

Report

Land to the north of The Drove Way, Istead Rise,
Gravesham

Flood Risk Assessment and Outline Drainage Strategy

For Ptarmigan Land A Ltd

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Prepared By:	Niyamal Ali & Toby Vaughan
Reviewed By:	Craig Thwaites (Associate Director)



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3rd Floor St Augustine's Court, 1 St. Augustine's Place, Bristol, BS1 4UD Tel: +44(0)117 974 1086

First Floor, 3 – 7 Herbal Hill, London, EC1R 5EJ Tel: +44(0)20 3873 4780

First Floor, Patten House, Moulders Lane, Warrington, WA1 2BA Tel: +44(0)1925 937 195

Nile House, Nile St, Brighton and Hove, Brighton, BN1 1HW Tel: +44(0)20 3873 4780

1 Aire St, Leeds, LS1 4PR Tel: +44(0)20 3873 4780

Avenue du Port, 86c Box 204, 1000 Bruxelles Tel: +44(0)20 3873 4780

Contents

1	Introduction	1
2	Planning Policy and Guidance	2
3	Sources of Potential Flood Risk	8
4	Outline Surface Water Drainage Strategy	12
5	Outline Foul Drainage Strategy	24
6	Conclusion	25
7	Appendices	26

Tables

Table 2-1	Flood Risk Vulnerability and Flood Zone Compatibility Summary	3
Table 4-1:	Surface water drainage hierarchy	12
Table 4-2:	Summary of EA Consultation and Responses	14
Table 4-3:	Infiltration testing obtained rates	15
Table 4-4:	Sustainable Drainage Systems	15
Table 4-5:	Impermeable Catchment Areas	17
Table 4-6:	Summary of Infiltration Basin Attenuation Volumes	18
Table 4-7:	Subsequent storm events	19
Table 4-8:	Pollution hazard indices	19
Table 4-9:	SuDS mitigation indices for discharges to groundwater (Based on Table 26.4 of the SuDS Manual)	20
Table 4-10:	Indicative SuDS maintenance schedule	20

Figures

Figure 1-1:	Site Location	1
Figure 3-1:	Flood Map for Planning	8
Figure 3-2:	Risk of Flooding from Surface Water mapping - Climate Change Flood Extent (2040-2060)	9
Figure 3-3:	Risk of Flooding from Reservoirs	11
Figure 4-1:	Source Protection Zones	13

1 Introduction

Logika have been commissioned to undertake a Flood Risk Assessment and Drainage Strategy on behalf of Ptarmigan Land (hereafter referred to as the 'Client') for a residential development located at Istead Rise, Kent at approximate postcode DA13 9JY (hereafter referred to as the 'Site').

1.1 Site Description

The Site consists of greenfield land and is 5.70 hectares (ha) in size. The Site is bound to the west, north and east by further greenfield land, and by existing residential development to the south. Refer to Figure 1-1 below.

Figure 1-1: Site Location



The topographic survey (Appendix A1) shows that the Site generally falls in a north westerly direction, from 61.94m Above Ordnance Datum (AOD) in the south east, to 58.43m AOD in the northwest corner.

1.2 Development Proposals

It is understood the development proposals (hereafter referred to as the 'Proposed Development') comprise the following

"Development for up to 100 residential dwellings (Class C3), including the formation of new accesses from The Drove Way, the provision of new areas of public open space and all other associated infrastructure and ancillary works (all detailed matters reserved other than means of access)."

Refer to Appendix A2 for the Proposed Development plans.

2 Planning Policy and Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹, last revised in February 2025, states that vulnerable development types should be directed away from areas at highest risk of flooding (whether existing or future risk). Where development is necessary in flood risk areas, the development should be made safe for its lifetime without increasing risk elsewhere.

The NPPF states that, when determining planning applications, Local Planning Authorities (LPAs) should ensure that flood risk is not increased elsewhere as a result of development. Where appropriate, applications should be supported by a site-specific FRA. Development should only be permitted in areas at risk of flooding where it can be demonstrated that:

- Within the Site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- The development remains operational in times of a flood;
- The development is appropriately flood resistant and resilient;
- Any residual risk can be safely managed; and
- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

2.2 Planning Practice Guidance

The Planning Practice Guidance (PPG)² provides additional advice to LPAs, to ensure that the NPPF is applied correctly when assessing development in areas at risk of flooding. Assessments of flood risk should identify sources of current and future risk and describe how these will be accounted for in a mitigation strategy.

A sequential approach should be employed, which involves applying the 'Sequential Test' and, if needed, the 'Exception Test'. This is designed to ensure that areas at little or no risk of flooding are developed in preference to higher risk areas. For site-specific risk assessments, the characteristics of a possible flood event should be considered. The ability of users to safely access and exit a site during a 'design' flood event and to evacuate before an extreme flood event (1 in 1,000 annual probability of flooding with allowance for climate change) should also be assessed.

The 'design' flood event is considered to be 1 in 100 annual exceedance probability event (AEP) for fluvial and pluvial sources, or the tidal 1 in 200 AEP event, plus the appropriate allowance for climate change.

Development layouts should be designed to locate the most vulnerable aspects of a development within areas of lowest flood risk, unless there are overriding reasons present. In addition, measures to avoid flood risk vertically can be taken by locating the most vulnerable uses in areas of lower flood

¹ Ministry of Housing, Communities and Local Government, February 2025. National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

² Department for Levelling Up, Housing and Communities and the Ministry of Housing, Communities and Local Government, September 2025. Planning Practice and guidance: Flood Risk and Coastal Change. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

risk. Such measures should also account for any residual flood risk occurring due to flood risk management infrastructure.

Management measures, such as safe access and egress routes, should be provided to deal with any residual risk remaining after avoidance, control and mitigation measures have been utilised. The provision of adequate flood warning should also be considered.

Flood Vulnerability and Flood Zone Incompatibility

The PPG provides guidance on flood risk vulnerability and flood zone incompatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:

- **Zone 1: low probability**, less than 1 in 1,000 annual probability of river or sea flooding in any year;
- **Zone 2: medium probability**, between a 1 in 100 and 1 in 1,000 annual probability of river flooding or between 1 in 200 and 1 in 1,000 annual probability of sea flooding in any year;
- **Zone 3a: high probability**, 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability flooding from the sea in any year;
- **Zone 3b: functional floodplain**, where water flows or is stored in times of flood, identification should take account of local circumstances but will typically flood with an annual probability of 1 in 30 or greater in any year or is designed to flood in an extreme 1 in 1,000 annual probability flood.

Annex 3 of the NPPF splits flood risk vulnerability into five classifications. The compatibility of these development uses within each Flood Zone is set out in Table 2 of the PPG:

- **Essential Infrastructure**: essential transport and utility infrastructure, wind turbines, solar farms;
- **Highly Vulnerable**: emergency services (those required to be operational during flooding), installations requiring hazardous substances consent, basement dwellings;
- **More Vulnerable**: residential dwellings, hospitals, schools, hotels, drinking establishments;
- **Less Vulnerable**: retail, offices, storage and distribution, leisure, restaurants; and
- **Water-Compatible Development**: docks, marinas, wharves.

The PPG provides guidance on flood risk vulnerability and flood zone compatibility. This is summarised below in Table 2-1.

Table 2-1 Flood Risk Vulnerability and Flood Zone Compatibility Summary

	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test	✓	✓
Zone 3a	Exception Test	✓	✗	Exception Test	✓
Zone 3b	Exception Test	✓	✗	✗	✗

Source: Table 2 and Annex 3 Flood Risk and Coastal Change PPG

The Proposed Development comprises a residential development and is therefore classed as 'more vulnerable'. As the Site is located within Flood Zone 1 (discussed further in Section 3.1), the PPG indicates that development is appropriate in this location.

Sequential and Exception Tests

The Sequential Test aims to steer new development to areas with the lowest risk of flooding. In line with the PPG, application of the Sequential Test should take into consideration all sources of flooding.

As the Site is located within Flood Zone 1, is largely in an area at a very low risk of flooding from surface water and low risk of flooding from groundwater and artificial sources, it is understood the Sequential Test, and by proxy, the Exception Test, does not need to be applied.

Climate Change Allowances

The NPPF and PPG explain when and how flood risk assessments should be completed, including demonstrating how flood risk will be managed now and over the development's lifetime, while taking into account climate change.

The Environment Agency (EA) published their most recent climate change allowances³ in May 2022. This guidance outlines their predictions of the anticipated changes to peak river flow, peak rainfall intensity and sea level rise as a result of climate change.

As the Site is located within Flood Zone 1 and shown to be outside of all climate change flood risk areas for the period of 2070 to 2125 on the EA's Flood Map for Planning, there is no need to address peak river flow allowances and any associated increase due to climate change.

Climate change allowances for peak rainfall in the medium risk scenario indicates that an uplift of 45% should be applied for the Site. As such, the proposed outline surface water drainage strategy should ensure that no flooding occurs in the system for all events up to and including the 1 in 100 plus 45% climate change scenario.

2.3 National Standards for Sustainable Drainage Systems

The National Standards for Sustainable Drainage Systems⁴ was last updated in July 2025 and is the current national guidance for the design, maintenance, and operation of SuDS. There are a number of technical standards which detail the appropriate design aspirations for SuDS systems in new developments. Those relevant to the Proposed Development have been summarised and highlighted below.

Technical Standard 1 details the drainage hierarchy which states that runoff should be discharged in the most sustainable manner first, this would consist of rainwater re-use or infiltration based methods. Where this cannot be achieved, subsequent discharge locations in decreasing order of sustainability would be utilised. These would comprise; to a surface water body, to a surface water sewer, and then to a combined sewer.

Technical Standard 2 details the requirement for the management of everyday rainfall. New developments must apply a SuDS approach to ensure that the first 5mm of rainfall, the majority of rainfall events, does not result in runoff from the Site to surface waters or a piped drainage system.

³ Environment Agency, 27 May 2022. Flood Risk Assessments: climate change allowances. Available at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

⁴ Department for Environment, Food and Rural Affairs, July 2025. National Standards for Sustainable Drainage Systems. Available at: <https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds>

Evidence should be provided that demonstrates the approach and helps to achieve technical standards 4 to 6.

Technical standard 3 states the following:

- The SuDS approach should be adopted to manage development runoff during extreme rainfall events, including for climate change and urban creep. They should ensure that:
 - People and property are protected from flooding of the SuDS features.
 - Flood risk to people and property downstream is mitigated.
 - The receiving waterbody is protected from morphological damage, or the impact on sewer capacity is limited.
- The local approach for the design of surface water drainage systems shall take precedence over national guidance where local policies and guidance is more stringent than at the national level.

Technical Standards 4 to 6 details water quality, amenity and biodiversity. The SuDS approach should be employed such that it protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development. The approach should maximise the benefits from multi-functional-spaces and landscapes to enhance amenity features.

Technical Standard 7 details the design aspects of drainage systems. Drainage systems should be designed so that they can be safely constructed, operated and maintained, and take into consideration the need to minimise negative impacts on natural resources and the environment. They should include for an appropriate management and maintenance plan which supports Standards 1-6 as well and ensuring the performance of the proposed drainage system.

2.4 Gravesham Local Plan Core Strategy

The Gravesham Local Plan⁵ was published in September 2014 and provides an overview of the objectives and policies for forthcoming developments within the borough. Policies relevant to flood risk and drainage are set out below.

Policy CS18: Climate Change

This details flood risk and sustainable drainage requirements for new developments in Gravesham. Those pertaining to the Proposed Development have been summarised below.

- Water Quality – the Council will have regard to the delivery of the Thames Basin Management Plan to support water bodies achieving good status over the plan's period.

As surface water generated at the Site will infiltrate to ground, the surface water drainage strategy will address water quality to ensure the potential contamination of any surface water runoff is mitigated against.

- Sustainable Drainage – Surface water runoff must have, at least, no greater adverse impact than the existing use.

⁵ Gravesham Borough Council, September 2014. Gravesham Local Plan Core Strategy. Available at: <https://www.gravesham.gov.uk/local-plan-policy/local-plan>

As the Site currently consists of greenfield land, the surface water drainage strategy will look to ensure surface water runoff is managed as close to its source as possible and will look to mimic natural conditions through the inclusion of SuDS features.

- Sustainable Drainage Systems (SuDS) must be employed, and be technically and financially feasible.

2.5 Gravesham Water and Flood Risk Background Paper

While Kent County Council (KCC and the Lead Local Flood Authority, LLFA) website indicates that Gravesham has a strategic flood risk assessment (SFRA) available, it appears the website links are invalid and therefore the SFRA could not be accessed. However, the Gravesham Local Plan provides a Regulation 18 Stage 2 Consultation document⁶ which provides further information on flood risk and water within the borough and was published in October 2020.

The document provides some notable information for the Site, these are summarised below:

- The Site is not located within any EA Drinking Water Protection Zones (Surface Water or Groundwater).

There are no specific policies within this document however the Council recognise there have been changes to flood risk and water policy since 2014. The document therefore provides an updated overview of flood risk and drainage for the borough, this will then feed into the emerging local plan which will have modernised development management policies for flood risk and water.

2.6 Drainage and Planning Policy Statement Kent County Council

The Drainage and Planning Policy Statement⁷ for KCC provides further requirements for implementing SuDS into developments. These have been summarised below.

- SuDS Policy 1 – Follow the drainage hierarchy. When surface water is not collected, it should be managed in the following order; to ground, to a surface water body, a surface water sewer, highway drain, or another drainage system, and to a combined sewer where there are absolutely no other options.
- SuDS Policy 2 – New drainage schemes must manage all sources of surface water and should be designed to match greenfield rates and volumes as far as possible. Flood risk must not be increased elsewhere and if any existing drainage connectivity is present, it should be retained. Drainage schemes should provide for exceedance flows and surface water flows from off site.
- SuDS Policy 3 – Drainage flow paths, watercourses, and catchments should be retained wherever possible.
- SuDS Policy 4 – New developments should be designed to take full account of any existing flood risk on site. Opportunities to reduce the identified risk should be investigated at the master planning stage and subsequently incorporated at detailed design.

⁶ Gravesham Borough Council, October 2020. Regulation 18 Stage 2 Consultation Gravesham Water and Flood Risk Background Paper. Available at: https://localplan.gravesham.gov.uk/gf2.ti/f/1210690/83697125.1/PDF/-/Gravesham_Water_and_Flood_Risk_Background_Paper.pdf

⁷ Kent County Council, December 2019. Drainage and Planning Policy Statement. Available at: <https://www.kent.gov.uk/about-the-council/strategies-and-policies/service-specific-policies/economic-regeneration-and-planning-policies/planning-policies/flooding-drainage-and-water-management-policies-and-guidance/drainage-and-planning-policy-statement>

- SuDS Policy 5 – The design of the drainage system must account for climate change, and changes to the impermeable area over the design life must be included for (through applying urban creep). Surface water should be managed at its source through the use of SuDS.
- SuDS Policy 6 – Designed drainage schemes should be maintainable, to ensure the drainage system continues to operate as designed and must be accompanied with the appropriate maintenance plan.
- SuDS Policy 7 – Full consideration of a drainage system's capacity to remove pollutants and discharge clean water should be investigated. Interception of small rainfall events should be incorporated into the design of the drainage system.
- SuDS Policy 8 and 9 – SuDS should be designed for multifunctionality and include amenity, biodiversity, quality and quantity benefits.

Consideration and reference has been made to SuDS guidance where appropriate within this report.

2.7 Design for Gravesham – Design Code Supplementary Planning Document (SPD)

The Design Code SPD for Gravesham⁸ was published in May 2024 and provides specific design requirements for new developments within Gravesham. Section 6.9 details SuDS requirements and these have been summarised below.

- The SuDS hierarchy must be employed for new developments.
- Applicants must take into account the characteristics of a Site and utilise the most suitable SuDS to manage surface water runoff.
- SuDS should provide additional benefits including amenity, biodiversity and water quality.
- Opportunities for blue roofs and the use of grey water should be explored.

⁸ Gravesham Borough Council, May 2024. Design for Gravesham Design Code Supplementary Planning Document. Available at: <https://www.gravesham.gov.uk/downloads/file/709/design-for-gravesham-design-code-spd->

3 Sources of Potential Flood Risk

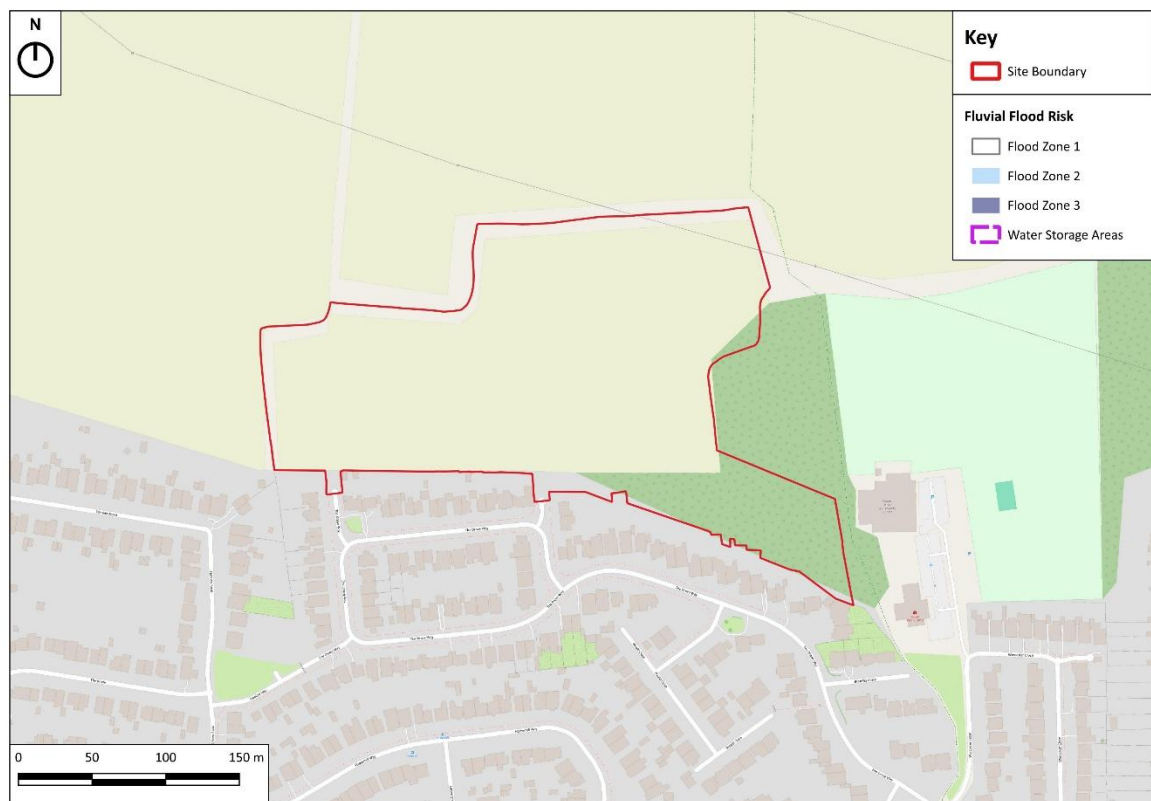
3.1 Fluvial/Tidal

There are no watercourses or ditches in the immediate vicinity of the Site. The Robins Creek, a main river as identified by the EA and a tributary to the River Thames, is the nearest watercourse located approximately 2.6km to the northwest of the Site.

The EA's Flood Map for Planning (Figure 3-1) shows that the Site is located within Flood Zone 1, indicating a low probability of flooding from fluvial and tidal sources.

The risk of flooding from fluvial and tidal sources is therefore considered to be low.

Figure 3-1: Flood Map for Planning



3.2 Pluvial

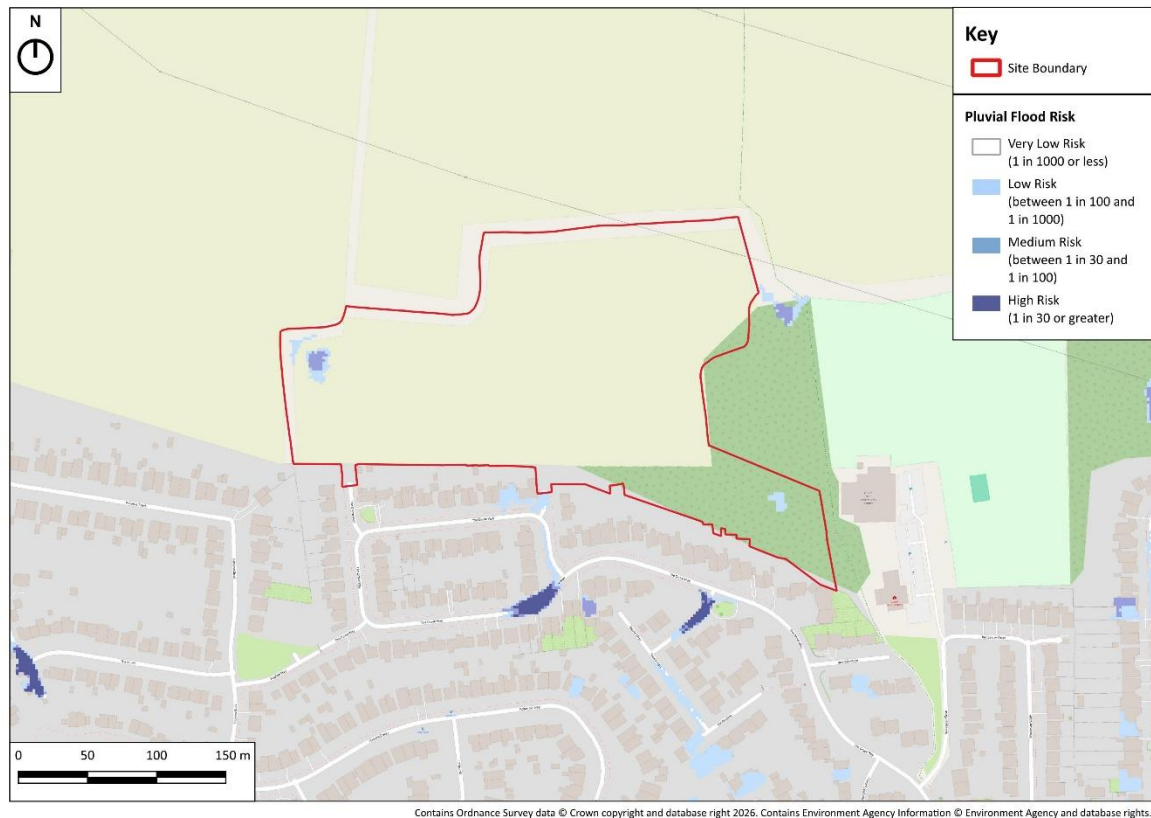
Pluvial flooding can occur during an extreme, high intensity rainfall event which overwhelms the infiltration capacity of underlying soils and/or the capacity of local natural or engineered drainage systems. This flood water will then be conveyed via overland flow routes based on the local topography.

3.2.1 Overland Pluvial Flows

The EA's surface water flood maps show that the vast majority of the Site is located within an area at a very low risk of flooding from surface water. This is the case for the present day and future climate change scenario.

It is noted that there is a small localised area of surface water flooding within the north west of the Site in both the present day and future climate change scenarios. The risk is shown to be low in the present day and up to medium in the future climate change scenario, and is likely to occur as a result of rainfall landing on the site itself. For the purposes of this report, only the future climate change scenario has been shown in Figure 3-2 below.

Figure 3-2: Risk of Flooding from Surface Water mapping - Climate Change Flood Extent (2040-2060)



Runoff from the hardstanding areas of the Proposed Development, will be managed by the surface water drainage features included as part of the scheme (discussed in greater detail within Section 4).

The risk of flooding from overland pluvial flows is considered to be low.

3.2.2 Sewer Flooding

Southern Water asset records (Appendix A3) indicate that there are no public sewers within the Site. The nearest Southern Water assets are located within The Drove Way to the south of the Site. These assets comprise foul sewers only.

