Intended for
LMO Overseas Investments Limited

Document type
Report

Date
September 2025

Document no.
RBU2025N02192-RAM-RP-00003

HORTON ROAD, WEST DRAYTON, UB7 8JL WATER CYCLE STRATEGY

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HORTON ROAD, WEST DRAYTON, UB7 8JL
WATER CYCLE STRATEGY

Project name	**CLEM Orbital**
Project no.	**1620017845-001**
Recipient	**LMO Overseas Investments Limited**
Document type	**Report**
Version	**2.0**
Date	**19/09/2025**
Prepared by	**J. Zemartis**
Checked by	**Simon Gaskell**
Approved by	**Simon Gaskell**
Description	**Water Cycle Strategy**

https://uk.ramboll.com

Revision	Date	Prepared by	Checked by	Approved by	Description
1.0	12/08/2025	JZ	SG	SG	First Draft
2.0	19/09/2025	JZ	JT	SG	For Issue

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CONTENTS

1. INTRODUCTION

1.1 Appointment and Brief

1.1.1 Ramboll UK Limited (Ramboll) has been commissioned by LMO Overseas Investment Ltd to undertake a Water Cycle Strategy (WCS) for planning. The WCS is in support of the Planning Application for the proposed redevelopment which would include the demolition of 13 light industrial units and the construction of two warehouse units on the Orbital Industrial Estate, Horton Rd, West Drayton UB7 8JL ('the Site').

1.2 Scope and Objectives

1.2.1 This WCS has been carried out in accordance with the National Planning Policy Framework (NPPF)[1]. It is to be used to assess the impact of the proposed development on water resources, surface water and wastewater as part of a planning application.

1.2.2 This report provides the following information:

1. A review of the Site setting including hydrological, hydrogeological and geological context;
2. A review of the applicable planning requirements in relation to water cycle strategy;
3. An assessment of the potential for the Site to be affected by flooding or increased risk of flooding elsewhere;
4. An assessment of the impact of the proposed development on surface water quality and quantity;
5. An assessment of the impact of the proposed development on water demand and management of water demand; and
6. An assessment of the approach to foul water drainage.

1.3 General Limitations and Reliance

1.3.1 In preparation of the report and performance of any other services, Ramboll has relied upon publicly-available information, information provided by the client and information provided by third parties. Accordingly, the conclusions reached in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

1.3.2 The key sources of information used to prepare this report are footnoted within the document. Ramboll cannot accept liability for the accuracy or otherwise of any information derived from third party sources.

1.3.3 Ramboll's services are not intended as legal advice, nor an exhaustive review of Site conditions and/or compliance. This report and accompanying documents are intended solely for the use and benefit of the client for the specified purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

[1] GOV.UK, National Planning Policy Framework (published December 2024) https://www.gov.uk/government/publications/national-planning-policy-framework--2 (accessed May 2025)

2. POLICY CONSIDERATIONS

2.1 National Planning Policy

2.1.1 According to NPPF Guidance[2] (which was most recently updated in January 2021) a Water Cycle Study, though not a formal requirement for the planning application, serves as an informative supplementary resource which identifies strategic planning needs for new developments regarding water supply, wastewater and flood risks. Components of these plans include:

- Surface water management;
- Flood risk and drainage systems;
- Adequate water supply and wastewater connections; and
- Infrastructure resilience for future water demands.

2.2 Local Planning Policy

Hillingdon Local Plan: Parts 1 & 2

2.2.1 The Hillingdon Local Plan: Part 1 – Strategic Policies includes broad policies for steering and shaping development whereas Part 2 – Development Management Policies establishes guidelines for decisions about planning applications[3].

2.2.2 According to the Hillingdon Local Plan, the development is classified as a 'Major Development' occupying an area greater than 1,000m^2.

2.2.3 The borough policy ensures that climate change adaptation is addressed at every stage of the development process by requiring major development proposals to consider the whole water cycle impact including flood risk management, foul and surface water drainage and water consumption.

Hillingdon Local Flood Risk Management Strategy, June 2024

2.2.4 As the Lead Local Flood Authority (LLFA) the London Borough of Hillingdon have prepared the Hillingdon Local Flood Risk Management Strategy (June 2024). This document sets out the requirements for the LLFA to review the proposed drainage elements of Major planning applications under the Flood and Water Management Act 2010.

2.2.5 The LLFA, as part of the planning application process, will review:

- If the drainage hierarchy set out in the London Plan (2021) is being adhered to and that the most sustainable drainage features possible have been proposed.
- If the proposed runoff rates are equal to or lower than greenfield runoff rates, or as close as reasonably practical with sufficient justification.
- If sufficient calculations supporting greenfield, existing and proposed runoff rates for 1 in 1 year (100% chance of occurrence each year), 1 in 30 year (3.3% chance of occurrence each year) and 1 in 100 year (1% chance of occurrence each year) rainfall events are provided, with an appropriate climate change allowance.
- If the proposed attenuation storage volume meets or exceeds the required attenuation storage volume for the Site.
- If maintenance tasks of proposed SuDS (including actions and frequencies) and a maintenance provider have been stated.

[2] https://www.gov.uk/guidance/water-cycle-studies (accessed August 2025)
[3] https://www.hillingdon.gov.uk/local-plan-and-review (accessed July 2025)

London Borough of Hillingdon SuDS Design and Evaluation Guide

2.2.6 Designs for the management of surface water runoff at the Site have been prepared in line with the London Borough of Hillingdon SuDS Design and Evaluation Guide[4].

The London Plan,

2.2.7 The London Plan 2016[5] is also applicable at the Site and provides important considerations on surface water management. Policy 5.13 discusses sustainable drainage for planning decisions, '*Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:*

1. *Store rainwater for later use*
2. *Use infiltration techniques, such as porous surfaces in non-clay areas*
3. *Attenuate rainwater in ponds or open water features for gradual release*
4. *Attenuate rainwater by storing in tanks or sealed water features for gradual release*
5. *Discharge rainwater direct to a watercourse*
6. *Discharge rainwater to a surface water sewer/drain*
7. *Discharge rainwater to the combined sewer.*

Drainage should be designed and implemented in ways that deliver other policy objectives of this Plan, including water use efficiency and quality, biodiversity, amenity, and recreation."

[4] https://www.hillingdon.gov.uk/article/5919/Sustainable-drainage-requirements-and-SuDS
https://www.london.gov.uk/sites/default/files/the_london_plan_2016_jan_2017_fix.pdf (accessed May 2025)

[5] https://www.london.gov.uk/Sites/default/files/the_london_plan_2016_jan_2017_fix.pdf (accessed April 2025)

3. SITE DESCRIPTION

3.1 Application Site Description

3.1.1 The Site is located at Orbital Industrial Estate, Horton Rd, West Drayton UB7 8JL (NGR TQ 06574 80204). The Site is situated within the larger Horton Industrial Estate, with surrounding areas being of mixed commercial, industrial and residential uses in proximity to the Site. It comprises approximately 0.91 hectares (ha) of land.

3.1.2 The northern boundary of the Site is defined by Horton Road, with residential properties beyond. To the east is the main section of the Horton Industrial Estate (light industrial and logistical uses). The southern edge of the Site is bordered by the Grand Union Canal with an east-west rail line beyond. On the western side of the Site there is a small portion of the Horton Industrial Estate, consisting of a single building (light industrial and logistical uses) with residential areas beyond. A Site location map is presented in Figure 3.1.

3.1.3 The Site currently comprises 13 units and is separated into three distinct areas. On the western side of the Site there is a through road to an adjacent property that does not provide access to any of the units and is separated by a fence, though this is within the Site boundary. All of the units are accessed via the eastern road off of Horton Road which also serves as the car parking area with spaces along the eastern boundary of the Site. Units 1-7 have entrances on the eastern road and are connected within one larger building. Units 8-13 are centred around a service area at the southern end of the property.

