Infrastruct CS Ltd
The Stables
High Cogges Farm
High Cogges
Nr Witney
Oxon
OX29 6UN

FLOOD RISK ASSESSMENT

Scheme name:

Newyears Green Lane, Harefield

Document reference: **5138-NEWY-ICS-XX-RP-C-07.001A**

Report Prepared By:
Reno Sam Ireanius
B.Eng M.Sc

Report Checked By:
Mateo Blanco
M.Eng GMICE

Report Authorised By:
Richard White
B.Sc (Hons), C.Env, C.Wem, I.Eng, MCIWEM

October 2022
Project Number: **5138**

Registered Office: Jamesons House, Compton Way, Witney, OX28 3AB
Registered in England and Wales 07521130,

Date:	**18 October 2022**
Project Number:	**5138**
Project Name:	**Newyears Green Lane, Harefield, UB9 6LX**
Prepared By:	**R. Ireanius**
Prepared For:	**London Borough of Hillingdon**

Document Revision Record

Issue	Checked By	Date	Description
Draft	**MBD**	**14th September 2022**	**Initial Issue**
A	**MBD**	**18th October 2022**	**Recommendations added to summary**

Foreword

This document has been prepared solely as a Flood Risk Assessment for the Client, London Borough of Hillingdon. No responsibility or liability will be accepted for any use that is made of this document other than by the Client for the purpose it was written. The conclusions resulting from this study and contained within this report are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

No person other than the client may copy use or rely on the contents of this document without prior permission. Some of the information presented within this report is based on third party information which is believed to be correct; no liability will be accepted for any discrepancies inaccuracy, mistakes or omissions in such information. The report also assesses the flood risk in relation to the requirements of the Environment Agency and as such assesses the site for a specific flood event and not all flood events. The contents of this document must not be copied or reproduced in whole or in part without the written consent of Infrastruct CS Ltd

Table of Contents

1.0 Summary

A Flood Risk Assessment (FRA) has been undertaken to accompany the planning application for the proposed development at Harefield, Hillingdon. This report has been prepared by Infrastruct CS Ltd on behalf of London Borough of Hillingdon in accordance with the guidelines set out in the National Planning Policy Framework.

The following table is an overview of the flood risk and drainage strategy for the proposed development of the site, based upon currently available information and finds the following –

ITEM	RESPONSE
Site Location	The property is located in Harefield, UB9 6JW. The approximate grid reference is 506236E, 188200N (Nat Grid TQ 06236 88200)
Size and Current Land Usage	The current site is approximately 0.59Ha in plan and was previously used with agricultural purposes.
Flood Zone	The development site falls entirely within Flood Zone 3, which is classified as high probability of flooding.
Fluvial Flood Risk	**High** – Refer to Section 6.1 A swale and a bund around the boundary of the site is recommended to protect it from these overland flows coming from the north. It is also proposed that finished floor levels will be raised 150mm above the average ground level.
Overland Flood Risk	**Low** to **Medium** – Refer to Section 7.1
Groundwater Flood Risk	**Low** to **Medium** – Refer to Section 7.2
Sewerage Flood Risk	**Low** – Refer to Section 7.3
Artificial Flood Risk	**Low** – Refer to Section 7.4
Proposed Development	The current architectural proposals involve the demolition of existing buildings and the construction of an educational hub.

Based on this assessment, it is concluded that in accordance with the Flood risk vulnerability and flood zone compatibility table in Section 6.6 from the Planning Practice Guidance document, the report considers the proposed development appropriate.

2.0 Introduction

2.1 Commission

London Borough of Hillingdon has commissioned Infrastruct CS Ltd, to prepare a Flood Risk Assessment (FRA) to support a planning application for this new development at Newyears Green Lane, Harefield.

2.2 Guidance

This flood risk assessment has been compiled in accordance with the recommendations of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG).

2.3 Aims and Objectives

The purpose of this flood risk assessment is to assess the potential flood risks by and to the proposed development. It will identify the flood risk zone, potential sources of flood risk, and will be used to support the proposed planning application.

3.0 Site Details

3.1 Location

The site is located in Harefield, UB9 6JW, and is bounded to the west by the Hillingdon Recycling Centre, to the south by Newyears Green Lane Road, and to the north and east by open greenfields.

Figure 3.1.1 - Site Context

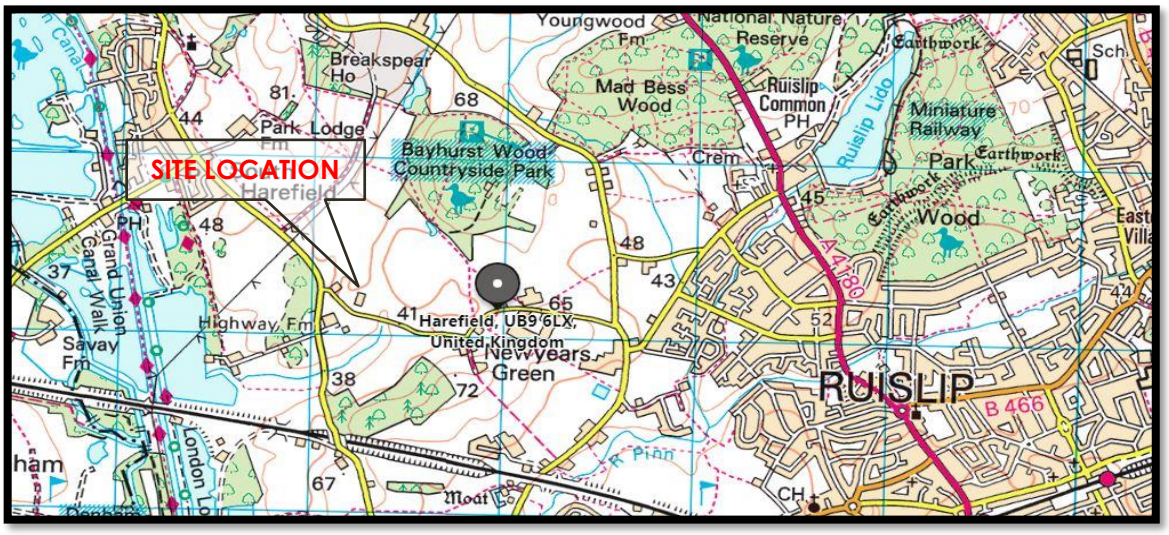


Figure 3.1.2 - Site location

3.2 Grid Reference

The Ordnance Survey National grid reference for the centre of the site is:

506236E, 188200N (Nat Grid TQ 06236 88200)

3.3 Topography and Site Description

The site covers an approximate brownfield area of 0.59ha, and is irregular on plan.

According to the LIDAR data, levels vary within the site between 49.00mAOD to the north-western corner and 44.80mAOD to the south-eastern corner. The maximum fall across the site is 4.2m over 101m, giving a gradient of 1 in 24. LIDAR contours can be found in Appendix A.

3.4 Ground Conditions

To date no intrusive ground investigation has taken place on site, however reference to the Geological Survey of Great Britain indicates the following strata:

Superficial deposits: None.

