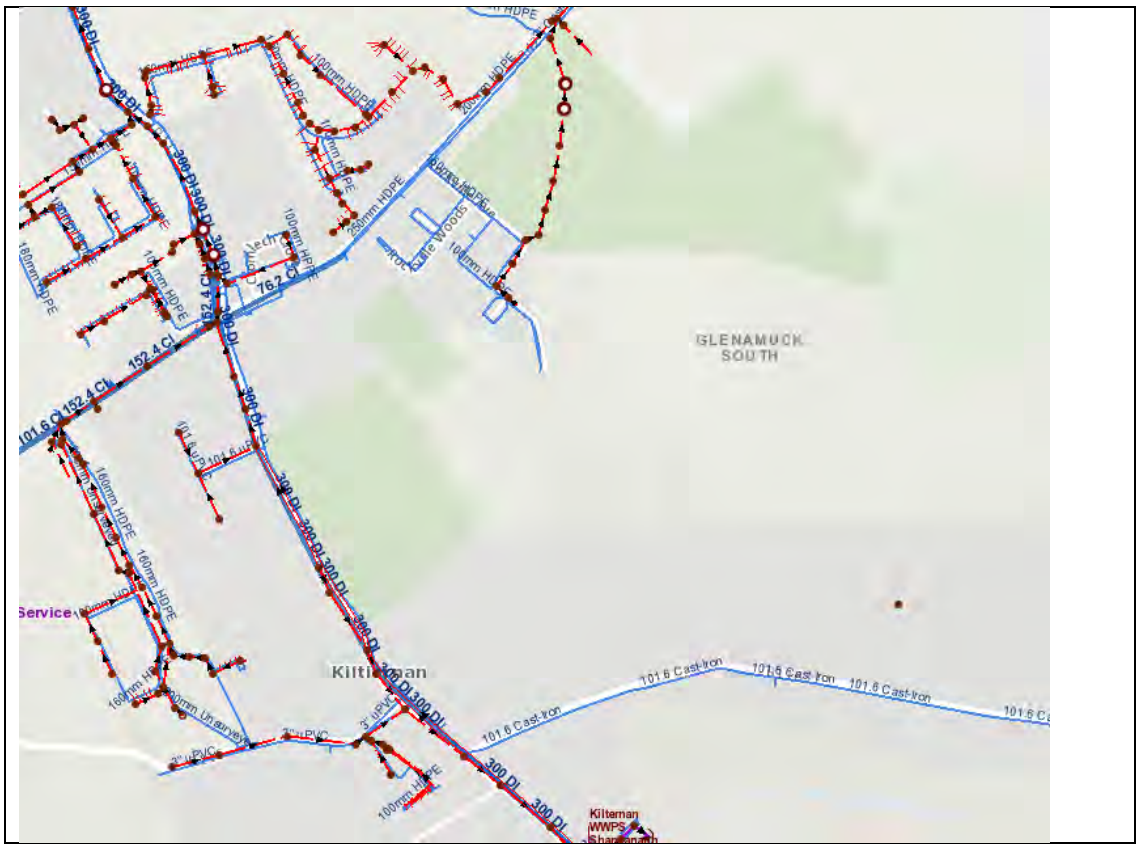
Section A - What is important to know?

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

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

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

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



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

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

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

Neil Durkan
Liscove Ltd
1st Floor, Maple House
Lower Kilmacud Road
Stillorgan
Co. Dublin
A94 E3F2

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

17 June 2024

Re: Design Submission for Kilternan Village, Enniskerry Road, Kilternan, Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS24004528

Dear Neil Durkan,

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: Antonio Garzón Mielgo
Email: antonio.garzonmielgo@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- 2104C-307 Foul Drainage Sheet 1
- 2104C-308 Foul Drainage Sheet 2
- 2104C-309 Foul Drainage Sheet 3
- 2104C-310 Rev A Watermain Layout Sheet 1 UE CDA
- 2104C-311 Rev A Watermain Layout Sheet 2 UE CDA
- 2104C-312 Rev A Watermain Layout Sheet 3 UE CDA
- 2104C-330 Foul Longutudinal Sections Sheet 1
- 2104C-331 Foul Longutudinal Sections Sheet 2
- 2104C-332 Foul Longutudinal Sections Sheet 3
- 2104C-333 Foul Longutudinal Sections Sheet 4
- 2104C-334 Foul Longutudinal Sections Sheet 5

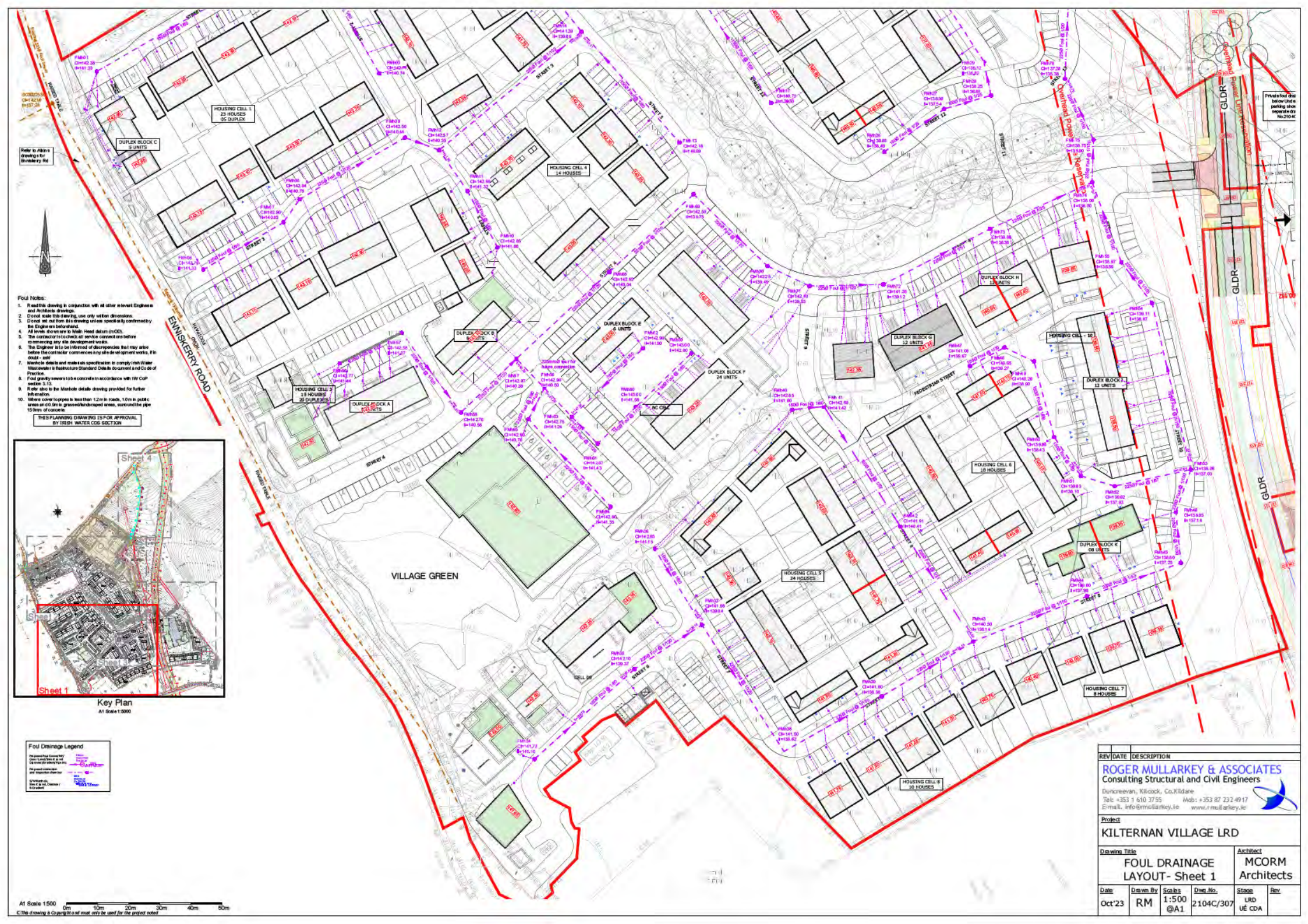
Additional Comments

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

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

*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.



REV	DATE	DESCRIPTION

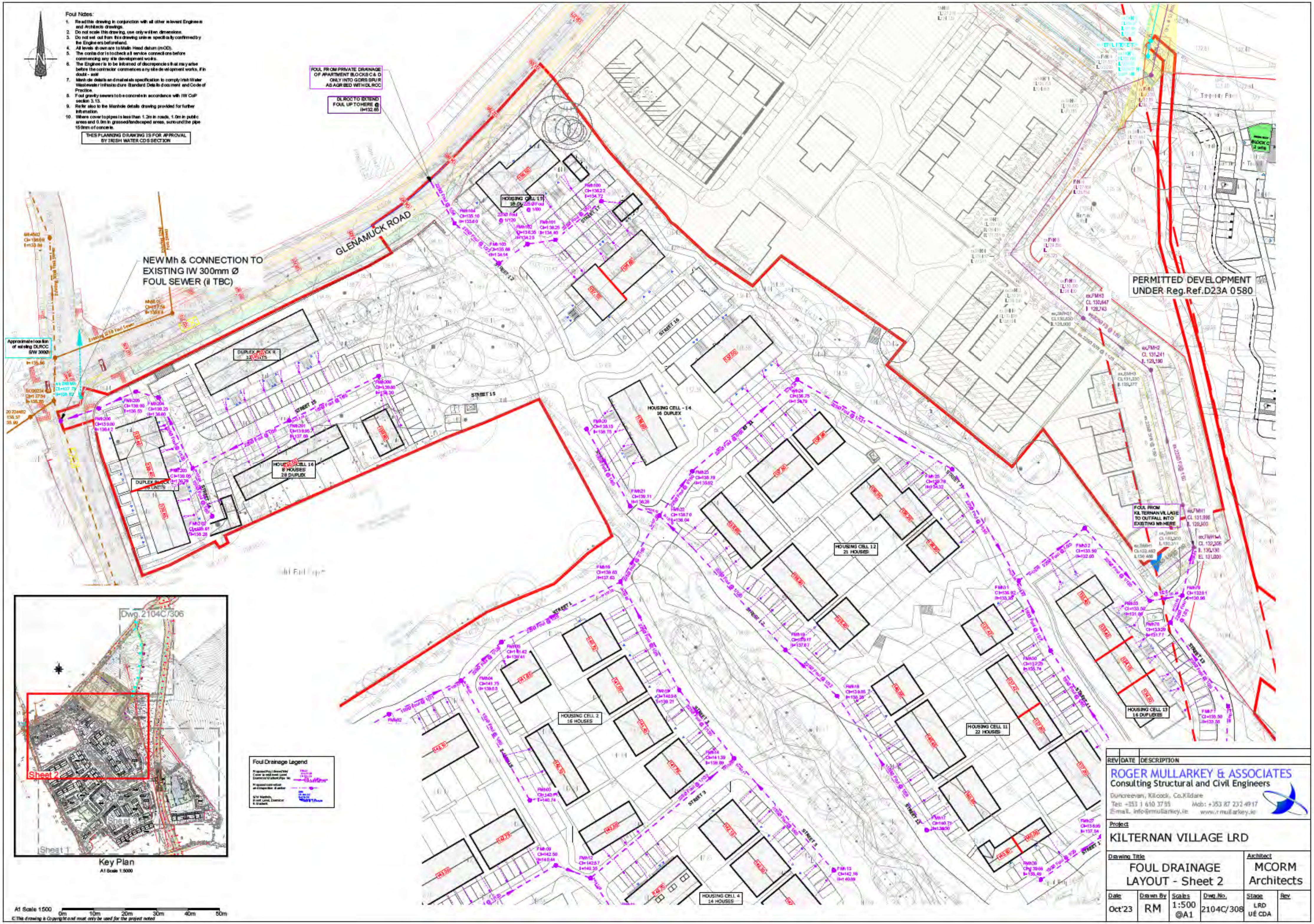
ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers
Duncreevan, Kilcock, Co.Kildare
Tel: +353 1 610 3755 Mob: +353 87 232 4917
E-mail: info@rmullarkey.ie www.rmullarkey.ie

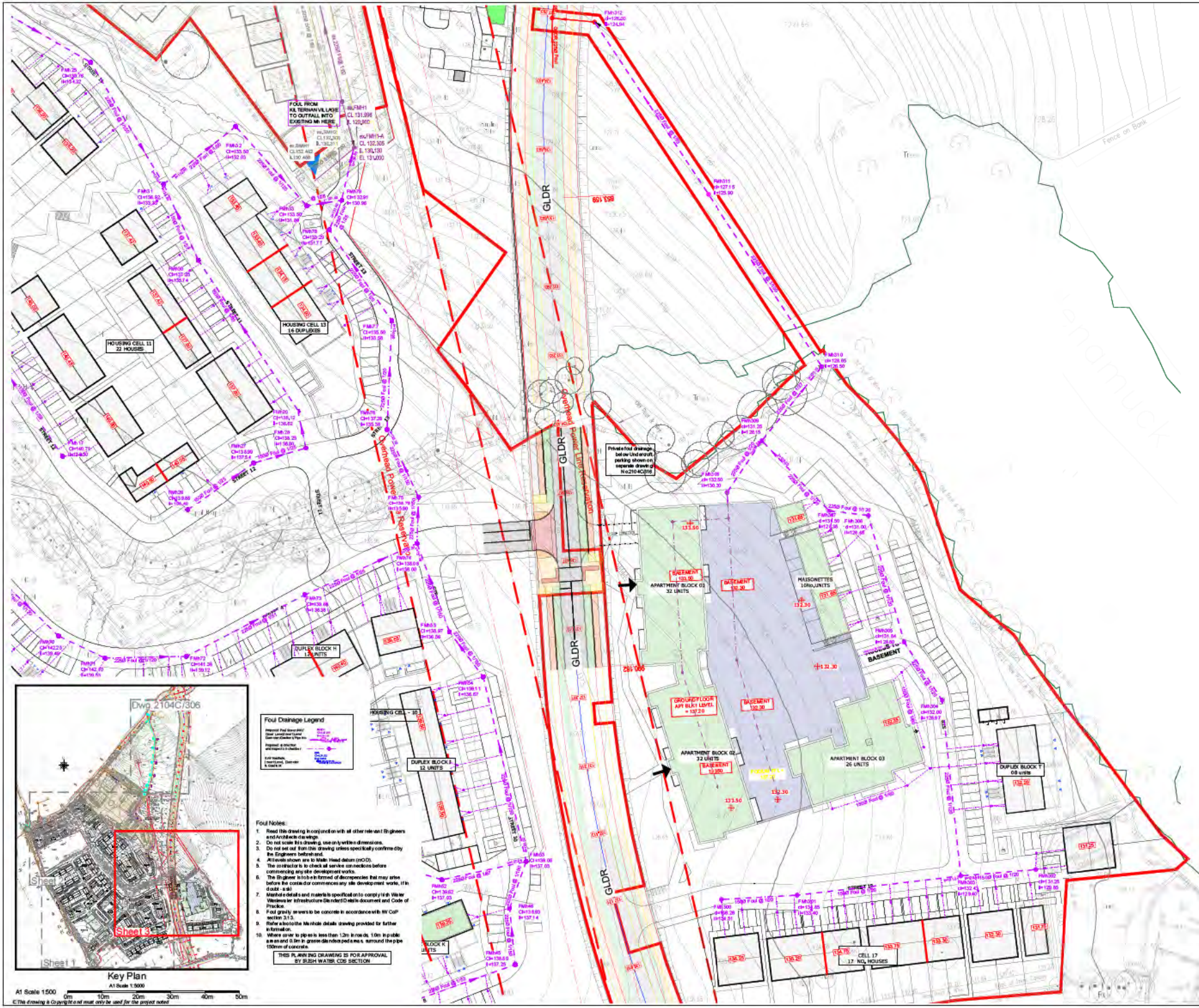
Project
KILTERNAN VILLAGE LRD

Drawing Title
FOUL DRAINAGE LAYOUT- Sheet 1

Architect
MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
Oct'23	RM	1:500 @A1	2104C/307	LRD UÉ CDA	


Foul Notes:
1. Read this drawing in conjunction with all other relevant Engineers and Architects drawings.
2. Do not scale this drawing, use only written dimensions.
3. Do not set out from this drawing unless specifically confirmed by the Engineers beforehand.
4. All levels shown are to Malin Head datum (mOD).
5. The contractor is to check all service connections before commencing any site development works.
6. The Engineer is to be informed of discrepencies that may arise before the contractor commences any site development works, if in doubt - ask!
7. Manhole details and materials specification to comply Irish Water Wastewater Infrastructure Standard Details document and Code of Practice.
8. Foul gravity sewers to be concrete in accordance with IW CoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipes is less than 1.2m in roads, 1.0m in public areas and 0.9m in grassed/landscaped areas, surround the pipe 150mm of concrete.
THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION
FOUL FROM PRIVATE DRAINAGE OF APARTMENT BLOCKS C & D ONLY INTO GDRS SPUR AS AGREED WITH DLRCC
DLRCC TO EXTEND FOUL UP TO HERE @ IL=132.85
NEW Mh & CONNECTION TO EXISTING IW 300mm Ø FOUL SEWER (IL TBC)
GLENAMUCK ROAD
Approximate location of existing DLRCC (IW 300Ø)
PERMITTED DEVELOPMENT UNDER Reg.Ref.D23A 0580
FOUL FROM KILTERNAN VILLAGE TO OUTFALL INTO EXISTING MH HERE
HOUSING CELL 15
HOUSING CELL - 14 16 DUPLEX
HOUSING CELL 16 8 HOUSES 28 DUPLEX
DUPLEX BLOCK K 12 UNITS
HOUSING CELL 12 21 HOUSES
HOUSING CELL 11 22 HOUSES
HOUSING CELL 13 16 DUPLEXES
HOUSING CELL 2 16 HOUSES
HOUSING CELL 4 14 HOUSES
STREET 1
STREET 2
STREET 3
STREET 5
STREET 11
STREET 12
STREET 13
STREET 15
STREET 16
STREET 17
STREET 20
STREET 21
Key Plan
A1 Scale 1:5000
Dwg.2104C/306
Sheet 1
Sheet 2
Foul Drainage Legend
A1 Scale 1:500
0m 10m 20m 30m 40m 50m
REV DATE DESCRIPTION
ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers
Duncreevan, Kilcock, Co.Kildare
Tel: +353 1 610 3755 Mob: +353 87 232 4917
E-mail. info@mullarkey.ie www.rmullarkey.ie
Project
KILTERNAN VILLAGE LRD
Drawing Title
FOUL DRAINAGE LAYOUT - Sheet 2
Architect
MCORM Architects
Date Oct'23
Drawn By RM
Scale 1:500 @A1
Dwg.No. 2104C/308
Stage LRD UÉ CDA
Rev



Key Plan

A1 Scale 1:500

0m 10m 20m 30m 40m 50m

Foul Drainage Legend

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8. Foul gravity sewers to be concrete in accordance with IW CoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipe is less than 1.2m in roads, 1.0m in public areas and 0.9m in grass verges and pedestrians, surround the pipe 150mm of concrete.

THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION

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Duncreevan, Kilcock, Co.Kildare
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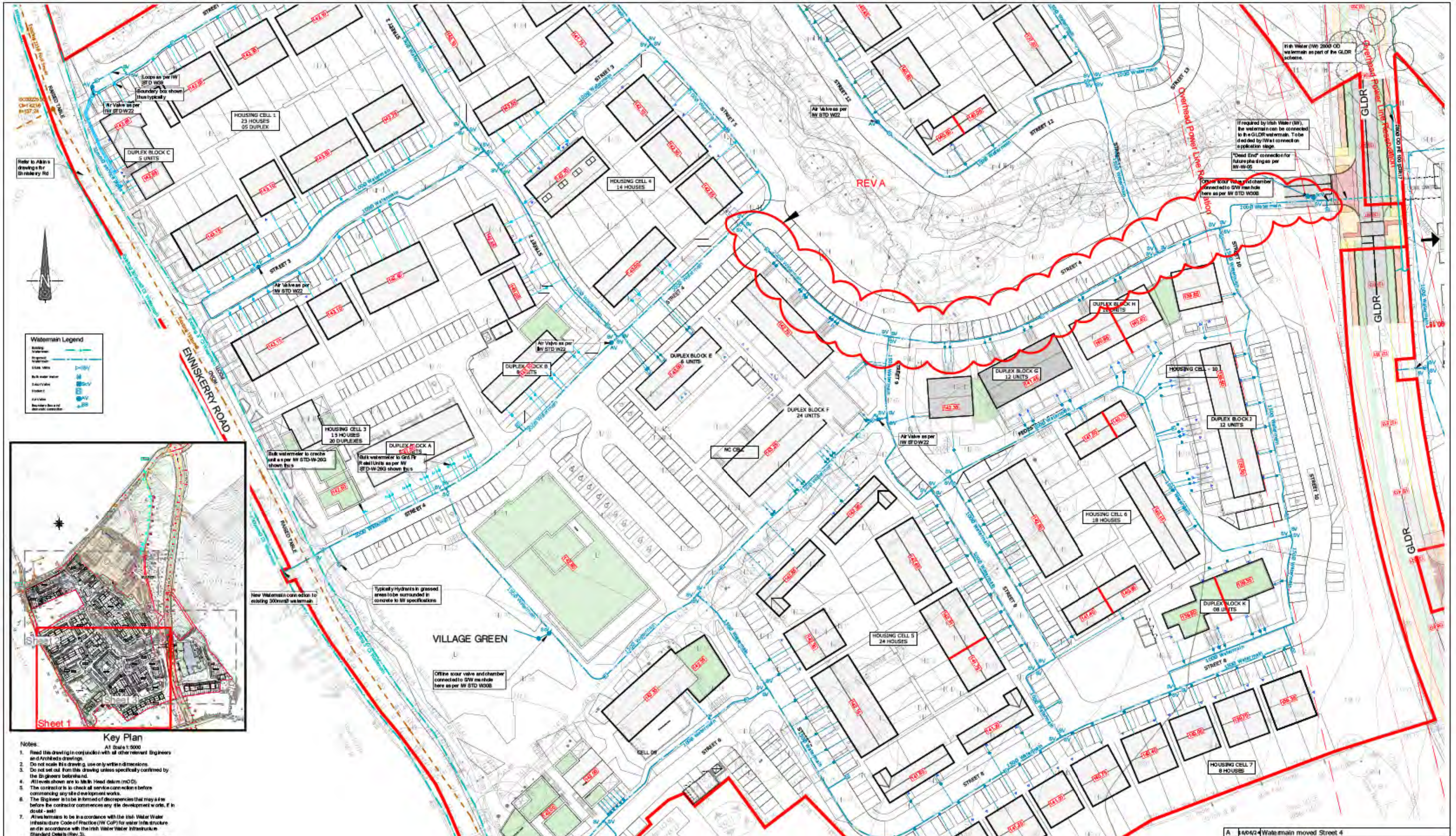
E-mail: info@rmullarkey.ie www.rmullarkey.ie

Project
KILTERNAN VILLAGE LRD

Drawing Title
FOUL DRAINAGE LAYOUT - Sheet 3

Architect
MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
Oct'23	RM	1:500 @A1	2104C/309	LRD UÉ CDA	



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6. The Engineer is to be informed of discrepencies that may arise before the contractor commences any site development works. If in doubt - ask!
7. All watermains to be in accordance with the Irish Water Water Infrastructure Code of Practice (IW CoP) for water infrastructure and in accordance with the Irish Water Water Infrastructure Standard Details (Rev.3).
8. All pipe materials to be in accordance with Section 3.9 the IW CoP as follows:
   Pipe Ø 100-150mm - HDPE, MDPE (PE80) and DI
   Pipe Ø 200-300mm - HPPE(PE-100), HDPE, MDPE(PE-80) and DI
   PE pipes to have an SDR rating of 11 or 17 and be compliant with IS EN 1220 Part 1,2 and 3 for plastic pipes and fittings under pressure.
   DI pipes to have a C40 pressure rating, with 16 bar fittings and be in compliance with IS EN 545.
9. Bulk meter and chamber to be agreed with DLRCC before construction commences.
10. Domestic and non-domestic meters will be supplied and installed by Irish Water.

