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HORTON ROAD, WEST DRAYTON, UB7 8JL FLOOD RISK ASSESSMENT

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HORTON ROAD, WEST DRAYTON, UB7 8JL
FLOOD RISK ASSESSMENT

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CONTENTS

APPENDICES

1. EXECUTIVE SUMMARY

This report presents a Flood Risk Assessment (FRA) commissioned by Le Masurier and prepared by Ramboll UK Limited in support of the Planning Application for 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'. Additionally, the report provides information to support a BREEAM evaluation under the BREEAM UK Non-Domestic Refurbishment And Fit Out (RFO) Standard 6.

The FRA has been conducted following the guidelines of the National Planning Policy Framework (NPPF) to assist the Local Planning Authority (LPA) and relevant statutory consultees in considering the flooding issues pertinent to the proposed development. The assessment includes an evaluation of flood risks from various sources such as tidal, fluvial, pluvial, groundwater, and infrastructure failure. Comparative analysis has been performed between the current site conditions and the proposed development to understand the potential impact on flood risk at other locations as a result of the development.

The report encompass:

- A review of the flood risk to the site based on data and maps from the Environment Agency (EA) and the Strategic Flood Risk Assessment (SFRA);
- An analysis of the proposed development's compatibility with the site's location concerning flood risk;
- An evaluation of the mitigation measures required to address identified flood risks; and
- An outline of proposals for managing surface water runoff from the redevelopment (a drainage strategy has been prepared separately for the site by Ridge Partners LLP and submitted to the LPA together with this document).

As the Site is located within Flood Zone 1, and as no other significant sources of flood risk have been identified, the proposed development is concluded to be appropriate in NPPF terms and no additional mitigation is proposed with respect to the risk of flooding at the site.

The drainage strategy outlined in the report demonstrates that the proposed SuDS measures, including permeable paving, geocellular infiltration tanks, and tanked permeable paving systems, will effectively manage surface water runoff. Rainfall events up to the 1 in 100 + 20% climate change rainfall event will be managed on the site by planned surface water infiltration systems, ensuring no surface water discharge into watercourses or sewers for such events.

2. INTRODUCTION

2.1 Appointment and Brief

2.1.1 Ramboll UK Limited (Ramboll) has been commissioned by LMO Overseas Investment Ltd to undertake a Flood Risk Assessment (FRA) for planning. The FRA is required 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'.

2.1.2 Additionally, this report contains information to support a BREEAM evaluation (BREEAM UK New Construction (Version 6.1, 2024)).

2.2 Scope and Objectives

2.2.1 This FRA has been carried out in accordance with the National Planning Policy Framework (NPPF)[1]. It is to be used to assist the Local Planning Authority (LPA) and relevant statutory consultees when considering the flooding issues of the proposed development, as part of a planning application.

2.2.2 This report considers the risks of various sources of flooding to the Site and the consequent risk of flooding to downstream receptors (such as people, property, habitats, infrastructure and statutory Sites) from the proposed development as a result of surface water runoff. A comparison is made between the current situation and the proposed future development.

2.2.3 This report provides the following information:

1. A review of the flood risk to the Site based upon flood data and the flood maps provided by the Environment Agency (EA) and the relevant Strategic Flood Risk Assessment (SFRA);
2. An assessment of flood risk from all sources including tidal, fluvial, pluvial, groundwater and infrastructure failure to the proposed development;
3. An assessment of the compatibility of the proposed development for its location based on flood risk and its proposed usage;
4. An assessment of the impact of the proposed development in terms of surface water runoff;
5. Proposals for measures to mitigate the generation of surface water runoff as a result of the proposed development; and,
6. Proposals to mitigate any residual flood risks to the development.

2.2.4 This report also evaluates the compliance of the Site with BREEAM New construction standards (Version 6.1) and specifically Criteria Pol 03 (Flood and surface water management).

2.3 General Limitations and Reliance

2.3.1 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.

2.3.2 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] GOV.UK, National Planning Policy Framework (published June 2019) https://www.gov.uk/government/publications/national-planning-policy-framework--2 (accessed 15 Sept 2020)

3. POLICY CONSIDERATIONS

3.1 National Planning Policy

3.1.1 According to NPPF Guidance[2] (which was most recently updated in April 2025) a Flood Risk Assessment is required for all development (including minor development and changes of use) proposed:

- in Flood Zones 2 or 3 or see flood map for planning;
- within Flood Zone 3b;
- within Flood Zone 1 with a Site area of 1 hectare or more;
- within Flood Zone 1 and the flood map for planning shows it is at increased risk of flooding from rivers or sea during its lifetime;
- with Flood Zone 1 and the flood map for planning shows it is at risk of flooding from surface water;
- in areas with critical drainage problems;
- within Flood Zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime; and
- that increases the vulnerability classification and may be subject to sources of flooding other than rivers or sea.

3.1.2 As the Site is located partially within a Critical Drainage Area (Section 4.7 below), an FRA is required under the NPPF.

3.2 Local Planning Policy

West London Strategic Flood Risk Assessment

3.2.1 The west London boroughs of Brent, Barnet, Ealing, Harrow, Hillingdon and Hounslow have commissioned a Strategic Flood Risk Assessment (SFRA) – the "West London Strategic Flood Risk Assessment"

3.2.2 According to the West London SFRA, an FRA is required as detailed in the West London Strategic Flood Risk Assessment Table 4-1[3], as this development is classified as a 'Major Development' occupying an area greater than 1,000 square metres.

3.2.3 According to Table 4-1, where a site-specific FRA is required for a site in Flood Zone 1 Flood risk from all sources should be assessed, including the potential impacts of climate change over the development's lifetime. Furthermore, the EA's 2016 climate change allowances must be used when assessing peak river flows, sea level rises and peak rainfall intensities.

Hillingdon Local Flood Risk Management Strategy, June 2024

3.0.2 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.

3.0.3 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.

[2] https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#:~:text=You%20should%20complete%20a%20FRA,see%20flood%20map%20for%20planning (accessed May 2025)
[3] https://westlondonsfra.london/wp-content/uploads/2019/03/West-London-SFRA-Table-4-1-v1.4.pdf (accessed April 2025)

- 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.

London Borough of Hillingdon SuDS Design and Evaluation Guide

3.2.4 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,

3.2.5 The London Plan 2016[5] is also applicable at the Site and provides important considerations with regard to surface water management. Policy 5.13 discusses sustainable drainage for planning decisions, '*Development should utilize 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)

4. SITE DESCRIPTION

4.1 Application Site Description

4.1.1 The Site is located at Orbital Industrial Estate, Horton Rd, West Drayton UB7 8JL. 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. The centre of the Site area is located at NGR TQ 06574 80204 and comprises approximately 0.91 hectares of land.

4.1.2 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.

4.1.3 The Site is currently composed of 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 through 7 have entrances on the eastern road and are connected within one larger building. Units 8 through 13 are centred around a service area at the southern end of the property.

4.1.4 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-000550) it is assumed that the existing drainage infrastructure at the Site is inadequate and will be replaced by a newly proposed drainage system (plans for which are appended to this report).

Figure 3.1: Site Location

4.2 The Proposed Development

4.2.1 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.

