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Land North of Borers Arms Road, Copthorne: Flood Risk Assessment and Outline Drainage Strategy

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Title

Land North of Borers Arms Road, Copthorne: Flood Risk Assessment and Outline Drainage Strategy

Client

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1. Introduction

1.1. Instruction

Aqua Terra Consultants Ltd (Aqua Terra) was instructed by Fairfax Acquisitions Ltd (the Client; Fairfax) to provide a Flood Risk Assessment (FRA) and Outline Drainage strategy (ODS) for a proposed residential led development on a parcel of land north of Borers Arms Road, Copthorne (the Site). Instruction to proceed was provided by email on the 9th January 2025.

1.2. Background

Fairfax are seeking outline planning permission for a residential led development in Copthorne. The proposed development involves the demolition of an existing commercial building, and the construction of up to 252No. new dwellings and up to 1,700m^2 of employment floorspace, with extensive green areas access roads, parking areas and SuDS features.

The FRA and ODS provide information on the nature of flood risk at the Site, the risk posed by the development to off-Site flood risk, and follows Government guidance with regards to development and flood risk and surface water management.

1.3. Scope of the report

The assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Technical Guidance to the National Planning Policy Framework (NPPF).

The assessment has:

- Considered the procedures of the National Planning Policy Guidance and Local Authority Guidance;
- Considered the Council Local Flood Risk Management Strategy and the Council Strategic Flood Risk Assessment;
- Considered the site constraints;
- Investigated all potential risks of current and future flooding to the site;
- Considered the impact the development may have elsewhere with regards to flood risk;
- Considered design proposals to mitigate any potential risk of flooding determined to be present; and,
- Development of an outline SuDS strategy to mitigate any potential increase in runoff and deterioration in water quality as well as providing amenity and biodiversity benefits.

1.4. Data sources

The main sources of data utilised in this assessment are summarised below:

- The proposed development plans as provided by the Client;
- Site topographic survey;
- Thames Water Sewer Asset Plans;
- LiDAR Digital Terrain Model (DTM) data obtained through data.gov.uk;
- Environment Agency (EA) flood risk data;
- Soilscapes soil mapping;
- British Geological Survey (BGS) mapping;
- Reigate & Banstead Borough Council, Mole Valley District Council and Tandridge District Council Level 1 Strategic Flood Risk Assessment (SFRA) (JBA, 2017);

- Hydrological descriptor data from the Flood Estimation Handbook (FEH) website (UK Centre for Ecology & Hydrology, 2023);
- DEFRA National Standards for SuDS (2025); and,
- The CIRIA SuDS Manual (CIRIA, 2015).

1.5. Limitations

This report is written strictly for the benefit of the Client and bound by the conditions presented in Appendix A.

2. Site Description

2.1. Site setting and surrounding area

The Site is located in Copthorne c. 5km north-east of Crawley, West Sussex (see Figure 2-1). The nearest postcode is RH10 3LH, and the National Grid Reference for the approximate centre of the Site is TQ 32434 39645. The Site lies adjacent to the boundary between Tandridge District Council (TDC) and Mid Sussex District Council (MSDC), with the southernmost part of the Site lying within MSDC. The Site is located within the Green Belt.

The Site covers an approximate area of 13.26Ha and is currently primarily a greenfield site covered with agricultural land, with the exception of a small stable at the central-west section and a small commercial area on the southern boundary (see Figure 2-2).

The Site is surrounded by residential area to the south and north-west, and agricultural land to the east and north.