The Thameside Surface Water Management Plan⁹ contains mapping detailing historic sewer flood events in Istead Rise. The historical Flooding Map DA03 (Appendix A4) indicates that there have been no incidents of sewer flooding within Istead Rise.

Given the lack of Southern Water assets within the Site boundary, and that there have been no historic sewer flooding incidents in the vicinity of the Site, the risk of flooding from surcharging sewers is considered to be low.

⁹ Kent County Council, May 2013. Thameside Stage 1 Surface Water Management Plan. Available at: [Thameside surface water management plan - Kent County Council](#)

3.3 Groundwater

Flooding from groundwater occurs when the water table rises and reaches ground level, particularly following prolonged rainfall. Groundwater flooding is usually much slower to occur than fluvial or surface water flooding and can last for days, weeks or even months. Groundwater flooding is more common in low-lying areas that are underlain by permeable geologies.

British Geological Survey¹⁰ (BGS) mapping shows that the Site is underlain by bedrock geology of the Seaford Chalk Formation and Thanet Sand Formation, with no superficial deposits. There are no borehole records located within the Site however, one borehole record (reference TQ67SW7) lies approximately 350m to the east of the Site. The record shows sandy and silty clays (with evidence of chalk bands) to a depth of 3.8m followed by chalk to subsequent depths.

To inform the drainage strategy, ground investigations were conducted to identify below ground characteristics of the Site. The ground investigation undertaken by EPS Strategies (Appendix A5) broadly confirmed the geology shown by the BGS mapping but did indicate that material interpreted as superficial head deposits underlying topsoil were observed and that this comprised brown, silty, gravelly clay with rootlets and flint.

The ground investigations also confirmed that no groundwater was encountered within exploratory boreholes at the Site. Groundwater monitoring was undertaken and a return visit in late March confirmed the absence of groundwater in the installed standpipe at 5.0m Below Ground Level (BGL).

On the basis that groundwater was not encountered to depths of 5.0m BGL in the wetter month of March and that there are some impermeable superficial deposits present, it is considered unlikely that groundwater flooding could reach the surface. The risk of flooding from groundwater sources, is therefore considered to be low.

Furthermore, the Proposed Development does not include for any basements, meaning there will be no resulting impact to any potential groundwater flows.

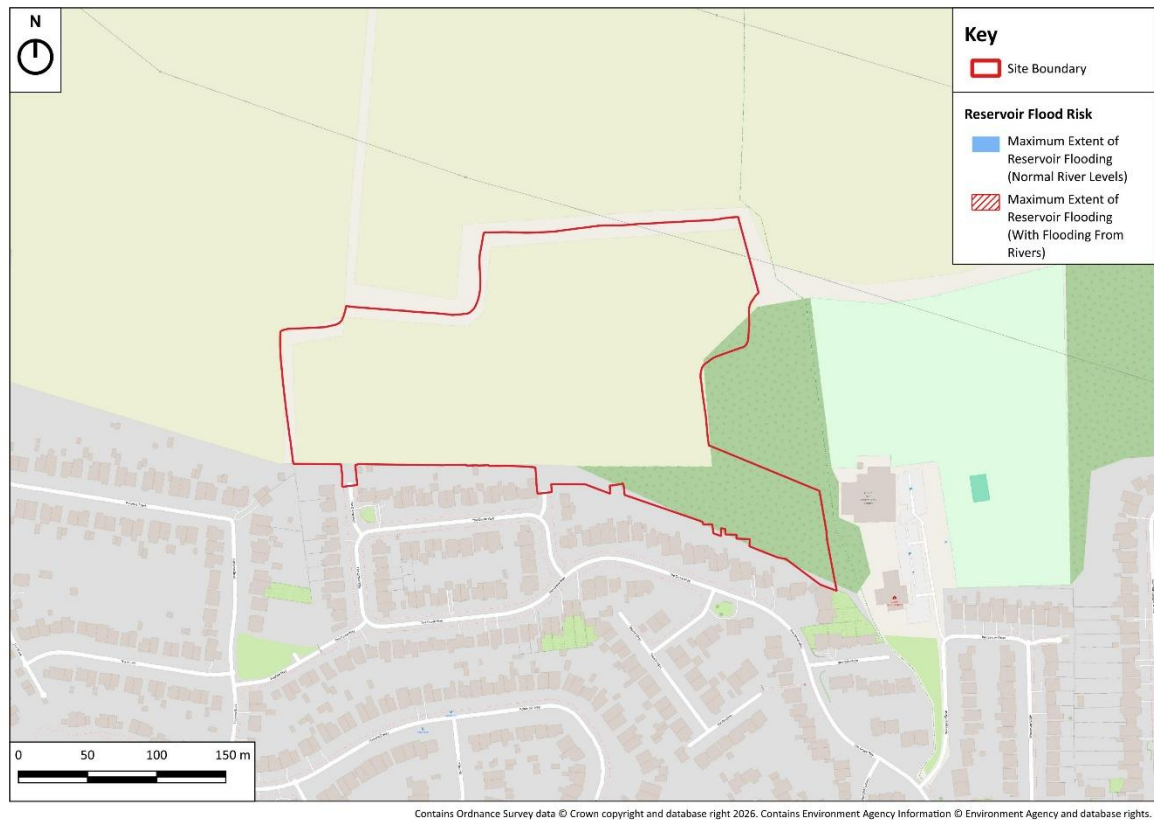
3.4 Artificial Sources

The EA's risk of flooding from reservoirs map (Figure 3-3) shows that the Site is located outside of the reservoir flood risk extent.

There are no artificial waterbodies in close proximity to the Site and the risk of flooding from artificial sources is therefore considered to be low.

¹⁰ British Geological Survey, Geoindex Onshore available at:
https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.214711319.1075902138.1751972686-410814623.1751972686

Figure 3-3: Risk of Flooding from Reservoirs



4 Outline Surface Water Drainage Strategy

4.1 Existing Drainage Regime

The Site is entirely greenfield in nature, given there are no nearby watercourses and therefore, it is anticipated that incident rainfall at the Site currently drains naturally via infiltration.

4.2 Proposed Drainage Regime

In preparing the proposed surface water drainage design, a meeting was held with KCC (the LLFA) to discuss the principles of the proposals. Meeting minutes from this are included within Appendix A6. KCC were consulted to request a slight amendment to the meeting minutes and a response is currently awaited.

4.2.1 Discharge Location

In assessing the surface water discharge location, Table 4-1 sets out the drainage hierarchy in decreasing order of preference and reflects policy within the Drainage and Planning Policy Statement for KCC.

Table 4-1: Surface water drainage hierarchy

Discharge Location	Comment
Water Re-use	Rainwater re-use systems have not been included at this outline planning stage. The inclusion of rainwater harvesting features for the Proposed Development in the form of rainwater butts for individual properties will be reviewed at the Reserved Matters stage. On the basis that capacity within rainwater harvesting features is unknown due to changes in usage, these will not be considered to provide attenuation but would be used for localised irrigation (e.g. for watering plants).
To Ground	Geological mapping indicates that the Site is underlain by Seaford Chalk and Thanet Sand, both of which are typically permeable and capable of supporting infiltration. Site specific infiltration testing was undertaken at the Site to confirm this assumption and the testing indicated that infiltration was favourable (report UK26.7780, included in Appendix A5 and rates are summarised further within this section). Therefore, it is proposed to drain the Proposed Development through the use of infiltration basins. In line with discussions with KCC, further site investigations would be carried out at Reserved Matters across the Site to inform the drainage design. Groundwater levels would be confirmed to ensure the base of infiltration features are set a minimum of 1m above groundwater levels in line with KCC guidance.
To a Surface Water Body	Infiltration features would be used to drain all surface water runoff generated at the Site. This therefore precludes the need to drain to a surface water body.
To a Surface Water Sewer	As above, infiltration features would be used to drain all surface water runoff generated at the Site and discharge to a surface water sewer is therefore not required.

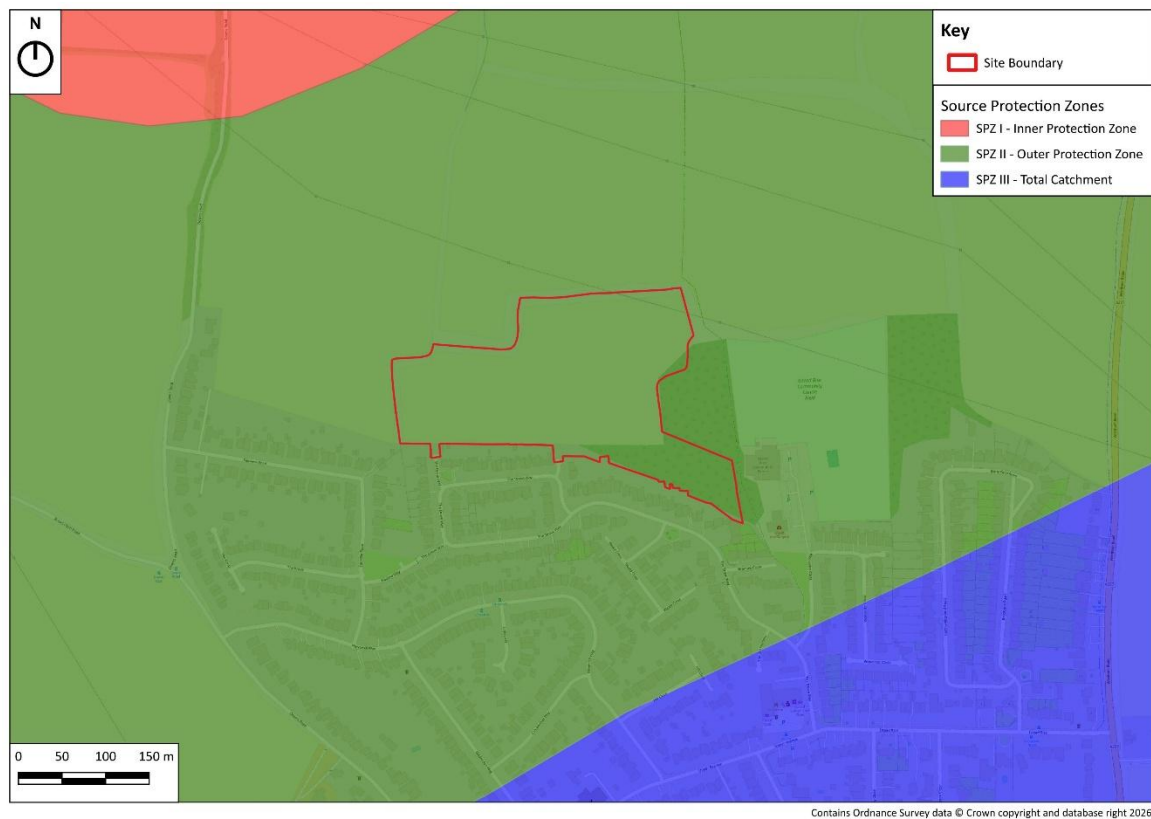
Discharge Location	Comment
To a Combined Sewer	As above, infiltration features would be used to drain all surface water runoff generated at the Site and discharge to a combined sewer is therefore not required.

Infiltration Considerations

Groundwater Conditions

With regards to the suitability of infiltration, it is worth noting that MAGIC¹¹ mapping indicates the Site is underlain by a principal bedrock aquifer and is within Source Protection Zone 2 (SPZ II) as identified by EA mapping (Figure 4-1 **Error! Reference source not found.**). MAGIC mapping shows that the Site is not located within any Drinking Water Safeguard Zones (surface water or groundwater) or Drinking Water Protected Areas.

Figure 4-1: Source Protection Zones



Given that infiltration is proposed within an SPZ, consultation was held with the EA to confirm any specific requirements that they have, making reference to their guidance "The Environment Agency's approach to groundwater protection"¹². Their responses (Appendix A7) and how this is addressed within the drainage design have been summarised into Table 4-2.

¹¹ MAGIC. Available at: <https://magic.defra.gov.uk/MagicMap.html>

¹² Environment Agency, February 2018. The Environment Agency's approach to groundwater protection. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692989/Environment-Agency-approach-to-groundwater-protection.pdf

Table 4-2: Summary of EA Consultation and Responses

EA Comment	How this is addressed
Hydrogeological Risk Assessments are only required when infiltrating within SPZ 1. Although risk assessments could be required for other reasons such as existing land contamination.	There are no proposals to infiltrate runoff within SPZ 1, infiltration will only be within SPZ 2 and there is no requirement for a Hydrological Risk Assessment. Given the greenfield nature of the Site, there is no anticipated existing land contamination.
Where infiltration is proposed, the following should be considered: • Appropriate pollution prevention measures should be used to prevent pollution to groundwater. • No infiltration should be provided into land impacted by contamination or land previously identified as being contaminated. • There must be no direct discharge to groundwater, an unsaturated zone beneath the base of the infiltration feature and any groundwater level. This must be maintained throughout the year. • Shallow infiltration systems are preferred over other systems such as deep bored soakaways.	Responses to each comment from the EA are provided below: • A series of SuDS features will be provided prior to infiltration and the quantification of treatment provided is included within Section 4.2.5 of this report. • As above, given the greenfield nature of the Site, there is no anticipated existing land contamination. • As set out previously, during the ground investigation works, groundwater was not observed to depths of 5m. Any infiltration feature proposed will include a minimum of 1m unsaturated zone below the base. Further information on depths of basins are included within Section 4.2.4. • Shallow infiltration basins are proposed to manage runoff and no deep borehole soakaways are included.

Infiltration Testing

Infiltration testing was undertaken at the Site by EPS Strategies in March of 2026. Due to a number of Site constraints (such as access issues for water bowzers), infiltration testing using trial pits to BRE 365 Soakaway Standards 2016 was not possible. Instead, three windowless sampling boreholes were drilled and falling head tests were carried out to determine infiltration rates. This approach was discussed and agreed with KCC in the meeting held and a request to make slight amendments to the meeting minutes to reflect this clearly was made to KCC. A response and amended meeting minutes are awaited however, it is understood that this approach is agreed.

These tests were undertaken in the northwest corner of the Site only with the test in WS01 undertaken at a depth of 5m, and within WS02 and WS03 at 2m depth. The tests were undertaken in line with BS 5930:2015+A1:2020 the *Code of Practice for Ground Investigations*.

As discussed with KCC, at the reserved matters stage, infiltration testing in line with BRE 365 Soakaway Testing Standards 2016 would be undertaken at the specific locations of drainage features to further inform the detailed drainage strategy. Again, a request to amend the meeting minutes to make this clear was sent to KCC as the approach was deemed acceptable in the pre-application meeting (Appendix A6 for meeting minutes) and a response is awaited. The full ground investigations report is provided within Appendix A5.

Infiltration rates obtained at each location within the Site are detailed in Table 4-3.

Table 4-3: Infiltration testing obtained rates

Borehole Location	Test Number	Infiltration Rate (m/s)
WS01	1	3.151×10^{-6}
WS02	1	2.434×10^{-4}
	2	7.160×10^{-5}
	3	2.680×10^{-5}
WS03	1	6.762×10^{-5}
	2	2.536×10^{-5}
	3	3.791×10^{-6}

As shown in Table 4-3, a range of infiltration rates were observed within the exploratory boreholes. At the outline stage, and to provide a conservative assessment on required attenuation volumes, the worst case infiltration rate of 3.151×10^{-6} at WS01 is to be used in drainage calculations.

4.2.2 Sustainable Drainage Systems

The most sustainable way to manage surface water runoff is through the use of Sustainable Drainage Systems (SuDS). SuDS need to be included for all new developments in line with planning policy and need to consider Site-specific constraints to ensure they are appropriate for new development.

SuDS mimic the natural drainage regime which help to reduce the quantity of discharge and as a result, help to reduce flood risk downstream. They bring a multitude of benefits including improving water quality, managing water quantity, increased biodiversity and amenity.

A variety of SuDS are available to manage surface water runoff. In order to adhere to the SuDS hierarchy, the constraints and opportunities of various SuDS have been assessed in Table 4-4. Justification is provided as to why certain features are feasible or unfeasible for the Proposed Development.

Table 4-4: Sustainable Drainage Systems

Device	Description	Constraints / Comments	✓/✗
Green/ brown/blue roofs (source control)	Provide soft/hard landscaping at roof level which reduces surface water runoff.	Residential units will be self-owned and will have pitched roofs. Therefore, there is no scope for green/blue roofs.	✗
Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration.	Infiltration testing results indicate that the use of infiltration features at the Site are feasible to drain surface water runoff. At the outline stage, larger infiltration basins have been provided to attenuate and discharge all surface water runoff.	✓
Permeable surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer,	Permeable surfacing will be incorporated across pedestrian and car parking areas of the Proposed Development. At the outline stage these features have not been included	✓

Device	Description	Constraints / Comments	✓/✗
	from which it can either infiltrate and / or slowly release to watercourses or sewers.	within attenuation calculations in lieu of detailed proposed levels and layout plans. These features will have the potential to provide additional sub-base storage for surface water runoff and further treatment benefits.	
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from a site by reusing water for non-potable uses e.g., toilet flushing or water butts.	Rainwater re-use systems such as external rainwater harvesting butts will be considered for inclusion within the Proposed Development at the Reserved Matters stage.	✓
Swales/Drainage Rills (conveyance)	Broad shallow channels that convey / store runoff and allow infiltration (ground conditions permitting).	Swales will be considered for inclusion (where practicable) to aid in the conveyance of surface water across the Proposed Development where appropriate.	✓
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration (ground conditions permitting).	Filter drains could be included across the development to aid in the conveyance of surface water and provide additional SuDS benefits. The potential for the inclusion of filter drains would be considered at the Reserved Matters stage.	✓
Filter Strips	Wide gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas.	The potential of filter strips will be dependent on available space and would be considered if appropriate at the Reserved Matters stage.	✓
Bioretention Systems / Rain Garden (end of pipe treatment).	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils. These features can also be accommodated within above ground planters.	Rain gardens could be included across the development, for example adjacent to roadsides or houses taking highway or rooftop runoff, to provide additional SuDS benefits. The potential for the inclusion of rain gardens would be considered at the Reserved Matters stage.	✓
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow	It is proposed that infiltration basins be included at topographically low areas within the Site and all runoff will ultimately be routed to these features.	✓

Device	Description	Constraints / Comments	✓/✗
	infiltration through the base.		
Detention Basin / Pond (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base. Where appropriate, permanent pools can be incorporated.	As above, infiltration basins will be utilised in the Proposed Development which precludes the need for detention basins.	✗
Attenuation underground (end of pipe treatment)	Oversized pipes or geocellular/sectional tanks designed to store water below ground level.	Given the inclusion on infiltration basins and other SuDS features, attenuation tanks are not considered necessary at this stage. This will be confirmed at the reserved matters stage.	✗

The proposed infiltration basins have been sized to store and discharge all runoff from the Proposed Development at the outline stage. The impact that the proposed permeable surfacing would have on attenuation sizing would be considered at the reserved matters stage.

Although not explicitly included within the scheme at outline stage, the potential to incorporate swales, rain gardens, filter drains and rainwater harvesting butts will be reviewed at the reserved matters stage and included where possible. These features would provide additional water quality, quantity, amenity and biodiversity benefits.

The location of the proposed SuDS features and overall outline drainage strategy is illustrated within Appendix A8.

4.2.3 Proposed Catchments

The Proposed Development has been split into two drainage catchments based upon existing topographic levels, catchment details are summarised in Table 4-5 and illustrated in Appendix A8.

At the outline stage and based on the anticipated density of the Proposed Development, the catchments have been assumed to have a maximum impermeable percentage of 65% (with the remainder being proposed as soft landscaping). In line with planning policy, a 10% increase in impermeable area has been applied to the catchments to account for urban creep and these values have been used in subsequent drainage calculations.

Table 4-5: Impermeable Catchment Areas

Catchment Reference	Area (ha)	Impermeable Area (ha) (65%)	Impermeable Area incl. 10% Urban Creep (ha)
Catchment 1	1.191	0.774	0.853
Catchment 2	1.405	0.913	1.005
Total	2.596	1.687	1.858

4.2.4 Attenuation Requirements

In modelling the attenuation requirements, the following design parameters were used in calculations:

- Modelling was undertaken within InfoDrainage 2026.2.
- FEH 2022 point rainfall data has been utilised.
- Attenuation features have been designed to accommodate the 1 in 100 year plus 45% climate change event with no flooding. 300mm freeboard has been included.
- The basins have been designed with a maximum side slope of 1 in 4.
- A Cv Value (runoff coefficient) of 1 was used for catchment areas.
- An infiltration rate of 3.151×10^{-6} m/s (0.0113 m/hour) was applied to each basin and is the worst observed rate from testing. This was applied to the base of the feature only (i.e. not to the side slopes)
- An additional 10% of impermeable area was applied to each catchment to account for urban creep, these areas are reflected in Table 4-5.
- As requested by KCC, the following simulations were run for storm events up to an including the 10,080 minute storm. These include the 2 year, 30 year, and 100 year plus 45% climate change events.
- As both basins were unable to achieve half drain times of less than 24 hours during the 1 in 100 year event, the basins have been sized to accommodate the maximum volume required during a consecutive storm scenario involving a 1 in 10 year event occurring immediately following a 1 in 100 year event, following KCC guidance (Appendix A6).

Modelling calculations are included in Appendix A9. Based on the modelling results, two infiltration basins providing a total attenuation volume of 2,528m³ would be required for the Proposed Development. The provided attenuation volumes for each basin are highlighted in Table 4-6 and their locations are illustrated in Appendix A7.

Table 4-6: Summary of Infiltration Basin Attenuation Volumes

Basin Reference	Attenuation Volume without Freeboard (m ³)	Attenuation Volume with Freeboard (m ³)
Infiltration Basin West (Catchment 1)	1,164	1,614
Infiltration Basin East (Catchment 2)	1,363	1,880
Total	2,538	3,494

An offset of 10m has been provided between the base of the infiltration basin (where infiltration will take place) and any residential units, highways and pumping stations. This is in line with the recommendations included within the infiltration testing report (Appendix A5).

Half Drain Times and Subsequent Storm Events

KCC require that infiltration features half drain within 24 hours for all storm events up to and including the 1 in 30 year storm. Modelling calculations (Appendix A9) indicate that both infiltration basins do not reach half of the maximum capacity of each feature for all storm events in the 1 in 30 year event. InfoDrainge indicates that half drain times are only shown when at least half the maximum capacity of a feature is reached and therefore, it is concluded that half drain times are achieved for all storm durations in the 1 in 30 year event.

However, half drain times are not achieved for all storm durations in the 1 in 100 year event. As half drain times of less than 24 hours are not being achieved for the 1 in 100 year event, the basins have been sized to ensure enough capacity is provided to hold runoff from a 1 in 100 year storm immediately followed by a 1 in 10 year storm. The maximum resident volumes for these storm events have been highlighted in Table 4-7 and compared to the attenuation provided by the infiltration basins.

Table 4-7: Subsequent storm events

Basin	Maximum Modelled Resident Volume (m ³)		Total Maximum Modelled Resident Volume (m ³)	Attenuation Provided (m ³ , without Freeboard)
	1 in 100 Year	1 in 10 Year		
Infiltration Basin West (Catchment 1)	726	329	1,055	1,164
Infiltration Basin East (Catchment 2)	852	385	1,237	1,363

In both instances, the infiltration basins have enough capacity to attenuate a 1 in 100 year storm event followed by a 1 in 10 year storm event while maintaining 300mm freeboard.

4.2.5 Water Quality

The quality of surface water runoff from the Site has been considered in line with the CIRIA SuDS Manual¹³ Simple Index Approach, to ensure adequate treatment and pollutant removal is provided for the scheme. Table 4-8 is based upon table 26.2 of the SuDS Manual and considers the pollution indices based upon the Proposed Development.

The Proposed Development would comprise residential roofs, and low traffic roads/private driveways, which represent a 'very low' to 'low' pollution hazard.