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

4.2.3 The southern half of the property will be occupied by Unit 2 and accessed via the western road coming off of Horton Road. Along the western side of the building a wider paved area will be utilized 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 (Figure 3.2).

5. REVIEW OF BASELINE DATA

5.1 Site Setting

Geological Setting

5.1.1 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).

5.1.2 Intrusive ground investigation was carried out by Ridge and Partners LLP in February 2025. Ground investigation found that the Site is directly underlain by made ground to depths of up to 1.6 m below ground level (BGL), further underlain by the Lynch Hill Gravel Member to a depth of 5 m BGL, at which depth drilling was terminated.

Topographic Setting

5.1.3 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.

5.1.4 According to LiDAR data, the Site is generally flat with the Site high point being the access routes off Horton Road (approximately 30.5 mAOD) 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 30 mAOD and the car park in the west also stands at approximately 30 mAOD.

[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 5.1: LiDAR Topographic Survey Data

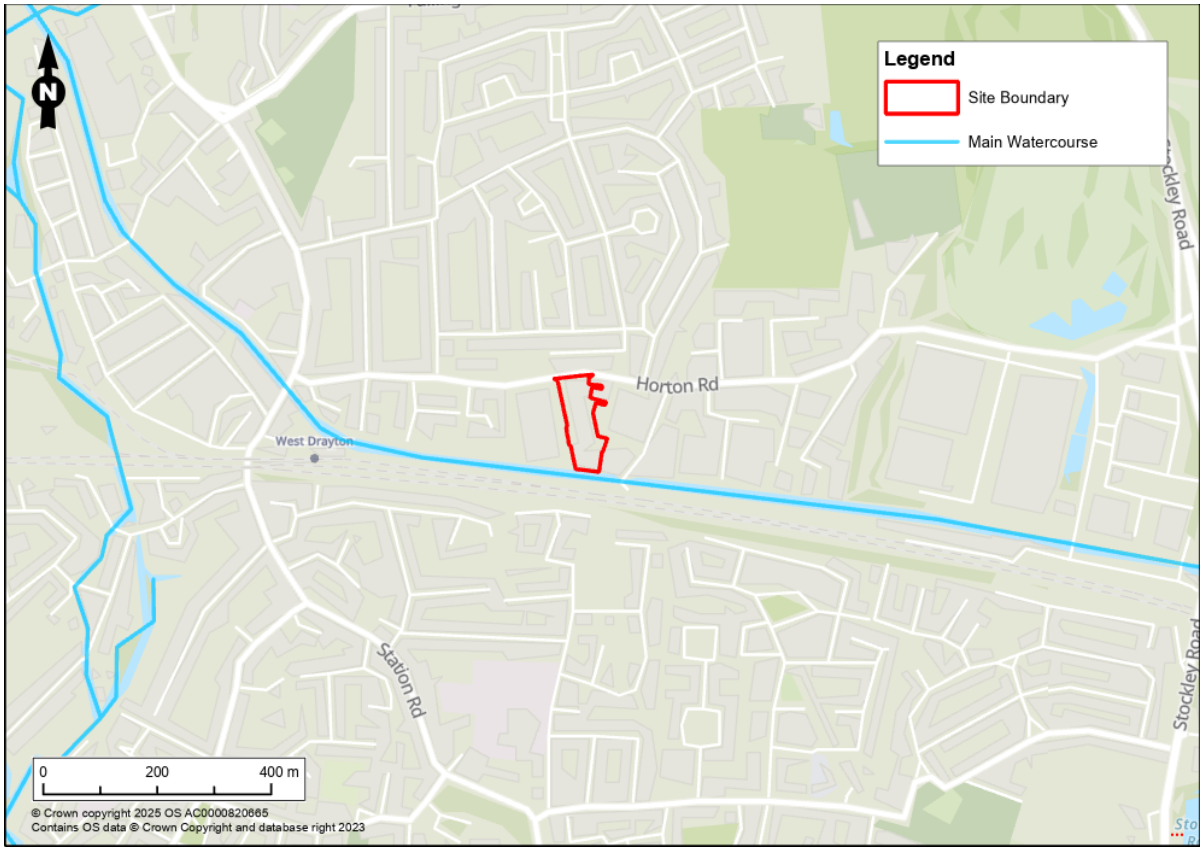
Hydrological Setting

5.1.5 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. with 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.

5.1.6 The London Borough of Hillingdon Local Flood Risk Management Strategy[8] details the relationship of the Grand Union Canal with 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 55.2: Hydrological Setting



Hydrogeological Setting

5.1.7 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 2.84 and 5m BGL at which point drilling was terminated.

5.1.8 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. According to the Ridge groundwater monitoring, groundwater was encountered at depths of 3.90 and 3.80 m BGL at two locations in the north of the Site. Groundwater was not encountered at further window sample locations.

5.1.9 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.

5.1.10 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.*"

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

5.1.11 According to British Geological Survey hydrogeological mapping[10] (at a 1:625,000 scale) the character of the bedrock, in the Thames Group rock unit which underlies the site, is characterised as "*Rocks with essentially no groundwater. Predominantly clayey sequence up to 140m thick confining underlying aquifers. Occasional springs at base have very hard water.*"

5.2 Sources of Flood Risk

Fluvial and Tidal Flood Risk – Present Day

5.2.1 According to the EA fluvial and tidal Flood Map for Planning (updated in March 2025), the entirety of the Site is shown to be located within Flood Zone 1 (Low probability).

5.2.2 The nearest area of Flood Zone 2 is located 750m to the north-west, with Flood Zone 3 located 750m west. These areas of Flood Zones are associated with Fray's River and the Grand Union Canal west, north-west of the Site.

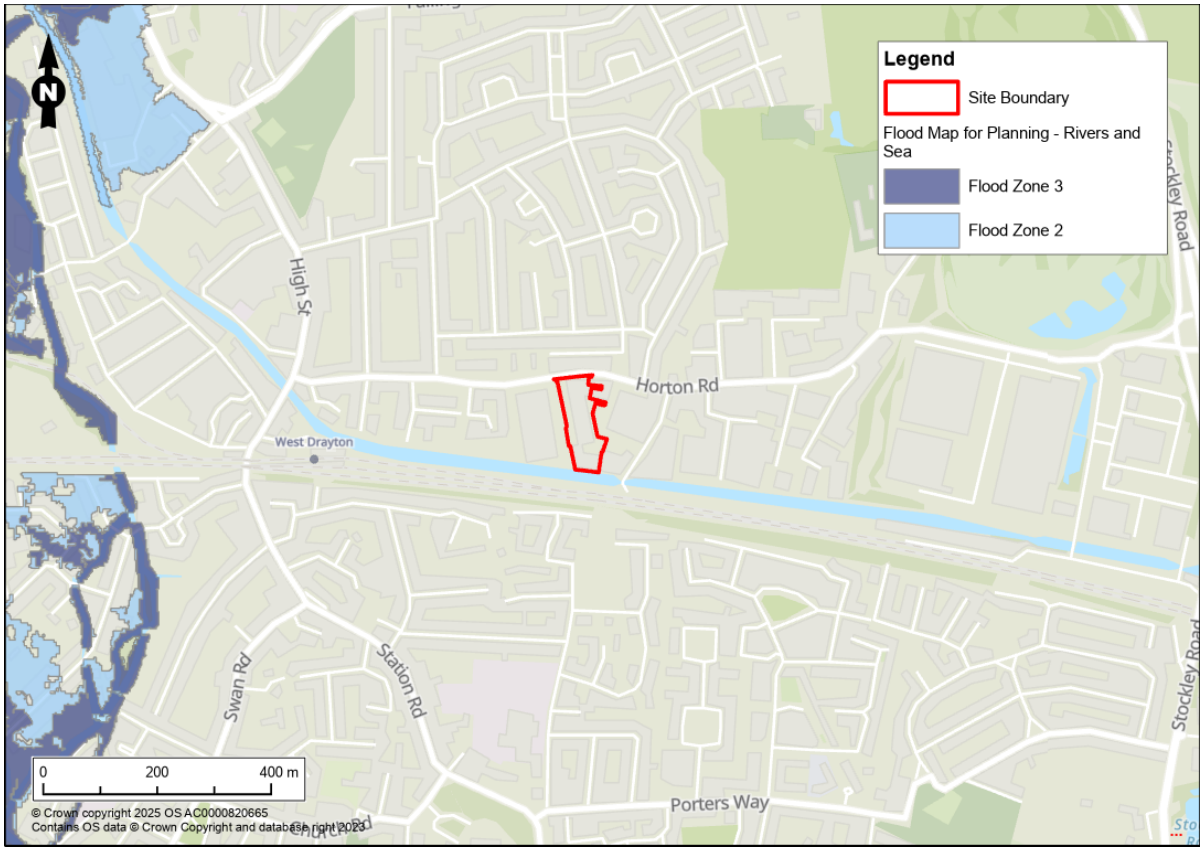
5.2.3 Flood zones are defined by the EA as follows:

- Flood Zone 1 - land considered by the EA to be outside the potential extent of flooding during a 1 in 1,000 (0.1%) annual probability event.
- Flood Zone 2 – land considered by the EA as having between a 1 in 100 and a 1 in 1,000 (1% to 0.1%) annual probability of flooding from rivers or watercourses; and
- Flood Zone 3 - land considered by the EA as having greater than a 1 in 100 (>1%) annual probability of flooding from rivers or watercourses.

5.2.4 It is important to note that the above designations do not take into account the presence of flood defences, nor do they include an allowance for changes in the probability of flooding due to climate change.

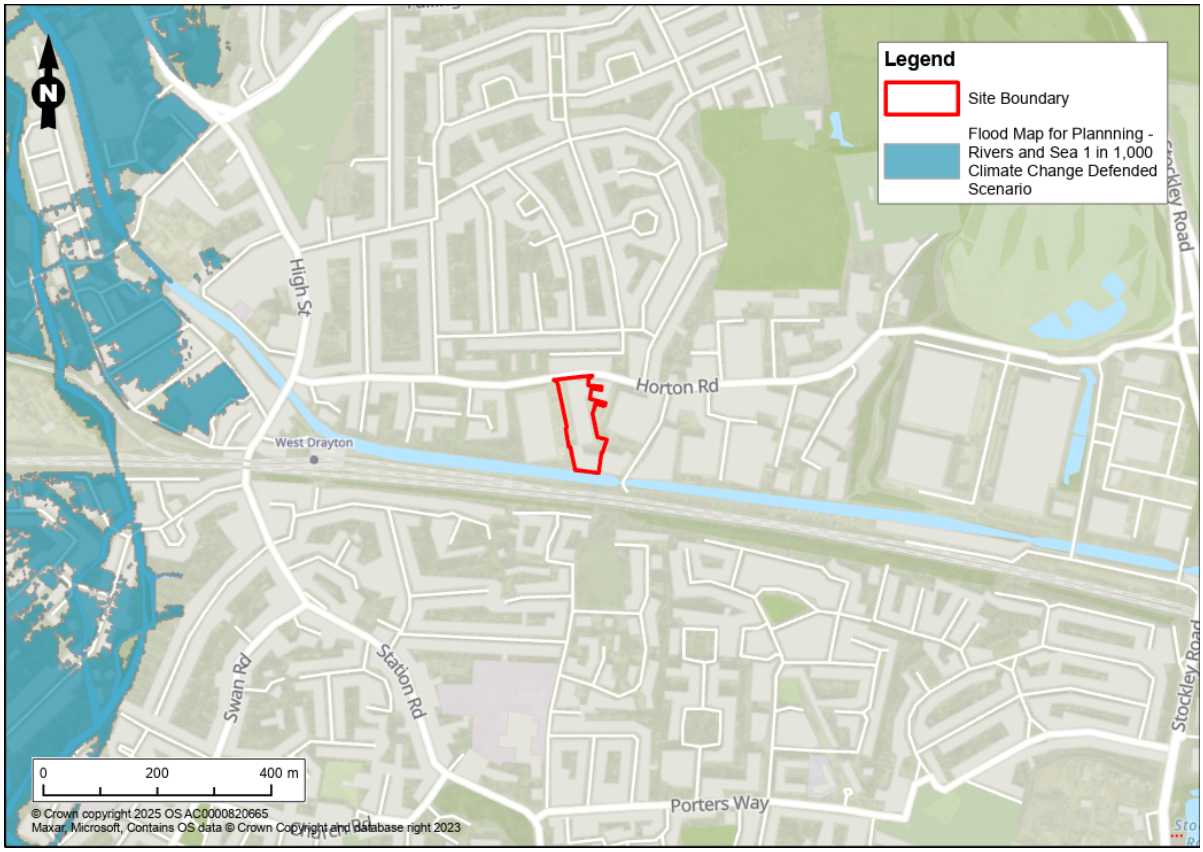
[10] https://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSBoreholes&_ga=2.137718576.1048361512.1685956719-1183799451.1685956719 (accessed May 2025)

Figure 5.3: EA Flood Map for Planning



5.2.5 The EA's Flood Map for Planning additionally includes river and sea mapping with allowance for climate change for the 2080s epoch (2070-2125) under a defended scenario. This mapping shows none of the Site to be within the 1 in 1,000 annual probability flood extent.

Figure 5.4: EA Flood Map for Planning



Flood Defences

5.2.6 According to the EA's Asset Information Management System (AIMS) data[11], there are no formal flood defences on or adjacent to the Site that protect it from flooding, which is consistent with the low flood risk classification applied within the EA's Flood Map for Planning. The nearest flood defences to the Site are approximately 1.1km to the north-west associated with Fray's River as it meets the Grand Union Canal at a location away from the site where regulatory maps record there to be a risk of fluvial flooding.

Surface Water and Sewer Drainage Flood Risk

5.2.7 The EA has undertaken national-scale modelling of potential surface water flood risks (i.e. those associated with extreme rainfall events and associated overland flow rather than flooding from rivers or the sea) which was most recently updated in 2025. Such risks are categorised as High, Medium, Low or Very Low as follows:

- High – Greater than a 1 in 30 (3.33%) chance each year;
- Medium – Between a 1 in 30 and 1 in 100 (3.33% to 1%) chance each year;
- Low – Between a 1 in 100 and a 1 in 1,000 (1% to 0.1%) chance each year; and,
- Very Low – Less than a 1 in 1,000 (0.1%) chance each year.