Figure 2-1 Site location

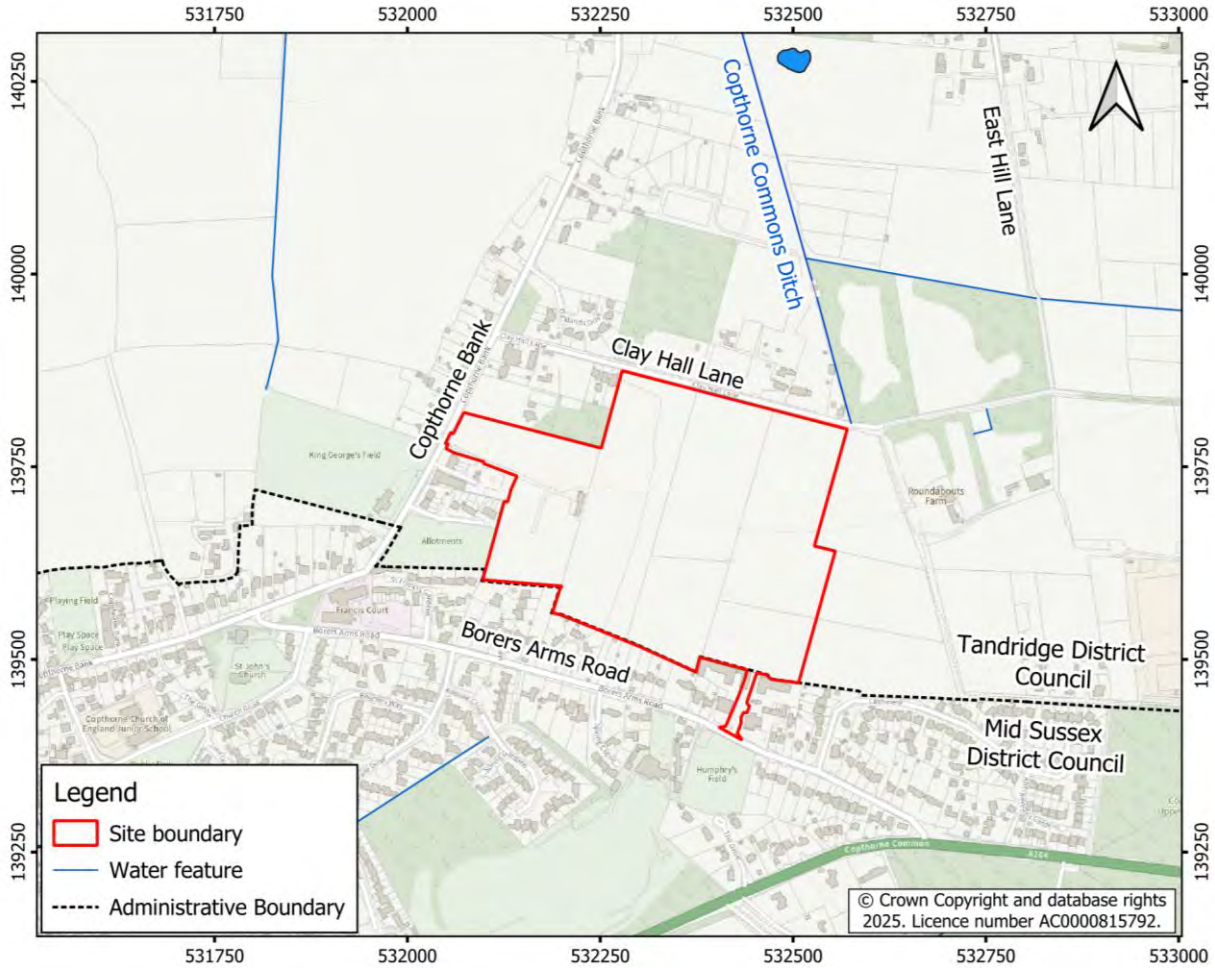
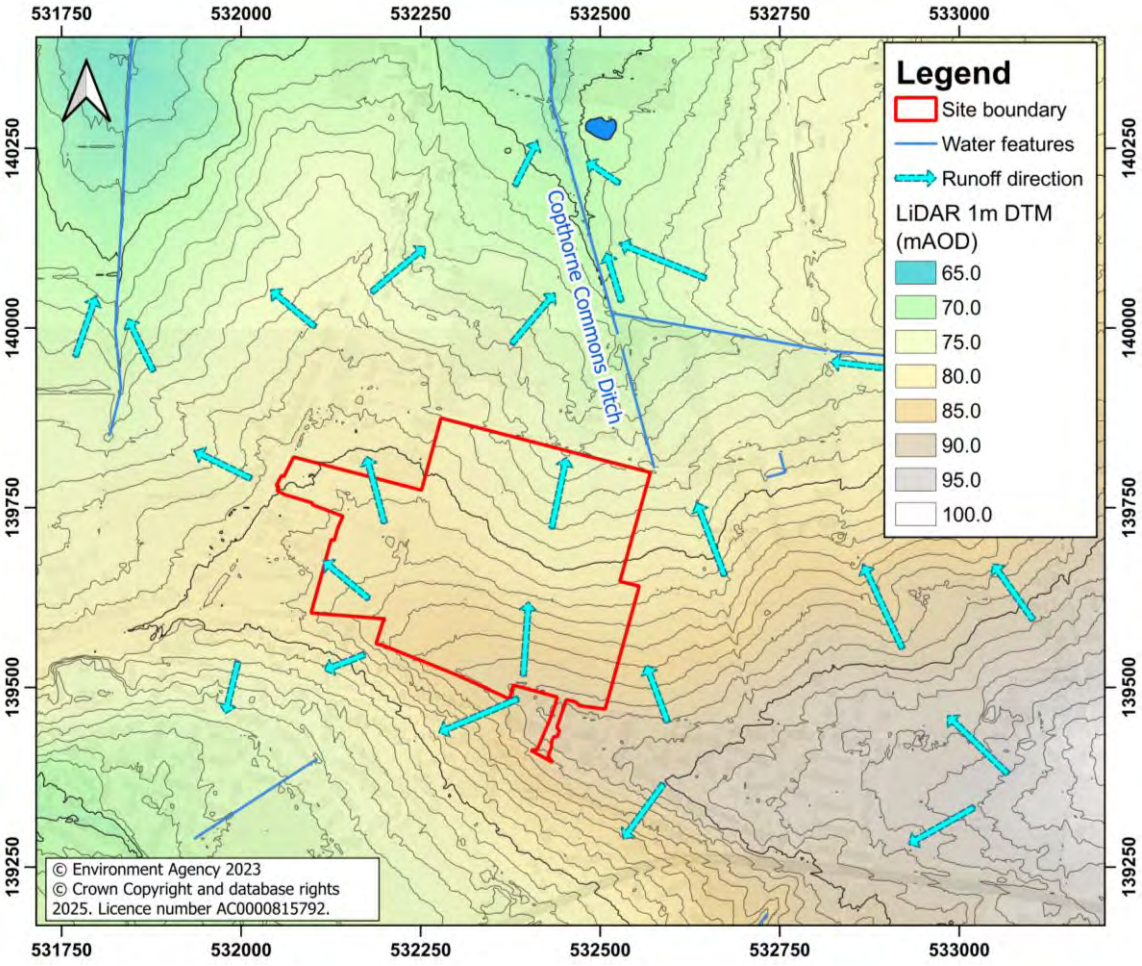


Figure 2-2 Current site layout / condition

2.2. Topography

According to 1m LiDAR DTM data (see Figure 2-3), ground elevations at the Site generally slope northwards and range between 88.7m above Ordnance Datum (m aOD) at the southern corner and 74.93m aOD at the northern boundary.