Table 4-8: Pollution hazard indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads	Low	0.5	0.4	0.4

¹³ CIRIA SuDS Manual (2015) (available at: https://www.susdrain.org/resources/SuDS_Manual.html)

To be conservative and at this outline stage, an assessment of the treatment that just the infiltration basin would provide has been undertaken. Table 4-9 below confirms that suitable mitigation would be provided by the infiltration basin alone, it is proposed however permeable paving will be included which will provide further treatment benefits. Furthermore, the potential to incorporate swales, raingardens and filter drains will be reviewed and reserved matters and would also provide further treatment.

Table 4-9: SuDS mitigation indices for discharges to groundwater (Based on Table 26.4 of the SuDS Manual)

Characteristics of SuDS Components	Total Suspended Solids (TSS)	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential of at least 300mm depth (infiltration basins)	0.6	0.5	0.6

4.2.6 Exceedance Routes

In the unlikely event of a severe blockage in the local drainage system, or a storm occurring that is greater than the 1 in 100 year plus 45% climate change event, exceedance flows would generally be directed to the north and northeast of the Site towards the infiltration basins.

An indicative overland exceedance flow route plan has been prepared and is included in Appendix A8.

4.2.7 SuDS Maintenance Regime

The PPG and CIRIA SuDS Manual sets out the requirement for developers to consider the operation, management, and maintenance of all SuDS for the lifetime of the development.

Post construction, the landowner or appointed maintenance company would be responsible for the SuDS included within the scheme. Table 4-10 outlines what maintenance is anticipated for the proposed SuDS features.

Table 4-10: Indicative SuDS maintenance schedule

SuDS and Task	Frequency
Infiltration Basins	
Reseed areas of poor vegetation growth. Repair erosion or other damage by reseedling or re-turfing. Repair/rehabilitation of inlets, outlets and overflows. Relevel uneven surfaces and reinstate design levels.	As required
Remove litter and debris. Inspect inlets, outlets and overflows for blockages and clear if needed. Inspect banksides, structures, pipework etc for physical damage. Cut grass for access routes.	Monthly

SuDS and Task	Frequency
Manage other vegetation and remove nuisance plants. Inspect inlets and facility surface for silt accumulation.	
Cut grass in and around basin.	Six monthly
Check any penstocks and other mechanical devices. Tidy all dead growth before start of growing season. Remove sediment from inlets, outlet and forebay. Manage wetland plants where provided.	Annually
Prune and trim any trees and remove cuttings.	Every 2 years or as required
Permeable Surfacing	
Brushing.	Annually or as required
Stabilise contributing adjacent areas. Removal of weeds. Remediation to any depressions, rutting and cracked considered detrimental to the structural performance or a hazard to users.	As required
Inspection of main structure, pipework and filtration devices and remove any sediments.	Quarterly or as required
Monitoring inspection chambers. Inspection for weed growth and silt accumulation.	Annually or as required
Rainwater Harvesting Systems	
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
Check filters for blockage by sediment, algae, or other matter, remove and replace surface infiltration medium as necessary.	Annually
Repair/rehabilitate inlets, outlet, and overflows and vents.	As required
Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed.	Annually
Swales	
Remove Litter. Cut grass, to retain grass height within specified design range. Inspect and manage vegetation coverage and remove nuisance plants. Inspect outlets, inlet and overflows for blockages and clear if required.	Monthly or as required

SuDS and Task	Frequency
Inspect infiltration surfaces for ponding, compaction, and silt accumulation. Record areas where these occur for greater than 48 hours.	
Reseed areas of poor vegetation growth and alter plant types to better suit conditions if required.	As required, if bare soil is exposed for 10% or more of the swale treatment area.
Repair erosion and other damage by returfing or re seeding. Relevel uneven surfaces to maintain design levels. Scarify and spike topsoil to improve infiltration performance where appropriate and prevent compaction/over siltation. Remove build up of sediment on upstream gravel trench, flow spreader or at the top of filter strips. Remove and dispose of any oil and petrol residues using safe standard practices.	As required
Filter Drains	
Removal of litter and debris from filter drain surface, access chambers and pre-treatment devices. Inspection of filter drain surface, inlet/outlet pipework, and control systems for blockages, clogging, standing water, and structural damage.	Monthly
Inspection of pre-treatment systems inlet and perforated pipework and establish appropriate silt removal frequencies. Removal of sediment from pre-treatment devices.	6 monthly
Remove or control any tree roots where encroachment into the filter drains occur. Using recommended methods, NJUG, 2007 or BS 3998:2010. Clear perforated pipework of blockages. At locations with high pollution risk, remove surface geotextile and replace/wash or replace overlying filter medium.	As required
Rain Gardens	
Inspection of the infiltration surface for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrains to determine if maintenance is necessary. Assess plants for disease, infection, poor growth, invasive species etc. and replace if necessary. Inspect inlets and outlets for blockages. Remove sediment, litter and debris build up from around the inlets or from forebays and on the surface.	Quarterly

SuDS and Task	Frequency
Check operation of underdrains by inspection of flows after rain.	Annually
Replace planting, to maintain planting density. Infill any holes or scour in the filter medium, improve erosion protection if required. Remove and replace filter medium and vegetation above.	As required

5 Outline Foul Drainage Strategy

5.1 Existing Drainage Regime

The Site is entirely greenfield and has no public foul sewers located within it. Southern Water asset records (Appendix A3) indicate that the nearest public foul sewer lies within The Drove Way approximately 30m to the south of the Site. The direction of flow of these sewers are shown to go south to the subsequent Southern Water foul network. The existing sewer is shown to be a 150mm vitrified clay pipe.

5.2 Proposed Foul Regime

Due to the existing ground levels across the Site and the levels of existing foul public sewers, it would not be possible to discharge foul flows by gravity. As such, it is the intention to utilise foul pumping stations to pump foul flows from the Proposed Development to the existing public foul sewers.

Foul flows generated in the proposed scenario would flow via gravity to two foul pumping stations (connected in series) located along the northern extent of the Proposed Development. Foul flows would then be pumped to the public sewers located in The Drove Way.

At this stage, the Kingspan Klargester Group were consulted to identify the anticipated foul pumping requirements to serve the Proposed Development (Appendix A10). A required foul pumping rate of 4.08 l/s has been advised by Kingspan Klargester Group and this has been calculated using the massing of the development, estimated distances and level differences between the Site and the anticipated connection point to the public foul sewers (at Southern Water Manhole Ref 2303). The proposed rate and foul drainage design will be reviewed at detailed design when further clarity can be provided. Appendix A8 shows the indicative location of the foul pumping stations which have been sized to adoptable standards and include for a 15m offset to all residential dwellings, the potential for adoption is to be discussed at the reserved matters stage.

To determine if the Southern Water network has sufficient capacity to receive foul flows from the Proposed Development, a Pre-Development Enquiry was submitted to Southern Water. A response from Southern Water is currently awaited.

6 Conclusion

The Site is located entirely within Flood Zone 1 which indicates a low probability of flooding from fluvial and tidal sources. The majority of the Site is also located within a very low risk of flooding from surface water in the present day and future climate change scenarios for 2040 to 2060.

The risk of flooding from sewers, groundwater and artificial sources are also considered to be low.

Surface water runoff generated in the proposed scenario would be attenuated and discharged to ground via infiltration through the use of infiltration basins. These features have been sized to accommodate runoff from all storm events up to and including the 1 in 100 year plus 45% climate change storm event. In line with KCC requirements, the basins have also been sized to accommodate runoff from a 1 in 100 year storm event followed by a 1 in 10 year storm event to account for half drain times of less than 24 hours during selected events not being achieved. The basins maintain 300mm freeboard for all events up to and including the 1 in 100 plus 45% climate change event in addition to the 1 in 100 year plus the 1 in 10 year subsequent storm events.

SuDS in the form of infiltration basins and permeable paving will be incorporated to provide source control, water quality, quantity, amenity and biodiversity benefits. At the reserved matters stage, the potential to incorporate swales, rain gardens, filter drains and rainwater harvesting butts will be reviewed and these will be included where possible.

Foul flows would be managed at the Site by utilising a series of two foul pumping stations to enable connection to the existing Southern Water foul network to the south. It is anticipated that a pump rate of 4.08 l/s will be required to serve the Proposed Development. A pre-development enquiry has been submitted to Southern Water to confirm capacity and a proposed connection point in the receiving foul network, a response is currently awaited.

It is considered that the Proposed Development is in line with the principles of the NPPF and local policy, and is therefore appropriate in terms of flood risk and drainage.

7 Appendices

A1 Topographic Survey

[illegible]

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

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This drawing should only be scaled using digital methods.

SURVEY CONTROL CO-ORDINATES				
STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
ST01	563236.472	170349.935	60.054	PK Nail
ST02	563230.116	170320.126	60.451	PK Nail
ST03	563378.089	170330.853	61.518	PK Nail
ST04	563231.658	170382.477	59.412	Peg & Nail
ST05	563276.851	170403.462	59.889	Peg & Nail
ST06	563325.594	170401.632	60.538	Peg & Nail

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies within the survey, adding to the survey or setting out points from the survey, any coordinated data must be directly derived from the original survey control. Survey Solutions are not responsible for any third-party adding survey data to the existing information.

V	DESCRIPTION	DRAIN	APPR	DATE
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IPSWICH / BEDFORD / BIRMINGHAM / COVENTRY / CRAWLEY / GLASGOW / LEEDS / LONDON-CENTRAL /
LONDON-EAST / MANCHESTER / NEWCASTLE / NORWICH / NOTTINGHAM / THAMES VALLEY

PROJECT TITLE
LAND NORTH OF THE DROVE WAY,
STEAD RISE, GRAVESEND, DA13.

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 2 of 4

CLIENT

PTARMIGAN PLANNING LTD

SURVEYOR	SURVEY DATE	CHE
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MT	26.01.2026	WH
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DRAWING NUMBER

7997IPLS-02

THE SURVEYOR

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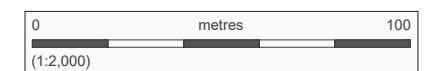
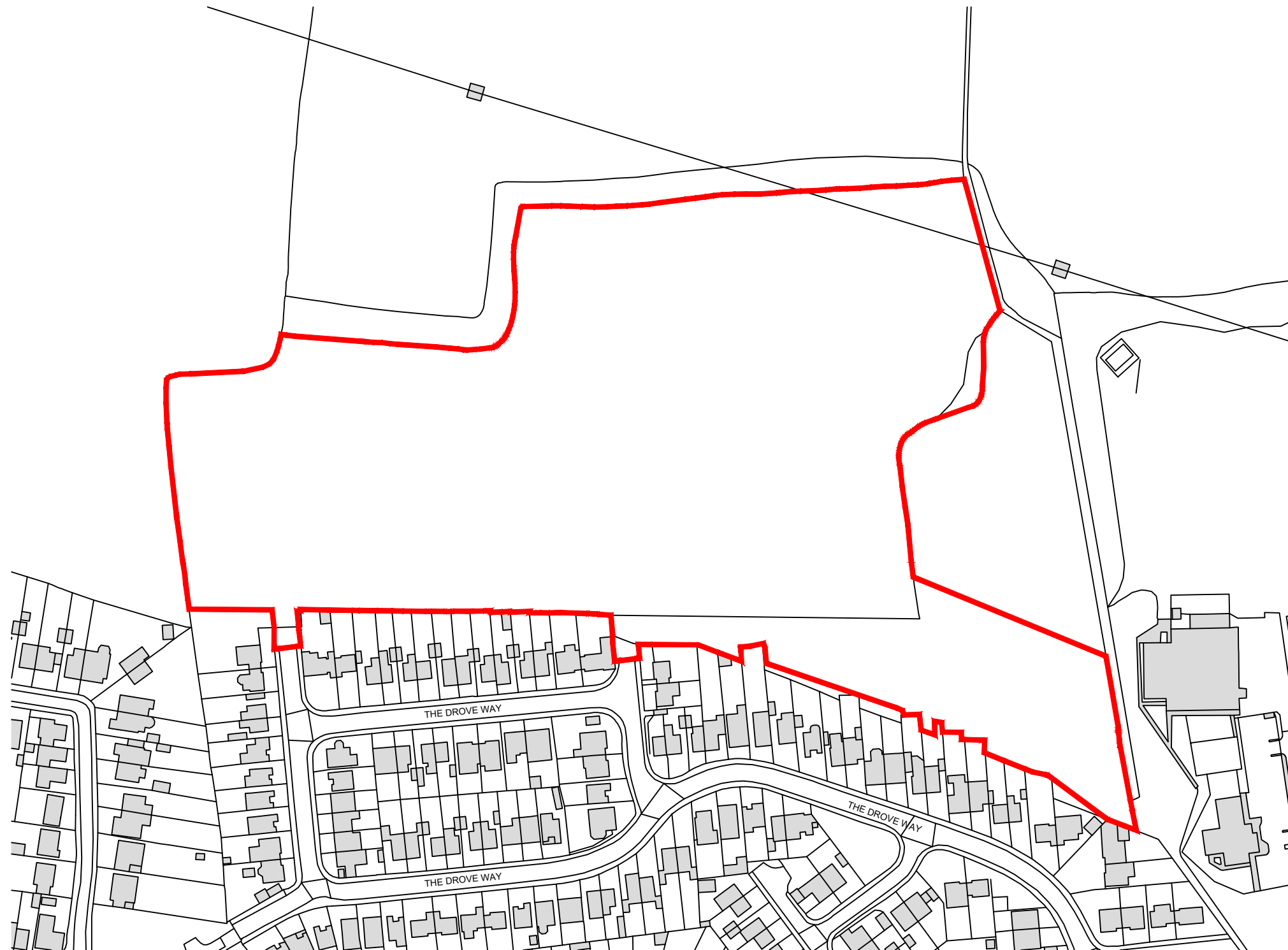
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A2 Development Proposals

 Site boundary



Project
Land to the North of The Drove Way,
Istead Rise, Gravesham
Drawing Title
Site Location Plan

Date 08/05/2026	Scale 1:2,000 at A3	Drawn by JL	Check by SR
Project No 1509	Drawing No 001	Revision B	



- Key
- 01 Vehicular and pedestrian access point
 - 02 Potential pedestrian access point
 - 03 Pedestrian, cycle and emergency access point
 - 04 Sustainable urban drainage system (SuDS)
 - 05 Development backing onto existing residential properties
 - 05 Parkland area which could include naturalistic young children's play spaces, tree planting and meadow planting
 - 06 Neighbourhood green
 - 07 Edible landscapes including community gardens, orchard planting, and/or fruit bearing trees and plants
 - 08 Meadow planting and species rich landscapes
 - 09 Informal footpaths
 - 10 Green corridor
 - 11 Retained and enhanced vegetation
 - 12 Foul water pumping station
 - 13 Informal woodland walking route
 - Public right of way: footpath
 - ★ Potential play on the way features

N.

0m 100m (1:2,000)

CLIENT:
Ptarmigan Land

PROJECT:
Land at Istead Rise, Gravesham

DRAWING:
Illustrative Masterplan

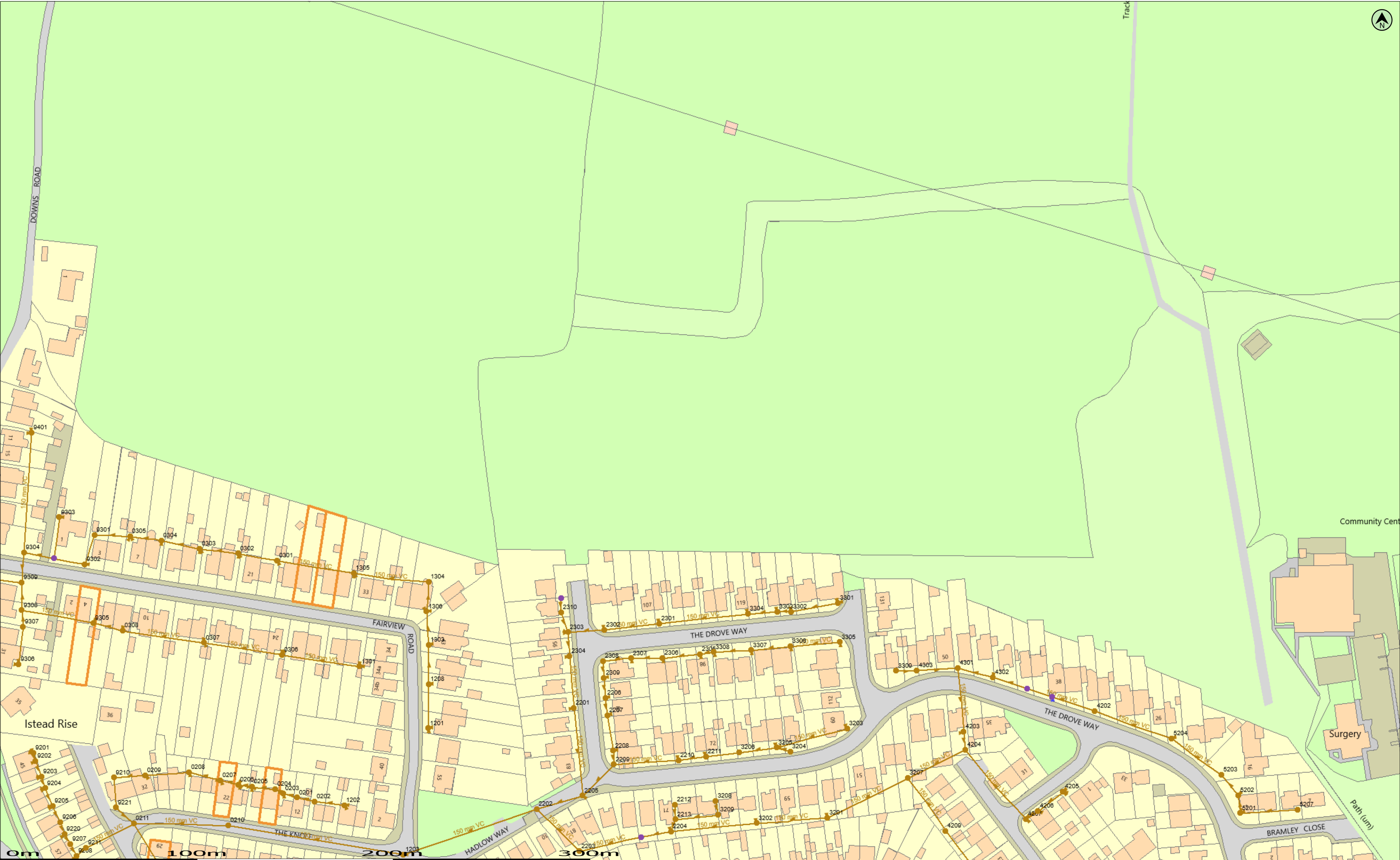
PROJECT NUMBER:
1509

DRAWING NUMBER: 006
CHECKED BY: SR

REVISION: V3
STATUS: Draft

DATE: 12/05/2026
SCALE: 1:2,000

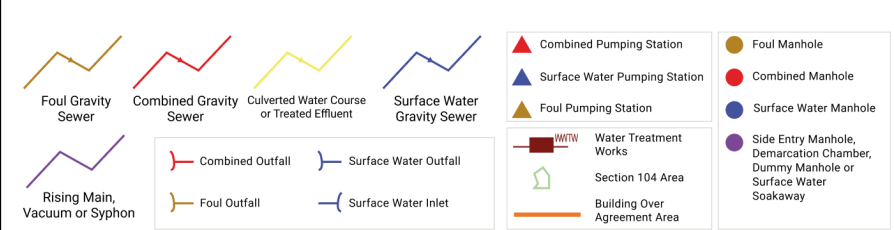
A3 Southern Water Asset Records



(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122 Date: 17/02/26 Scale: 1:1250 Map Centre: 563294,170429 Data updated: 16/01/26 Our Ref: 2031687 - 1 Wastewater Plan A2 Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

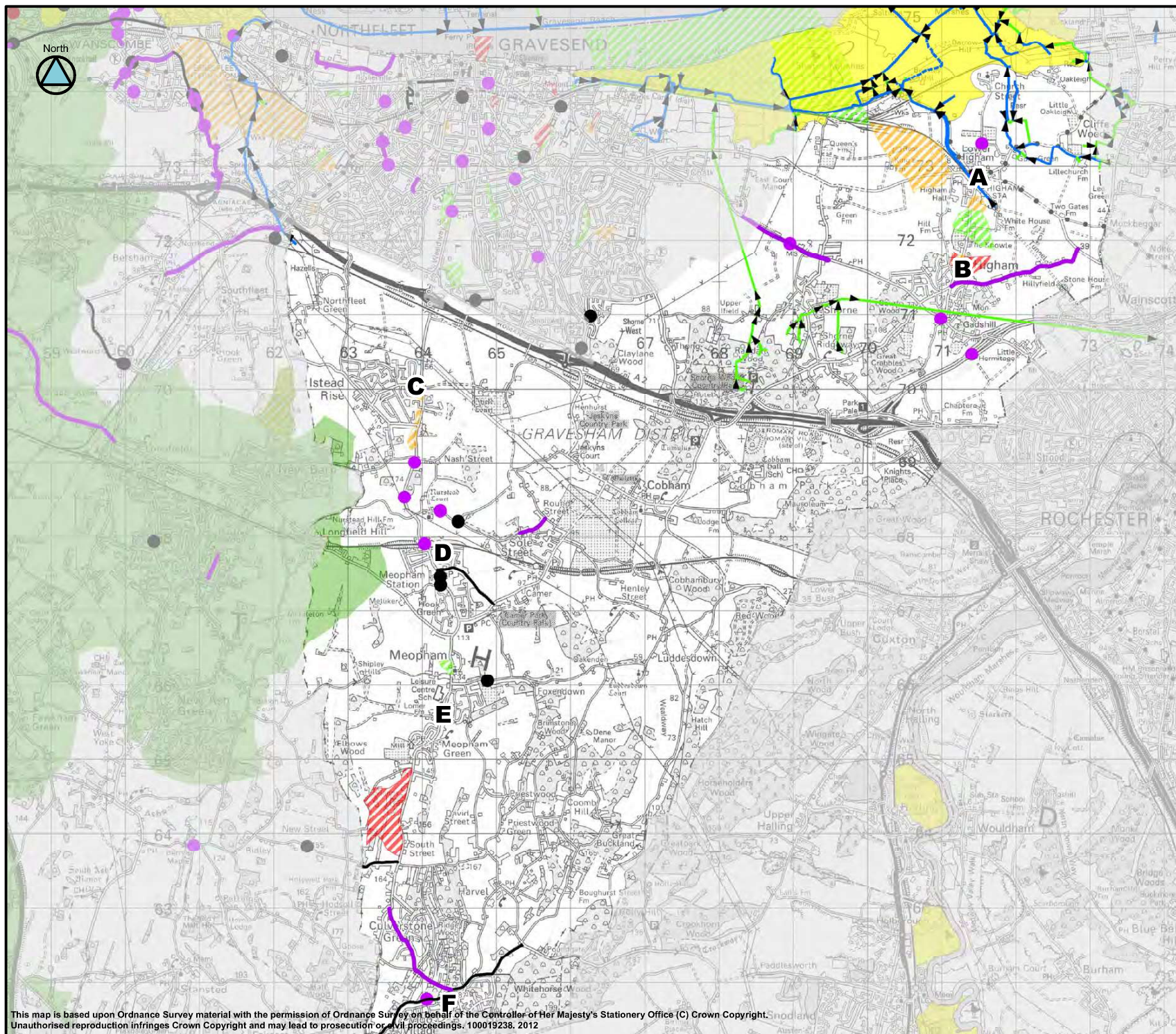


sophiemccabe@logikaconsultants.co.uk

Istead Rise, Kent



A4 Thameside Surface Water Management Plan Mapping



Legend

- Main River (EA) - open channel
- Main River (EA) - culverted
- Ordinary Watercourse - open channel
- Ordinary Watercourse - culverted
- A Lower Higham
- B Higham
- C Istead Rise
- D Hook Green & Meopham Station
- E Meopham
- F Vigo Village

Historic flooding (other RMAs)*

- Other/Unknown
- Fluvial
- Groundwater
- Combined
- Surface Water
- Sewer
- Tidal

* Where an entire road has been highlighted in the historic layer, this does not mean that all the road has flooded in the past but rather no specific location was identified in the records received.