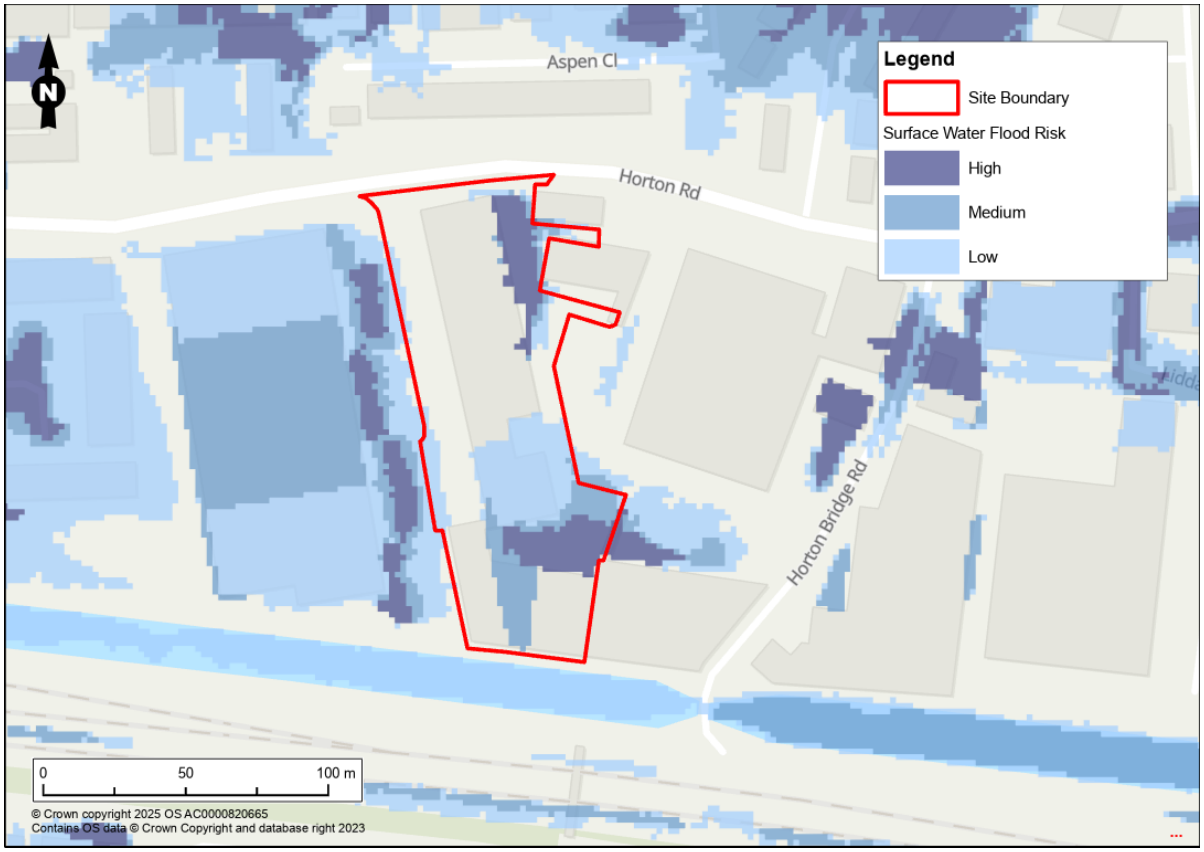
[11] https://environment.data.gov.uk/dataset/8e5be50f-d465-11e4-ba9a-f0def148f590 (accessed April 2025)

Present Day Surface Water Flood Risk

Present Day Surface Water Flood Risk

5.2.8 According to EA mapping, most of the Site including a majority of the building footprints are shown to be at a very low chance of surface water flooding. There are two areas in the north-east and south-east areas of the Site shown to be at a high chance of surface water flooding. The north-eastern area affects the eastern access point from Horton Road onto the Site, shown to partially encroach on building footprints. In the south-eastern area, which serves as a car parking area for the adjacent buildings, there is a high chance of surface water flooding. Building footprints to the north and south of this car parking area are shown to be affected by a medium and low chance of surface water flooding. In summary, surface water flooding with a high chance of affecting the Site accounts for approximately 20% of total Site area, medium chance affects 10% and low chance could affect 20% of Site areas including building footprints on the south side of the Site.

Figure 5.5: EA Surface Water Flood Risk



5.2.9 Across England, the new mapping has resulted in a 43% increase in the number of buildings in areas at risk of flooding from surface water. This is due to changes in the modelling methodology including to the way buildings are represented. The EA's previous surface water flood risk maps assumed that shallow water would be deflected around the walls of buildings. This meant that the properties themselves did not appear to be at risk of flooding on the maps.

5.2.10 This is no longer the case, and the potential effect of building walls is ignored. The EA's modelling initially assumes buildings to be raised 30cm above surrounding ground and then if greater than 25% of the footprint is shown to be at risk of internal flooding, this risk would be extended and presented across the entire footprint. In addition, even if the resultant modelling does not predict an internal flood risk, the EA's mapping would infill the building as having a chance of flooding if

more than 50% of the length of external perimeter of the property (excluding dividing walls between terraced properties) is wet to a depth greater than 75mm. Therefore, it is likely that the EA mapping overestimates the risk of water ingress to the built units, and it is the external areas at risk of surface water flooding.

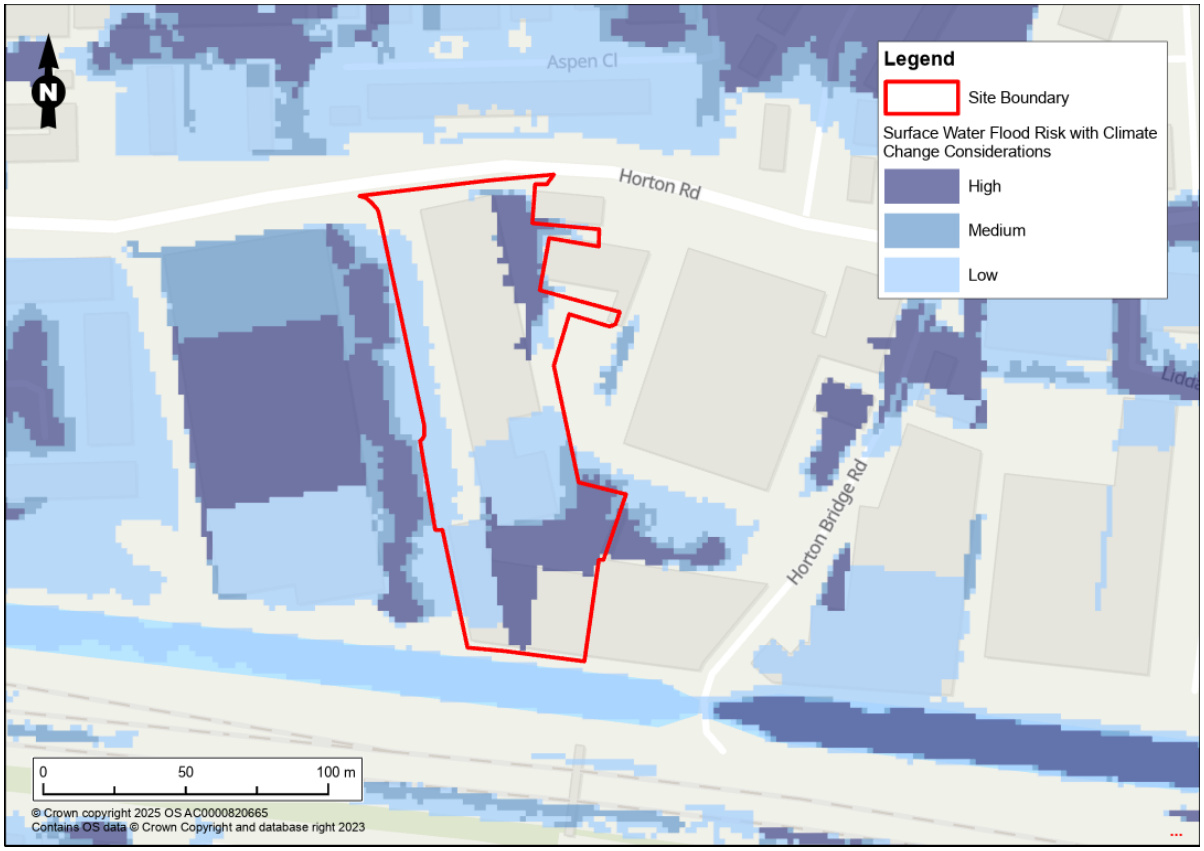
5.2.11 As current drainage assets at the site shall be replaced with a new drainage system and as levelling and resurfacing shall be carried out at the site, surface water flood risk shown on regulatory maps is not indicative of the potential for surface water accumulation following redevelopment.