3.1.4 In line with the drainage strategy prepared for the Site by Ridge and Partners LLP (dated May 2025, Document Ref.: 5027861-RDG-XX-XX-T-C-000500) it is stated that the existing drainage infrastructure at the Site is assumed inadequate and will be replaced by a newly proposed drainage system (plans for which are appended to this report).

Figure 3.1: Site Location

3.2 The Proposed Development

3.2.1 The proposed development is for the demolition of existing properties and redevelopment with two warehouse buildings for logistics uses and associated ancillary uses. Two access routes from Horton Road will serve the eastern and western sides of the warehouse buildings and provide independent access to each.

3.2.2 The northern half of the property will be occupied by Unit 1 and will be accessed via the eastern road off Horton Road. Along the southern end of the building, a service yard, car parking spaces and landscaping will be utilised.

3.2.3 The southern half of the property will be occupied by Unit 2 and accessed via the western road off Horton Road. Along the western side of the building, a wider paved area will be utilised as a turning area for larger vehicles on-site. To the south of Unit 2 is another service yard along with car parking spaces and landscaping.

4. REVIEW OF BASELINE DATA

4.1 Geological Setting

4.1.1 According to British Geological Survey (BGS) data[6], the Site is underlain by Lynch Hill Gravel Member (sand and gravel) superficial deposits. The deeper bedrock geology comprises London Clay Formation (clay, silt and sand).

4.1.2 According to ground investigation carried out by Ridge and Partners LLP on-site between 25th and 27th February 2025, ground conditions are summarised as follows:

- the Site is directly underlain by made ground to a depth of between 0.95m and 1.58m below ground level (bgl); further underlain by
- Lynch Hill Gravel Member to a depth of between 2.84m and 5m bgl at which point drilling was terminated.

4.2 Topographic Setting

4.2.1 No detailed site-specific topographic survey of the Site has been available for review. Therefore, Light Detection and Ranging (LiDAR) aerial topographic data (acquired from the EA[7]) has been reviewed in order to estimate external ground elevations and natural surface water drainage directions. The data is presented as a Digital Terrain Model (DTM) which is filtered to remove buildings and structures, with a 1m grid resolution.

4.2.2 According to LiDAR data, the Site is generally flat with the highest point being the access routes off Horton Road at approximately 30.5m Above Ordnance Datum (AOD) with a gentle slope down to the Site boundary along the Grand Union Canal to the south. The south-eastern car parking area in between building footprints stands at 30mAOD and the car park in the west also stands at approximately 30mAOD.

[6] https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.102324097.1435060994.1706713164-1937611093.1706713164 (accessed April 2025)
[7] https://environment.data.gov.uk/dataset/13787b9a-26a4-4775-8523-806d13af58fc (accessed April 2025)

Figure 4.1: LiDAR Aerial Topographic Survey Data

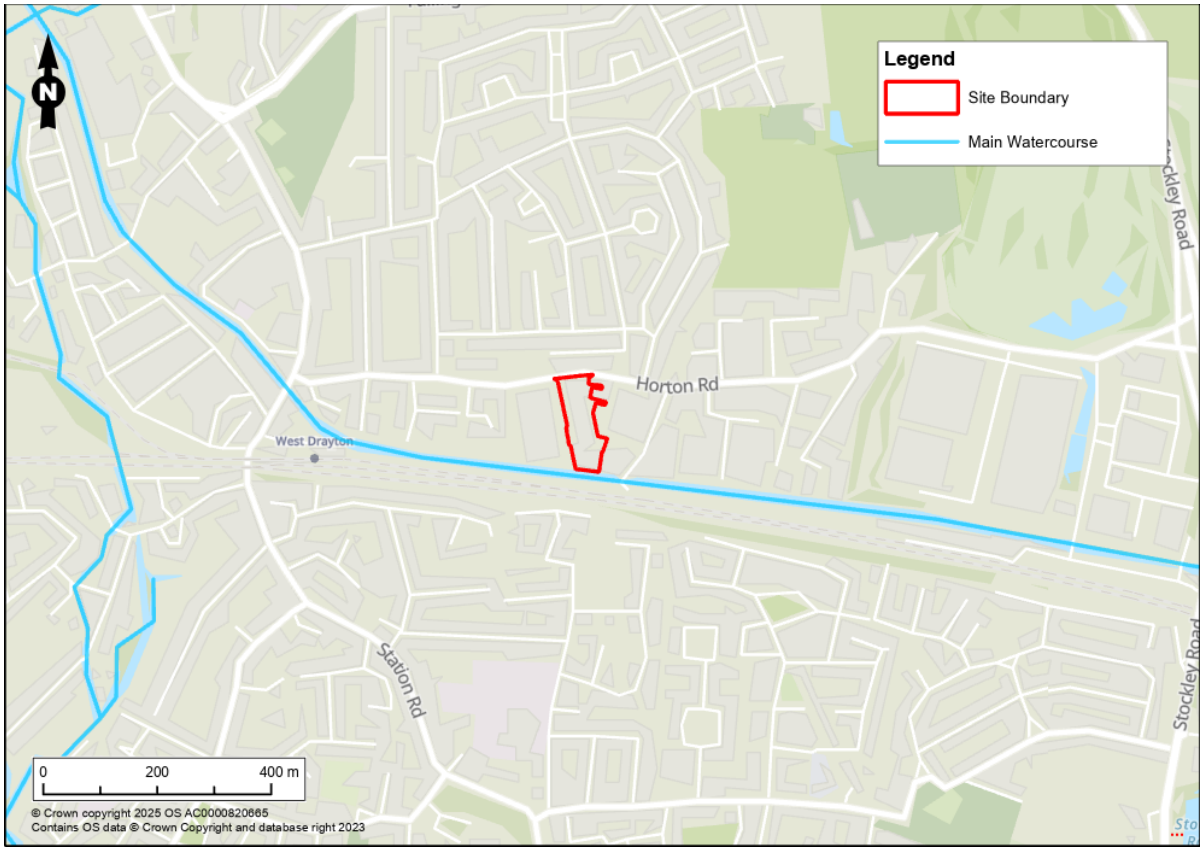
4.3 Hydrological Setting

4.3.1 The Grand Union Canal is adjacent to the southern boundary of the Site. The Grand Union Canal runs in an east-west direction and joins the River Brent at Hanwell Lock approximately 8.5km east of the Site. The River Brent is a tributary of the River Thames. The River Fray is situated approximately 800m west at its nearest point, approximately 1km north-west the Rivers Pinn and Fray converge.

4.3.2 The London Borough of Hillingdon Local Flood Risk Management Strategy[8] details the relationship between the Grand Union Canal and other waterways within the borough. The Grand Union Canal is managed by the Canal and River Trust which ensures regular maintenance and critical management of flood risks and water levels. The Grand Union Canal is not tidally influenced as there are a series of locks downstream near Brentford before the River Brent connects with the River Thames.

[8] https://www.hillingdon.gov.uk/flooding (accessed May 2025)

Figure 4.2: Hydrological Setting



4.4 Hydrogeological Setting

4.4.1 DEFRA's online magic map[9] classifies the Site's bedrock as part of an Unproductive Aquifer. These are defined by the EA as "*rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.*

4.4.2 Groundwater monitoring was carried out by Ridge and Partners LLP between the 20th of March and 31st March 2025 at five windowless sample locations distributed across the Site. Ridge's groundwater monitoring encountered groundwater at depths of 3.90m and 3.80m bgl at two locations in the north of the Site. Groundwater was not encountered at other window sample locations.

4.4.3 Further details of infiltration testing are provided in the Ridge Drainage Strategy. Infiltration testing provided confirmation that infiltration could provide a viable form of surface water disposal.