Sewer Flooding Incidents (Thames Water)**

Number of flood occurrences per postcode area

- 1 - 3
- 4 - 6
- 7 - 8<

** Polygons only represent the postcode area and not the flood extent

Sewer Flooding Incidents (Southern Water)**

Number of flood occurrences per postcode area

- 1
- 2
- 3<

Client: Kent County Council

Partners: Southern Water, Environment Agency

Consultant: JBA consulting

Thames Water

DARTFORD BOROUGH COUNCIL

Gravesham Borough Council

Sevenoaks DISTRICT COUNCIL

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Scale 1:50,000

Thameside Stage 1 SWMP

Historical Flooding
DA03

A5 Ground Investigations Report



Ground Investigation Report

Land north of The Drove Way

Istead Rise

Kent

DA13 9JY

Prepared for:

Ptarmigan Land A Ltd

2 Frederic Mews

Kinnerton Street

London

SW1X 8EQ

EPS Project Reference: UK26.7780

Date Issued: 26th March 2026

Report Status: Issue 1



LAND NORTH OF THE DROVE WAY, ISTEAD RISE

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a ground investigation, undertaken to determine ground conditions and give relevant information for use in infiltration design for the site and its future development. Pertinent findings and conclusions may be summarised as follows:

- The ground investigation took place in the northwestern corner of an agricultural field, located to the north of The Drove Way, on the outskirts of the village of Istead Rise in Kent.
- The works involved the formation of three boreholes (WS01-WS03) to a maximum depth of 5.0m, located on the fringes of the field which had recently be ploughed at the time of the assessment. Once the drilling work was complete 'falling head' infiltration testing was carried out in each borehole.
- The ground conditions were recorded as a limited thickness of topsoil above superficial Head Deposits comprising gravelly clay; proven to a maximum depth of 1.0m. Structureless chalk was present directly beneath the Head Deposits, comprising around 20-30% chalk gravel in a sandy, silt matrix. Groundwater strike wasn't encountered in any of the locations, and a return visit did not find any in the standpipe which was installed to 5.0m below existing surface level.
- The work has established that the chalk bedrock is typically representative of 'low to medium permeability conditions', and is likely to be a viable infiltration medium, subject to formal design.
- It should also be noted that the risks associated with chalk dissolution should be considered, with offsets likely to be required between any new drainage infrastructure and new or existing buildings.

The above points represent a simplified summary of the findings of this assessment and **must not** form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.



Project Reference:	UK26.7780	
Title:	Ground Investigation Report – Land north of The Drove Way, Istead Rise	
Client:	Ptarmigan Land A Ltd	
Date:	26 th March 2026	
EPS Contact Details:	7B Caxton House Broad Street Cambourne Cambridge CB23 6JN	T: 01954 710666 E: info@epstrategies.co.uk W: www.epstrategies.co.uk
Status:	Issue 1	

Author:	Reviewed:	Authorised:
<i>J Abraham</i>	<i>B Virtue</i>	<i>B Virtue</i>
James Abraham	Ben Virtue	Ben Virtue
Consultant	Associate Director	Associate Director

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The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Scope of Works	1
1.2	Limitations and Constraints.....	2
2	SITE CHARACTERISATION	3
2.1	Site Location and Context.....	3
3	SUMMARY OF INVESTIGATIONS	4
3.1	Exploratory Hole Locations.....	4
3.2	Infiltration Testing.....	5
4	FINDINGS OF THE INVESTIGATION.....	6
4.1	Ground Conditions	6
4.1.1	<i>Topsoil</i>	6
4.1.2	<i>Head Deposits</i>	6
4.1.3	<i>Seaford Chalk Formation</i>	7
4.2	Groundwater	7
4.3	Physical Evidence of Contamination.....	7
4.4	Infiltration Test Results	7

FIGURES

Figure 1	Site Location Plan
Figure 2	Borehole Location Plan

Appendices

Appendix A	Selected Site Photographs
Appendix B	Site Specific Borehole Logs

1 INTRODUCTION

In March 2026, Environmental Protection Strategies Ltd (EPS) was commissioned by Ptarmigan Land A Ltd to complete infiltration testing at Land north of The Drove Way, Istead Rise, Kent, DA13 9JY ('the site'). A site location plan is presented as Figure 1 and selected site photographs are included as Appendix A.

The work was commissioned to support the drainage strategy for a proposed residential scheme by assessing the nature of the ground conditions and providing soil infiltration rates.

It should be noted that a Phase I Desk Study or formal contamination assessment did not form part of the brief for the works undertaken.

1.1 Scope of Works

To perform an exploratory assessment of the site in accordance with the principles and requirements of BS 5930:2015+A1:2020 '*Code of practice for ground investigations*' the following tasks were undertaken:

Intrusive Investigation:

- Site walkover, inspection and obtaining photographic records.
- Health and safety briefing/ site supervision.
- Drilling of three windowless sample boreholes to a maximum depth of 5.0m below ground level (bgl), using a track-mounted, percussive rig.
- Continual logging of ground conditions including inspection of soils for visual and olfactory contamination (on a purely precautionary basis).
- Completion of 'falling head' infiltration tests in each location to assess the permeability of shallow soils.
- Installation of a standpipe at one borehole location with a return monitoring visit conducted to check for the presence of groundwater.
- Reinstatement of remaining boreholes.

Reporting:

- Data collection and calculation of infiltration rates
- Reporting

The findings of these investigations and their conclusions are presented in the following sections.

1.2 Limitations and Constraints

The purpose of this report is to present the findings of a ground investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all the ground conditions that might be present beneath a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes / trial pits to recover soil samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface. However, it should be appreciated that ground conditions are naturally variable. For this reason, it is possible that samples collected during the investigation may not represent the conditions across the entire site.

This report does not include specific investigation for the presence of either Potential Asbestos Containing Material (PACM) or Japanese Knotweed at the subject site however, if obvious evidence of either is observed during EPS site walkover, details will be provided in this report. Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

Whilst it is recognised that information contained within this report may assist relevant and suitably qualified professionals, this report does not provide a geotechnical appraisal of ground conditions with respect to suitability of foundations or future structures, nor does it intend to identify a need for any associated geotechnical ground improvement works.

2 SITE CHARACTERISATION

The following information has been obtained from publicly available records to characterise the site and setting.

2.1 Site Location and Context

Detail	Description
Location	The site is located to the north of The Drove Way, on the northern fringes of the village of Istead Rise in Kent.
National Grid Reference	563265, 170461
Topographic Elevation	The study area is generally fairly flat, with levels between approximately 59m and 60m above ordnance datum (AOD). It should be noted that levels reduce significantly to the west, north and east of the plot.
Description of Site	EPS attended site on the 10th March 2026 and the area of investigation was noted as a roughly 'L' shaped agricultural field which had recently been ploughed. The verges of the field were surfaced with grass and mature hedgerows and occasional trees were noted to the west, north and east respectively. Residential housing along The Drove Way, is present to the south. A few access points are present including through neighbouring fields and a gated entrance to the northeast (off Wrotham Road). A narrow pathway is also present in the southwest corner and links the adjacent residential road. At the time of the works, the surface of the fields and grass verges was wet and soft.
Geology	Geological mapping indicates the site is underlain directly by bedrock of the Seaford Chalk Formation. It should be noted that slight sections of superficial Head Deposits (sand, gravel, clay and silt) are present in the local area and may encroach beneath the study area.

3 SUMMARY OF INVESTIGATIONS

The ground investigation was undertaken on the 10th March 2026, in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of the site activities is presented in the following sections.

3.1 Exploratory Hole Locations

The exploratory hole positions were largely preselected by the Client's drainage engineer, once the access constraints had been established (as the wet and soft ground prevented heavy equipment from being tracked into position). As a result, only a smaller drilling rig was able to reach the study area to conduct intrusive works.

The location of below/ above ground utilities and infrastructure, as well as operational/ health and safety factors associated with undertaking ground investigation works near a residential area were also considered.

In total, three windowless sampling boreholes (WS01 – WS03) were drilled to a maximum depth of 5.0m bgl. The overall objective of the intrusive works was to assess the nature of the ground profile across the proposed development area, specifically where future drainage features are being considered.

'Falling head' tests were subsequently attempted in each borehole, to gather information on the permeability of the sub-surface soil layers, and ultimately the feasibility of using infiltration drainage in support of any future scheme.

The boreholes were formed in accordance with standard EPS methodologies, and all subcontractors were supervised by an EPS engineer throughout the works. Upon completion of the infiltration testing, two of the positions (WS02 and WS03) were backfilled and levelled at the surface with compacted soil arisings.

The monitoring standpipe installed in WS01 comprised 50mm diameter HDPE well casing, with slotted casing (1mm slot) from the base of the open borehole to approximately 1.0m below the surface. The installation was completed with 1m of plain pipe which was also left sticking above ground level so that it could be easily identified during return visits. A filter pack of 2-3mm of washed gravel extended from the base of the open borehole to approximately 0.1m above the slotted section, with a bentonite seal to surface.

A borehole location plan is presented as Figure 2.

3.2 Infiltration Testing

The boreholes were logged for ground conditions encountered and the 'falling head' infiltration tests were undertaken at each borehole in general accordance with the methodology outlined in BS 5930:2015+A1:2020 '*Code of practice for ground investigations*', to assess the permeability of the natural soil profile. The results of this testing are discussed in Section 4.4 below.

4 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the various aspects of the ground investigation.

4.1 Ground Conditions

BGS mapping indicates the area to be underlain by bedrock of the Seaford Chalk Formation, albeit Head Deposits are intermittently present. Given this, and the nature of the ground conditions encountered during the intrusive investigation, the shallow soils have been interpreted to consist of the following:

- Topsoil
- Head Deposits
- Seaford Chalk Formation

A summary of the general strata encountered across the site is provided in the table below, with more detailed description given in the following sub-sections.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Range of Strata Thickness (m)
Topsoil	0.2	0.2
Head Deposits	1.0	0.3 – 0.8
Seaford Chalk Formation	>5.0	>1.0 - >4.1 (not proven)

4.1.1 Topsoil

An initial layer of topsoil was recorded in each borehole, comprising brown, slightly silty clay with rootlets.

4.1.2 Head Deposits

Material interpreted as superficial Head Deposits was encountered underlying the topsoil in all three boreholes, comprising brown, silty, gravelly clay with rootlets and flint. Within WS01 and WS03, the gravel also comprised chalk which is quite common for this strata. The maximum depth of the clay was 1.0m in WS03, which suggest that the superficial soils are thickest towards the south of the study area.

4.1.3 Seaford Chalk Formation

All boreholes encountered chalk bedrock underlying the Head Deposits and were typically described as an off-white structureless chalk recovered as 20-30% chalk gravel in a sandy, silt matrix. The gravels present consist of chalk and rare flints.

A thin section of brownish white, clayey, silty gravel was noted at the top of the chalk bedrock in WS01 and WS02, interpreted to be representative of small, weathered section of the unit. The Seaford Chalk Formation was proven to a maximum depth of 5.0m bgl in WS01.

Site specific borehole logs are included as Appendix B.

4.2 Groundwater

Groundwater was not encountered within any of the borehole locations.

Furthermore, a return visit was carried out on the 20th March 2026 which confirmed the absence of groundwater in the standpipe to 5.0m bgl.

4.3 Physical Evidence of Contamination

No palpable evidence of contamination was encountered within any of soils recovered from the boreholes. The soils did not include any notable evidence of waste or putrefiable material, with hydrocarbon staining/ odours also absent.

4.4 Infiltration Test Results

On completion of the drilling works, 'falling head' infiltration tests were attempted at each borehole location, in order to assess the permeability of the underlying soils across the northwestern area of the site. Three repeat tests were achieved within two of the borehole locations (WS02 and WS03).

The results are summarised in the below table and discussed in the subsequent paragraphs.

Borehole Location	Test Number	Infiltration Rate (m/s)
WS01	1	3.151×10^{-6}
WS02	1	2.434×10^{-4}
	2	7.160×10^{-5}
	3	2.680×10^{-5}
WS03	1	6.762×10^{-5}
	2	2.536×10^{-5}
	3	3.791×10^{-6}

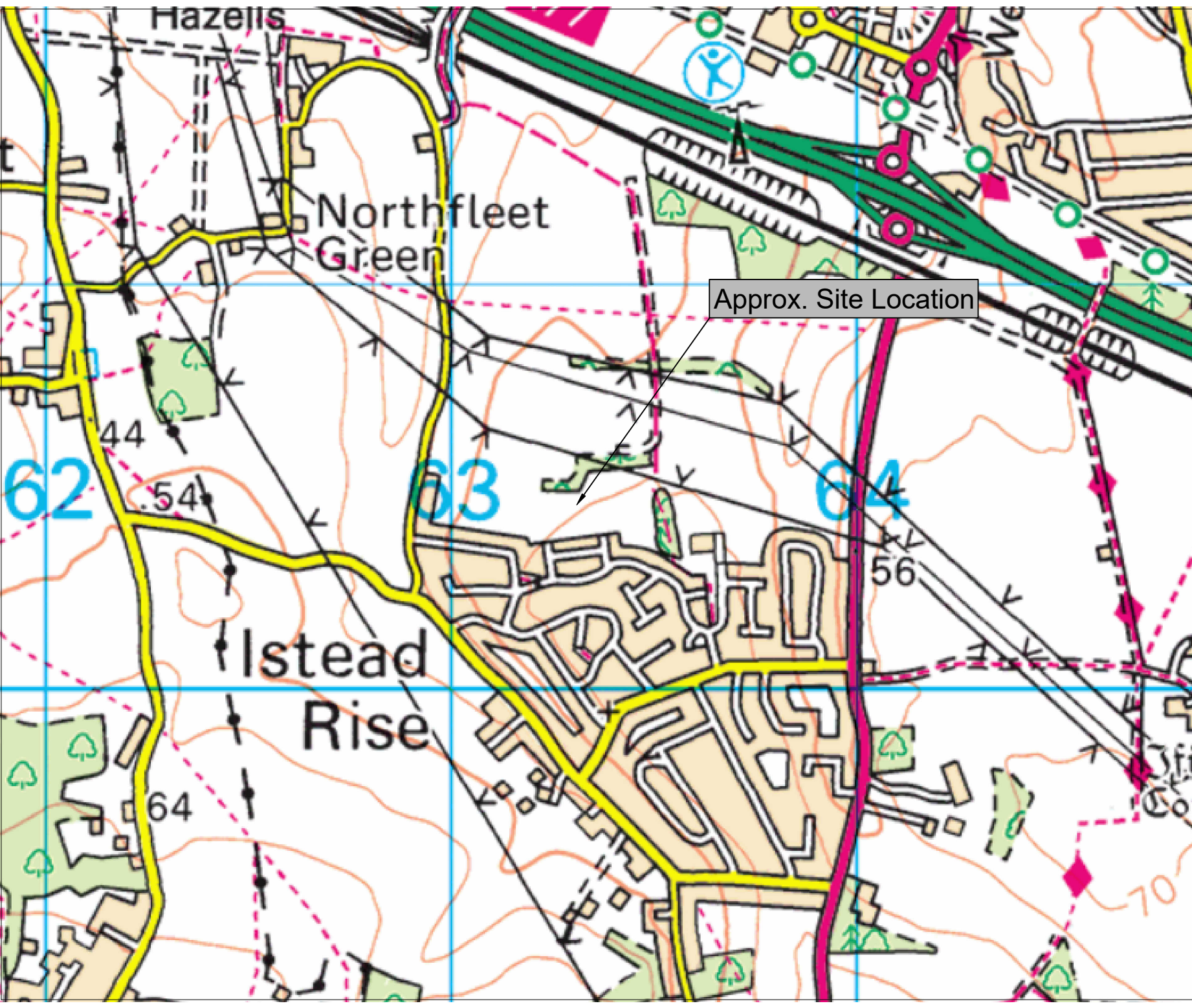
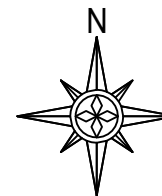
The calculated infiltration rates suggest that the underlying chalk bedrock is representative of 'low to medium permeability conditions', which was relatively consistent across the borehole locations. The calculated rates suggest that the Seaford Chalk Formation is a suitable medium for infiltration drainage.

The testing excluded any shallow cohesive soils of the Head Deposits (where present), as this material is not considered a viable infiltration medium.

Groundwater ingress wasn't recorded during the initial intrusive works, nor during a return monitoring visit, to maximum depth of 5.0m bgl.

Should infiltration drainage be implemented as part of the proposed scheme, consideration should be given to the potential for dissolution features to be created from any infiltration drainage infrastructure. It would be prudent to consider the risk of creating such features by discharging surface waters into the ground at a focussed point, and it is likely that a minimum distance of 10m will be required between any new infiltration features and new or existing buildings.

FIGURES



Rev	Date	Drawn	Description	Chkd



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Site
Land north of The Drove Way, Istead Rise,
Kent, DA13 9JY

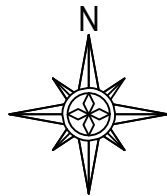
Client
Ptarmigan Land A Ltd

Title
Figure 1 - Site Location Plan

Surveyed:		Drawn by:	JA
Checked by:	BV	Date:	March 2026

Scale	(A4 Sheet)	Drawing Reference
Not to Scale		UK26.7780_01

Job No	Rev
UK26.7780	01



- KEY:
-  SITE BOUNDARY
 -  EPS WINDOWLESS SAMPLE BOREHOLE
 -  EPS WINDOWLESS SAMPLE BOREHOLE WITH MONITORING STANDPIPE INSTALLED

Rev	Date	Drawn	Description	Chk'd



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www.epstrategies.co.uk

Site
Land north of The Drove Way, Istead Rise,
Kent, DA13 9JY

Client
Ptarmigan Land A Ltd

Title
Figure 2 - Borehole Location Plan

Surveyed:		Drawn by:	JA
Checked by:	BV	Date:	March 2026

Scale	(A4 Sheet)	Drawing Reference
Not to Scale		UK26.7780_02

Job No	Rev
UK26.7780	01

APPENDICES

APPENDIX A

Selected Site Photographs

Photo 1: View showing the location of WS01, which was installed with a standpipe.



Photo 2: Image looking southwest across the site.



Photo 3: Image looking northeast from the position of WS02.

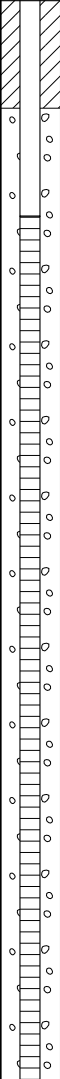
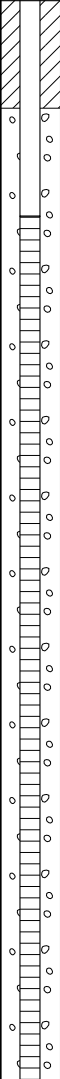
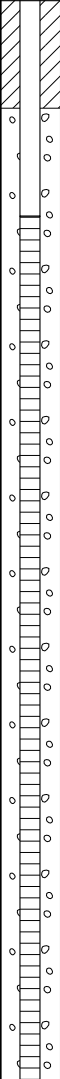


Photo 4: Image of the soil cores from WS01

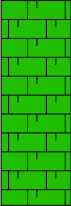
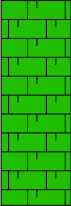
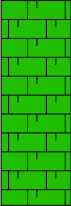


APPENDIX B

Site Specific Borehole Logs

				Dynamic (Windowless) Sampler WS01Sheet 1 of 1																																																																																																																																																								
Hole Type WLS		Easting 563193.00		Northing 170456.00		Ground Level (m)		Scale 1:35																																																																																																																																																				
Project Name Land North of The Drove Way, Istead Rise				Project No. UK26.7780		Start Date 2026-03-10		End Date 2026-03-10																																																																																																																																																				
Client Ptarmigan Land A Ltd				Consultant James Abraham				Contractor																																																																																																																																																				
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Hole Type WLS		Easting 563232.00		Northing 170472.00		Ground Level (m)		Scale 1:35		
Project Name Land North of The Drove Way, Istead Rise				Project No. UK26.7780		Start Date 2026-03-10		End Date 2026-03-10		
Client Ptarmigan Land A Ltd				Consultant James Abraham				Contractor		
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata			
		Depth (m)	Type/ Ref	Results			Legend	Description		
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						0.80				
								Off white, structureless chalk, comprising 20-30% chalk gravel in a sandy silt matrix. Gravels consist of fine-coarse subangular chalk with rare flints [Seaford Chalk Formation].	1.0	
										
						(1.20)			1.5	
										
						2.00			2.0	
								End of Borehole at 2.00m		
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Remarks No groundwater encountered, three falling head tests completed.							Method, Plant, Stability, Dimensions			Logger
Checked By: JA Approved By: BV Status: FINAL										

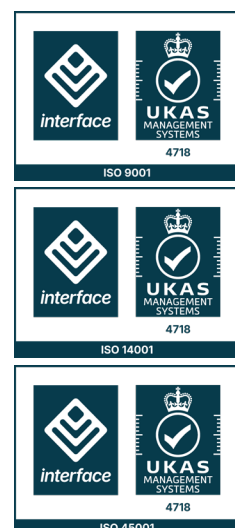
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Project Name Land North of The Drove Way, Istead Rise				Project No. UK26.7780		Start Date 2026-03-10		End Date 2026-03-10																																																																	
Client Ptarmigan Land A Ltd				Consultant James Abraham				Contractor																																																																	
<table><tr><td rowspan="2">Inst/ Backfill</td><td rowspan="2">Water Levels</td><td colspan="3">Samples and Tests</td><td rowspan="2">Level (m)</td><td rowspan="2">Depth (m)</td><td colspan="2">Strata</td><td rowspan="2"></td></tr><tr><td>Depth (m)</td><td>Type/ Ref</td><td>Results</td><td>Legend</td><td>Description</td></tr><tr><td rowspan="5"></td><td rowspan="5"></td><td rowspan="5"></td><td rowspan="5"></td><td rowspan="5"></td><td rowspan="5"></td><td>(0.20)</td><td></td><td colspan="2">TOPSOIL: Brown silty CLAY with rootlets.</td><td rowspan="5"> 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 </td></tr><tr><td>0.20</td><td></td><td colspan="2">Brown, silty, gravelly CLAY, gravel consists of medium-coarse, subrounded-subangular flint [Head Deposits].</td></tr><tr><td>(0.70)</td><td></td><td colspan="2"></td></tr><tr><td>0.90 (0.10)</td><td></td><td colspan="2">Light brown, silty, gravelly CLAY with rootlets, gravel consists of fine-medium subrounded-subangular chalk and flint [Head Deposits].</td></tr><tr><td>1.00</td><td></td><td colspan="2">Off white, structureless chalk, comprising 20-30% chalk gravel in a sandy silt matrix. Gravels consist of fine-coarse subangular chalk with rare flints [Seaford Chalk Formation].</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>(1.00)</td><td></td><td colspan="2"></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>2.00</td><td></td><td colspan="2">End of Borehole at 2.00m</td><td></td></tr></table>										Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata			Depth (m)	Type/ Ref	Results	Legend	Description							(0.20)		TOPSOIL: Brown silty CLAY with rootlets.		0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0	0.20		Brown, silty, gravelly CLAY, gravel consists of medium-coarse, subrounded-subangular flint [Head Deposits].		(0.70)				0.90 (0.10)		Light brown, silty, gravelly CLAY with rootlets, gravel consists of fine-medium subrounded-subangular chalk and flint [Head Deposits].		1.00		Off white, structureless chalk, comprising 20-30% chalk gravel in a sandy silt matrix. Gravels consist of fine-coarse subangular chalk with rare flints [Seaford Chalk Formation].								(1.00)											2.00		End of Borehole at 2.00m		
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Remarks No groundwater encountered, three falling head tests completed.							Method, Plant, Stability, Dimensions			Logger																																																															
Checked By: JA Approved By: BV Status: FINAL																																																																									



7b Caxton House
Broad Street
Cambourne
Cambridge CB23 6JN

T +44(0) 1954 710666
E info@epstrategies.co.uk
W www.epstrategies.co.uk

Registered office as above. Environmental Protection Strategies Ltd (04330320) trading as EPS.