5.2.12 According to regulatory maps, there are no surface water flow paths leading on to the site.

Climate Change Surface Water Flood Risk

5.2.13 The EA's most recent update to the surface water flood risk maps shows the same flood risk classifications, including an allowance for climate change projected forwards to the 2040 to 2060 epoch. The future surface water maps show approximately 30% of the Site to be within an area at High risk of surface water flooding, including the north-eastern access of Horton Road as well as the south-eastern car parking area and adjacent building footprints. Almost the entirety of the southern end of the Site, not already mentioned as at a high chance of surface water flooding, is expected to be within areas of medium or low risk of surface water flooding including the building footprints.

Figure 5.6: EA Surface Water Flood Risk with Climate Change

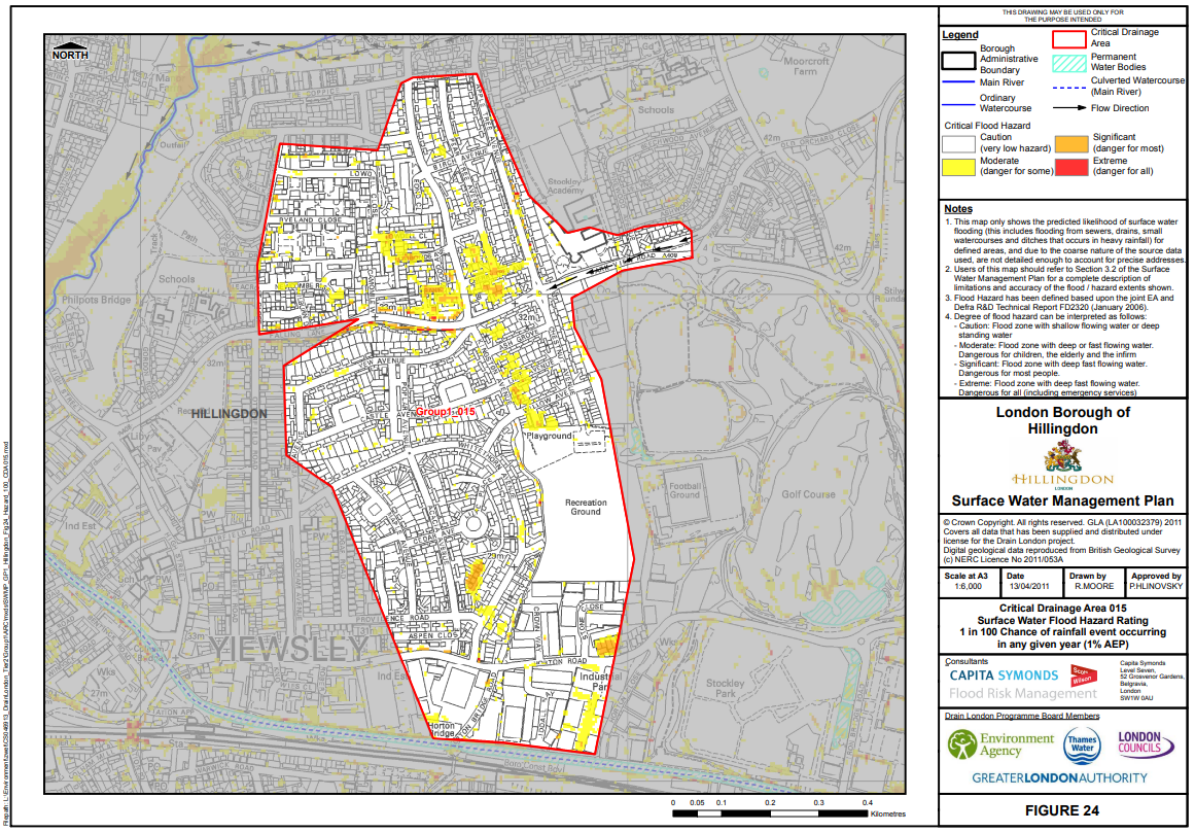


5.2.14 Additionally, according to the London Borough of Hillingdon Surface Water Management Plans[12], the Site is partially located within Critical Drainage Aea 015. The critical drainage area map evaluates the flood hazard rating of relative areas in the borough. Approximately 80% of Site area

[12] https://www.hillingdon.gov.uk/article/3271/Surface-water-management-plan (accessed April 2025)

is located within this drainage area, and approximately 15% of total Site area is rated as having a moderate (danger to some) flood hazard rating in the south-eastern corner of the property, pre-development. This rating coincides with lower lying areas of the Site discussed above as having high surface water flood risk.

Figure 5.7: London Borough of Hillingdon Surface Water Management Plan for Area 015



Groundwater Flood Risk

5.2.15 Groundwater flooding occurs when the water table rises above ground elevations, or it rises to depths containing basement level development. It is most likely to happen in low lying areas underlain by permeable geology. This is most common on regional scale chalk aquifers, but there may also be a risk on sandstone and limestone aquifers or on thick deposits of sands and gravels underlain by less permeable strata such as that in a river valley.

5.2.16 Groundwater monitoring carried out at the Site between the 20th of March and 31st March 2025 found that, groundwater was encountered at depths of 3.90 and 3.80 m BGL at two locations in the north of the Site. Groundwater flooding is considered to be a low risk overall based on the depth to groundwater recorded at the Site, the low productivity of the underlying aquifer and as the operational Site would be wholly hardstanding, limiting the potential for vertical migration of groundwater.