[9] https://magic.defra.gov.uk/ (accessed April 2025)

5. FLOOD RISK ASSESSMENT

5.1 Flood Risk Summary

Fluvial and Tidal Flood Risk

5.1.1 The Site is located entirely in Flood Zone 1 and is therefore assessed by the EA to be at a Low risk from fluvial or tidal flooding (less than a 1 in 1,000 (0.1%) annual probability). Based on the Site's location within Flood Zone 1 (Low risk) and the existing footprint of the Site, there is a negligible risk that the Site could lead to an increased risk of fluvial flooding elsewhere.

Surface Water Flood Risk

5.1.2 Areas of the Site are currently assessed to be at risk for surface water flooding according to EA's RoFSW mapping. However, RoFSW mapping is not generally considered suitable for property-scale assessment and the EA advises that this mapping should not be relied upon for site-specific flood risk assessments. Areas with the potential for surface water accumulation reflect the current layout and ground elevations at the Site and would therefore no longer be applicable following the full redevelopment of the Site. Additionally, existing drainage assets would be replaced with a new surface water drainage system.

Other Sources of Flood Risk

5.1.3 The Site is assessed to be at a low risk of flooding from all other sources including groundwater, reservoirs and canals based on a review of available EA data.

5.2 Flood Risk Vulnerability

5.2.1 According to Table 2 (Flood Risk Vulnerability Classification) in the Planning Practice Guidance to the NPPF[10], the Site is classed as Less vulnerable as the Site contains buildings used for shops, financial, professional and other services.

5.2.2 Based on Table 3 (Flood Risk Vulnerability and Flood Zone Compatibility) in the Planning Practice Guidance to the NPPF and the location of the Site within Flood Zone 1, development is appropriate.

5.3 Sequential Test

5.3.1 The Site is located in Flood Zone 1 and is at a Low risk of flooding therefore the sequential test is not required.

5.4 Mitigation

5.4.1 A Drainage Strategy has been prepared for the redevelopment of the Site that would mitigate the risk of pluvial flooding. A summary of the Drainage Strategy is provided below and plans of the proposed drainage layout are included as Appendix 1. The full Drainage Strategy prepared by Ridge and Partners LLP (dated May 2025, Ref.: 5027861-RDG-XX-XX-T-C-000500) and submitted together with this WCS as Appendix 2.

5.4.2 The proposed Drainage Strategy demonstrates that surface water runoff would be managed at the Site through the use of SuDS techniques, for events up to the 1 in 100 year event including a 20% allowance for climate change.

[10] GOV.uk (2014) Planning Practice guidance: Flood Risk and Coastal Change https://www.gov.uk/guidance/flood-risk-and-coastal-change

6. DRAINAGE

6.1.1 The proposed Drainage Strategy has been prepared by Ridge and Partners LLP (dated May 2025, Ref.: 5027861-RDG-XX-XX-T-C-000500). This section provides a summary of the key conclusions of this report.

6.1.2 In line with the SuDS hierarchy, surface water runoff will be managed through infiltration to ground via two underground infiltration tanks, tanked permeable block paving and porous surfacing of car parking areas at locations distributed across the Site. The feasibility has been confirmed through soakaway testing at several locations.

6.2 Surface Water

6.2.1 Sustainable drainage is an approach to drainage design which takes a holistic view on the impact and benefits of surface water. Rather than attempting to move rainwater from the Site to the discharge point as quickly as possible, it aims to use permeable spaces to retain water on-site and infiltrate naturally or discharging it at a reduced rate. This helps the development reduce the risk of flooding within the wider drainage catchment.

6.2.2 The proposed SuDS measures at the Site include a combination of permeable paving, geocellular infiltration tanks and tanked permeable paving systems. Specifically:

- Permeable Paved Parking Bays: These are designed to allow water to infiltrate directly into the ground, reducing surface runoff.
- Below Ground Geocellular Infiltration Tanks: These tanks are situated beneath the service yards, providing additional capacity for water infiltration and storage. The design volume of these infiltration tanks is 39.20m^3 and 427.50m^3 for Units 1 and 2 respectively.
- Tanked Permeable Paving: These structures will be installed where permeable paving is situated within 5m of buildings, such as along the western access road as well as along the eastern boundary of the Unit 2 service yard.

6.2.3 The Drainage Strategy by Ridge and Partners LLP has been included as Appendix 2 and includes a detailed assessment of the Site.

Water Quality

6.2.4 A water quality assessment, conducted using the Simple Index Approach and the Pollution Hazard Indices from the SuDS Manual (C753), indicates that the selected SuDS components are designed to mitigate the risk of pollutant discharge effectively.

6.2.5 The mitigation indices for the proposed treatment trains are structured to ensure that the combined Pollution Mitigation Indices of the SuDS components matches or exceeds the pollution Pollution Hazard Indicies for Total Suspended Solids (TSS), metals and hydrocarbons.

6.2.6 Therefore, the required level of treatment is provided within each treatment train to mitigate the risk of discharge of pollutants for the purpose of the development. Therefore, the design complies with the water quality requirements set out in Chapter 4 of the SuDS Manual.

Water Quantity

6.2.7 Infiltration testing was completed at the Site in accordance with BRE Digest 365. Falling head testing was conducted at three locations: locations WS01, WS03 and WS07 to provide indicative infiltration rates. The highest rate of infiltration was recorded at WS07 (1 at 1.17 x 10^{-4} m/s) and the lowest rate of infiltration for WS03 (4.32 x 10^{-6} m/s).

6.2.8 Sufficient infiltration rates were identified from Site tests, allowing for the implementation of soakaways and permeable paving systems to manage surface water disposal.

6.2.9 The drainage design for the Site is bespoke and includes no increase in the impermeable surfaces as a result of the refurbishment works and hardstanding areas will be served by SuDS to allow full infiltration for rainfall events up to and including the 1 in 100 (1%) + 20% climate change allowance.

6.2.10 As all surface water discharge from the Site would be infiltrated to ground (for rainfall events up to and including the 1 in 100 (1%) + 20% climate change allowance), the largest practical reduction in surface water runoff rates that could be implemented has been achieved.

6.3 Foul Water

6.3.1 Foul water will be drained from the building and then discharge into sewerage along Horton Road. According to Ridge and Partners LLP Drainage Strategy Sheet (Ref: 5027861-RDG-XX-XX-D-C-000500-P01), the approximate peak flow rate is 2.42 litres/second.

6.4 Capacity Approval

6.4.1 As the existing Site is connected to public water and sewer services through Thames Water, it is understood that there is likely existing capacity for continued usage. The proposed development has set expectations for net improvement of usage across the Site.

6.4.2 In future stages of development for the Site, connection to public water services will be subject to agreement with the water supplier that suitable capacity for the property is available. Confirmation should also be obtained from the sewerage undertaker that suitable capacity for connections to the mains sewer is available.

7. WATER DEMAND MANAGEMENT

7.1 Water Use

7.1.1 BREEAM standard Wat01 method determines water efficiency for a building based on the building's actual component specification and default usage patterns for the building type and its activity area.

7.1.2 The development is targeting 4 credits for water consumption which reflects a 50% improvement over baseline building water consumption. This will be achieved through specification of low flow appliances within the units.

7.1.3 It is currently understood that rainwater harvesting is unlikely to be installed, however further investigation will be conducted as design progresses and sanitary provisions are confirmed.

7.1.4 Additionally, the proposed development significantly reduces the overall number of units at the Site, with the existing units of various ages likely providing lower standards of water efficiency. The proposed development would conform to current building regulations for water efficiency.

7.2 Smart Metering

7.2.1 BREEAM standard Wat02 aims to reduce the consumption of potable water in new buildings through the effective management and monitoring of water consumption.

7.2.2 The development is targeting 1 credit for water monitoring. Pre-assessment conducted by the design team has confirmed that a pulsed water meter will be specified on the incoming supply with appropriate sub-metering as required.

7.3 Leak Detection

7.3.1 Water leak detection systems help to reduce the impact of major water leaks that may otherwise go undetected. These systems identify whether more water is flowing through a pipe than the pre-set maximum (the water consumption criteria). If the flow is exceeded for a set amount of time an audible alarm is activated which indicates that there is a leak.

