MERIDIAN

CIVIL ENGINEERING CONSULTANCY

HEDGES FARM,

WORMINGHALL ROAD, OAKLEY

HP18 9QY

SURFACE WATER DRAINAGE STRATEGY

NOVEMBER 2023

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Ref: MC0363 KSA Hedges Farm SWDS

CONTENTS

APPENDICES

Client : Sevenoaks Environmental

Rev	Date	Prepared by	Checked by	Approved by
-	07/11/23	BB	MN	MN

1.0 INTRODUCTION

1.1 Meridian Civil Engineering Consultancy LTD (MCEC) has been instructed by Kyle Seeley Associates to prepare a site-specific Surface Water Drainage Strategy for the development at Hedges Farm, Worminghall Road, Oakley HP18 9QY.

1.2 It is understood the proposed development is for the demolition of the existing barn and the construction of 7 new residential plots with an associated access road.

1.3 The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Flood zone 1 is described as land having a less than 1 in 1,000 annual probability of river or sea flooding.

1.4 The EA Long Term Flood risk map extract below shows the site to be in a 'very low risk' for the most parts which means it is modelled that the site The EA Long Term Flood risk map extract (figure 4) below shows the site to be in a 'very low risk' which means it is modelled that the site would be largely unaffected by the modelled pluvial events up to and including 1 in 1000 year event. Surface water runoff originating from the site is to be controlled in line with recent regulations and as described in this report.

1.5 Based on the desktop study in this report, it is deemed that infiltration is unlikely to be suitable for managing surface water runoff due to the mostly clayey nature of the soil and the potential high groundwater table. It is recommended that BRE 365 infiltration testing and groundwater monitoring is conducted on site prior to finalising the drainage design on site.

1.6 A review of Google Street View shows the existence of a ditch crossing the entrance to the site (referred as the "ditch near the entrance" further in this report). The ditch near the entrance is also visible within the topographic survey (Appendix I). It is proposed to connect the surface water runoff of the site to the ditch near the entrance. The connectivity of the ditch near the entrance and more detailed levels will be required at detailed design to confirm a suitable design of offsite surface water connection. It may be required to introduce a pump depending on more detailed investigation of the ditch and level strategy for the site. The new connection into the ditch is to be agreed with the Lead Local Flood Authority prior to construction.

1.7 The greenfield runoff rate for an area equivalent to the proposed 1730m^2 of roof and hardstanding areas is very low and as such, it is not practical to limit the peak discharge rate to a greenfield equivalent rate. As such, a practical limit of 2 l/s has been selected for the peak discharge rate from the site, which provides significant betterment over the existing runoff rates.

1.8 The proposals are to drain the roof runoff and the hardstanding areas around the houses (including the access road) into the sub-base of the permeable pavement access road. A detention basin in the southwest corner of the site is proposed to boost the storage of the permeable sub-base.

1.9 Hydraulic calculations using the FEH rainfall model, show that a total attenuation storage of 150m^3 would be required to limit the peak runoff rate for the 100-year storm event + 40% climate change to a rate of 2 l/s.

1.10 Treatment to the surface water runoff is to be provided via the proposed permeable pavement.

1.11 An asset location map provided by Thames Water shows the presence of a 225mm foul sewer in Worminghall Road. The foul strategy is to utilise a gravity connection into the 225mm public sewer.

1.12 It is deemed that the strategy described in this report demonstrates that the proposed development can be accommodated in a sustainable manner (in relation to drainage) without increasing the flood risk on or offsite.

2.0 POLICY COMPLIANCE

2.1 The purpose of this assessment is to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the:

- National Planning Policy Framework
- CIRIA report C753 The SuDS Manual
- Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems
- Buckinghamshire County Council Developer Advice for Surface Water Drainage Strategies

3.0 SITE LOCATION AND DESCRIPTION OF PROPOSALS

3.1 The proposed development location is at Hedges Farm, Worminghall Road, Oakley HP18 9QY. The approximate site location is outlined in red within Figure 1 below. The site currently consists of a barn and greenfield land. The site is on the western side of Worminghall Road, Hedges Farm is to the south of the site and there are residential houses to the north of the site.

Figure 1: Site location with approximate redline boundary

3.2 It is understood the proposed development is for the demolition of the existing barn and the construction of 7 new residential plots with an associated access road. Architect's plans are included in Appendix I.

3.3 The existing barn has a footprint of approximately 170m^2. The combined plan area of the buildings' footprint, access road and driveways would be approximately 1730m^2.

4.0 EXISTING DRAINAGE ARRANGEMENTS

4.1 An asset location map provided by Thames Water shows the presence of a 225mm foul sewer in Worminghall Road. The asset location report by Southern Water is provided in Appendix II.

4.2 The existence of any surface water drainage on site is unknown. However, review of Google Street View shows the existence of a ditch crossing the entrance to the site (referred as the "ditch near the entrance" further in this report). The ditch near the entrance is also visible within the topographic survey (Appendix I). It is proposed to connect the surface water runoff of the site to the ditch near the entrance. The connectivity of the ditch near the entrance and more detailed levels will be required at detailed design to confirm a suitable design of offsite surface water connection.

Figure 2: Extract from CCTV survey plan

5.0 GEOLOGY, INFILTRATION POTENTIAL AND GROUNDWATER

5.1 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site comprises limestone and mudstone. The British Geological Survey (BGS) Geology of Britain Viewer indicates that there are no superficial deposits recorded at the site.