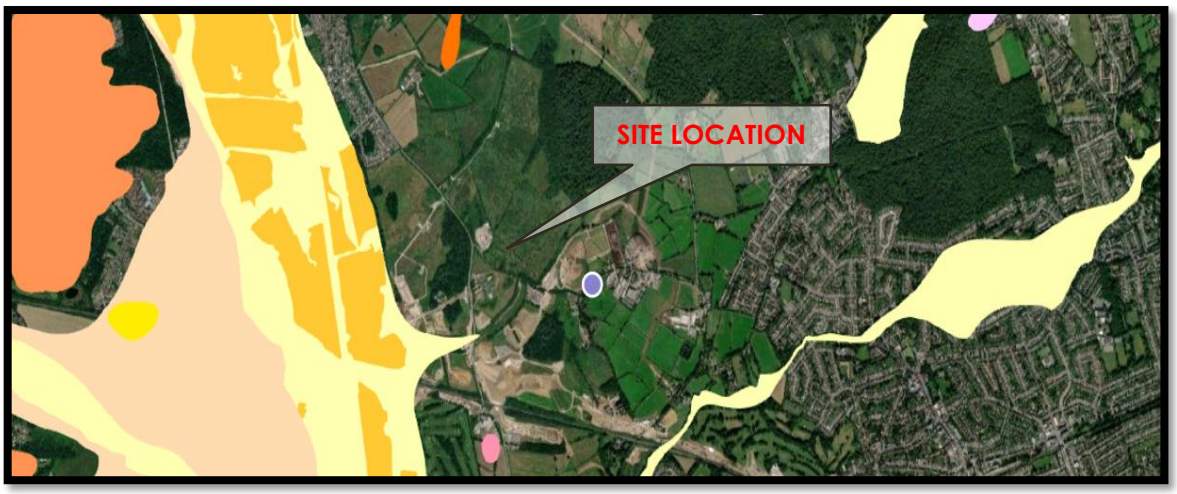


Figure 3.4.1 – Superficial Deposits – BGS online map

Bedrock geology: Lambeth Group - Clay, silt and sand. Sedimentary bedrock formed between 59.2 and 47.8 million years ago during the Palaeogene period.

Figure 3.4.2 – Bedrock Geology – BGS online map

The EA 2015 Historic Landfill Locations map, available in the West London SFRA online tool indicates that the whole site forms part of an historic landfill.

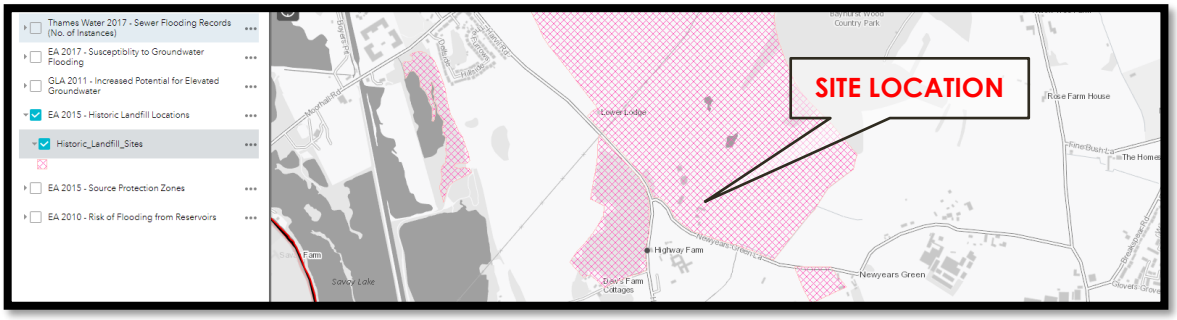


Figure 3.4.3 – West London SFRA – Historic Landfill Sites

Intrusive site investigations carried out adjacent/near the development and shown on the British Geological Survey database (BGS ID: TQ08NE4) Showed the following strata:

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (and any additional remarks)	THICKNESS. Feet.	THICKNESS. Inches.	DEPTH. Feet.	DEPTH. Inches.
	About 180' above mean sea level				
	Water rose to about 48' below surface				
LC	Yellow clay	2	6		
	Darker yellow clay	13	6	16	0
London clay	Hard, blue clay, very dry, with green pebbles, gypsum, shells, and a little iron; a layer of stones (? septaria) at bottom	13	6	29	6
RB	Blue and brown clay mixed	15	6	45	0
	Very hard, dry mixture of brown clay and sand	9	0	54	0
	Yellow, sandy loam	4	6	58	6
	Sand	4	6	63	0

Figure 3.4.4 – British Geological Survey database (BGS ID: TQ08NE4)

3.5 Ground Water

The aforementioned borehole found standing water 48' below ground level.

Further in-situ testing is required to confirm the depth of groundwater.

3.6 Existing Site Drainage

To date no underground services survey has been carried out, and the existing drainage of the site is assumed to be a free discharge into the ground.

The Thames Water wastewater plans show no sewers (foul or surface water) within the immediate vicinity of the site. However, from the 1st October 2011, many private sewers were transferred into public ownership and may not be recorded on the public sewer map. Please refer to Appendix C for a copy of the sewer record plans.

3.7 Existing Watercourses

The nearest main watercourse to the site is an unknown river, which according to the West London Strategic Flood Risk Assessment online mapping tool is culverted until Newyears Green Lane. From that point onwards, it flows above land until it discharges into the Savay Lake near the Queensmead Sailing Club. Savay Lake is 1.1km away on the southwestern side.

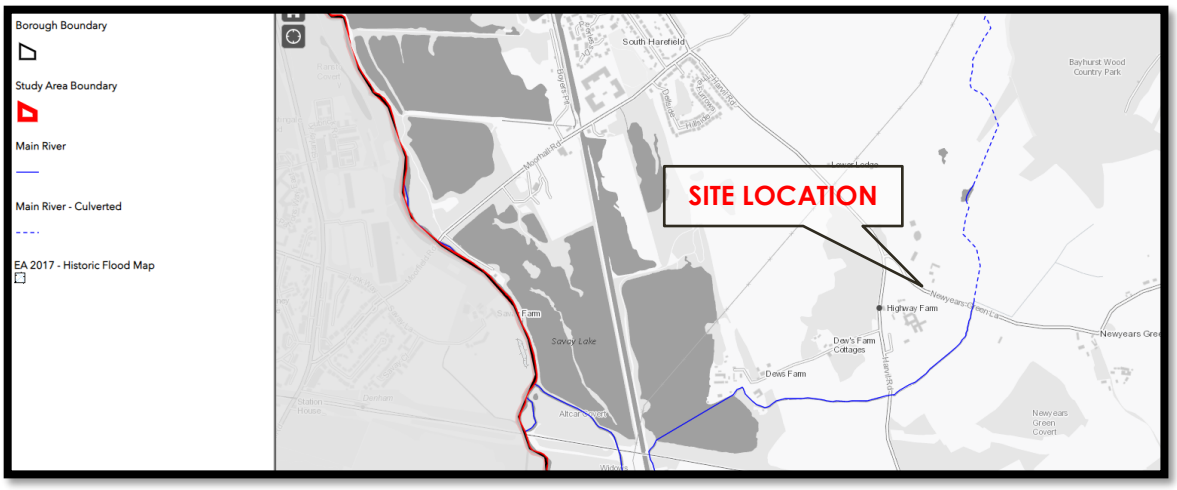


Figure 3.7 – Local Rivers

3.8 Environment Agency Groundwater and Aquifer Protection

Reference to the Environment Agency Groundwater Protection Zone Map shows the area is sited in Zone 3 groundwater protection zone. The Environment Agency have defined Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes, and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk.

Zone 3 (Total catchment) is defined as the total area needed to support the abstraction or discharge from the protected groundwater source.