5.2.17 No basements or significant sub-surface structures are proposed at the Site.

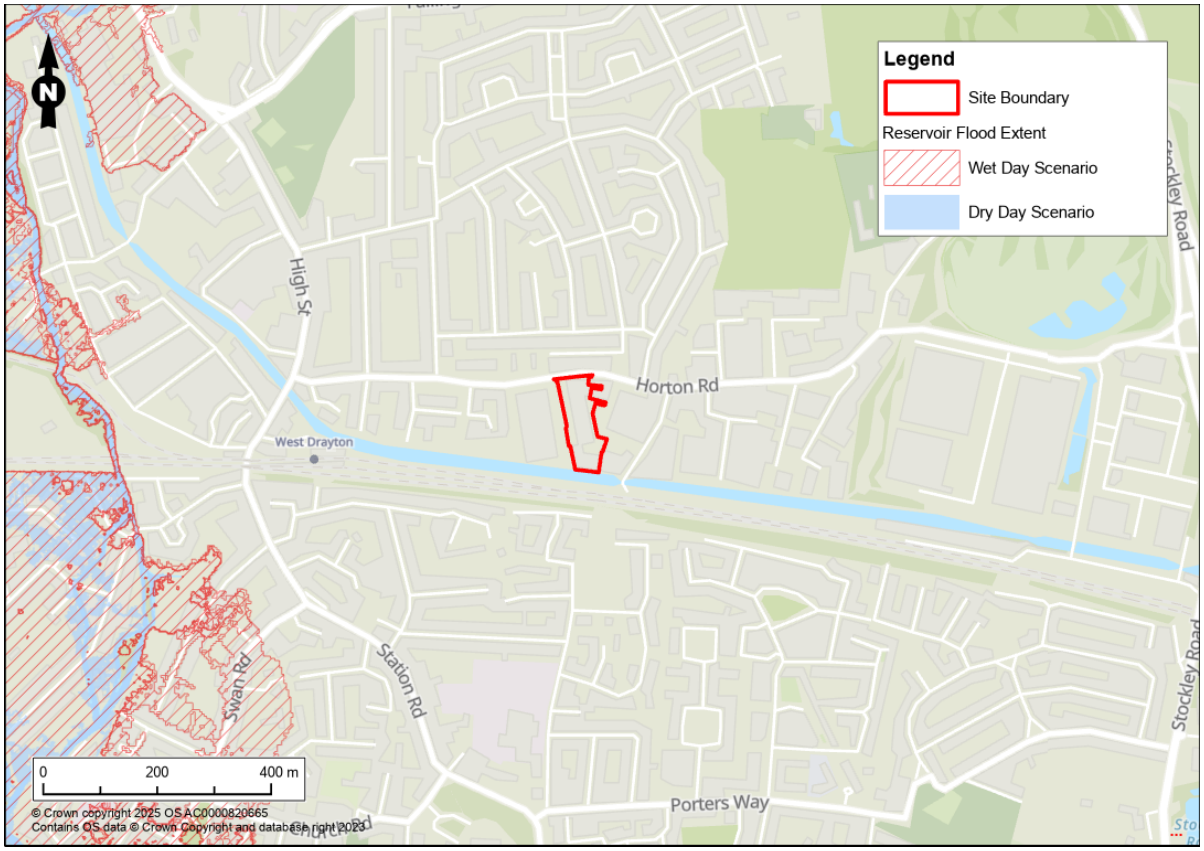
Risk from Reservoirs, Canal and Other Artificial Sources

5.2.18 The EA's online mapping[13] suggests that the Site is not at a potential flood risk associated with reservoir failure, either during periods of normal river flows (the 'dry day' scenario) and during

[13] https://www.gov.uk/check-long-term-flood-risk (accessed April 2025)

periods when river flows are higher than usual (the 'wet day' scenario). The nearest area of flood risk associated with reservoir failure is approximately 760m north-west of the Site adjacent to upstream areas of the Grand Union Canal. This area is at risk of a "Wet Day" scenario associated with the George V Flood Storage Area and the Hilfield Park Reservoir.

Figure 5.8: Reservoir Flood Extents



Historic Flooding

5.2.19 The EA publishes geospatial data regarding historical flood events[14]. According to available EA spatial data, there are no historical records of flooding on or near the Site. The closest recorded historical flood event occurred 1km north-west of the Site associated with the River Pinn.

5.2.20 The absence of coverage by recorded flood outlines by the EA for a specific area does not mean that the area has never flooded, only that there are currently no records of flooding in that area. It is also possible that the pattern of flooding in a specified area has changed, and the area would now flood or not flood under different circumstances.

5.2.21 According to the Flood Incidents and Investigations resource[15] published by the London Borough of Hillingdon there have been multiple recorded historical incidents of flooding across the borough since 1914. In all of the cases outlined in the flood investigations none detail incidents of flooding along Horton Road where the Site is located. Prior to an event that occurred in 2013, recorded flood events are not as detailed as more recent events, however there are some references to flooding along the River Pinn and Fray's River which are within 1km of the Site.

[14] https://environment.data.gov.uk/dataset/8c75e700-d465-11e4-8b5b-f0def148f590 (accessed April 2025)
[15] https://storymaps.arcgis.com/collections/d7aad8a5f7394360a08d4b16fe8e54f6 (accessed April 2025)

6. ASSESSMENT OF FLOOD RISK

6.1 Flood Risk Summary

Fluvial and Tidal Flood Risk

6.1.1 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

6.1.2 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

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

6.2 Flood Risk Vulnerability

6.2.1 According to Table 2 (Flood Risk Vulnerability Classification) in the Planning Practice Guidance to NPPF[16] the Site is classed as Less vulnerable as the Site contains buildings used for shops, financial, professional, and other services.

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

6.3 Sequential Test

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

6.4 Mitigation

6.4.1 A Site-specific drainage strategy has been developed 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 2. Furthermore, a full drainage strategy has been prepared by Ridge and Partners LLP (dated May 2025, Ref.: 5027861-RDG-XX-XX-T-C-000550) and submitted to the LPA together with this FRA.

6.4.2 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 an allowance for climate change.

6.4.3 No further flood risk mitigation is required at the site.

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

6.5 Flood Risk Conclusions

6.5.1 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.

No further flood risk assessment is deemed necessary.

7. IMPACT OF DEVELOPMENT ON SURFACE WATER RUNOFF

7.1.1 A Drainage Strategy for the Site has been prepared by Ridge, and drawings of the proposed drainage strategy are appended to this report.

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

7.2 Infiltration testing

7.2.1 Infiltration testing was completed on 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).

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

7.3 Drainage Strategy

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

- Below Ground Geocellular Infiltration Tanks: These tanks are situated beneath the service yards, providing additional capacity for water infiltration and storage.
- Permeable Paved Parking Bays: These are designed to allow water to infiltrate directly into the ground, reducing surface runoff. Tanked Permeable Paving will be installed where permeable paving is situated within 5m of buildings.

7.3.2 Small amounts of flooding occur across the network in the 1 in 100 +20% climate change rainfall event. These will be managed by allowing surface water flooding on limited areas of paving (to infiltrate into the network) and roadway (to re-enter the network via surface water collection systems), away from buildings. The total volume of above ground storage proposed in the 1 in 100 + 20% CC event is

7.4 Water Quality

7.4.1 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.

7.4.2 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.

7.4.3 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.

7.5 Impact On Surface Water Runoff: Summary

7.5.1 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.

7.5.2 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 offsite increase in flood risk and is likely to represent a significant betterment to existing conditions.