5.2 A nearby borehole (BGS reference: SP61SW153), located approximately 100m to the east of the site, indicates the soil likely comprises slightly silty clay with some fine medium gravel. Additionally, water was struck at 0.9m below ground level – it is not clear if this is the general groundwater table in the area or perched water. See Appendix III containing the borehole log.

5.3 Based on the desktop study in this report, it is deemed that infiltration is unlikely to be suitable for managing surface water runoff. It is recommended that BRE 365 infiltration testing and groundwater monitoring is conducted on site prior to finalising the drainage design on site.

6.0 FLOOD RISK OVERVIEW

6.1 Tidal and Fluvial

6.1.1 The Environment Agency (EA) mapping for Flood Risk (Figure 3), shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Flood zone one is described as land having a less than 1 in 1,000 annual probability of river or sea flooding.

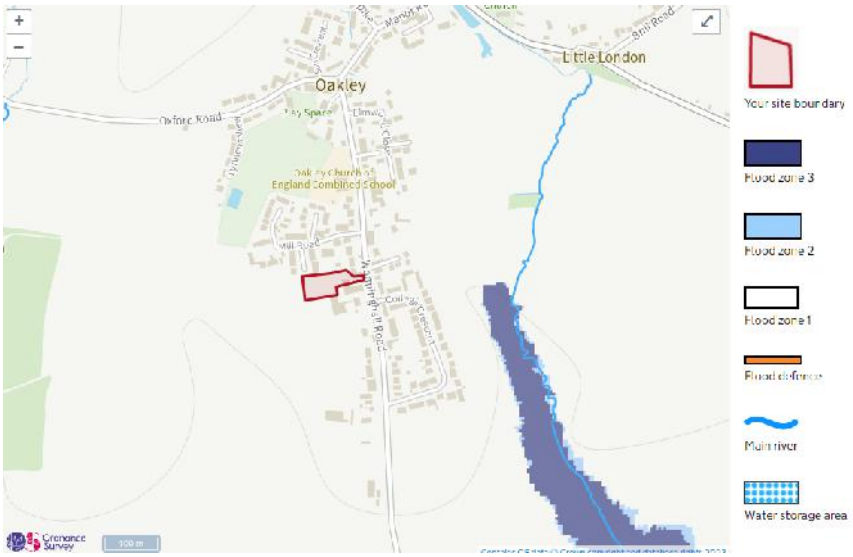

Figure 2:EA Flood Zone 2 and 3 extents

6.2 EA Long Term Flood Risk Maps.

6.2.1 The EA Long Term Flood risk map extract (figure 4) below shows the site to be in a 'very low risk' which means it is modelled that the site would be largely unaffected by the modelled pluvial events up to and including 1 in 1000 year event. Surface water runoff originating from the site is to be controlled in line with recent regulations and as described in this report.

6.2.2 Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

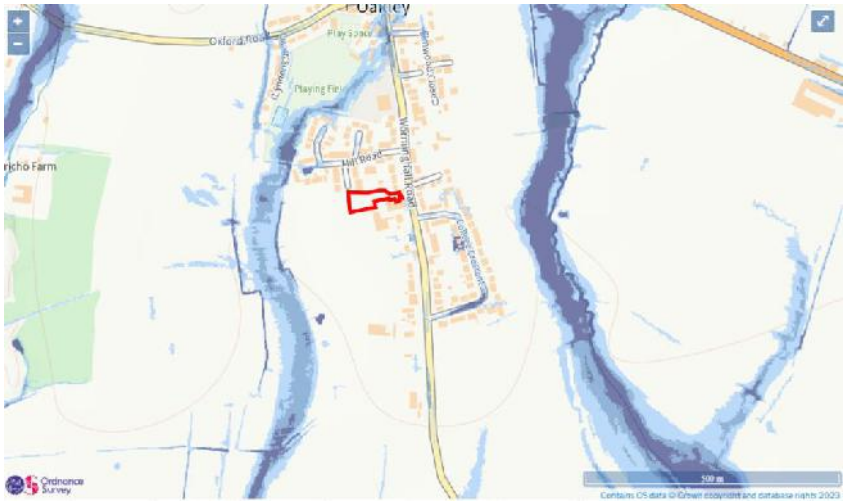

Figure 3: Long term Risk of Flooding from Surface Water map extract

7.0 CLIMATE CHANGE ALLOWANCES

7.1 Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere.

7.2 Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances.

7.3 The data published on the DEFRA database shows the site located within the Thames and South Chilterns Management Catchment and for residential development (lifespan 100yrs) an upper end allowance of 40% should be applied to rainfall events as the climate change allowance within this region.

8.0 SUSTAINABLE URBAN DRAINAGE (SUDS) ASSESSMENT

8.1 In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

8.2 The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
⇩	1.	Store rainwater for later use	✓	Rainwater harvesting is being considered by the developer and could be used around the wider site where feasible.
	2.	Use infiltration techniques, such as porous surfaces in non-clay areas	x	The ground likely comprises clay and groundwater is likely to be close to the surface.
	3.	Attenuate rainwater in ponds or open water features for gradual release	✓	A detention basin is proposed to boost the storage of the permeable pavement sub-base.
	4.	Attenuate rainwater by storing in tanks or sealed water features for gradual release	✓	Below-ground attenuation proposed in the form of permeable pavement sub-base.
	5.	Discharge rainwater direct to a watercourse	✓	A ditch along Worminhall Road is proposed to be used for offsite connection
	6.	Discharge rainwater to a surface water sewer/drain	x	Surface and combines sewers not available in proximity.
	7.	Discharge rainwater to Combined Sewer	x	