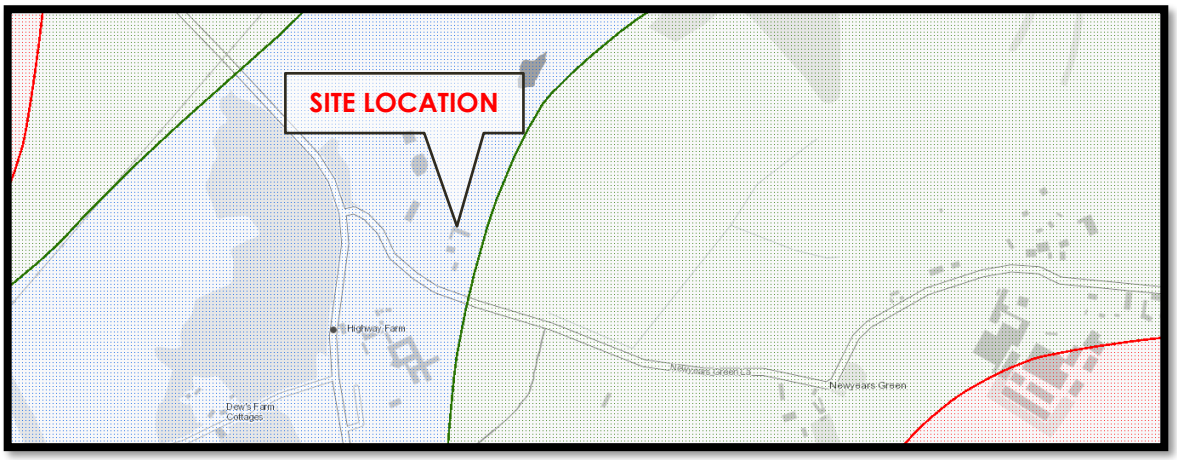


Figure 3.8.1 – Groundwater Protection Zones

KEY:

- **Zone I** – Inner Protection Zone
- **Zone I** – Subsurface Activity
- **Zone II** – Outer Protection Zone
- **Zone II** – Subsurface Activity
- **Zone III** – Total Catchment
- **Zone III** – Subsurface Activity
- **Zone of Special Interest**

The Environment Agency use the zones to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.

A study of the aquifer maps on the Environment Agency website revealed the site to be located within a Secondary A bedrock aquifer, which is designated as:

Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;

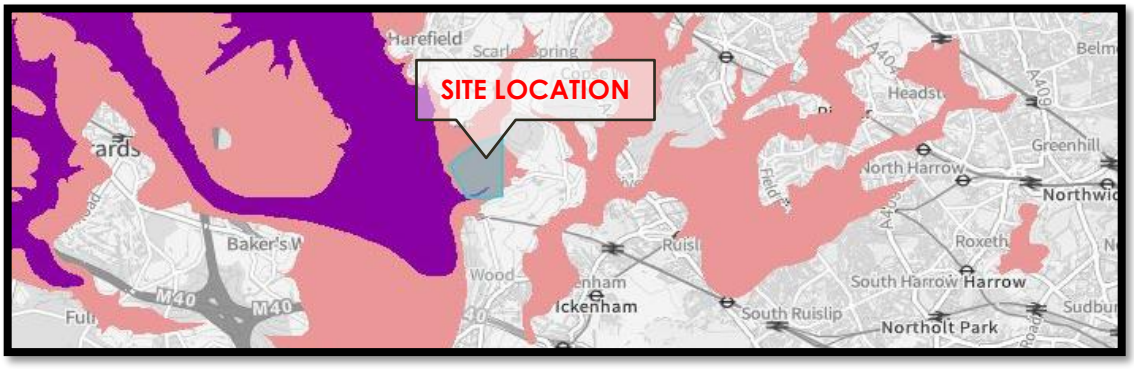


Figure 3.8.2 – Aquifer Designation Map – Bedrock

KEY:

- **Principal**
- **Secondary A**
- **Secondary B**
- **Secondary (undifferentiated)**
- **Unknown (Lakes & Landslip)**
- **Unproductive**

4.0 Proposed Development

The current architectural proposals involve the demolition of existing buildings and the construction of an educational hub with recycling stalls. The proposed development plans can be found in Appendix B.

5.0 Local Planning Policy and Guidance

5.1 London Plan

Policy G1 Green infrastructure:

A London's network of green and open spaces, and green features in the built environment, should be protected and enhanced. Green infrastructure should be planned, designed and managed in an integrated way to achieve multiple benefits.

B Boroughs should prepare green infrastructure strategies that identify opportunities for cross-borough collaboration, ensure green infrastructure is optimised and consider green infrastructure in an integrated way as part of a network consistent with Part A.

C Development Plans and area-based strategies should use evidence, including green infrastructure strategies, to:

1) identify key green infrastructure assets, their function and their potential function

2) identify opportunities for addressing environmental and social challenges through strategic green infrastructure interventions.

D Development proposals should incorporate appropriate elements of green infrastructure that are integrated into London's wider green infrastructure network.

Policy SI 12 Flood risk management:

A Current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.

B Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.

C Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.

D Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.

E Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.

F Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.

G Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat.

Policy SI 13 Sustainable drainage:

A Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.

B Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:

1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)

2) rainwater infiltration to ground at or close to source

3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)

4) rainwater discharge direct to a watercourse (unless not appropriate)

5) controlled rainwater discharge to a surface water sewer or drain

6) controlled rainwater discharge to a combined sewer.

C Development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

D Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

5.2 LB Hillingdon - Local Plan

POLICY DMEI 9: Management of Flood Risk

A) Development proposals in Flood Zones 2 and 3a will be required to demonstrate that there are no suitable sites available in areas of lower flood risk. Where no appropriate sites are available, development should be located on the areas of lowest flood risk within the site. Flood defences should provide protection for the lifetime of the development. Finished floor levels should reflect the Environment Agency's latest guidance on climate change.

B) Development proposals in these areas will be required to submit an appropriate level Flood Risk Assessment (FRA) to demonstrate that the development is resilient to all sources of flooding.

C) Development in Flood Zone 3b will be refused in principle unless identified as an appropriate development in Flood Risk Planning Policy Guidance. Development for

appropriate uses in Flood Zone 3b will only be approved if accompanied by an appropriate FRA that demonstrates the development will be resistant and resilient to flooding and suitable warning and evacuation methods are in place.

D) Developments may be required to make contributions (through legal agreements) to previously identified flood improvement works that will benefit the development site.

E) Proposals that fail to make appropriate provision for flood risk mitigation, or which would increase the risk or consequences of flooding, will be refused.

Policy DMEI 10: Water Management, Efficiency, and Quality

A) Applications for all new build developments (not conversions, change of use, or refurbishment) are required to include a drainage assessment demonstrating that appropriate sustainable drainage systems (SuDS) have been incorporated in accordance with the London Plan Hierarchy (Policy 5.13: Sustainable drainage).

B) All major new build developments, as well as minor developments in Critical Drainage Areas or an area identified at risk from surface water flooding must be designed to reduce surface water run-off rates to no higher than the pre-development greenfield run-off rate in a 1:100 year storm scenario, plus an appropriate allowance for climate change for the worst storm duration. The assessment is required regardless of the changes in impermeable areas and the fact that a site has an existing high run-off rate will not constitute justification.

C) Rain Gardens and non-householder development should be designed to reduce surface water run-off rates to Greenfield run-off rates.

D) Schemes for the use of SuDS must be accompanied by adequate arrangements for the management and maintenance of the measures used, with appropriate contributions made to the Council where necessary.

E) Proposals that would fail to make adequate provision for the control and reduction of surface water run-off rates will be refused.

F) Developments should be drained by a SuDs system and must include appropriate methods to avoid pollution of the water environment. Preference should be given to utilising the drainage options in the SuDS hierarchy which remove the key pollutants that hinder improving water quality in Hillingdon. Major development should adopt a 'treatment train' approach where water flows through different SuDS to ensure resilience in the system.

Water Efficiency

G) All new development proposals (including refurbishments and conversions) will be required to include water efficiency measures, including the collection and reuse of rainwater and grey water.