TYPICAL DETAIL REFERENCES	
DETAIL TYPE	IW STANDARD DETAILS (Rev03)
Hydrant Chambers	STD-W-18
Thrust Blocks	STD-W-28
Bulk Water Meter	STD-W-26
Air Valve	STD-W-22
Sluice Valve	STD-W-15
Bedding/bedding	STD-W-13
Boundary/Connection	STD-W-03
Marker Plates	STD-W-27
Scour Valve	STD-W-30

THIS IS A PRE-PLANNING DRAWING FOR APPROVAL OF THE IRISH WATER CDS SECTION

A1 Scale 1:500 — 0m 10m 20m 30m 40m 50m

REV	DATE	DESCRIPTION
A	14/05/24	Watermain moved Street 4

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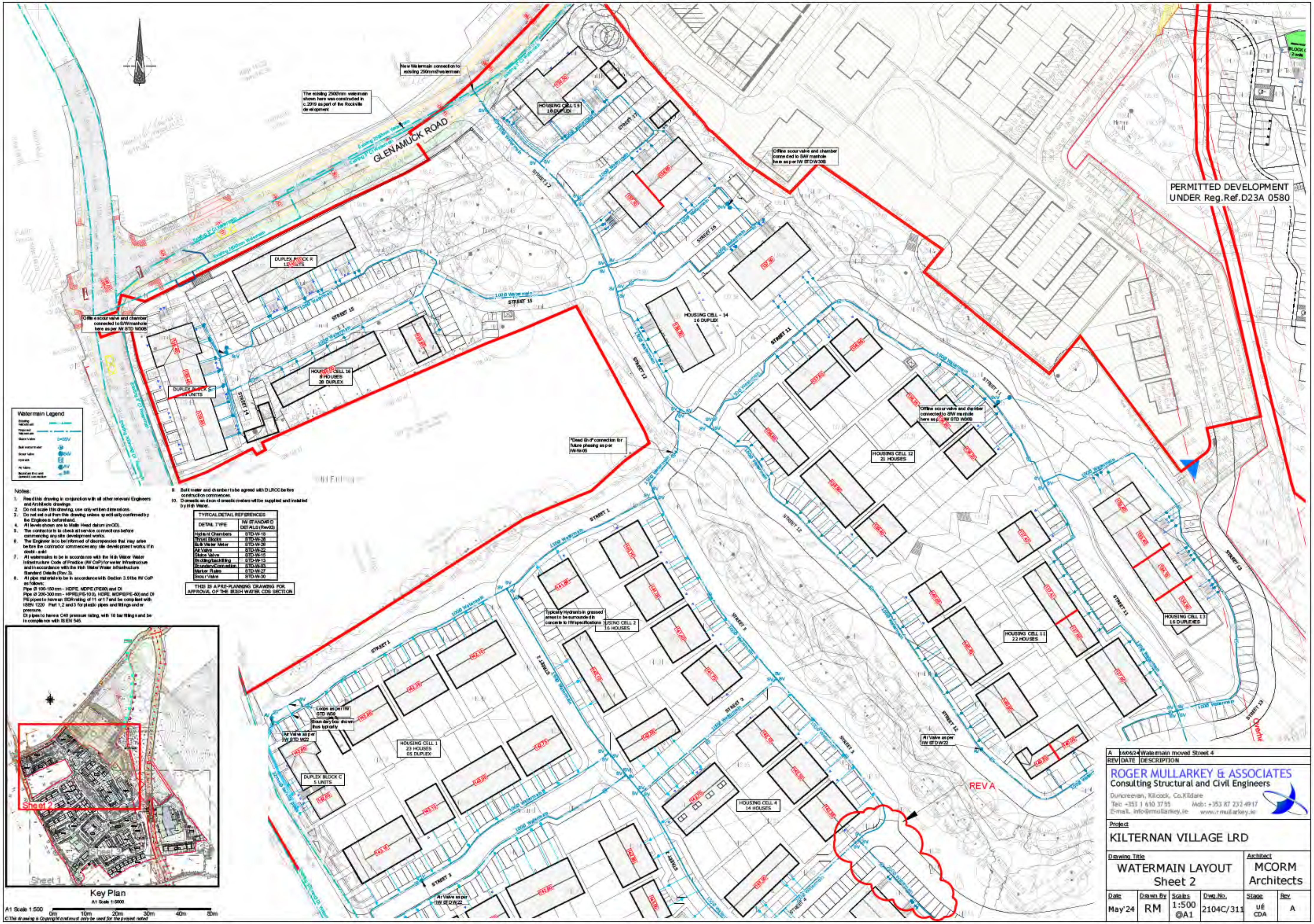
Project: KILTERNAN VILLAGE LRD

Drawing Title: WATERMAIN LAYOUT Sheet 1

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
May'24	RM	1:500 @A1	2104C/310	UE CDA	A



Watermain Legend

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9. Bulk meter and chamber to be agreed with DLRCC before construction commences.
10. Domestic and non-domestic meters will be supplied and installed by Irish Water.

TYPICAL DETAIL REFERENCES	
DETAIL TYPE	IW STANDARD DETAILS (Rev03)
Hydrant Chambers	STD-W-18
Thrust Blocks	STD-W-28
Bulk Water Meter	STD-W-26
Air Valve	STD-W-22
Sluice Valve	STD-W-15
Bedding/backfilling	STD-W-13
Boundary/Connection	STD-W-03
Marker Plates	STD-W-27
Scour Valve	STD-W-30

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A1 Scale 1:500

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REV	DATE	DESCRIPTION
A	16/04/24	Watermain moved Street 4

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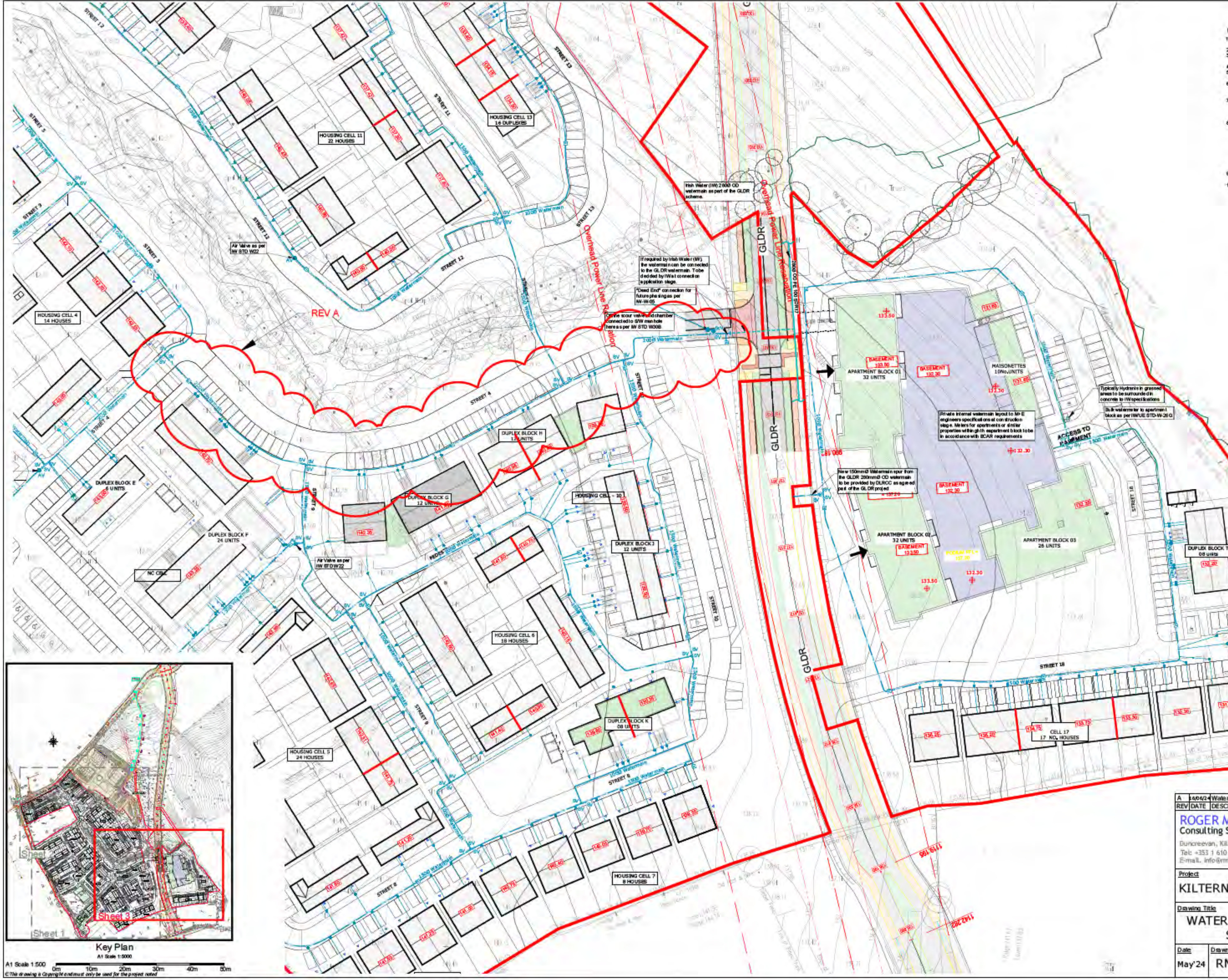
E-mail. info@rmullarkey.ie www.rmullarkey.ie

Project: KILTERNAN VILLAGE LRD

Drawing Title: WATERMAIN LAYOUT Sheet 2

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg.No.	Stage	Rev
May'24	RM	1:500 @A1	2104C/311	UÉ CDA	A



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Hydrant Chambers	STDW-16
Thrust Blocks	STDW-25
Bulk Water Meter	STDW-26
Air Valve	STDW-22
Sluice Valve	STDW-15
Bedding/backfilling	STDW-13
Boundary/Connection	STDW-03
Marker Plates	STDW-27
Scour Valve	STDW-30

THIS IS A PRE-PLANNING DRAWING FOR APPROVAL OF THE IRISH WATER CDS SECTION

REV	DATE	DESCRIPTION
A	14/04/24	Watermain moved Street 4

ROGER MULLARKEY & ASSOCIATES
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Project: KILTERNAN VILLAGE LRD

Drawing Title: WATERMAIN LAYOUT Sheet 3

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg.No.	Stage	Rev
May'24	RM	1:500 @A1	2104C/312	UE CDA	A

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Foul Notes:

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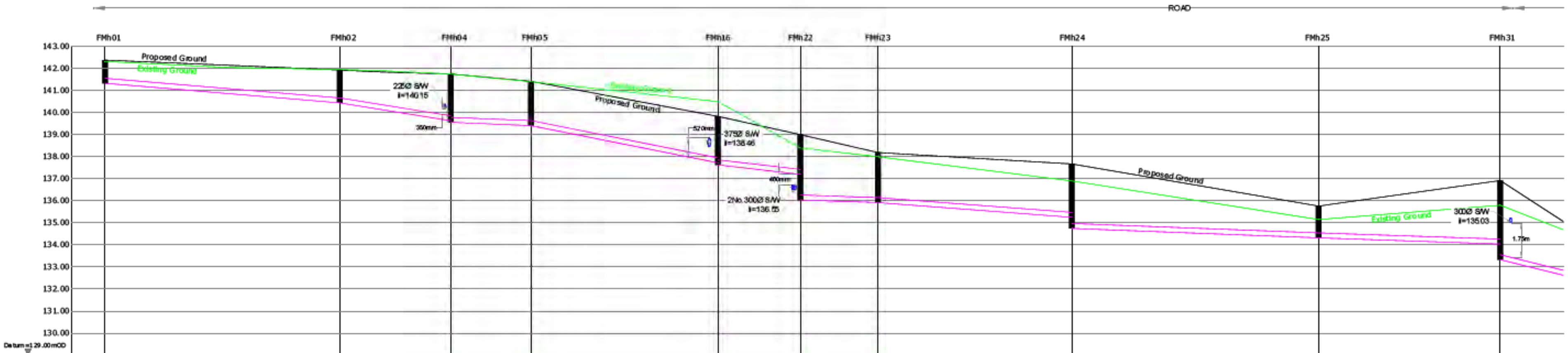
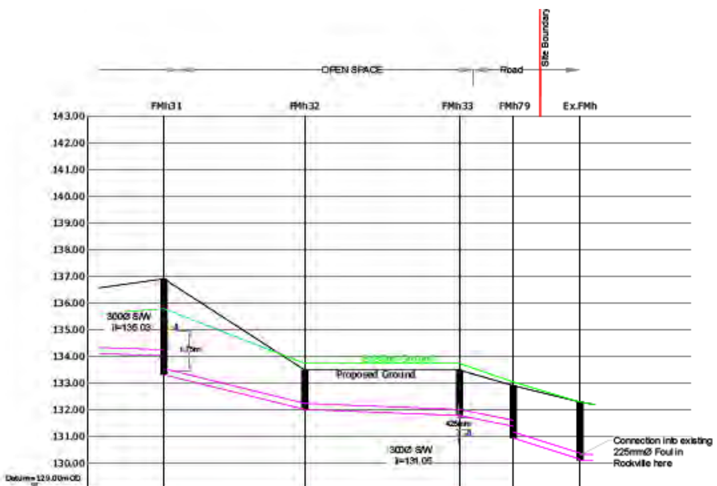


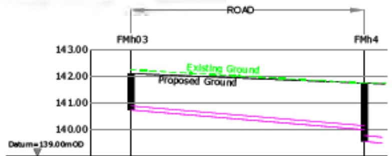
	FMh01	FMh02	FMh04	FMh05	FMh16	FMh22	FMh23	FMh24	FMh25	FMh31
Existing Levels	142.32	141.95	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	136.90	135.15	135.80
Proposed Cover Levels	142.38	141.93	141.75	141.42	139.83	139.00	138.19	137.75	135.76	136.92
Proposed Invert Levels	141.33	140.44	139.63 / 139.55	139.41	137.72 / 137.63	137.20 / 136.04	135.92	135.25 / 134.79	134.32	134.04 / 133.33
Pipe Length	53.3	25.2m	17.8m	42.4m	24.4m	17.6m	44.1m	56.6m	41.3	26.4
Pipe Size & Gradient	150Ø @ 1/60	150Ø @ 1/31	225Ø @ 1/20	225Ø @ 1/25	225Ø @ 1/150	225Ø @ 1/150	225Ø @ 1/66	225Ø @ 1/121	225Ø @ 1/150	225Ø @ :

Foul Longitudinal Section
FMh1 to FMh31
Vertical Scale 1:100
Horizontal Scale 1:500



	FMh31	FMh32	FMh33	FMh79	Ex.FMh
Existing Levels	[illegible]	[illegible]	[illegible]	133.06	132.31
Proposed Cover Levels	136.92	133.50	133.50	132.91	132.31
Proposed Invert Levels	134.04 / 133.33	132.03	131.80	131.40 / 130.96	130.17 / 130.13
Pipe Length	28.4m	29.0m	10.0m	12.5m	
Pipe Size & Gradient	225Ø @ 1/20	225Ø @ 1/120	225Ø @ 1/26	225Ø @ 1/150	

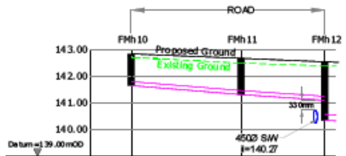
Foul Longitudinal Section
FMh31 to Outfall
Vertical Scale 1:100
Horizontal Scale 1:500



	FMh03	FMh4
Existing Levels	142.25	141.75
Proposed Cover Levels	142.11	141.75
Proposed Invert Levels	140.74	140.00 / 139.55
Pipe Length	43.7m	
Pipe Size & Gradient	150Ø @ 1/60	

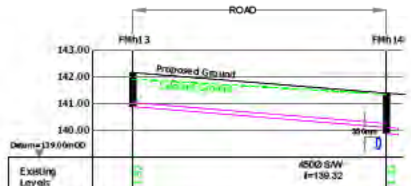
Foul Longitudinal Section
FMh03 to FMh04
Vertical Scale 1:100
Horizontal Scale 1:500

REFER TO Dwg.No.2104C/307-309 FOR PLAN ALIGNMENT OF FOUL SEWER SHOWN ON THIS DRAWING



	FMh10	FMh11	FMh12
Existing Levels	142.72	142.50	142.40
Proposed Cover Levels	142.85	142.68	142.57
Proposed Invert Levels	141.66	141.32	141.05 / 140.35
Pipe Length	20.5m	15.6m	
Pipe Size & Gradient	150Ø @ 1/60	150Ø @ 1/60	

Foul Longitudinal Section
FMh10 to FMh12
Vertical Scale 1:100
Horizontal Scale 1:500



	FMh13	FMh14
Existing Levels	141.52	[illegible]
Proposed Cover Levels	142.16	141.39
Proposed Invert Levels	140.89	140.11 / 139.89
Pipe Length	47.5m	
Pipe Size & Gradient	150Ø @ 1/60	

Foul Longitudinal Section
FMh13 to FMh14
Vertical Scale 1:100
Horizontal Scale 1:500

REV	DATE	DESCRIPTION

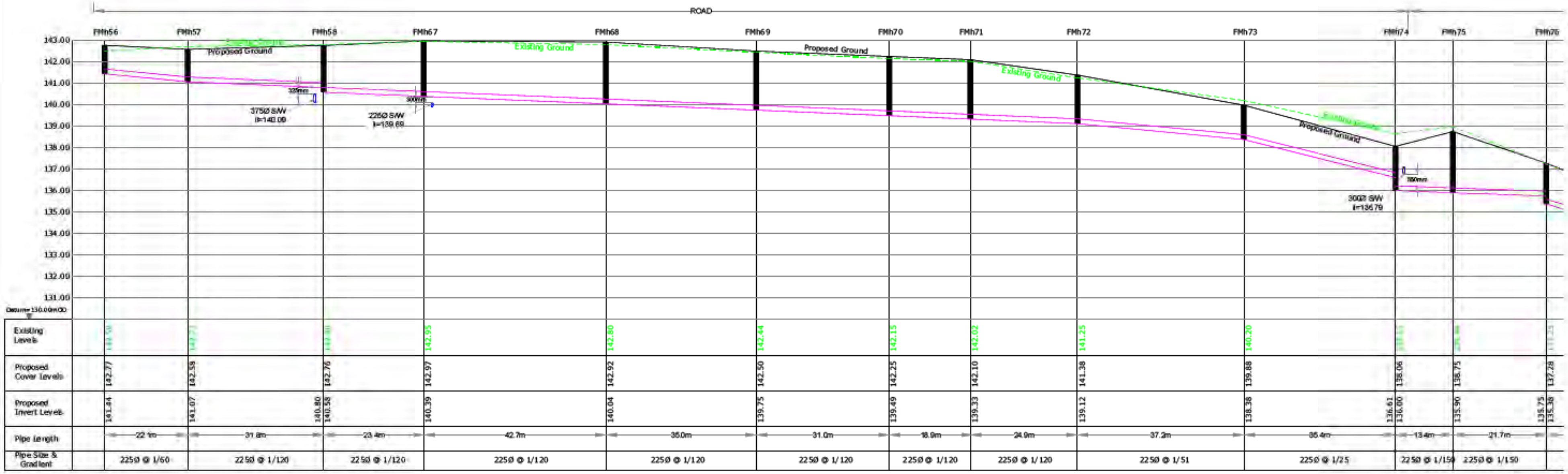
ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers
Dunderrien, Kilcock, Co.Kildare
Tel: +353 1 610 3755 Mob: +353 87 252 4017
E-mail: info@rmullarkey.ie www.rmullarkey.ie

