



Flood Risk Assessment

Land East of Pirton, Herts

Client

Gladman Developments Ltd

Ref: 13383

Date: November 2025

Consulting Engineers

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Issue	Issue date	Compiled	Checked
First Issue	31.03.2025	PH	FVV
Second Issue	02.06.2025	PH	FVV
Third Issue	13.06.2025	PH	FVV
Fourth Issue	24.11.2025	PH	FVV

Executive Summary

- The planning application is submitted on behalf of Gladman Developments Ltd to North Hertfordshire District Council for the development of Land East of Pirton, Herts. The Application Proposal is described in Section 1.
- This Flood Risk Assessment ("FRA") aims to address the requirements of relevant Local Plan Policies and demonstrate compliance with the National Planning Policy Framework ("NPPF") and relevant planning practice guidance, in particular "Flood risk and coastal change" (PPG).
- The Site lies entirely within Flood zone 1 – Low probability remote from any fluvial risk area. There are no areas of potential surface water flood risk mapped at the site and no other sources of flood risk affecting the site have been identified.
- In-situ soakaway tests have demonstrated insufficient soil permeability for point-load soakaways. Shallow groundwater was encountered which limits the use of permeable surfacing with direct infiltration. Attenuated discharges to the existing ditch watercourse will be required with flows limited to greenfield runoff rates.
- The proposed SuDS strategy includes a 3-stage treatment train comprising: 1) permeable paving with sub-base filtration and/or roadside bioretention features (e.g. rain gardens and tree pits); 2) grassed conveyance swales; and 3) an attenuation pond. The treatment train will provide sufficient water quality protection for the Drinking Water Safeguard Zone (Surface Water).
- The SuDS attenuation system has been sized with sufficient volume provided to cater for the 1 in 100 (1%) annual exceedance probability ("AEP") plus 40% climate change rainfall events.
- Foul drainage from the development will be pumped to the existing sewer network in Drovers Way.

1 Introduction

- 1.1 The outline planning application is submitted on behalf of Gladman Developments Ltd to North Hertfordshire District Council for the development of Land East of Pirton, Herts.
- 1.2 The Proposed Development comprises c.130 residential units along with associated roads, parking and open space.
- 1.3 GTA Civils & Transport Ltd was appointed by Gladman Developments Ltd to provide a FRA to support the planning application to North Hertfordshire District Council (NHDC) as described above. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.4 This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF) and relevant planning practice guidance, in particular "Flood risk and coastal change" (PPG ID7, updated August 2022).

2 Policy Context

Local Plan

- 2.1 The North Hertfordshire Local Plan 2011-2031 was adopted in November 2022. The policies relevant to this FRA are summarised or quoted in the following paragraphs.
- 2.2 Policy SP11: Natural resources and sustainability. This policy sets out that NHDC will: *"Take a risk based approach to development and flood risk, directing development to areas at lowest risk in accordance with the NPPF and ensuring the provision of Sustainable Drainage Systems (SuDS) and other appropriate measures;"* and *"Support the principles of the Water Environment (Water Framework Directive) Regulations 2017 and seek to protect, enhance and manage the water environment"*.
- 2.3 Policy NE7: Reducing flood risk. This policy states:
- "Planning permission for development proposals will be granted provided that (as applicable):*
- a) Development is located outside of medium and high-risk flood areas (flood zone 2 and 3) and other areas affected by other sources of flooding where possible;*
 - b) Where (a) is not possible, application of the sequential and exception tests is demonstrated where development is proposed in areas of flood risk using the Strategic Flood Risk Assessment (SFRA) and Environment Agency flood maps;*
 - c) A FRA has been prepared in accordance with national guidance that considers the lifetime of the development, climate change impacts and safe access and egress;*
 - d) It will be located, designed and laid out to ensure the risk of flooding is reduced whilst not increasing flood risk elsewhere;*
 - e) The impact of any residual flood risk will be minimised through flood resistant, resilient design and construction;*
 - f) Any flood protection and mitigation measures necessary will not cause harm to nature conservation, heritage assets, and/or landscape and recreation and, where possible, will have a positive impact in these respects; and*
 - g) Overland flow routes and functional floodplain areas are protected from all development other than that which is "water compatible" and this must be designed and constructed to remain operational and safe for users during flood*

events, resulting in no net loss of flood plain storage and not impeding water flows or increasing flood risk elsewhere."

2.4 Policy NE8: Sustainable drainage systems. This policy states:

"Planning permission for development will be granted provided that:

- a) The most appropriate sustainable drainage solution is used taking into account technical, viability and design issues to reduce the risk of surface water flooding, enhance biodiversity, water quality and provide amenity benefits;*
- b) It aims to mimic the natural drainage patterns and processes as far as possible; and*
- c) Drainage solutions follow the SuDS hierarchy."*

2.5 The Pirton Neighbourhood Development Plan was made in April 2018. There are no specific policies relating to flood risk.

2.6 The Local Plan is supported by evidence base documents and studies including those relevant to this FRA as discussed in the following paragraphs.

2.7 The Strategic Flood Risk Assessment (SFRA) was updated in September 2016. The SFRA gives a district-wide overview of flood risk from various sources along with policy recommendations. The findings of the SFRA relevant to this FRA are discussed in the following section.

2.8 The Infrastructure Delivery Plan (IDP) was also published in September 2016. The IDP mentions that Hitchin Sewage Treatment Works (STW), which serves Pirton, has no current or anticipated capacity issues. There are no specific infrastructure projects related to flood risk which are required to service the proposed development site.

2.9 The North Hertfordshire Surface Water Management Plan (SWMP) prepared by Hertfordshire County Council (HCC) was published in 2017. The SWMP identifies Hotspots where specific drainage policies apply to manage existing flood risk areas. The application site is not in the vicinity of any Hotspots.

Legislative Context

2.10 The Flood and Water Management Act 2010 (FWMA) updated legislation to ensure better protection from flooding, manage water more sustainably, improve public services and secure water resources during periods of drought. The FWMA helps reduce

flood risk by:

- clarifying who is responsible for managing all sources of flood risk;
- encouraging more sustainable forms of drainage in new developments; and
- making it easier to resolve misconnections to sewers.

2.11 The FWMA established the creation of the Lead Local Flood Authority (LLFA) at county or unitary level to manage local flood risk. Each LLFA is required to prepare a Local Flood Risk Management Strategy which considers all sources of flood risk and identifies objectives to manage local flood risk to local communities.

2.12 The LLFA relevant to the Development is Hertfordshire County Council.

2.13 The FWMA also laid the groundwork for national Sustainable Drainage Systems (SuDS) standards to be created. No legislation has yet been passed for this, but Defra has published non-statutory technical standards for SuDS which are frequently referred to by LLFAs in establishing suitable standards for development.

2.14 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 tie the UK into the EU Water Framework Directive (WFD) which sets environmental objectives for water bodies. The Regulations set out how the Environment Agency (EA) monitors the ecological and chemical status of surface water bodies and the chemical and quantitative status of groundwater. The EA has published River Basin Management Plans (RBMP) to coordinate the WFD objectives in each river basin district. The RBMP information relevant to the Site is discussed later in this report.

3 Existing Site & Current Flood Risk

Site Location

- 3.1 The Application Site comprises 6.65 Ha of open farmland on the eastern fringe of Pirton. The site lies east of Drovers Way. The proposed access is via the west boundary to Drovers Way and the length of existing highway is included in the red line boundary up to the junction with Holwell Road at the north.
- 3.2 A location plan is in Appendix A.

Topography

- 3.3 The site slopes gently down eastwards at typically 1:80 with ground level elevations ranging from 67.5m AOD at the west boundary down to 65.5m AOD at the east boundary.
- 3.4 Survey data is in Appendix B.

Hydrology

- 3.5 A ditch watercourse runs east along the nearside of the lane at the south boundary of the site. This ditch, mapped in the SFRA as part of the Connected Ordinary Watercourse Network, joins a tributary of the River Hiz 0.9km east of the site.
- 3.6 The site is within a Drinking Water Safeguard Zone (DWSZ) (Surface Water).

Geology

- 3.7 The published bedrock geology for the site comprises West Melbury Marly Chalk Formation. Superficial deposits of Lowestoft Formation – Diamicton are shown across the southern third of the site. The surface soils are classed as "Shallow lime-rich soils over chalk or limestone, loamy, freely draining".
- 3.8 The site is not within a groundwater Source Protection Zone (SPZ).
- 3.9 Infiltration tests were conducted in January 2017 as part of a previous planning application for the site. The results were too slow for soakaway drainage with shallow groundwater encountered in each trial pit. The test locations and results are shown on the constraints plan in Appendix E.
- 3.10 Ground investigations carried out for the neighbouring development to the west also reported failed infiltration tests and shallow groundwater.

Flood Zone

- 3.11 The EA's Flood Map for Planning shows the Site lies entirely within Zone 1 – Low Probability, having less than a 1 in 1,000 (0.1%) annual exceedance probability (AEP) of river flooding.
- 3.12 The Flood Map for Planning extract is in Appendix C.

Surface Water Flood Risk

- 3.13 The EA's Risk of Flooding from Surface Water (RoFSW) mapping extracts are shown in Appendix C. There are no areas risk mapped at the site.

Reservoir Flood Risk

- 3.14 The site is not close to any reservoir flood risk area shown on the EA's mapping.
- 3.15 There are no impounded water features in the vicinity and the Site is not close to any reservoir flood risk area shown on the EA's mapping.
- 3.16 The EA's "Flood Risk Map from Reservoirs" is in Appendix D.

Groundwater Flood Risk

- 3.17 The site is at Negligible risk of groundwater flooding according to the GeoSmart GW5 mapping. The shallow groundwater encountered at the site in 2017 reveals that the potential for emergence cannot be absolutely discounted, but there are no low spots or valleys at the site where any emerging groundwater could accumulate to any significant extent.

Climate Change

- 3.18 The site lies within the Upper and Bedford Ouse Management Catchment. The applicable peak rainfall allowances for the 2070s epoch are 35% for the 1 in 30 (3.3%) annual exceedance probability (AEP) event and 40% for the 1 in 100 (1%) AEP event.

Historical Flooding

- 3.19 A review of the available data and documents has not identified any records of flooding incidents at or close to the site.

Existing Drainage Characteristics

- 3.20 There are no public surface water or combined sewers mapped in the vicinity. The neighbouring development to the west relies on a surface water attenuation system which discharges to the ditch to the south-west of the Application Site.
- 3.21 The existing drainage pattern at the site will be partly infiltration into the near-surface soils and partly overland to the east as directed by the topography.
- 3.22 There are public foul sewers in Drovers Way which run north and then west along Holwell Road and West Lane. A pumped rising main runs east along the lane to the south of the site. This likely serves Pirton and connects to Hitchin STW to the east.
- 3.23 The sewer records are included in Appendix D.
- 3.24 The existing hard surfacing in Drovers Way which lies within the red line boundary is served by the approved surface water attenuation system installed with that development. No changes are proposed which require any surface water management interventions. For the purposes of this FRA, the field parcel, comprising 6.44 Ha, is being assessed as a 100% greenfield site.
- 3.25 Greenfield runoff rates have been calculated using Causeway Flow software as follows:
- | | |
|--------------|------------|
| 1 in 1 AEP | 0.1 l/s/Ha |
| Qbar | 0.1 l/s/Ha |
| 1 in 30 AEP | 0.4 l/s/Ha |
| 1 in 100 AEP | 0.5 l/s/Ha |
- 3.26 These very low rates relate to the Soil Factor value of 0.1. In reality, the ground investigations undertaken indicate that runoff rates will be somewhat higher than these calculations.

4 Proposed Flood Risk Mitigation

- 4.1 The Site lies entirely within Flood Zone 1. All types of development are appropriate within this Zone in terms of flood risk according to the NPPF and planning practice guidance.
- 4.2 There are no areas of potential surface water flood risk mapped at the site.
- 4.3 Groundwater flood risk is negligible based on the geology mapping and intrusive ground investigations.
- 4.4 The proposed development follows the sequential approach outlined in the NPPF as it will be located on land with least flood risk. The Sequential Test is not required. No further specific flood risk mitigation measures are required beyond the management of development runoff. This is discussed in the next section.

5 Proposed Surface Water Strategy

- 5.1 As discussed in Section 3, the ground investigations have ruled out point-load soakaways. Based on the shallow groundwater encountered it is unlikely that permeable surfacing with direct infiltration can be considered, but this will be explored at detailed stage. In the event that some source control infiltration measures can be incorporated, this would only be possible for a small part of the development and an off-site discharge would still be required. For the purposes of this outline FRA, a strategy has been identified comprising an attenuated off-site discharge.
- 5.2 From Section 3, the greenfield Qbar runoff rate was calculated using IH124 as 0.1 l/s/Ha, but this appears unrealistically low. A minimum practicable flow rate of 2 l/s/Ha has therefore been adopted for the drainage strategy.
- 5.3 The proposed SuDS strategy includes the following stages:
- On-plot source control techniques will be explored at detailed stage.
 - A three-stage SuDS treatment train will be in place for all paved surfaces as follows:
 - 1) Permeable surfacing maximised as well as roadside bioretention features, rain gardens and tree pits (lined with outfall to drainage network).
 - 2) Conveyance swales.
 - 3) Attenuation pond with controlled discharge.
- 5.4 An outfall is available to the existing ditch watercourse at the south-east corner of the site. There are no 3rd party ownership issues. The connection will be made via a setback swale outfall. The swale connection will be subject to Ordinary Watercourse Consent from HCC.
- 5.5 A conservative assessment of impermeable areas has been made based on the Development Framework Plan (see Appendix E). The storage volume required has been identified to cater for the 1 in 100 AEP +40% rainfall events with discharge limited to 2 l/s/Ha. Based on the assessment the discharge rate from the development will be 5.5 l/s. Storage will be located within the following features:
- Permeable pavement sub-base cells (lined).
 - The large conveyance swale on the east boundary with a permanent water zone at the downstream end.

- A final attenuation pond at the south-east.
- 5.6 The drainage strategy is illustrated on plan in Appendix E. Storage calculations are included in Appendix F to demonstrate safe management of the 1 in 100 AP +40% storm events. Calculations are based on FEH 2022 data, with CV values of 1.
- 5.7 Exceedance: Exceedance routes are indicated on the strategy plan in Appendix E.
- 5.8 Water quality: The DWSZ designation means it will be important to include sufficient stages of pollutant removal within the drainage system design. The proposed SuDS strategy includes appropriate runoff treatment measures in the form of permeable paving, bioretention rain gardens, swales and an open pond to capture pollutants before they enter the receiving water environment.
- 5.9 Based on the Simple Index Approach described in CIRIA C753 (The SuDS Manual) the development's pollution hazard indices are outlined in Table 5.1 below along with the relevant SuDS mitigation indices for the proposed SuDS components. For multiple stages, only the 1st stage has the full index value counted with subsequent stages counted at 50%.