Table 2: SuDS Drainage Hierarchy

8.3 The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 3, below.

SUITABILITY OF SUDS COMPONENTS		
SuDS Component	Comment	Suitability
Infiltrating SuDS	Based on BGS records, the ground likely comprises clay and groundwater is likely to be close to the surface. However, it is recommended that infiltration testing and groundwater monitoring is undertaken to confirm the surface water drainage strategy.	x
Permeable Pavement	The majority of the new hardstanding areas are proposed to be of permeable construction.	✓
Green / Blue Roofs	Green and/or blue roofs have not been deemed practical for the proposed residential roofs due to the largely pitch nature of the roofs.	x
Rainwater Harvesting	Rainwater harvesting could be implemented on site. It is recommended that a rainwater harvesting tank is considered in order to reduce the reduce the clean water usage of the site by providing water for toilet flushes and washing machines. Alternatively water butts should be placed on site for re-use in amenity areas	✓
Swales	Not deemed necessary with the proposed strategy	x
Rills and Channels	Such conveyancing SuDS techniques would provide little benefit overall due to the small scale of the site.	x
Bioretention Systems	Bioretention systems could be retrofitted into the garden but would overall provide little benefit to storage volumes.	x
Retention Ponds, Wetlands, Detention Basins	A detention basin is proposed to boost the storage of the permeable pavement sub-base.	✓
Geocellular Systems	Geocellular systems can be configured to suit almost every site/development. While they are suitable for the site, the storage within the permeable pavement sub-base and the detention basin is sufficient.	-
Proprietary Treatment Systems	Roof runoff is considered to be largely uncontaminated. Runoff from the paved areas is to be treated via permeable pavement.	x
Filter Drains and Filter Strips	Not deemed necessary with the proposed strategy.	x

Table 3: Suitability of SuDS Components

9.0 SURFACE WATER DRAINAGE STRATEGY

9.1 In accordance with Buckinghamshire County Council Developer Advice for Surface Water Drainage Strategy (BCC guidance), developments should use SuDS to reduce both the volume and runoff rates to the drainage system.

9.2 BCC guidance states that the peak runoff rate from a development on previously developed land must be as close to the greenfield runoff rate from the equivalent site area.

9.3 The greenfield runoff rate for an area equivalent to the proposed 1730m^2 of roof and hardstanding areas is very low and as such, it is not practical to limit the peak discharge rate to a greenfield

equivalent rate. As such, a practical limit of 2 l/s has been selected for the peak discharge rate from the site, which provides significant betterment over the existing runoff rates.

9.4 Proposed Surface water discharge rates have been calculated below and supporting calculations are included in Appendix IV.

SURFACE WATER DISCHARGE RATES SUMMARY						
	Area (ha)		Discharge Rates (l/s)			
			2 year/Q_{BAR}	30 year	100 year	100 year +40%CC
Greenfield Rates	**0.173** (proposed total roof and hardstanding areas)		0.73	1.68	2.33	-
Existing rates	**0.017** (existing barn)		3.4	8.9	11.5	-
Proposed Rates	**0.039** (proposed total roof and hardstanding area)		1.9	2.0	2.0	2.0

Table 5: Calculated Runoff rates

9.5 The proposals are to drain the roof runoff and the hardstanding areas around the houses (including the access road) into the sub-base of the permeable pavement access road.

9.6 A services strip of standard paving is shown for the access road to allow foul drainage and services to be under standard paving for easier future maintenance.

9.7 A detention basin in the southwest corner of the site is proposed to boost the storage of the permeable sub-base.

9.8 Due to the level difference between the west and east side of the site, the permeable pavement is split into two "cells" with flow control after the first cell in order to maximise the storage capacity of the system.

9.9 At this stage, it is not known if the proposed drainage systems would need to be tanked. This would need to be confirmed with groundwater investigations on site.

9.10 The current strategy assumes gravity drainage to the ditch near the entrance in Worminghall Road. It may be required to introduce a pump depending on more detailed investigation of the ditch and level strategy for the site. The new connection into the ditch is to be agreed with the Lead Local Flood Authority prior to construction.

9.11 The proposed drainage layout is shown in Appendix V.

9.12 Hydraulic calculations using the FEH rainfall model, show that a total attenuation storage of 150m^3 would be required to limit the peak runoff rate for the 100-year storm event + 40% climate change to a rate of 2 l/s.

9.13 Proposed drainage calculations based on FEH rainfall model and 40% climate change allowance are included in Appendix IV. A proposed storm drainage strategy plan layout is included in Appendix V.

10.0 WATER QUALITY

10.1 Runoff from the roofs and the untrafficked paved areas is largely considered to be uncontaminated.

10.2 The primary risk to water quality is from the trafficked areas. All trafficked areas are proposed to be treated via permeable pavement.

10.3 The Pollution Hazard Indices are summarised in Table 4 – Summary of Pollution Hazard Indices for different Land Use below (based on Table 26.2 of The SuDS Manual):

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads)	Low	0.5	0.4	0.4

Table 6: Summary of Pollution hazard Indices for different Land Use

10.4 The Mitigation Indices of the proposed SuDS techniques are summarised in Table 6 below.

INDICATIVE SuDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER			
SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

Table 7: Indicative SuDS Mitigation Indices.

10.5 It can be seen that the Total SuDS Mitigation Index ≥Pollution Hazard Index therefore the water treatment provided by this SuDS train is enough to remove the potential pollutants.