Project: KILTERNAN VILLAGE LRD

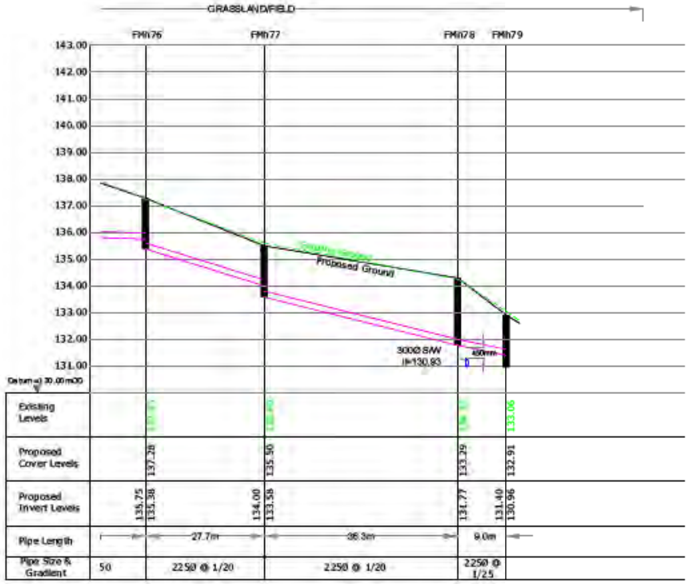
Drawing Title: FOUL LONGITUDINAL SECTIONS- Sheet 1

Architect: MCORM Architects

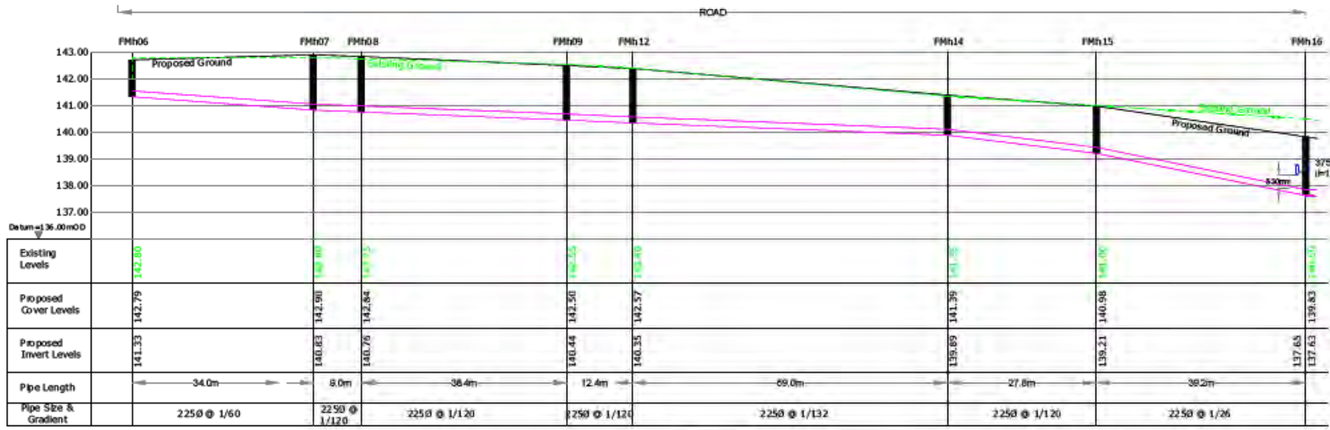
Date	Drawn By	Scales	Dwg No.	Stage	Rev
May'24	RM	As Shown @A1	2104C/330	LRD UÉ CDA	



Foul Longitudinal Section
FMh56 to FMh76
Vertical Scale 1:100
Horizontal Scale 1:500



Foul Longitudinal Section
FMh76 to FMh79
Vertical Scale 1:100
Horizontal Scale 1:500



Foul Longitudinal Section
FMh06 to FMh16
Vertical Scale 1:100
Horizontal Scale 1:500

REFER TO Dwg.No.2104C/307-309 FOR PLAN ALIGNMENT OF FOUL SEWER SHOWN ON THIS DRAWING

Foul Notes:

1. Read this drawing in conjunction with all other relevant Engineers and Architects drawings.
2. Do not scale this drawing, use only written dimensions.
3. Do not set out from this drawing unless specifically confirmed by the Engineers beforehand.
4. All levels shown are to Malin Head datum (mOD).
5. The contractor is to check all service connections before commencing any site development works.
6. The Engineer is to be informed of discrepancies that may arise before the contractor commences any site development works. If in doubt - ask!
7. Manhole details and materials specification to comply Irish Water Waste water Infrastructure Standard Details document and Code of Practice.
8. Foul gravity sewers to be concrete in accordance with IWCoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipes is less than 1.2m in roads, 1.0m in public areas and 0.9m in grassed/landscaped areas, surround the pipe 150mm of concrete.

THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION

A1 Scale 1:500 — 0m 10m 20m 30m 40m 50m

REV	DATE	DESCRIPTION

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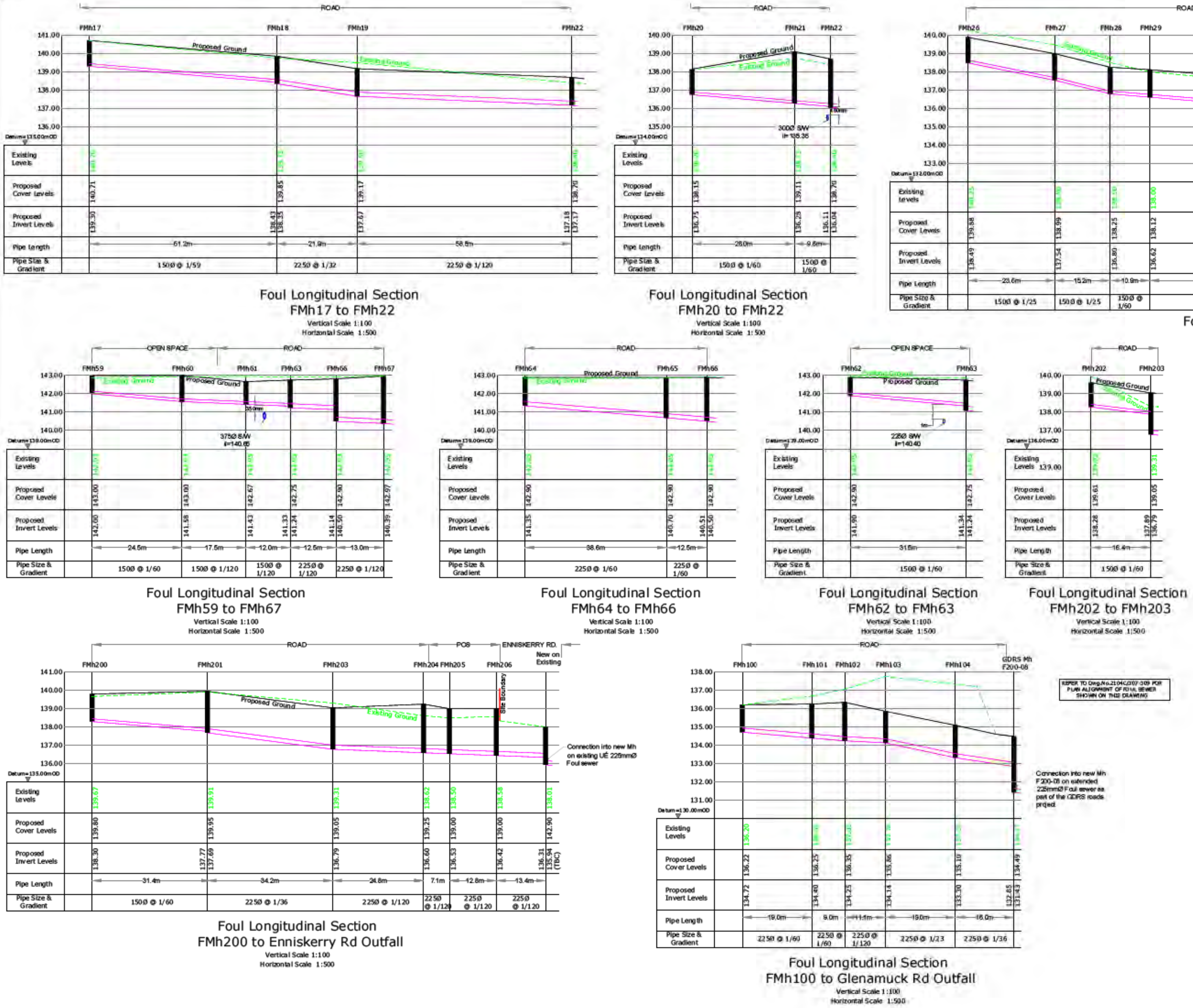
Email: info@rmullarkey.ie www.rmullarkey.ie

Project: KILTERNAN VILLAGE LRD

Drawing Title: FOUL LONGITUDINAL SECTIONS- Sheet 2

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg.No.	Stage	Rev
May'24	RM	As Shown @A1	2104C/331	LRD UÉ CDA	



REFER TO Dwg.No.2104C/207-209 FOR PLAN ALIGNMENT OF FOUL SEWER SHOWN ON THIS DRAWING

Foul Notes:

1. Read this drawing in conjunction with all other relevant Engineers and Architects drawings.
2. Do not scale this drawing, use only written dimensions.
3. Do not set out from this drawing unless specifically confirmed by the Engineers beforehand.
4. All levels shown are to Malin Head datum (mOD).
5. The contractor is to check all service connections before commencing any site development works.
6. The Engineer is to be informed of discrepancies that may arise before the contractor commences any site development works. If in doubt - ask.
7. Manhole details and materials specification to comply Irish Water Wastewater Infrastructure Standard Details document and Code of Practice.
8. Foul gravity sewers to be concrete in accordance with IWCoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipe is less than 1.2m to roads, 1.0m in public areas and 0.9m in grassed/landscaped areas, surround the pipe 150mm of concrete.

THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION

A1 Scale 1:500 0m 10m 20m 30m 40m 50m

REV	DATE	DESCRIPTION

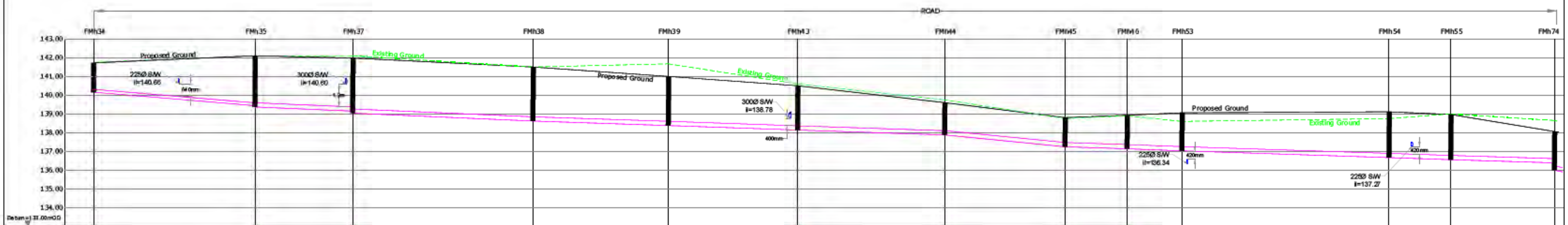
ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers

Project: KILTERNAN VILLAGE LRD

Drawing Title: FOUL LONGITUDINAL SECTIONS- Sheet 3

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
May'24	RM	As Shown @A1	2104C/332	LRD UÉ CDA	



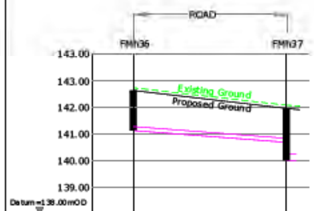
	FMh34	FMh35	FMh37	FMh38	FMh39	FMh43	FMh44	FMh45	FMh46	FMh53	FMh54	FMh55	FMh74
Existing Levels	[illegible]	[illegible]	[illegible]	141.50	141.67	140.60	[illegible]	[illegible]	[illegible]	138.60	138.75	139.00	138.65
Proposed Cover Levels	141.72	142.10	141.98	141.50	141.00	140.50	139.60	138.80	138.93	139.06	139.11	138.97	138.06
Proposed Invert Levels	140.16	139.44 / 139.37	139.15 / 139.04	138.62	138.38	138.14	137.88	137.25	137.14	137.03	136.67	136.56	136.39 / 136.00

Pipe	Pipe Length	Pipe Size & Gradient
FMh34–FMh35	31.4m	150Ø @ 1/60
FMh35–FMh37	34.2m	225Ø @ 1/120
FMh37–FMh38	34.2m	225Ø @ 1/120
FMh38–FMh39	34.2m	225Ø @ 1/150
FMh39–FMh43	34.2m	225Ø @ 1/150
FMh43–FMh44	34.2m	225Ø @ 1/150
FMh44–FMh45	34.2m	225Ø @ 1/53
FMh45–FMh46	34.2m	225Ø @ 1/150
FMh46–FMh53	34.2m	225Ø @ 1/150
FMh53–FMh54	34.2m	225Ø @ 1/150
FMh54–FMh55	34.2m	225Ø @ 1/150
FMh55–FMh74	34.2m	225Ø @ 1/150

Foul Longitudinal Section FMh35 to FMh74

Vertical Scale 1:100
Horizontal Scale 1:500

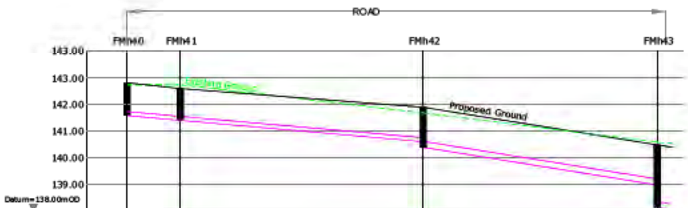
REFER TO Dwg.No.2104C/307-309 FOR PLAN ALIGNMENT OF FOUL SEWER SHOWN ON THIS DRAWING



	FMh36	FMh37
Existing Levels	141.75	142.10
Proposed Cover Levels	142.65	141.98
Proposed Invert Levels	141.15	140.71 / 139.04
Pipe Length	28.6m	
Pipe Size & Gradient	150Ø @ 1/60	

Foul Longitudinal Section FMh36 to FMh37

Vertical Scale 1:100
Horizontal Scale 1:500

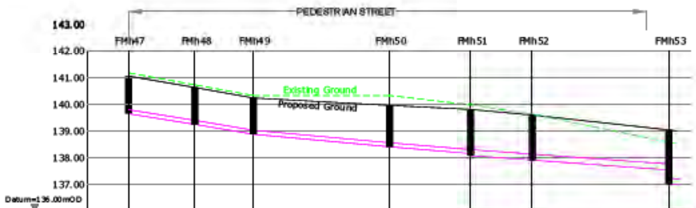


	FMh40	FMh41	FMh42	FMh43
Existing Levels	142.79	[illegible]	[illegible]	[illegible]
Proposed Cover Levels	142.85	142.68	141.91	140.50
Proposed Invert Levels	141.60	141.42	140.62 / 140.41	139.00 / 138.14

Pipe	Pipe Length	Pipe Size & Gradient
FMh40–FMh41	10.0m	150Ø @ 1/60
FMh41–FMh42	45.8m	150Ø @ 1/57
FMh42–FMh43	43.8m	225Ø @ 1/31

Foul Longitudinal Section FMh40 to FMh43

Vertical Scale 1:100
Horizontal Scale 1:500



	FMh47	FMh48	FMh49	FMh50	FMh51	FMh52	FMh53
Existing Levels	141.20	140.75	140.35	140.35	[illegible]	[illegible]	[illegible]
Proposed Cover Levels	141.08	140.65	140.26	139.98	139.83	139.62	139.06
Proposed Invert Levels	139.67	139.27	138.90	138.43	138.10	139.93	137.56 / 137.03

Pipe	Pipe Length	Pipe Size & Gradient
FMh47–FMh48	12.4m	150Ø @ 1/60
FMh48–FMh49	10.9m	150Ø @ 1/60
FMh49–FMh50	25.5m	150Ø @ 1/58
FMh50–FMh51	15.3m	150Ø @ 1/60
FMh51–FMh52	11.5m	225Ø @ 1/64
FMh52–FMh53	25.6m	150Ø @ 1/60

Foul Longitudinal Section FMh47 to FMh53

Vertical Scale 1:100
Horizontal Scale 1:500

Foul Notes:

1. Read this drawing in conjunction with all other relevant Engineers and Architects drawings.
2. Do not scale this drawing, use only written dimensions.
3. Do not set out from this drawing unless specifically confirmed by the Engineers beforehand.
4. All levels shown are to Main Head datum (mOD).
5. The contractor is to check all service connections before commencing any site development works.
6. The Engineer is to be informed of discrepancies that may arise before the contractor commences any site development works. If in doubt - ask.
7. Manhole details and materials specification to comply Irish Water Wastewater Infrastructure Standard Details document and Code of Practice.
8. Foul gravity sewers to be concrete in accordance with IWCoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipes is less than 1.2m in roads, 1.0m in public areas and 0.9m in grassed/landscaped areas, surround the pipe 150mm of concrete.

THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION

REV	DATE	DESCRIPTION

ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers
Dunderrean, Kilcock, Co.Kildare
Tel: +353 1 610 3755 Mob: +353 87 252 9817
Email: info@rmullarkey.ie www.rmullarkey.ie

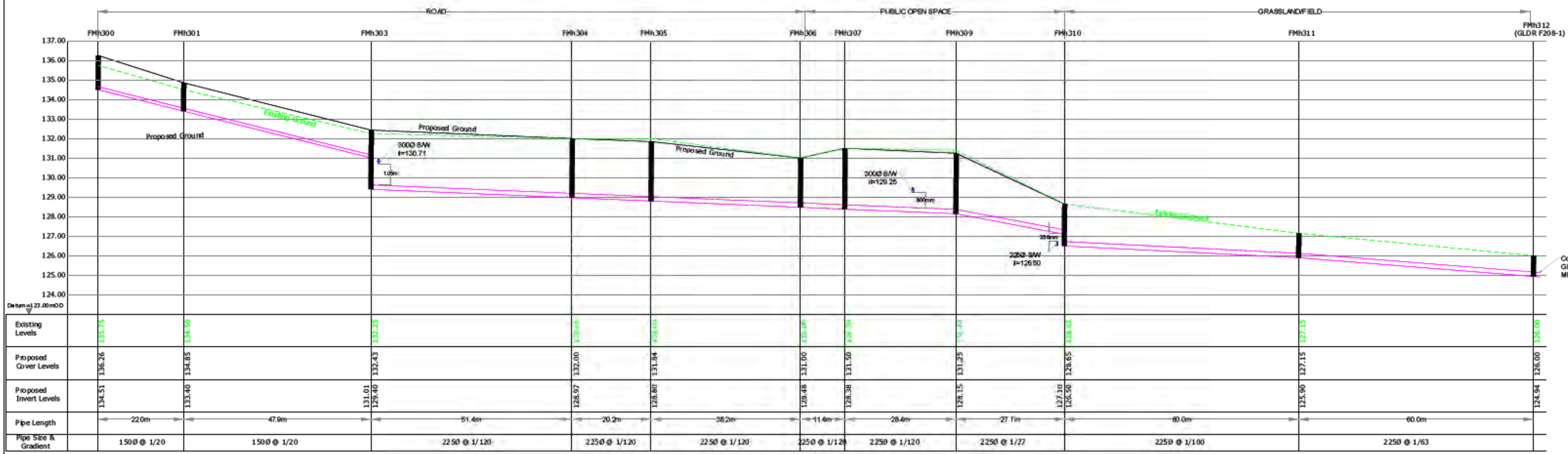
Project: KILTERNAN VILLAGE LRD

Drawing Title: FOUL LONGITUDINAL SECTIONS- Sheet 4

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
May'24	RM	As Shown @A1	2104C/333	LRD UE CDA	

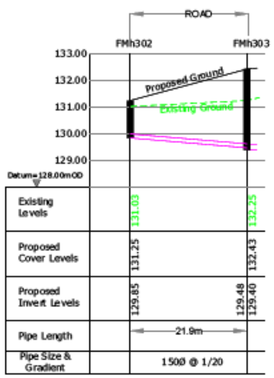
A1 Scale 1:500 0m 10m 20m 30m 40m 50m



Foul Longitudinal Section
FMh300 to GLDR Outfall

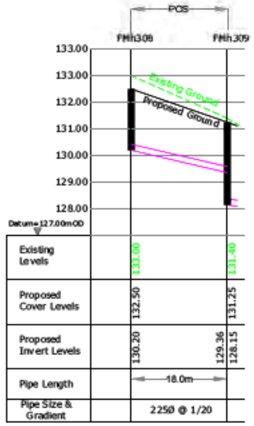
Vertical Scale 1:100
Horizontal Scale 1:500

REFER TO Dwg.No.2104C/309 FOR PLAN ALIGNMENT OF FOUL SEWER SHOWN ON THIS DRAWING



Foul Longitudinal Section
FMh302 to FMh303

Vertical Scale 1:100
Horizontal Scale 1:500



Foul Longitudinal Section
FMh308 to FMh309

Vertical Scale 1:100
Horizontal Scale 1:500

Foul Notes:

1. Read this drawing in conjunction with all other relevant Engineers and Architects drawings.
2. Do not scale this drawing, use only written dimensions.
3. Do not set out from this drawing unless specifically confirmed by the Engineers beforehand.
4. All levels shown are to Malin Head datum (mOD).
5. The contractor is to check all service connections before commencing any site development works.
6. The Engineer is to be informed of discrepancies that may arise before the contractor commences any site development works. If in doubt - ask.
7. Manhole details and materials specification to comply Irish Water Wastewater Infrastructure Standard Details document and Code of Practice.
8. Foul gravity sewers to be concrete in accordance with IWCoP section 3.13.
9. Refer also to the Manhole details drawing provided for further information.
10. Where cover to pipe is less than 1.2m in roads, 1.0m in public areas and 0.9m in grassed/landscaped areas, surround the pipe 150mm of concrete.

THIS PLANNING DRAWING IS FOR APPROVAL BY IRISH WATER CDS SECTION

REV	DATE	DESCRIPTION

ROGER MULLARKEY & ASSOCIATES
Consulting Structural and Civil Engineers
Kilcock, Co.Kildare
Tel: +353 1 610 3755
Email: info@rmullarkey.ie

Project: KILTERNAN VILLAGE LRD

Drawing Title: FOUL LONGITUDINAL SECTIONS- Sheet 5

Architect: MCORM Architects

Date	Drawn By	Scales	Dwg No.	Stage	Rev
May'24	RM	As Shown @A1	2104C/334	LRD UÉ CDA	

A1 Scale 1:500 0m 10m 20m 30m 40m 50m

Appendix 12.17

GDRS/GLDR Capital Projects Correspondence

DLRCC Road Projects Office,

1, Harbour Square,

Dun Laoghaire,

Co Dublin,

12 June 2024.

To Roger Mullarkey & Associates,

Consulting Engineers,

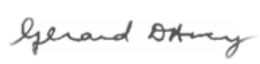
Kilcock, Co Kildare.