Pollutant type	TSS	Metals	Hydrocarbons
Pollution hazard indices			
Residential roofs – Very low	0.2	0.2	0.05
Vehicular areas – Low	0.5	0.4	0.4
Spine roads – Medium	0.7	0.6	0.7
SuDS mitigation indices			
Permeable pavement	0.7	0.6	0.7
Bioretention system	0.8	0.8	0.8
Swale	0.5	0.6	0.6
Paving → Swale	0.95	0.9	1.0
Bioretention → Swale	1.05	1.1	1.1
Pond	0.7	0.7	0.5
Paving → Swale → Pond	1.3	1.25	1.25
Bioretention → Swale → Pond	1.4	1.45	1.35

Table 5.1: Runoff Treatment – Simple Index Approach

- 5.10 Table 5-1 demonstrates that the 3-stage treatment train will achieve sufficient pollutant removal. The mitigation indices surpass the pollution hazard indices after the 2nd stage of treatment (the conveyance swales). The addition of a further stage is then an appropriate provision where there is a sensitive receptor downstream. With 3 stages of treatment, the risk of detrimental impact on water quality in the DWSZ will be low.
- 5.11 Ownership and maintenance: A draft Drainage Maintenance Plan (DMP) outlining ownership and maintenance responsibilities is included in Appendix G. This is a draft version based on the information currently available at this stage; the DMP will be updated as the design of each phase is developed and will remain a live document over the duration of the project. A summary of the various ownership responsibilities is as follows:
- Individual property drainage will be cared for by the property owner.
 - Adopted sewers and qualifying SuDS components will be the responsibility of Anglian Water, or will be vested in a sewerage company under a NAV agreement. The final arrangements will be confirmed at the next stage.
 - The remaining drainage features along with the site-wide infrastructure will be cared for by the Estate Management Company set up by the developer.
 - The developer will be responsible for maintaining completed SuDS components in advance of transfer to / adoption by the relevant party.
- 5.12 Foul drainage: The proposed foul drainage network will connect into the existing public foul sewer in Drovers Way. The connection will be pumped and subject to agreement with Anglian Water. The proposed connection location is shown on the strategy plan in Appendix E.
- 5.13 Details of any off-site upgrades required will be established in discussion with Anglian Water post-planning. Any such upgrades will be carried out by Anglian Water and funded by Infrastructure Charges which all developers must pay at time of connection. The delivery programme for any upgrades would be agreed the timeframe for the development occupation is compatible.

LLFA consultation response

- 5.14 Following submission of the current planning application, the LLFA at HCC raised comments in its consultation response dated 21 August 2025. A meeting was held with the LLFA officers at a meeting on 16 October 2025 to agree the details needed to address the comments. These are discussed in the following paragraphs.

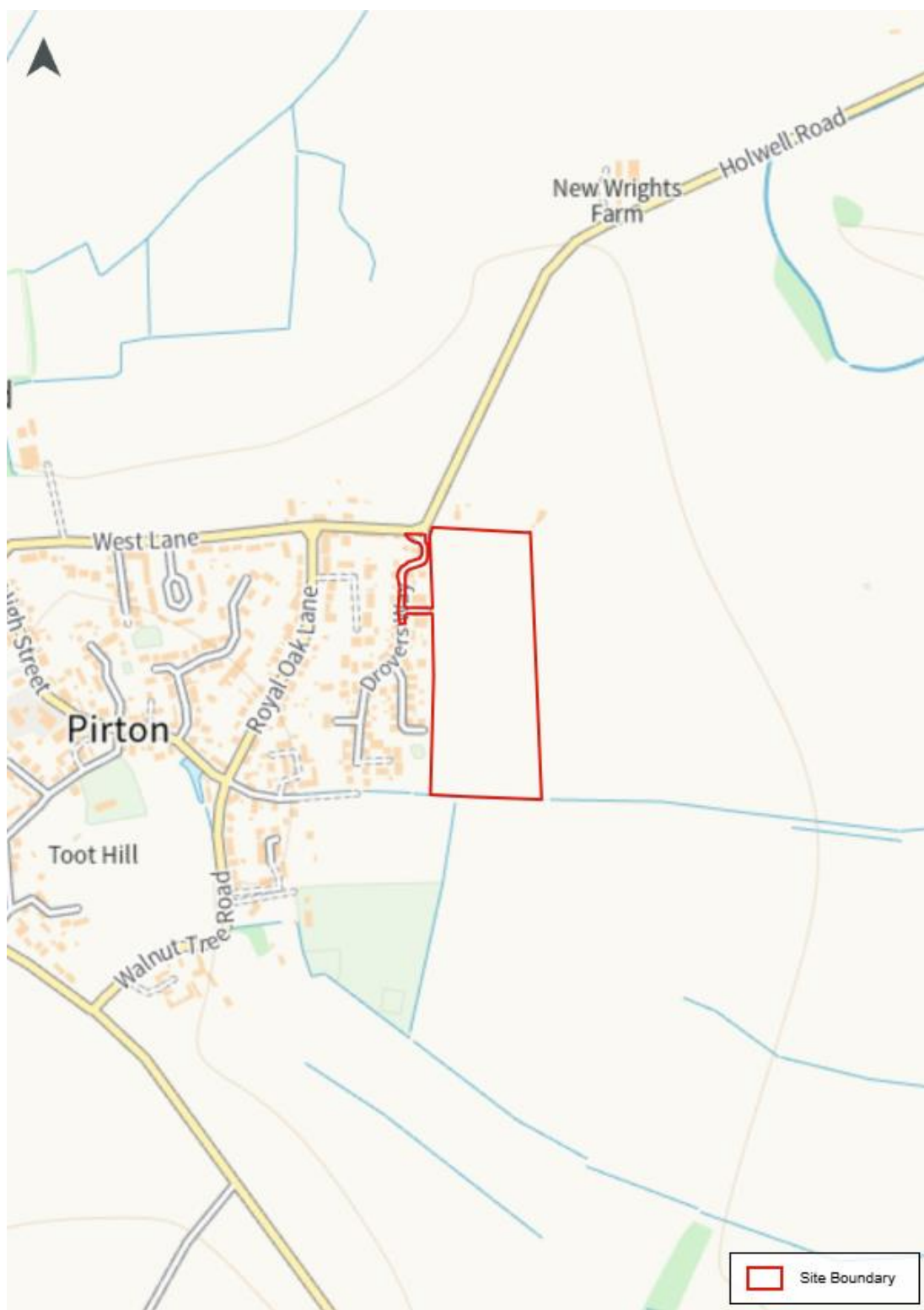
- 5.15 A study of the existing ditch watercourse capacity was made as part of the original planning application for the neighbouring development to the west (NHC ref: 15/01618/1). The study concluded that the ditch has plenty of spare capacity for its catchment flows. A further survey of the ditch including levels, photos and culvert CCTV has been conducted and the survey reports are included as Appendix J. The surveys demonstrate the onward connectivity of this watercourse as described in Section 3 of this FRA.
- 5.16 The proposed SuDS strategy limits runoff from the development to 2 l/s/Ha as requested by the LLFA. This is a reduction from the National standards for SuDS which only requires 3 l/s/Ha as a minimum flow rate. This restriction is applied to the 1 in 100 annual exceedance probability (AEP) storm events with a 40% allowance for climate change. The total discharge has been calculated as 5.5 l/s which could be accommodated in a pipe as small as 100mm diameter.
- 5.17 The above information collectively demonstrates that the proposed watercourse is a suitable destination for the proposed development runoff.
- 5.18 The strategic SuDS crest levels have been raised by 120mm in order to provide a minimum freeboard of 300mm during the 1 in 100 AEP plus climate change events as requested. The levels are shown on the updated strategy plan in Appendix E and the updated calculations in Appendix F.
- 5.19 The methodology for calculating runoff from green open space into the SuDS scheme was agreed with the LLFA officers during the meeting on 16 October 2025. The site surface soils are freely draining with a soil factor of 0.1. Therefore, a runoff coefficient of 15% was agreed.
- 5.20 The areas of green open space where excess runoff will enter the development SuDS are shown on the updated drainage strategy plan (see Appendix E). An additional area of hard surfacing equivalent to 15% of the green open space area has been input to the calculations to conservatively represent the excess runoff from these green spaces during a storm event. As expected, the revised calculations show an increase in the storage volume required which has been accommodated in the SuDS design by raising the crest levels as mentioned above.

6 Conclusions

- 6.1 The site lies entirely within Flood zone 1 remote from any fluvial risk area. There are no other identified sources of flood risk affecting the proposed development. The development is appropriate in terms of flood risk.
- 6.2 The proposed surface water strategy limits runoff to greenfield rates to protect flood risk downstream. The calculated runoff rates are considered unrealistically low and do not represent the site characteristics accurately. A minimum practicable flow rate of 2 l/s/Ha has been adopted.
- 6.3 The proposed SuDS components will capture pollutants to protect water quality in the receiving water environment.
- 6.4 The development complies with the NPPF and relevant planning practice guidance in terms of flood risk.
- 6.5 The proposed SuDS and foul drainage strategies comply with Local Plan Policies SP11, NE7 and NE8 in terms of flood risk.

Appendix A

Location Plan

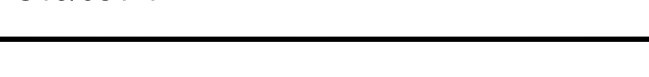


Aerial Photo



Appendix B

Site Survey



Appendix C

Flood Maps



EA Flood Map for Planning



EA Risk of Flooding from Surface Water Extents Map

Appendix D

Sewer Records



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Date: 20/11/24

Scale: 1:1250

Map Centre: 515087,231871

Data updated: 31/10/24

Our Ref: 1624031 - 1

Wastewater Plan A1
Powered by digiart

This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2024 Ordnance Survey AC0000813445. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

Foul Sewer		Outfall*
Surface Sewer		
Combined Sewer		
Final Effluent		Inlet*
Rising Main*		
Private Sewer*		
Decommissioned Sewer*		Manhole*

	Sewage Treatment Works
	Public Pumping Station
	Decommissioned Pumping Station

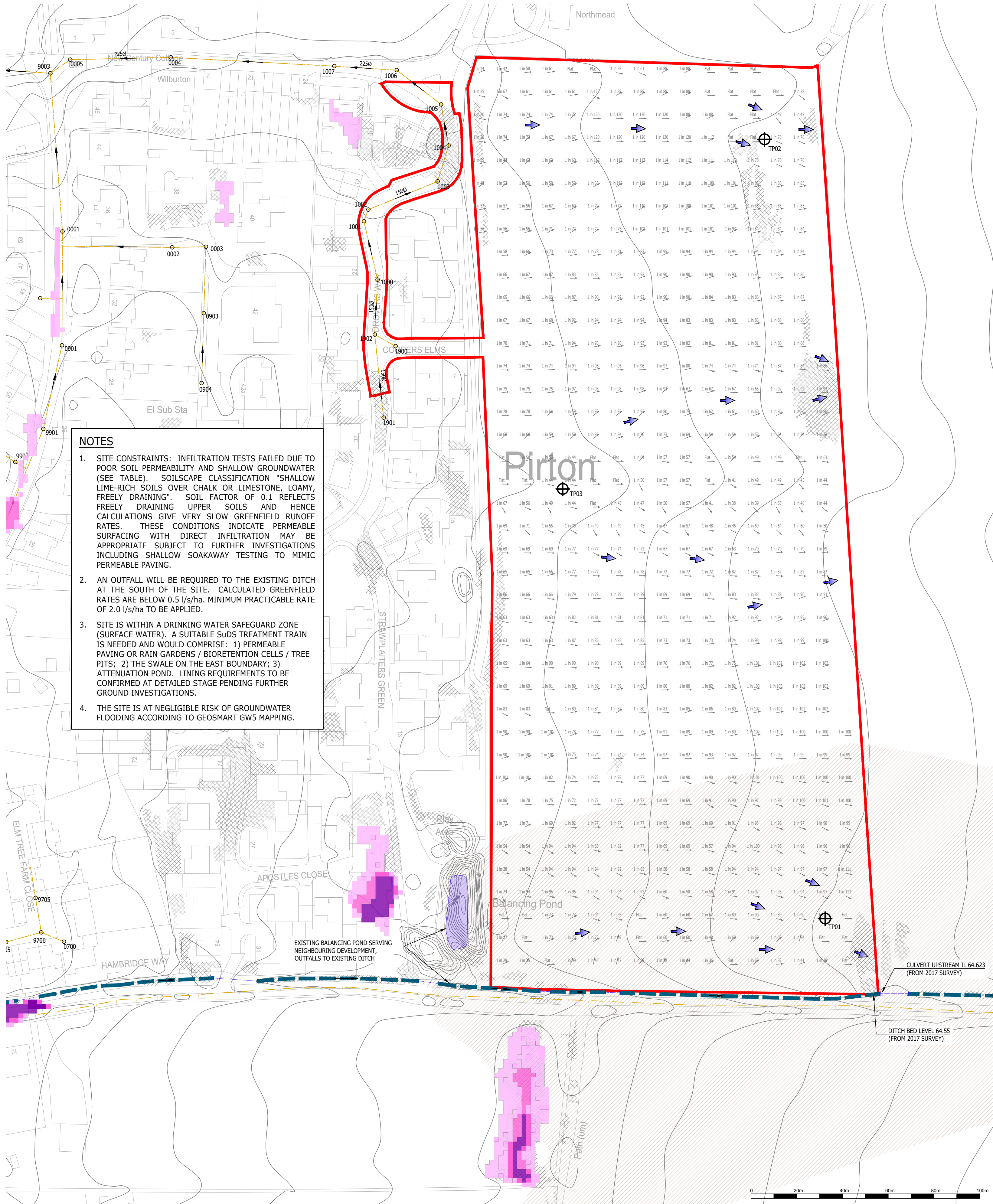
*(Colour denotes effluent type)