Figure 2-3 Existing ground elevations (LiDAR data) and inferred flow directions



2.3. Soils, geology and hydrogeology

According to Soilscapes mapping and British Geological Survey (BGS) 1:50,000 scale mapping, the general geological sequence underlying the Site is as follows:

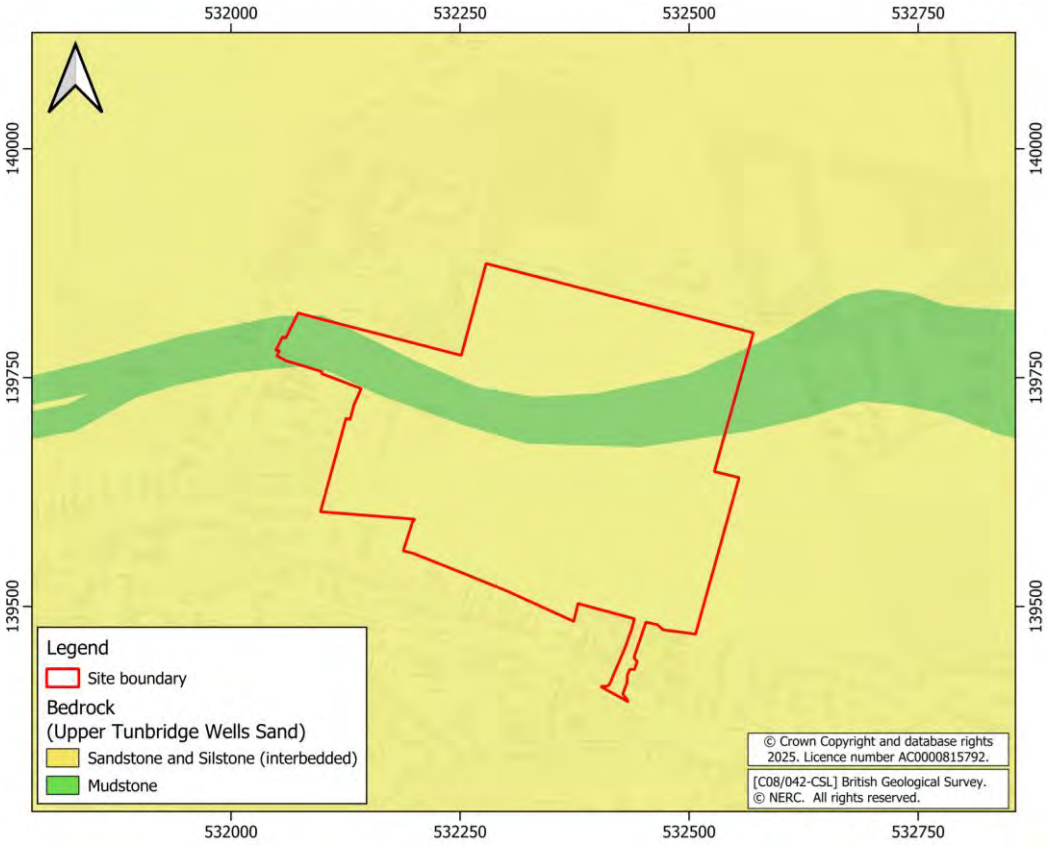
- Soils: Slightly acid loamy and clayey soils with impeded drainage.
- Superficial deposits: Absent across the Site.
- Solid geology (see Figure 2-4): Upper Tunbridge Wells Sand (sandstone and siltstone, interbedded) across the majority of the Site, with an east-west trending band of Upper Tunbridge Wells Sand (mudstone) across the central section of the Site.

The Upper Tunbridge Wells Sand bedrock sandstone and siltstone unit is classified as a Secondary A aquifer, which are designated by the EA as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. This unit has 'High' Groundwater vulnerability as defined by the EA.

The Upper Tunbridge Wells Sand bedrock mudstone unit is an Unproductive stratum, which are described by the EA as deposits with low permeability that have negligible significance for water supply or river base flow.

The Site is not within a Source Protection Zone.

Figure 2-4 Bedrock geology at the Site



2.3.1. Soakaway test results

Soakaway testing was undertaken at four locations across the Site in April 2025 in accordance with the BRE Digest 365 methodology. Full details of the Site work and results are presented in the Aqua Terra report (Aqua Terra, 2025). Groundwater was encountered in two of the pit locations, at c. 1.85m and 2.5m below ground level (m bgl).

All four soakaway tests failed to drain away within sufficient time, and it was concluded that soakaway drainage is not viable at the Site.

2.4. Climate

The Standard Annual Average Rainfall (SAAR) for the area is 790 mm (CEH, 2025).

2.5. Hydrology

There are several drainage ditches and ponds in the vicinity of the Site (which may be expected given the low infiltration potential in the area). Copthorne Commons Ditch, which originates just to the northeast of the Site, flows northwards and is a Statutory Main River as defined by the EA.