Dear Mr Mullarkey,

Ref : Plan ref PAC LRD 2 /006 /23. Liscove.

I can confirm that the proposed design and current phasing of the scheme LRD, plan ref PAC LRD 2/006 /23 is consistent with the latest design details and phasing of the GDRS road scheme. The proposed development does not encroach on or preclude any and all works associated with the proposed GDRS.

Regards,



Gerry D'Arcy.

Senior Executive Engineer,

DLRCC Road Projects Office.

Appendix 12.18

Water and Wastewater Calculations

Foul Wastewater Calculations

New Network - DOMESTIC Wastewater Flows - TOTAL SITE						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	487Units	2.7No./Unit	1,315	150	197,235	
Total =					**197,235 l/day**	
Flowrate per day (l/s)						**2.28l/s**
Growth Rate					1	1
Infiltration (I)					10%	0.2
Dry Weather Flow					**PG + I**	**2.48 l/s**
Peaking Factor (Pf_{Dom})					3	
Design Foul Flow (l/s)					**Pf_{Dom} x PG**	**7.45 l/s**
Misconnection Allowance (SW)					1.5%	0.04l/s
Design Flow (l/s)						**7.49 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows -TOTAL SITE						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	5,434m^2	1per 5m^2	1087	50	54,340	
Crèche	691m^2	1child/5m^2 + Staff (20%) + support accommodation	166	50	8,282	
Total =					**62,622 l/day**	
Flowrate per 12hr day (l/s)						**1.45l/s**
Growth Rate					1	1
Infiltration (I)					10%	0.14
Dry Weather Flow					**PG + I**	**1.6 l/s**
Peaking Factor (Pf_{Dom})					4	
Design Foul Flow (l/s)					**Pf_{Dom} x PG**	**6.4 l/s**
Misconnection Allowance (SW)					1.5%	0.09l/s
Design Flow (l/s)						**6.4 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Wastewater Flows - CATCHMENT 1(Rockville Outfall) - Phase 1						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	83Units	2.7No./Unit	224	150	33,615	
				Total =	**33,615 l/day**	
				Flowrate per day (l/s)		**0.39/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.04
				Dry Weather Flow	**PG + I**	**0.43 l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**2.57 l/s**
				Misconnection Allowance (SW)	1.5%	0.04l/s
				Design Flow (l/s)		**2.6 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows - CATCHMENT 1(Rockville Outfall) - Phase 1						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	1,534m^2	1per 5m^2	307	50	15,350	
Crèche	691m^2	1child/5m^2 + Staff (20%) + support accommodation	166	50	8,282	
				Total =	**23,632 l/day**	
				Flowrate per 12hr day (l/s)		**0.55l/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.05
				Dry Weather Flow	**PG + I**	**0.60l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**3.63/s**
				Misconnection Allowance (SW)	1.5%	0.05l/s
				Design Flow (l/s)		**3.64 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Wastewater Flows – CATCHMENT 1(Rockville Outfall) – Phase 2						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	121Units	2.7No./Unit	327	150	49,005	
				Total =	**49,005 l/day**	
				Flowrate per day (l/s)		**0.57/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.06
				Dry Weather Flow	**PG + I**	**0.63 l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**3.76 l/s**
				Misconnection Allowance (SW)	1.5%	0.05l/s
				Design Flow (l/s)		**3.8 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows - CATCHMENT 1(Rockville Outfall) - Phase 2						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	3,900m^2	1per 5m^2	780	50	3,900	
				Total =	**3,900 l/day**	
				Flowrate per 12hr day (l/s)		**0.09l/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.01
				Dry Weather Flow	**PG + I**	**0.1l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**0.6l/s**
				Misconnection Allowance (SW)	1.5%	0.01l/s
				Design Flow (l/s)		**0.61 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Wastewater Flows - CATCHMENT 1(Rockville Outfall) - Phase 3						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	104Units	2.7No./Unit	281	150	42,150	
				Total =	**42,150 l/day**	
				Flowrate per day (l/s)		**0.49/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.05
				Dry Weather Flow	**PG + I**	**0.54 l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**3.25 l/s**
				Misconnection Allowance (SW)	1.5%	0.05l/s
				Design Flow (l/s)		**3.3 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows - CATCHMENT 1(Rockville Outfall) - Phase 3						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	0m^2	1per 5m^2	0	50	0	
				Total =	**0 l/day**	
				Flowrate per 12hr day (l/s)		**0.l/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0
				Dry Weather Flow	**PG + I**	**0l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**0l/s**
				Misconnection Allowance (SW)	1.5%	0.0/s
				Design Flow (l/s)		**0.0 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Wastewater Flows - CATCHMENT 2(Glenamuck Rd Outfall) - Phase 4						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	54Units	2.7No./Unit	146	150	21,870	
				Total =	**21,870 l/day**	
				Flowrate per day (l/s)		**0.25/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.02
				Dry Weather Flow	**PG + I**	**0.27 l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**1.62 l/s**
				Misconnection Allowance (SW)	1.5%	0.02l/s
				Design Flow (l/s)		**1.64l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows - CATCHMENT 2(Glenamuck Rd Outfall) - Phase 4						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	0m^2	1per 5m^2	0	50	0	
				Total =	**0 l/day**	
				Flowrate per 12hr day (l/s)		**0.l/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0
				Dry Weather Flow	**PG + I**	**0l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**0l/s**
				Misconnection Allowance (SW)	1.5%	0.0/s
				Design Flow (l/s)		**0.0 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Wastewater Flows - CATCHMENT 3(GLDR Outfall) - Phase 5						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Residential	125Units	2.7No./Unit	338	150	50,625	
				Total =	**50,625 l/day**	
				Flowrate per day (l/s)		**0.59/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0.06
				Dry Weather Flow	**PG + I**	**0.65 l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**3.9 l/s**
				Misconnection Allowance (SW)	1.5%	0.06l/s
				Design Flow (l/s)		**3.96l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Wastewater Flows - CATCHMENT 3(GLDR Outfall) - Phase 5						
Usage	**Quantity**	**Occupancy (h)**	**Population (P)**	**Consumption (G) (l/h/day)**	**Loading (PxG)(l/day)**	
Retail/Comm	0m^2	1per 5m^2	0	50	0	
				Total =	**0 l/day**	
				Flowrate per 12hr day (l/s)		**0.l/s**
				Growth Rate	1	1
				Infiltration (I)	10%	0
				Dry Weather Flow	**PG + I**	**0l/s**
				Peaking Factor (Pf_{Dom})	6	
				Design Foul Flow (l/s)	**Pf_{Dom} x PG**	**0l/s**
				Misconnection Allowance (SW)	1.5%	0.0/s
				Design Flow (l/s)		**0.0 l/s**

Based on Irish Water Code of Practice Wastewater Infrastructure (Rev 2 July 2020)

Water Demand Calculations

New Network - DOMESTIC Water Demand - Total Site								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	487 Units	2.7 No./Unit	1,315	150	197,250	2.28	2.85	**14.27 l/s**
Peak Hour Water Demand (Domestic)								**14.27 /s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Water Demand- Total Site								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	5,434m^2	1per 5m^2	1087	50	54,340	1.26	1.57	7.86
Crèche	691m^2	1child/5m^2 + Staff (20%) + support accommodation	166	50	8,282	0.19	0.24	1.12
Peak Hour Water Demand (Commercial)								**9.1l/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Water Demand - Phase 1								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	83 Units	2.7 No./Unit	224	150	33,615	0.39	0.49	**2.4 l/s**
Peak Hour Water Demand (Domestic)								**2.4 /s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Water Demand- Phase 1								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	1,534m^2	1per 5m^2	307	50	15,340	0.36	0.44	2.22
Crèche	691m^2	1child/5m^2 + Staff (20%) + support accommodation	1166	50	8,282	0.19	0.24	1.12
Peak Hour Water Demand (Commercial)								**3.34l/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Water Demand - Phase 2								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	121 Units	2.7 No./Unit	327	150	49,005	0.57	0.71	**3.5 l/s**
Peak Hour Water Demand (Domestic)								**3.5 /s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Water Demand- Phase 2								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	3,900m^2	1per 5m^2	780	50	39,000	0.90	1.13	5.64
Peak Hour Water Demand (Commercial)								**5.64l/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Water Demand - Phase 3								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	104 Units	2.7 No./Unit	281	150	42,120	0.49	0.62	**3.1 l/s**
Peak Hour Water Demand (Domestic)								**3.1 /s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Water Demand- Phase 3								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	$0m^2$	1per $5m^2$	0	50	0	0	0	0
Peak Hour Water Demand (Commercial)								**0/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Water Demand - Phase 4								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	54 Units	2.7 No./Unit	146	150	21,870	0.25	0.32	**1.58 l/s**
Peak Hour Water Demand (Domestic)								**1.581 /s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - COMMERCIAL Water Demand- Phase 4								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	$0m^2$	1per $5m^2$	0	50	0	0	0	0
Peak Hour Water Demand (Commercial)								**0/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

New Network - DOMESTIC Water Demand - Phase 5								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Resi'	125 Units	2.7 No./Unit	338	150	50,625	0.25	0.31	**1.56 l/s**
Peak Hour Water Demand (Domestic)								**1.56 l/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

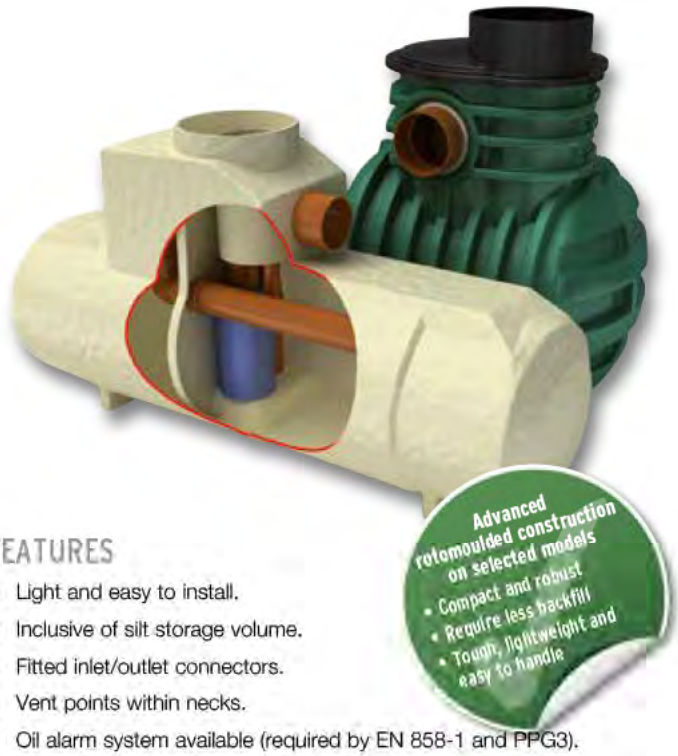
New Network - COMMERCIAL Water Demand- Phase 5								
Usage	**Quantity**	**Occupancy**	**Population**	**Consumption (l//h/day)**	**Ave. Daily Domestic Demand (l/day)**	**Ave. Daily(12hr) Domestic Demand (l/s)**	**Ave. Day/Peak Week (l/s)**	**Peak Hour Water Demand (l/s)**
Retail/ Comm	$0m^2$	1per $5m^2$	0	50	0	0	0	0
Peak Hour Water Demand (Commercial)								**0/s**

Based on Irish Water Code of Practice for Water Infrastructure (Rev 2 July 2020)

Appendix 12.19

Bypass Interceptor

Bypass NSB RANGE



APPLICATION

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

PERFORMANCE

Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Silt storage capacity.
- Oil storage volume.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 NSB = 0.0018A(m2). Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

Tank 1
SMh96 (MD Pipe No.10.015)- Q100 Flowrate = 24l/s

Tank 8
SMh106 (MD Pipe No.22.000)- Q100 Flowrate = 8l/s

Tank 9
SMh114 (MD Pipe No.23.003)- Q100 Flowrate = 7l/s

Tank 10
SMh124 (MD Pipe No.24.004)- Q100 Flowrate = 11l/s
SMh136 (MD Pipe No.26.006)- Q100 Flowrate = 12l/s

SIZES AND SPECIFICATIONS

UNIT NOMINAL SIZE	FLOW (l/s)	PEAK FLOW RATE (l/s)	DRAINAGE AREA (m²)	STORAGE CAPACITY (litres) SILT	OIL	UNIT LENGTH (mm)	UNIT DIA. (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT	STANDARD FALL ACROSS (mm)	MIN. INLET INVERT (mm)	STANDARD PIPEWORK DIA.
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

Tank 1
SMh44 (MD Pipe No.1.014)- Q100 Flowrate = 52l/s

Rotomoulded chamber co ne access shaft – diameter of largest shown.

Appendix 12.20

Hydrobrake Calculations

CATCHMENT 1 - TANK 1

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.500	42.000	1.500	35.855	1.500	47.382
Flush-Flo™	0.489	41.849	0.877	31.453	0.418	51.534
Kick-Flo®	1.051	35.364	1.053	30.240	1.052	39.984
Mean Flow		35.596		28.086		41.503

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422

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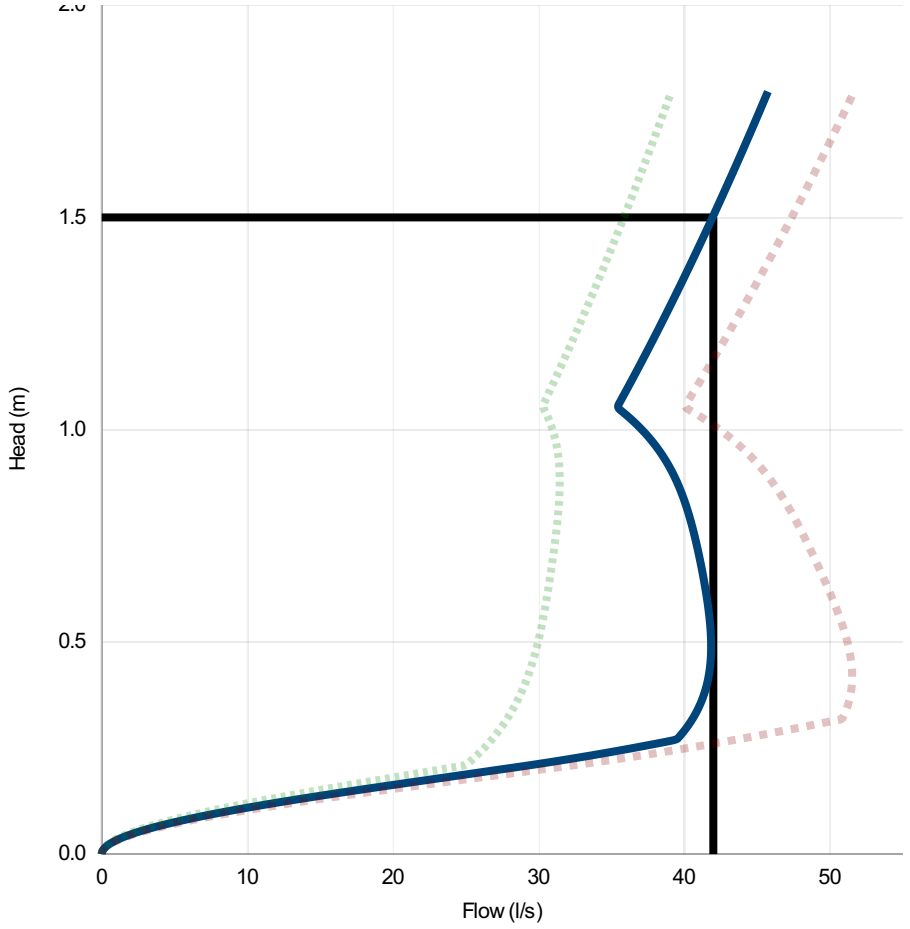


Head (m)	Flow (l/s)
0.000	0.000
0.052	2.445
0.103	9.042
0.155	18.445
0.207	28.899
0.259	37.835
0.310	40.418
0.362	41.206
0.414	41.648
0.466	41.832
0.517	41.827
0.569	41.694
0.621	41.477
0.672	41.204
0.724	40.888
0.776	40.518
0.828	40.063
0.879	39.469
0.931	38.661
0.983	37.548
1.034	36.025
1.086	35.925
1.138	36.735
1.190	37.526
1.241	38.300
1.293	39.058
1.345	39.800
1.397	40.528
1.448	41.242
1.500	41.944

DESIGN ADVICE

The head/flow characteristics of this SHE-0267-4200-1500-4200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International A CRH COMPANY

DATE	12/06/2024 17:44
Site	Kilternan LRD
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0267-4200-1500-4200

Hydro-Brake® Optimum

CATCHMENT 1 - TANK 1

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	42.000
Flush-Flo™	0.489	41.849
Kick-Flo®	1.051	35.364
Mean Flow		35.596

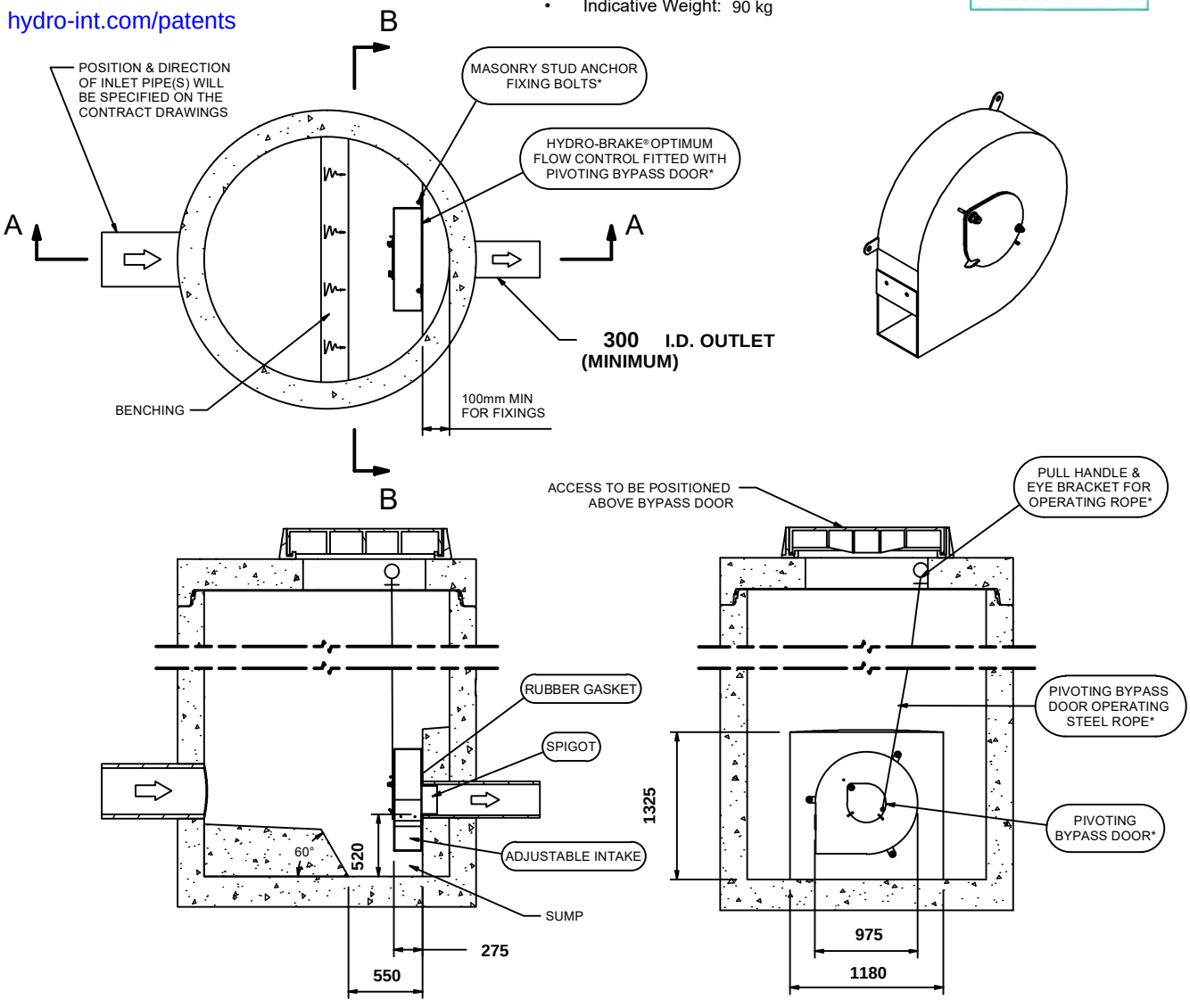
hydro-int.com/patents

Hydro-Brake® Optimum Flow Control including:

- 5 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 90 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422



SECTION A-A

SECTION B-B

IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0267-4200-1500-4200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 17:44
SITE	Kilternan LRD
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0267-4200-1500-4200
Hydro-Brake® Optimum

Hydro International Ltd • Unit 2, Rivermead Court • Kenn Business Park • Windmill Road • Kenn • Clevedon • BS21 6FT • Tel: 01275 878371 • www.hydro-int.com • Email: enquiries@hydro-int.com

info@rmullarkey.ie

CATCHMENT 1 - TANK 2

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.500	50.000	1.500	42.466	1.500	56.645
Flush-Flo™	0.505	49.823	0.901	37.393	0.429	61.606
Kick-Flo®	1.067	42.400	1.071	36.100	1.067	48.100
Mean Flow		42.134		33.105		49.263