A6 Kent County Council Consultation



PRE-APPLICATION MEETING

Meeting Minutes

Date/Time : 5 March 2026, 2pm

Location : Via MS Teams

Attendees: Emily Neale – KCC
Alex Brauningner – KCC
Ailsa Goudie – Tor & Co
Toby Vaughan – Logika
Niyamal Ali – Logika

Site Location: Istead Rise Kent DA13 9JY

LPA District pre app

reference:

KCC reference: NON/2026/109085

Site overview:

- Site located south of Gravesend, on the northern edge of Istead Rise.
- Flood Zone 1 – not at risk from tidal or fluvial flooding.
- No nearby watercourses.
- Geology:
 - Mostly Seaford Chalk with some sand.
 - Borehole data indicates potential clay in upper layers.
- Topography: Land falls northwards to two low points on site.

Ground Investigation & Infiltration Testing:

- BRE 365 infiltration testing proposed.
- Three trial pits planned in low-point areas.
- Additional deep borehole soakaway tests due to potential of clay presence.
- Groundwater monitoring:
 - Two visits planned (early & late March/April).

LLFA Response

- Infiltration-led strategy expected due to chalk geology and lack of watercourses.
- Fallback option discussed: pumping to foul sewer - LLFA stated this is not acceptable (removed from drainage hierarchy under new national standards. As of June 2025, the Department for Environment, Food and Rural Affairs published the new National Standards for Sustainable Drainage Systems. The LLFA will be applying these standards to all new major developments we are consulted on)

- Infiltration in the area expected to be viable based on previous schemes and general presence of soakaway drainage throughout the area.
- LLFA agreed that the proposed groundwater monitoring visit at this time of year is acceptable. Current season reflects near peak groundwater levels.
- Access Limitations - Contractor may only access locations approx. 12m offset from ideal test points. LLFA confirmed this is acceptable for outline stage.
- Kent County Council guidance recommends separation distances that reflect the depth of the drainage measures i.e. 5m for conventional soakaways and 10m for deep bored soakaways. The CIRIA report C574D "Engineering in Chalk" recommends specifically:
 - in areas where dissolution features are known to be prevalent, soakaways should be avoided, if at all possible, but if unavoidable, should be sited at least 20 m away from any foundations.
 - Where the chalk is of low density, or its density is not known, soakaways should be site at least 10 m away from any foundations

SUDS Expectations:

LLFA encourage:

- Rain gardens
- Rainwater butts (Kent is water-stressed; minimum requirement)
- Permeable paving in private/ shared parking areas
- Swales where appropriate (e.g. along access roads or as an alternative to piped conveyance through open space).
- Emphasis on source control and integrating features throughout the site in line with the national standards. These new standards place particular emphasis on applying SuDS measures throughout the development to capture and manage runoff at source. The objective is to reduce the scale of end point features such as attenuation basins, which can become considerably large when draining extensive catchments and applying the design criteria.
- Outline application should include principles that will carry into Reserved Matters.

Climate Change Allowances

- The climate change allowances to apply to the design is 35% for the 30 year return (3.3%) and 45% for the 100 year (1%).

In this location the allowance for the 2050s epoch is higher than that for the 2070s epoch for the 100 (1%) year storm scenario. We would expect that for a development that has a lifetime beyond 2061, the higher of the two allowances is to be used.

The latest information on the allowances and map can be found at the following link: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Attenuation Basins proposed:

- Max depth: 1 m
- Freeboard: 300 mm
- Side slopes: 1 in 4
- LLFA confirmed these parameters are considered acceptable from a general surface water design perspective.

Half-drain time:

- Infiltration features shall be designed so that rainfall events up to the 30 year (3.3% AEP) event shall half empty their runoff volume within a maximum of 24 hours.
- It is acceptable for the 100 year return event not to half drain within 24 hours however the system should have enough capacity after 24 hours to accommodate a 1 in 10 year return period event.
- Should the system exceed the half drain time for the 100 year return event we would seek for the 1 in 10 year event to be run off the back of the 1 in 100 year return event in order to demonstrate operational effectiveness of the system.

Supporting Drainage Modelling

- A simple network model is acceptable for outline stage.
- LLFA recommend the utilisation of the FEH 2022 rainfall dataset for simulation. A Cv value of 1 should be used when modelling only impermeable areas. The drain down time (when using Causeway Flow) may need to be extended from the default 240 minutes to ensure the peak volumes are allowed for within the design.
- Simulations against the varying storm events that include the 2, 30 and the 100 year events up to and including the 10,080 minute storm duration.

Foul Drainage

- Proposed two foul pumping stations due to split levels on site. Flows to be pumped south into Istead Rise network.
- LLFA acknowledged but do not advise on foul strategy.

Other items for consideration:

- We note that the site is located in a groundwater Source Protection Zone. Consultation with the Environment Agency early in the planning process is recommended to identify any constraints or specific requirements in this area that may impact the proposed SuDs methods. Design should include sufficient pollution control features and demonstrate a 'management train' approach as detailed in the SuDS Manual.

A7 Environment Agency Consultation

Niyamal Ali
Logika Consultants

Our ref: KT/2026/133315/01-L01
Your ref: Istead Rise, Kent

Sent by email

Date: 4 March 2026

Dear Niyamal

Query on drainage strategy for an emerging residential development

Land to the north of Istead Rise, Kent

Thank you for your request for charged advice for the above site (agreement reference: ENVPAC/1/KSL/00952), which was agreed on 19 February 2026.

As part of this consultation, we have not been given any documents to review, but the site location and proposed high-level approach to drainage. The query related to the requirement for a hydrogeological risk assessment and any comments on the drainage approach.

The following environmental constraints and opportunities within our remit have been screened for the site:

- Source Protection Zone 2
- Principal chalk aquifer

Environment Agency position

The answer to the question asked about the requirement for a specific hydrogeological risk assessment in position G13 is that it applies for Source Protection Zone 1 only.

That being said, there may be reasons for risk assessments to be applied to a development site for other reasons, such as for land contamination investigations. If any issues are identified through these investigations that are pertinent to the drainage design, we expect appropriate risk assessments to be carried out.

The following points should be noted wherever infiltration drainage (such as soakaways) is proposed at a site:

- Appropriate pollution prevention methods (such as trapped gullies or interceptors) should be used to prevent hydrocarbons draining to ground from roads, hardstandings and car parks. Clean uncontaminated roof water should drain directly to the system entering after any pollution prevention methods.
- No infiltration system should be sited in or allowed to discharge into land impacted by contamination or land previously identified as being contaminated.
- There must be no direct discharge to groundwater, a controlled water. An unsaturated zone must be maintained throughout the year between the base

of the system and the water table.

- A series of shallow systems are preferable to systems such as deep bored soakaways, as deep bored soakaways can act as conduits for rapid transport of contaminants to groundwater.

We also noted that the query mentioned that foul drainage would not discharge to ground 'if it can be avoided'. For the avoidance of doubt, we would expect the effluent to pass to sewer in such a site setting. Environmental permit applications to ground at a site may be refused where we consider a sewer connection is feasible, such as this location. We clearly state on that we will not give you a permit for a private sewage treatment system if it is reasonable for you to connect to the public sewer.

If you're planning a new development, plan your foul sewerage at an early stage and consult with the local council and sewerage undertaker. If you got planning permission on the basis that the development will be connected to the public foul sewer, this indicates it is likely to be reasonable to do so.

We will not normally give you a permit for use of a private sewage treatment system based on the nearest public foul sewer not having enough capacity. If necessary, you should agree improvements to the sewerage network with the sewerage undertaker so you can connect to it. These improvements must be put in place before the development is occupied. This reflects [planning practice guidance](#) and [building regulations](#).

Disclaimer

Please note that the view expressed in this letter is a response to a pre-application enquiry and does not represent our final view in relation to any future planning application made in relation to this site. We reserve the right to change our position in relation to any such application. You should seek your own expert advice in relation to technical matters relevant to any planning application before submission.

Should you have any queries regarding this response, please contact me.

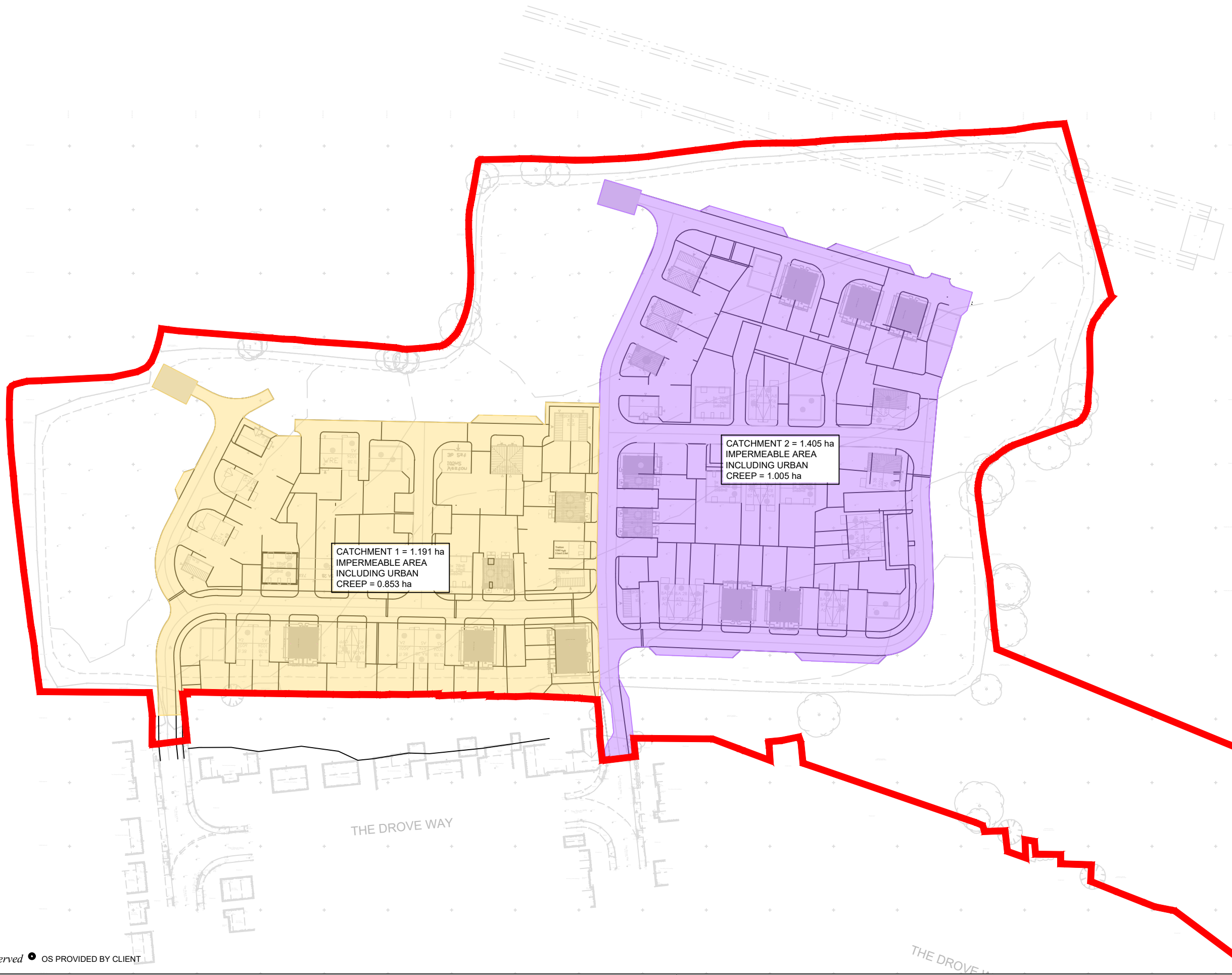
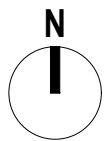
Yours sincerely,

Gabrielle Delorme

Sustainable Places Planning Specialist

E-mail kslplanning@environment-agency.gov.uk

A8 Outline Drainage Strategy Drawings



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KEY

SITE BOUNDARY

CATCHMENT 1 = 1.191 ha

CATCHMENT 2 = 1.405 ha

01

First Issue

29.05.26

NA

TV

CT

REVISION

DETAILS

DATE

DRAWN

CHK'D

APP'D

CLIENT

Ptarmigan Land
A Ltd

PROJECT

Land to the North of
The Drove Way, Istead Rise,
Gravesham

DRAWING TITLE

Proposed
Catchment Plan

DRAWING No.
16611A-30-C001

REV
01

SHEET SIZE
A3

SCALE
1:1200

DATE
29.05.26

DRAWN BY
NA

CHECKED BY
TV

APPROVED BY
CT

Logika
CONSULTANTS

PART OF

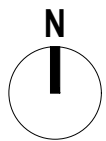
Logika Group

3 - 7 HERBAL HILL
FARRINGTON, LONDON
EC1R 6J
T 020 3873 4780
logikaconsultants.co.uk

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KEY

- SITE BOUNDARY
- CATCHMENT 1
- CATCHMENT 2
- INFILTRATION BASINS
- 10m OFFSET FROM BASE OF INFILTRATION BASIN
- INDICATIVE FOUL PUMPING STATION LOCATIONS
- EXISTING FW SEWER
- EXISTING FW MANHOLE
- INDICATIVE RISING MAIN
- INDICATIVE SURFACE WATER SEWERS

INFILTRATION BASIN EAST

- CL: 59.05
- IL: 57.75
- BASIN DEPTH: 1.3m (INCLUDING 300mm FREEBOARD)
- VOLUME: 1,363m³
- INFILTRATION RATE: 3.15 x 10⁻⁶ m/s
- HATCH INDICATES MAXIMUM EXTENT OF WET AREA

INFILTRATION BASIN WEST

- CL: 58.70
- IL: 57.40
- BASIN DEPTH: 1.3m (INCLUDING 300mm FREEBOARD)
- VOLUME: 1,165m³
- INFILTRATION RATE: 3.15 x 10⁻⁶ m/s
- HATCH INDICATES MAXIMUM EXTENT OF WET AREA

TOP OF BASIN

2m MAINTENANCE BERM

10m OFFSET FROM BASE OF INFILTRATION BASIN

BOTTOM OF BASIN

FOUL PUMPING STATION EAST

TOP OF BASIN

2m MAINTENANCE BERM

10m OFFSET FROM BASE OF INFILTRATION BASIN

BOTTOM OF BASIN

INDICATIVE CONNECTION TO PUBLIC SOUTHERN WATER FOUL SEWER (MH REF 2303). CONNECTION TO BE DETERMINED FOLLOWING CAPACITY CHECK RESPONSE AND DETAILED DESIGN

THE DROVE WAY

01 First Issue

REVISION DETAILS DATE DRAWN CHKD APPD

CLIENT
Ptarmigan Land
A Ltd

PROJECT
Land to the North of
The Drove Way, Istead Rise
Gravesham

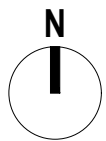
DRAWING TITLE
Proposed Outline
Drainage Strategy

DRAWING No. 16611A-30-C002 REV 01

SHEET SIZE A3 SCALE 1:1200 DATE 29.05.26

DRAWN BY NA CHECKED BY TV APPROVED BY CT

Logika CONSULTANTS PART OF Logika Group
3 - 7 HERBAL HILL FARRINGDON, LONDON EC1R 6J
T 020 3873 4780 logikaconsultants.co.uk



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KEY

- SITE BOUNDARY
- CATCHMENT 1
- CATCHMENT 2
- INFILTRATION BASINS
- INDICATIVE FOUL PUMPING STATION LOCATIONS
- EXISTING FW SEWER
- EXISTING FW MANHOLE
- INDICATIVE RISING MAIN
- INDICATIVE SURFACE WATER SEWERS
- PROPOSED FLOW EXCEEDANCE ROUTES

01 First Issue

REVISION DETAILS DATE DRAWN CHKD APPD

CLIENT
Ptarmigan Land
A Ltd

PROJECT
Land to the North of
The Drove Way, Istead Rise,
Gravesham

DRAWING TITLE
Indicative Exceedance
Flow Routes Plan

DRAWING No. 16611A-30-C003 REV 01

SHEET SIZE A3 SCALE 1:1200 DATE 29.05.26

DRAWN BY NA CHECKED BY TV APPROVED BY CT

Logika CONSULTANTS PART OF Logika Group
3 - 7 HERBAL HILL
FARRINGTON, LONDON
EC1R 6J
T 020 3873 4780
logikaconsultants.co.uk

A9 Modelling Calculations

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Inflows Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



DRN



Catchment West

Type : Catchment Area

Area (ha)

0.853

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment East

Type : Catchment Area

Area (ha)

1.005

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



 **Pond West**

Type : Pond

Dimensions			
Exceedance Level (m)		10.000	
Depth (m)		1.300	
Base Level (m)		8.700	
Freeboard (mm)		300	
Initial Depth (m)		0.000	
Porosity (%)		100	
Average Slope (1:X)		4.00	
Total Volume (m³)		1165.455	
Depth (m)		Area (m²)	Volume (m³)
0.000		932.23	0.000
1.300		1580.00	1614.544

Inlets	
Inlet	
Inlet Type	Point Inflow
Incoming Item(s)	Catchment West
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced	
Base Infiltration Rate (m/hr)	0.0113
Safety Factor	2.0
Perimeter	Circular
Length (m)	94.551
Friction Scheme	Manning's n
n	0.03

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



 **Pond East**

Type : Pond

Dimensions			
Exceedance Level (m)		10.000	
Depth (m)		1.300	
Base Level (m)		8.700	
Freeboard (mm)		300	
Initial Depth (m)		0.000	
Porosity (%)		100	
Average Slope (1:X)		4.00	
Total Volume (m³)		1363.751	
Depth (m)		Area (m²)	Volume (m³)
0.000		1110.71	0.000
1.300		1810.00	1880.057

Inlets	
Inlet	
Inlet Type	Point Inflow
Incoming Item(s)	Catchment East
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced	
Base Infiltration Rate (m/hr)	0.0113
Safety Factor	2.0
Perimeter	Circular
Length (m)	44.024
Friction Scheme	Manning's n
n	0.03

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Inflow Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment East	Pond East		Time of Concentration	1.005	100	0	100	1.005
Catchment West	Pond West		Time of Concentration	0.853	100	0	100	0.853
TOTAL		0.0		1.858				1.858

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
	Designed by: NA	Checked by: TV	Approved By: CT	
Report Title: Rainfall Analysis Criteria	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall		
FEH		Type: FEH
Site Location	GB 563369 170441 TQ 63369 70441	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period	
Return Period (years)	Increase Rainfall (%)
100.0	45.000
100.0	0.000
30.0	0.000
10.0	0.000
2.0	0.000