H) All new residential development should demonstrate water usage rates of no more than 105 litres/person/day.

I) It is expected that major development8 proposals will provide an integrated approach to surface water run-off attenuation, water collection, recycling and reuse.

Water and Wastewater Infrastructure

J) All new development proposals will be required to demonstrate that there is sufficient capacity in the water and wastewater infrastructure network to support the proposed development. Where there is a capacity constraint the local planning authority will require

the developer to provide a detailed water and/or drainage strategy to inform what infrastructure is required, where when and how it will be delivered.

Policy DMEI 11: Protection of Ground Water Resources

All development proposals within a Source Protection Zone, Safeguard Zone or Water Protection Zone must assess any risk to groundwater resources and demonstrate that these would be protected throughout the construction and operational phases of development.

6.0 Flood Risk Policy

6.1 Environment Agency Flood Map

The flood map for the development site shown below suggests that the site wholly falls within Zone 3 which is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding;(Land shown in light blue on the Flood Map)

Figure 6.1 - Environment Agency © 2017 - Flood Zone map

KEY: **Flood Zone 3**

It is, therefore, the consideration of this FRA that the site has a high risk of flooding from fluvial sources.

The extents of the flood zone have been compared against the LIDAR topography and it is clear that they do not follow any contour line. Around the site levels fall quickly towards the south which seems to indicate water gets into the site from the north, at higher level, than from the East where the culverted river is.

A swale and a bund around the boundary of the site is recommended to protect it from these overland flows coming from the north, probably surging near Middle Lodge where the river is culverted. Floodplain compensation is not required due to the topography of the site, which is quite steep and would not hold any water in the traditional sense.

It is proposed that finished floor levels will be raised 150mm above the average ground level to mitigate against the risk of water flooding, although the exact FFL needs to be confirmed once a topographic survey of the site is undertaken.

6.2 Historic Flood Events

The Environment Agency hold historic flood data and, according to the current dataset, historic flood outlines indicate that the site has never suffered from fluvial flooding.

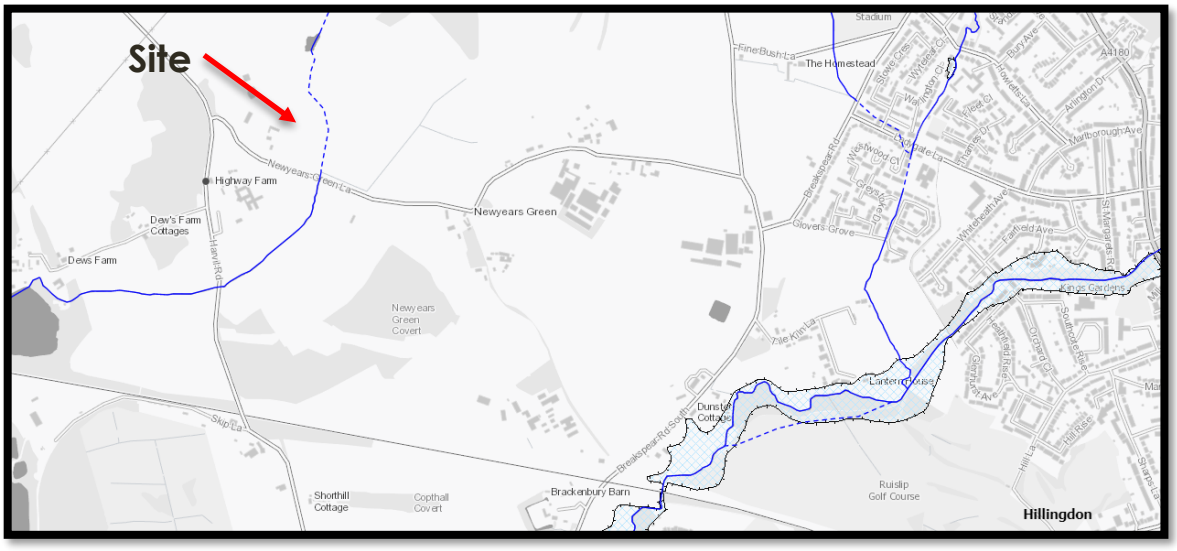


Fig 6.2. – Historic Flood outlines

The Environment Agency's Product 4 document has been requested but not received at the time of writing. It is not expected to be available due to the nature of the watercourse, as it is not the typical the EA would model.

6.3 The National Planning Policy Framework

The National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG) gives direction for development with respect to flooding. These documents promote a sequential approach to encourage development away from areas that may be or are susceptible to flooding. In doing so it categorizes flood zones in the context of their probability of flooding, as shown in the table within Section 6.4 below.

6.4 Flood Zone Definition

The National Planning Policy Framework Definition of Flood Zones

Flood zone	Fluvial	Tidal	Probability of flooding
1	< 1 in 1000 year	<1 in 1000 year	Low probability
2	Between < 1 in 1000 year and 1 in 100 year	Between <1 in 1000 year and 1 in 200 year	Medium Probability
3a	> 1 in 100 year	> 1 in 200 year	High probability
3b	Either > 1 in 20 or as agreed between the EA and the LPA	Either > 1 in 20 or as agreed between the EA and the LPA	Functional flood plain

6.5 Flood Zones – Table 1 PPG

(Note: These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 3a - High Probability
Definition
This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Appropriate uses
The water-compatible and less vulnerable uses of land in (Table.2 NPPF) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable uses and essential infrastructure permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in time of flood.
FRA requirements
All development proposals in this zone should be accompanied by a FRA.
Policy aims
In this zone, developers and local authorities should seek opportunities to: reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques; and relocate existing development to land with a lower probability of flooding.

6.6 Flood Risk Vulnerability Classification - Extract from Table 2 PPG

More Vulnerable

- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels.
- Non–residential uses for health services, nurseries, and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific

6.7 Flood Risk Vulnerability & Flood Zone Compatibility Table

Vulnerability classification flood zone	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
1	√	√	√	√	√
2	√	√	Exception test required	√	√
3a	Exception test required	√	x	Exception test required	√
3b	Exception test required	√	x	x	x

√ Development is appropriate x development is not appropriate

The above table, taken from PPG (Table 3), confirms that educational buildings within flood zone 3 is appropriate development, provided that the Exception Test is passed.

6.8 Exception Test

The Exception Test is an additional test to be applied by decision-makers following application of the Sequential Test. The Exception Test is a series of three criteria as shown below, all of which must be satisfied for development in a flood risk area to be considered acceptable. For the Exception Test to be passed:

a) It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk,

b) The development should be on developable previously developed land or, if not, it must be demonstrated there is no such alternative land available; and

c) A FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall.

Benefit to The Community

The current buildings are currently in a state of disrepair and the new educational workshops will clearly have a positive impact in the community.

Previously Developed Land

The existing property is in disrepair, outdated and in need of modernising. As the proposals are on an existing site, fully impermeable, this part of the exception test is satisfied.

Flood Risk

Although the site is shown in Flood Zone 3, a detailed analysis indicates that the flood risk comes from the north, at a higher elevation, and that can be diverted with a bund. As the proposed buildings will have a higher FFL, reducing the flood risk, this part of the exception test is satisfied. The use of SUDS can potentially provide an effective method of managing surface water from the site, reducing the impact on the local catchment.