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422

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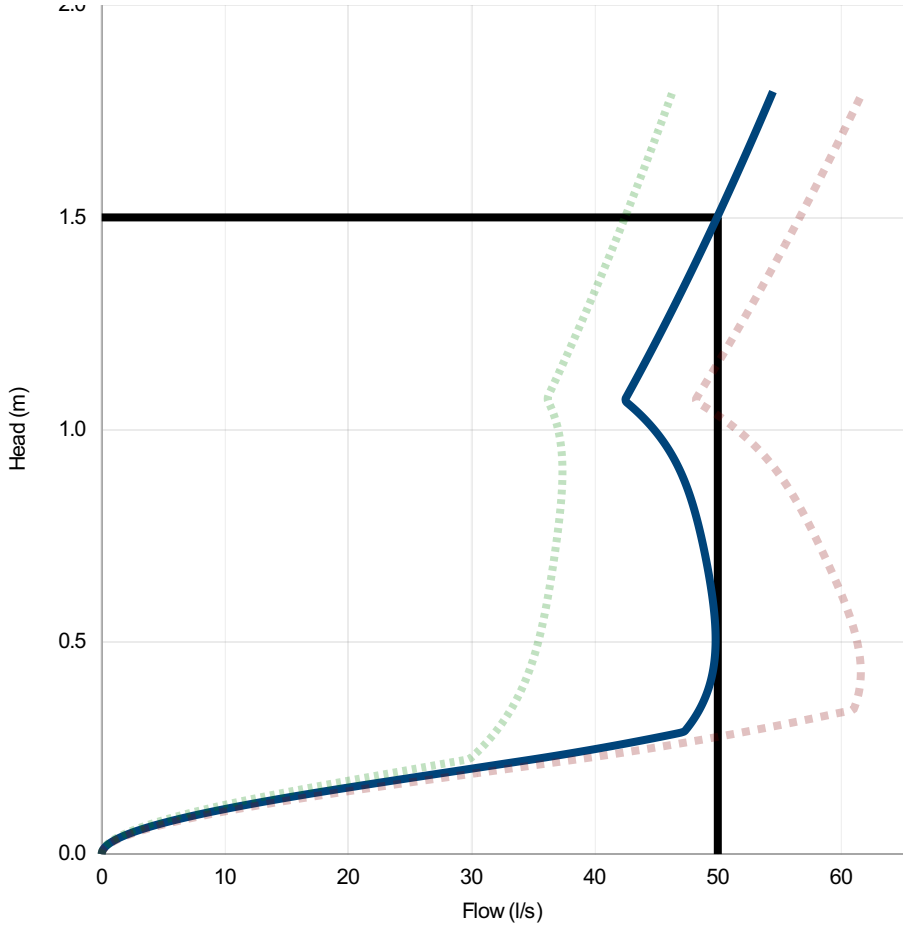


Head (m)	Flow (l/s)
0.000	0.000
0.052	2.556
0.103	9.523
0.155	19.642
0.207	31.277
0.259	42.175
0.310	47.865
0.362	48.876
0.414	49.476
0.466	49.764
0.517	49.818
0.569	49.707
0.621	49.483
0.672	49.185
0.724	48.831
0.776	48.420
0.828	47.924
0.879	47.294
0.931	46.453
0.983	45.307
1.034	43.740
1.086	42.759
1.138	43.726
1.190	44.669
1.241	45.593
1.293	46.497
1.345	47.382
1.397	48.251
1.448	49.103
1.500	49.940

DESIGN ADVICE

The head/flow characteristics of this SHE-0288-5000-1500-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International A CRH COMPANY

DATE	12/06/2024 17:48
Site	Tank 2
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0288-5000-1500-5000

Hydro-Brake® Optimum

CATCHMENT 1 - TANK 2

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	50.000
Flush-Flo™	0.505	49.823
Kick-Flo®	1.067	42.400
Mean Flow		42.134

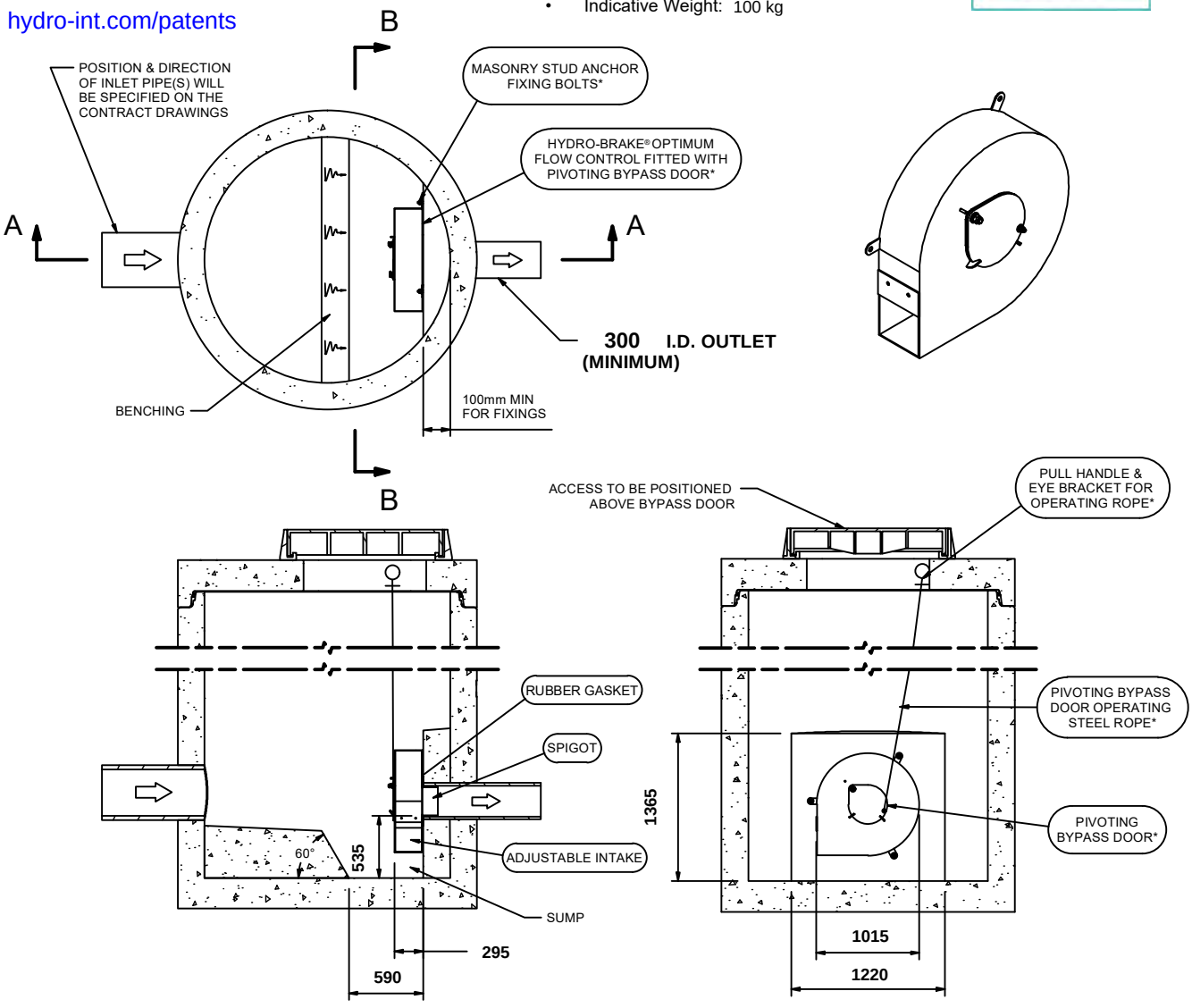
hydro-int.com/patents

Hydro-Brake® Optimum Flow Control including:

- 5 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 100 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422



SECTION A-A

SECTION B-B

IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
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THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

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The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International A CRH COMPANY

DATE	12/06/2024 17:48
SITE	Tank 2
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0288-5000-1500-5000
Hydro-Brake® Optimum

 Hydro International Ltd • Unit 2, Rivermead Court • Kenn Business Park • Windmill Road • Kenn • Clevedon • BS21 6FT • Tel: 01275 878371 • www.hydro-int.com • Email: enquiries@hydro-int.com

info@rmullarkey.ie

CATCHMENT 1 - TANK 3

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.500	30.000	1.500	25.886	1.500	33.642
Flush-Flo™	0.462	29.969	0.819	22.616	0.402	36.491
Kick-Flo®	1.016	24.900	1.016	21.480	1.017	27.960
Mean Flow		25.688		20.502		29.735

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422

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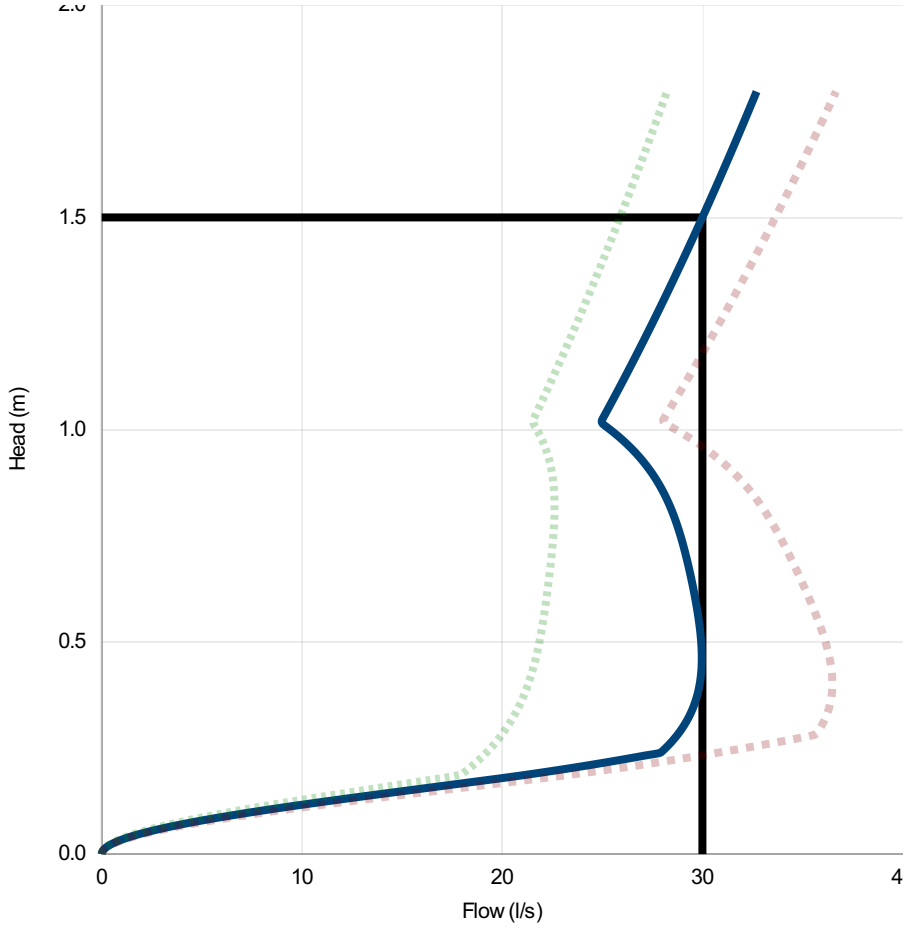


Head (m)	Flow (l/s)
0.000	0.000
0.052	2.239
0.103	8.135
0.155	16.136
0.207	23.992
0.259	28.345
0.310	29.174
0.362	29.665
0.414	29.907
0.466	29.969
0.517	29.906
0.569	29.762
0.621	29.566
0.672	29.333
0.724	29.062
0.776	28.732
0.828	28.307
0.879	27.730
0.931	26.934
0.983	25.839
1.034	25.119
1.086	25.710
1.138	26.287
1.190	26.851
1.241	27.402
1.293	27.942
1.345	28.471
1.397	28.989
1.448	29.498
1.500	29.998

DESIGN ADVICE

The head/flow characteristics of this SHE-0230-3000-1500-3000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International A CRH COMPANY

DATE	12/06/2024 17:50
Site	Tank 3
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0230-3000-1500-3000

Hydro-Brake® Optimum

CATCHMENT 1 - TANK 3

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	30.000
Flush-Flo™	0.462	29.969
Kick-Flo®	1.016	24.900
Mean Flow		25.688

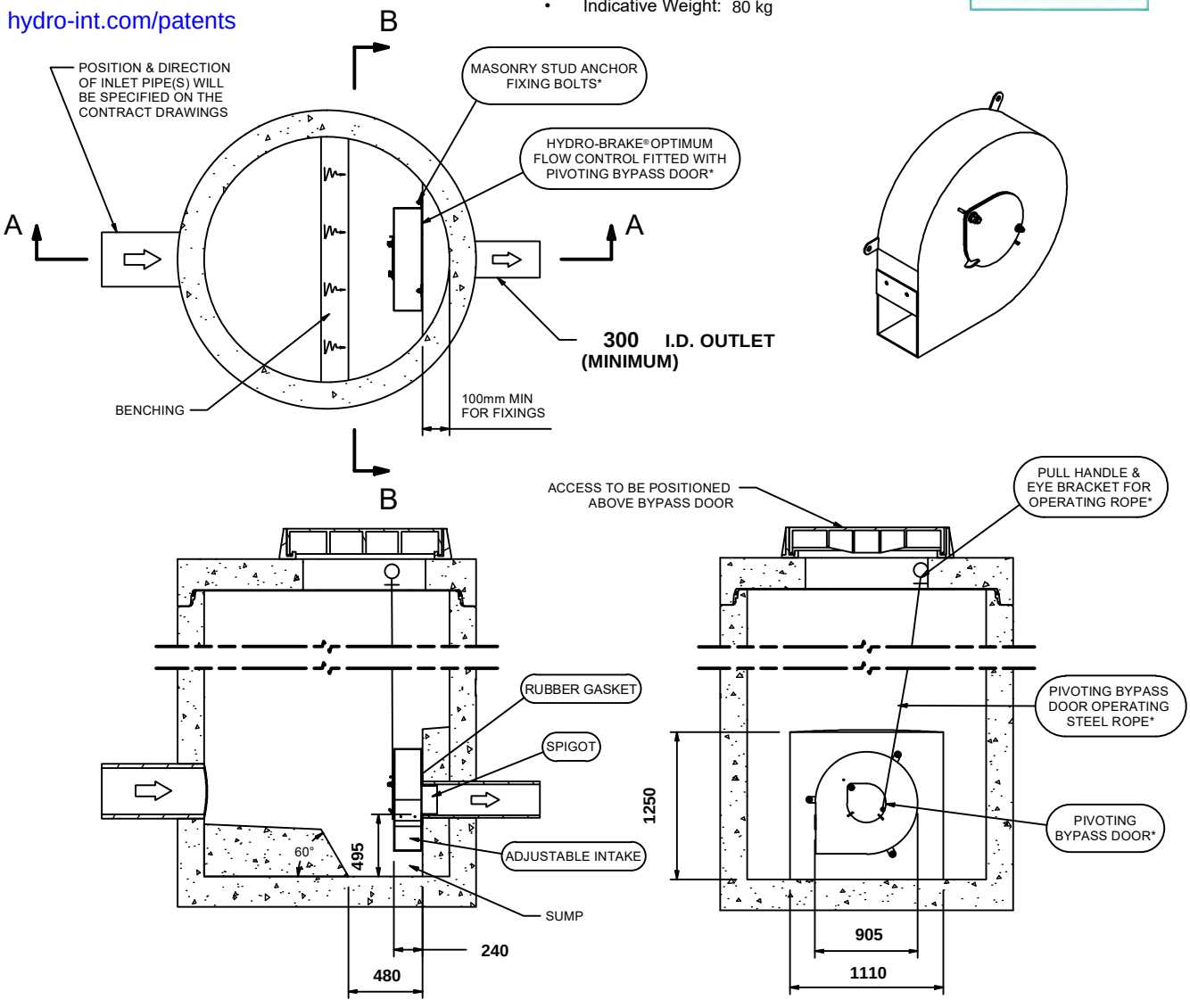
hydro-int.com/patents

Hydro-Brake® Optimum Flow Control including:

- 5 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 80 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422



SECTION A-A

SECTION B-B

IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0230-3000-1500-3000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 17:50
SITE	Tank 3
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0230-3000-1500-3000
Hydro-Brake® Optimum

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info@rmullarkey.ie

CATCHMENT 1 - TANK 4

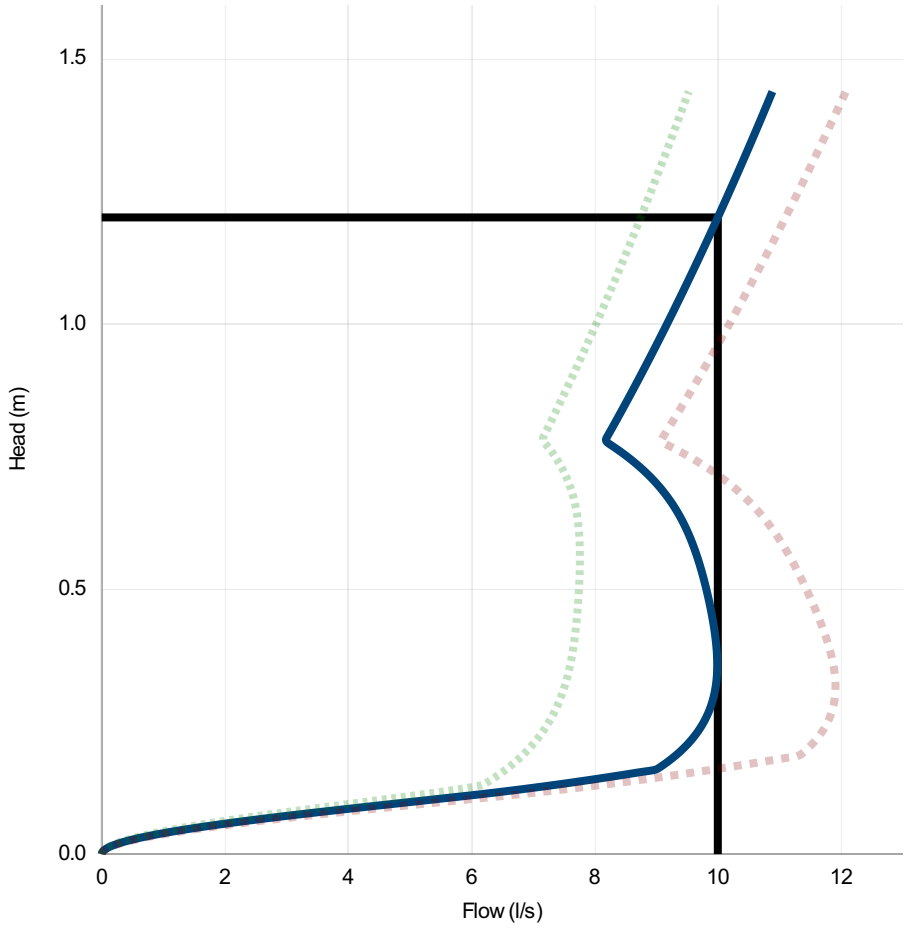
Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.200	10.000	1.200	8.749	1.200	11.098
Flush-Flo™	0.357	9.991	0.559	7.761	0.316	11.910
Kick-Flo®	0.778	8.160	0.780	7.140	0.777	9.060
Mean Flow		8.656		7.112		9.891

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422 Valid: 01/04/2022 - 31/03/2027

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.041	1.092
0.083	3.802
0.124	6.946
0.166	9.083
0.207	9.507
0.248	9.770
0.290	9.917
0.331	9.981
0.372	9.988
0.414	9.955
0.455	9.896
0.497	9.819
0.538	9.725
0.579	9.608
0.621	9.456
0.662	9.250
0.703	8.966
0.745	8.578
0.786	8.202
0.828	8.401
0.869	8.595
0.910	8.784
0.952	8.969
0.993	9.150
1.034	9.326
1.076	9.500
1.117	9.670
1.159	9.836
1.200	10.000

DESIGN ADVICE

The head/flow characteristics of this SHE-0143-1000-1200-1000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International A CRH COMPANY

DATE	12/06/2024 17:52
Site	Tank 4
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0143-1000-1200-1000

Hydro-Brake® Optimum

CATCHMENT 1 - TANK 4

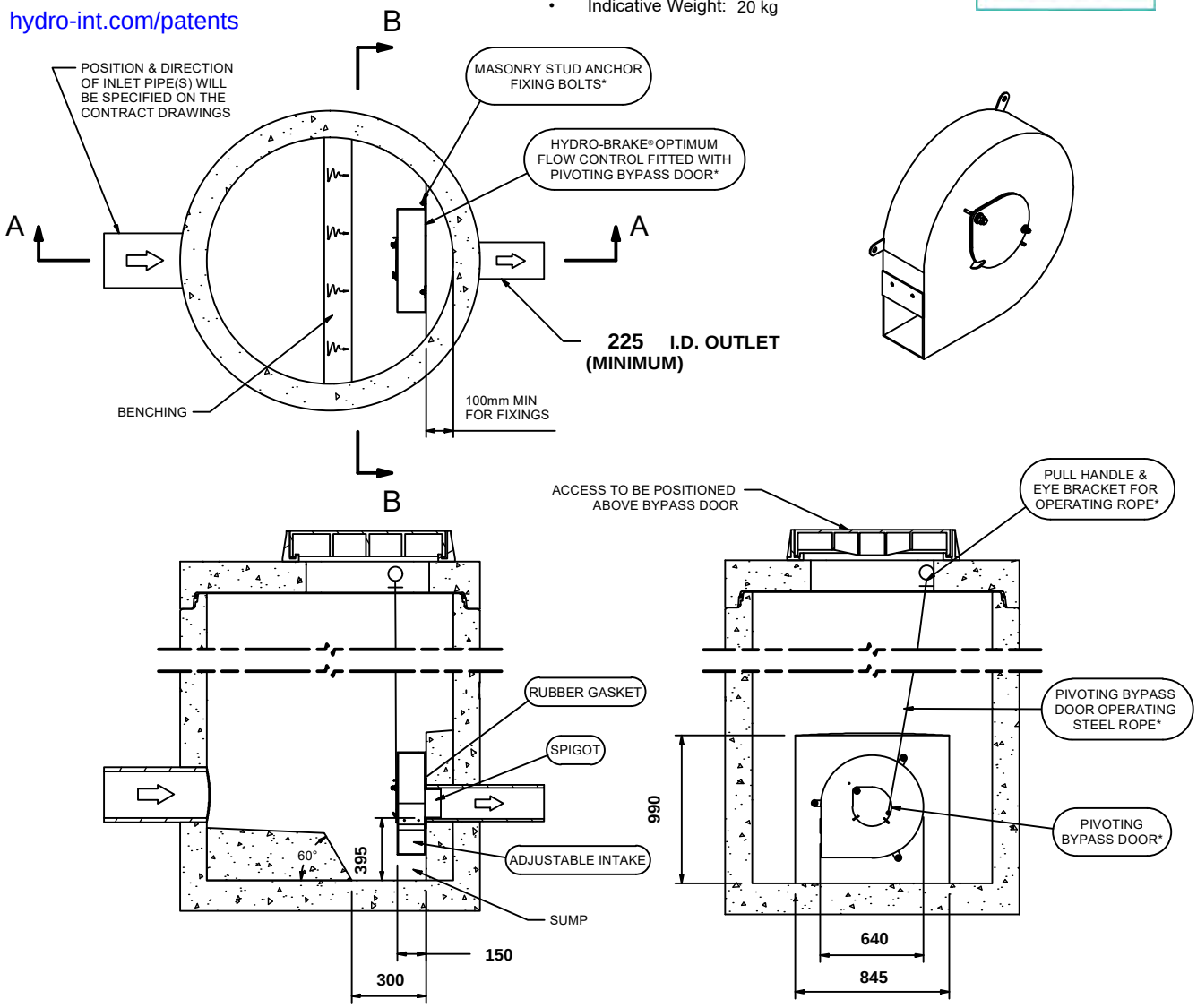
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.200	10.000
Flush-Flo™	0.357	9.991
Kick-Flo®	0.778	8.160
Mean Flow		8.656