7.3.2 For BREEAM standard Wat03, the development is targeting 2 credits regarding both leak detection systems and flow control devices. Pre-assessment conducted by the design team have confirmed that it is viable to include a leak detection system capable of detecting a major leak, with components of the system located between local utilities main supply and building as well as a second on the water supply within the assessed building.

7.3.3 In addition, flow control devices are viable within the development and would be PIR sensors connected to solenoid valves within sanitary areas.

7.3.4 Based on design details for the proposed development by Ridge and Partners LLP, major leak detection has been included on the incoming main cold water flow rate.

7.4 Water Supply

7.4.1 The Site is known to be served by public water supply managed by Thames Water and there is understood to be existing capacity.

7.4.2 Based on design details for the proposed development by Ridge and Partners LLP, the water flow rate for the Site is:

- Unit 1 – 0.4 litres/second
- Unit 2 – 0.46 litres/second

8. CONCLUSION

This report has set out how the Site will manage the water cycle and is therefore considered acceptable from a water management perspective.

8.1 Flooding

8.1.1 Based on the findings of this Flood Risk Assessment and in consideration of the recommendations made, it is concluded that any flood risk is appropriately managed by the development proposals over the lifetime of the development, taking climate change into account and fittingly for the vulnerability of proposed users.

8.1.2 No further flood risk assessment is deemed necessary.

8.2 Drainage

8.2.1 The strategy complies with the London Borough of Hillingdon Council SuDS Design and Evaluation Guide for commercial property, by providing attenuation for storm events up to a 1 in 100-year event plus 20% for climate change.

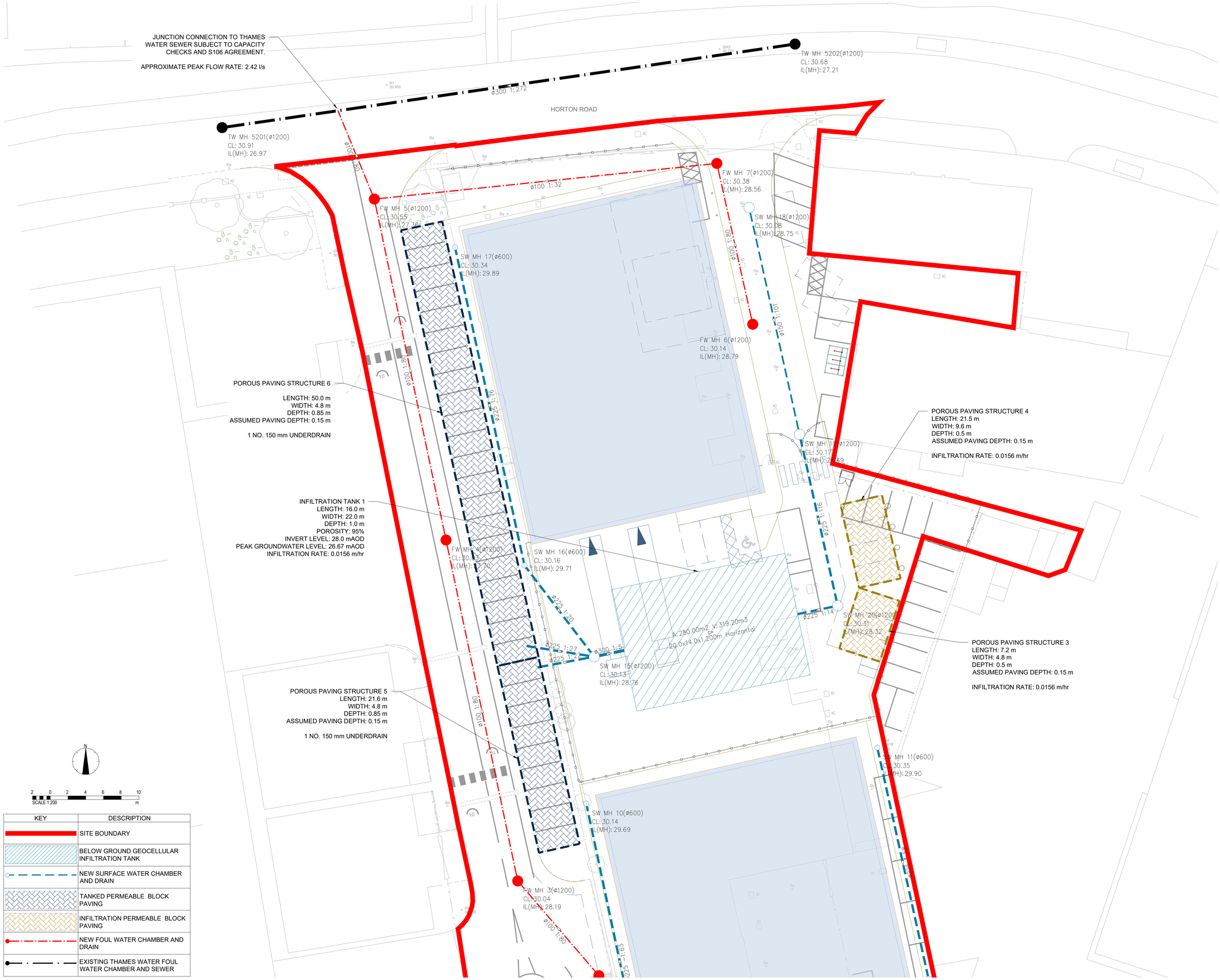
8.2.2 The Drainage Strategy demonstrates that, based on the suitable attenuation of surface water runoff and infiltration to ground, the proposed development would not lead to an off-site increase in flood risk and is likely to represent an improvement to existing conditions.

8.2.3 The design complies with the water quality requirements set out in Chapter 4 of the SuDS Manual, utilising sustainable drainage systems to improve water quality and reduce the rate of run-off from the Site.

8.3 Water Demand Management

8.3.1 Water use will be reduced when compared to current baseline conditions through the implementation of smart metering and net improvement of Site features that will provide improved water efficiency in line with building regulations and BREEAM requirements. Leak detection will be utilised such that leaks do not go un-noticed and can be managed quickly.

APPENDIX 1
RIDGE AND PARTNERS LLP, DRAINAGE LAYOUT



KEY	DESCRIPTION
	SITE BOUNDARY
	BELOW GROUND GEOCELLULAR INFILTRATION TANK
	NEW SURFACE WATER CHAMBER AND DRAIN
	TANKED PERMEABLE BLOCK PAVING
	INFILTRATION PERMEABLE BLOCK PAVING
	NEW FOUL WATER CHAMBER AND DRAIN
	EXISTING THAMES WATER FOUL WATER CHAMBER AND SEWER

CDM REGULATIONS 2015

Significant or non-obvious risks and risks which are difficult to manage are identified on this drawing using the following symbol identified to the right with brief accompanying text. For further details of the risks identified by designers, reference should be made to CDM hazard register.