6.9 Other Flooding Mechanisms

In addition to the potential for assessing flooding from fluvial and tidal sources NPPF also requires that consideration is given to other mechanisms for flooding:

- Flooding from land – intense rainfall, often in short duration, that is unable to soak into the ground or enter drainage systems, can run rapidly off land and result in local flooding.
- Flooding from groundwater – occurs when water levels in the ground rise above the surface elevations.
- Flooding from sewers – In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and wastewater sewers known as combined sewers. Flooding can result causing surcharging when the sewer is overwhelmed by heavy rainfall.
- Flooding from reservoirs, canals and other artificial sources – Non-natural or artificial sources of flooding can result from sources such as reservoirs, canals lakes etc, where water is held above natural ground levels.

7.0 Other Sources of Flood Risk to The Development

7.1 Flooding from Overland Flows

The risk of flooding due to overland flood flows is considered low by the Environment Agency. In the detailed dataset provided by the Environment Agency in can be seen that no severe volumes of overland flows come from the northern areas, and that localised ponding is indeed an issue in the central courtyard of the site.

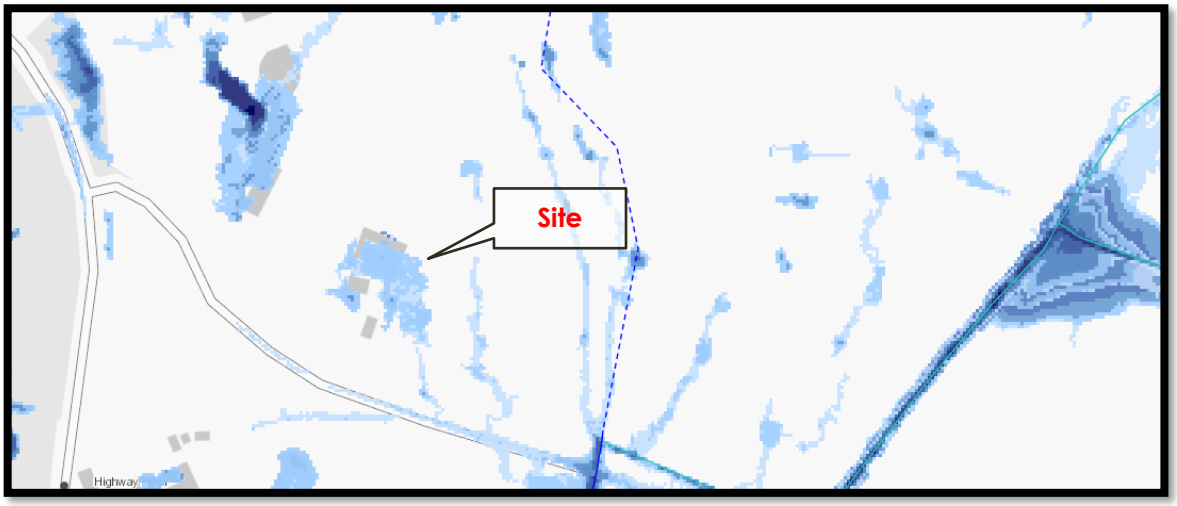


Fig 7.1 – Surface Water Flooding – West London SFRA Map

KEY:

High (Greater than 3.3% chance of flooding)

Medium (Between 1% and 3.3% chance of flooding)

Low (Between 0.1% and 1% chance of flooding)

Very Low (Less than 0.1% chance of flooding)

It is, therefore, the consideration of this FRA that the site has a low to medium risk of flooding from overland flows. The risk could be reduced to very low if an adequate drainage strategy is implemented and maintained accordingly.

7.2 Flooding from Rising Groundwater

Groundwater flooding is dependent on local variations in topography, geology and soils. The causes of groundwater flooding are generally understood; however it is difficult to predict the actual location, timing and extent of groundwater flooding without comprehensive datasets.

There is a lack of reliable measured datasets to undertake flood frequency analysis and even with datasets, this analysis is complicated due to the non-independence of groundwater level data. Surface water flooding incidents are sometimes mistaken for groundwater flooding incidents, such as where runoff via infiltration seeps from an embankment, rather than locally high groundwater levels.

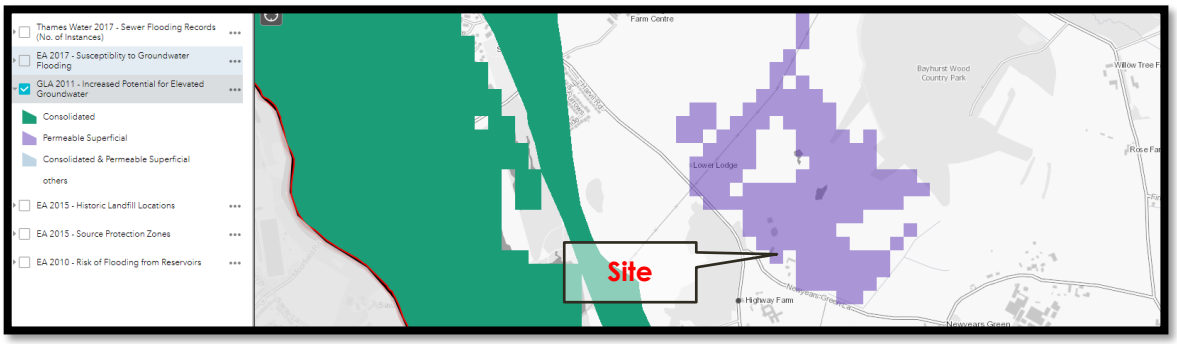


Fig 7.2.1 – Sewer, Groundwater and Artificial Flood Risk map – West London SFRA Map

A look into the West London SFRA Sewer, Groundwater and Artificial Flood Risk map shows the site surrounded (although outside) by an area of increased potential for elevated groundwater – Permeable Superficial-.

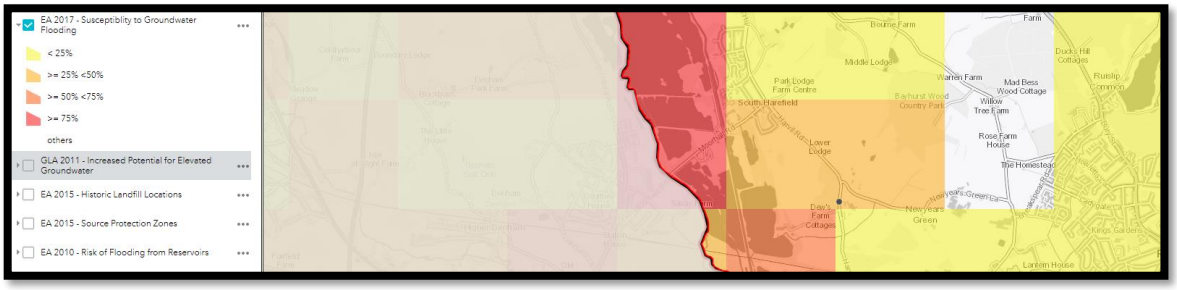


Fig 7.2.2 – Susceptibility to Groundwater Flooding – West London SFRA Map

It also indicates a 25% to 50% susceptibility to groundwater flooding.

It is, therefore, the consideration of this FRA that the site has a low to medium risk of flooding from rising groundwater levels.

7.3 Flooding from the Local Sewerage Network

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding from sewers can also occur as a result of blockage, poor maintenance or structural failure.

As there are no sewers in the area, the risk is negligible. The site is also at a higher elevation than the road so any potential future sewer flooding would be contained within the public highway, away from the development.

It is, therefore, the consideration of this FRA that the site has a low risk of flooding by surcharging of the local sewer network.

7.4 Flooding from Reservoirs, Canals & Other Artificial Sources

Reservoirs in the UK have an extremely good safety record. The EA is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected, and essential safety work is carried out. These reservoirs therefore present a minimal risk.