7.5.3 The design complies with the water quality requirements set out in Chapter 4 of the SuDS Manual.

8. BREEAM

8.1 Background: BREEAM UK New Construction (Version 6.1, 2024)

8.1.1 The Technical Guide for the BREEAM UK New Construction is a performance-based assessment method and certification scheme for new buildings that is quantified by individual measures and associated criteria across a range of environmental issues. This includes Criteria Pol 03 (Flood and surface water management) which aims to avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, and minimise the risk and impact of localised flooding on and off-Site, watercourse pollution and other environmental damage. The POL 03 criteria is split into three parts:

- Flood resilience - (2 credits);
- Surface water run-off - (2 credits); and
- Minimising watercourse pollution - (1 credit)

Flood Resilience

8.1.2 Two (2) credits are available under 'flood resilience' where a Site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding (in accordance with current best practice national planning guidance). The FRA takes all current and future sources of flooding into consideration, including:

- Fluvial (rivers);
- Tidal;
- Surface water: sheet run-off from adjacent land (urban or rural);
- Groundwater: most common in low-lying areas underlain by permeable rock (aquifers);
- Sewers: combined, foul or surface water sewers; and
- Reservoirs, canals and other artificial sources.

8.1.3 Where a Site-specific FRA confirms the development is situated in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain (in accordance with current best practice national planning guidance, one (1) credit can be achieved if additional measures can be achieved to increase the resilience and resistance of the development to flooding.

Surface Water Run-off

8.1.4 A prerequisite condition for surface water run-off credits notes that surface water run-off design solutions must be bespoke, i.e. they must take account of the specific Site requirements and natural or man-made environment of and surrounding the Site. The priority levels detailed below must be followed, with justification given by the appropriate consultant where water is allowed to leave the Site. Priority levels are as follows:

- Priority Level 1 Water is collected for use in the development (e.g. rainwater harvesting)
- Priority Level 2 Water is infiltrated into the ground
- Priority Level 3 Water is discharged to surface water body
- Priority Level 4 Water is discharged to the drainage system
- Priority Level 5 Water is discharged to a combined sewer

8.1.5 Two (2) credits are available under 'surface water run-off' in regards to the rate and volume of surface water management on Site.

8.1.6 For the rate of surface water run-off, drainage measures for brownfield Sites are specified so that the peak rate of run-off from the Site to the watercourses (natural or municipal) shows a 30% improvement for the developed Site compared with the pre-developed Site. This should comply at

the 1-year and 100-year return period events. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. As well as calculations that include an allowance for climate change (made in accordance with current best practice planning guidance).

8.1.7 For the volume of surface water run-off, flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); and either

- Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed Site's development. This must be for the 100-year 6-hour event, including an allowance for climate change (made in accordance with current best practice planning guidance). Any additional predicted volume of run-off for this event is prevented from leaving the Site by using infiltration or other SuDS techniques where relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. Or (when the above can't be achieved):
- Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options. Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options:
    - The pre-development one-year peak flow rate
    - The mean annual flow rate (Qbar)
    - 2L/s/ha

8.1.8 Noting again, for the one-year peak flow rate, the one-year return period event criterion applies. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. As well as calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.

Minimizing Watercourse Pollution

8.1.9 To achieve the one (1) credit for Minimising Watercourse Pollution, it must be demonstrated that there is no discharge from the developed Site for rainfall up to 5 mm.

8.1.10 For areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment must be provided, using appropriate SuDS techniques.

8.1.11 For areas with a high risk of contamination or spillage of substances, such as petrol and oil, separators (or an equivalent system) should be installed in surface water drainage systems.

8.1.12 Chemical or liquid gas storage areas have a means of containment fitted to the Site drainage system (i.e. shut-off valves) to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.

8.1.13 All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific Site requirements and natural or man-made environment of and surrounding the Site.

8.1.14 A comprehensive and up to date drainage plan of the Site should be made available for the building or Site occupiers and relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.

8.1.15 All external storage and delivery areas must be designed and detailed in accordance with the current best practice planning guidance.

8.2 BREEAM Assessment

Flood Resilience

8.2.1 As set out, the Site is located entirely within Flood Zone 1 (low potential risk). The Site is shown in EA mapping to be at risk for surface water flooding pre-development, however with the development of the Site that will improve surface water drainage infrastructure at the Site and mitigate flood risk to the Site. There are no other significant sources of flood risk identified. Therefore, the proposed development is considered to be at a Low risk of flooding under BREAAM guidelines and would likely achieve **two credits**.

Surface Water Runoff

8.2.2 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.

8.2.3 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.

8.2.4 No surface water run-off will be discharged into a watercourses or the sewers as a result of the refurbishment for rainfall events up to and including the 1 in 100 (1%) + 20% climate change allowance. As all surface water runoff will be infiltrated to ground, the largest practical reduction in surface water runoff rates that could be implemented has been achieved. Therefore, the proposed development is considered to adequately manage surface water runoff volume under BREAAM guidelines and would likely achieve **two credits**.

Minimizing Watercourse Pollution

8.2.5 As no surface water runoff will discharge from the Site for rainfall events up to and including the 1 in 100 (1%) + 20% climate change allowance the Site will exceed requirements for minimising watercourse pollution. Therefore, the proposed development is considered to adequately minimize watercourse pollution under BREAAM guidelines and would likely achieve **one credit**.

8.3 BREEAM Summary

Table 9.3: Summary of BREEAM Assessment Criteria Achieved

BREEAM Criteria: Pol 03 Flood and surface water management		
Assessment Criteria	**Available Credits**	**Credits Achieved**
Flood Risk Management	2	2
Surface Water Runoff	2	2
Minimizing Watercourse Pollution	1	1

APPENDIX 1
THE PROPOSED DEVELOPMENT

01
013

SITE LAYOUT PLAN

1:500

NOTES:

SUBJECT TO STATUTORY CONSENTS

SUBJECT TO SURVEY

BASED ON OS MAP REPRODUCED BY PERMISSION OF CONTROLLER OF HM STATIONARY OFFICE (c) CROWN COPYRIGHT

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KEY

PLANNING BOUNDARY

NOTE:
BOUNDARY TAKEN FROM INTERPOLATION OF TITLE NOS. AGL52907, NGL564654 & NGL254539

REV	DATE	NOTE	DRAW	CHCK
–	–	–	–	–

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TITLE
HORTON ROAD, WEST DRAYTON