11.0 FOUL WATER DRAINAGE STRATEGY

11.1 An asset location map provided by Thames Water shows the presence of a 225mm foul sewer in Worminghall Road.

11.2 It is proposed to construct a new foul connection into the public foul sewer in Worminghall Road.

11.3 The peak foul discharge rate based on DCG's guidance (4000 L/day/dwelling) would be 0.33 l/s.

11.4 The new connection is to be agreed with the sewer authority prior to construction.

12.0 SCHEDULE OF MAINTENANCE

12.1 All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owners before adoption.

12.2 In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.

12.3 The property owner will be responsible for the management and maintenance of SuDS devices.

12.4 General maintenance of key SuDS components are provided below.

12.5 Maintenance for the geocellular crates is to be in accordance with manufacturer's recommendations.

PROPOSED SCHEDULE OF MAINTENANCE FOR BELOW GROUND DRAINAGE				
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Foul Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Surface Water Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried as necessary
Catchpits	1 year	1 year	N/A	Cleansing to be carried as necessary
Hydrobrake	0.5 year	As required	N/A	Following any significant storm event, the chamber and flow control mechanism should be visually inspected to ensure no blockage has occurred.
Detention Basin	1 month	Cleansing to be carried as necessary	N/A	Inspect inlets, outlets and overflows for blockages and clear if required; Tidy dead growth before start of growing season
Permeable Block Paving	1 year	'Swept' clean of debris every 2 years.	N/A	Refer to block manufacturers guidance for long term maintenance requirements.

Table 6: Schedule of maintenance for below ground drainage

13.0 CONCLUSION

13.1 Meridian Civil Engineering Consultancy LTD (MCEC) has been instructed by Kyle Seeley Associates to prepare a site-specific Surface Water Drainage Strategy for the development at Hedges Farm, Worminghall Road, Oakley HP18 9QY.

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APPENDIX I Topographic Survey and Architects Plans

Mapping contents © Crown copyright and database rights 2023 Ordnance Survey 100035207

0 10 20 30 40m
Scale 1:1250

0 10 20m
Scale 1:500

Rev.	Notes	Date

KYLE SEELEY ASSOCIATES

Client
HEDGES FARM

Project
HEDGES FARM, WORMINGHALL ROAD, OAKLEY, HP18 9QY

Drawing Title
LOCATION AND BLOCK PLAN

Drawn	Date	Scale
KRMS	18.10.2023	AS SHOWN @ A1

Drawing No. 001 Rev. A


Hedge
B/W fence
Grass
Concrete
Caravan
Post and Wire fence
Post and Rail fence
Hardstanding Surface
Panel Fence
Headwall
Wormingford Road
Tarmac
Cattle Gate
Wall
Eave
Ridge
Chim
POST

ILLUSTRATIVE LAYOUT

PLOT 1
PLOT 2
PLOT 3
PLOT 4
PLOT 5
PLOT 6
PLOT 7
2
3
1
BUILDING TO BE REMOVED
ARRANGEMENT SHOWN PER 23/02235/AGN
WORMINGHALL ROAD
7
30
32
49
51
53
LB
83.1m

N

0 2 4 6 8m
Scale 1:200

1 PROPOSED VEHICULAR ACCESS
2 REFUSE TURNING
3 VISIBILITY SPLAYS OF 2.4M X 43M

Hedges Farm

Developement Details	
Item	GEA
site area	4404 m2
plot 1 2 bed	50 m2
plot 2 3 bed semi	58 m2
plot 3 3 bed semi	58 m2
plot 4 4 bed	82 m2
plot 5 4 bed	82 m2
plot 6 4 bed	82 m2
plot 7 3 bed	60 m2
road, parking & pave	1160 m2
green space	2730 m2

REV. NOTES DATE

KYLE SEELEY ASSOCIATES

CLIENT
HEDGES FARM

PROJECT
HEDGES FARM, WORMINGHALL ROAD, OAKLEY, HP18 9QY

DRAWING TITLE
PROPOSED SITE PLAN

DRAWN	DATE	SCALE
KRMS	18.10.2023	1:200 @ A1

DRAWING NO. 002 REV. B

APPENDIX II Public Sewer Records

Asset location search

Property Searches

Meridian Civils
62

BRIGHTON
BN2 6PF

Search address supplied Hedges Farm
Worminghall Road
Oakley
HP18 9QY

Your reference MC0363

Our reference ALS/ALS Standard/2023_4905093

Search date 31 October 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Hedges Farm, Worminghall Road, Oakley, HP18 9QY