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 20 kg

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0143-1000-1200-1000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 17:52
SITE	Tank 4
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0143-1000-1200-1000
Hydro-Brake® Optimum

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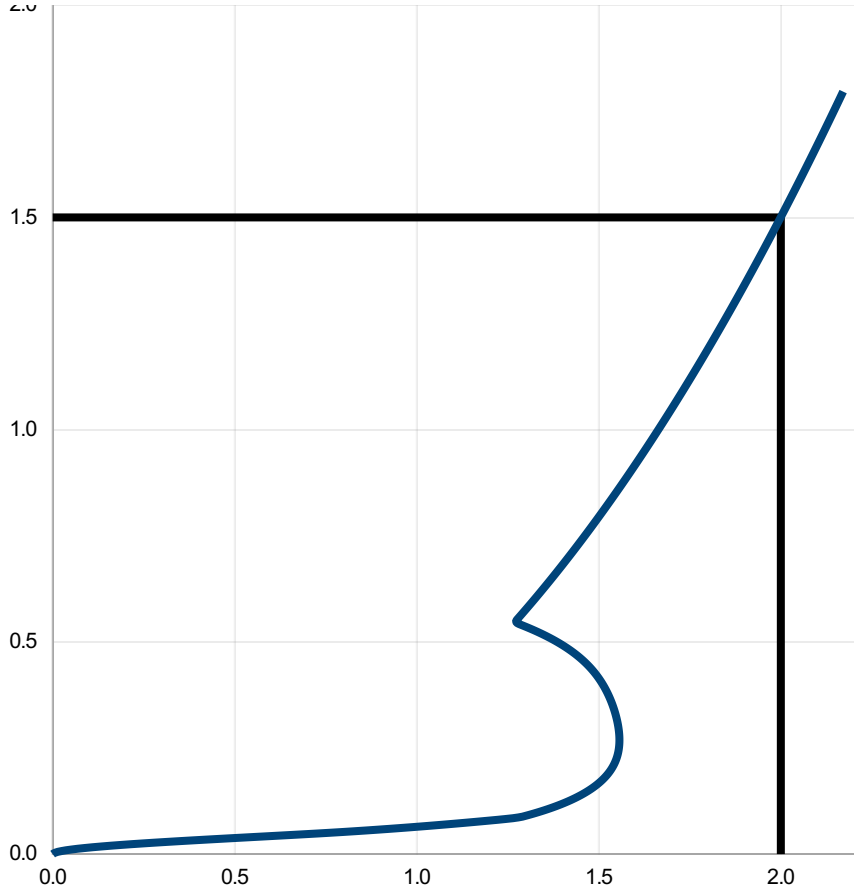
info@rmullarkey.ie

CATCHMENT 1 - TANK 5

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	2.000
Flush-Flo™	0.269	1.557
Kick-Flo®	0.545	1.268
Mean Flow		1.550

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.052	0.789
0.103	1.351
0.155	1.482
0.207	1.539
0.259	1.556
0.310	1.551
0.362	1.533
0.414	1.500
0.466	1.444
0.517	1.347
0.569	1.292
0.621	1.343
0.672	1.392
0.724	1.439
0.776	1.484
0.828	1.528
0.879	1.570
0.931	1.611
0.983	1.651
1.034	1.689
1.086	1.727
1.138	1.764
1.190	1.800
1.241	1.835
1.293	1.869
1.345	1.903
1.397	1.935
1.448	1.968
1.500	1.999

DESIGN ADVICE

The head/flow characteristics of this SHE-0061-2000-1500-2000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	12/06/2024 17:54
Site	Tank 5
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0061-2000-1500-2000

Hydro-Brake® Optimum

CATCHMENT 1 - TANK 5

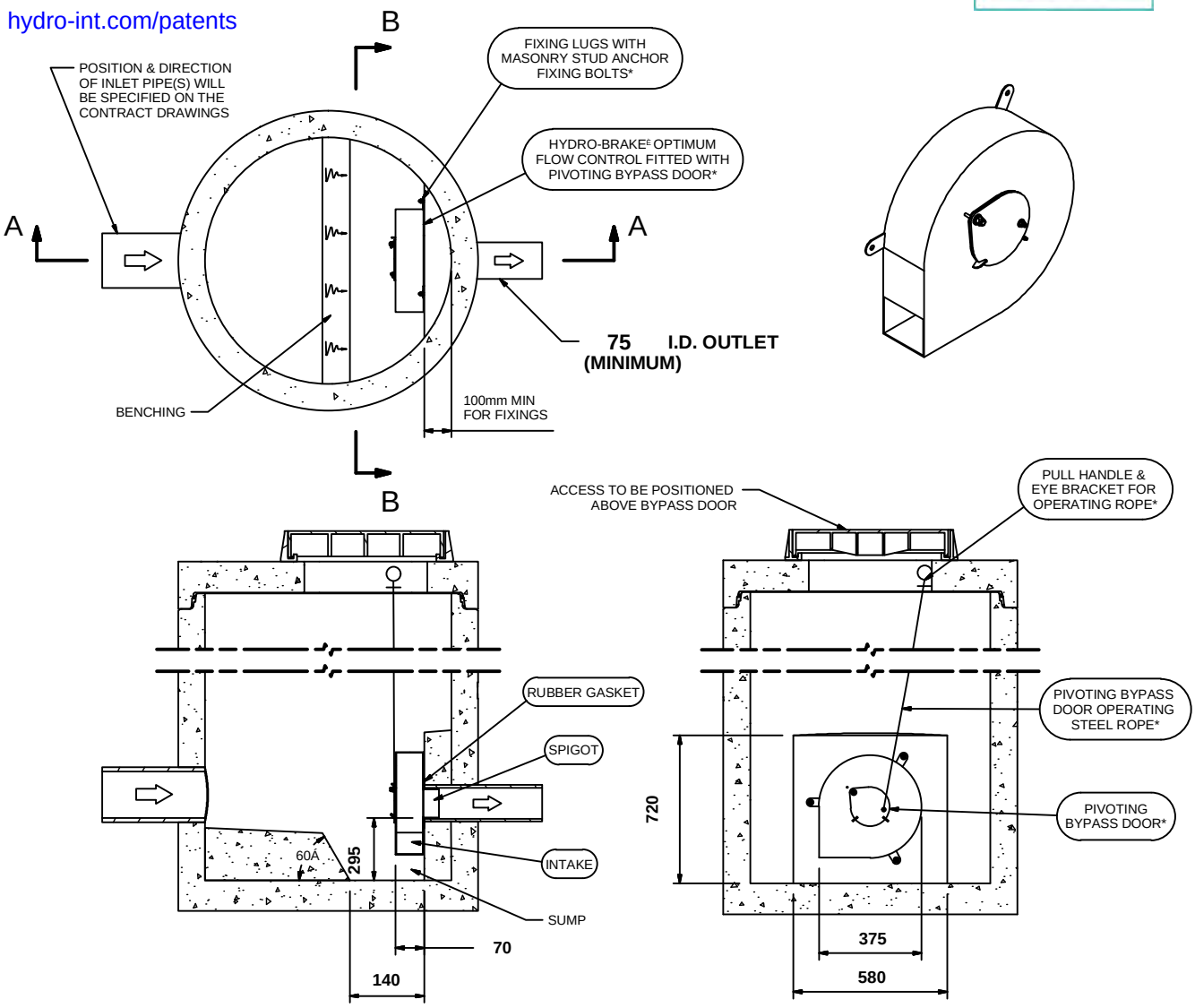
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	2.000
Flush-Flo™	0.269	1.557
Kick-Flo®	0.545	1.268
Mean Flow		1.550

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 10 kg

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0061-2000-1500-2000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 17:54
SITE	Tank 5
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0061-2000-1500-2000
Hydro-Brake® Optimum

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info@rmullarkey.ie

Catchment 1 - Tank 6

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	2.000	5.000	2.000	4.498	2.000	5.419
Flush-Flo™	0.398	4.133	0.508	3.380	0.366	4.740
Kick-Flo®	0.816	3.300	0.820	2.970	0.816	3.590
Mean Flow		3.950		3.448		4.360

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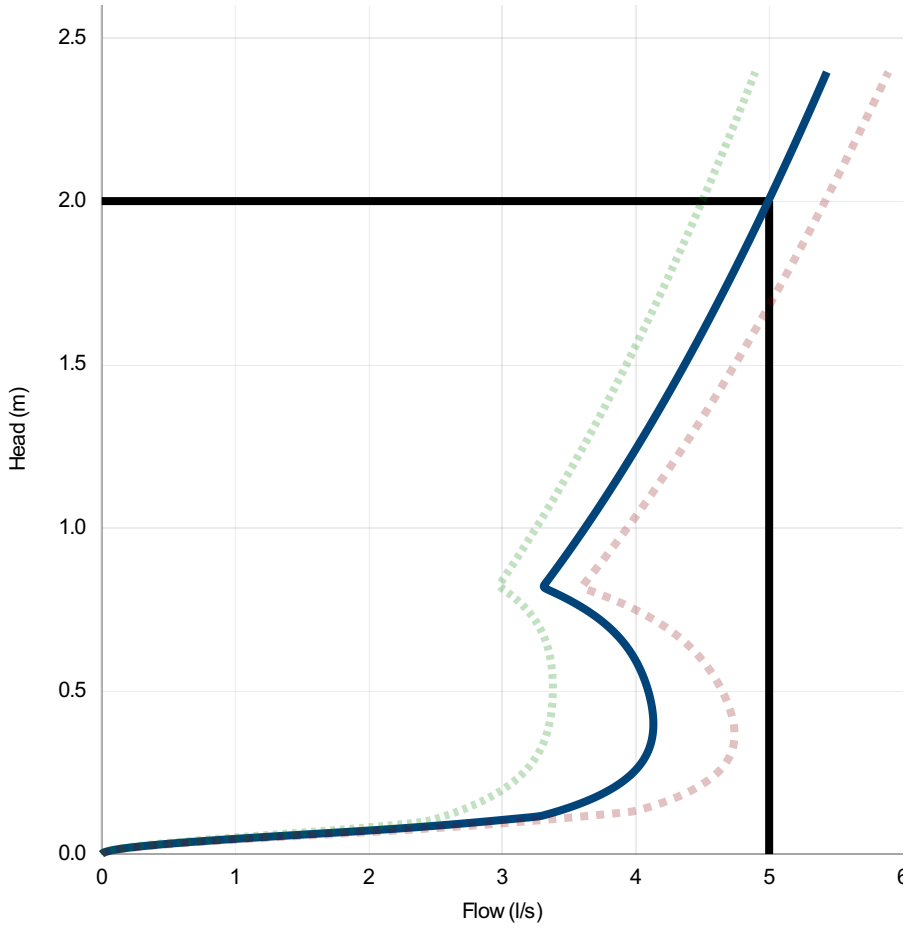


Head (m)	Flow (l/s)
0.000	0.000
0.069	1.874
0.138	3.468
0.207	3.847
0.276	4.037
0.345	4.118
0.414	4.132
0.483	4.105
0.552	4.049
0.621	3.958
0.690	3.814
0.759	3.586
0.828	3.321
0.897	3.445
0.966	3.564
1.034	3.679
1.103	3.790
1.172	3.898
1.241	4.002
1.310	4.103
1.379	4.202
1.448	4.298
1.517	4.391
1.586	4.483
1.655	4.572
1.724	4.660
1.793	4.746
1.862	4.830
1.931	4.912
2.000	4.993

DESIGN ADVICE

The head/flow characteristics of this SHE-0092-5000-2000-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	12/06/2024 17:57
Site	Tank 6
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0092-5000-2000-5000

Hydro-Brake® Optimum

Catchment 1 - Tank 6

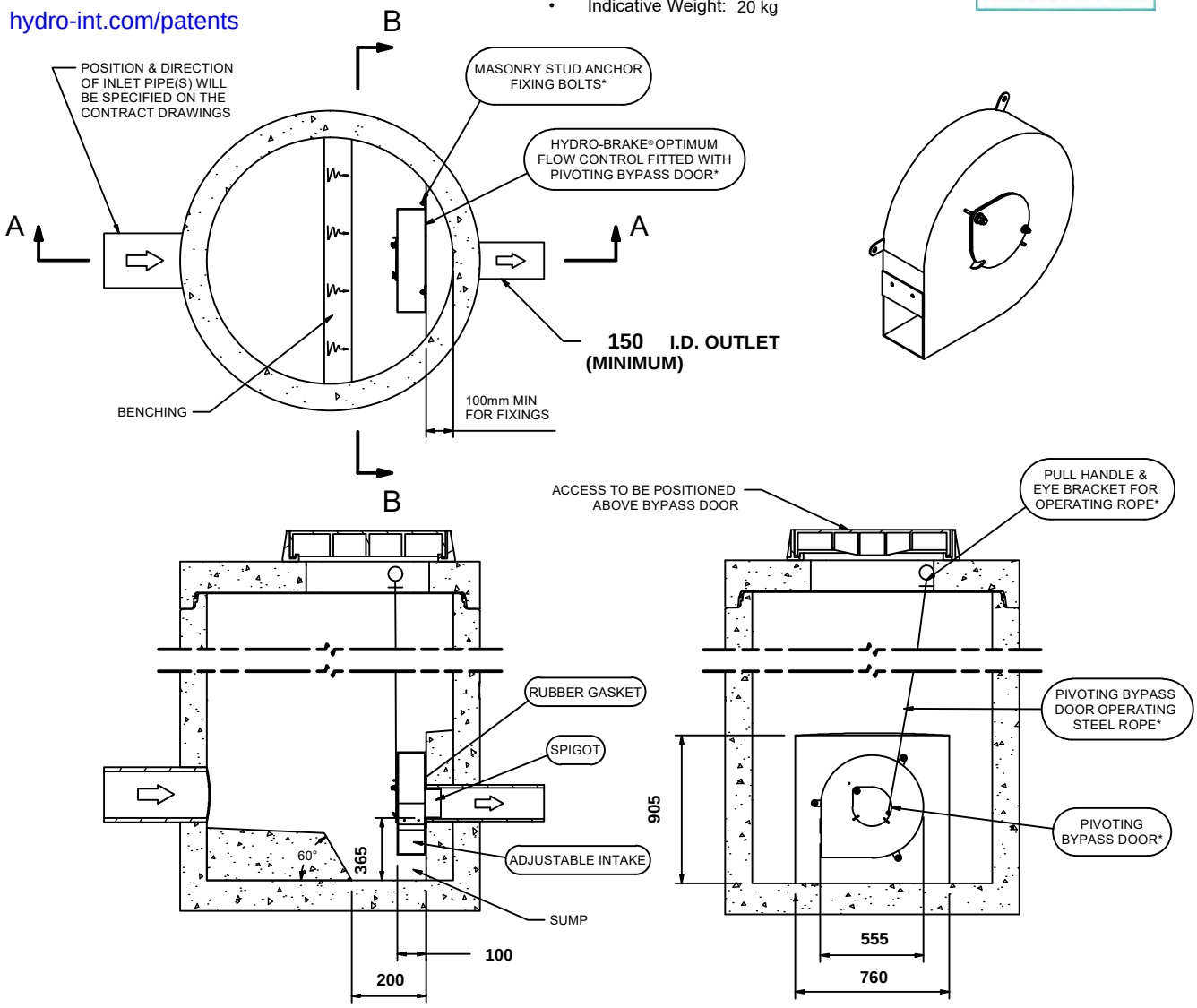
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.000	5.000
Flush-Flo™	0.398	4.133
Kick-Flo®	0.816	3.300
Mean Flow		3.950

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 20 kg

hydro-int.com/patents



IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0092-5000-2000-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 17:57
SITE	Tank 6
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0092-5000-2000-5000
Hydro-Brake® Optimum

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info@rmullarkey.ie

Catchment 1 - Tank 7

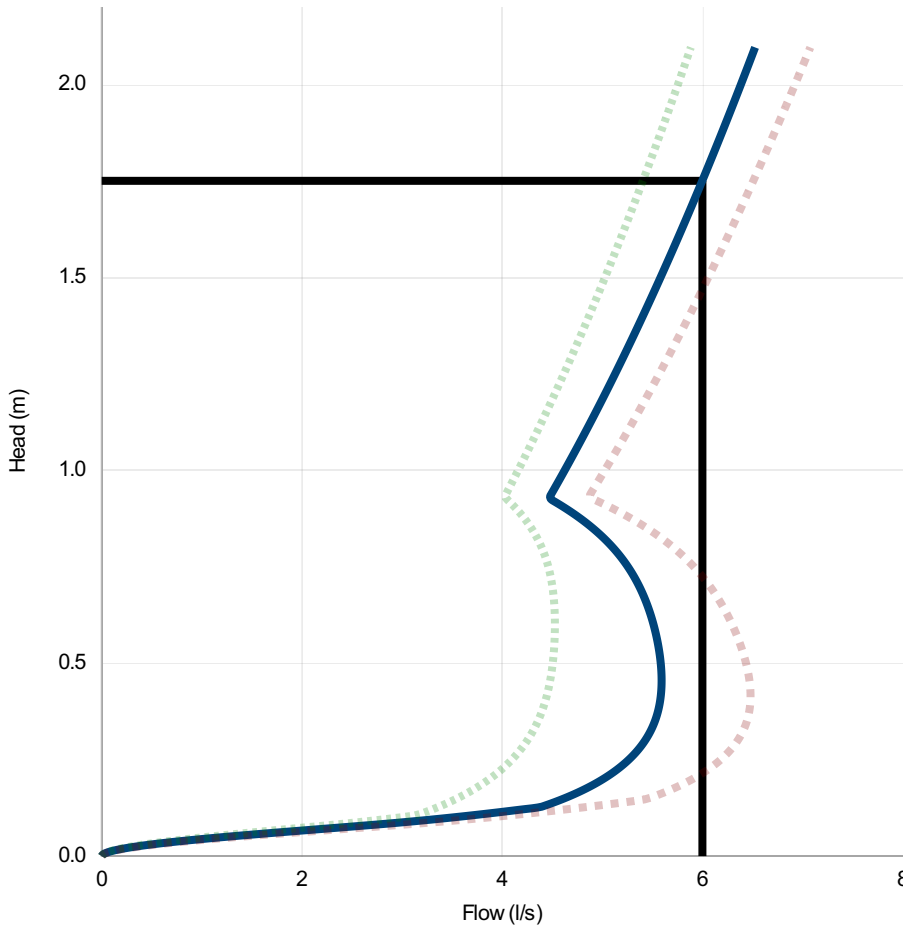
Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.750	6.000	1.750	5.405	1.750	6.508
Flush-Flo™	0.456	5.592	0.601	4.527	0.415	6.481
Kick-Flo®	0.926	4.464	0.929	4.020	0.930	4.860
Mean Flow		5.039		4.326		5.620

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.060	1.714
0.121	4.189
0.181	4.882
0.241	5.228
0.302	5.433
0.362	5.542
0.422	5.587
0.483	5.589
0.543	5.561
0.603	5.508
0.664	5.430
0.724	5.317
0.784	5.156
0.845	4.928
0.905	4.610
0.966	4.550
1.026	4.680
1.086	4.805
1.147	4.927
1.207	5.046
1.267	5.161
1.328	5.274
1.388	5.384
1.448	5.492
1.509	5.597
1.569	5.700
1.629	5.802
1.690	5.901
1.750	5.998

DESIGN ADVICE

The head/flow characteristics of this SHE-0104-6000-1750-6000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International A CRH COMPANY

DATE	12/06/2024 18:00
Site	Tank 7
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0104-6000-1750-6000