Storm Durations	
Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		





Summary Results for Pond West: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	8.991	8.992	0.291	0.292	667.1	289.660	0.000	2.346	0.0	0.000		75.146	OK
FEH: 100 years: +45 %: 15 mins: Winter	8.991	8.992	0.291	0.292	626.7	289.824	0.000	2.359	0.0	0.000		75.132	OK
FEH: 100 years: +45 %: 30 mins: Summer	9.076	9.076	0.376	0.376	446.3	381.779	0.000	4.893	0.0	0.000		67.242	OK
FEH: 100 years: +45 %: 30 mins: Winter	9.076	9.076	0.376	0.376	418.9	381.901	0.000	4.893	0.0	0.000		67.232	OK
FEH: 100 years: +45 %: 60 mins: Summer	9.160	9.160	0.460	0.460	386.6	476.375	0.000	10.061	0.0	0.000		59.125	OK
FEH: 100 years: +45 %: 60 mins: Winter	9.160	9.160	0.460	0.460	310.9	476.474	0.000	10.026	0.0	0.000		59.117	OK
FEH: 100 years: +45 %: 120 mins: Summer	9.237	9.237	0.537	0.537	274.0	565.958	0.000	20.456	0.0	0.000		51.439	OK
FEH: 100 years: +45 %: 120 mins: Winter	9.237	9.237	0.537	0.537	197.2	566.172	0.000	20.336	0.0	0.000		51.421	OK
FEH: 100 years: +45 %: 180 mins: Summer	9.288	9.288	0.588	0.588	215.2	626.132	0.000	30.886	0.0	0.000		46.276	OK
FEH: 100 years: +45 %: 180 mins: Winter	9.288	9.288	0.588	0.588	148.3	626.426	0.000	30.680	0.0	0.000		46.251	OK
FEH: 100 years: +45 %: 240 mins: Summer	9.327	9.327	0.627	0.627	180.0	673.207	0.000	41.334	0.0	0.000		42.237	OK
FEH: 100 years: +45 %: 240 mins: Winter	9.327	9.327	0.627	0.627	121.0	673.561	0.000	41.041	0.0	0.000		42.206	OK
FEH: 100 years: +45 %: 360 mins: Summer	9.386	9.386	0.686	0.686	137.9	747.365	0.000	62.258	0.0	0.000		35.874	OK
FEH: 100 years: +45 %: 360 mins: Winter	9.387	9.387	0.687	0.687	90.8	747.915	0.000	61.802	0.0	0.000		35.826	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026				
	Designed by: NA	Checked by: TV	Approved By: CT		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 100 years: +45 %: 480 mins: Summer	9.434	9.434	0.734	0.734	115.3	807.917	0.000	83.206	0.0	0.000		30.678	OK
FEH: 100 years: +45 %: 480 mins: Winter	9.435	9.435	0.735	0.735	74.6	808.748	0.000	82.580	0.0	0.000		30.607	OK
FEH: 100 years: +45 %: 600 mins: Summer	9.474	9.474	0.774	0.774	99.2	858.422	0.000	104.168	0.0	0.000		26.345	OK
FEH: 100 years: +45 %: 600 mins: Winter	9.474	9.474	0.774	0.774	64.0	859.482	0.000	103.388	0.0	0.000		26.254	OK
FEH: 100 years: +45 %: 720 mins: Summer	9.507	9.507	0.807	0.807	87.5	901.598	0.000	125.140	0.0	0.000		22.640	OK
FEH: 100 years: +45 %: 720 mins: Winter	9.508	9.508	0.808	0.808	56.4	902.885	0.000	124.200	0.0	0.000		22.529	OK
FEH: 100 years: +45 %: 960 mins: Summer	9.559	9.559	0.859	0.859	71.8	971.152	0.000	167.099	0.0	0.000		16.672	OK
FEH: 100 years: +45 %: 960 mins: Winter	9.560	9.560	0.860	0.860	46.3	973.029	0.000	165.838	0.0	0.000		16.511	OK
FEH: 100 years: +45 %: 1440 mins: Summer	9.626	9.626	0.926	0.926	53.8	1061.670	0.000	251.047	0.0	0.000		8.905	OK
FEH: 100 years: +45 %: 1440 mins: Winter	9.628	9.628	0.928	0.928	34.7	1064.602	0.000	249.127	0.0	0.000		8.654	OK
FEH: 100 years: +45 %: 2160 mins: Summer	9.673	9.673	0.973	0.973	39.8	1127.205	0.000	376.985	0.0	0.000		3.282	OK
FEH: 100 years: +45 %: 2160 mins: Winter	9.676	9.676	0.976	0.976	25.7	1131.989	0.000	373.994	0.0	0.000		2.872	OK
FEH: 100 years: +45 %: 2880 mins: Summer	9.689	9.689	0.989	0.989	31.8	1149.783	0.000	502.898	0.0	0.000		1.345	OK
FEH: 100 years: +45 %: 2880 mins: Winter	9.694	9.694	0.994	0.994	20.5	1156.817	0.000	498.733	0.0	0.000		0.741	OK
FEH: 100 years: +45 %: 4320 mins: Summer	9.673	9.673	0.973	0.973	22.7	1127.512	0.000	754.548	0.0	0.000		3.256	OK
FEH: 100 years: +45 %: 4320 mins: Winter	9.682	9.682	0.982	0.982	14.7	1140.422	0.000	747.575	0.0	0.000		2.148	OK
FEH: 100 years: +45 %: 5760 mins: Summer	9.639	9.639	0.939	0.939	17.9	1080.543	0.000	1005.604	0.0	0.000	5720	7.286	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
		Designed by: NA	Checked by: TV		Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 100 years: +45 %: 5760 mins: Winter	9.654	9.654	0.954	0.954	11.6	1100.571	0.000	995.584	0.0	0.000		5.567	OK
FEH: 100 years: +45 %: 7200 mins: Summer	9.608	9.608	0.908	0.908	15.0	1038.100	0.000	1251.506	0.0	0.000	6040	10.927	OK
FEH: 100 years: +45 %: 7200 mins: Winter	9.622	9.622	0.922	0.922	9.7	1057.215	0.000	1242.255	0.0	0.000	5650	9.287	OK
FEH: 100 years: +45 %: 8640 mins: Summer	9.589	9.589	0.889	0.889	13.0	1011.588	0.000	1488.315	0.0	0.000	6265	13.202	OK
FEH: 100 years: +45 %: 8640 mins: Winter	9.591	9.591	0.891	0.891	8.4	1014.641	0.000	1486.590	0.0	0.000	5505	12.940	OK
FEH: 100 years: +45 %: 10080 mins: Summer	9.576	9.576	0.876	0.876	11.6	994.258	0.000	1719.928	0.0	0.000	6505	14.689	OK
FEH: 100 years: +45 %: 10080 mins: Winter	9.576	9.576	0.876	0.876	7.5	993.436	0.000	1720.598	0.0	0.000	6300	14.760	OK
FEH: 100 years: +0 %: 15 mins: Summer	8.904	8.904	0.204	0.204	459.0	199.366	0.000	2.305	0.0	0.000		82.894	OK
FEH: 100 years: +0 %: 15 mins: Winter	8.903	8.905	0.203	0.205	431.1	199.438	0.000	2.319	0.0	0.000		82.888	OK
FEH: 100 years: +0 %: 30 mins: Summer	8.965	8.965	0.265	0.265	307.8	262.503	0.000	4.832	0.0	0.000		77.476	OK
FEH: 100 years: +0 %: 30 mins: Winter	8.965	8.965	0.265	0.265	288.9	262.459	0.000	4.835	0.0	0.000		77.480	OK
FEH: 100 years: +0 %: 60 mins: Summer	9.025	9.025	0.325	0.325	266.6	326.831	0.000	9.974	0.0	0.000		71.957	OK
FEH: 100 years: +0 %: 60 mins: Winter	9.025	9.026	0.325	0.326	214.4	326.928	0.000	9.940	0.0	0.000		71.948	OK
FEH: 100 years: +0 %: 120 mins: Summer	9.081	9.081	0.381	0.381	189.0	387.139	0.000	20.331	0.0	0.000		66.782	OK
FEH: 100 years: +0 %: 120 mins: Winter	9.081	9.081	0.381	0.381	136.0	387.334	0.000	20.212	0.0	0.000		66.765	OK
FEH: 100 years: +0 %: 180 mins: Summer	9.117	9.117	0.417	0.417	148.4	427.099	0.000	30.730	0.0	0.000		63.353	OK
FEH: 100 years: +0 %: 180 mins: Winter	9.117	9.117	0.417	0.417	102.3	427.350	0.000	30.523	0.0	0.000		63.332	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 100 years: +0 %: 240 mins: Summer	9.144	9.144	0.444	0.444	124.1	457.979	0.000	41.150	0.0	0.000		60.704	OK
FEH: 100 years: +0 %: 240 mins: Winter	9.144	9.144	0.444	0.444	83.5	458.340	0.000	40.853	0.0	0.000		60.673	OK
FEH: 100 years: +0 %: 360 mins: Summer	9.186	9.186	0.486	0.486	95.1	505.916	0.000	62.024	0.0	0.000		56.591	OK
FEH: 100 years: +0 %: 360 mins: Winter	9.186	9.186	0.486	0.486	62.6	506.635	0.000	61.554	0.0	0.000		56.529	OK
FEH: 100 years: +0 %: 480 mins: Summer	9.219	9.219	0.519	0.519	79.5	544.487	0.000	82.928	0.0	0.000		53.281	OK
FEH: 100 years: +0 %: 480 mins: Winter	9.220	9.220	0.520	0.520	51.4	545.485	0.000	82.276	0.0	0.000		53.196	OK
FEH: 100 years: +0 %: 600 mins: Summer	9.246	9.246	0.546	0.546	68.4	576.197	0.000	103.849	0.0	0.000		50.560	OK
FEH: 100 years: +0 %: 600 mins: Winter	9.247	9.247	0.547	0.547	44.1	577.414	0.000	103.024	0.0	0.000		50.456	OK
FEH: 100 years: +0 %: 720 mins: Summer	9.268	9.268	0.568	0.568	60.3	602.778	0.000	124.780	0.0	0.000	225	48.280	OK
FEH: 100 years: +0 %: 720 mins: Winter	9.270	9.270	0.570	0.570	38.9	604.305	0.000	123.777	0.0	0.000	245	48.149	OK
FEH: 100 years: +0 %: 960 mins: Summer	9.303	9.303	0.603	0.603	49.5	644.367	0.000	166.660	0.0	0.000	700	44.711	OK
FEH: 100 years: +0 %: 960 mins: Winter	9.305	9.305	0.605	0.605	31.9	646.499	0.000	165.297	0.0	0.000	730	44.528	OK
FEH: 100 years: +0 %: 1440 mins: Summer	9.343	9.343	0.643	0.643	37.1	693.978	0.000	250.439	0.0	0.000	1265	40.454	OK
FEH: 100 years: +0 %: 1440 mins: Winter	9.346	9.346	0.646	0.646	24.0	697.395	0.000	248.321	0.0	0.000	1320	40.161	OK
FEH: 100 years: +0 %: 2160 mins: Summer	9.365	9.365	0.665	0.665	27.4	720.219	0.000	376.066	0.0	0.000	1570	38.203	OK
FEH: 100 years: +0 %: 2160 mins: Winter	9.369	9.369	0.669	0.669	17.7	725.911	0.000	372.695	0.0	0.000	1665	37.714	OK
FEH: 100 years: +0 %: 2880 mins: Summer	9.362	9.362	0.662	0.662	21.9	716.630	0.000	501.540	0.0	0.000	1525	38.511	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



FEH: 100 years: +0 %: 2880 mins: Winter	9.369	9.369	0.669	0.669	14.1	725.55 3	0.000	496.810	0.0	0.000	1665	37.745	OK
FEH: 100 years: +0 %: 4320 mins: Summer	9.322	9.322	0.622	0.622	15.7	667.77 9	0.000	750.203	0.0	0.000	1330	42.702	OK
FEH: 100 years: +0 %: 4320 mins: Winter	9.333	9.333	0.633	0.633	10.1	680.99 6	0.000	743.770	0.0	0.000	1270	41.568	OK
FEH: 100 years: +0 %: 5760 mins: Summer	9.290	9.290	0.590	0.590	12.4	628.51 1	0.000	986.081	0.0	0.000	1510	46.072	OK
FEH: 100 years: +0 %: 5760 mins: Winter	9.290	9.290	0.590	0.590	8.0	629.38 9	0.000	985.754	0.0	0.000	1400	45.996	OK
FEH: 100 years: +0 %: 7200 mins: Summer	9.267	9.267	0.567	0.567	10.3	601.73 8	0.000	1138.86 5	0.0	0.000	1095	48.369	OK
FEH: 100 years: +0 %: 7200 mins: Winter	9.264	9.264	0.564	0.564	6.7	597.69 2	0.000	1138.95 1	0.0	0.000	1015	48.716	OK
FEH: 100 years: +0 %: 8640 mins: Summer	9.251	9.251	0.551	0.551	9.0	581.94 4	0.000	1185.44 8	0.0	0.000		50.067	OK
FEH: 100 years: +0 %: 8640 mins: Winter	9.241	9.241	0.541	0.541	5.8	570.10 9	0.000	1185.43 6	0.0	0.000		51.083	OK
FEH: 100 years: +0 %: 10080 mins: Summer	9.238	9.238	0.538	0.538	8.0	566.59 1	0.000	1231.56 1	0.0	0.000		51.385	OK
FEH: 100 years: +0 %: 10080 mins: Winter	9.220	9.220	0.520	0.520	5.2	545.80 8	0.000	1231.73 3	0.0	0.000		53.168	OK
FEH: 30 years: +0 %: 15 mins: Summer	8.862	8.862	0.162	0.162	360.6	156.69 4	0.000	2.277	0.0	0.000		86.555	OK
FEH: 30 years: +0 %: 15 mins: Winter	8.862	8.862	0.162	0.162	338.8	156.71 0	0.000	2.291	0.0	0.000		86.554	OK
FEH: 30 years: +0 %: 30 mins: Summer	8.907	8.907	0.207	0.207	238.4	202.68 9	0.000	4.784	0.0	0.000		82.609	OK
FEH: 30 years: +0 %: 30 mins: Winter	8.907	8.907	0.207	0.207	223.8	202.73 9	0.000	4.789	0.0	0.000		82.604	OK
FEH: 30 years: +0 %: 60 mins: Summer	8.954	8.954	0.254	0.254	205.5	250.73 4	0.000	9.901	0.0	0.000		78.486	OK
FEH: 30 years: +0 %: 60 mins: Winter	8.954	8.954	0.254	0.254	165.3	250.85 4	0.000	9.869	0.0	0.000		78.476	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 30 years: +0 %: 120 mins: Summer	9.000	9.000	0.300	0.300	147.4	299.71 1	0.000	20.228	0.0	0.000		74.284	OK
FEH: 30 years: +0 %: 120 mins: Winter	9.000	9.000	0.300	0.300	106.1	299.88 7	0.000	20.113	0.0	0.000		74.269	OK
FEH: 30 years: +0 %: 180 mins: Summer	9.028	9.028	0.328	0.328	115.8	329.85 5	0.000	30.600	0.0	0.000		71.697	OK
FEH: 30 years: +0 %: 180 mins: Winter	9.028	9.028	0.328	0.328	79.8	330.11 3	0.000	30.398	0.0	0.000		71.675	OK
FEH: 30 years: +0 %: 240 mins: Summer	9.048	9.048	0.348	0.348	96.4	351.38 5	0.000	40.992	0.0	0.000		69.850	OK
FEH: 30 years: +0 %: 240 mins: Winter	9.048	9.048	0.348	0.348	64.9	351.80 9	0.000	40.700	0.0	0.000		69.814	OK
FEH: 30 years: +0 %: 360 mins: Summer	9.075	9.075	0.375	0.375	72.9	380.77 4	0.000	61.808	0.0	0.000		67.328	OK
FEH: 30 years: +0 %: 360 mins: Winter	9.076	9.076	0.376	0.376	48.0	381.55 9	0.000	61.338	0.0	0.000		67.261	OK
FEH: 30 years: +0 %: 480 mins: Summer	9.094	9.094	0.394	0.394	60.0	401.40 7	0.000	82.650	0.0	0.000		65.558	OK
FEH: 30 years: +0 %: 480 mins: Winter	9.094	9.094	0.394	0.394	38.8	402.46 9	0.000	81.990	0.0	0.000		65.467	OK
FEH: 30 years: +0 %: 600 mins: Summer	9.107	9.107	0.407	0.407	51.0	416.85 2	0.000	103.506	0.0	0.000		64.233	OK
FEH: 30 years: +0 %: 600 mins: Winter	9.109	9.109	0.409	0.409	32.9	418.29 3	0.000	102.664	0.0	0.000		64.109	OK
FEH: 30 years: +0 %: 720 mins: Summer	9.118	9.118	0.418	0.418	44.5	429.00 4	0.000	124.372	0.0	0.000		63.190	OK
FEH: 30 years: +0 %: 720 mins: Winter	9.120	9.120	0.420	0.420	28.7	430.70 2	0.000	123.338	0.0	0.000		63.044	OK
FEH: 30 years: +0 %: 960 mins: Summer	9.134	9.134	0.434	0.434	36.0	446.59 2	0.000	166.112	0.0	0.000		61.681	OK
FEH: 30 years: +0 %: 960 mins: Winter	9.136	9.136	0.436	0.436	23.2	449.00 4	0.000	164.693	0.0	0.000		61.474	OK
FEH: 30 years: +0 %: 1440 mins: Summer	9.150	9.150	0.450	0.450	26.7	464.79 7	0.000	249.587	0.0	0.000		60.119	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 30 years: +0 %: 1440 mins: Winter	9.153	9.153	0.453	0.453	17.2	468.79 3	0.000	247.343	0.0	0.000		59.776	OK
FEH: 30 years: +0 %: 2160 mins: Summer	9.153	9.153	0.453	0.453	19.8	467.71 0	0.000	374.549	0.0	0.000		59.869	OK
FEH: 30 years: +0 %: 2160 mins: Winter	9.159	9.159	0.459	0.459	12.7	474.70 3	0.000	371.076	0.0	0.000		59.269	OK
FEH: 30 years: +0 %: 2880 mins: Summer	9.143	9.143	0.443	0.443	15.9	457.30 2	0.000	498.442	0.0	0.000		60.762	OK
FEH: 30 years: +0 %: 2880 mins: Winter	9.151	9.151	0.451	0.451	10.3	466.11 7	0.000	494.281	0.0	0.000		60.006	OK
FEH: 30 years: +0 %: 4320 mins: Summer	9.124	9.124	0.424	0.424	11.7	435.71 9	0.000	734.250	0.0	0.000		62.614	OK
FEH: 30 years: +0 %: 4320 mins: Winter	9.124	9.124	0.424	0.424	7.5	435.32 9	0.000	734.613	0.0	0.000		62.647	OK
FEH: 30 years: +0 %: 5760 mins: Summer	9.111	9.111	0.411	0.411	9.4	421.35 6	0.000	832.043	0.0	0.000		63.846	OK
FEH: 30 years: +0 %: 5760 mins: Winter	9.106	9.106	0.406	0.406	6.1	415.21 8	0.000	832.289	0.0	0.000		64.373	OK
FEH: 30 years: +0 %: 7200 mins: Summer	9.105	9.105	0.405	0.405	8.1	413.74 8	0.000	889.875	0.0	0.000		64.499	OK
FEH: 30 years: +0 %: 7200 mins: Winter	9.092	9.092	0.392	0.392	5.2	399.50 1	0.000	890.224	0.0	0.000		65.721	OK
FEH: 30 years: +0 %: 8640 mins: Summer	9.100	9.100	0.400	0.400	7.2	408.48 1	0.000	946.058	0.0	0.000		64.951	OK
FEH: 30 years: +0 %: 8640 mins: Winter	9.079	9.079	0.379	0.379	4.6	385.61 0	0.000	946.251	0.0	0.000		66.913	OK
FEH: 30 years: +0 %: 10080 mins: Summer	9.097	9.097	0.397	0.397	6.5	405.24 3	0.000	1001.86 8	0.0	0.000		65.229	OK
FEH: 30 years: +0 %: 10080 mins: Winter	9.068	9.068	0.368	0.368	4.2	373.24 6	0.000	1001.86 7	0.0	0.000		67.974	OK
FEH: 10 years: +0 %: 15 mins: Summer	8.823	8.824	0.123	0.124	273.0	118.54 9	0.000	2.242	0.0	0.000		89.828	OK
FEH: 10 years: +0 %: 15 mins: Winter	8.823	8.824	0.123	0.124	256.5	118.63 3	0.000	2.255	0.0	0.000		89.821	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 10 years: +0 %: 30 mins: Summer	8.857	8.858	0.157	0.158	179.7	152.153	0.000	4.725	0.0	0.000		86.945	OK
FEH: 10 years: +0 %: 30 mins: Winter	8.857	8.858	0.157	0.158	168.6	152.215	0.000	4.733	0.0	0.000		86.939	OK
FEH: 10 years: +0 %: 60 mins: Summer	8.892	8.892	0.192	0.192	154.6	187.377	0.000	9.808	0.0	0.000		83.922	OK
FEH: 10 years: +0 %: 60 mins: Winter	8.892	8.892	0.192	0.192	124.3	187.512	0.000	9.780	0.0	0.000		83.911	OK
FEH: 10 years: +0 %: 120 mins: Summer	8.933	8.933	0.233	0.233	113.9	229.482	0.000	20.102	0.0	0.000		80.310	OK
FEH: 10 years: +0 %: 120 mins: Winter	8.933	8.933	0.233	0.233	82.0	229.644	0.000	19.993	0.0	0.000		80.296	OK
FEH: 10 years: +0 %: 180 mins: Summer	8.957	8.957	0.257	0.257	90.4	254.235	0.000	30.443	0.0	0.000		78.186	OK
FEH: 10 years: +0 %: 180 mins: Winter	8.957	8.957	0.257	0.257	62.3	254.479	0.000	30.250	0.0	0.000		78.165	OK
FEH: 10 years: +0 %: 240 mins: Summer	8.973	8.973	0.273	0.273	75.6	271.135	0.000	40.807	0.0	0.000		76.736	OK
FEH: 10 years: +0 %: 240 mins: Winter	8.974	8.974	0.274	0.274	50.8	271.609	0.000	40.525	0.0	0.000		76.695	OK
FEH: 10 years: +0 %: 360 mins: Summer	8.993	8.993	0.293	0.293	57.2	292.546	0.000	61.563	0.0	0.000		74.899	OK
FEH: 10 years: +0 %: 360 mins: Winter	8.994	8.994	0.294	0.294	37.7	293.350	0.000	61.102	0.0	0.000		74.830	OK
FEH: 10 years: +0 %: 480 mins: Summer	9.006	9.006	0.306	0.306	47.0	305.624	0.000	82.337	0.0	0.000		73.776	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.007	9.007	0.307	0.307	30.4	306.841	0.000	81.688	0.0	0.000		73.672	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.014	9.014	0.314	0.314	39.8	314.169	0.000	103.123	0.0	0.000		73.043	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.015	9.015	0.315	0.315	25.7	315.651	0.000	102.284	0.0	0.000		72.916	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.019	9.019	0.319	0.319	34.6	319.739	0.000	123.906	0.0	0.000		72.565	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
	Designed by:	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 10 years: +0 %: 720 mins: Winter	9.021	9.021	0.321	0.321	22.3	321.58 9	0.000	122.881	0.0	0.000		72.407	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.024	9.024	0.324	0.324	27.7	325.33 7	0.000	165.459	0.0	0.000		72.085	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.026	9.026	0.326	0.326	17.9	327.89 9	0.000	164.051	0.0	0.000		71.865	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.023	9.023	0.323	0.323	20.3	324.58 0	0.000	248.400	0.0	0.000		72.150	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.027	9.027	0.327	0.327	13.1	328.96 7	0.000	246.236	0.0	0.000		71.773	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.013	9.013	0.313	0.313	14.9	313.21 4	0.000	371.155	0.0	0.000		73.125	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.017	9.017	0.317	0.317	9.6	318.20 2	0.000	368.941	0.0	0.000		72.697	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.005	9.005	0.305	0.305	12.1	305.33 5	0.000	488.956	0.0	0.000		73.801	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.005	9.005	0.305	0.305	7.8	305.39 0	0.000	488.877	0.0	0.000		73.796	OK
FEH: 10 years: +0 %: 4320 mins: Summer	8.996	8.996	0.296	0.296	9.0	295.53 4	0.000	595.100	0.0	0.000		74.642	OK
FEH: 10 years: +0 %: 4320 mins: Winter	8.991	8.991	0.291	0.291	5.8	289.83 1	0.000	595.227	0.0	0.000		75.131	OK
FEH: 10 years: +0 %: 5760 mins: Summer	8.990	8.990	0.290	0.290	7.4	289.38 9	0.000	652.250	0.0	0.000		75.169	OK
FEH: 10 years: +0 %: 5760 mins: Winter	8.977	8.977	0.277	0.277	4.8	275.02 4	0.000	652.199	0.0	0.000		76.402	OK
FEH: 10 years: +0 %: 7200 mins: Summer	8.987	8.987	0.287	0.287	6.4	285.98 7	0.000	707.998	0.0	0.000		75.461	OK
FEH: 10 years: +0 %: 7200 mins: Winter	8.965	8.965	0.265	0.265	4.1	262.64 7	0.000	707.686	0.0	0.000		77.464	OK
FEH: 10 years: +0 %: 8640 mins: Summer	8.985	8.985	0.285	0.285	5.8	283.69 9	0.000	762.130	0.0	0.000		75.658	OK
FEH: 10 years: +0 %: 8640 mins: Winter	8.955	8.955	0.255	0.255	3.7	251.85 3	0.000	762.254	0.0	0.000		78.390	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
		Designed by: NA	Checked by: TV		Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 10 years: +0 %: 10080 mins: Summer	8.984	8.984	0.284	0.284	5.3	282.944	0.000	816.060	0.0	0.000	75.722	OK
FEH: 10 years: +0 %: 10080 mins: Winter	8.945	8.945	0.245	0.245	3.4	241.919	0.000	815.729	0.0	0.000	79.243	OK
FEH: 2 years: +0 %: 15 mins: Summer	8.785	8.774	0.085	0.074	161.0	69.859	0.000	2.168	0.0	0.000	94.006	OK
FEH: 2 years: +0 %: 15 mins: Winter	8.783	8.774	0.083	0.074	151.3	69.899	0.000	2.181	0.0	0.000	94.002	OK
FEH: 2 years: +0 %: 30 mins: Summer	8.794	8.794	0.094	0.094	106.5	89.385	0.000	4.605	0.0	0.000	92.330	OK
FEH: 2 years: +0 %: 30 mins: Winter	8.794	8.794	0.094	0.094	100.0	89.445	0.000	4.616	0.0	0.000	92.325	OK
FEH: 2 years: +0 %: 60 mins: Summer	8.813	8.814	0.113	0.114	91.2	108.720	0.000	9.593	0.0	0.000	90.671	OK
FEH: 2 years: +0 %: 60 mins: Winter	8.814	8.814	0.114	0.114	73.3	108.793	0.000	9.579	0.0	0.000	90.665	OK
FEH: 2 years: +0 %: 120 mins: Summer	8.847	8.847	0.147	0.147	72.2	142.000	0.000	19.815	0.0	0.000	87.816	OK
FEH: 2 years: +0 %: 120 mins: Winter	8.847	8.847	0.147	0.147	51.9	142.157	0.000	19.724	0.0	0.000	87.802	OK
FEH: 2 years: +0 %: 180 mins: Summer	8.866	8.866	0.166	0.166	59.1	161.212	0.000	30.096	0.0	0.000	86.167	OK
FEH: 2 years: +0 %: 180 mins: Winter	8.867	8.867	0.167	0.167	40.7	161.570	0.000	29.928	0.0	0.000	86.137	OK
FEH: 2 years: +0 %: 240 mins: Summer	8.879	8.879	0.179	0.179	50.3	173.922	0.000	40.398	0.0	0.000	85.077	OK
FEH: 2 years: +0 %: 240 mins: Winter	8.880	8.880	0.180	0.180	33.8	174.476	0.000	40.149	0.0	0.000	85.029	OK
FEH: 2 years: +0 %: 360 mins: Summer	8.894	8.894	0.194	0.194	38.8	189.123	0.000	61.027	0.0	0.000	83.773	OK
FEH: 2 years: +0 %: 360 mins: Winter	8.895	8.895	0.195	0.195	25.6	189.948	0.000	60.613	0.0	0.000	83.702	OK
FEH: 2 years: +0 %: 480 mins: Summer	8.901	8.901	0.201	0.201	32.1	196.717	0.000	81.655	0.0	0.000	83.121	OK
FEH: 2 years: +0 %: 480 mins: Winter	8.903	8.903	0.203	0.203	20.8	197.922	0.000	81.070	0.0	0.000	83.018	OK
FEH: 2 years: +0 %: 600 mins: Summer	8.905	8.905	0.205	0.205	27.3	200.433	0.000	102.274	0.0	0.000	82.802	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
		Designed by: NA	Checked by: TV		Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 2 years: +0 %: 600 mins: Winter	8.907	8.907	0.207	0.207	17.6	201.96 6	0.000	101.522	0.0	0.000	82.671	OK
FEH: 2 years: +0 %: 720 mins: Summer	8.906	8.906	0.206	0.206	23.8	201.70 3	0.000	122.856	0.0	0.000	82.693	OK
FEH: 2 years: +0 %: 720 mins: Winter	8.908	8.908	0.208	0.208	15.3	203.62 0	0.000	121.960	0.0	0.000	82.529	OK
FEH: 2 years: +0 %: 960 mins: Summer	8.904	8.904	0.204	0.204	19.0	199.80 6	0.000	163.872	0.0	0.000	82.856	OK
FEH: 2 years: +0 %: 960 mins: Winter	8.907	8.907	0.207	0.207	12.3	202.52 2	0.000	162.736	0.0	0.000	82.623	OK
FEH: 2 years: +0 %: 1440 mins: Summer	8.896	8.896	0.196	0.196	13.9	191.19 3	0.000	244.423	0.0	0.000	83.595	OK
FEH: 2 years: +0 %: 1440 mins: Winter	8.898	8.898	0.198	0.198	9.0	193.07 0	0.000	243.709	0.0	0.000	83.434	OK
FEH: 2 years: +0 %: 2160 mins: Summer	8.887	8.887	0.187	0.187	10.3	182.17 4	0.000	338.756	0.0	0.000	84.369	OK
FEH: 2 years: +0 %: 2160 mins: Winter	8.886	8.886	0.186	0.186	6.6	180.70 7	0.000	338.742	0.0	0.000	84.495	OK
FEH: 2 years: +0 %: 2880 mins: Summer	8.881	8.881	0.181	0.181	8.3	175.88 9	0.000	365.739	0.0	0.000	84.908	OK
FEH: 2 years: +0 %: 2880 mins: Winter	8.876	8.876	0.176	0.176	5.3	170.59 1	0.000	365.753	0.0	0.000	85.363	OK
FEH: 2 years: +0 %: 4320 mins: Summer	8.872	8.872	0.172	0.172	6.3	166.54 3	0.000	414.241	0.0	0.000	85.710	OK
FEH: 2 years: +0 %: 4320 mins: Winter	8.857	8.857	0.157	0.157	4.0	152.17 3	0.000	414.270	0.0	0.000	86.943	OK
FEH: 2 years: +0 %: 5760 mins: Summer	8.864	8.864	0.164	0.164	5.2	159.16 0	0.000	458.509	0.0	0.000	86.344	OK
FEH: 2 years: +0 %: 5760 mins: Winter	8.841	8.841	0.141	0.141	3.4	135.74 0	0.000	458.727	0.0	0.000	88.353	OK
FEH: 2 years: +0 %: 7200 mins: Summer	8.859	8.859	0.159	0.159	4.6	153.66 9	0.000	502.128	0.0	0.000	86.815	OK
FEH: 2 years: +0 %: 7200 mins: Winter	8.827	8.827	0.127	0.127	2.9	121.69 4	0.000	502.233	0.0	0.000	89.558	OK
FEH: 2 years: +0 %: 8640 mins: Summer	8.854	8.854	0.154	0.154	4.1	148.92 3	0.000	544.713	0.0	0.000	87.222	OK
FEH: 2 years: +0 %: 8640 mins: Winter	8.814	8.814	0.114	0.114	2.7	109.46 8	0.000	544.642	0.0	0.000	90.607	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