REV	DESCRIPTION	DATE	BY	CHKD
P01	PLANNING ISSUE	23/05/2025	EP	ACB

ORIGINATOR: www.ridge.co.uk

RIDGE

PROJECT NUMBER: 5027861

CLIENT:
LE MASURIER LTD

IN ASSOCIATION WITH:

PROJECT:
LA MASURIER
HORTON ROAD

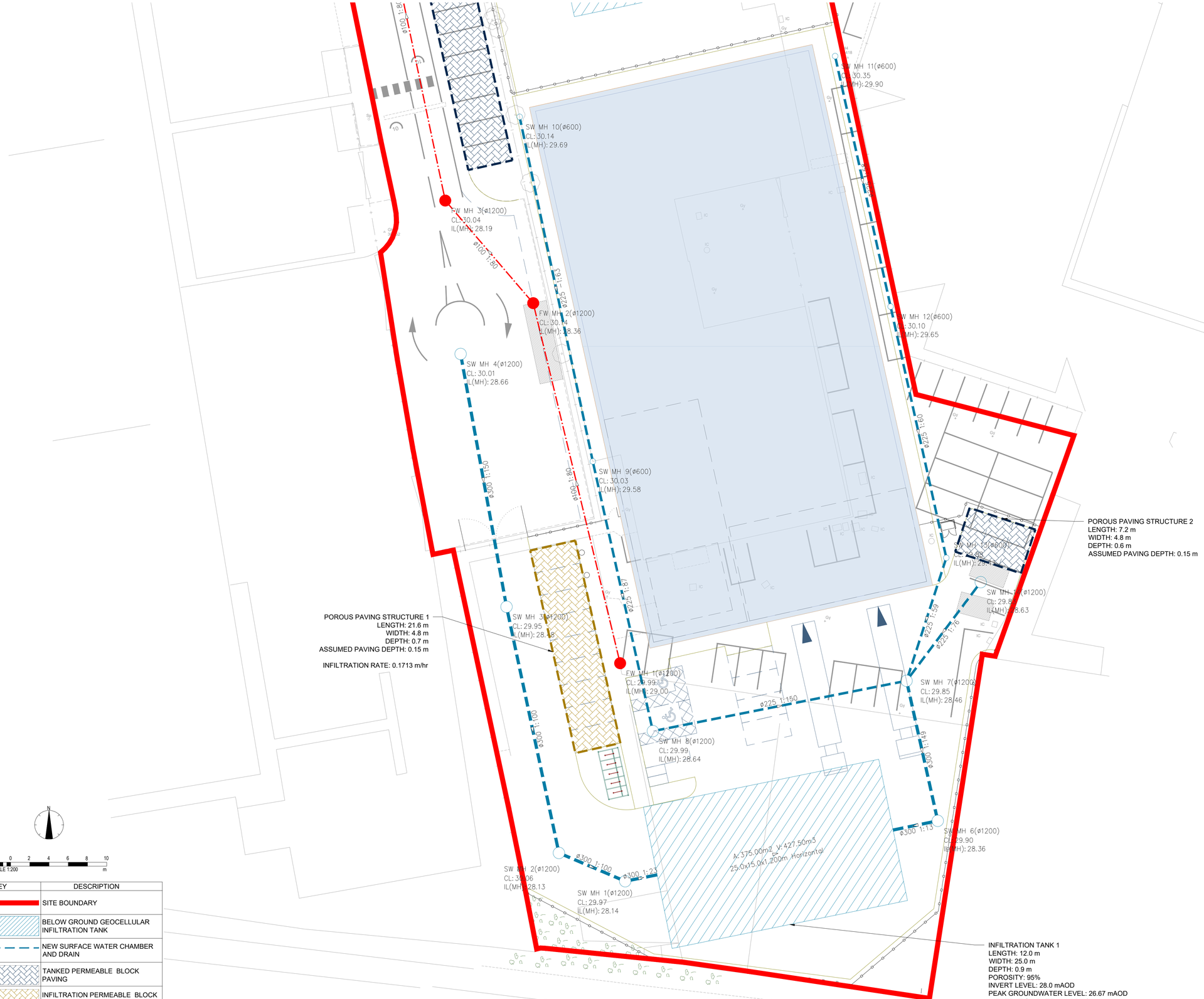
TITLE:
DRAINAGE STRATEGY
SHEET 1-2

DRAWN BY:	TA	CHECKED BY:	ACB	APPROVED BY:	ACB
SCALE @ A1:	1:200	DATE OF REVIEW:	MAY 2025		

ISO 19650 STATUS:
S2 - Suitable for Information

DRAWING No: 5027861-RDG-XX-XX-D-C-000500-P01 Drainage Strategy.dwg

PROJECT:	ORG:	FUNCTION:	SPATIAL:	FORM:	DISCIPLINE:	NUMBER:	REV:
5027861	RDG	XX	XX	D	C	000500	P01



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Significant or non-obvious risks and which are difficult to manage are identified on this drawing using the following symbol identified to the right with brief accompanying text. For further details of the risks identified by designers, reference should be made to CDM hazard register.

REV	DESCRIPTION	DATE	BY	CHKD
P01	PLANNING ISSUE	23/05/2025	EP	ACB

ORIGINATOR: www.ridge.co.uk

RIDGE

PROJECT NUMBER: 5027861

CLIENT:
LE MASURIER LTD

IN ASSOCIATION WITH:

PROJECT:
LA MASURIER
HORTON ROAD

TITLE:
DRAINAGE STRATEGY
SHEET 2-2

DRAWN BY:	TA	CHECKED BY:	ACB	APPROVED BY:	ACB
SCALE @ A1:	1:200	DATE OF REVIEW:	MAY 2025		

ISO 19650 STATUS:
S2 - Suitable for Information

DRAWING No: 5027861-RDG-XX-XX-D-C-000500-P01 Drainage Strategy.dwg

PROJECT:	ORG:	FUNCTION:	SPATIAL:	FORM:	DISCIPLINE:	NUMBER:	REV:
5027861	RDG	XX	XX	D	C	000501	P01

APPENDIX 2
RIDGE AND PARTNERS LLP, DRAINAGE STRATEGY

RIDGE

HORTON ROAD – INDUSTRIAL DEVELOPMENT
LE MASURIER LTD

DRAINAGE STRATEGY

23rd May 2025

LE MASURIER – INDUSTRIAL DEVELOPMENT, LE MASURIER LTD

DRAINAGE STRATEGY

5027861-RDG-XX-XX-T-C-000550

May 2025

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VERSION CONTROL

VERSION	DATE	DESCRIPTION	CREATED BY	REVIEWED BY
1.0	23/05/25	Planning Issue	EP	ACB

CONTENTS

EXECUTIVE SUMMARY

Ridge and Partners LLP have been commissioned by Le Masurier Limited to prepare a drainage strategy in support of the full planning application for the proposed development off Horton Road, West Drayton.

The surface water drainage strategy has been designed to capture surface water as close to the source as possible. The design has been developed assuming the existing surface water drainage systems will be abandoned and grubbed up and a new system proposed in its place. Infiltration porous paving structures and below ground geocellular infiltration tanks have been proposed as a means of surface water disposal with additional tanked porous paving where infiltration was not viable due to proximity to the proposed buildings.

InfoDrainage drainage design software has been utilised to develop the surface water drainage strategy for the site. Results indicate that surface water runoff can be contained within the drainage systems for all storm events up to and including the 1in100+20% climate change storm event with ~ 1.25 m^3 of flooding across the site in the most critical event.

As with the surface water, it is assumed any existing foul drainage systems will be abandoned and grubbed up and a new foul drainage system will be provided. The proposed foul drainage network will drain via gravity into the existing Thames Water network across Horton Road. It is assumed the site will not increase the foul load on the Thames Water sewers in comparison to the previous development on the site. It is understood the existing site is made up of more units than the proposed site, which it is assumed will lead to a reduction in the number of foul discharge units. A S106 application will be undertaken following planning approval to confirm the additional flow rate to the Thames Water sewer.

1. INTRODUCTION

Ridge and Partners LLP have been commissioned by Le Masurier Limited to prepare a drainage strategy in support of the full planning application for the proposed development off Horton Road, West Drayton.

The full site area associated with this reserved matters application covers an approximate area of 0.9 ha including the erection of 2 light industrial units and associated external works. This document should be read in conjunction with the Flood Risk Assessment being developed for the site by Ramboll.

This Drainage Strategy sets out the drainage design concept for the proposed development to manage surface and foul water disposal in the post-development scenario.