Hydrological descriptors for the Site are provided in Table 2-1. In general, the mean annual rainfall is below the national average, although similar to other areas in the southeast and the Base Flow Index (BFI) is moderate.

Table 2-1 Hydrological point descriptors

Descriptor	Value
NGR	TQ 32435 39654
BFIHOST19	0.468
PROPWET	0.36
SAAR6190	790 mm

2.6. Current drainage arrangements

At present, the agricultural parts of the Site are not thought to be served by a formal drainage system and surface water runoff will either infiltrate into the ground or run off overland. Surface runoff at the Site follows the topographical gradient, flowing roughly northwards and mostly draining to the Copthorne Commons Ditch, with small areas sloping the urban drainage network to the east/northeast of the Site. The existing commercial area likely drains to the local sewer network, although this has not been confirmed.

3. Proposed Development

The illustrative masterplan for the Site is provided in Appendix B.

The proposed development application description is as follows: “outline planning application with all matters reserved except for access for the demolition of an existing commercial building and the erection of up to 260 dwellings, up to 1,700sqm of employment floorspace E(c)(iii), E(g)(i)(ii)(iii), car parking, associated landscaping, open space, and associated development works, with access from Copthorne Bank and Borers Arms Road2.

An existing commercial building at the south of the Site (c. 244m^2) will be demolished and replaced by 1,700m^2 of employment floorspace.

The Site will be accessed from Copthorne Bank to the west and Borers Arms Road to the south.

The Site is currently primarily used as agricultural land, which is classified as "Less Vulnerable" in terms of flood risk vulnerability. Following development, the residential development would be classified as ‘More Vulnerable’, and the commercial premises as 'Less Vulnerable'.

A total lifespan of 100 years has been considered within this assessment.

4. Flood Risk to the Development

4.1. Rivers and Seas

The EA's flood risk for planning data is shown in Figure 4-1 and definitions of each Flood Zone are included in Table 4-1.

The entire Site is within Flood Zone 1 and therefore at very low risk of fluvial flooding.

There are flood defences along the banks of the Copthorne Commons Ditch. According to the EA data, these flood defences are of 'Natural High Ground' type, are in 'good' condition, and are designed to defend up to a 1 in 10 year flood event. The exact crest height of the defence is unknown.

Neither the SFRA (JBA, 2017) nor the EA database of historical flooding contains any evidence of fluvial flooding having occurred in this area.

Table 4-1 EA Flood Zone definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

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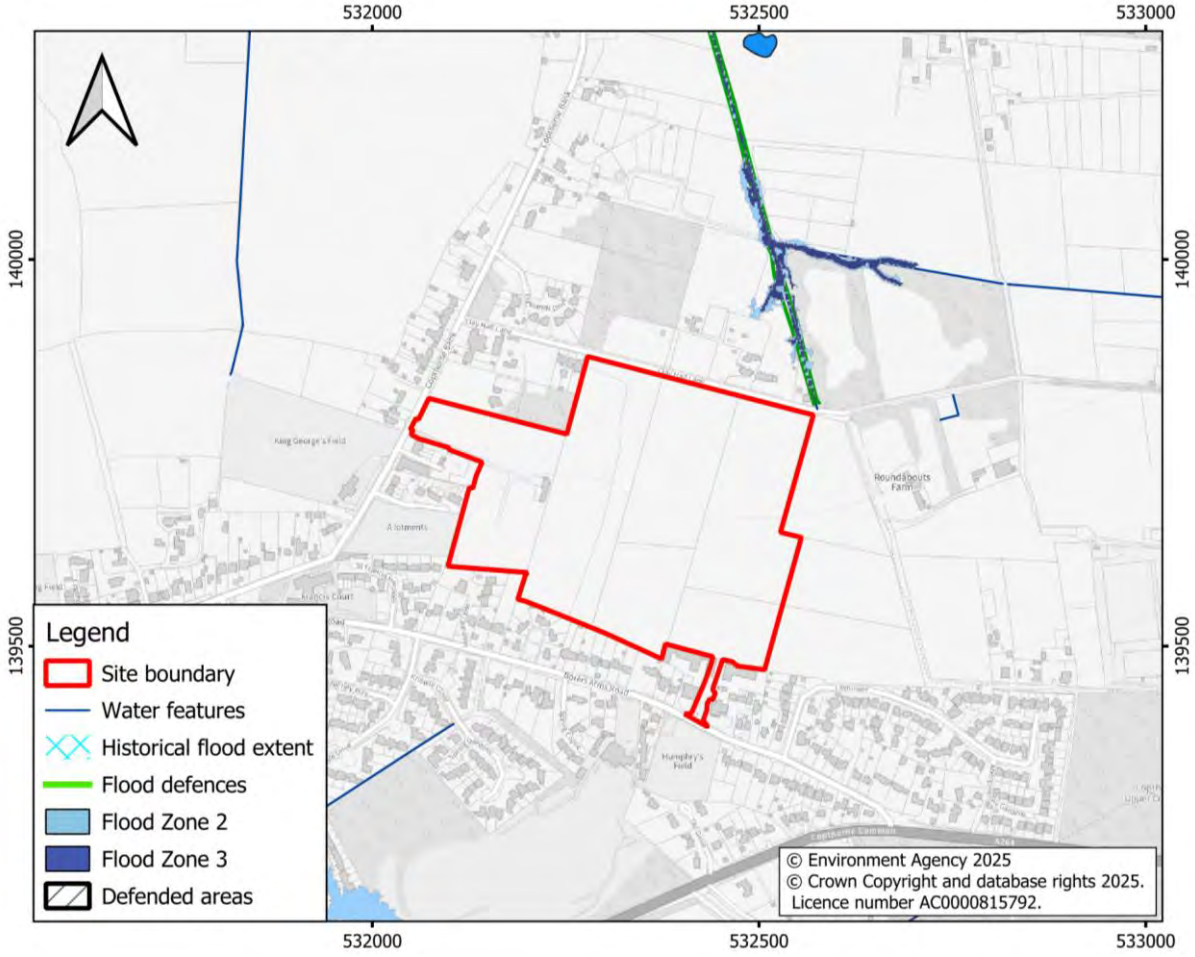
Figure 4-1 EA Flood Risk for Planning data