Hydro-Brake® Optimum

Catchment 1 - Tank 7

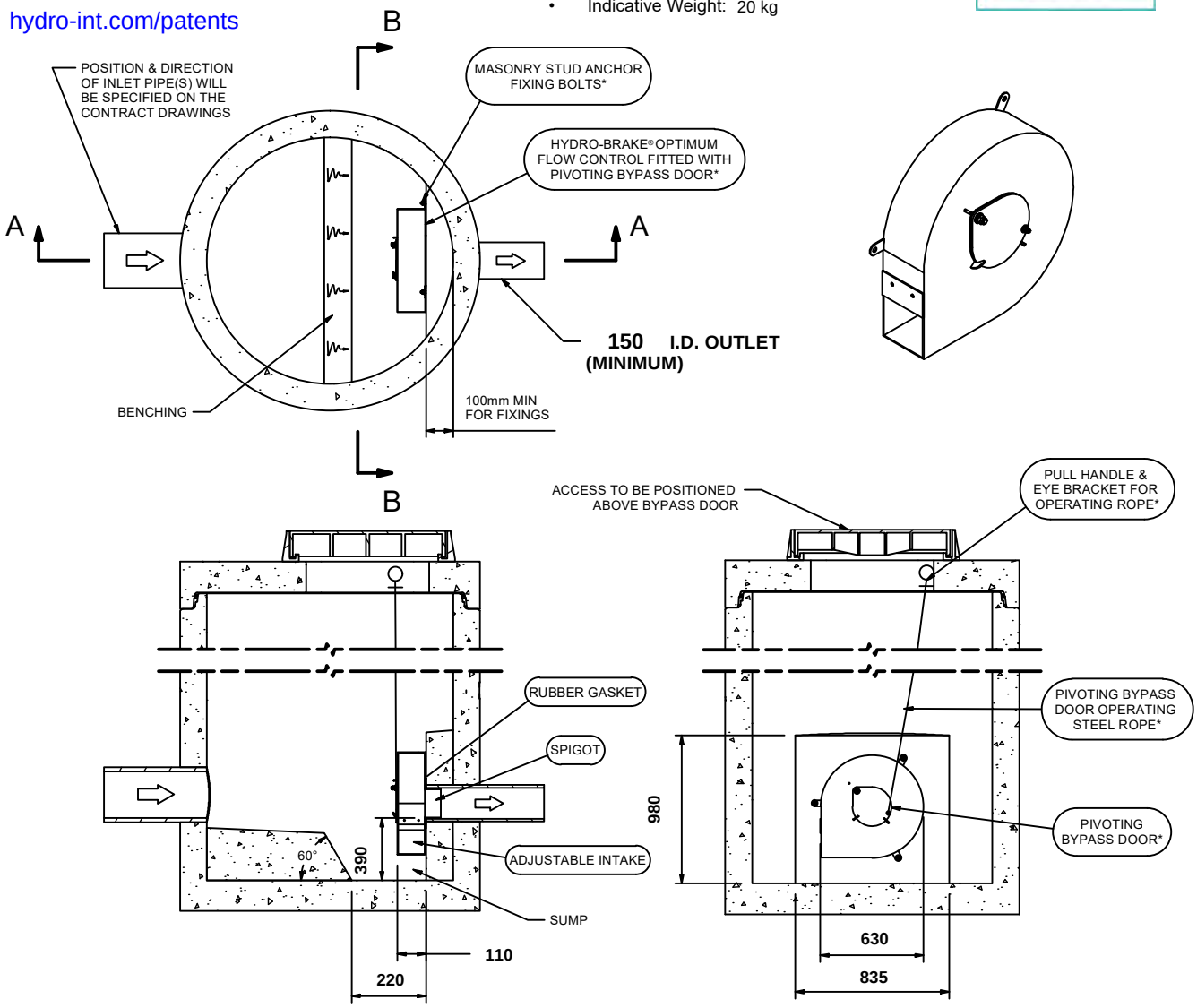
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.750	6.000
Flush-Flo™	0.456	5.592
Kick-Flo®	0.926	4.464
Mean Flow		5.039

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 20 kg

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT:
LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0104-6000-1750-6000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	12/06/2024 18:00
SITE	Tank 7
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0104-6000-1750-6000
Hydro-Brake® Optimum

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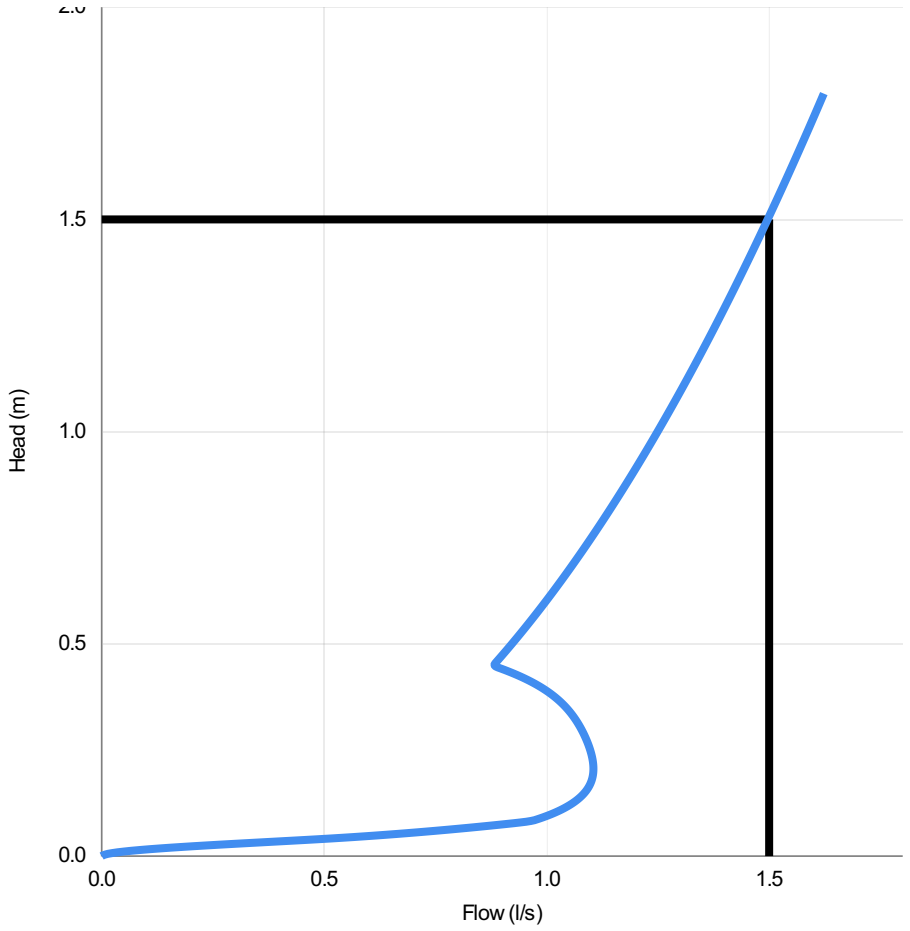
info@rmullarkey.ie

Catchment 2 - Glenamuck Rd

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	1.500
Flush-Flo	0.206	1.105
Kick-Flo®	0.448	0.879
Mean Flow		1.139

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.052	0.657
0.103	1.021
0.155	1.090
0.207	1.105
0.259	1.095
0.310	1.072
0.362	1.032
0.414	0.960
0.466	0.894
0.517	0.935
0.569	0.975
0.621	1.013
0.672	1.049
0.724	1.084
0.776	1.117
0.828	1.149
0.879	1.180
0.931	1.210
0.983	1.240
1.034	1.268
1.086	1.296
1.138	1.323
1.190	1.349
1.241	1.375
1.293	1.401
1.345	1.425
1.397	1.449
1.448	1.473
1.500	1.497

DESIGN ADVICE

The head/flow characteristics of this SCL-0050-1500-1500-1500 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	02/11/2023 16:01
Site	Catchment 2
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SCL-0050-1500-1500-1500

Hydro-Brake Optimum®

Catchment 2 - Glenamuck Rd

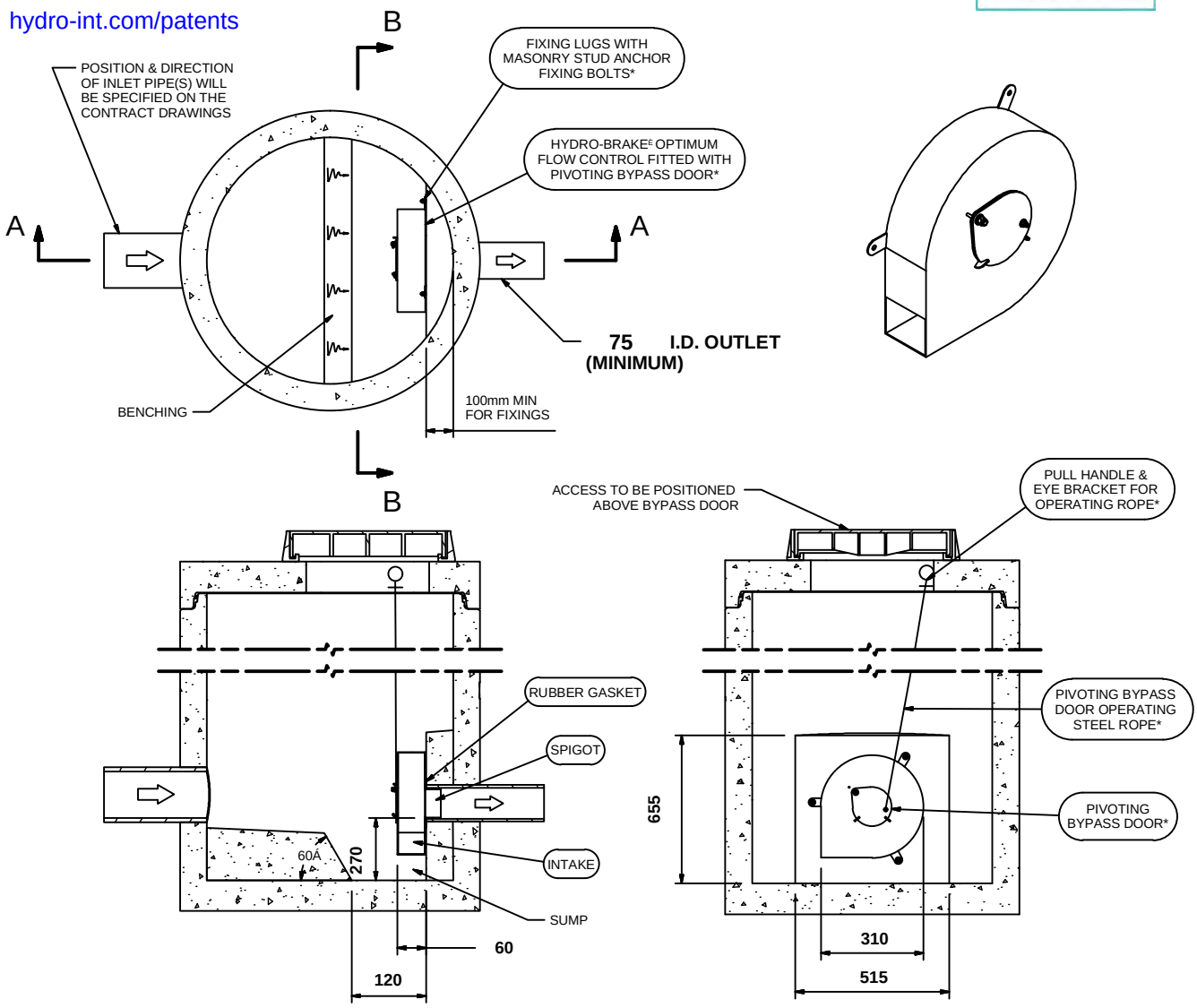
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	1.500
Flush-Flo™	0.206	1.105
Kick-Flo®	0.448	0.879
Mean Flow		1.139

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 0 kg

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

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The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	02/11/2023 16:01
SITE	Catchment 2
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SCL-0050-1500-1500-1500
Hydro-Brake® Optimum

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info@rmullarkey.ie

Catchment 3 - Enniskerry Rd

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	1.500
Flush-Flo™	0.206	1.105
Kick-Flo®	0.448	0.879
Mean Flow		1.139

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 0 kg

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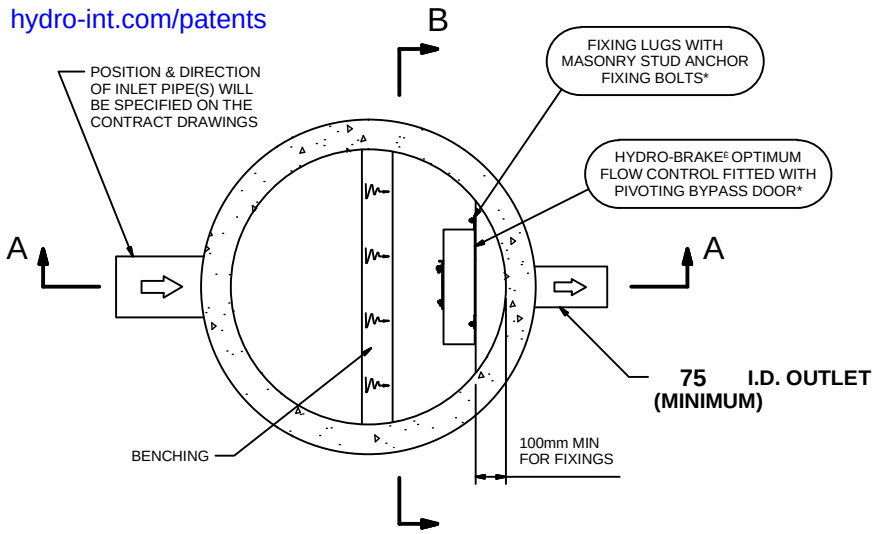
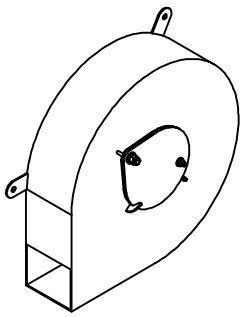
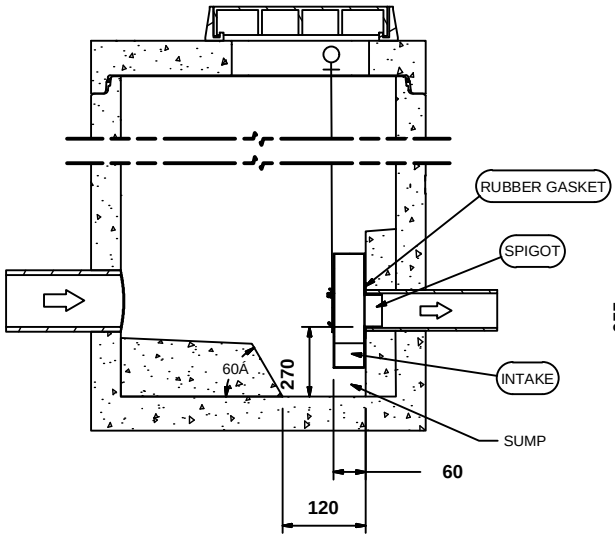
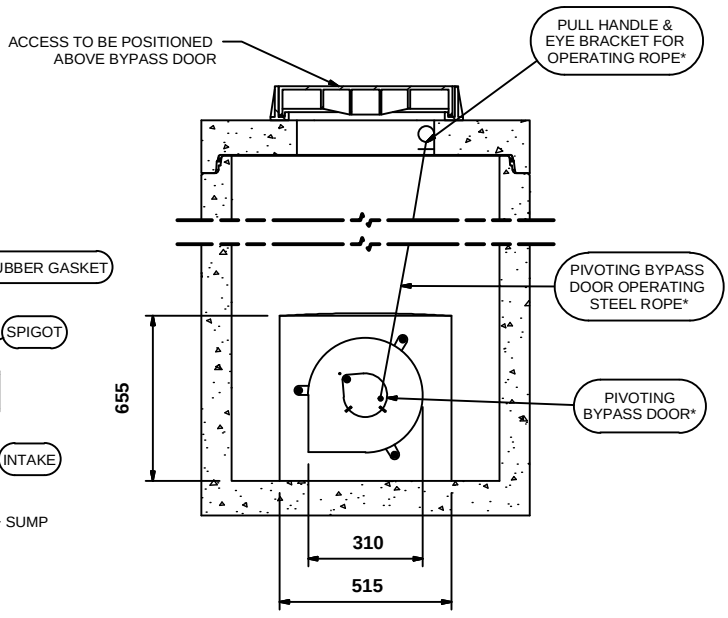






SECTION A-A



SECTION B-B

IMPORTANT:
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Hydro International
A CRH COMPANY

DATE	02/11/2023 15:58
SITE	Catchment 3
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SCL-0050-1500-1500-1500
Hydro-Brake® Optimum

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info@rmullarkey.ie

Catchment 3 - Enniskerry Rd

Technical Specification

Control Point	Head (m)	Flow (l/s)
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Flush-Flo	0.206	1.105
Kick-Flo®	0.448	0.879
Mean Flow		1.139

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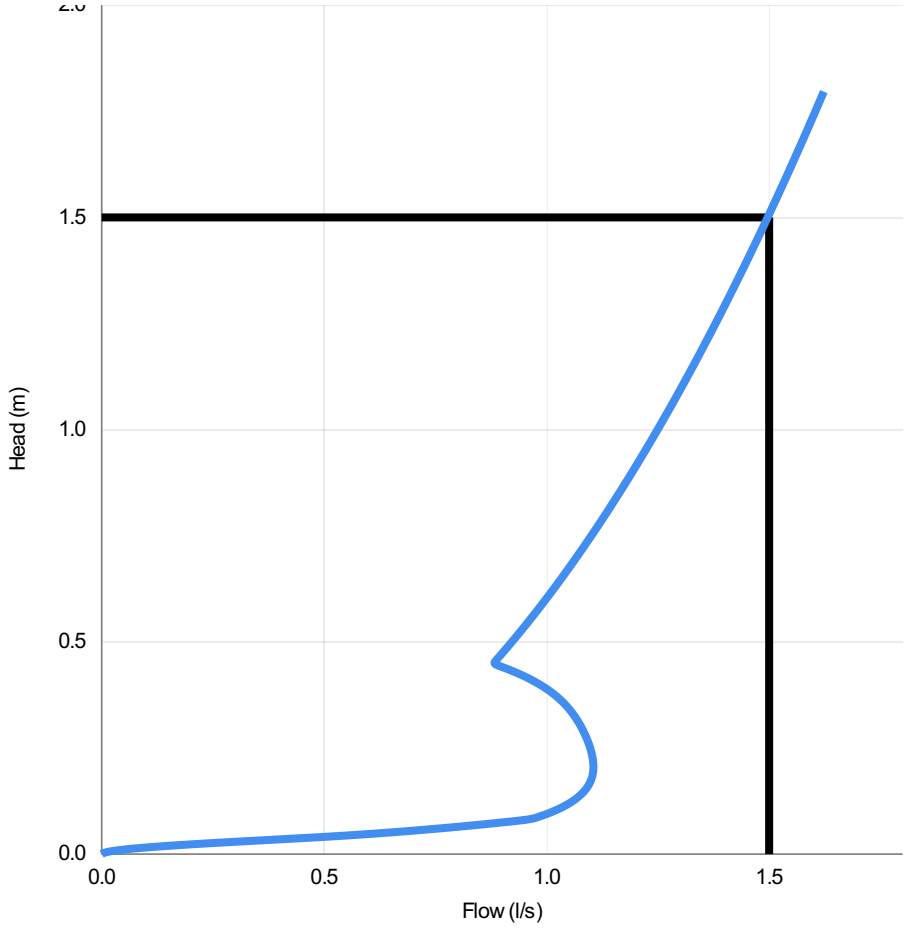

Head (m)	Flow (l/s)
0.000	0.000
0.052	0.657
0.103	1.021
0.155	1.090
0.207	1.105
0.259	1.095
0.310	1.072
0.362	1.032
0.414	0.960
0.466	0.894
0.517	0.935
0.569	0.975
0.621	1.013
0.672	1.049
0.724	1.084
0.776	1.117
0.828	1.149
0.879	1.180
0.931	1.210
0.983	1.240
1.034	1.268
1.086	1.296
1.138	1.323
1.190	1.349
1.241	1.375
1.293	1.401
1.345	1.425
1.397	1.449
1.448	1.473
1.500	1.497

DESIGN ADVICE

The head/flow characteristics of this SCL-0050-1500-1500-1500 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	02/11/2023 15:58
Site	Catchment 3
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SCL-0050-1500-1500-1500

Hydro-Brake Optimum®

Catchment 4 - Tank 10

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	1.750	4.000	1.750	3.597	1.750	4.342
Flush-Flo™	0.370	3.375	0.466	2.766	0.337	3.884
Kick-Flo®	0.752	2.712	0.752	2.432	0.752	2.952
Mean Flow		3.193		2.781		3.534

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422

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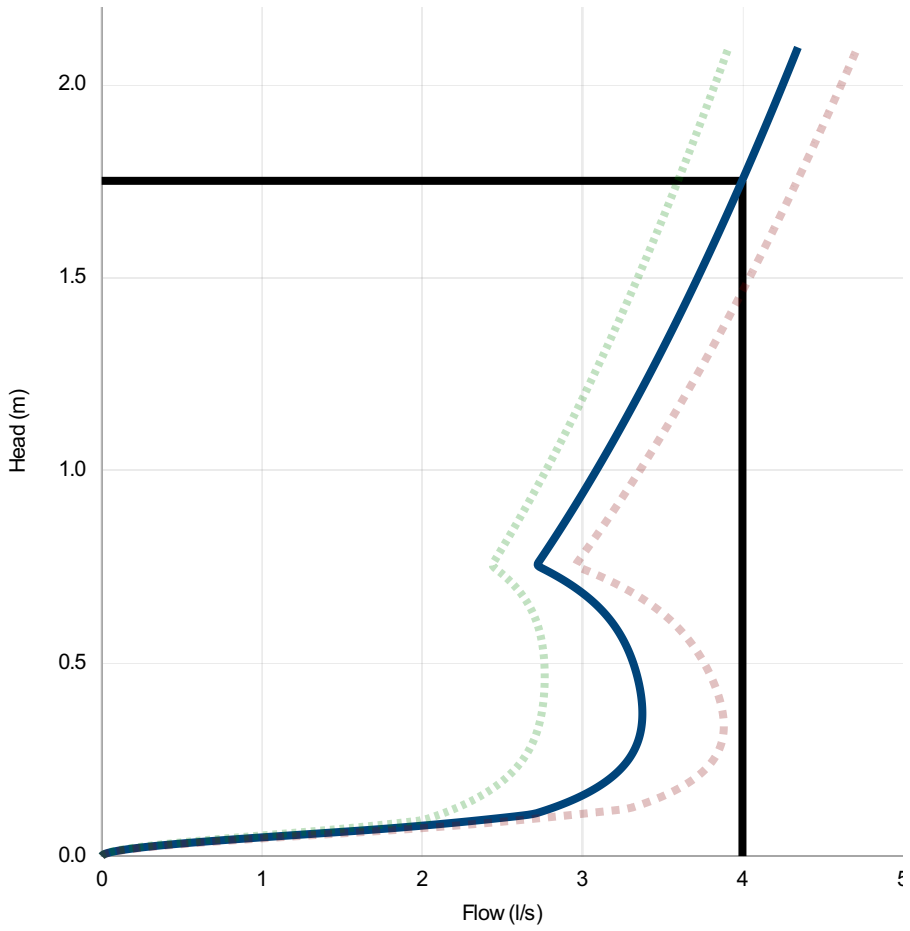