2. SITE DESCRIPTION

2.1. Site Location

Site Name: Horton Road – Industrial Development
Site Address: Orbital Industrial Estate, West Drayton
Site Location: Easting: 506582, Northing: 180178
National Grid Reference: TQ 065801
Site Area: Total 0.9 ha

The existing site (Orbital Industrial Estate) is located south of Horton Road, West Drayton and is accessed directly via a T-junction. The Grand Union Canal is immediately to the south of the site, with a railway located immediately beyond the canal.

An extract showing the proposed red line boundary from is shown below in *Figure 1*.

Figure 1 – Approximate Red Line Boundary and Existing Development (Ground Condition Assessment, 2025)

2.2. Land use and Topography

The existing site comprises of light industrial use with no soft landscaping. Existing uses include food production, a butcher, car repairs and a joinery. The site is mainly adjacent to other industrial areas, and the Grand Union Canal to the south, although there are residential flats to the north on the opposite site of Horton Road.

The topography of the site is consistently flat, primarily situated at approximately 30mAOD (Above Ordnance Datum). Across the site, the point of lowest elevation is in the south and west reaching a level of 29.8mAOD, while the point of highest elevation reaches 30.61mAOD along the eastern site boundary.

The topographical survey undertaken at the site is presented in **Appendix A** – Topographical Survey.

2.3. Hydrology

The Grand Union Canal runs alongside the southern boundary of the site. The canal functions as a tributary of Fray's River / the River Pinn approximately 1.4km northwest of the proposed site. The canal is regulated by the Canal & River Trust, while the River Pinn is a designated Main River regulated by the Environment Agency. This information is shown in the below extract (*Figure 2*) from the Statutory Main River Map.

Additionally, the canal also outfalls to the River Brent, located approximately 9km to the east. The River Brent subsequently discharges into the River Thames in Brentford.

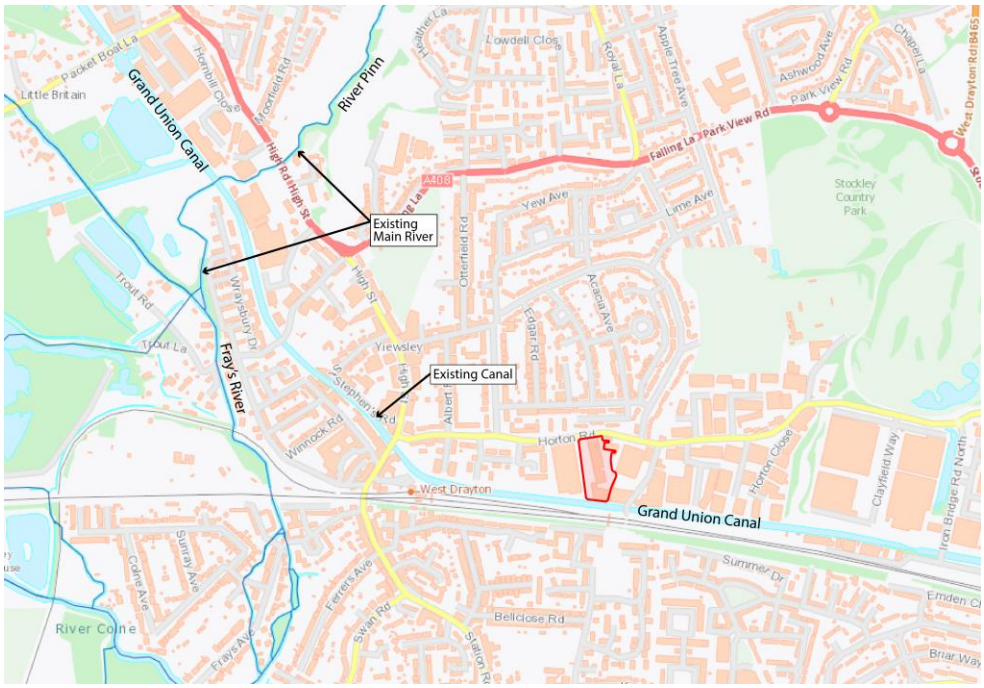

Figure 2 – Extract of Statutory Main River map (Environment Agency, 2025)

2.4. Geological Records

British Geological Survey (BGS) online mapping for the area shows that the site is likely underlain by bedrock of London Clay Formation below superficial geology deposits of formation Lynch Hill Gravel Member. The BGS bedrock and superficial geology records for the surrounding area of the site are shown in *Figure 3* and *Figure 4*.

Figure 3 - Superficial Deposits at the site (British Geological Survey, 2025)

Figure 4 - Bedrock Deposits at the site (British Geological Survey, 2025)

2.5. Site Investigation

An intrusive ground investigation was undertaken by Ridge and Partners LLP on site between 25th and 27th February 2025. This consisted of 8 windowless sample boreholes WS01 – WS08 (up to a maximum depth of 5.0mbgl). The borehole locations are shown in the below extract (*Figure 5*) from the Exploratory Hole Location Plan within the ground condition assessment found in Appendix F – Ground Condition Assessment.

Figure 5 - Windowless Borehole Location Plan (Ground Condition Assessment, Ridge 2025)

The site investigation reported the following ground conditions as summarised below:

Table 1 - Summary of Ground Conditions (Ground Condition Assessment, Ridge 2025)

STRATUM	DEPTH TO TOP (MBGL)	DEPTH TO BASE (MBGL)
Made Ground	0.09 - 0.19	0.95 - 1.58
Lynch Hill Gravel Member	0.96 - 1.58	2.84 – 5.00

Groundwater monitoring was undertaken on the site between 20th March and 31st March 2025. The following groundwater information was recorded:

Table 2 - Groundwater Strikes (Ground Condition Assessment, Ridge 2025)

LOCATION	INITIAL STRIKE (MBGL)	RISING TO (MBGL)	PEAK GROUNDWATER LEVEL (MAOD)
WS01	3.90	3.70 (in 30 minutes)	26.66
WS02	3.80	3.53 (in 60 minutes)	26.67

Table 3 – Groundwater Levels (Ground Condition Assessment, Ridge 2025)

LOCATION	20/03/2025 (MBGL)	24/03/2025 (MBGL)	31/03/2025 (MBGL)
WS01	Damp	Dry	Damp
WS03	Dry	Dry	Dry
WS07	Dry	Dry	Dry

2.6. Infiltration testing

Infiltration testing was completed on the site in accordance with BRE Digest 365. Falling head testing was conducted at locations WS01, WS03 and WS07 (as shown in *Figure 5*) targeting the underlying natural soils to provide indicative infiltration rates. The calculated infiltration rates are shown in *Table 4* below.

Table 4 - Soil Infiltration Testing Results (Ground Condition Assessment, Ridge 2025)

HOLE ID	TEST	RESPONSE ZONE (MBGL)	STRATA TESTED	TOTAL TEST TIME (MINS)	INFILTRATION RATE (M/S)
WS01	1	1.60 – 3.60	Lynch Hill Gravel	15	1.00×10^{-5}
WS01	2	1.60 – 3.60	Lynch Hill Gravel	15	8.57×10^{-6}
WS01	3	1.60 – 3.60	Lynch Hill Gravel	15	6.40×10^{-6}
WS03	1	1.27 – 2.27	Lynch Hill Gravel	15	5.81×10^{-6}
WS03	2	1.27 – 2.27	Lynch Hill Gravel	16	6.55×10^{-6}
WS03	3	1.27 – 2.27	Lynch Hill Gravel	15	4.32×10^{-6}
WS07	1	2.00 – 3.00	Lynch Hill Gravel	2	1.17×10^{-4}
WS07	2	2.00 – 3.00	Lynch Hill Gravel	2.50	9.66×10^{-5}
WS07	3	2.00 – 3.00	Lynch Hill Gravel	5.50	4.76×10^{-5}

Sufficient infiltration was found in all 3 windowless boreholes; therefore, infiltration has been deemed a viable form of surface water disposal. A minimum design infiltration rate of 4.32×10^{-6} m/s can be applied across the site. The design infiltration rate for any proposed infiltration features will be reviewed based on the results from the closest infiltration testing site.