4.2. Surface Water

Surface water (pluvial) flooding is usually associated with extreme rainfall events but may also occur when rain falls on land that is already saturated or has a low permeability. Rainfall that is unable to infiltrate into the ground generates overland flow which can lead to flooding or 'ponding' in localised topographical depressions before the runoff is able to enter local drainage systems and watercourses.

A map of EA's Risk of Flooding from Surface Water (RoFSW) data is shown in Figure 4-2, and the risk of surface water flooding reaching or exceeding a depth of 0.2 m is shown in Figure 4-3. This data includes the 'Central' climate change allowance for the 2050s epoch (2040-2060).

The majority of the Site has Very Low risk of surface water flooding, however, there are multiple areas with an elevated risk associated with local depressions and overland flow routes:

- Three linear features at the north-eastern section of the Site that follow the topographical gradient north-south and flow into the Copthorne Commons Ditch to the north of the Site,
- A small pond at the western section of the Site associated with a local topographical depression; and,
- A narrow west-east trending feature at the border of what are currently commercial premises (likely drainage ditch). This feature crosses the vehicular access road to the Borers Arms Road.

The first two areas are shallow and are not expected to reach a peak depth of 0.2 m according to the modelling data. The area bordering the commercial premises has a High risk of reaching depths of 0.3 m, and negligible risk of reaching depths of 0.6 m (although this is likely to be drainage ditch).

The SFRA (JBA, 2017) does not confirm the location of Critical Drainage Areas (CDA) within the area of Tandridge District Council, although it is assumed that since most of the Site is at very low risk of flooding and no historic flood has been recorded, the Site is not located within a CDA.

Figure 4-2 Flood Risk from Surface Water (with climate change allowance)