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13383/FVV



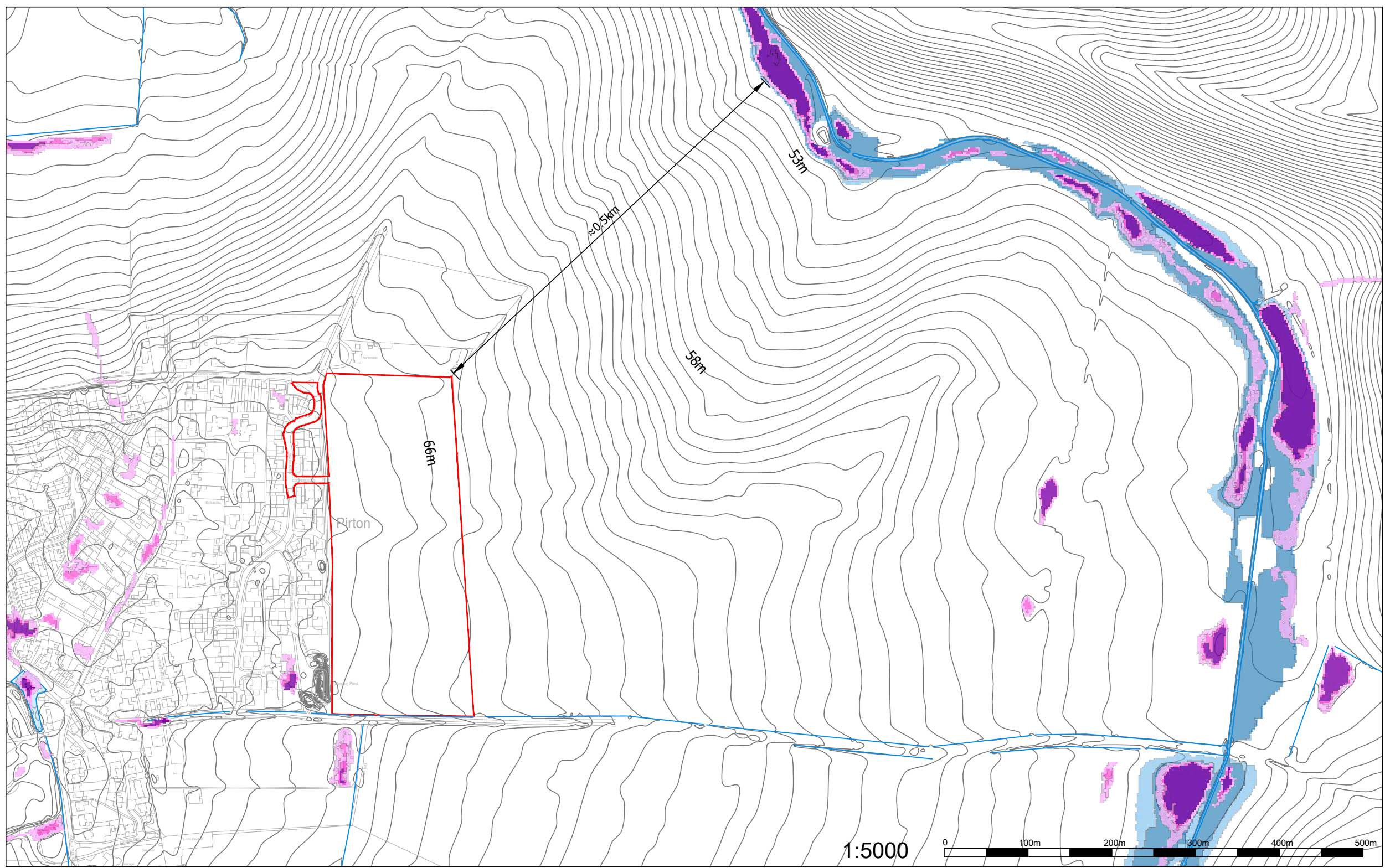
Appendix E

Drawings



- NOTES**
1. SITE CONSTRAINTS: INFILTRATION TESTS FAILED DUE TO POOR SOIL PERMEABILITY AND SHALLOW GROUNDWATER (SEE TABLE). SOILSCAPE CLASSIFICATION "SHALLOW LIME-RICH SOILS OVER CHALK OR LIMESTONE, LOAMY, FREELY DRAINING". SOIL FACTOR OF 0.1 REFLECTS FREELY DRAINING UPPER SOILS AND HENCE CALCULATIONS GIVE VERY SLOW GREENFIELD RUNOFF RATES. THESE CONDITIONS INDICATE PERMEABLE SURFACING WITH DIRECT INFILTRATION MAY BE APPROPRIATE SUBJECT TO FURTHER INVESTIGATIONS INCLUDING SHALLOW SOAKAWAY TESTING TO MIMIC PERMEABLE PAVING.
 2. AN OUTFALL WILL BE REQUIRED TO THE EXISTING DITCH AT THE SOUTH OF THE SITE. CALCULATED GREENFIELD RATES ARE BELOW 0.5 l/s/ha. MINIMUM PRACTICABLE RATE OF 2.0 l/s/ha TO BE APPLIED.
 3. SITE IS WITHIN A DRINKING WATER SAFEGUARD ZONE (SURFACE WATER). A SUITABLE SUDS TREATMENT TRAIN IS NEEDED AND WOULD COMPRISE: 1) PERMEABLE PAVING OR RAIN GARDENS / BIORETENTION CELLS / TREE PITS; 2) THE SWALE ON THE EAST BOUNDARY; 3) ATTENUATION POND. LINING REQUIREMENTS TO BE CONFIRMED AT DETAILED STAGE PENDING FURTHER GROUND INVESTIGATIONS.
 4. THE SITE IS AT NEGLIGIBLE RISK OF GROUNDWATER FLOODING ACCORDING TO GEOSMART GW5 MAPPING.

SITE PLAN
1:1,000



SITE CONTEXT
1:5,000

KEY

- SITE BOUNDARY (6.65 HA)
- 0.5m GROUND CONTOURS (LIDAR)
- FLOOD ZONE 3
- FLOOD ZONE 2
- SURFACE WATER FLOOD RISK HIGH (1 IN 30 AEP)
- SURFACE WATER FLOOD RISK MEDIUM (1 IN 100 AEP)
- SURFACE WATER FLOOD RISK LOW (1 IN 1,000 AEP)
- EXISTING DITCH
- EXISTING DITCH CULVERT
- EXISTING FOUL SEWERS
- EXISTING FOUL RISING MAIN
- ZONE OF SUPERFICIAL DEPOSITS (LOWESTOFT FORMATION - DIAMICTON; BEDROCK THROUGHOUT IS WEST MELBURY MARLY CHALK FORMATION)
- TRIAL PIT LOCATIONS
- EXISTING DEPRESSIONS (FROM SCALGO LIVE)
- EXISTING SITE GRADIENTS
- INDICATIVE OVERLAND FLOW ROUTES (EXISTING)

Infiltration Testing (conducted 24.01.2017)

Trial Pit	Pit Depth (m bgl)	Depth to Groundwater (m bgl)	Infiltration Rate (m/s)	Infiltration Rate (m/hr)
TP01	1.50	0.8	TEST FAILED	TEST FAILED
TP02	1.80	1.2	5.97 x 10 ⁻⁷	0.002
TP03	1.85	1.5	1.06 x 10 ⁻⁶	0.004

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations, record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.
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9. Should any apparent discrepancies between the data contained within the DWG file and the current contract drawings become evident, it must be reported back to GTA Civils & Transport as soon as reasonably practicable. Precedence should be given to the current contract drawings (PDF) unless advised otherwise.

Date	DECEMBER 2024	Scale @ A1	1:1,000
Clients Ref.	Project Ref.	13383	

gta Civils & Transport
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Drawing Number 13383-1100 Rev. P3



Appendix F

Calculations

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	1.000		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
PAVING	0.390	5.00	66.000	1350	515317.585	231782.440	0.600	65.400
PAVING OUTFALL			65.920		515334.456	231779.986	0.970	64.950
SWALE OUTLET	1.838	5.00	65.920		515339.006	231759.579	0.970	64.950
POND INLET			65.920		515341.063	231723.179	1.120	64.800
POND OUTLET	0.535	5.00	65.920	1200	515332.014	231699.434	1.120	64.800

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)
1.000	PAVING	PAVING OUTFALL	17.048	0.600	65.400	65.100	0.300	56.8	300	Circular	5.14	50.0
1.002	SWALE OUTLET	POND INLET	36.458	0.600	64.950	64.800	0.150	243.1	300	Circular	5.61	50.0

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	4320	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 | 2160 | 2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	40	0	0
30	35	0	0				

Node PAVING Online Orifice Control

Flap Valve	✓	Invert Level (m)	65.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.020		

Node PAVING Online Weir Control

Flap Valve	x	Invert Level (m)	65.850	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Width (m)	1.000		

Node POND OUTLET Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	64.800	Product Number	CTL-SHE-0113-5500-0800-5500
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.5	Min Node Diameter (mm)	1200

Node POND OUTLET Pond Storage Structure

Invert Level (m)	64.800	Time to half empty (mins)	Analyse flow through structure	x
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Inlets

POND INLET

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	880.3	0.200	1092.8	0.400	1314.3	0.600	1542.9	0.800	1778.5	1.000	2021.0
0.100	984.6	0.300	1202.7	0.500	1427.8	0.700	1659.8	0.900	1898.9	1.120	2168.3

Node SWALE OUTLET Pond Storage Structure

Invert Level (m) 64.950 | Time to half empty (mins) 3480 | Analyse flow through structure x

Inlets

PAVING OUTFALL

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	503.2	0.200	1434.3	0.400	1932.7	0.600	2434.5	0.800	2939.7	0.970	3371.8
0.100	1010.0	0.300	1683.0	0.500	2183.1	0.700	2686.7	0.900	3193.6		

Node PAVING Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	78.000	Depth (m)
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	65.400	Length (m)	50.000	Inf Depth (m)
Safety Factor	2.0	Time to half empty (mins)		Slope (1:X)	999.0	

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	PAVING	2100	65.500	0.100	2.1	88.0876	0.0000	OK
240 minute summer	PAVING OUTFALL	148	65.099	0.149	22.9	0.0000	0.0000	OK
240 minute summer	SWALE OUTFALL	144	65.101	0.151	75.2	130.8492	0.0000	OK
720 minute summer	POND INLET	585	65.075	0.275	26.2	0.0000	0.0000	OK
720 minute summer	POND OUTFALL	585	65.071	0.271	19.7	279.6570	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	PAVING	1.000	PAVING OUTFALL	0.2	0.400	0.002	0.0106	
2160 minute winter	PAVING	Weir	PAVING OUTFALL	0.0				
240 minute summer	SWALE OUTFALL	1.002	POND INLET	37.1	1.251	0.523	1.5266	
720 minute summer	POND OUTFALL	Hydro-Brake®		5.5				549.5

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	PAVING	2820	65.703	0.303	5.4	325.1183	0.0000	FLOOD RISK
960 minute winter	PAVING OUTFALL	975	65.493	0.543	22.2	0.0000	0.0000	OK
960 minute winter	SWALE OUTFALL	945	65.493	0.543	65.4	835.8060	0.0000	SURCHARGED
960 minute winter	POND INLET	945	65.493	0.693	29.0	0.0000	0.0000	OK
960 minute winter	POND OUTFALL	945	65.488	0.688	22.7	868.9052	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	PAVING	1.000	PAVING OUTFALL	0.4	0.452	0.003	0.6977	
2880 minute winter	PAVING	Weir	PAVING OUTFALL	0.0				
960 minute winter	SWALE OUTFALL	1.002	POND INLET	29.0	0.887	0.408	2.5673	
960 minute winter	POND OUTFALL	Hydro-Brake®		5.5				1535.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	PAVING	2880	65.781	0.381	6.8	417.1396	0.0000	FLOOD RISK
1440 minute winter	PAVING OUTFALL	1440	65.614	0.664	19.8	0.0000	0.0000	OK
1440 minute winter	SWALE OUTLET	1410	65.615	0.665	58.0	1132.8980	0.0000	SURCHARGED
1440 minute winter	POND INLET	1410	65.614	0.814	18.7	0.0000	0.0000	OK
1440 minute winter	POND OUTLET	1410	65.609	0.809	20.3	1077.6420	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute winter	PAVING	1.000	PAVING OUTFALL	0.5	0.402	0.003	1.0021	
2880 minute winter	PAVING	Weir	PAVING OUTFALL	0.0				
1440 minute winter	SWALE OUTLET	1.002	POND INLET	18.7	0.846	0.264	2.5673	
1440 minute winter	POND OUTLET	Hydro-Brake®		5.5				1692.2

Appendix G

Draft Drainage Maintenance Plan

DRAFT

Drainage Maintenance Plan

Land East of Pirton, Herts



Contents

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Schedule of Appendices

A Site Drainage Plans

Issue	Issue date	Compiled	Checked
First Draft Issue	27.03.2025	PH	FVV
Second Draft Issue	02.06.2025	PH	FVV

1 Introduction

- 1.1 This report has been prepared by GTA Civils & Transport Ltd for Gladman Developments Ltd in relation to the development at Land East of Pirton, Herts. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.2 This Draft Drainage Maintenance Plan (DMP) has been prepared for inclusion as an Appendix to the Flood Risk Assessment (FRA) report required by North Herts District Council (NHDC) as part of the Application.
- 1.3 The Draft DMP sets out the framework for the management of the proposed sustainable drainage systems (SuDS) at the development. The document will be updated with further information through the next stage of detailed design and coordination. At this stage, what is set out herein is intended to be sufficient to demonstrate the viability of the proposed SuDS maintenance regime for planning purposes.

2 Summary Description of Drainage Systems

- 2.1 Existing: the pre-development Site comprises existing agricultural fields.
- 2.2 The proposals comprise construction of up to 130 residential units along with access roads, parking and soft landscaping.
- 2.3 Drainage design: the drainage layout drawings, by GTA Civils & Transport Ltd, are included in Appendix A (for the Draft DMP – see FRA Appendix E).
- 2.4 The surface water drainage design is based on treated and attenuated surface water runoff discharging to the existing ditch watercourse at the south of the site.
- 2.5 Off-site discharges are limited to greenfield rates. This is achieved by attenuation volume provided within an open pond. The SuDS scheme also incorporates roadside swales/bioretention features and conveyance swales with pocket wetland zones.
- 2.6 All features mentioned above have been included in this draft DMP; however, this document will be updated at detailed design stage.
- 2.7 Foul drainage will connect to Anglian Water's existing foul sewer network in Drovers Way to the west.

3 Ownership & Maintenance Responsibilities

- 3.1 Responsibility for the maintenance of the drainage system will be apportioned generally as follows:
- The developer will remain responsible for each drainage component until such time as it is handed over to the adopting authority, agent or end user.
 - Individual property drainage will be cared for by the property owner.
 - Adopted sewers and SuDS components will be the responsibility of Anglian Water, or will be vested in a sewerage company under a NAV agreement. The final arrangements will be confirmed at the next stage.
 - The remaining drainage features along with the site-wide infrastructure will be cared for by the Estate Management Company. This includes permeable pavements in non-adopted areas and the piped systems that are not owned by the public bodies mentioned above.
 - The main piped foul sewer networks downstream of each individual property will be adopted by the sewerage authority.
- 3.2 The drainage layout plans in Appendix A are colour-coded to illustrate the various ownerships across the development [...TO BE COMPLETED AT THE NEXT STAGE...].
- 3.3 The following sections set out schedules detailing the maintenance requirements for each of the main drainage items used within the scheme. The Estate Management Company will undertake the inspections and maintenance activities in accordance with these schedules. Public bodies will maintain adopted features in line with their established procedures.
- 3.4 Additional reference should be made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).
- 3.5 This DMP should be considered a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance

of the drainage systems over time. Changes should be agreed with the drainage authority and recorded and dated in the DMP.

3.6 Important safety information is set out in the next section.

4 Health and Safety

4.1 All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:

- The Health and Safety at Work etc Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Workplace (Health, Safety and Welfare) Regulations 1992

4.2 The Estate Management Company is responsible for suitable risk assessment and management to ensure safe working conditions and practices. Measures to protect potential visitors also need to be considered.

4.3 Specialist contractors used should work to industry guidelines and be able to demonstrate safe working practices.

4.4 Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and policies implemented based on risk assessment.