2.7. Hydrogeology

There are no source protection zones within 1.5km of the site boundary.

2.8. Existing Drainage

A full utility survey of the site has not currently been completed and therefore is not included within the scope of this Drainage Strategy. For the purposes of this assessment, it is assumed that the existing drainage infrastructure is inadequate and will be replaced by a newly proposed drainage system.

2.9. Critical Drainage Areas (CDA)

The site is identified as being on the boundary of a critical drainage area, as shown in the extract below (*Figure 6*). A critical drainage area as defined by the Drain London Tier 2 Technical Specification is "a *discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer and/or river) often cause flooding in a Flood Risk Area during severe weather thereby affecting people, property or local infrastructure."*

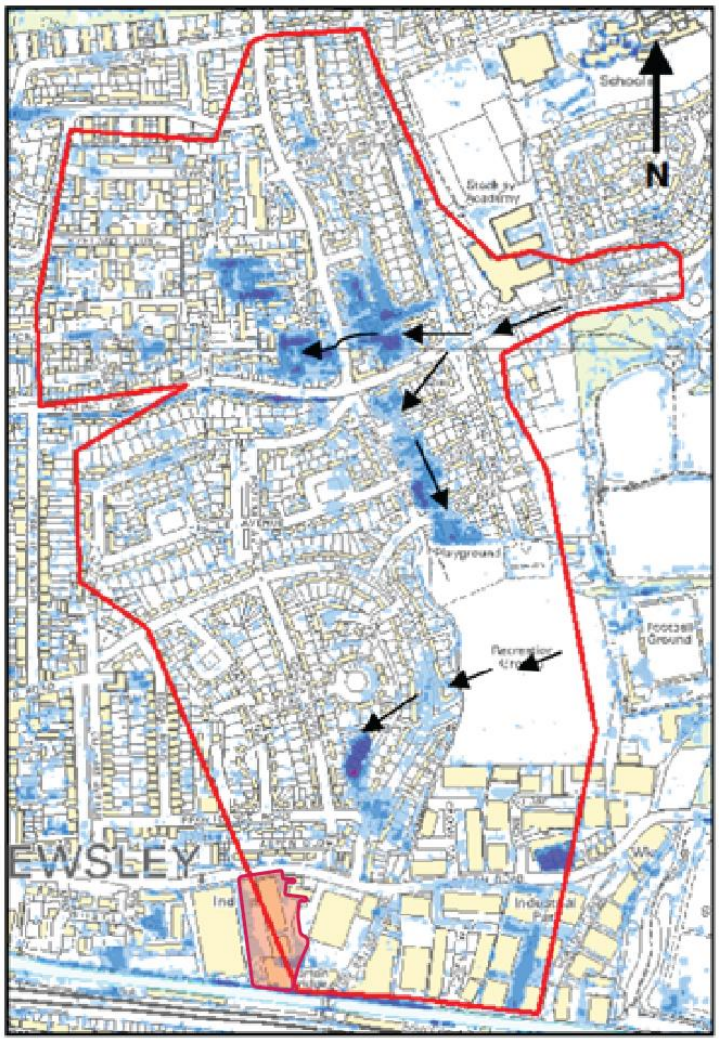

Figure 6 – Critical Drainage Area (London Borough of Hillingdon, Surface Water Management Plan, 2025)

As highlighted in *Figure 6* the site does not intersect with any of the critical overland flow routes as depicted by the black arrows. Moreover, as discussed in Section 4, the proposed surface water drainage strategy has been designed to manage run off from the 1 in 100 + 20% climate change storm event through infiltration. Therefore, the proposed development will not increase the risk of flooding within the critical drainage area or increase pressure on the existing surface water drainage network in the CDA.

3. DEVELOPMENT PROPOSALS

The proposed development covers an area of approximately 0.9 ha. The site is an existing brownfield site comprising of many independent industrial units.

The proposed development is summarised as follows:

- Construction of two no. large industrial units;
- Concrete service yards to facilitate delivery;
- Rework of existing access road to the proposed units; and
- Associated hard and soft landscaping to facilitate access to the units including parking bays and footpaths.

The proposed development is illustrated in Appendix C – Proposed Site Plan.

4. SURFACE WATER DRAINAGE PROPOSALS

4.1. Overview

The proposed surface water drainage strategy is summarised below:

- Proposed tanked permeable paved parking bays with piped connections to infiltration systems;
- Proposed below ground geocellular infiltration tank beneath the service yards; and
- Proposed permeable paved parking bays infiltrating to ground.

The proposed surface water drainage strategy is illustrated in Appendix D – Proposed Drainage Strategy.

4.2. Proposed SuDS Strategy

For the proposed surface water management strategy for the site, the drainage hierarchy has been followed. The drainage hierarchy (in order of preference for surface water runoff disposal) is summarised as follows:

- Infiltration (discharge to ground via soakaway or another form of suitable infiltration system);
- Outfall to a watercourse/ surface water body;
- Discharge to a surface water sewer, highway drainage or other positive drainage system; and
- Where none of the above are viable, discharge to a combined sewer.

Sufficient infiltration was found in all 3 windowless boreholes; therefore, in accordance with the drainage hierarchy, infiltration will be utilised for surface water disposal. As mentioned in Section 2.6, a minimum design infiltration rate of 4.32 $x10^{-6}$ m/s will be used across the site.

To ensure compliance with the London Borough of Hillingdon Council SuDS Design and Evaluation Guide, the site will attenuate surface water up to the 1 in 100 + 20% climate change event. As the site is a commercial development, it is not required to provide storage up to the 1 in 100 + 40% climate change event. Furthermore, Cv Values for 0.9 for areas of hardstanding and 0.95 for roofs have been utilised.

Following the definition of finished floor levels by the architects, a full levels model can be developed, and an overland flow routing plan will be produced. It is currently presumed the site will mimic the overland flow routes of the existing site, with any exceedance flow travelling to the south of the site and into the Grand Union Canal.

4.3. Design of Surface Water Drainage and InfoDrainage Modelling

The site drainage has been modelled using InfoDrainage, which is the latest programme offered by Innovyze to replace MicroDrainage. The output results include all the data that is typically presented in MicroDrainage outputs, plus greater visibility of proposed SuDS features and graphical representation. Innovyze has worked extensively with approving authorities to ensure the output from InfoDrainage facilitates a more streamlined review. InfoDrainage design software has been utilised to design the surface water drainage systems; network details and results for the 2-year, 30-year, 100-year, and 100-

year + 20% climate change storm events are provided in Appendix E – Infodrainage Results and Outputs of this report.

The following section should be read in conjunction with drawing 5027861-RDG-XX-XX-D-C-000500-000501Proposed Drainage Strategy drawings in Appendix D – Proposed Drainage Strategy.

Below ground soakaways formed from high-strength geocellular tanks have been specified beneath the service yard for each of the proposed units to dispose of surface water. Permeable paved parking bays have also been specified to the perimeter of each of the yards and the access road. Where the parking spaces are situated further than 5 m from the face of the building, the permeable paving will be specified to allow for infiltration. Where they are closer to the building, a tanked system is proposed.

The infiltration rate for each of the proposed features has been determined based on the results of the closest infiltration test undertaken as part of the ground condition assessment. Infiltration rates from WS07 have been utilised for Infiltration Tank 1 and Porous Paving 1 and infiltration rates from WS03 have been utilised for Infiltration Tank 2, Porous Paving 3 and Porous Paving 4.