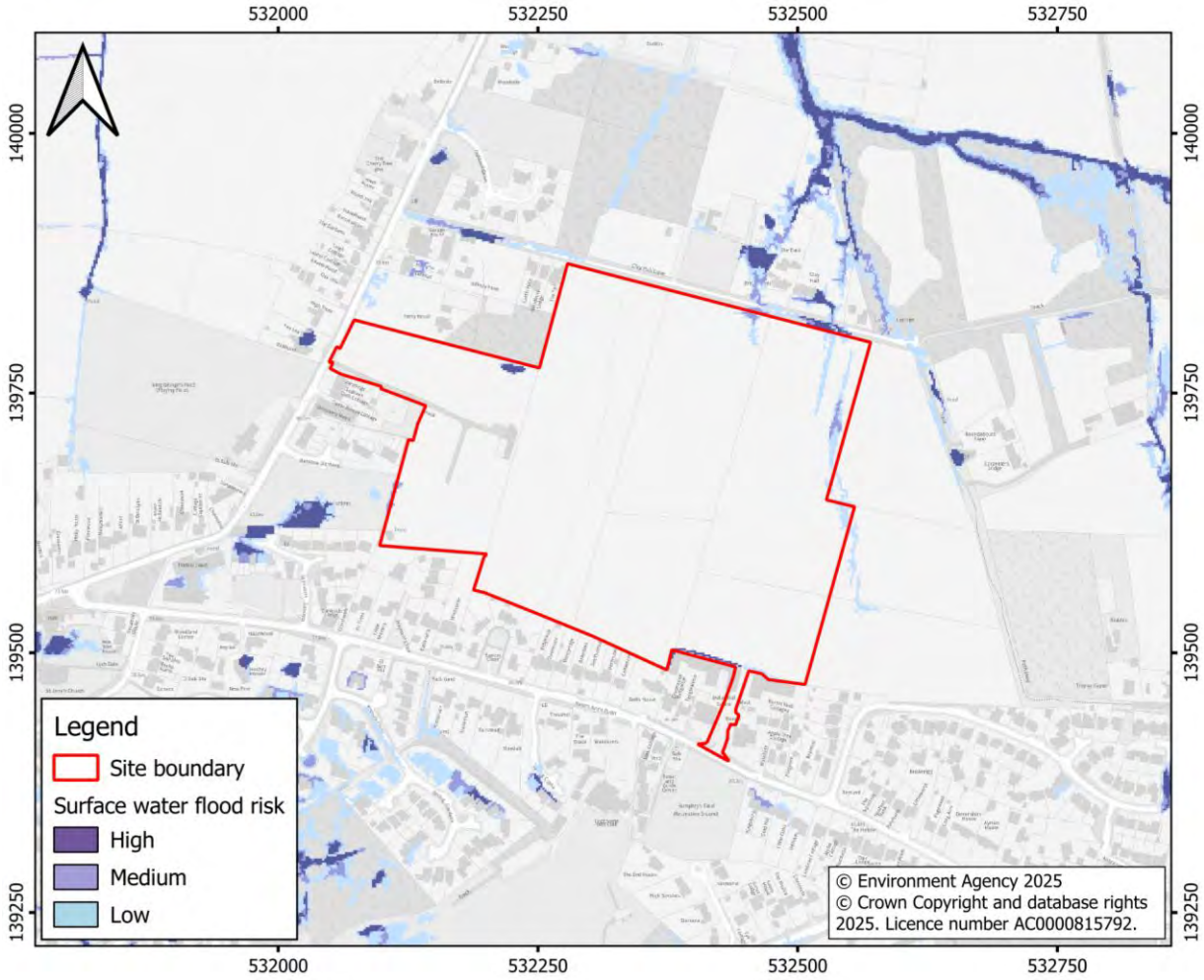
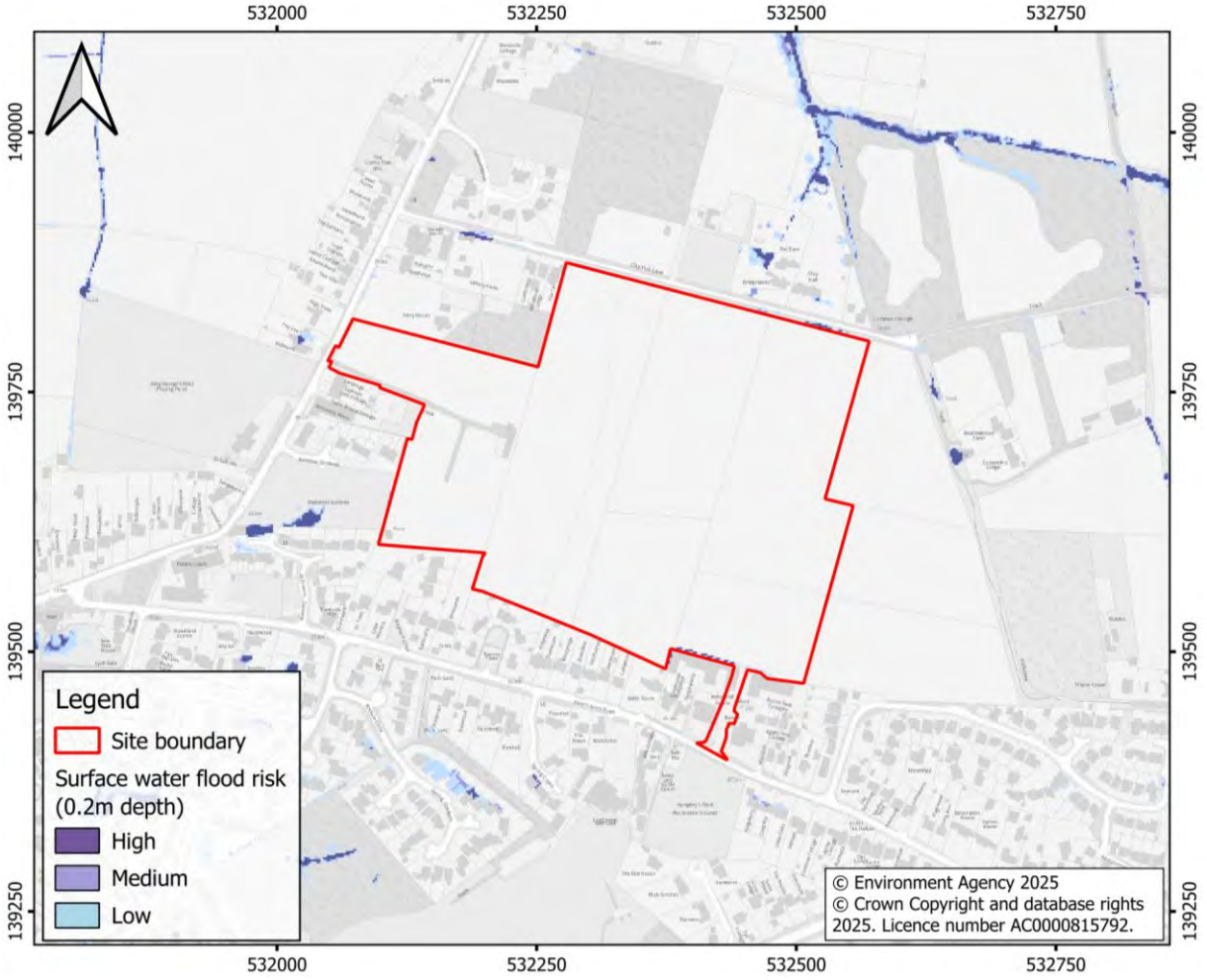


Figure 4-3 EA surface water flood depth risk (0.2m; with climate change allowance)



4.3. Groundwater

Groundwater flooding is caused by the natural emergence of water at surface level originating from underlying permeable sediments or rocks (aquifers). The groundwater may emerge as one or more-point discharges (springs) or as diffuse upwelling of water over an extended area. Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days.