4.5 Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.

4.6 Entry of pipes, chambers, tanks and culverts should be avoided. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.

4.7 For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

5 Schedule A – Sewers, Manholes, Gullies, Channel Drains

- 5.1 Regular inspection and maintenance is required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.
- 5.2 Prior to construction: a CCTV survey to be carried out on all receiving existing public sewer systems prior to connection with adopted sewers.
- 5.3 Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems, prior to connection with adopted sewers.
- 5.4 The report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client & Management Company for future reference.
- 5.5 Ongoing maintenance responsibility for all adopted sewers is by the sewerage authority and for adoptable highway drainage is by Hertfordshire County Council. All other private gullies and drainage marked black on the layouts to be maintained by the Management Company in shared areas and the homeowner within any conveyed land. Operation and maintenance requirements for all sewers, manholes, gullies and channel drains are described in the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly intervals.
	Common yard & car park & other hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems.	Monthly.
	Debris removal from gullies & channel drains (where may cause risks to performance).	6 Monthly intervals, after autumn leaf fall, or as required based on specific observations.
	Lift and inspect receiving manholes to check for any blockages.	Monthly.
Remedial Actions	Repair any damaged gully or channel drain gratings.	As required.
	Replace / fix any loose channel drain covers.	As required.
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits & drainage channels during the survey.	10-yearly intervals.

5.6 Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements.

5.7 In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in 'Safe Working in Sewers and

at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.

5.8 Further information on safety is set out in Section 4.

6 Schedule B – Attenuation Ponds, Swales and Control Chambers

6.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass.	Monthly (during growing season),
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required.
	Inspect permanent water depth for silt accumulation. Silt removal is only to be carried out after consultation with Environmental Officers.	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or reseeded.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.
	Remove build-up of silt accumulation from permanent water depth. Silt removal is only to be carried out after consultation with Environmental Officers.	Monthly for 6 months, quarterly for 2 years, then half yearly

	Remove and dispose of oils or petrol residues using safe standard practices.	As required.
Control Chambers and Hydrobrakes	Check hydrobrake orifices are clear and retention tank door is closed. Check function of retention tank door and oil if necessary. Similarly, check outfalls and inlets of attenuation ponds to ensure pipes are clear and free-flowing.	First 2 years of occupation – Monthly Then annually

6.2 Safety information is set out in Section 4.

7 Schedule C – Permeable Pavements

7.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Standard road sweeper	Annually after autumn leaf fall
Occasional Maintenance	Weed removal	Annually
Remedial Actions	Remediate adjacent landscaping to original levels	As required
	Paving repairs including replenishment of lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required if infiltration is reduced by clogging
Monitoring	Initial inspection	Monthly for first three months
	Inspection for evidence of poor operation and/or weed growth	Quarterly, 48 hrs after large storms in first six months
	Inspection for silt accumulation to establish sweeping frequencies	Annually
	Monitor inspection chambers	Annually

7.2 Safety information is set out in Section 4.

8 Schedule D – Rain Gardens, Bioretention Features, Tree Pits

8.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time and assess standing water levels in underdrain	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly; monthly for tree pits
Regular Maintenance	Remove litter, debris and weeds	At least quarterly; monthly for tree pits
	Replace any plants, to maintain planting density	As required
	Manage other vegetation and remove nuisance plants from tree pits	Monthly (at start, then as required)
	Remove sediment, build-up from around inlets and forebays	Quarterly to biannually
Occasional Maintenance	Infill any holes or scour, improve erosion protection	As required
	Repair minor accumulations of silt by raking away surface mulch,	As required

	scarifying surface of filter medium and replacing mulch Tree pits: check tree health and manage tree appropriately Tree pits: remove silt build-up from inlets and surface and replace mulch as necessary Tree pits: watering	Annually Annually, or as required As required in periods of drought
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly
Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

8.2 Safety information is set out in Section 4.

9 Schedule E – Riparian Watercourse

9.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Litter and debris removal	Monthly
	Cut back vegetation, remove cuttings	Annually between September and March, trim alternate banks each year
Occasional Maintenance	Silt removal from ditch bed including culverts	Rolling programme over 3 years
Remedial Actions	Repair erosion damage, re-seed bare patches on banks	As required
	Clear blockages	As required
	Repair culverts and headwall structures	As required
Monitoring	Inspect culverts for blockages and any damage	Monthly
	CCTV survey of long or multi-directional culverts	5 years

9.2 Safety: The dynamic nature of open and culverted watercourses means that risk should be assessed on a case-by-case basis. Appropriate clothing and protective wear should be worn by all involved in the maintenance. High visibility jackets are recommended when carrying out maintenance near a road. Works that will affect the highway require a temporary Traffic Regulation Order (TRO) from Hertfordshire County Council and adequate notice to be given to the travelling public. The increased risk of working near a road will need to be considered.

- 9.3 Culvert entry should be avoided. Works should be carried out from the surface using appropriate equipment.
- 9.4 Further safety information is set out in Section 4.
- 9.5 There are legal duties regarding Ordinary Watercourses which should be reviewed and understood prior to undertaking significant maintenance. The regulating authority is Staffordshire County Council as the Lead Local Flood Authority and information should be available on the Council's website.
- 9.6 Environmental laws may also apply depending on the habitat at each location.
- 9.7 The riparian ownership of each ditch should also be understood so that work does not take place on 3rd party land without prior agreement.

10 Contamination or Dilution of Spillage

10.1 In the event of a spillage it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

10.2 Environment Agency – Emergency Contact Number

In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is **0800 80 70 60** (Freephone 24hrs).

- End of Report -

Appendix A

Site Drainage Layouts

[Refer to FRA Appendix E]

Appendix H

LLFA Proforma

Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed development this pro-forma must be completed in full and be submitted with any planning application which seeks permission for 'major' development. This information contained in this form will be used by Hertfordshire County Council in its role as Lead Local Flood Authority and 'statutory consultee' on SuDs for all 'major' planning applications. The pro-forma is supported by the [Defra/EA Guidance on Rainfall Runoff Management](#). The pro-forma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

1. Site Details

Site	Land east of Pirton, Herts
Address & post code or LPA reference	East of Coopers Elms SG5 3EU
Grid reference	515250, 231900
Is the existing site developed or Greenfield?	Greenfield
Total Site Area served by drainage system (excluding open space) (Ha)*	See FRA Appendix E & F
Topographical survey plan showing existing site layout, site levels and drainage system	See FRA Appendix B & E

* The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers & Local Authorities
Impermeable area (ha) (catchment areas to be shown on a plan)	0	2.76	2.76	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed permeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)	watercourse		N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
Existing and proposed calculations	☒	☐		Please provide Hydraulic modelling calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration	☐	☒	Infiltration tests failed	e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse	☒	☐	Ditch watercourse within site at south boundary	e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA).
To surface water sewer	☐	☒		Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above	☐	☒		e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.
Has the drainage proposal had regard to the SuDS hierarchy?	☒	☐		Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Layout plan showing where the sustainable drainage infrastructure will be located on site.	☒	☐	FRA Appendix E, drawing 13383/1101	Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of development.

Technical Standards S2 and S3

4. Peak Discharge Rates – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
Greenfield QBAR	Refer to FRA	N/A	N/A	Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1		5.5		Proposed discharge rates (with mitigation) should be as close as reasonably practicable to predevelopment greenfield run-off rates with long term storage or Qbar, they must be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events. If discharging to watercourse post development results need to be with and without a surcharged outfall. The critical results need to be provided for both the critical storm by level and critical storm by outflow.
1 in 30		5.5		
1 in 100		5.5		
1 in 100 plus climate change	N/A	5.5		To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change should be added to the peak rainfall intensity. EA Guidance - Flood Risk Assessments: Climate Change Allowances https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Technical Standards S4 to S9

5. Calculate discharge volumes –The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Volume (m³)	Proposed Volume (m³)	Difference (m³) (Proposed-Existing)	Notes for developers & Local Authorities
1 in 1				Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30				
1 in 100				
1 in 100 plus climate change			N/A - discharge at greenfield Qbar	To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

		Notes for developers & Local Authorities
Storage volume required to retain discharge rates as existing (m ³)	2,628	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing
Where will the storage be provided on site?	On-plot paving cells, swale (east) and pond (south)	

7. How is Storm Water stored on site?

Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

			Notes for developers & Local Authorities
Infiltration	State the Site's Geology/drift material overlaying)	WEST MELBURY MARLY CHALK	Avoid infiltrating in made ground.
	Does the site have a high ground water table? Yes/No?	Likely - based on 2017 soakaway tests	If yes, please provide details of the site's hydrology.
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?	No	Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ)
	Are infiltration rates suitable?	No	Infiltration rates should be no lower than 1×10^{-6} m/s.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	No	Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
	State the distance between a proposed infiltration device base and the ground water (GW) level	n/a	Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
	Were infiltration rates obtained by desk study or infiltration test?	In situ testing	Infiltration rates can be estimated from desk studies for outline planning permission if a back-up attenuation scheme is provided. Site specific BRE 365 tests should be provided for Full planning Permission
Is infiltration feasible?	Yes/No?	No	If infiltration is not feasible how will the additional volume be stored?. The applicant should then consider the following options in the next section.

7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

		Notes for developers & Local Authorities
Please confirm what option has been chosen and how much storage is required on site.	Option 1 - 2,628m ³	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Additional Consideration to comply with the Technical Standards and PPG

		Notes for developers & Local Authorities
Which Drainage Systems measures have been used?	SuDS treatment train includes permeable paving, swale, pond	SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	Green spaces provided to facilitate flow routes; to be assessed at detailed stage	Safely: not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths.
How are rates being restricted?	Hydrobrakes	Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices not be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
Drainage during construction period	To be provided at detailed stage	Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control.
Key Drainage components / Features	Attenuation swale and pond	Which component if blocked (even partial) will lead to flooding?

Technical Standards S10 to S12

9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

How is the entire drainage system to be maintained in perpetuity?	Refer to FRA Appendix G	Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust. Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed. — Specification notes that describe how work is to be undertaken and the materials to be used. — A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate. — A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the Management Plan. Where open water is involved please provide a health and safety plan within the management plan.
Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.	Refer to FRA Appendix G	If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.
Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.	n/a	

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By **Florence Van Vaerenbergh**

Qualification of person responsible for signing off this pro-forma **MEng MICE**

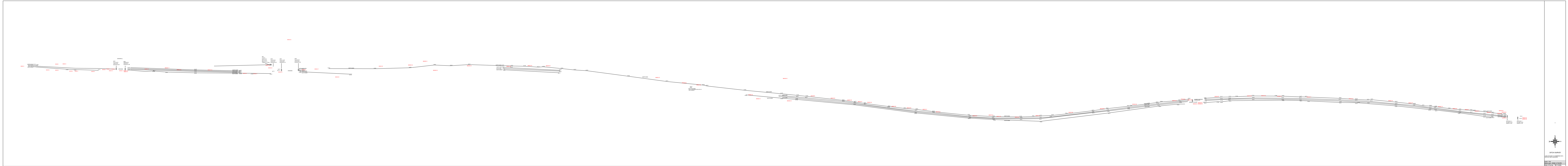
Company **GTA Civils & Transport Ltd**

On behalf of (Client's details) **Gladman Developments Ltd**

Date: **24.11.2025**

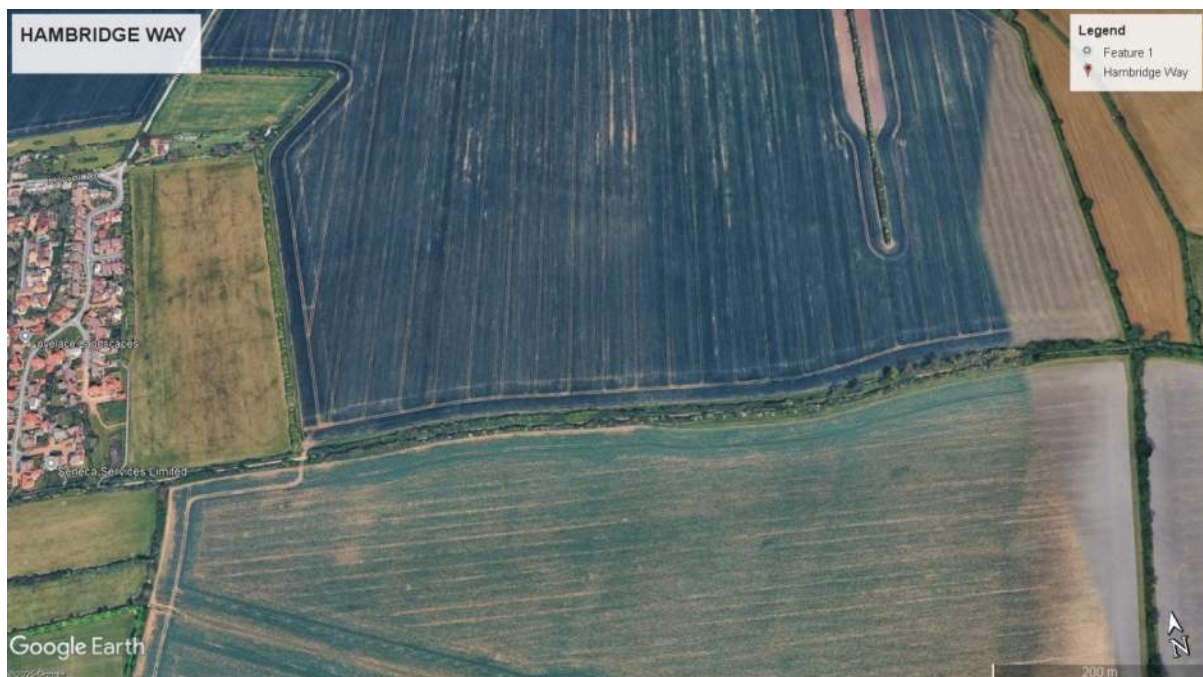
Appendix J

Ditch Survey



DITCH SURVEY

LAND ADJAYCENT TO HAMBRIDGE WAY, PERTON, HERTFORDSHIRE



NOTE: Images flow West to East

IMAGE1



IMAGE 2



IMAGE 3



IMAGE 4



IMAGE 5



IMAGE 6



IMAGE 7



IMAGE 8



IMAGE 9



IMAGE 10



IMAGE 11



IMAGE 12



IMAGE 13



IMAGE 14



IMAGE 15



IMAGE 16



IMAGE 17



IMAGE 18



IMAGE 19



IMAGE 20



Looking east. Ditch to the left side of image.

IMAGE 21



IMAGE 22



IMAGE 23



IMAGE 24



IMAGE 25



IMAGE 26



IMAGE 27



Image 28



Looking east

Image 29



IMAGE 30



Above image location looking east.