Flooding may result from the failure of engineering installations including flood defence, land drainage pumps, sluice gates and floodgates. Hard defences may fail through the slow deterioration of structural components such as the rusting of sheet piling, erosion of concrete reinforcement and toe protection or the failure of ground anchors. This deterioration can be difficult to detect, so that failure, when it occurs, is often sudden and unexpected.

Failure is more likely when the structure is under maximum stress, such as extreme fluvial events.

Fig 7.4 – Maximum extent of flooding from reservoirs – Flood map for planning

There are no known reservoirs, canals or other artificial sources creating flood risk to the site.

It is, therefore, the consideration of this FRA that the site has a low risk of flooding by reservoirs, canals or other artificial sources.

8.0 Emergency Planning and Dry Route of Escape

8.1 Dry Access, Egress, and Escape

The only official access to the site is via Newyears Green Lane, to the south, which is in Flood Zone 3. Based on the Environment Agency flood maps, the shortest route to an area in Flood Zone 1 is to utilise this road towards the West until Harvil Rd, and from there head north to Harefield or south to Ickenham.

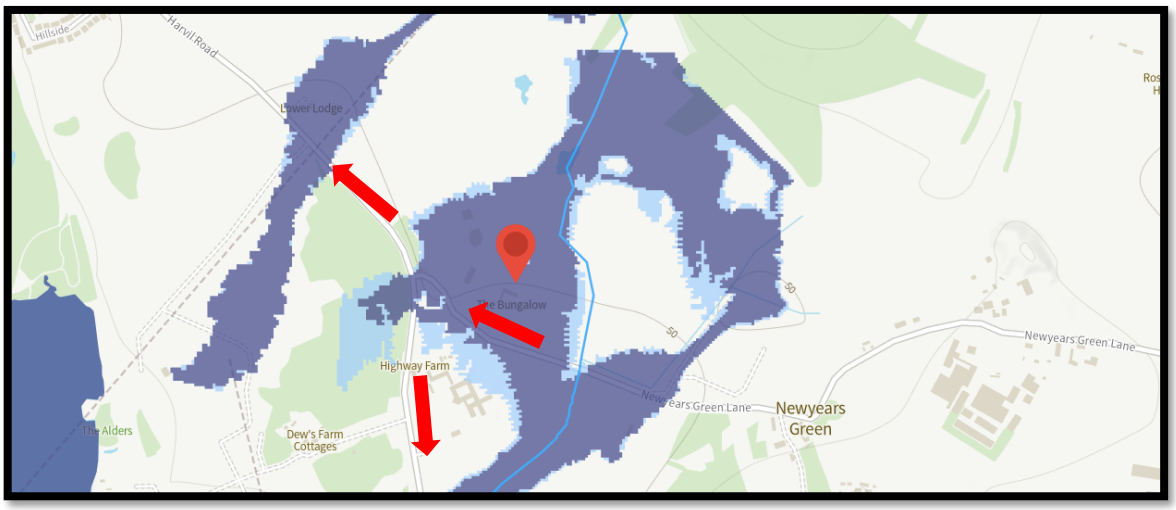


Fig 8.1 - Suggested route to Flood Zone 1

8.2 Awareness

The Agency operates a flood watch scheme called Flood line (**0345 988 1188**). In many places, the Agency can warn interested parties by either telephone, mobile, email, SMS text message or fax of a potential flood up to six hours in advance.

According to the West London SFRA online mapping tool, the site is already in the EA Flood Alert Area.

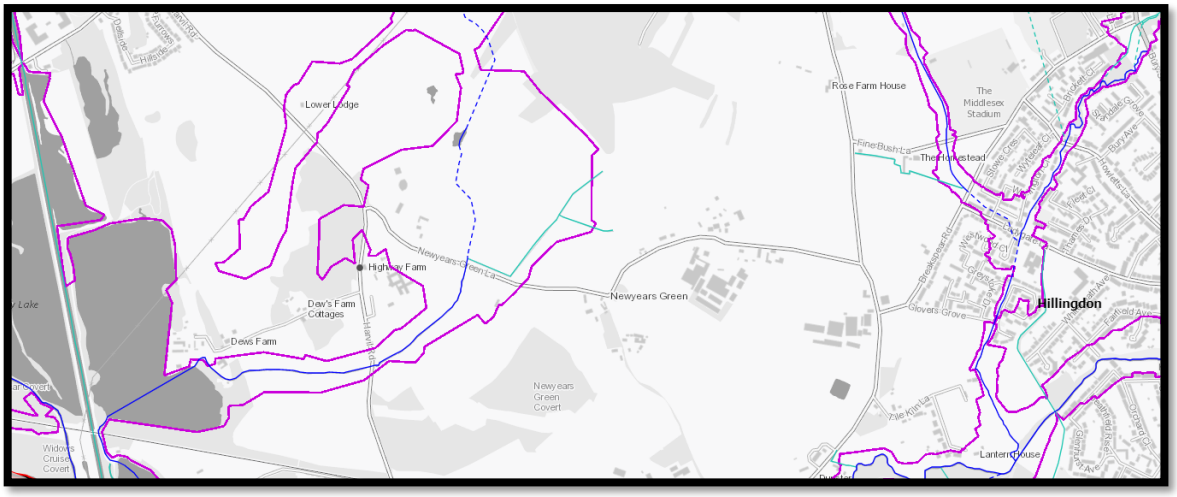


Fig 8.2 – West London SFRA map – Flood Alert Areas

8.3 Equipment

The preparation of a flood kit is essential for instances when evacuation is required. This kit will also be useful for general emergency situations and should be stored for general emergency situations and be easily accessible if flooding occurs. These items should include:

- A torch
- Blankets or a sleeping bag, warm clothing and waterproofs
- A first-aid kit, including a supply of any essential medication
- A list of useful telephone numbers
- A supply of bottled water
- A stock of non-perishable food items
- A portable radio and supply of batteries
- Children's essentials (milk, baby food, sterilised bottles and spoons, nappies, wipes, nappy bags, clothing, comforter, teddy).
- Food and accommodation (cages) for pets, if resident
- Wellington boots or similar waterproof boots
- Check your insurance cover – ensure it covers flood damage
- Know how to turn off the gas, electricity, and water mains supplies
- Think about what items you would want to move to safety during a flood

8.4 Flood Watch

On receipt of the Flood Watch warning from the Environment Agency, or from other sources, e.g. TV, Radio, local contacts.

- Flooding is possible, and the situation could worsen.
- Flood watch means – "Flooding of low lying land is expected. Be aware,
- Be prepared, Watch out.

When a flood watch warning is issued, users should:

- Be aware of water levels and whether the river is rising or falling
- Reconsider travel plans
- Listen and watch for weather and flood warnings on local radio and television stations
- Contact Floodline on **0345 988 1188**
- Check that the flood kit has been prepared
- Copy vital hard copy and electronic records and store them in a safe place. This includes financial and insurance records.
- Keep a store of plastic bags (grocery bags are fine) to place around the legs of furniture when you receive a flood warning.
- At this stage, residents should ensure that their neighbours are aware of the Flood Watch alert in case they are not subscribed or did not receive the alert.

8.5 Severe Flood Warning

A flood evacuation should be implemented as a matter of urgency when a Severe Flood Warning is issued. Severe Flood Warning means severe flooding is now expected. There is extreme danger to life and property and people are advised to act immediately, i.e. evacuate.

The Agency aim to provide at least 2 hours warning between the Flood Warning alert being issued and the commencement of flooding. The Agency recommends that users should evacuate when a Flood Warning or Severe Flood Warning status is issued.

If flood levels continue to rise, people are advised to evacuate before safe access is lost. At this level driving through flood water may become hazardous and they must evacuate beforehand.