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

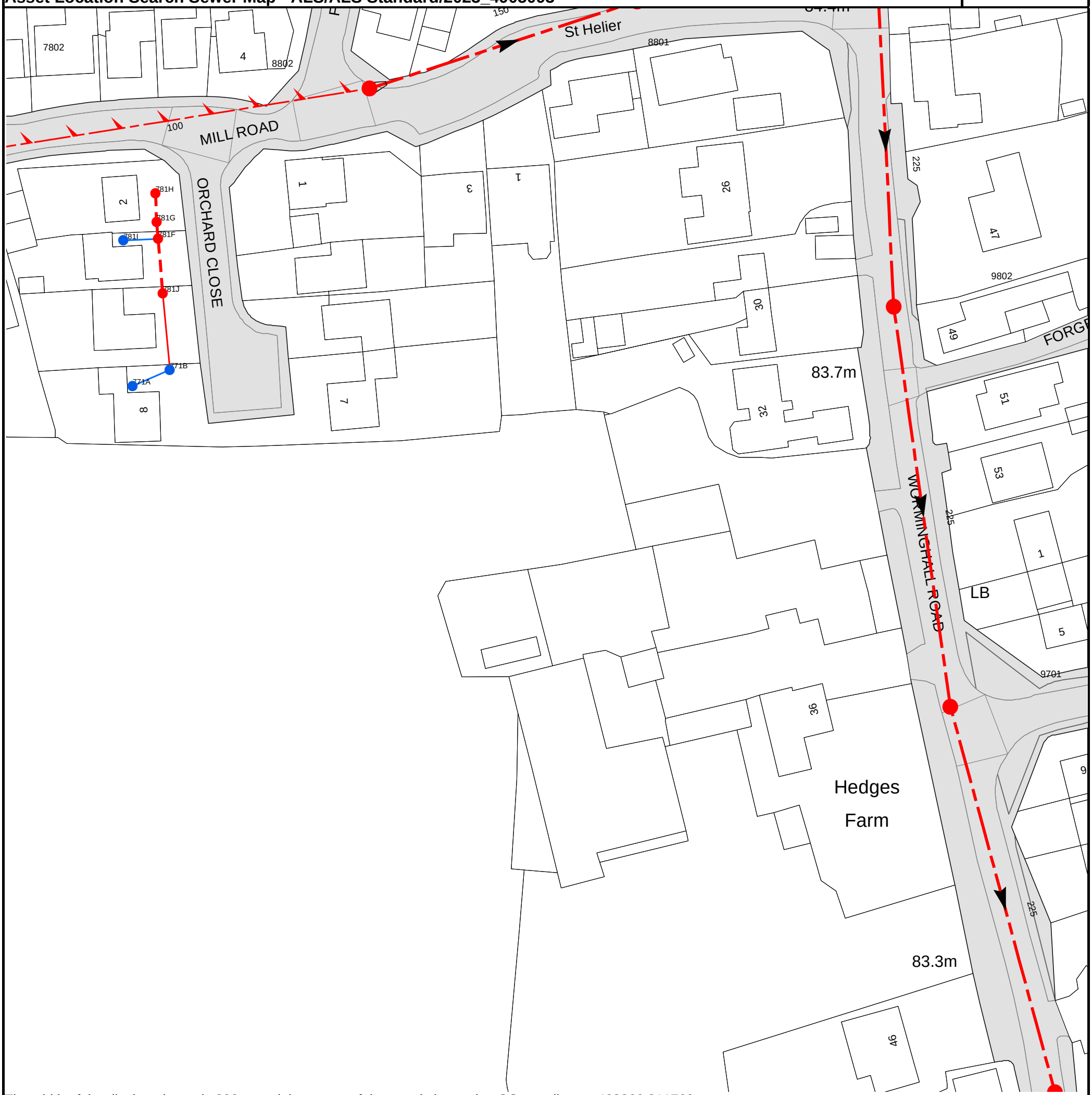
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2023_4905093



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 463866,211760

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
781I	n/a	n/a
771A	n/a	n/a
781H	n/a	n/a
781G	n/a	n/a
781F	n/a	n/a
781J	n/a	n/a
771B	n/a	n/a
8802	83.56	82.99
9601	83.21	81.32
9701	83.33	81.52
9802	83.79	81.8

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

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

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

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

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

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

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

Sewer Fittings

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

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

Operational Controls

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

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

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

- Inlet
- Outfall
- Undefined End

Other Symbols

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

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

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

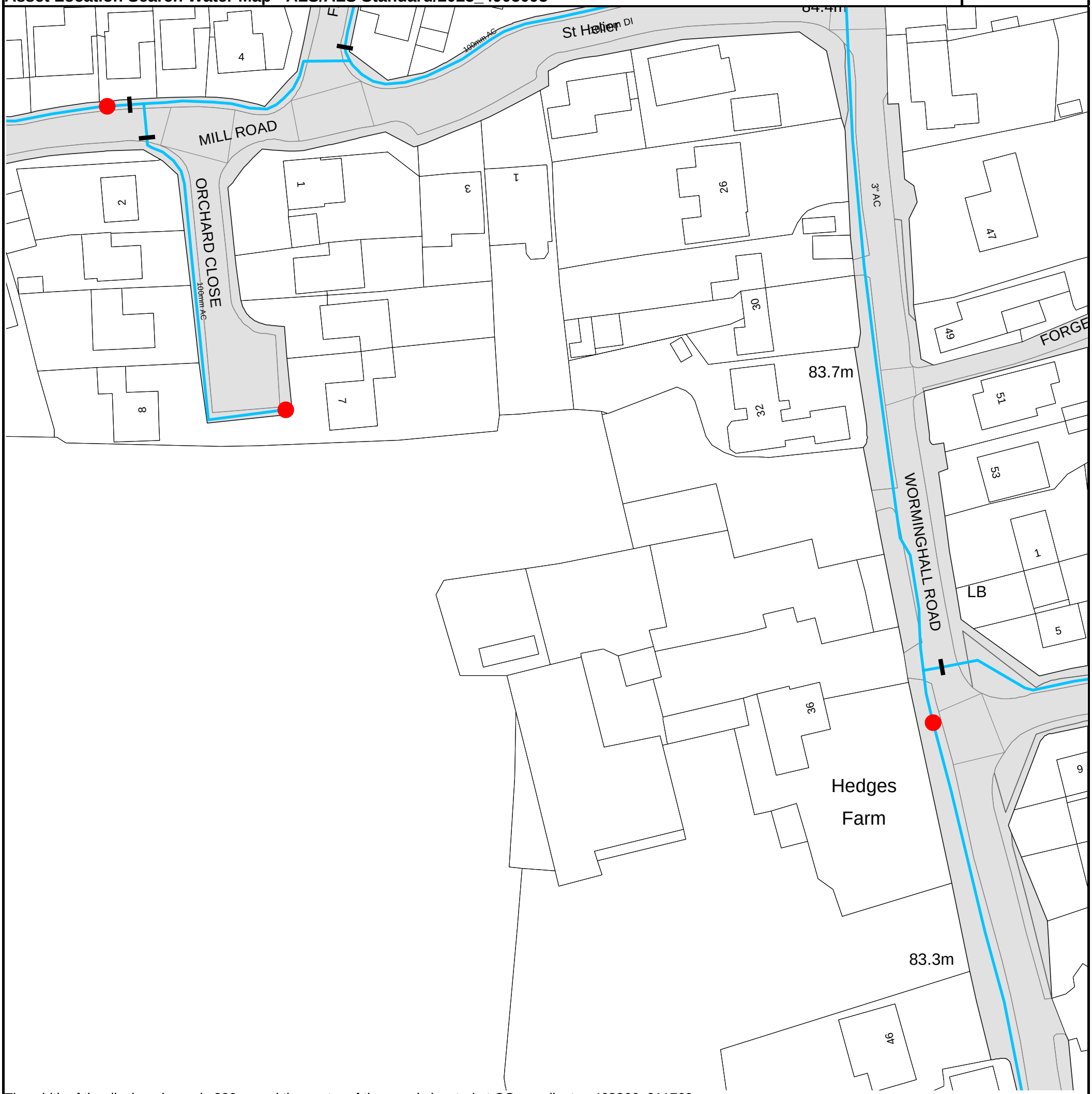
- Casement — Ducts may contain high voltage cables. Please check with Thames Water.
- Conduit Bridge
- Subway
- Tunnel