IMAGE 31

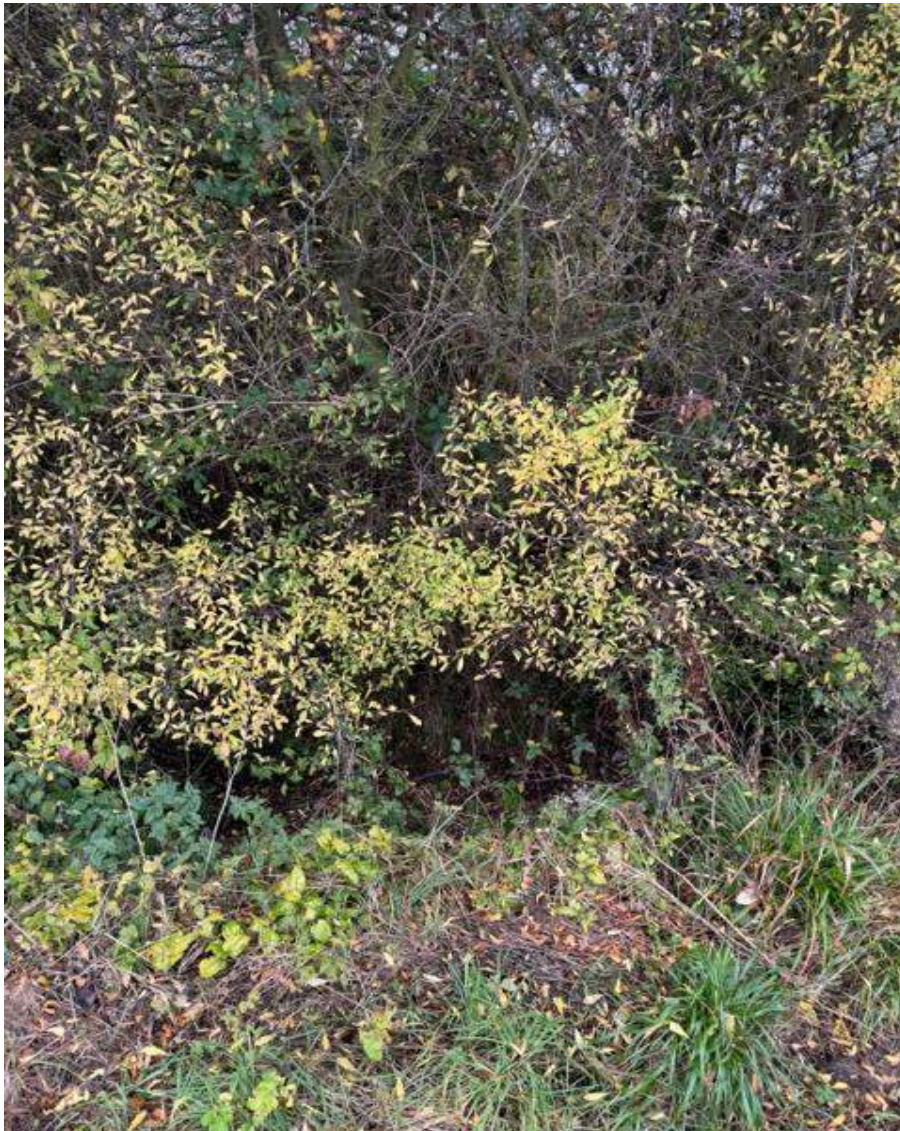


IMAGE 32

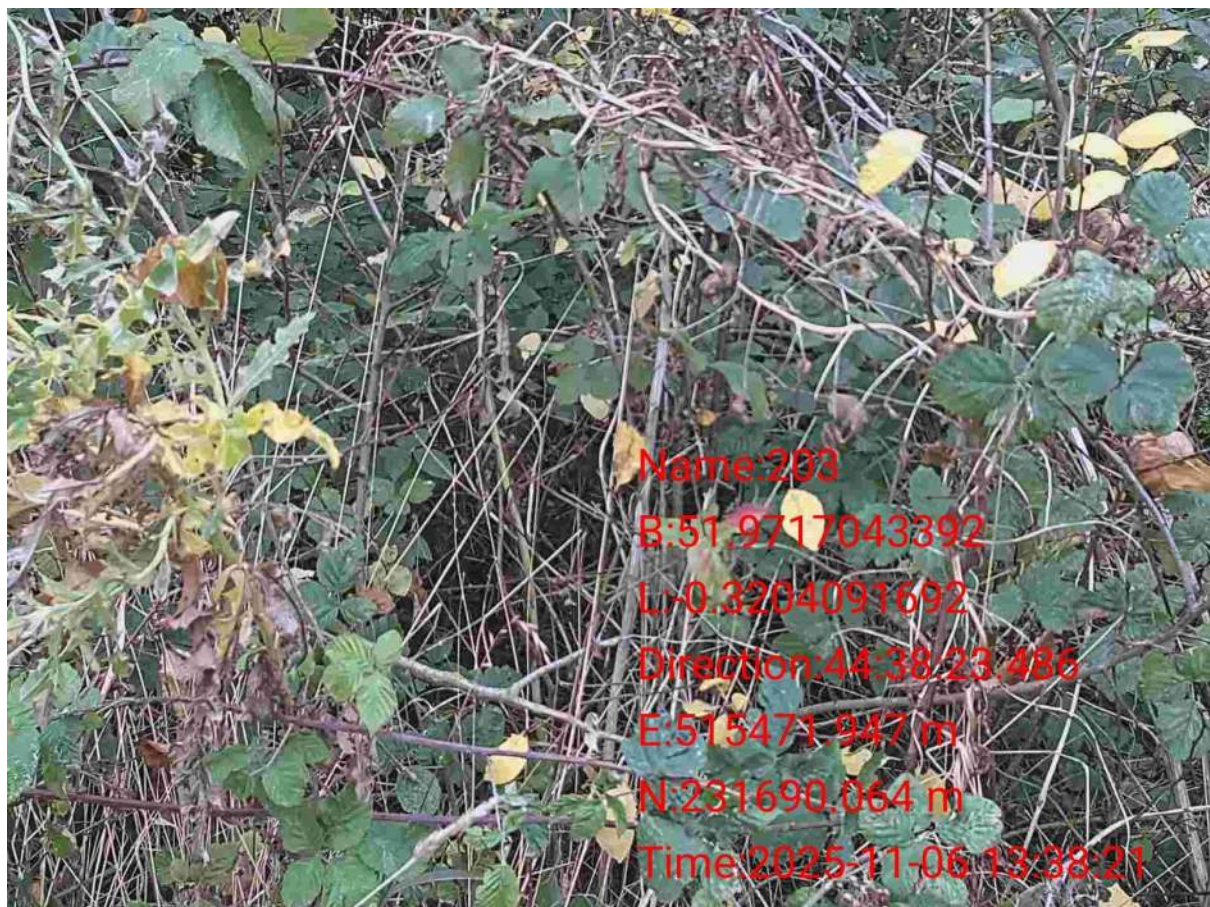


IMAGE 33



IMAGE 34



Image 35

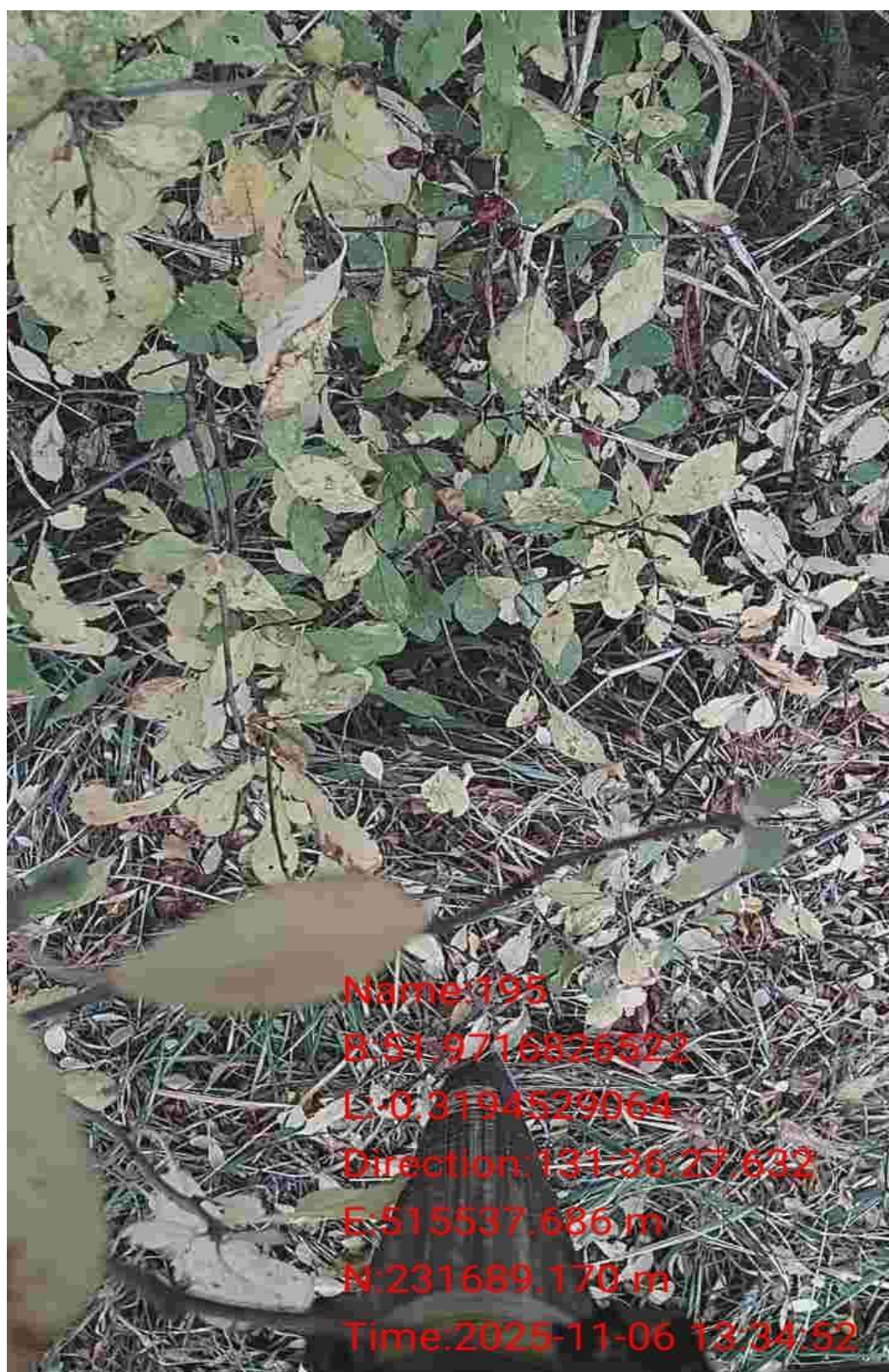


IMAGE 36



IMAGE 37



IMAGE 38



IMAGE 39



IMAGE 40



IMAGE 41



Looking east

IMAGE 42



IMAGE 43



Usable track from path to field

IMAGE 44



IMAGE 45



IMAGE 46



IMAGE 47



IMAGE 48

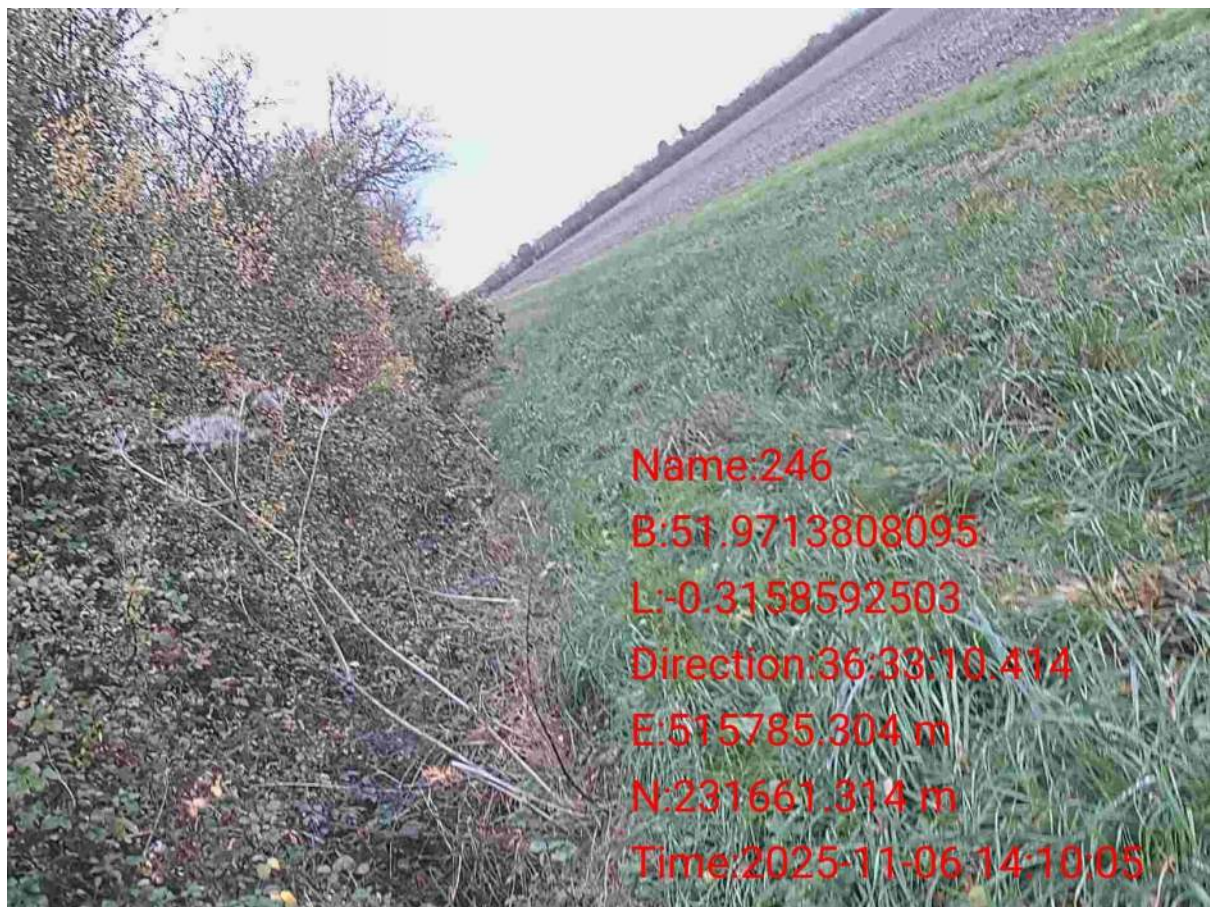


IMAGE 49



IMAGE 50



IMAGE 51



IMAGE 52



IMAGE 53



IMAGE 54



IMAGE 55



IMAGE 56



IMAGE 57



IMAGE 58



IMAGE 59



IMAGE 60



IMAGE 61



IMAGE 62



IMAGE 63



IMAGE 64



IMAGE 65



IMAGE 66



Headwall for buried pipe/culvert

IMAGE 67





IMAGE 69

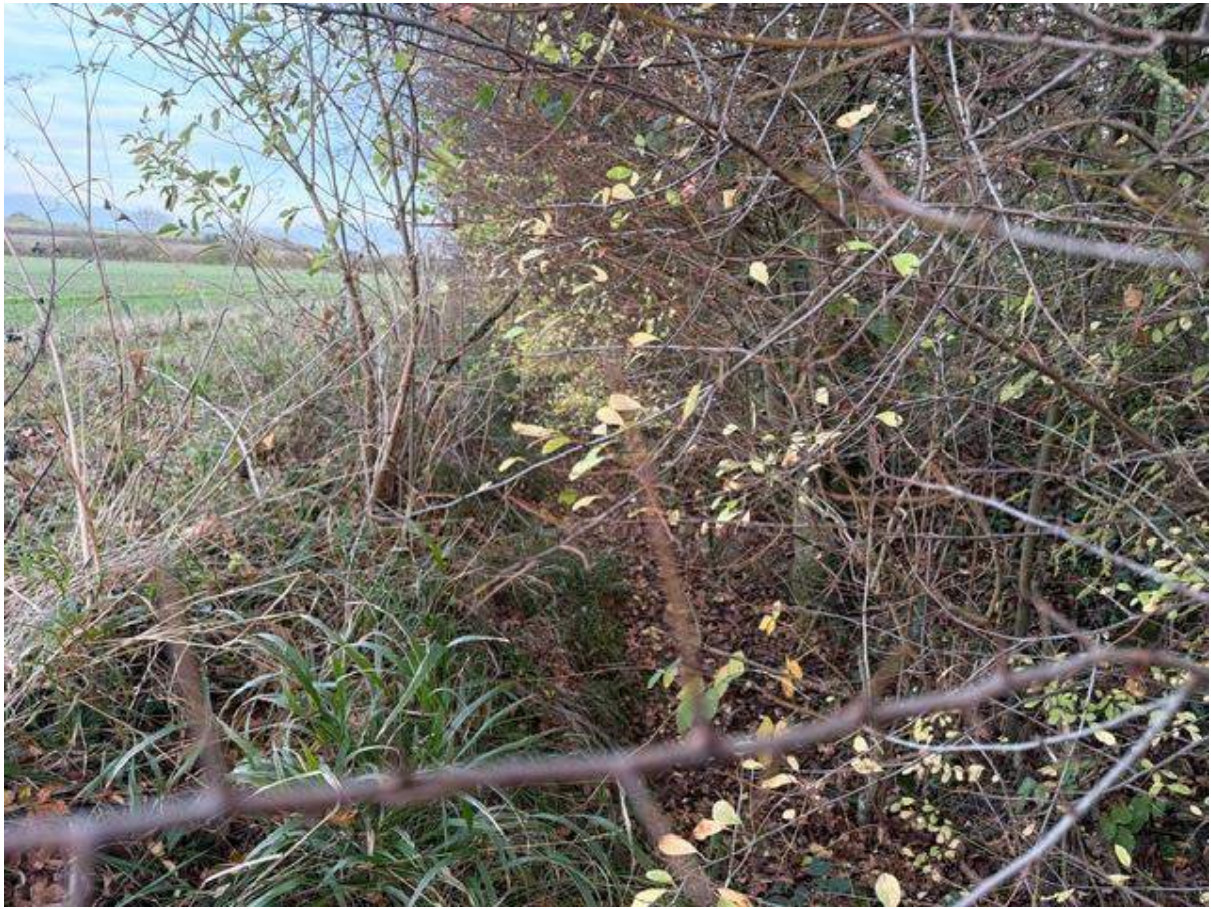


IMAGE 70



IMAGE 71



IMAGE 72



IMAGE 73

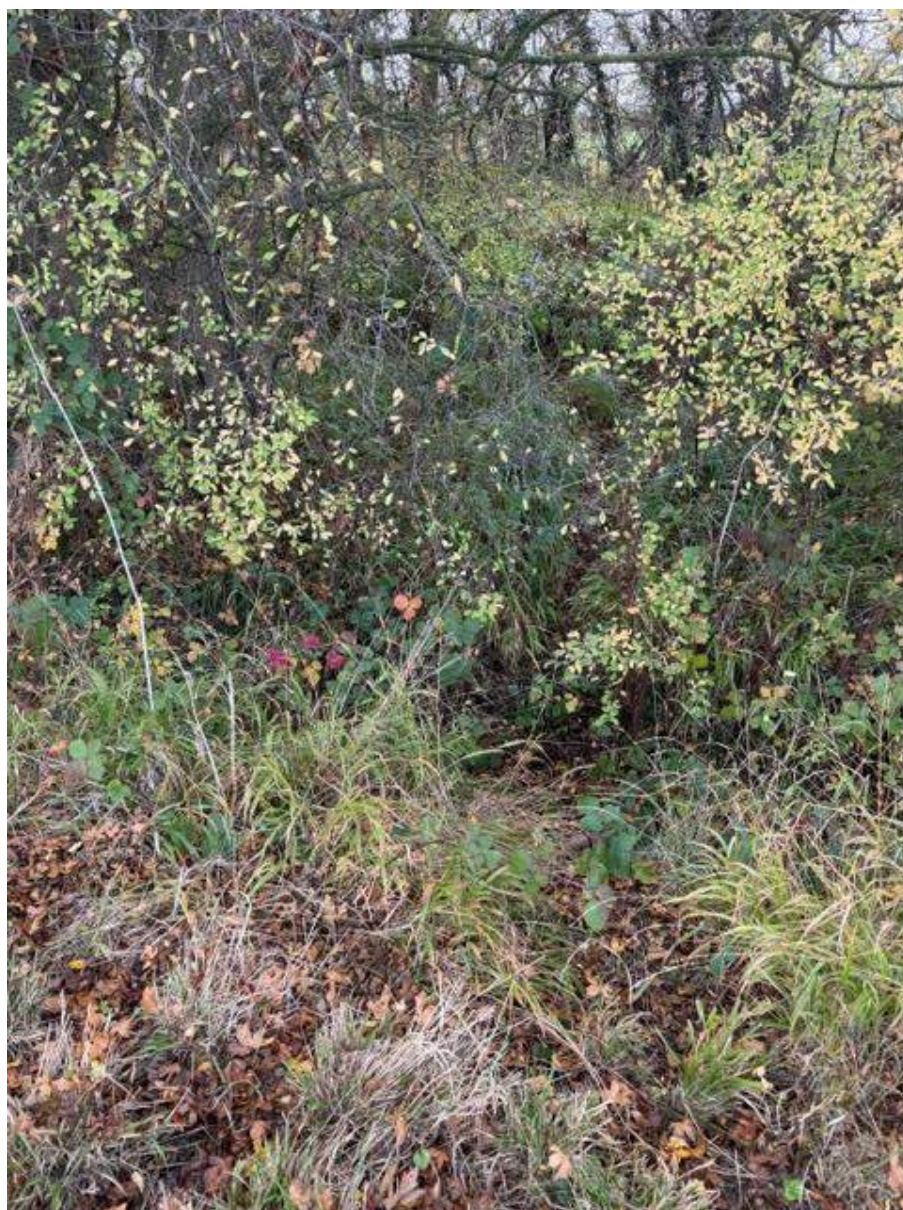


IMAGE 74



IMAGE 75

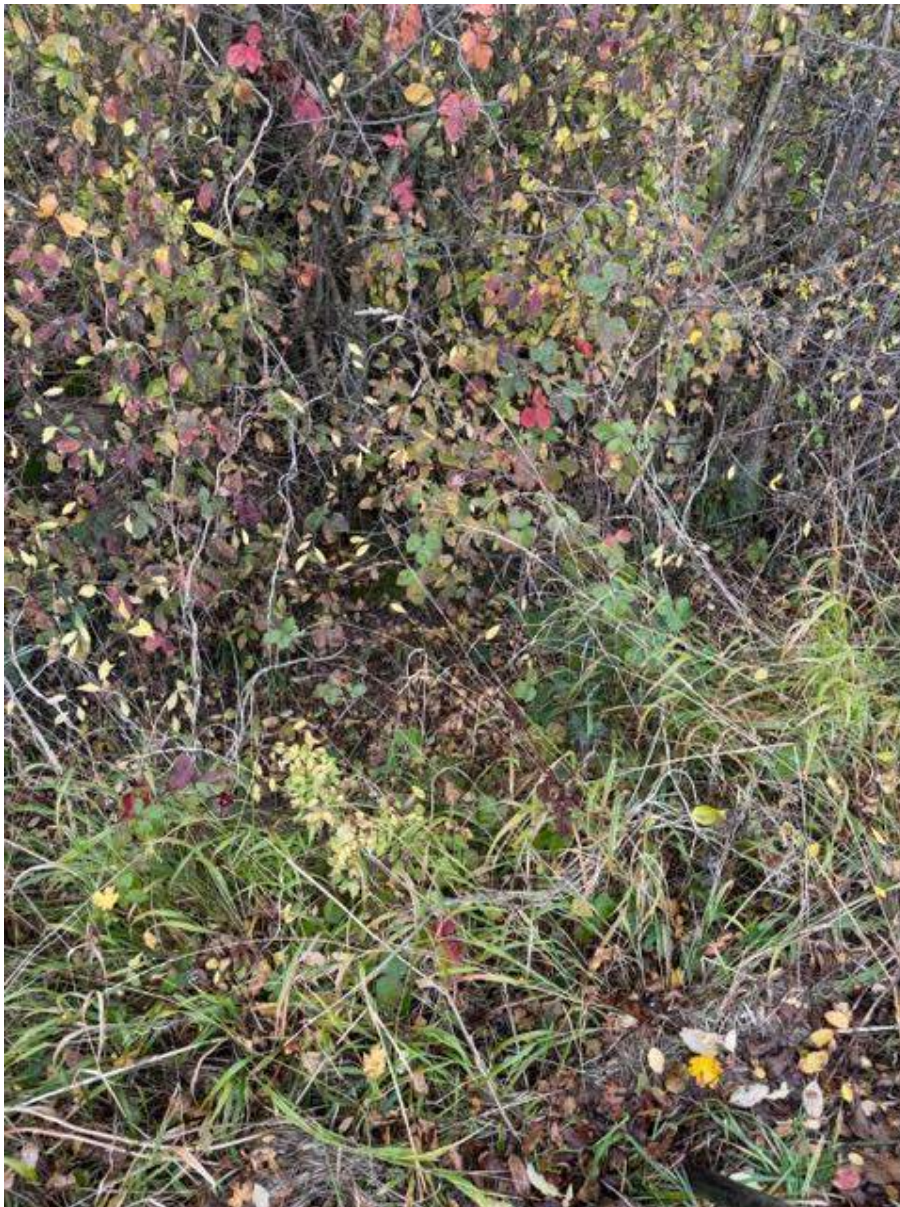


IMAGE 76



IMAGE 77



IMAGE 78



IMAGE 79



IMAGE 80



IMAGE 81



IMAGE 82



IMAGE 83



IMAGE 84



IMAGE 85



END

Project

Project Name: Land Off Drovers Way - Pirton
Project Description: CCTV Survey
Project Status: Complete
Project Date: 12/11/2025
Inspection Standard: MSCC5 Sewers & Drainage GB (SRM5 Scoring)



EYES ON DRAINAGE

CCTV-Trace-Plot-Map-Repair

Table of Contents

Project Name	Project Number	Project Date
Land Off Drovers Way - Pirton		12/11/2025

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Section Summary	P-7
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Section Item 2: HW3 > HW4 (HW3X)	4
Section Item 3: Outfall 6 > Outfall 7 (Outfall 6X)	7
Section Item 4: SW1 > HW5 (SW1X)	9
Section Item 5: A > SW1 (AX)	11
Section Item 6: B > SW1 (BX)	13
Disclaimer	15

Project Information**Project Name**
Land Off Drovers Way - Pirton**Project Number****Project Date**
12/11/2025**Client**

Company: gta Civils & Transport
Department: Maple House
Street: 192-198 London Road
Town or City: Burgess Hill
County: West Sussex
Post Code: RH15 9RD
Phone: 01444 871444

**Site**

Street: Land Off Drovers Way
Town or City: Pirton
County: Hertfordshire

Contractor

Company: Eyes On Drainage Services Ltd
Department: Merrion House
Street: Bines Green
Town or City: Horsham
County: West Sussex
Post Code: RH13 8EH
Phone: 01403 710971
Mobile: 077111 84951
Email: info@eyesondrainage.co.uk



Scoring Summary

Project Name
Land Off Drovers Way - Pirton

Project Number

Project Date
12/11/2025

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
1	HW1X	5	Hole in drain or sewer from 9 o'clock to 3 o'clock