Users should monitor the flood progression and evacuate, on foot, as soon as possible. Should the flood levels be higher than 100mm, residents should utilise the safe haven (Building) until such time that the flood waters subside.

8.6 All Clear

All clear means that flood watches or warning are no longer in force in this area.

- Keep listening to weather reports
- Only return to evacuated buildings if you are told it is safe
- Beware sharp objects and pollution in flood water.

Users should contact the local authority to check that it is safe to return to their buildings.

Users should be aware that if floodwaters have entered the property it will need to be cleaned, disinfected and repaired and fully dried out prior to reoccupation. Check that the building is safe before entering, and if there are any doubts professional opinion should be sought. If there is any doubt that appliances may be water damaged they must be checked before switching the power or gas back on. Contact the insurance company as soon as possible to get their approval before arranging any clean-up or repairs.

9.0 Flood Resistant & Resilient Measures

9.1 Flood Resistant measures

As part of the works associated with the development of the buildings, it is the recommendation of this report that consideration should be given to flood resistant measures. These are mechanisms which can be implemented by the occupier to provide additional defences against flood water ingress. Systems such as flood barriers to external door openings can prove an effective measure but must be used in conjunction with suitable ground floor construction techniques to prevent water entering the unit. More information can be gained from the CIRIA document 'Improving the flood performance of new buildings'.

9.2 Flood Resilient measures

As part of the works associated with the construction of the new buildings, it is the recommendation of this report that flood resilient measures are used within the design to minimize the impact an extreme flood event would have on the property. As these works are associated with the creation of a units at ground floor level, it would mainly involve the siting of sockets and fuse boxes away from floor level. More information can be gained from the CIRIA document 'Improving the flood performance of new buildings'.

10.0 Recommendations and Conclusion

Flood risk to the site has been assessed, and where risks have been deemed above low, mitigation measures have been proposed to reduce the risk to the site.

Therefore, in line with the recommendations of the National Planning Policy Framework, the development site lies within land classified as flood zone 3, which is considered at a high risk of flooding. It is appropriate for a development of this nature. Having assessed the other forms of flood risk to and from the development site, this report finds that the site is not considered at high risk from any other sources of flooding.

11.0 References & Bibliography

- The National Planning Policy Framework July 2021
- Planning Practice Guidance.
- Environment Agency - Rainfall-Runoff Management for Developments
- Environment Agency indicative flood maps https://flood-map-for-planning.service.gov.uk/
- Environment Agency indicative groundwater source protection zone maps http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx
- Environment Agency indicative Aquifer designation maps http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx
- CIRIA 2015, The Sustainable Drainage Systems (SUDS) Manual C753
- London Borough of Hillingdon - Local Flood Risk Management Strategy 2015
- London Borough of Hillingdon – Preliminary Flood Risk Assessment
- West London Strategic Flood Risk Assessment (interactive maps)
- Environment Agency - Adapting to Climate Change: Advice for the Flood and Coastal Erosion Management Authorities March 2016

Appendix A - Flood Zones and LIDAR Levels

NOTES

1. All dimensions and levels are in metres unless otherwise noted
2. This drawing is to be read in conjunction with the relevant Architect's/Engineer's drawings, specifications and CDM documentation
3. This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE - EXCEPT FOR PLANNING PURPOSES). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
4. This drawing contains coloured lines / information that may not be clear if reproduced in black and white.
5. Digital copies of this plan can only be considered accurate if supplied directly by Infrastruct CS Ltd.

REV	DRAWN	CHECK	REVISION COMMENTS	ISSUE DATE
P01	NJ	MBD	Initial issue	13/09/22

DRAWING TITLE
Flood Zone 3 & Levels

SHEET NO. 1/1

PROJECT
Newyears Green Lane
Harefield

CLIENT
HILLINGDON
LONDON

Infrastruct CS Ltd

SCALE @ A1 1:500 — 0m 12.5m 25.0m

ENGINEER MBD
DRAFT NJ
APPROVED RJW

PROJECT NUMBER	STATUS	ISSUE PURPOSE
5138	S2	INFORMATION

PROJECT	ORIGIN	PHASE	LEVEL	TYPE	ROLE	NO.	REVISION
NEWY	ICS	01	XX	DR	C	0200	P01

The Stables, High Cogges Farm, High Cogges, Witney, OX29 6UN - Tel: 01993 709709: info@infrastructcs.co.uk

5138-NEWY-ICS-01-M3

Appendix B - Development Proposals

timber walls & cement fibre corrugated

BUILDING STRUCTURES WITHIN, SITE APPROX AREA = 563.9m²

HARD SURFACE AREA (IN PINK HATCH) = 2103.9m²

Combination of trees and shrubs

Large shed corrugated roof panels & wall panels

Overgrown Grass

Photos of existing barn

Large shed corrugated roof panels & wall panels GIA = 105m²

Cement

Stables constructed of metal sheets / timber walls & cement fibre corrugated

BARN

CM Panel shed

Timber Shed

Brick Shed in undergrowth

GARAGE

15m high conifer trees

Concrete panel garage, no front door

Hatched area shows extent of gravel chipping surface

Lean to shed with corrugated plastic sheet roof

Single storey traditional built bungalow

NEW YEARS GREEN LANE

The Bungalow

45.7m

Metal Gate with barbed wire

Photos of existing bungalow

Photos of existing corner buildings and stables

N

0 10 20 30 40 50m

Scale 1:500

NOTES

Existing photos show the four main structures: the bungalow, the barn, the corner metal clad structures and the stables. Other smaller structures were inaccessible or not visible due to undergrowth.

All structures are in a derelict state.

Rev	Revision notes	Initials	Date
A	Existing photographs and note added	db	25.08.22

HILLINGDON
LONDON

PLACE DIRECTORATE
CAPITAL PROGRAMME WORKS SERVICE
2E/10, CIVIC CENTRE, UXBRIDGE, UB8 1UW
Tel: 01895 250 111 www.hillingdon.gov.uk

PROJECT
THE BUNGALOW SITE
NEWYEARS GREEN LANE,
HAREFIELD, UB9 6LX

DESCRIPTION
THE BUNGALOW SITE
EXISTING SITE LAYOUT

SCALE	DRAWN BY	CHECKED BY	DATE
1:500 @ A3	DB	SV	JUN 22

DRAWING No. 2022/D/334/P/02

REV. A

Appendix C - Thames Water Sewer Records

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2022_4715723

0 10 20 40 60 80 Meters

Scale:	1:1791
Width:	500m
Printed By:	Skrishna1
Print Date:	09/09/2022
Map Centre:	506206,188209
Grid Reference:	TQ0688SW

Comments:

ALS/ALS Standard/2022_4715723

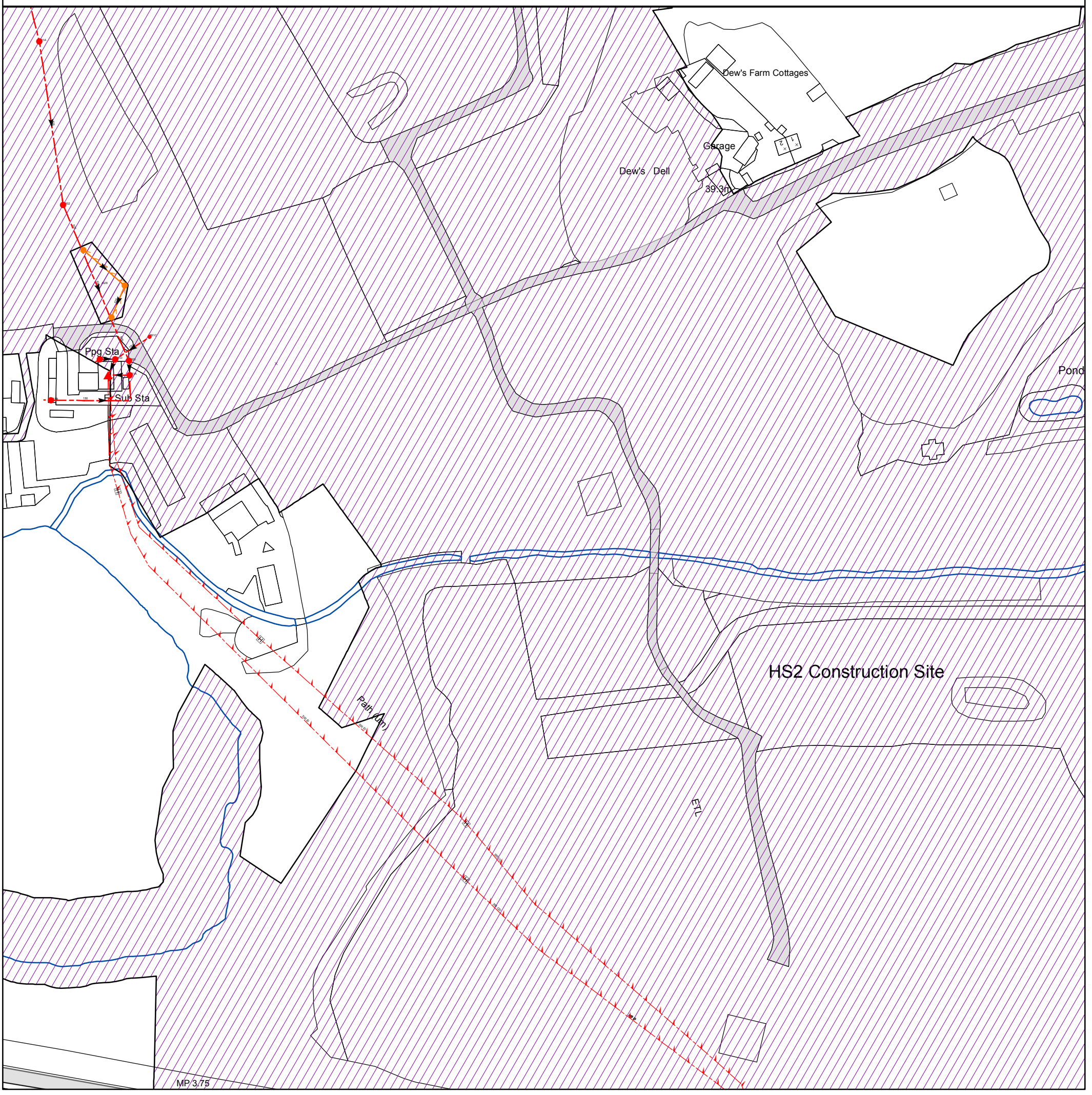
NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL

REFERENCE	COVER LEVEL	INVERT LEVEL

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2022_4715723



0 10 20 40 60 80
Meters

Scale:	1:1791
Width:	500m
Printed By:	Skrishna1
Print Date:	09/09/2022
Map Centre:	505750,187750
Grid Reference:	TQ0587NE

Comments:

ALS/ALS Standard/2022_4715723

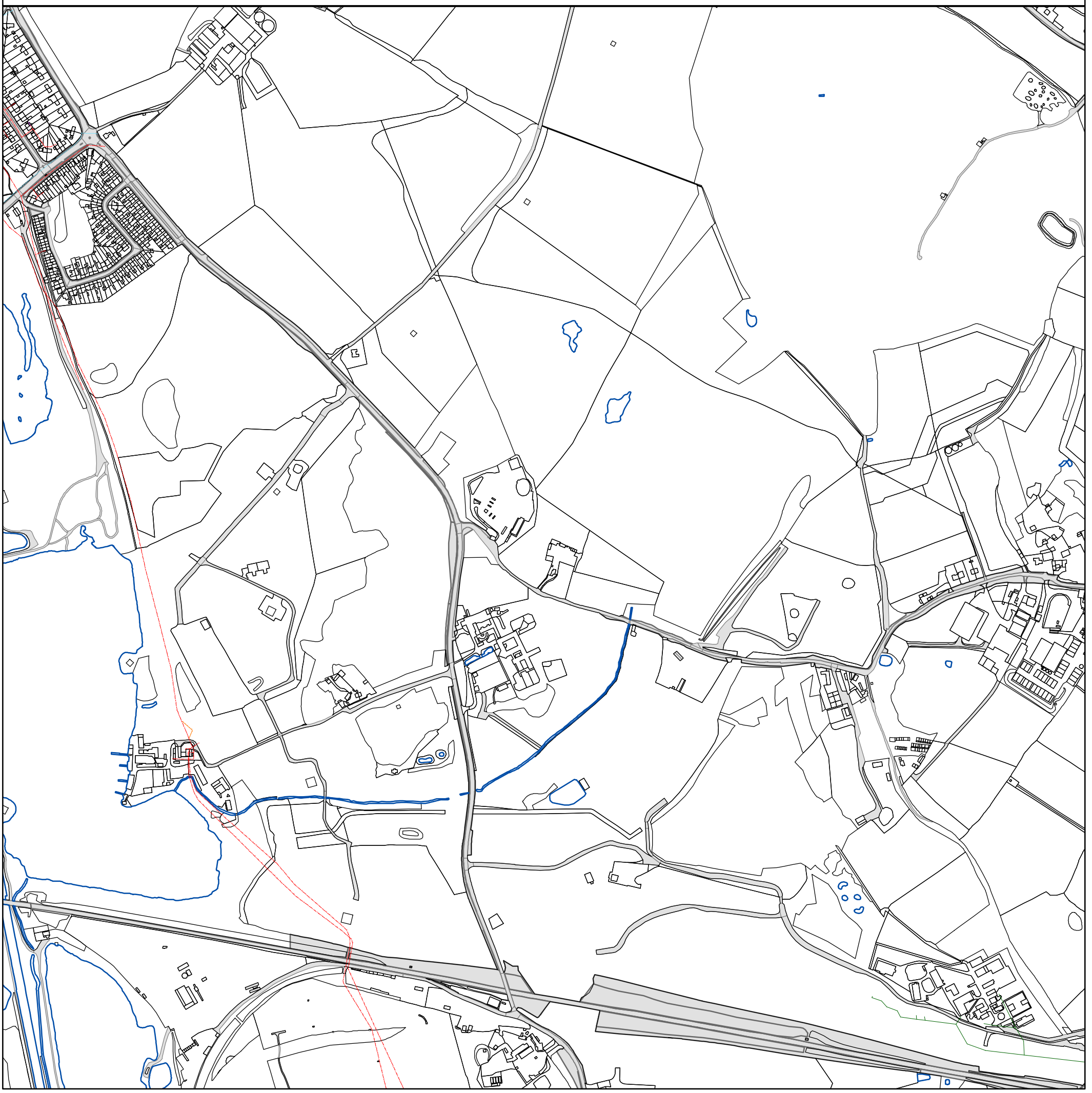
NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL
581C	37.274	36.174
581A	37.054	32.984
581D	36.961	35.811
591A		

REFERENCE	COVER LEVEL	INVERT LEVEL
581B	36.59	34.88
5803	36.95	33.02
581E	36.928	35.958
5802	36.95	33.33

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2022_4715723



0 45 90 180 270 360
Meters

Scale:	1:7161
Width:	2000m
Printed By:	Skrishna1
Print Date:	09/09/2022
Map Centre:	506206,188209
Grid Reference:	TQ0688SW

Comments:

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement.

If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.