Notes:

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

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

Asset Location Search Water Map - ALS/ALS Standard/2023_4905093



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 463866, 211760.

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- **Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number

APPENDIX III BGS Borehole Log

BOREHOLE One

Worminghall Road, Oakley.

Date of boring 28.07.1983

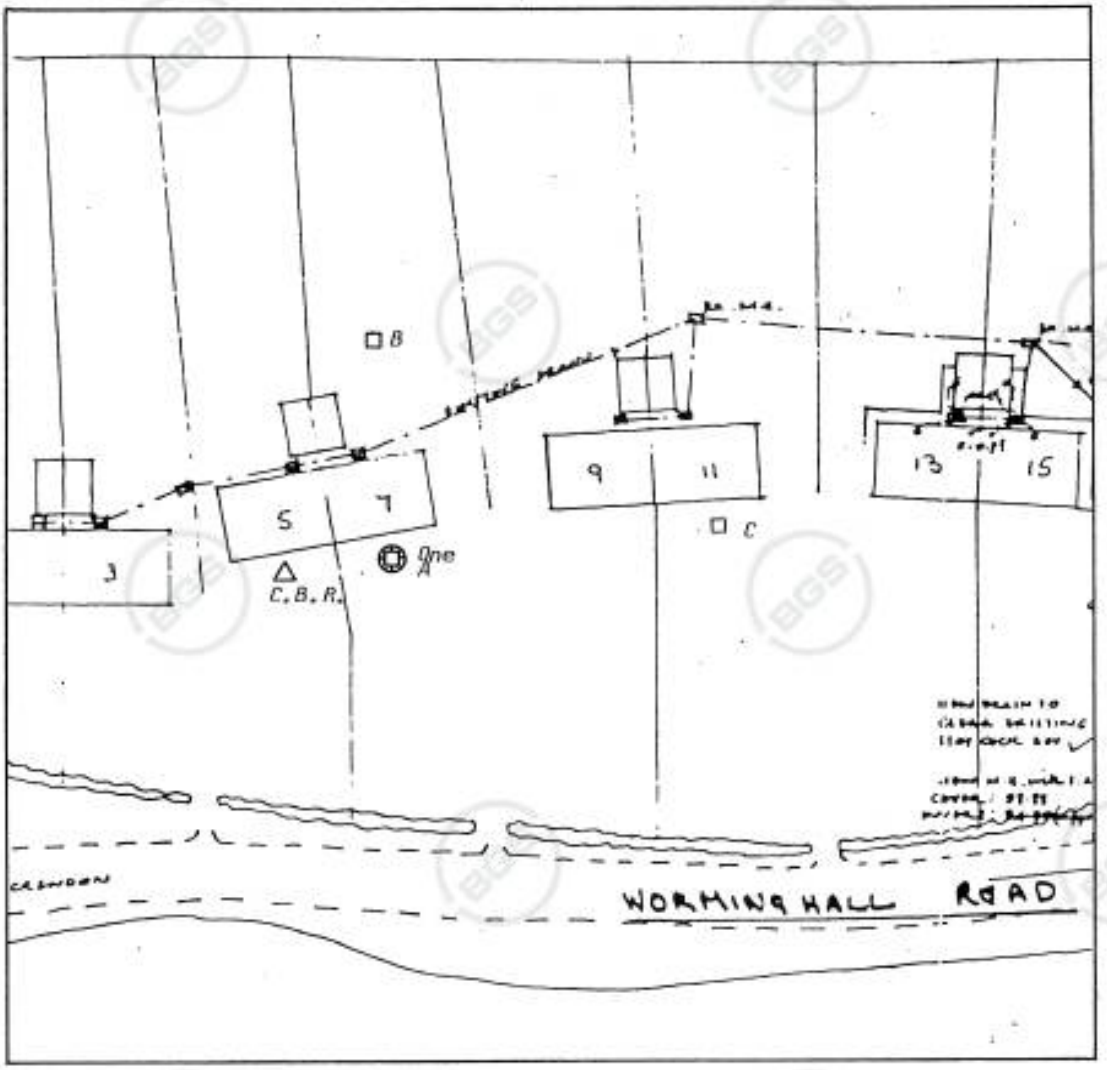
Diameter of boring : 105 mm

Lining tubes : mm to m

Ground Level 28.07.1983

Description of Strata	Change of Strata			S.P.T. C.P.T. N-value	Samples		Water Level	Depth of Casing
	Legend	Depth	Ruleured Level		Depth	Type		
		m	m		m		m	m
TOPSOIL								
CORALLIAN BEDS Firm light brown slightly silty CLAY with some fine medium gravel					0.50	B		
- slightly sandy with occasional limestone gravel		1.00			1.00	J		
					1.20	U38		
					1.50	J		
- sand content increasing		2.00			2.00	J		
- limestone parting					2.40	J		
		3.00						
		4.00						
		5.00						

August, 1983	BOREHOLE LOG	Report No. S.425



Legend

⊕ Borehole Location

□ Penetration Probe Location

△ California Bearing Ratio Test Pit

Scale

1 : 500 1.0cm : 5.00m

SITE LOCATION PLAN

August, 1983

Report No. S.424

TYRONE

APPENDIX IV Hydraulic Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Bojidar Boiadjiev
Site name:	Hedges Farm
Site location:	

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.80078° N
Longitude:	1.07499° W
Reference:	1271204811
Date:	Nov 07 2023 09:37

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.173

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	624	624
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.73	0.73
1 in 1 year (l/s):	0.62	0.62
1 in 30 years (l/s):	1.68	1.68
1 in 100 year (l/s):	2.33	2.33
1 in 200 years (l/s):	2.73	2.73

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.017	4.00	10.000	450	463840.360	211757.676	1.350
4			10.000	450	463858.606	211757.805	1.531

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	4	18.246	0.600	8.650	8.469	0.181	100.8	150	4.30	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.001	17.7	3.2	1.200	1.381	0.017	0.0	43	0.760

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0
Summer CV	0.950	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.950	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0
30	0	0	0
100	0	0	0

Results for 2 year +10% A 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
15 minute summer	1	10	8.696	0.046	3.4	0.0199	0.0000	OK
15 minute summer	4	10	8.513	0.044	3.4	0.0000	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)
15 minute summer	1	1.000	4	3.4	0.765	0.192	0.0811	1.3

Results for 30 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