2	HW3X	5	Multiple defects

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	HW1X	4	Settled deposits, fine, 40% cross-sectional area loss, finish
2	HW3X	4	Deformed sewer or drain, 40%
4	SW1X	3	Settled deposits, fine, 10% cross-sectional area loss, finish
5	AX	3	Settled deposits, fine, 5% cross-sectional area loss, finish
6	BX	3	Settled deposits, fine, 10% cross-sectional area loss

Abandoned Surveys

Section	PLR	Description
5	AX	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

Project Pictures

Project Name	Project Number	Project Date
Land Off Drovers Way - Pirton		12/11/2025



HW1



HW1



HW2



HW2



HW2 pipe soffit not visible



HW3

Project Pictures

Project Name	Project Number	Project Date
Land Off Drovers Way - Pirton		12/11/2025



HW3



HW4



HW4



HW4 Outfall deformed



HW5



HW5

Project Pictures

Project Name	Project Number	Project Date
Land Off Drovers Way - Pirton		12/11/2025



SW1



Outfall 6 location



Outfall 6



Outfall 6



Outfall 7 into stream



375mm Outfall from balancing pond

Section Profile

Project Name
Land Off Drovers Way - Pirton

Project Number

Project Date
12/11/2025

Circular, 225 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
1	HW1	HW2	06/11/2025	Hambridge way	Concrete	6.50 m	6.50 m
2	HW3	HW4	06/11/2025	Hambridge way	Concrete	11.80 m	11.80 m

Total: 2 Inspections x Circular 225 mm, 0 mm = 18.30 m Total Length and 18.30 m Inspected Length

Circular, 375 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
4	SW1	HW5	06/11/2025	Hambridge way	Concrete	3.50 m	3.50 m
6	B	SW1	06/11/2025	Hambridge way	Concrete	0.40 m	0.40 m

Total: 2 Inspections x Circular 375 mm, 0 mm = 3.90 m Total Length and 3.90 m Inspected Length

Circular, 600 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
3	Outfall 6	Outfall 7	06/11/2025	Hambridge way	Concrete	7.50 m	7.50 m

Total: 1 Inspection x Circular 600 mm, 0 mm = 7.50 m Total Length and 7.50 m Inspected Length

Total: 5 Inspections = 29.70 m Total Length and 29.70 m Inspected Length

Section Summary

Project Name Land Off Drovers Way - Pirton	Project Number	Project Date 12/11/2025
--	-----------------------	-----------------------------------

Number of sections	6
Total length of sections	129.70 m
Total length of inspected sections	72.00 m
Total length of not inspected sections	57.70 m
Number of abandoned inspections	1
Number of section inspection photos	27
Number of section inspection videos	6
Number of section inspection scans	0
Number of section inclination measurements	0