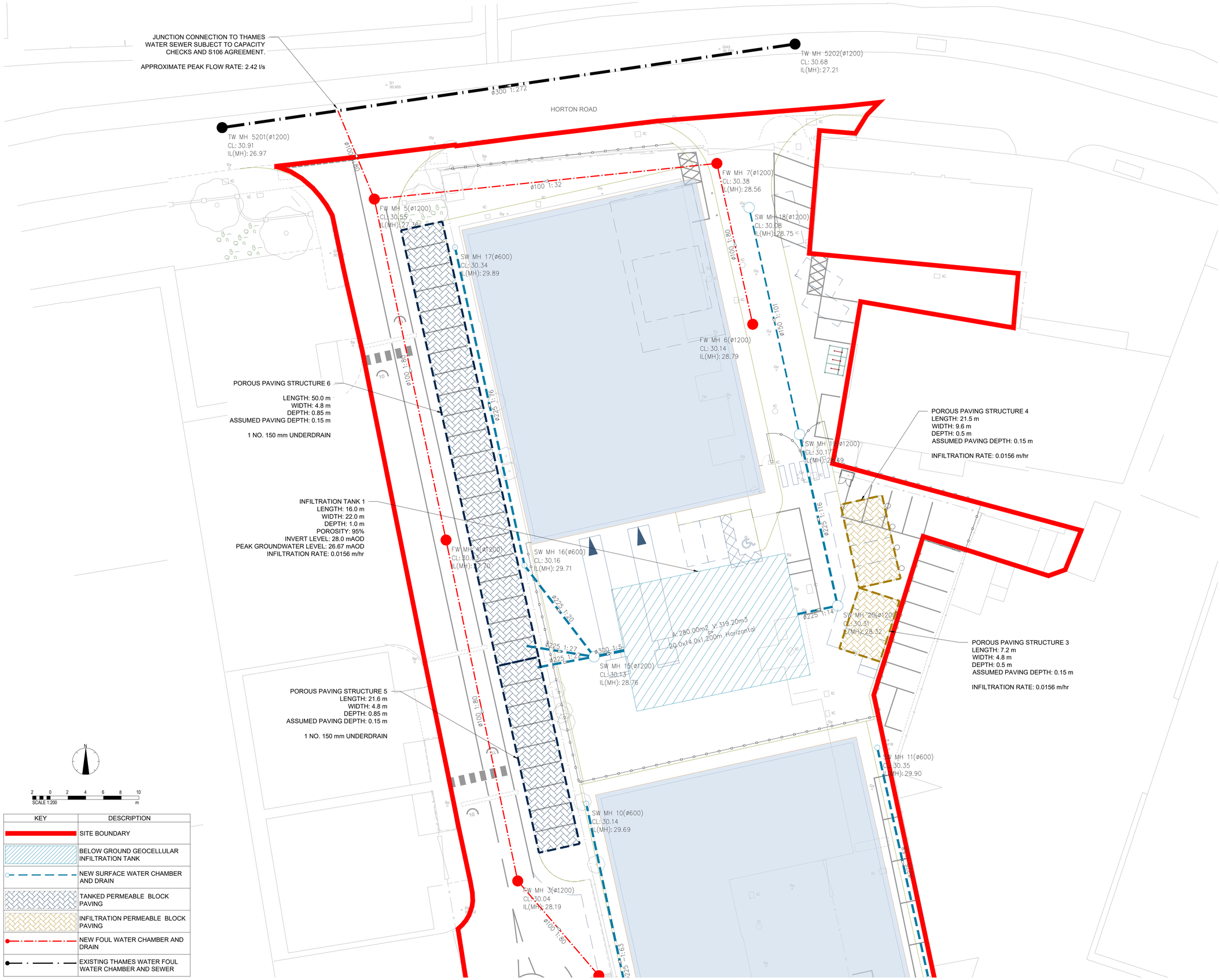
DRAWING
COLOURED SITE LAYOUT PLAN

CLIENT
LE MASURIER

DATE	SCALE	DRAWN
AUGUST 2024	1:500@A1	sd
	STATUS	CHECKED
	FEASIBILITY	mt

DRAWING NUMBER
31906 / FE / 013

APPENDIX 2
DRAINAGE STRATEGY



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

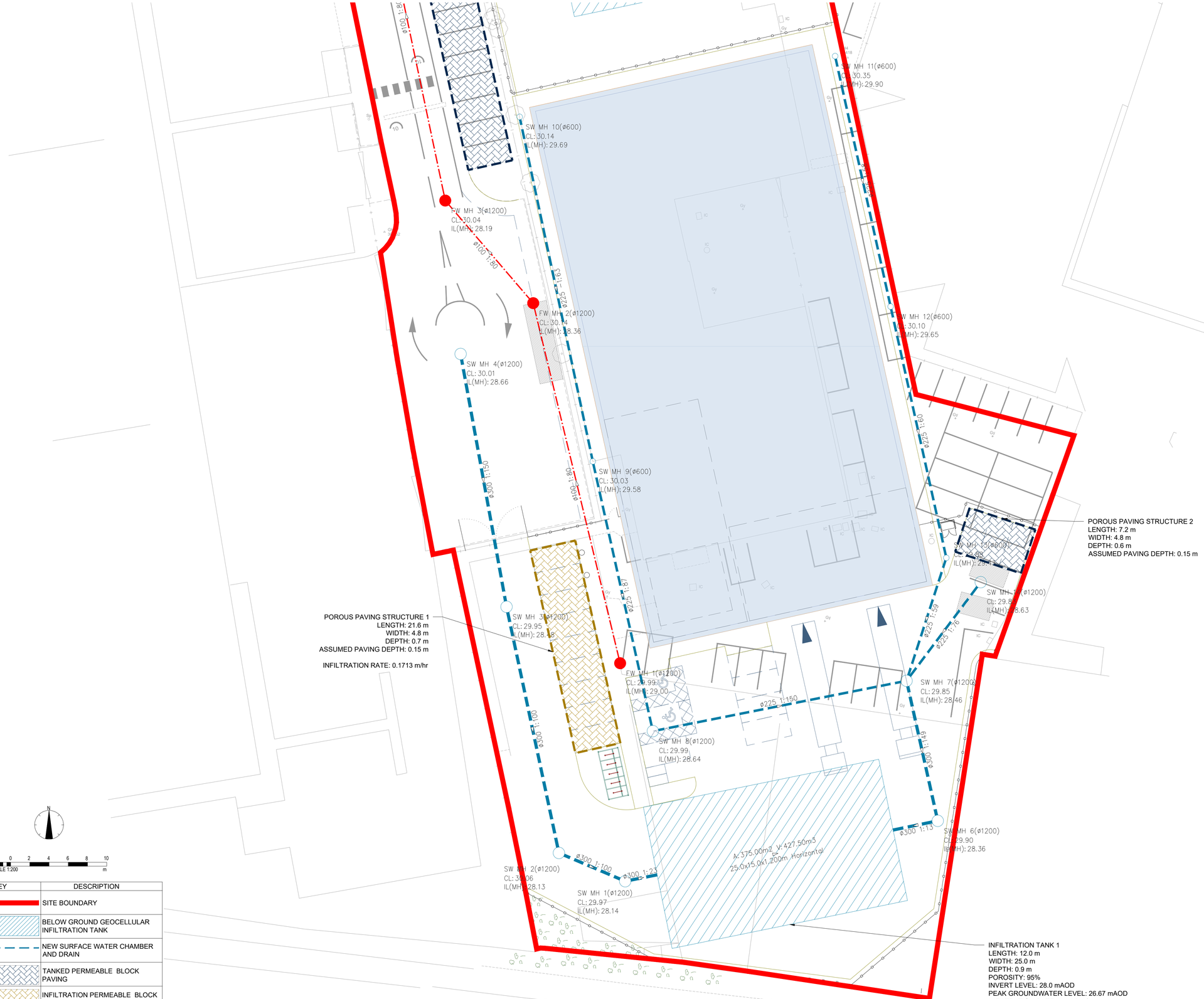
TITLE:
DRAINAGE STRATEGY
SHEET 1-2

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



KEY	DESCRIPTION
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CDM REGULATIONS 2015

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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