FEH: 2 years: +0 %: 10080 mins: Summer	8.850	8.850	0.150	0.150	3.8	145.07 6	0.000	586.644	0.0	0.000		87.552	OK
FEH: 2 years: +0 %: 10080 mins: Winter	8.803	8.803	0.103	0.103	2.5	98.794	0.000	586.165	0.0	0.000		91.523	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



Summary Results for Pond East: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	8.989	8.989	0.289	0.289	786.0	341.164	0.000	2.888	0.0	0.000		74.983	OK
FEH: 100 years: +45 %: 15 mins: Winter	8.989	8.989	0.289	0.289	738.3	341.357	0.000	2.900	0.0	0.000		74.969	OK
FEH: 100 years: +45 %: 30 mins: Summer	9.074	9.075	0.374	0.375	525.8	449.650	0.000	5.954	0.0	0.000		67.028	OK
FEH: 100 years: +45 %: 30 mins: Winter	9.074	9.074	0.374	0.374	493.5	449.790	0.000	5.952	0.0	0.000		67.018	OK
FEH: 100 years: +45 %: 60 mins: Summer	9.159	9.159	0.459	0.459	455.5	561.027	0.000	12.152	0.0	0.000		58.862	OK
FEH: 100 years: +45 %: 60 mins: Winter	9.159	9.159	0.459	0.459	366.3	561.145	0.000	12.115	0.0	0.000		58.853	OK
FEH: 100 years: +45 %: 120 mins: Summer	9.236	9.236	0.536	0.536	322.8	666.451	0.000	24.597	0.0	0.000		51.131	OK
FEH: 100 years: +45 %: 120 mins: Winter	9.237	9.237	0.537	0.537	232.3	666.690	0.000	24.460	0.0	0.000		51.113	OK
FEH: 100 years: +45 %: 180 mins: Summer	9.287	9.287	0.587	0.587	253.6	737.230	0.000	37.070	0.0	0.000		45.941	OK
FEH: 100 years: +45 %: 180 mins: Winter	9.288	9.288	0.588	0.588	174.8	737.553	0.000	36.836	0.0	0.000		45.917	OK
FEH: 100 years: +45 %: 240 mins: Summer	9.326	9.326	0.626	0.626	212.0	792.573	0.000	49.558	0.0	0.000		41.883	OK
FEH: 100 years: +45 %: 240 mins: Winter	9.327	9.327	0.627	0.627	142.6	792.972	0.000	49.226	0.0	0.000		41.854	OK
FEH: 100 years: +45 %: 360 mins: Summer	9.387	9.387	0.687	0.687	162.5	879.740	0.000	74.554	0.0	0.000		35.491	OK
FEH: 100 years: +45 %: 360 mins: Winter	9.387	9.387	0.687	0.687	107.0	880.401	0.000	74.045	0.0	0.000		35.443	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
		Designed by: NA	Checked by: TV		Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 100 years: +45 %: 480 mins: Summer	9.435	9.435	0.735	0.735	135.8	950.890	0.000	99.569	0.0	0.000		30.274	OK
FEH: 100 years: +45 %: 480 mins: Winter	9.436	9.436	0.736	0.736	87.9	951.872	0.000	98.873	0.0	0.000		30.202	OK
FEH: 100 years: +45 %: 600 mins: Summer	9.475	9.475	0.775	0.775	116.8	1010.185	0.000	124.595	0.0	0.000		25.926	OK
FEH: 100 years: +45 %: 600 mins: Winter	9.476	9.476	0.776	0.776	75.4	1011.418	0.000	123.740	0.0	0.000		25.836	OK
FEH: 100 years: +45 %: 720 mins: Summer	9.508	9.508	0.808	0.808	103.1	1060.908	0.000	149.628	0.0	0.000		22.207	OK
FEH: 100 years: +45 %: 720 mins: Winter	9.509	9.509	0.809	0.809	66.5	1062.373	0.000	148.602	0.0	0.000		22.099	OK
FEH: 100 years: +45 %: 960 mins: Summer	9.561	9.561	0.861	0.861	84.6	1142.491	0.000	199.705	0.0	0.000		16.224	OK
FEH: 100 years: +45 %: 960 mins: Winter	9.563	9.563	0.863	0.863	54.6	1144.556	0.000	198.330	0.0	0.000		16.073	OK
FEH: 100 years: +45 %: 1440 mins: Summer	9.628	9.628	0.928	0.928	63.4	1248.379	0.000	299.883	0.0	0.000		8.460	OK
FEH: 100 years: +45 %: 1440 mins: Winter	9.631	9.631	0.931	0.931	40.9	1251.734	0.000	297.792	0.0	0.000		8.214	OK
FEH: 100 years: +45 %: 2160 mins: Summer	9.676	9.676	0.976	0.976	46.9	1324.553	0.000	450.160	0.0	0.000		2.874	OK
FEH: 100 years: +45 %: 2160 mins: Winter	9.679	9.679	0.979	0.979	30.2	1330.084	0.000	446.872	0.0	0.000		2.469	OK
FEH: 100 years: +45 %: 2880 mins: Summer	9.692	9.692	0.992	0.992	37.4	1350.065	0.000	600.422	0.0	0.000		1.004	OK
FEH: 100 years: +45 %: 2880 mins: Winter	9.697	9.697	0.997	0.997	24.1	1358.360	0.000	595.770	0.0	0.000		0.395	OK
FEH: 100 years: +45 %: 4320 mins: Summer	9.674	9.674	0.974	0.974	26.8	1321.695	0.000	900.797	0.0	0.000		3.084	OK
FEH: 100 years: +45 %: 4320 mins: Winter	9.684	9.684	0.984	0.984	17.3	1337.106	0.000	892.794	0.0	0.000		1.954	OK
FEH: 100 years: +45 %: 5760 mins: Summer	9.638	9.638	0.938	0.938	21.1	1263.902	0.000	1200.661	0.0	0.000	5620	7.322	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
	Designed by: NA	Checked by: TV	Approved By: CT	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 100 years: +45 %: 5760 mins: Winter	9.653	9.653	0.953	0.953	13.6	1288.1 47	0.000	1188.53 9	0.0	0.000	5960	5.544	OK
FEH: 100 years: +45 %: 7200 mins: Summer	9.607	9.607	0.907	0.907	17.6	1214.0 82	0.000	1493.11 7	0.0	0.000	5940	10.975	OK
FEH: 100 years: +45 %: 7200 mins: Winter	9.620	9.620	0.920	0.920	11.4	1235.1 54	0.000	1482.50 0	0.0	0.000	5540	9.430	OK
FEH: 100 years: +45 %: 8640 mins: Summer	9.587	9.587	0.887	0.887	15.3	1182.7 85	0.000	1774.63 7	0.0	0.000	6155	13.270	OK
FEH: 100 years: +45 %: 8640 mins: Winter	9.589	9.589	0.889	0.889	9.9	1185.2 84	0.000	1773.30 4	0.0	0.000	5915	13.086	OK
FEH: 100 years: +45 %: 10080 mins: Summer	9.574	9.574	0.874	0.874	13.6	1162.5 10	0.000	2050.26 6	0.0	0.000	6395	14.756	OK
FEH: 100 years: +45 %: 10080 mins: Winter	9.573	9.573	0.873	0.873	8.8	1160.7 49	0.000	2051.05 5	0.0	0.000	6185	14.886	OK
FEH: 100 years: +0 %: 15 mins: Summer	8.903	8.903	0.203	0.203	540.7	234.77 0	0.000	2.849	0.0	0.000		82.785	OK
FEH: 100 years: +0 %: 15 mins: Winter	8.902	8.903	0.202	0.203	508.0	234.86 3	0.000	2.864	0.0	0.000		82.778	OK
FEH: 100 years: +0 %: 30 mins: Summer	8.963	8.963	0.263	0.263	362.6	309.10 4	0.000	5.903	0.0	0.000		77.334	OK
FEH: 100 years: +0 %: 30 mins: Winter	8.963	8.963	0.263	0.263	340.4	309.05 0	0.000	5.901	0.0	0.000		77.338	OK
FEH: 100 years: +0 %: 60 mins: Summer	9.024	9.024	0.324	0.324	314.2	384.80 7	0.000	12.084	0.0	0.000		71.783	OK
FEH: 100 years: +0 %: 60 mins: Winter	9.024	9.024	0.324	0.324	252.6	384.92 4	0.000	12.043	0.0	0.000		71.775	OK
FEH: 100 years: +0 %: 120 mins: Summer	9.079	9.079	0.379	0.379	222.6	455.72 1	0.000	24.501	0.0	0.000		66.583	OK
FEH: 100 years: +0 %: 120 mins: Winter	9.079	9.079	0.379	0.379	160.2	455.94 6	0.000	24.355	0.0	0.000		66.567	OK
FEH: 100 years: +0 %: 180 mins: Summer	9.115	9.115	0.415	0.415	174.9	502.65 8	0.000	36.952	0.0	0.000		63.142	OK
FEH: 100 years: +0 %: 180 mins: Winter	9.115	9.115	0.415	0.415	120.5	502.96 3	0.000	36.702	0.0	0.000		63.119	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
	Designed by:	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 100 years: +0 %: 240 mins: Summer	9.142	9.142	0.442	0.442	146.2	538.906	0.000	49.420	0.0	0.000		60.484	OK
FEH: 100 years: +0 %: 240 mins: Winter	9.143	9.143	0.443	0.443	98.3	539.358	0.000	49.065	0.0	0.000		60.450	OK
FEH: 100 years: +0 %: 360 mins: Summer	9.184	9.184	0.484	0.484	112.1	595.175	0.000	74.382	0.0	0.000		56.358	OK
FEH: 100 years: +0 %: 360 mins: Winter	9.185	9.185	0.485	0.485	73.8	596.045	0.000	73.831	0.0	0.000		56.294	OK
FEH: 100 years: +0 %: 480 mins: Summer	9.218	9.218	0.518	0.518	93.7	640.443	0.000	99.365	0.0	0.000		53.038	OK
FEH: 100 years: +0 %: 480 mins: Winter	9.218	9.218	0.518	0.518	60.6	641.612	0.000	98.609	0.0	0.000		52.952	OK
FEH: 100 years: +0 %: 600 mins: Summer	9.245	9.245	0.545	0.545	80.6	677.553	0.000	124.361	0.0	0.000		50.317	OK
FEH: 100 years: +0 %: 600 mins: Winter	9.246	9.246	0.546	0.546	52.0	678.985	0.000	123.417	0.0	0.000		50.212	OK
FEH: 100 years: +0 %: 720 mins: Summer	9.267	9.267	0.567	0.567	71.1	708.675	0.000	149.364	0.0	0.000	255	48.035	OK
FEH: 100 years: +0 %: 720 mins: Winter	9.268	9.268	0.568	0.568	45.9	710.438	0.000	148.223	0.0	0.000	275	47.906	OK
FEH: 100 years: +0 %: 960 mins: Summer	9.302	9.302	0.602	0.602	58.3	757.264	0.000	199.384	0.0	0.000	720	44.472	OK
FEH: 100 years: +0 %: 960 mins: Winter	9.303	9.303	0.603	0.603	37.6	759.705	0.000	197.838	0.0	0.000	750	44.293	OK
FEH: 100 years: +0 %: 1440 mins: Summer	9.342	9.342	0.642	0.642	43.8	814.921	0.000	299.439	0.0	0.000	1270	40.244	OK
FEH: 100 years: +0 %: 1440 mins: Winter	9.345	9.345	0.645	0.645	28.2	818.973	0.000	297.034	0.0	0.000	1320	39.947	OK
FEH: 100 years: +0 %: 2160 mins: Summer	9.363	9.363	0.663	0.663	32.3	844.554	0.000	449.488	0.0	0.000	1555	38.071	OK
FEH: 100 years: +0 %: 2160 mins: Winter	9.367	9.367	0.667	0.667	20.8	851.437	0.000	445.602	0.0	0.000	1655	37.567	OK
FEH: 100 years: +0 %: 2880 mins: Summer	9.359	9.359	0.659	0.659	25.8	839.218	0.000	599.421	0.0	0.000	1505	38.462	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



FEH: 100 years: +0 %: 2880 mins: Winter	9.366	9.366	0.666	0.666	16.6	849.73 3	0.000	593.841	0.0	0.000	1650	37.691	OK
FEH: 100 years: +0 %: 4320 mins: Summer	9.317	9.317	0.617	0.617	18.5	779.70 7	0.000	896.290	0.0	0.000	1375	42.826	OK
FEH: 100 years: +0 %: 4320 mins: Winter	9.328	9.328	0.628	0.628	11.9	795.43 3	0.000	888.608	0.0	0.000	1235	41.673	OK
FEH: 100 years: +0 %: 5760 mins: Summer	9.285	9.285	0.585	0.585	14.6	734.03 8	0.000	1176.63 8	0.0	0.000	1475	46.175	OK
FEH: 100 years: +0 %: 5760 mins: Winter	9.285	9.285	0.585	0.585	9.4	734.21 4	0.000	1176.38 9	0.0	0.000	1365	46.162	OK
FEH: 100 years: +0 %: 7200 mins: Summer	9.262	9.262	0.562	0.562	12.2	702.06 1	0.000	1341.72 8	0.0	0.000	1055	48.520	OK
FEH: 100 years: +0 %: 7200 mins: Winter	9.258	9.258	0.558	0.558	7.9	696.64 2	0.000	1341.48 0	0.0	0.000	835	48.917	OK
FEH: 100 years: +0 %: 8640 mins: Summer	9.245	9.245	0.545	0.545	10.6	678.53 9	0.000	1396.31 0	0.0	0.000		50.245	OK
FEH: 100 years: +0 %: 8640 mins: Winter	9.234	9.234	0.534	0.534	6.8	663.58 2	0.000	1396.63 3	0.0	0.000		51.341	OK
FEH: 100 years: +0 %: 10080 mins: Summer	9.232	9.232	0.532	0.532	9.4	660.53 9	0.000	1451.34 6	0.0	0.000		51.565	OK
FEH: 100 years: +0 %: 10080 mins: Winter	9.214	9.214	0.514	0.514	6.1	635.09 0	0.000	1451.13 6	0.0	0.000		53.431	OK
FEH: 30 years: +0 %: 15 mins: Summer	8.861	8.861	0.161	0.161	424.9	184.49 0	0.000	2.822	0.0	0.000		86.472	OK
FEH: 30 years: +0 %: 15 mins: Winter	8.861	8.861	0.161	0.161	399.1	184.51 0	0.000	2.837	0.0	0.000		86.470	OK
FEH: 30 years: +0 %: 30 mins: Summer	8.905	8.906	0.205	0.206	280.9	238.61 2	0.000	5.862	0.0	0.000		82.503	OK
FEH: 30 years: +0 %: 30 mins: Winter	8.906	8.906	0.206	0.206	263.6	238.67 8	0.000	5.861	0.0	0.000		82.498	OK
FEH: 30 years: +0 %: 60 mins: Summer	8.952	8.952	0.252	0.252	242.1	295.12 5	0.000	12.026	0.0	0.000		78.359	OK
FEH: 30 years: +0 %: 60 mins: Winter	8.952	8.952	0.252	0.252	194.7	295.25 8	0.000	11.984	0.0	0.000		78.350	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 30 years: +0 %: 120 mins: Summer	8.998	8.998	0.298	0.298	173.6	352.66 3	0.000	24.423	0.0	0.000		74.140	OK
FEH: 30 years: +0 %: 120 mins: Winter	8.998	8.998	0.298	0.298	124.9	352.89 4	0.000	24.273	0.0	0.000		74.123	OK
FEH: 30 years: +0 %: 180 mins: Summer	9.026	9.026	0.326	0.326	136.4	388.01 7	0.000	36.855	0.0	0.000		71.548	OK
FEH: 30 years: +0 %: 180 mins: Winter	9.026	9.026	0.326	0.326	94.0	388.35 9	0.000	36.598	0.0	0.000		71.523	OK
FEH: 30 years: +0 %: 240 mins: Summer	9.046	9.046	0.346	0.346	113.6	413.28 4	0.000	49.303	0.0	0.000		69.695	OK
FEH: 30 years: +0 %: 240 mins: Winter	9.046	9.046	0.346	0.346	76.4	413.79 8	0.000	48.936	0.0	0.000		69.657	OK
FEH: 30 years: +0 %: 360 mins: Summer	9.073	9.073	0.373	0.373	85.9	447.63 1	0.000	74.222	0.0	0.000		67.176	OK
FEH: 30 years: +0 %: 360 mins: Winter	9.073	9.073	0.373	0.373	56.6	448.59 0	0.000	73.647	0.0	0.000		67.106	OK
FEH: 30 years: +0 %: 480 mins: Summer	9.091	9.091	0.391	0.391	70.7	471.69 7	0.000	99.160	0.0	0.000		65.412	OK
FEH: 30 years: +0 %: 480 mins: Winter	9.092	9.092	0.392	0.392	45.8	472.98 6	0.000	98.361	0.0	0.000		65.317	OK
FEH: 30 years: +0 %: 600 mins: Summer	9.105	9.105	0.405	0.405	60.1	489.68 6	0.000	124.109	0.0	0.000		64.093	OK
FEH: 30 years: +0 %: 600 mins: Winter	9.106	9.106	0.406	0.406	38.8	491.39 0	0.000	123.098	0.0	0.000		63.968	OK
FEH: 30 years: +0 %: 720 mins: Summer	9.116	9.116	0.416	0.416	52.5	503.73 8	0.000	149.065	0.0	0.000		63.062	OK
FEH: 30 years: +0 %: 720 mins: Winter	9.117	9.117	0.417	0.417	33.8	505.80 2	0.000	147.832	0.0	0.000		62.911	OK
FEH: 30 years: +0 %: 960 mins: Summer	9.131	9.131	0.431	0.431	42.4	524.03 6	0.000	198.983	0.0	0.000		61.574	OK
FEH: 30 years: +0 %: 960 mins: Winter	9.133	9.133	0.433	0.433	27.4	526.94 0	0.000	197.292	0.0	0.000		61.361	OK
FEH: 30 years: +0 %: 1440 mins: Summer	9.147	9.146	0.447	0.446	31.4	544.52 6	0.000	298.811	0.0	0.000		60.071	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
	Designed by: NA	Checked by: TV	Approved By: CT	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 30 years: +0 %: 1440 mins: Winter	9.150	9.150	0.450	0.450	20.3	549.32 8	0.000	296.111	0.0	0.000		59.719	OK
FEH: 30 years: +0 %: 2160 mins: Summer	9.148	9.148	0.448	0.448	23.3	546.60 3	0.000	448.347	0.0	0.000		59.919	OK
FEH: 30 years: +0 %: 2160 mins: Winter	9.154	9.154	0.454	0.454	15.0	554.99 6	0.000	443.992	0.0	0.000		59.304	OK
FEH: 30 years: +0 %: 2880 mins: Summer	9.138	9.138	0.438	0.438	18.8	533.23 3	0.000	596.472	0.0	0.000		60.900	OK
FEH: 30 years: +0 %: 2880 mins: Winter	9.146	9.146	0.446	0.446	12.1	543.89 4	0.000	591.208	0.0	0.000		60.118	OK
FEH: 30 years: +0 %: 4320 mins: Summer	9.119	9.119	0.419	0.419	13.8	507.90 9	0.000	877.009	0.0	0.000		62.756	OK
FEH: 30 years: +0 %: 4320 mins: Winter	9.118	9.118	0.418	0.418	8.9	507.24 0	0.000	877.270	0.0	0.000		62.806	OK
FEH: 30 years: +0 %: 5760 mins: Summer	9.106	9.106	0.406	0.406	11.1	490.73 6	0.000	980.270	0.0	0.000		64.016	OK
FEH: 30 years: +0 %: 5760 mins: Winter	9.100	9.100	0.400	0.400	7.2	483.08 4	0.000	980.225	0.0	0.000		64.577	OK
FEH: 30 years: +0 %: 7200 mins: Summer	9.099	9.099	0.399	0.399	9.5	481.50 6	0.000	1048.66 9	0.0	0.000		64.693	OK
FEH: 30 years: +0 %: 7200 mins: Winter	9.085	9.085	0.385	0.385	6.1	464.10 7	0.000	1048.75 1	0.0	0.000		65.968	OK
FEH: 30 years: +0 %: 8640 mins: Summer	9.094	9.094	0.394	0.394	8.4	475.17 4	0.000	1114.82 0	0.0	0.000		65.157	OK
FEH: 30 years: +0 %: 8640 mins: Winter	9.072	9.072	0.372	0.372	5.4	447.09 8	0.000	1114.87 0	0.0	0.000		67.216	OK
FEH: 30 years: +0 %: 10080 mins: Summer	9.091	9.091	0.391	0.391	7.6	470.99 5	0.000	1180.04 4	0.0	0.000		65.463	OK
FEH: 30 years: +0 %: 10080 mins: Winter	9.061	9.061	0.361	0.361	4.9	432.08 8	0.000	1180.45 3	0.0	0.000		68.316	OK
FEH: 10 years: +0 %: 15 mins: Summer	8.822	8.822	0.122	0.122	321.7	139.54 1	0.000	2.787	0.0	0.000		89.768	OK
FEH: 10 years: +0 %: 15 mins: Winter	8.822	8.822	0.122	0.122	302.2	139.64 2	0.000	2.803	0.0	0.000		89.760	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	NA	TV	CT	
Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ				