PLR:	HW1X	Upstream Node:	HW1
Inspection Direction:	Downstream	Downstream Node:	HW2
Inspected Length:	6.50 m	Dia/Height:	225 mm
Total Length:	6.50 m	Material:	Concrete

No.	m+	Code	Observation
1	0.00	OF	Start node, outfall, reference: HW1
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.00	DES	Settled deposits, fine, 40% cross-sectional area loss, start
4	2.00	GP	General photograph taken at this point
5	4.50	H	Hole in drain or sewer from 9 o'clock to 3 o'clock
6	4.50	MCVC	Pipe material changes to vitrified clay at this point
7	6.50	DES	Settled deposits, fine, 40% cross-sectional area loss, finish
8	6.50	OFF	Finish node, outfall, reference: HW2

PLR:	HW3X	Upstream Node:	HW3
Inspection Direction:	Downstream	Downstream Node:	HW4
Inspected Length:	11.80 m	Dia/Height:	225 mm
Total Length:	11.80 m	Material:	Concrete

No.	m+	Code	Observation
1	0.00	OF	Start node, outfall, reference: HW3
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.00	DES	Settled deposits, fine, 5% cross-sectional area loss, start
4	4.00	DER	Settled deposits, coarse, 10% cross-sectional area loss
5	4.50	MCPVC	Pipe material changes to polyvinyl chloride at this point
6	10.20	D	Deformed sewer or drain, 15%
7	11.00	DES	Settled deposits, fine, 5% cross-sectional area loss, finish
8	11.80	D	Deformed sewer or drain, 40%

Section Summary

Project Name Land Off Drovers Way - Pirton	Project Number	Project Date 12/11/2025
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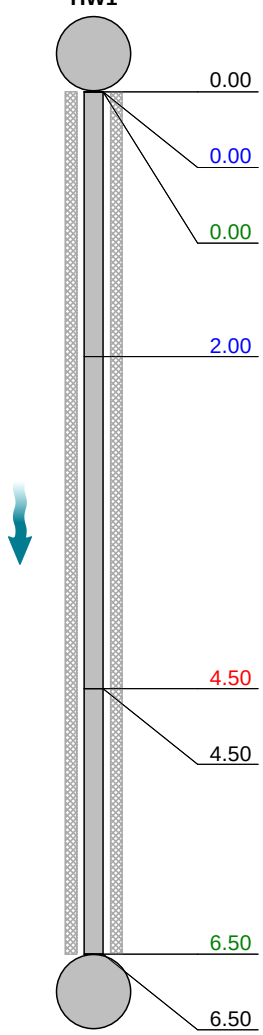
No.	m+	Code	Observation																
9	11.80	OFF	Finish node, outfall, reference: HW4																
<table> <tr> <td>PLR:</td><td>Outfall 6X</td><td>Upstream Node:</td><td>Outfall 6</td></tr> <tr> <td>Inspection Direction:</td><td>Upstream</td><td>Downstream Node:</td><td>Outfall 7</td></tr> <tr> <td>Inspected Length:</td><td>7.50 m</td><td>Dia/Height:</td><td>600 mm</td></tr> <tr> <td>Total Length:</td><td>7.50 m</td><td>Material:</td><td>Concrete</td></tr> </table>				PLR:	Outfall 6X	Upstream Node:	Outfall 6	Inspection Direction:	Upstream	Downstream Node:	Outfall 7	Inspected Length:	7.50 m	Dia/Height:	600 mm	Total Length:	7.50 m	Material:	Concrete
PLR:	Outfall 6X	Upstream Node:	Outfall 6																
Inspection Direction:	Upstream	Downstream Node:	Outfall 7																
Inspected Length:	7.50 m	Dia/Height:	600 mm																
Total Length:	7.50 m	Material:	Concrete																
No.	m+	Code	Observation																
1	0.00	OF	Start node, outfall, reference: Outfall 6																
2	0.00	WL	Water level, 0% of the vertical dimension																
3	6.00	OJM	Open joint, medium																
4	7.50	OFF	Finish node, outfall, reference: Outfall 6																
<table> <tr> <td>PLR:</td><td>SW1X</td><td>Upstream Node:</td><td>SW1</td></tr> <tr> <td>Inspection Direction:</td><td>Upstream</td><td>Downstream Node:</td><td>HW5</td></tr> <tr> <td>Inspected Length:</td><td>3.50 m</td><td>Dia/Height:</td><td>375 mm</td></tr> <tr> <td>Total Length:</td><td>3.50 m</td><td>Material:</td><td>Concrete</td></tr> </table>				PLR:	SW1X	Upstream Node:	SW1	Inspection Direction:	Upstream	Downstream Node:	HW5	Inspected Length:	3.50 m	Dia/Height:	375 mm	Total Length:	3.50 m	Material:	Concrete
PLR:	SW1X	Upstream Node:	SW1																
Inspection Direction:	Upstream	Downstream Node:	HW5																
Inspected Length:	3.50 m	Dia/Height:	375 mm																
Total Length:	3.50 m	Material:	Concrete																
No.	m+	Code	Observation																
1	0.00	MH	Start node, manhole, reference: HW5																
2	0.00	WL	Water level, 0% of the vertical dimension																
3	0.00	DES	Settled deposits, fine, 10% cross-sectional area loss, start																
4	3.20	DES	Settled deposits, fine, 10% cross-sectional area loss, finish																
5	3.50	MHF	Finish node, manhole, reference: SW1																
<table> <tr> <td>PLR:</td><td>AX</td><td>Upstream Node:</td><td>A</td></tr> <tr> <td>Inspection Direction:</td><td>Upstream</td><td>Downstream Node:</td><td>SW1</td></tr> <tr> <td>Inspected Length:</td><td>100.00 m</td><td>Dia/Height:</td><td>375 mm</td></tr> <tr> <td>Total Length:</td><td>100.00 m</td><td>Material:</td><td>Concrete</td></tr> </table>				PLR:	AX	Upstream Node:	A	Inspection Direction:	Upstream	Downstream Node:	SW1	Inspected Length:	100.00 m	Dia/Height:	375 mm	Total Length:	100.00 m	Material:	Concrete
PLR:	AX	Upstream Node:	A																
Inspection Direction:	Upstream	Downstream Node:	SW1																
Inspected Length:	100.00 m	Dia/Height:	375 mm																
Total Length:	100.00 m	Material:	Concrete																
No.	m+	Code	Observation																
1	0.00	MH	Start node, manhole, reference: SW1																
2	0.00	WL	Water level, 0% of the vertical dimension																
3	0.00	DES	Settled deposits, fine, 10% cross-sectional area loss, start																
4	39.00	DES	Settled deposits, fine, 5% cross-sectional area loss, change																
5	42.30	DES	Settled deposits, fine, 5% cross-sectional area loss, finish																
6	42.30	SA	Survey abandoned, Unable to continue, assumed cable drag																
7	100.00	REM	General remark, Assumed to serve balancing pond																
<table> <tr> <td>PLR:</td><td>BX</td><td>Upstream Node:</td><td>B</td></tr> <tr> <td>Inspection Direction:</td><td>Upstream</td><td>Downstream Node:</td><td>SW1</td></tr> <tr> <td>Inspected Length:</td><td>0.40 m</td><td>Dia/Height:</td><td>375 mm</td></tr> <tr> <td>Total Length:</td><td>0.40 m</td><td>Material:</td><td>Concrete</td></tr> </table>				PLR:	BX	Upstream Node:	B	Inspection Direction:	Upstream	Downstream Node:	SW1	Inspected Length:	0.40 m	Dia/Height:	375 mm	Total Length:	0.40 m	Material:	Concrete
PLR:	BX	Upstream Node:	B																
Inspection Direction:	Upstream	Downstream Node:	SW1																
Inspected Length:	0.40 m	Dia/Height:	375 mm																
Total Length:	0.40 m	Material:	Concrete																
No.	m+	Code	Observation																
1	0.00	MH	Start node, manhole, reference: SW1																
2	0.00	WL	Water level, 0% of the vertical dimension																
3	0.00	DES	Settled deposits, fine, 10% cross-sectional area loss																
4	0.40	MHF	Finish node, manhole, reference: B, Capped, assumed for future use																

Section Inspection - 06/11/2025 - HW1X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	06/11/25	9:16	Not Specified	No Rain Or Snow	No	HW1X
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Downstream	Upstream Node:	HW1
Road:	Hambridge Way	Inspected Length:	6.50 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	6.50 m	Downstream Node:	HW2
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	225 mm		
Flow Control:	No flow control	Material:	Concrete		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:57	Position [m]	Code	Observation	MPEG	Photo	Grade																																																								
Depth: m HW1  Depth: m HW2 <table><tr><td>0.00</td><td>OF</td><td>Start node, outfall, reference: HW1</td><td>00:00:00</td><td>1, 2</td><td></td><td></td></tr><tr><td>0.00</td><td>WL</td><td>Water level, 0% of the vertical dimension</td><td>00:00:25</td><td></td><td></td><td></td></tr><tr><td>0.00</td><td>S01</td><td>DES Settled deposits, fine, 40% cross-sectional area loss, start</td><td>00:00:25</td><td>3</td><td></td><td></td></tr><tr><td>2.00</td><td>GP</td><td>General photograph taken at this point</td><td>00:00:39</td><td>4</td><td></td><td></td></tr><tr><td>4.50</td><td>H</td><td>Hole in drain or sewer from 9 o'clock to 3 o'clock</td><td>00:01:19</td><td>5</td><td></td><td>5</td></tr><tr><td>4.50</td><td>MCVC</td><td>Pipe material changes to vitrified clay at this point</td><td>00:01:22</td><td>6, 7</td><td></td><td></td></tr><tr><td>6.50</td><td>F01</td><td>DES Settled deposits, fine, 40% cross-sectional area loss, finish</td><td>00:01:24</td><td></td><td></td><td>4</td></tr><tr><td>6.50</td><td>OFF</td><td>Finish node, outfall, reference: HW2</td><td>00:01:45</td><td>8, 9</td><td></td><td></td></tr></table>								0.00	OF	Start node, outfall, reference: HW1	00:00:00	1, 2			0.00	WL	Water level, 0% of the vertical dimension	00:00:25				0.00	S01	DES Settled deposits, fine, 40% cross-sectional area loss, start	00:00:25	3			2.00	GP	General photograph taken at this point	00:00:39	4			4.50	H	Hole in drain or sewer from 9 o'clock to 3 o'clock	00:01:19	5		5	4.50	MCVC	Pipe material changes to vitrified clay at this point	00:01:22	6, 7			6.50	F01	DES Settled deposits, fine, 40% cross-sectional area loss, finish	00:01:24			4	6.50	OFF	Finish node, outfall, reference: HW2	00:01:45	8, 9		
0.00	OF	Start node, outfall, reference: HW1	00:00:00	1, 2																																																											
0.00	WL	Water level, 0% of the vertical dimension	00:00:25																																																												
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4.50	MCVC	Pipe material changes to vitrified clay at this point	00:01:22	6, 7																																																											
6.50	F01	DES Settled deposits, fine, 40% cross-sectional area loss, finish	00:01:24			4																																																									
6.50	OFF	Finish node, outfall, reference: HW2	00:01:45	8, 9																																																											

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	165.0	25.4	165.0	5.0	1	5.0	5.4	35.0	5.0

Section Pictures - 06/11/2025 - HW1X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	HW1X		



1, 00:00:00, 0.00 m
Start node, outfall, reference: HW1



2, 00:00:00, 0.00 m
Start node, outfall, reference: HW1



3, 00:00:25, 0.00 m
Settled deposits, fine, 40% cross-sectional area loss, start



4, 00:00:39, 2.00 m
General photograph taken at this point



5, 00:01:19, 4.50 m
Hole in drain or sewer from 9 o'clock to 3 o'clock



6, 00:01:22, 4.50 m
Pipe material changes to vitrified clay at this point

Section Pictures - 06/11/2025 - HW1X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	HW1X		



7, 00:01:22, 4.50 m
Pipe material changes to vitrified clay at this point



8, 00:01:45, 6.50 m
Finish node, outfall, reference: HW2



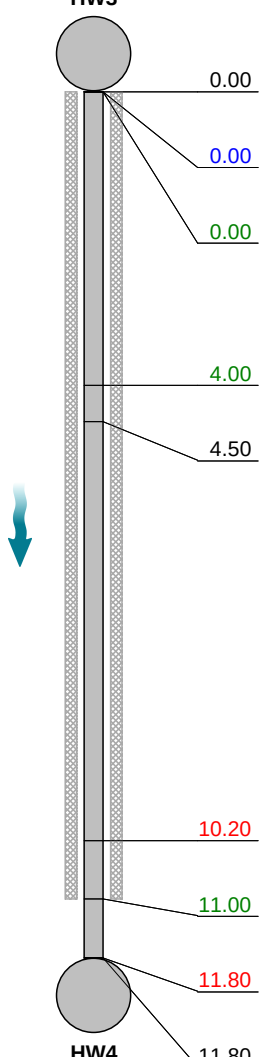
9, 00:01:45, 6.50 m
Finish node, outfall, reference: HW2

Section Inspection - 06/11/2025 - HW3X

Item No. 2	Insp. No. 1	Date 06/11/25	Time 10:16	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR HW3X
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Downstream	Upstream Node:	HW3
Road:	Hambridge Way	Inspected Length:	11.80 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	11.80 m	Downstream Node:	HW4
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse			Pipe Shape:	Circular
Type of Pipe:	Gravity drain/sewer			Dia/Height:	225 mm
Flow Control:	No flow control			Material:	Concrete
Year Constructed:	Not Specified			Lining Type:	No Lining
Inspection Purpose:	Routine inspection			Lining Material:	No Lining

Comments:
Recommendations:

Scale: 1:103	Position [m]	Code	Observation	MPEG	Photo	Grade																																													
Depth: m HW3  0.00 0.00 0.00 4.00 4.50 10.20 11.00 11.80 HW4 Depth: m <table><tr><td>OF</td><td>Start node, outfall, reference: HW3</td><td>00:00:00</td><td></td><td></td></tr><tr><td>WL</td><td>Water level, 0% of the vertical dimension</td><td>00:00:08</td><td>1</td><td></td></tr><tr><td>S01 DES</td><td>Settled deposits, fine, 5% cross-sectional area loss, start</td><td>00:00:13</td><td></td><td></td></tr><tr><td>DER</td><td>Settled deposits, coarse, 10% cross-sectional area loss</td><td>00:00:35</td><td>2</td><td>3</td></tr><tr><td>MCPVC</td><td>Pipe material changes to polyvinyl chloride at this point</td><td>00:00:47</td><td>3</td><td></td></tr><tr><td>D</td><td>Deformed sewer or drain, 15%</td><td>00:02:08</td><td>4</td><td>5 / 3</td></tr><tr><td>F01 DES</td><td>Settled deposits, fine, 5% cross-sectional area loss, finish</td><td>00:02:04</td><td></td><td>3</td></tr><tr><td>D</td><td>Deformed sewer or drain, 40%</td><td>00:01:39</td><td>5, 6</td><td>5 / 4</td></tr><tr><td>OFF</td><td>Finish node, outfall, reference: HW4</td><td>00:01:40</td><td>7</td><td></td></tr></table>							OF	Start node, outfall, reference: HW3	00:00:00			WL	Water level, 0% of the vertical dimension	00:00:08	1		S01 DES	Settled deposits, fine, 5% cross-sectional area loss, start	00:00:13			DER	Settled deposits, coarse, 10% cross-sectional area loss	00:00:35	2	3	MCPVC	Pipe material changes to polyvinyl chloride at this point	00:00:47	3		D	Deformed sewer or drain, 15%	00:02:08	4	5 / 3	F01 DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:02:04		3	D	Deformed sewer or drain, 40%	00:01:39	5, 6	5 / 4	OFF	Finish node, outfall, reference: HW4	00:01:40	7	
OF	Start node, outfall, reference: HW3	00:00:00																																																	
WL	Water level, 0% of the vertical dimension	00:00:08	1																																																
S01 DES	Settled deposits, fine, 5% cross-sectional area loss, start	00:00:13																																																	
DER	Settled deposits, coarse, 10% cross-sectional area loss	00:00:35	2	3																																															
MCPVC	Pipe material changes to polyvinyl chloride at this point	00:00:47	3																																																
D	Deformed sewer or drain, 15%	00:02:08	4	5 / 3																																															
F01 DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:02:04		3																																															
D	Deformed sewer or drain, 40%	00:01:39	5, 6	5 / 4																																															
OFF	Finish node, outfall, reference: HW4	00:01:40	7																																																

Construction Features
Structural Defects
Miscellaneous Features
Service & Operational Observations

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	165.0	28.0	330.0	5.0	4	5.0	2.6	31.0	4.0

Section Pictures - 06/11/2025 - HW3X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	HW3X		



1, 00:00:08, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:35, 4.00 m
Settled deposits, coarse, 10% cross-sectional area loss



3, 00:00:47, 4.50 m
Pipe material changes to polyvinyl chloride at this point



4, 00:02:08, 10.20 m
Deformed sewer or drain, 15%



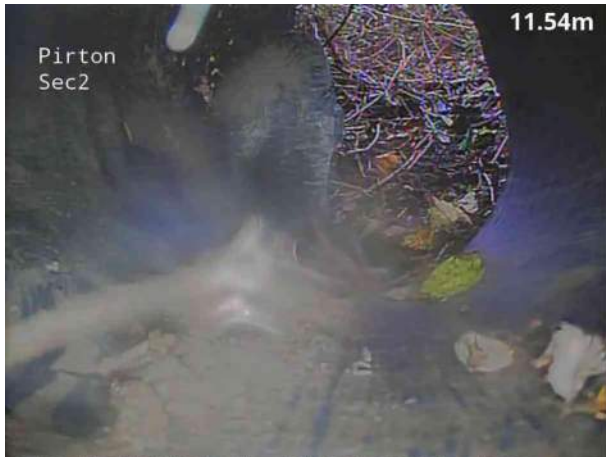
5, 00:01:39, 11.80 m
Deformed sewer or drain, 40%



6, 00:01:39, 11.80 m
Deformed sewer or drain, 40%

Section Pictures - 06/11/2025 - HW3X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	HW3X		



7, 00:01:40, 11.80 m
Finish node, outfall, reference: HW4

Section Inspection - 06/11/2025 - Outfall 6X

Item No. 3	Insp. No. 1	Date 06/11/25	Time 10:57	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR OUTFALL 6X
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Upstream	Upstream Node:	OUTFALL 6
Road:	Hambridge Way	Inspected Length:	7.50 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	7.50 m	Downstream Node:	OUTFALL 7
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Flow Control:	No flow control	Material:	Concrete		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:65	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m Outfall 7							
		0.00	OF	Start node, outfall, reference: Outfall 6	00:00:00		
		0.00	WL	Water level, 0% of the vertical dimension	00:00:07	1	
		6.00	OJM	Open joint, medium		2	1
		7.50	OFF	Finish node, outfall, reference: Outfall 6		3	
Outfall 6 Depth: m							

Construction Features
Structural Defects
Miscellaneous Features
Service & Operational Observations

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	1.0	0.1	1.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 06/11/2025 - Outfall 6X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	OUTFALL 6X		



1, 00:00:07, 0.00 m
Water level, 0% of the vertical dimension



2, 6.00 m
Open joint, medium



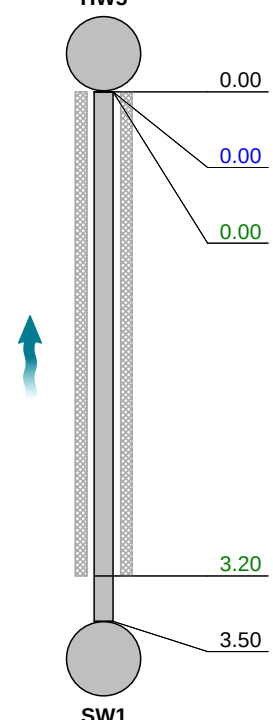
3, 7.50 m
Finish node, outfall, reference: Outfall 6

Section Inspection - 06/11/2025 - SW1X

Item No. 4	Insp. No. 1	Date 06/11/25	Time 10:57	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW1X
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Upstream	Upstream Node:	SW1
Road:	Hambridge Way	Inspected Length:	3.50 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	3.50 m	Downstream Node:	HW5
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse			Pipe Shape:	Circular
Type of Pipe:	Gravity drain/sewer			Dia/Height:	375 mm
Flow Control:	No flow control			Material:	Concrete
Year Constructed:	Not Specified			Lining Type:	No Lining
Inspection Purpose:	Routine inspection			Lining Material:	No Lining

Comments:
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	MPEG	Photo	Grade																																				
Depth: m HW5  <table><tr><th>Position [m]</th><th>Code</th><th>Observation</th><th>MPEG</th><th>Photo</th><th>Grade</th></tr><tr><td>0.00</td><td>MH</td><td>Start node, manhole, reference: HW5</td><td>00:00:00</td><td></td><td></td></tr><tr><td>0.00</td><td>WL</td><td>Water level, 0% of the vertical dimension</td><td>00:00:01</td><td>1</td><td></td></tr><tr><td>0.00</td><td>S01</td><td>DES Settled deposits, fine, 10% cross-sectional area loss, start</td><td>00:00:02</td><td></td><td></td></tr><tr><td>3.20</td><td>F01</td><td>DES Settled deposits, fine, 10% cross-sectional area loss, finish</td><td>00:00:25</td><td>2</td><td>3</td></tr><tr><td>3.50</td><td>MHF</td><td>Finish node, manhole, reference: SW1</td><td>00:00:33</td><td>3</td><td></td></tr></table>								Position [m]	Code	Observation	MPEG	Photo	Grade	0.00	MH	Start node, manhole, reference: HW5	00:00:00			0.00	WL	Water level, 0% of the vertical dimension	00:00:01	1		0.00	S01	DES Settled deposits, fine, 10% cross-sectional area loss, start	00:00:02			3.20	F01	DES Settled deposits, fine, 10% cross-sectional area loss, finish	00:00:25	2	3	3.50	MHF	Finish node, manhole, reference: SW1	00:00:33	3	
Position [m]	Code	Observation	MPEG	Photo	Grade																																						
0.00	MH	Start node, manhole, reference: HW5	00:00:00																																								
0.00	WL	Water level, 0% of the vertical dimension	00:00:01	1																																							
0.00	S01	DES Settled deposits, fine, 10% cross-sectional area loss, start	00:00:02																																								
3.20	F01	DES Settled deposits, fine, 10% cross-sectional area loss, finish	00:00:25	2	3																																						
3.50	MHF	Finish node, manhole, reference: SW1	00:00:33	3																																							

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	2.3	8.0	3.0

Section Pictures - 06/11/2025 - SW1X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
4	Upstream	SW1X		



1, 00:00:01, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:25, 3.20 m
Settled deposits, fine, 10% cross-sectional area loss, finish



3, 00:00:33, 3.50 m
Finish node, manhole, reference: SW1

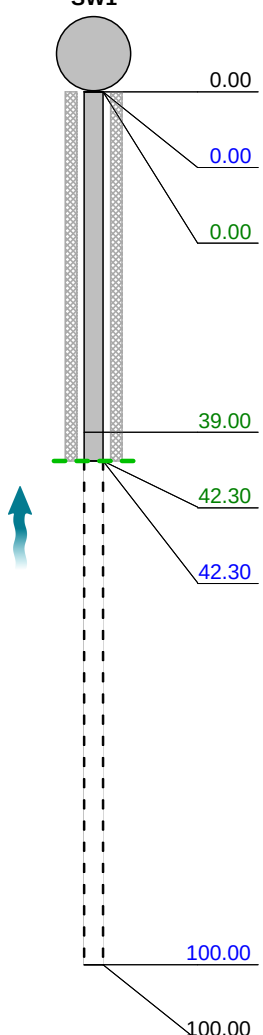
Section Inspection - 06/11/2025 - AX

Item No. 5	Insp. No. 1	Date 06/11/25	Time 11:27	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR AX
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Upstream	Upstream Node:	A
Road:	Hambridge Way	Inspected Length:	100.00 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	100.00 m	Downstream Node:	SW1
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse			Pipe Shape:	Circular
Type of Pipe:	Gravity drain/sewer			Dia/Height:	375 mm
Flow Control:	No flow control			Material:	Concrete
Year Constructed:	Not Specified			Lining Type:	No Lining
Inspection Purpose:	Routine inspection			Lining Material:	No Lining

Comments:

Recommendations:

Scale:	1:866	Position [m]	Code	Observation	MPEG	Photo	Grade																																																								
Depth: m SW1  <table><tr><td>0.00</td><td>MH</td><td></td><td>Start node, manhole, reference: SW1</td><td>00:00:00</td><td></td><td></td></tr><tr><td>0.00</td><td>WL</td><td></td><td>Water level, 0% of the vertical dimension</td><td>00:00:01</td><td>1</td><td></td></tr><tr><td>0.00</td><td>S01</td><td>DES</td><td>Settled deposits, fine, 10% cross-sectional area loss, start</td><td>00:00:01</td><td></td><td></td></tr><tr><td>39.00</td><td>C01</td><td>DES</td><td>Settled deposits, fine, 5% cross-sectional area loss, change</td><td>00:03:15</td><td>2</td><td></td></tr><tr><td>42.30</td><td>F01</td><td>DES</td><td>Settled deposits, fine, 5% cross-sectional area loss, finish</td><td>00:04:38</td><td></td><td>3</td></tr><tr><td>42.30</td><td>SA</td><td></td><td>Survey abandoned: Unable to continue, assumed cable drag</td><td>00:04:38</td><td>3</td><td></td></tr><tr><td>100.00</td><td>REM</td><td></td><td>General remark: Assumed to serve balancing pond</td><td>00:04:38</td><td></td><td></td></tr><tr><td>100.00</td><td></td><td></td><td>End of pipe</td><td></td><td></td><td></td></tr></table>								0.00	MH		Start node, manhole, reference: SW1	00:00:00			0.00	WL		Water level, 0% of the vertical dimension	00:00:01	1		0.00	S01	DES	Settled deposits, fine, 10% cross-sectional area loss, start	00:00:01			39.00	C01	DES	Settled deposits, fine, 5% cross-sectional area loss, change	00:03:15	2		42.30	F01	DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:04:38		3	42.30	SA		Survey abandoned: Unable to continue, assumed cable drag	00:04:38	3		100.00	REM		General remark: Assumed to serve balancing pond	00:04:38			100.00			End of pipe			
0.00	MH		Start node, manhole, reference: SW1	00:00:00																																																											
0.00	WL		Water level, 0% of the vertical dimension	00:00:01	1																																																										
0.00	S01	DES	Settled deposits, fine, 10% cross-sectional area loss, start	00:00:01																																																											
39.00	C01	DES	Settled deposits, fine, 5% cross-sectional area loss, change	00:03:15	2																																																										
42.30	F01	DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:04:38		3																																																									
42.30	SA		Survey abandoned: Unable to continue, assumed cable drag	00:04:38	3																																																										
100.00	REM		General remark: Assumed to serve balancing pond	00:04:38																																																											
100.00			End of pipe																																																												

Construction Features

Structural Defects

Miscellaneous Features

Service & Operational Observations

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	0.9	86.0	3.0

Section Pictures - 06/11/2025 - AX

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	AX		



1, 00:00:01, 0.00 m
Water level, 0% of the vertical dimension



2, 00:03:15, 39.00 m
Settled deposits, fine, 5% cross-sectional area loss, change



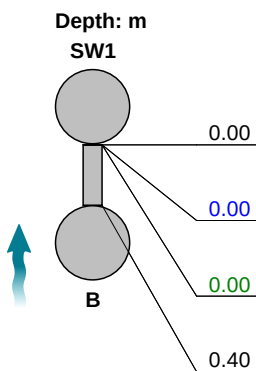
3, 00:04:38, 42.30 m
Survey abandoned, Unable to continue, assumed cable drag

Section Inspection - 06/11/2025 - BX

Item No. 6	Insp. No. 1	Date 06/11/25	Time 11:29	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR BX
Operator JY		Vehicle FV73 RZB		Camera P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Pirton	Inspection Direction:	Upstream	Upstream Node:	B
Road:	Hambridge Way	Inspected Length:	0.40 m	Upstream Pipe Depth:	
Location:	Verge	Total Length:	0.40 m	Downstream Node:	SW1
Surface Type:	Grass	Joint Length:		Downstream Pipe Depth:	
Use:	Culverted watercourse			Pipe Shape:	Circular
Type of Pipe:	Gravity drain/sewer			Dia/Height:	375 mm
Flow Control:	No flow control			Material:	Concrete
Year Constructed:	Not Specified			Lining Type:	No Lining
Inspection Purpose:	Routine inspection			Lining Material:	No Lining

Comments:
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
							
		0.00	MH	Start node, manhole, reference: SW1	00:00:00		
		0.00	WL	Water level, 0% of the vertical dimension	00:00:00		
		0.00	DES	Settled deposits, fine, 10% cross-sectional area loss	00:00:00	1	3
		0.40	MHF	Finish node, manhole, reference: B: Capped, assumed for future use	00:00:16	2	

Construction Features
Structural Defects
Miscellaneous Features
Service & Operational Observations

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	5.0	2.0	5.0

Section Pictures - 06/11/2025 - BX

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Upstream	BX		



1, 00:00:00, 0.00 m
Settled deposits, fine, 10% cross-sectional area loss



2, 00:00:16, 0.40 m
Finish node, manhole, reference: B, Capped, assumed for future use

Disclaimer

Although every effort has been made to produce a thorough and precise report, Eyes On Drainage Services Ltd cannot be held liable for any discrepancies or omissions.
Furthermore Eyes On Drainage Services Ltd cannot be held responsible for any actions taken based on the information supplied within this report.



Civil Engineering - Transport Planning - Flood Risk

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