The specification of the SuDS features have been summarised in *Table 5* below:

Table 5 - Proposed SuDS Summary

SUDS FEATURE	FETAURE DEPTH (M)	FEATURE LENGTH (M)	FEATURE WIDTH (M)	OUTFLOW CONTROL
Infiltration Tank 1	1.00	12.0	25.0	Infiltration into ground at 0.1713 m/hr
Infiltration Tank 2	1.00	16.0	22.0	Infiltration into ground at 0.0156 m/hr
Porous Paving 1	0.55	21.6	4.8	Infiltration into ground at 0.1713 m/hr
Porous Paving 2	0.45	7.8	4.8	Free discharge to SW MH 14
Porous Paving 3	0.35	7.2	4.8	Infiltration into ground at 0.0156 m/hr
Porous Paving 4	0.35	9.6	4.8	Infiltration into ground at 0.0156 m/hr
Porous Paving 5	0.70	22.0	4.8	Free discharge to SW MH 15
Porous Paving 6	0.7	50.0	4.8	Free discharge to SW MH 15

Small amounts of flooding occur across the network in the 1 in 100 +20% climate change rainfall event. A summary of the areas of flooding can be found in the *Table 6* below:

Table 6 - Flooded Volumes for the 1 in 100 +20% climate change event

STRUCTURE	FLOODED VOLUME (M3)	LOCATION OF FLOOD
Porous Paving 5	0.612	Surface flooding across Porous Paving 5 to infiltrate into network via tanked porous paving.
SW MH 10	0.253	
SW MH 18	0.388	Flooded volume to be managed within roadway and re enter the network via surface water collection systems

4.4. Water Quality

In accordance with Table 4.3 in Chapter 4 of the SUDS manual (C753) a water quality assessment has been undertaken using the Simple Index Approach. This approach is set out in Section 26.7.1 of the SUDS Manual.

From Table 26.2 of the SUDS Manual, the pollution hazard indices are notes as follows:

Table 7 - Pollution Hazard Indices

LAND USE	POLLUTION HAZARD LEVEL	TOTAL SUSPENDED SOLIDS (TSS)	METALS	HYDROCARBONS
Commercial Roofs	Low	0.3	0.2	0.05
Commercial Roads / Delivery Area	Medium	0.7	0.6	0.7

To deliver adequate treatment, the selected SuDS components should have a total mitigation index that equals or exceeds the pollution hazard index.

Total SUDS Mitigation ≥ Pollution Hazard Index

Where multiple SUDS components are proposed:

Total SUDS Mitigation Index = Mitigation index of the primary SUDS component + 0.5 * Mitigation indices of the secondary SUDS component

There are three treatment trains within the proposed scheme, the mitigation indices for each treatment train are as follows

Table 8 - Pollution Mitigation Indices

TREATMENT TRAIN	TYPE OF SUDS COMPONENT	MITIGATION INDICIES		
		TSS	METALS	HYDROCARBONS
Treatment Train 1	Permeable Paving for discharge to groundwater	0.7	0.6	0.7
Treatment Train 2	Tanked Permeable Paving	0.7	0.6	0.7
	Full retention Separator (e.g. SPEL ESR Full Flow Treatment System)	0.8	0.6	0.9
	TOTAL	1.1	0.9	1.15
Treatment Train 3	Full retention Separator (e.g. SPEL ESR Full Flow Treatment System)	0.8	0.6	0.9

As highlighted above in *Table 8*, the required level of treatment is provided within each treatment train to mitigate the risk of discharge of pollutants for the purpose of the development. Therefore, the design complies with the water quality requirements set out in Chapter 4 of the SuDS Manual.

5. FOUL DRAINAGE PROPOSAL

The location and condition of the existing foul drainage for the site is unknown, therefore it has been assumed the existing network will be abandoned and grubbed up and a new network has been proposed.

The site will drain via gravity, one drain run serving Unit 2 at the rear of the site and one serving Unit 1 to the front. The networks will meet at the site access bellmouth and discharge into the 300 mm dia Thames Water sewer on Horton Road between TW manholes 5201 and 5202.

It is assumed the site will not increase the foul load on the Thames Water sewers in comparison to the previous development on the site. It is understood the existing site is made up of more units than the proposed site, which it is assumed will lead to a reduction in the number of foul discharge units.

6. MAINTENANCE PLAN

The construction, operation, and maintenance requirements of all SuDS components has been considered as part of the proposed drainage strategy. It is important for the performance of the surface water systems that they are maintained on a regular basis. Maintenance should always be completed alongside the manufacturer's requirements.

A summary of the management and maintenance requirements and the expected design life of the above surface water drainage assets is provided in *Table 9* below.

Table 9 - Management and Maintenance Plan

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY	ESTIMATED ASSET DESIGN LIFE
Geocellular Tanks			*>50 years if installed to manufacturer recommendations.*
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually.	
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly.	
	Remove sediment from pre-treatment structures and/ or internal forebays.	Annually, or as required.	
Remedial Actions	Repair/ rehabilitate inlets, outlet, overflows and vents.	As required.	
Monitoring	As per 'Regular Maintenance' activities.	Annually.	
	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years or as required.	
Manholes/ Catchpits			*>50 years*
Regular Maintenance	Inspect chamber for build-up of any debris/ sediment in the base of catchpits and remove as required.	Annually.	

	Inspect covers and frames for any signs of damage, or indications of covers becoming loose/ tampered with.	Annually.	
Remedial Actions	Repair/ replace covers or frame. Remove silt/ debris from base of catchpit.	As required.	
Monitoring	As per 'Regular Maintenance' activities.	Annually.	
Pipes			*>50 years*
Regular Maintenance	Inspect chamber by visually checking for evidence of standing water in pipe runs (pipe invert submerged) and chamber is free-flowing. This may be an indication of blockages within the pipe. High-pressure jet/ rod as necessary to remove any blockage.	Annually.	
	Check for any obstructions across pipe inlets/ outlets within chamber/ Remove any debris or other obstructions as necessary.	Annually.	
Remedial Actions	Rodding and/ or CCTV condition survey and high-pressure jetting. Clearance of pipe inlets/ outlets within the chamber.	As required.	
Monitoring	Intrusive inspection (CCTV condition survey) to be undertaken of pipes and high-pressure jet washing/ rodding to be undertaken as required to cleanse systems of debris/ blockages. Undertake any other repairs e.g. pipe lining if identified from survey.	Every 10 years or as required.	

Porous Paving		*As standard block paving*
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall or altered frequency based on site specific observations of clogging
	Stabilise and mow contributing adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required, minimum once a year
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip has been raised to within 50 mm of the level of the pacing	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or hazard to users, and relace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10-15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, remedial action	Three- monthly, 48 h after large storms in first six months
	Inspect silt accumulation rate and	Annually

	establish appropriate brushing frequencies		
	Monitor inspection chambers	Annually	
Petrol Separators			*Maintenance should be undertaken in accordance with manufacturers recommendations.*
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly	
	Change the filter media	As recommended by the manufacturer	
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill	
Remedial Actions	Replace malfunctioning parts or structures	As required	
Monitoring	Inspect for evidence of poor operation	Six monthly	
	Inspect filter media and establish appropriate replacement frequencies	Six monthly	
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months	

7. CONCLUSION

Ridge and Partners LLP have been commissioned by Le Masurier Limited to prepare a drainage strategy in support of the full planning application for the proposed development off Horton Road, West Drayton. This report demonstrates that the scheme complies with the London Borough of Hillingdon Council SuDS Design and Evaluation Guide

The proposed surface water drainage strategy has been sized to accommodate the 1 in 100 +20% climate change storm events with ~ 1.25 m^3 of flooding across the site in the most critical event. Surface water will be disposed via infiltration utilising permeable paving and below ground geo-cellular tank structures. A full levels strategy has yet to be developed for the site. Following this, an exceedance flow routing pan and a proposed surface water catchment areas plan can be developed.

Foul water will be disposed via a gravity connection to the Thames Water sewer network on Horton Road. This connection point is subject to a capacity agreement with Thames Water and approved S106 application.

A water quality assessment has been undertaken using the pollution hazard indices and Simple Index Approach, which has concluded the SuDS treatment train provides a sufficient level of treatment to satisfy CIRIA requirements.