15 minute summer	1	10	8.728	0.078	8.9	0.0322	0.0000	OK
15 minute summer	4	10	8.544	0.075	8.9	0.0000	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)
15 minute summer	1	1.000	4	8.9	0.982	0.503	0.1654	3.4

Results for 100 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
15 minute summer	1	10	8.743	0.093	11.5	0.0380	0.0000	OK
15 minute summer	4	10	8.557	0.088	11.5	0.0000	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)
15 minute summer	1	1.000	4	11.5	1.040	0.650	0.2017	4.5

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1			83.700	600	463853.729	211759.207	0.650
PP2	0.094	4.00	83.600		463857.687	211759.789	0.750
2			83.500	1200	463923.757	211768.613	0.650
3			83.500		463926.929	211766.856	0.675
PP1	0.079	4.00	83.800		463828.688	211755.286	0.750
Basin	0.007	4.00	83.900		463825.031	211748.611	0.800
4			83.800	1200	463829.084	211751.948	0.750

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Basin	4	5.250	0.600	83.100	83.050	0.050	105.0	150	4.09	50.0
1.001	4	PP1	3.361	0.600	83.050	83.050	0.000	0.0	150	4.15	50.0
1.002	PP1	1	25.346	0.600	83.050	83.050	0.000	0.0	150	4.57	50.0
1.003	1	PP2	4.001	0.600	83.050	82.850	0.200	20.0	150	4.60	50.0
1.004	PP2	2	66.810	0.600	82.850	82.850	0.000	0.0	150	5.71	50.0
1.005	2	3	3.626	0.600	82.850	82.825	0.025	145.0	150	5.78	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.980	17.3	1.3	0.650	0.600	0.007	0.0	28	0.576
1.001	1.000	17.7	1.3	0.600	0.600	0.007	0.0	0	∞
1.002	1.000	17.7	16.4	0.600	0.500	0.086	0.0	0	∞
1.003	2.262	40.0	16.4	0.500	0.600	0.086	0.0	67	2.155
1.004	1.000	17.7	34.2	0.600	0.500	0.180	0.0	0	∞
1.005	0.832	14.7	34.2	0.500	0.525	0.180	0.0	150	0.848

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0
Summer CV	0.950	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.950	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0
30	0	10	0
100	40	10	0

Node 1 Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Diameter (m)	0.020
Downstream Link	1.003	Invert Level (m)	83.050	Discharge Coefficient	0.600

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.005	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0075-2000-0500-2000
Invert Level (m)	82.850	Min Outlet Diameter (m)	0.100
Design Depth (m)	0.500	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.0		

Node PP1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	83.050	Slope (1:X)	9999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	85.000		

Node PP2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	82.850	Slope (1:X)	9999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	4.000	Inf Depth (m)	
Porosity	0.30	Length (m)	114.000		

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	83.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	0.800	70.0	0.0	0.801	0.0	0.0