Head (m)	Flow (l/s)
0.000	0.000
0.060	1.410
0.121	2.785
0.181	3.104
0.241	3.272
0.302	3.351
0.362	3.375
0.422	3.365
0.483	3.332
0.543	3.277
0.603	3.190
0.664	3.055
0.724	2.847
0.784	2.764
0.845	2.859
0.905	2.951
0.966	3.039
1.026	3.125
1.086	3.208
1.147	3.288
1.207	3.367
1.267	3.443
1.328	3.518
1.388	3.591
1.448	3.662
1.509	3.732
1.569	3.800
1.629	3.867
1.690	3.933
1.750	3.997

DESIGN ADVICE

The head/flow characteristics of this SHE-0084-4000-1750-4000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

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Hydro International A CRH COMPANY

DATE	12/06/2024 18:02
Site	Tank 10
DESIGNER	Roger Mullarkey
Ref	Kilternan Village LRD

SHE-0084-4000-1750-4000

Hydro-Brake® Optimum

Catchment 4 - Tank 10

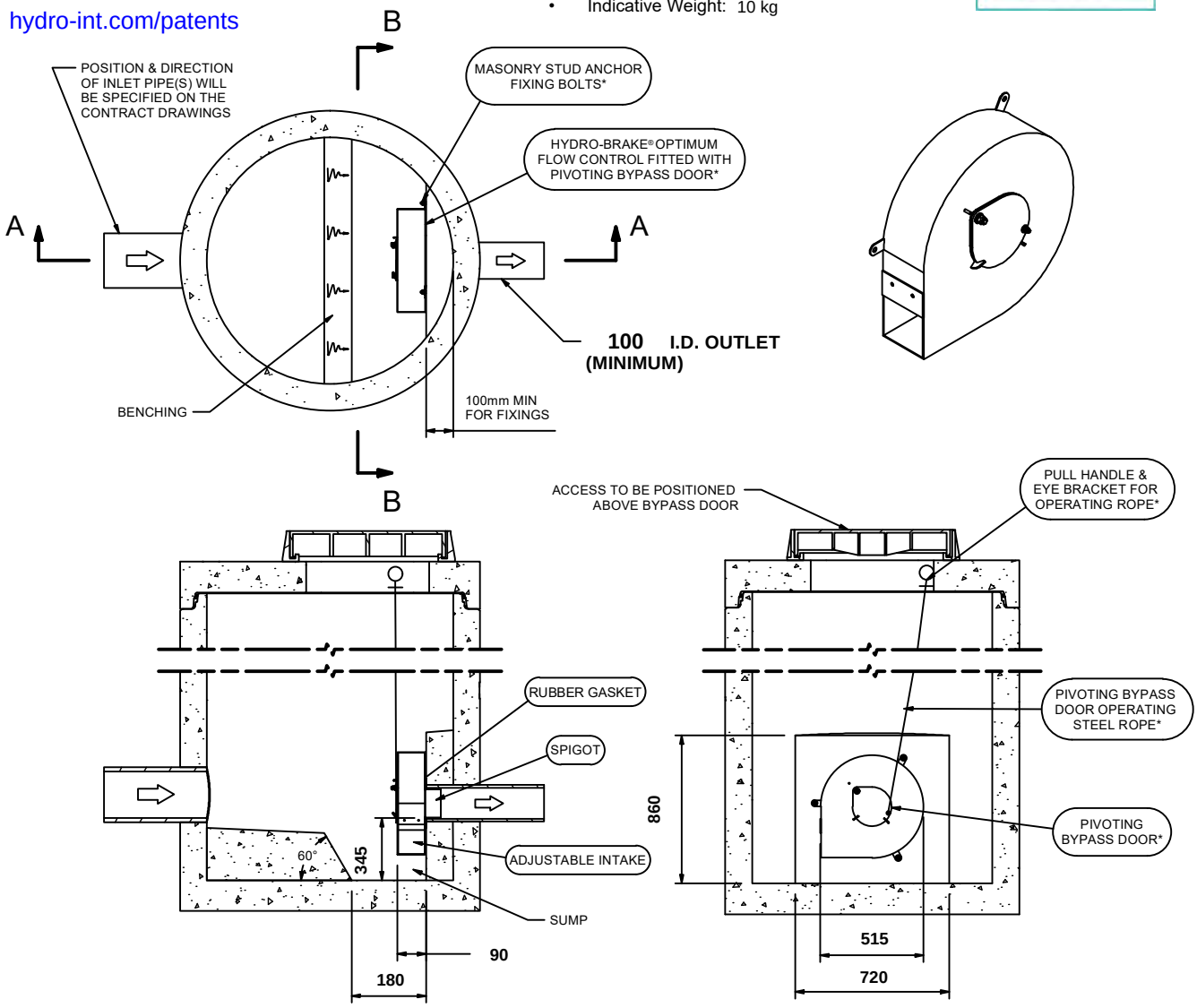
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.750	4.000
Flush-Flo™	0.370	3.375
Kick-Flo®	0.752	2.712
Mean Flow		3.193

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 10 kg

hydro-int.com/patents



SECTION A-A SECTION B-B

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Hydro International
A CRH COMPANY

DATE	12/06/2024 18:02
SITE	Tank 10
DESIGNER	Roger Mullarkey
REF	Kilternan Village LRD

SHE-0084-4000-1750-4000
Hydro-Brake® Optimum

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info@rmullarkey.ie

Appendix 12.21

Offsite Connection Legals

CANNONS

SOLICITORS

(Incorporating THOMAS P. O'CONNOR)

Linden Court,
The Plaza,
Stillorgan,
Co. Dublin
Telephone 01 278 5016
(From UK 00-353-1-278 5016)
Fax 01 278 4503
DX 103 004 Stillorgan
e-mail: cannons@securemail.ie

Joseph P. Kelly

Suzanne M. Roche

Our ref: JK/PD/D Your ref: Date 20 June 2024

The Planning Department,
Dun Laoghaire Rathdown County Council,
County Hall,
Maine Road,
Dun Laoghaire,
Co. Dublin

Re: Our client: Liscove Limited
Lands At Wayside, Enniskerry Road And Glenamuck Road, Kilternan, Dublin 18

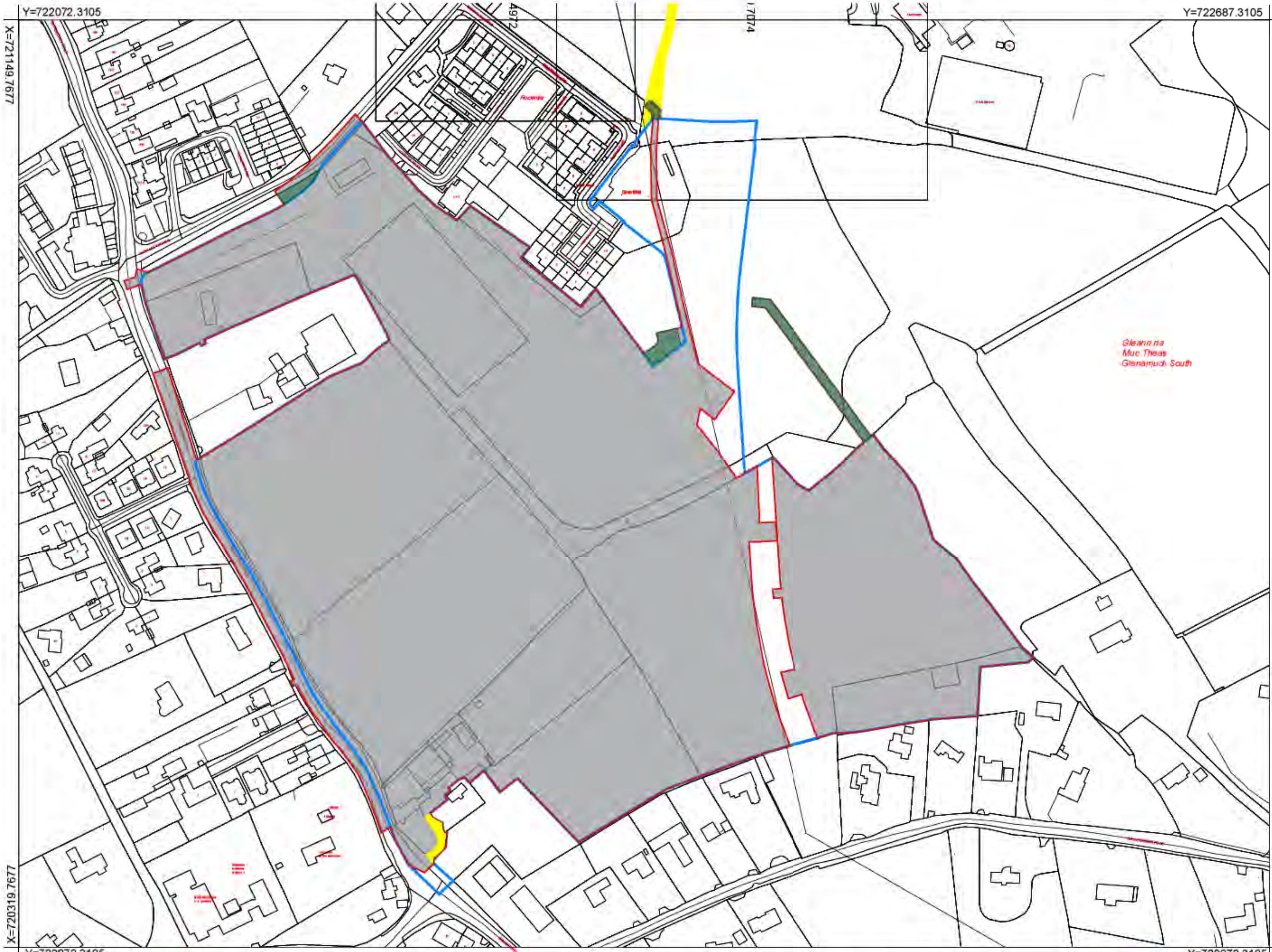
Dear Sirs,

We hereby confirm and certify that our above named client Liscove Limited is the legal and beneficial owner of all of the lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 ("**the Liscove Lands**") outlined blue on the map attach hereto ("the **Site Map**") prepared by our client's architects MCORM.

We confirm and certify also that the Liscove Lands has the benefit of all required legal rights/easements over the areas shown coloured green on the Site Map. In particular the owner for the time being of the Liscove Lands holds the right in fee simple to enter as and when it requires upon the areas coloured green to connect into existing services (and for the purposes of this letter "services" includes the drainage of foul water, surface water and soil and any conduits required for same) or to lay and construct new services for the benefit of the Liscove Lands and any development constructed or to be constructed on it, together with the right to inspect, cleanse, maintain, renew or replace such services.

Yours faithfully,

Joseph P Kelly
Principal
CANNONS



REPRODUCED UNDER LICENCE NO. CYAL50171770

Description:
Historic 6" Latest Edition

Publisher / Source:
Ordnance Survey Ireland (OSI)

Data Source / Reference:
WW003
Revision Date =
Survey Date =
Levelled Date = 31-Dec-1912

DN025
Revision Date =
Survey Date = 31-Dec-1937
Levelled Date = 31-Dec-1940

DN026
Revision Date =
Survey Date = 31-Dec-1937
Levelled Date = 31-Dec-1940

File Format:
Tagged Image File Format (TIFF)

File Name:
R_50195626_1.tif

Clip Extent / Area of Interest (AOI):
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URX,LRY= 724239.7677,719782.8105
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URX,URY= 724239.7677,724976.8105

Projection / Spatial Reference:
IRENET95_Irish_Transverse_Mercator

Centre Point Coordinates:
X,Y = 720734.7677,722379.8105

Data Extraction Date:
26-May-2021

Product Version:
1.3

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Please visit 'www.osi.ie/about/terms-conditions'.

'SITE MAP 1'

LEGEND
- SITE BOUNDARY OF PLANNING APPLICATION
- LANDS UNDER CONTROL OF THE APPLICANT
- LANDS UNDER CONTROL OF THRID PARTIES

GENERAL NOTES

DO NOT SCALE FROM DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY. ARCHITECT TO BE NOTIFIED OF ANY DISCREPANCIES.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS DRAWINGS, SPECIFICATIONS, CONSULTANTS DESIGN TEAM DRAWINGS AND SPECIFICATIONS.

LRD

REV	DATE	DESCRIPTION	ISSUED BY

REVISIONS

CLIENT: LISCOVE_LTD

PROJECT TITLE: KILTERNAN_VILLAGE_LRD

DRAWING TITLE: SITE_LOCATION_MAP_1 FOR_INFORMATION_OWNERSHIP

DRN BY	CHK BY	SCALE	DATE	REVISION	JOB NO
SM	-	1:2500	JUN'24	-	21009.2

DRAWING NUMBER: PL100.2

STATUS CODE: -

MCORM
ARCHITECTURE AND URBAN DESIGN

No.1 Grantham Street, Dublin 8
D08 A49Y Tel: +353 (01) 478 8700

Block 6, Central Business Park,
Tullamore, County Offaly, R35 F6R8
Tel: +353 (057) 932 3867

E: arch@mcorm.com W: mcorm.com

Appendix 12.22

Stage 2 DLRCC Opinion Response

	LRD Notice of Response Ref PAC/LRD2/006/23	
No	**DLR Municipal Services Opinion**	**Response**
8	Design of the proposed surface water management system including attenuation features and cross sections of all SuDS features proposed on site in the context of surface water management on the site, discharge rates equal to greenfield sites, integration of appropriate phased works.	The S/W management system are outlined in detail in the main Engineering Infrastructure Report and Stormwater Impact Assessment ("the *Report*"). Refer to that report for details of all related issues.
10	A letter from Irish Water confirming that there is sufficient capacity in the public infrastructure to facilitate a connection for the proposed development obtained no more than 6 months before the date of lodgement of the LRD Application.	A letter from Uisce Éireann (formerly Irish Water) confirming capacity in the infrastructure is included in Appendix 12.16 of the *Report*.
13a	As standard, the applicant is requested to ensure that all surface water design proposals are in accordance with the requirements of Appendix 7: Sustainable Drainage System Measures of the County Development Plan 2022-2028.	Compliance with Appendix 7 of the CDP is demonstrated in detail the *Report*
13b	As standard, the applicant is requested to ensure that the proposed surface water design is in accordance with County Development Plan 2022-2028 Section 10.2.2.6 Policy Objective EI4: Sustainable Drainage Systems, such that the proposal meets the requirements of the Greater Dublin Strategic Drainage Study (GDSDS) policies in relation to Sustainable Drainage Systems (SuDS). The design must incorporate SuDS measures appropriate to the scale of the proposed development such as green roofs, bioretention areas, permeable paving, rainwater harvesting, swales, etc. that minimise flows to the public drainage system and maximises local infiltration potential.	A full SuDS treatment train approach has been implemented in the design and is detailed in Chapter 7 of the *Report*.
13c	The applicant has provided hydraulic simulation results for a limited number of rainfall duration. Hydraulic simulation results are required for each standard rainfall return event from the 15 minute to 10800 minute event in order to demonstrate the performance of the proposed surface water drainage network for all rainfall events. The applicant is requested to provided updated hydraulic modelling results including each rainfall return event.	All hydraulic simulations between the 15min to 10800 minute events are provided. refer to Appendix 12.1 of the *Report*.
13d	In point 7.1.10 the applicant has indicated that extensive roofs are to be provided on all flat roofs within the site. The applicant has indicated that a minimum of 50% green roof is required for extensive roofs. Appendix 7.2 of the DLRCC CDP sets out a requirement for 70% green roof when an extensive roof is to be provided, with 50% required if intensive. The applicant is requested to ensure that the proposed development meets the requirements of Appendix 7.2: Green Roof Policy of the County Development Plan 2022-2028, such that all developments with a total roof area greater than 300 square metres include a green roof (note that the percentage coverage required depends on the type of green roof proposed). The applicant is requested to demonstrate by calculation and by representation on a drawing that the proposed green roof extents are in accordance with the Council's Green Roof policy. A detailed cross section of the proposed build-up of the green roof should be	70% minimum area of Green roof has been complied with and is summarised as been in compliance with DLRCC CDP in Chapter 7 of the *Report* and details are shown on Dwg.No.2104C/216 and Dwg.No.'s 2104C/303-305.

	provided, including dimensions. The applicant should demonstrate that the green roof is designed in accordance with BS EN 12056-3:2000 and The SUDS Manual (CIRIA C753).	
13e	The applicant has indicated that partial elements of the drainage network will be located outside of the area to be taken in charge. The applicant is requested to reconsider the element of lands to be taken in charge or alternatively commit to providing a wayleave agreement for these lands. The wayleave agreement should be in favour of Dun Laoghaire-Rathdown County Council for the sections of proposed public surface water infrastructure that are to be located in lands not to be taken in charge. Such a wayleave agreement shall be accompanied by dimensioned drawings showing the locations of all surface water drainage elements in relation to adjoining property boundaries. The wayleave shall be agreed and in place prior to the taking-in-charge of the development.	The Applicant has confirmed they have the ability to deliver the services and ancillary works required to implement the designed scheme in full. There are developer legal agreements in place with 3rd party landowners effected by drainage pipeline routes outside of the Applicants ownership and legal confirmation of same are included in Appendix 12.21 of the *Report*
13f	As standard, the applicant is requested to ensure that a penstock is provided in the flow control device chamber and that the flow control device provided does not have a bypass door. The applicant shall also ensure a silt trap is being provided in the flow control device chamber.	Noted and detailed on Dwg.2104C/317
13g	As standard, the applicant is requested to ensure that any changes to parking and hardstanding areas shall be constructed in accordance with the recommendations of the Greater Dublin Strategic Drainage Study for sustainable urban drainage systems (SuDS) i.e. permeable surfacing, and in accordance with Section 12.4.8.3 Driveways/Hardstanding Areas of the County Development Plan 2022-2028. Appropriate measures shall be included to prevent runoff from driveways entering onto the public realm as required. Where unbound material is proposed for driveway, parking or hardstanding areas, it shall be contained in such a way to ensure that it does not transfer on to the public road or footpath on road safety grounds.	All parking areas are of permeable paving surfacing as detailed in the *Report* and shown on Dwg.No.'s 2104C/303-305 and 318.
13h	As standard, the applicant is requested to submit supporting standard details, including cross-sections and long-sections, and commentary that demonstrates that all proposed SuDS measures have been designed in accordance with the recommendations of CIRIA C753 (The SuDS manual).	All SuDS measures are detailed on Dwg.No.'s 2104C/314 & 316 & 317 and design examples included in the Appendix 12.2 of the *Report*.
13i	As standard, the applicant is requested to submit long-sections of the surface water drainage system, clearly labelling cover levels, invert levels, pipe gradients and pipe diameters.	Long sections are included with the Stage 3 submission. refer to Dwg.No.'s 2104C/323-328
13j	As standard, the applicant is requested to include in the final submission, the fully dimensioned plans and sections of the attenuation storage system. All relevant inlet and outlet levels, dimensioned clearances between other utilities, and actual depths of cover to the tank shall be provided. The applicant shall include confirmation from the chosen manufacturer of the storage system that the specific model chosen, with the depth of cover being provided, has the required load bearing capacity to support the loading that may imposed upon it.	Dimensioned drawings of the attenuation systems are shown on Dwg.2104C/320 & 321 and calculation and manufacturers details are included in the Appendix 12.3 of the report, including the tank system suppliers letter confirming the loading capacity.

13k	As standard, the applicant is requested to confirm that a utilities clash check has been carried out ensuring all utilities' vertical and horizontal separation distances can be provided throughout the scheme. The applicant should demonstrate this with cross-sections at critical locations such as junctions, site thresholds and connection points to public utilities. Minimum separation distances shall be in accordance with applicable Codes of Practice.	Utility clashes have been assessed and crossing points detailed on Dwg.No.'s 2104C/323-328 & 330-334.
13l	As standard, and as noted within the application, the applicant is requested to ensure that a Stage 1 Stormwater Audit is carried out for the development. In accordance with the Stormwater Audit policy, the audit shall be forwarded to DLRCC prior to lodging the planning application. All recommendations shall be complied with, unless agreed in writing otherwise with DLRCC.	A Stormwater Audit has been completed and the results submitted to DLRCC prior to lodgement of the Stage 3 submission. Refer to the Appendix 12.6 of the Report.
13m	It is noted that a blockage analysis has been carried out, however it appears to be on a limited rainfall period. The applicant is asked to justify this approach or carry out the analysis for all standard rainfall time event. The applicant is requested to comment on the proposed surface water drainage system in the event of blockage or partial blockage of the system, commenting on any surcharging or flood risk that may be identified. The applicant is requested to submit a drawing identifying and showing details of safe overland flow routes both within and without the site. The overland flow route plan should identify drop kerbs or ramps requested for channelling the flow, should address low point areas in the site and should detail how properties, both within the development and on adjacent lands, will be protected in the event of excessive overland flows.	The blockage analysis was carried out in accordance with the previous recommendations given from DLRCC's Municipal Services Department. As part of the assessment carried out for the Stage 3 submission, the rainfall period has been extended to 120 minutes, the results of which are detailed in the Appendix 12.1 of the Report. Furthermore, an overland flow/exceedance flow assessment has been illustrated on Dwg.2104C/315 showing the routing and dropped kerbs identified as well as details relating to same. refer also to paragraph 6.28 of the Report for more detail.
18n	The Applicant will be required to obtain and submit written confirmation from the relevant project engineer within the Capital Projects Team to demonstrate that both the proposed design and phasing of the development is consistent with the latest design details and phasing of the road scheme. The Applicant shall also submit drawings and details which demonstrate that the proposed development does not encroach on or preclude any and all works associated with the GDRS scheme, and submit confirmation of same from the relevant project engineer.	A letter from the Capital Projects Team confirming consistency of the LRD proposal with the GDRS project is included in Appendix 12.17