FEH: 10 years: +0 %: 30 mins: Summer	8.856	8.856	0.156	0.156	211.7	179.051	0.000	5.811	0.0	0.000		86.871	OK
FEH: 10 years: +0 %: 30 mins: Winter	8.856	8.856	0.156	0.156	198.7	179.138	0.000	5.811	0.0	0.000		86.864	OK
FEH: 10 years: +0 %: 60 mins: Summer	8.890	8.891	0.190	0.191	182.1	220.434	0.000	11.952	0.0	0.000		83.836	OK
FEH: 10 years: +0 %: 60 mins: Winter	8.891	8.891	0.191	0.191	146.5	220.603	0.000	11.909	0.0	0.000		83.824	OK
FEH: 10 years: +0 %: 120 mins: Summer	8.931	8.931	0.231	0.231	134.2	269.852	0.000	24.327	0.0	0.000		80.213	OK
FEH: 10 years: +0 %: 120 mins: Winter	8.932	8.932	0.232	0.232	96.6	270.080	0.000	24.176	0.0	0.000		80.196	OK
FEH: 10 years: +0 %: 180 mins: Summer	8.955	8.955	0.255	0.255	106.5	298.888	0.000	36.738	0.0	0.000		78.083	OK
FEH: 10 years: +0 %: 180 mins: Winter	8.955	8.955	0.255	0.255	73.4	299.195	0.000	36.477	0.0	0.000		78.061	OK
FEH: 10 years: +0 %: 240 mins: Summer	8.971	8.971	0.271	0.271	89.0	318.621	0.000	49.165	0.0	0.000		76.636	OK
FEH: 10 years: +0 %: 240 mins: Winter	8.971	8.971	0.271	0.271	59.9	319.254	0.000	48.792	0.0	0.000		76.590	OK
FEH: 10 years: +0 %: 360 mins: Summer	8.991	8.991	0.291	0.291	67.4	343.598	0.000	74.040	0.0	0.000		74.805	OK
FEH: 10 years: +0 %: 360 mins: Winter	8.992	8.992	0.292	0.292	44.4	344.598	0.000	73.447	0.0	0.000		74.732	OK
FEH: 10 years: +0 %: 480 mins: Summer	9.003	9.003	0.303	0.303	55.4	358.757	0.000	98.929	0.0	0.000		73.693	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.004	9.004	0.304	0.304	35.8	360.228	0.000	98.103	0.0	0.000		73.586	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.011	9.011	0.311	0.311	46.9	368.532	0.000	123.825	0.0	0.000		72.977	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.012	9.012	0.312	0.312	30.2	370.338	0.000	122.771	0.0	0.000		72.844	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.016	9.016	0.316	0.316	40.7	374.814	0.000	148.721	0.0	0.000		72.516	OK

Project: Land to the North of The Drove Way, Istead Rise,						Date: 29/05/0026							
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						Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ							

FEH: 10 years: +0 %: 720 mins: Winter	9.018	9.018	0.318	0.318	26.3	377.099	0.000	147.427	0.0	0.000		72.348	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.021	9.021	0.321	0.321	32.6	380.876	0.000	198.498	0.0	0.000		72.071	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.023	9.023	0.323	0.323	21.1	384.085	0.000	196.710	0.0	0.000		71.836	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.019	9.019	0.319	0.319	23.9	378.847	0.000	297.894	0.0	0.000		72.220	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.023	9.023	0.323	0.323	15.4	384.314	0.000	295.068	0.0	0.000		71.819	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.008	9.008	0.308	0.308	17.6	364.413	0.000	444.696	0.0	0.000		73.279	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.012	9.012	0.312	0.312	11.3	370.328	0.000	441.868	0.0	0.000		72.845	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.000	9.000	0.300	0.300	14.2	355.019	0.000	584.773	0.0	0.000		73.967	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.000	9.000	0.300	0.300	9.2	355.102	0.000	584.780	0.0	0.000		73.961	OK
FEH: 10 years: +0 %: 4320 mins: Summer	8.991	8.991	0.291	0.291	10.6	343.542	0.000	701.315	0.0	0.000		74.809	OK
FEH: 10 years: +0 %: 4320 mins: Winter	8.985	8.985	0.285	0.285	6.8	336.161	0.000	701.115	0.0	0.000		75.350	OK
FEH: 10 years: +0 %: 5760 mins: Summer	8.985	8.985	0.285	0.285	8.7	335.766	0.000	768.465	0.0	0.000		75.379	OK
FEH: 10 years: +0 %: 5760 mins: Winter	8.971	8.971	0.271	0.271	5.6	318.336	0.000	768.456	0.0	0.000		76.657	OK
FEH: 10 years: +0 %: 7200 mins: Summer	8.981	8.981	0.281	0.281	7.6	331.318	0.000	834.081	0.0	0.000		75.705	OK
FEH: 10 years: +0 %: 7200 mins: Winter	8.959	8.959	0.259	0.259	4.9	303.267	0.000	833.904	0.0	0.000		77.762	OK
FEH: 10 years: +0 %: 8640 mins: Summer	8.979	8.979	0.279	0.279	6.8	328.815	0.000	898.075	0.0	0.000		75.889	OK
FEH: 10 years: +0 %: 8640 mins: Winter	8.948	8.948	0.248	0.248	4.4	290.035	0.000	897.940	0.0	0.000		78.733	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 10 years: +0 %: 10080 mins: Summer	8.978	8.978	0.278	0.278	6.2	327.212	0.000	960.991	0.0	0.000	76.006	OK
FEH: 10 years: +0 %: 10080 mins: Winter	8.938	8.938	0.238	0.238	4.0	278.271	0.000	961.129	0.0	0.000	79.595	OK
FEH: 2 years: +0 %: 15 mins: Summer	8.773	8.773	0.073	0.073	189.7	82.162	0.000	2.713	0.0	0.000	93.975	OK
FEH: 2 years: +0 %: 15 mins: Winter	8.773	8.773	0.073	0.073	178.3	82.205	0.000	2.731	0.0	0.000	93.972	OK
FEH: 2 years: +0 %: 30 mins: Summer	8.793	8.793	0.093	0.093	125.5	105.070	0.000	5.695	0.0	0.000	92.295	OK
FEH: 2 years: +0 %: 30 mins: Winter	8.793	8.793	0.093	0.093	117.8	105.148	0.000	5.700	0.0	0.000	92.290	OK
FEH: 2 years: +0 %: 60 mins: Summer	8.812	8.812	0.112	0.112	107.4	127.687	0.000	11.776	0.0	0.000	90.637	OK
FEH: 2 years: +0 %: 60 mins: Winter	8.812	8.812	0.112	0.112	86.4	127.797	0.000	11.736	0.0	0.000	90.629	OK
FEH: 2 years: +0 %: 120 mins: Summer	8.845	8.846	0.145	0.146	85.0	166.669	0.000	24.105	0.0	0.000	87.779	OK
FEH: 2 years: +0 %: 120 mins: Winter	8.846	8.846	0.146	0.146	61.2	166.898	0.000	23.962	0.0	0.000	87.762	OK
FEH: 2 years: +0 %: 180 mins: Summer	8.864	8.865	0.164	0.165	69.6	189.149	0.000	36.473	0.0	0.000	86.130	OK
FEH: 2 years: +0 %: 180 mins: Winter	8.865	8.865	0.165	0.165	47.9	189.616	0.000	36.219	0.0	0.000	86.096	OK
FEH: 2 years: +0 %: 240 mins: Summer	8.877	8.877	0.177	0.177	59.2	203.962	0.000	48.857	0.0	0.000	85.044	OK
FEH: 2 years: +0 %: 240 mins: Winter	8.878	8.877	0.178	0.177	39.8	204.662	0.000	48.490	0.0	0.000	84.993	OK
FEH: 2 years: +0 %: 360 mins: Summer	8.891	8.891	0.191	0.191	45.7	221.467	0.000	73.637	0.0	0.000	83.760	OK
FEH: 2 years: +0 %: 360 mins: Winter	8.892	8.892	0.192	0.192	30.1	222.589	0.000	73.044	0.0	0.000	83.678	OK
FEH: 2 years: +0 %: 480 mins: Summer	8.899	8.899	0.199	0.199	37.8	230.104	0.000	98.417	0.0	0.000	83.127	OK
FEH: 2 years: +0 %: 480 mins: Winter	8.900	8.900	0.200	0.200	24.5	231.698	0.000	97.586	0.0	0.000	83.010	OK
FEH: 2 years: +0 %: 600 mins: Summer	8.902	8.902	0.202	0.202	32.1	234.152	0.000	123.183	0.0	0.000	82.830	OK

Project: Land to the North of The Drove Way, Istead Rise,		Date: 29/05/0026			
		Designed by: NA	Checked by: TV		Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ			

FEH: 2 years: +0 %: 600 mins: Winter	8.904	8.904	0.204	0.204	20.7	236.18 4	0.000	122.121	0.0	0.000	82.681	OK
FEH: 2 years: +0 %: 720 mins: Summer	8.903	8.903	0.203	0.203	28.0	235.30 4	0.000	147.920	0.0	0.000	82.746	OK
FEH: 2 years: +0 %: 720 mins: Winter	8.905	8.905	0.205	0.205	18.1	237.80 8	0.000	146.629	0.0	0.000	82.562	OK
FEH: 2 years: +0 %: 960 mins: Summer	8.901	8.901	0.201	0.201	22.4	232.36 1	0.000	197.252	0.0	0.000	82.962	OK
FEH: 2 years: +0 %: 960 mins: Winter	8.904	8.904	0.204	0.204	14.5	235.97 1	0.000	195.546	0.0	0.000	82.697	OK
FEH: 2 years: +0 %: 1440 mins: Summer	8.892	8.892	0.192	0.192	16.4	221.48 5	0.000	293.722	0.0	0.000	83.759	OK
FEH: 2 years: +0 %: 1440 mins: Winter	8.893	8.893	0.193	0.193	10.6	223.66 1	0.000	292.738	0.0	0.000	83.600	OK
FEH: 2 years: +0 %: 2160 mins: Summer	8.883	8.883	0.183	0.183	12.1	210.75 8	0.000	399.127	0.0	0.000	84.546	OK
FEH: 2 years: +0 %: 2160 mins: Winter	8.881	8.881	0.181	0.181	7.8	209.07 9	0.000	399.208	0.0	0.000	84.669	OK
FEH: 2 years: +0 %: 2880 mins: Summer	8.876	8.876	0.176	0.176	9.8	203.37 5	0.000	430.991	0.0	0.000	85.087	OK
FEH: 2 years: +0 %: 2880 mins: Winter	8.871	8.871	0.171	0.171	6.3	196.82 3	0.000	431.009	0.0	0.000	85.568	OK
FEH: 2 years: +0 %: 4320 mins: Summer	8.867	8.867	0.167	0.167	7.4	192.09 1	0.000	488.064	0.0	0.000	85.914	OK
FEH: 2 years: +0 %: 4320 mins: Winter	8.852	8.852	0.152	0.152	4.8	174.70 9	0.000	488.180	0.0	0.000	87.189	OK
FEH: 2 years: +0 %: 5760 mins: Summer	8.859	8.859	0.159	0.159	6.1	183.14 6	0.000	540.350	0.0	0.000	86.570	OK
FEH: 2 years: +0 %: 5760 mins: Winter	8.836	8.836	0.136	0.136	3.9	154.84 6	0.000	540.445	0.0	0.000	88.646	OK
FEH: 2 years: +0 %: 7200 mins: Summer	8.854	8.854	0.154	0.154	5.4	176.18 2	0.000	591.710	0.0	0.000	87.081	OK
FEH: 2 years: +0 %: 7200 mins: Winter	8.821	8.821	0.121	0.121	3.5	138.03 5	0.000	591.721	0.0	0.000	89.878	OK
FEH: 2 years: +0 %: 8640 mins: Summer	8.849	8.849	0.149	0.149	4.8	170.44 6	0.000	641.220	0.0	0.000	87.502	OK
FEH: 2 years: +0 %: 8640 mins: Winter	8.808	8.808	0.108	0.108	3.1	123.25 0	0.000	641.258	0.0	0.000	90.962	OK

Project: Land to the North of The Drove Way, Istead Rise,	Date: 29/05/0026		
	Designed by: NA	Checked by: TV	Approved By: CT
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Logika Consultants Ltd: 3-7 Herball Hill Farringdon EC1R 5EJ		



FEH: 2 years: +0 %: 10080 mins: Summer	8.845	8.845	0.145	0.145	4.5	165.914	0.000	691.113	0.0	0.000		87.834	OK
FEH: 2 years: +0 %: 10080 mins: Winter	8.798	8.798	0.098	0.098	2.9	110.711	0.000	691.404	0.0	0.000		91.882	OK

A10 Kingspan Klargest Group Consultation

Niyamal Ali

From: Klargester Pump Enquiries <acpumpsales@kingspan.com>
Sent: 30 April 2026 12:32
To: Niyamal Ali
Cc: Toby Vaughan
Subject: RE: Foul pumping station requirements for a new Site - Istead Rise - AC210240

Hi Niyamal,

It would only be the lift and distance from the second pumping station to the mains connection that would matter and based on a total lift of 5 meters from the base of the unit across 253 meters the flow rate would be 4.08 L/S.

Kind Regards,

Connor

Klargester Pump Enquiries

T: 01296 633116

From: Niyamal Ali <Niyamalali@logikaconsultants.co.uk>
Sent: 30 April 2026 11:57
To: Klargester Pump Enquiries <acpumpsales@kingspan.com>
Cc: Toby Vaughan <tobyvaughan@logikaconsultants.co.uk>
Subject: [EXTERNAL] RE: Foul pumping station requirements for a new Site - Istead Rise - AC210240

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Hi Connor,

We've had to estimate for now (i.e. pump station locations to be determined) however I have measured these out on based on our indicative CAD plans. I am unable to provide exact detailed plans due to being under NDA, however we don't anticipate any major change from the below stated distances and lift.

- Distance = 451m to public sewer total (see notes)
- Lift = From the western most pump station to the public sewer connection is 1.5m (see notes)
- Notes: From northern most pump station to western pump station is 198m distance, from the western pumpstation to the connection in The Drove Way is 253m distance. The lift between the two pump stations is minimal (i.e., <0.3m) but due to the existing ground levels in between, we don't anticipate being able to make a gravity connection between the two stations.

Kind Regards,

Niyamal

Niyamal Ali

Consultant
Pronouns: He, Him, His



PART OF
Logika Group

Logika Consultants Ltd

First Floor, 3-7 Herbal Hill, Farringdon, London EC1R 5EJ

T 020 3873 4780 X 260 E niyamalali@logikaconsultants.co.uk



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From: Klargester Pump Enquiries <acpumpsales@kingspan.com>
Sent: 30 April 2026 11:48
To: Niyamal Ali <Niyamalali@logikaconsultants.co.uk>
Cc: Toby Vaughan <tobyvaughan@logikaconsultants.co.uk>
Subject: RE: Foul pumping station requirements for a new Site - Istead Rise - AC210240

Hi Niyamal,

I can't without the pumping lift and distance confirming as this directly impacts the end flow rate. If you give me some figures to work with I can give a flow rate based on this.

Kind Regards,

Connor

Klargester Pump Enquiries

T: 01296 633116

From: Niyamal Ali <Niyamalali@logikaconsultants.co.uk>
Sent: 30 April 2026 11:45
To: Klargester Pump Enquiries <acpumpsales@kingspan.com>
Cc: Toby Vaughan <tobyvaughan@logikaconsultants.co.uk>
Subject: [EXTERNAL] RE: Foul pumping station requirements for a new Site - Istead Rise - AC210240

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Hi Connor,

Thanks for this, I will pass the information on.

We'll need to submit a pre-development enquiry to Southern Water to determine capacity requirements for the scheme.

Would you be able to confirm what the required pump rate is for a scheme of this magnitude? We'll need to state this information on the application form.

Kind Regards,

Niyamal

Niyamal Ali

Consultant

Pronouns: He, Him, His



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T 020 3873 4780 X 260 E niyamalali@logikaconsultants.co.uk



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From: Klargest Pump Enquiries <acpumpsales@kingspan.com>

Sent: 29 April 2026 16:20

To: Niyamal Ali <Niyamalali@logikaconsultants.co.uk>

Cc: Toby Vaughan <tobyvaughan@logikaconsultants.co.uk>

Subject: RE: Foul pumping station requirements for a new Site - Istead Rise - AC210240

Good afternoon Niyamal,

Thank you for your enquiry.

Please see below and attached for our budgetary offering.

AC210240 is your quote reference. Please quote this number in future correspondence regarding this quotation.

- At this stage we have assumed these pumping stations to be private not adopted.
- We have based the storage on 4 full time residents per property.
- Pump type to be confirmed when the levels are confirmed.

Reference:	PSTOR28E-05
Material:	Foul
No. of Pumps:	2
Pump Type:	Grundfos SLV.80 TBC
Impeller Design:	Super Vortex
Supply Voltage:	3 Phase 400v
Method of Starting:	DOL
Level Controls:	Floats
Control Sequence:	Duty/Standby
Length of Cable:	10 meters
GRP Chamber Diameter:	2820mm

Depth of Chamber: **TBC**
 Storage Below Inlet: 32,593 litres
 Inlet Invert Supplied: **TBC**
 Inlet Connection: 1no. 160mm @ 90° or 270° **TBC**
 Pump Outlet: 90mm compression fitting (to suit 90mm OD Black MDPE SDR17 rising main supplied by others)
 Access Cover & Frame: 1no. 900x1500mm Pedestrian Duty Cover (vehicle duty cover supplied by others)
 2no. 600x600mm Pedestrian Duty Cover (vehicle duty cover supplied by others)
 Controls: Dual Control Panel, Visual & Audible Alarms

Quantity	Description/Model	Price (per unit)
2	PSTOR28E-05 Horizontal Twin Pump Station	£22,202
2	1012404 Weatherproof Kiosk Inc Beacon	£800

Quantity	Item/Description	Price (per unit)
2	Premium Commissioning – commissioning as scope of works, inc supplied and fitted (at point of commissioning) Kingspan Smartserv Pro GSM telemetry alarm for complete peace of mind. Smartserv alerts both Kingspan and designated contacts. Includes 3 years Kingspan monitoring free of charge.*	£900

*Kingspan monitoring is for alert only. Service/maintenance packages are available at separate cost on request.

Please note the commissioning charge quoted is offered at a specially discounted rate, only available when purchased at the same time as your Kingspan product. Commissioning rate is valid for 90 days post unit order date.

Commissioning will be invoiced at the same time as the unit. When ready to arrange commissioning of your Klargestor product, please call our Service Department on 028 3836 4595 or email commissioning@kingspan.com

Current Lead time:	35-40 working days from receipt of order (subject to daily changes) for both
--------------------	--

This quote is valid for 7 days.

Please note prices quoted include delivery to site (UK Mainland or dock), but exclude VAT, offloading and any installation costs.

Please do not hesitate to contact us if we can be of any further assistance.

Kind Regards,

Connor

Klargester Pump Enquiries



T: 01296 633116

E: acpumpsales@kingspan.com

www.kingspanwaterandenergy.com



In accordance with GDPR, Kingspan is committed to complying with data privacy obligations in a clear and concise manner. We have updated our privacy policy which can be viewed at [KWE Customer Privacy Policy](#) | Kingspan GB for further information.

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From: Niyamal Ali Niyamalali@logikaconsultants.co.uk

Sent: 29 April 2026 14:17

To: Klargester Pump Enquiries acpumpsales@kingspan.com

Cc: Toby Vaughan <tobyvaughan@logikaconsultants.co.uk>

Subject: [EXTERNAL] Foul pumping station requirements for a new Site - Istead Rise

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Hello,

We are in the early masterplanning stage for a new residential development located at Istead Rise (DA13 9JY) and was hoping to request some information regarding foul pumping requirements and sizing for the project.

Unfortunately we are under NDA and therefore cannot provide specific layout plans for the development. However, we can provide the following location and data information:

- The development will serve up to 100 homes.
 - Due to topography of the Site, it is anticipated that two foul pumping stations will be required (please assume each pump station will serve 50 standard residential units). See attached indicative mark up of indicative pump station locations and catchments).
 - There is the potential for one foul pumping station to be utilised so please let us know if the pump rate changes as a result of this, the feasibility of this is to be further explored on our end.
- The lowest points of the Site are located in the northern and western areas of the Site (please see attached LiDAR plan).
- We are taking the approach of locating two foul pumping stations in these lower areas and pumping up foul flows to make a connection to the public sewer in The Drove Way (to the south of the Site).
 - We wanted to ask if it is feasible to connect two rising mains together (i.e. please see attached indicative route 2), or would the system have to follow as shown in route 1 (this is the approach we have previously used on similar schemes where one pump station pumps into the other).
 - There is a possibility of making a connection to another point within The Drove Way, this is shown on Route 3 and is shorter in distance and has less lift. I would anticipate that if the pumping distance and lift is less, then the foul pump rate calculated for the

routes 1/2 would be sufficient to serve route 3 as well. However, Please do let me know if this is incorrect.

- As such please see below maximum anticipated pump distance and lift for routes 1 and 2.

Route 1:

- Distance = 451m to public sewer total (see notes)
- Lift = From the western most pump station to the public sewer connection is 1.5m (see notes)
- Pump stations serve 50 units each
- Notes: From northern most pump station to western pump station is 198m distance, from the western pumpstation to the connection in The Drove Way is 253m distance. The lift between the two pump stations is minimal (i.e., <0.3m) but due to the existing ground levels in between, we don't anticipate being able to make a gravity connection between the two stations.

Route 2:

- Distance = From northern most pump station to public sewer connection is 362m. From western most pump station to public sewer connection is 253m. (see notes)
- Lift = From northern most pump station to public sewer connection is 1.3m. From western most pump station to public sewer connection is 1.5m.
- Pump stations serve 50 units each
- Notes: I have indicated these rising mains as connecting into each other, if this is not possible then please disregard this route.

At this stage we anticipate that we would utilise route 1 but please let us know the feasibility of routes 2 and 3.

The anticipated connection point and public sewer is shown to be a 150mm VC diameter pipe. Please let us know if this causes a change in the required pump rate.

If you're able to provide us with the required foul pumping rate (and required sizing of tanks if possible), that would be much appreciated. I appreciate it is difficult to describe the indicative strategy without a specific plan (apologies for my terrible paint skills!), so if you'd prefer, I'd be happy to set up a quick teams call to go through on screen.

Kind Regards,

Niyamal

Niyamal Ali

Consultant

Pronouns: He, Him, His



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