Results for 2 year +10% A Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	1	570	83.179	0.129	0.3	0.0365	0.0000	OK
360 minute summer	PP2	224	82.953	0.103	4.5	13.1804	0.0000	OK
360 minute summer	2	224	82.939	0.089	1.9	0.1005	0.0000	OK
15 minute summer	3	1	82.825	0.000	0.6	0.0000	0.0000	OK
720 minute summer	PP1	570	83.179	0.129	2.1	16.1906	0.0000	OK
720 minute summer	Basin	555	83.179	0.079	0.3	1.4167	0.0000	OK
720 minute summer	4	570	83.179	0.129	0.1	0.1461	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)
720 minute summer	1	Orifice	PP2	0.3				
360 minute summer	PP2	1.004	2	1.9	0.169	0.105	0.7932	
360 minute summer	2	Hydro-Brake®	3	1.9				25.6
720 minute summer	PP1	1.002	1	0.3	0.057	0.016	0.4087	
720 minute summer	Basin	1.000	4	0.1	0.049	0.006	0.0671	
720 minute summer	4	1.001	PP1	0.1	-0.040	0.005	0.0542	

Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	1	585	83.335	0.285	0.4	0.0807	0.0000	SURCHARGED
240 minute summer	PP2	192	83.098	0.248	12.9	32.9050	0.0000	SURCHARGED
240 minute summer	2	192	83.089	0.239	2.4	0.2701	0.0000	SURCHARGED
15 minute summer	3	1	82.825	0.000	2.0	0.0000	0.0000	OK
600 minute winter	PP1	585	83.335	0.285	3.3	36.4778	0.0000	SURCHARGED
600 minute winter	Basin	585	83.335	0.235	0.5	5.4807	0.0000	SURCHARGED
600 minute winter	4	585	83.335	0.285	0.2	0.3228	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	1	Orifice	PP2	0.4				
240 minute summer	PP2	1.004	2	2.4	0.183	0.137	1.1762	
240 minute summer	2	Hydro-Brake®	3	2.0				45.4
600 minute winter	PP1	1.002	1	0.4	0.060	0.025	0.4462	
600 minute winter	Basin	1.000	4	-0.2	0.102	-0.012	0.0924	
600 minute winter	4	1.001	PP1	-0.2	0.054	-0.013	0.0592	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	1	705	83.602	0.552	0.5	0.1562	0.0000	FLOOD RISK
240 minute winter	PP2	232	83.347	0.497	15.3	67.4089	0.0000	FLOOD RISK
240 minute winter	2	232	83.338	0.488	2.3	0.5518	0.0000	FLOOD RISK
15 minute summer	3	1	82.825	0.000	2.0	0.0000	0.0000	OK
720 minute winter	PP1	705	83.602	0.552	5.1	64.5261	0.0000	FLOOD RISK
720 minute winter	Basin	705	83.602	0.502	1.0	16.2902	0.0000	FLOOD RISK
720 minute winter	4	705	83.602	0.552	0.6	0.6243	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	1	Orifice	PP2	0.5				
240 minute winter	PP2	1.004	2	2.3	0.179	0.132	1.1762	
240 minute winter	2	Hydro-Brake®	3	2.0				46.6
720 minute winter	PP1	1.002	1	0.5	0.065	0.029	0.4462	
720 minute winter	Basin	1.000	4	-0.6	0.098	-0.035	0.0924	
720 minute winter	4	1.001	PP1	-0.6	-0.058	-0.037	0.0592	

APPENDIX V Surface Water Drainage Strategy Plan

1. GENERAL
a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, UXO SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015: FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL. FOR PROPRIETARY SYSTEMS SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY MERIDIAN DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED

3. BELOW GROUND DRAINAGE
a. UPVC-U PIPES TO BS 4660 : 2000 AND PLASTIC INSPECTION CHAMBERS AND FITTINGS TO BS EN 13598-1:2020. CLAY PIPES TO BS EN 295-1:2013. CONCRETE MANHOLE AND INSPECTION CHAMBERS TO BS EN 1917:2002
b. ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE App C - DESIGN AND CONSTRUCTION GUIDANCE AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
d. ALL PRIVATE FOUL SEWER PIPES TO BE 100mm DIAMETER FROM SOIL STACKS UNLESS OTHERWISE STATED ON THE DRAWING AND 150mm WHERE SERVING MORE THAN 9 PROPERTIES.
c. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
d. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100mm DIAMETER FROM DOWNPIPES AND 150mm DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.
e. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES OR SOIL STACKS DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER.
f. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

LEGEND

- PROPOSED SW PIPE RUN
- PROPOSED PERFORATED SW DRAIN
- PROPOSED TYPE 3 SW INSPECTION CHAMBER
- PROPOSED HYDROBRAKE MANHOLE
- PROPOSED ORIFICE PLATE MANHOLE
- PROPOSED SW RODDING EYE
- PROPOSED SW RAINWATER PIPE
- HEADWALL
- STANDARD PAVING - FOUL WATER / SERVICES STRIP
- PERMEABLE PAVING - MAY NEED TO BE TANKED
- DIFFUSER UNITS
- DETENTION BASIN - MAY NEED TO BE TANKED
- PROPOSED FW PIPE RUN
- PROPOSED TYPE 2 FW MANHOLE
- PROPOSED TYPE 3 FW INSPECTION CHAMBER
- PROPOSED TYPE 4 FW INSPECTION CHAMBER

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PRELIMINARY

MERIDIAN
CIVIL ENGINEERING CONSULTANCY

CLIENT: KYLE SEELEY ASSOCIATES

SITE: HEDGES FARM
WORMINGHALL ROAD, OAKLEY, HP18 9QY

TITLE: SURFACE WATER DRAINAGE STRATEGY
DRAINAGE LAYOUT

SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:200	03.11.23	BB	MN

PROJECT NO:	DRAWING NO:	REVISION:
MC0363	CIV01	P0