The SFRA (JBA, 2017) data indicates that the Site has a negligible risk of groundwater flooding.

4.4. Sewers

Sewer flooding can occur during periods of intense rainfall and/or if a sewer becomes blocked with debris.

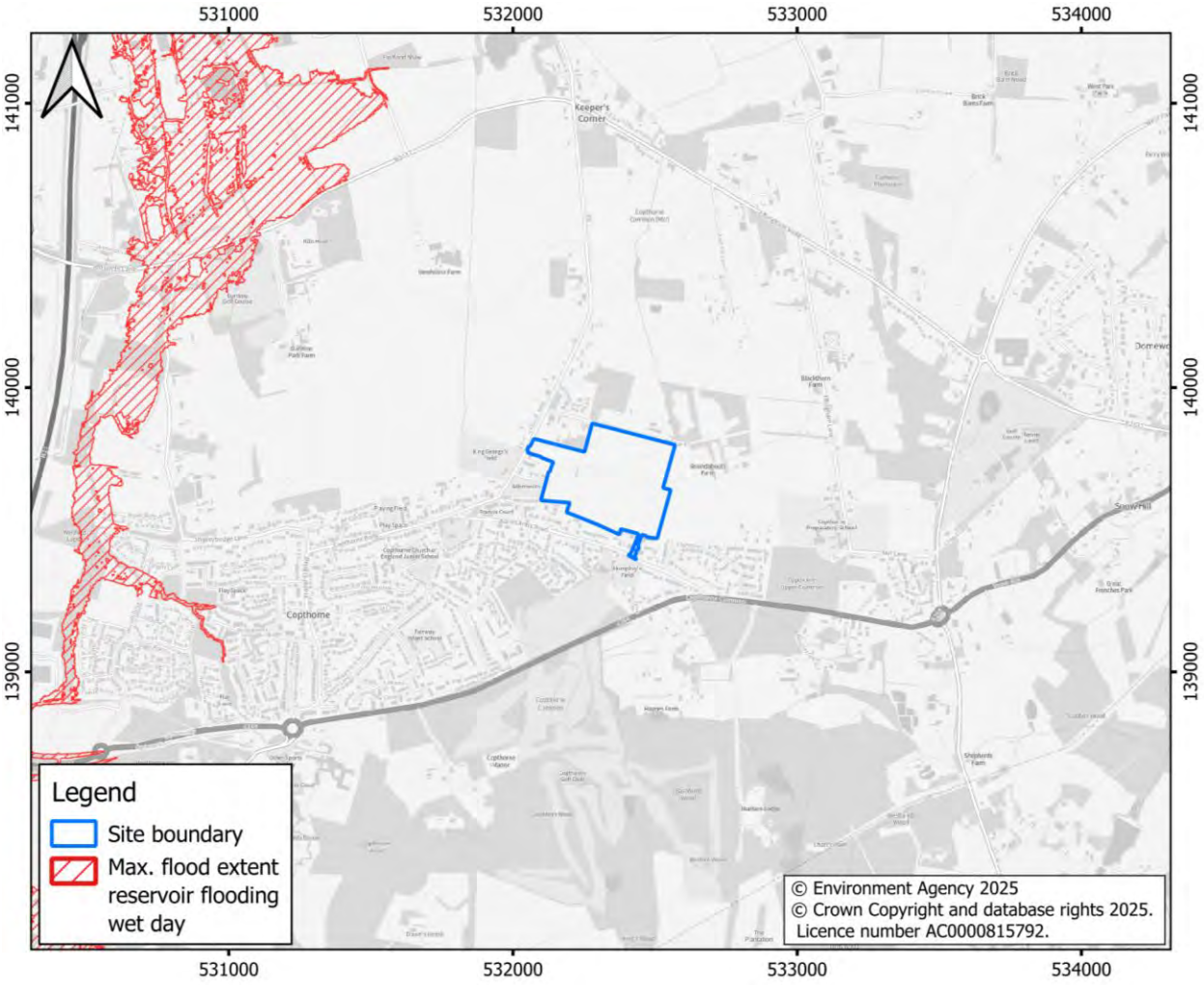
According to the SFRA (JBA, 2017), there have been 8No. sewer flooding records within the RH10 3 postcode area. The risk of sewer flooding is therefore Low.

4.5. Reservoirs

According to EA data, the Site is not at risk of flooding in the event of reservoir failure (see Figure 4-4). The risk of reservoir flooding is related to the failure of a large water storage reservoir. The risk of failure is considered to be extremely low (DEFRA, 2010), therefore the mapped flood extent represents a worst-case scenario. The nearest area at risk of located c. 1.36km west of the Site.

There are no other large water bearing feature in the area of interest which may impact flood risk at the Site.

Figure 4-4 EA's risk of flooding from reservoir failure (wet day scenario)



5. Suitability of the development

5.1. Sequential Test

The Sequential Test, outlined in the PPG for Flood risk and Coastal Change, identifies that developments should be directed to areas at the lowest probability of flooding.

The Site is entirely within Flood Zone 1, and is not thought to be at risk of flooding from groundwater, sewer or reservoirs. There are small areas at a low to high risk of surface water flooding, although these areas are shallow and/or will be managed by the drainage strategy (see Section 7). With regards to flood risk, the developed residential area is classified as "More Vulnerable" and the commercial area is classified as "Less Vulnerable".

According to the NPPF (see Table 5-1), "Less Vulnerable" and "More Vulnerable" site uses are considered appropriate within Flood Zones 1 and a Sequential Test / Exception Test is not required.

Table 5-1 Flood risk vulnerability and flood zone compatibility.

Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1 (low probability)	✓	✓	✓	✓	✓
Zone 2 (medium probability)	✓	✓	Exception Test required	✓	✓
Zone 3a (high probability)	Exception Test required	✓	x	Exception Test required	✓
Zone 3b (functional floodplain)	Exception Test required	✓	x	x	x

✓ *Development is appropriate.*
x *Development should not be permitted.*

6. Mitigation

6.1. Fluvial/tidal/reservoir flooding mitigation

The Site lies entirely within Flood Zone 1, and there are no flood risks from reservoirs. Therefore, no mitigation measures are necessary.

6.2. Groundwater flooding mitigation

As per the SFRA mapping (JBA, 2017) , the area is classed as having negligible risk of groundwater flooding, and as such no mitigation measures are deemed necessary.

6.3. Mitigation of sewer flooding to the Site

Non-return valves to sewer connections are a viable mitigation against sewer flooding. However, the risk of sewer flooding is considered to be low in this instance.

6.4. Mitigation of surface water flooding to the Site

There are multiple areas with an elevated risk of surface water flooding, which are associated with small topographical depressions and surface water flowpaths. The Site layout plans (see Appendix B) have been developed to ensure that the risks are mitigated and the development areas are located outside of the surface water flood risk areas, as discussed in Section 7.

6.5. Mitigation of surface water flooding from the Site

The National Planning Policy Framework (NPPF) stipulates that all new developments must be “safe, without increasing flood risk elsewhere”. As such, the following stipulations are provided in the EA guidance for managing rainfall runoff (Environment Agency, 2013):

- Stormwater runoff rates and volumes discharged from urban developments should approximate to the Site greenfield response over a range of storm frequencies of occurrence (return periods).
- Runoff for extreme events should be managed on-site. This requires:
  - the peak rate of stormwater runoff to be limited;
  - the volume of runoff to be limited;
  - the pollution load to receiving waters from stormwater runoff to be minimised; and,
  - the assessment of overland flows and temporary flood storage across the Site.

An Outline Drainage Strategy has been created to demonstrate that there will be no increase in runoff from the Site under a range of design storm scenarios, and that all Site runoff will be sustainably managed in accordance with the local and national policy and guidance. This includes suitable allowances for future increases in rainfall intensity caused by climate change. The Drainage Strategy is presented in Section 7.

6.6. Flood evacuation plan

Considering the development area's Flood Zone 1 classification, a flood warning and evacuation plan are not required in this instance.

7. Drainage Strategy

7.1. Introduction

The proposed residential development will be located on largely previously undeveloped, 'greenfield' land. A proportion of the Site would comprise impermeable areas following its development (for example, rooftops and roads). Without appropriate management, this would result in an increase in both the volume and rate of surface runoff generated by the Site, which could lead to an increase in surface water flood risk elsewhere (i.e. downstream). Surface runoff from the developed Site will, however, be sustainably managed using SuDS, as described in the following sections.

This drainage strategy has been prepared in accordance with the DEFRA (2025) National Standards for SuDS, which supersede the earlier 2015 non-statutory guidance, and with the requirements of West Sussex County Council as the Lead Local Flood Authority (LLFA).

The 2025 Standards establish a national framework for the design, delivery and adoption of SuDS, consistent with the implementation of Schedule 3 of the Flood and Water Management Act. They set out clear requirements across four outcome areas:

1. Peak flow control – development should not increase flood risk off-site and peak discharges should be limited to greenfield rates.
2. Runoff volume control – post-development runoff volume should not exceed the equivalent greenfield volume for the 1 in 100 year, 6-hour event, with long-term storage provided where necessary.
3. Water quality – SuDS must prevent deterioration of receiving water bodies, with pollutant mitigation demonstrated through the Simple Index Approach or equivalent.
4. Amenity and biodiversity – SuDS should deliver wider benefits including habitat creation, biodiversity enhancement and opportunities for public amenity.

The design of the proposed SuDS for this site has been assessed against each of these outcome areas and is described in the following sections. The strategy also accounts for climate change allowances, urban creep, exceedance routing and maintenance/ adoption arrangements, as required under the 2025 Standards.

SuDS aim to mimic the natural drainage characteristics of a site prior to its development by controlling surface water runoff as close to where the rain falls as possible e.g. through interception and re-use, evaporation and infiltration into the ground. Furthermore, SuDS provide opportunities to remove pollutants from runoff and also provide amenity and biodiversity benefits.

7.2. Greenfield runoff calculations and permissible discharge rates

LiDAR Digital Terrain Model (DTM) data have been used to delineate the Proposed Development into two distinct surface water drainage catchments: a larger eastern catchment and a smaller western catchment. The development areas within both catchments were assessed using GIS software to quantify impermeable hardstanding, including roof areas, parking areas, roads, and impermeable public footpaths (see Figure 7-1), this has been used to represent the "positively drainage area" in this instance.

The Institute of Hydrology Report 124 (IH124) method has been used to estimate the greenfield runoff rate for the eastern and western sub-catchments. The 'QBAR' greenfield runoff rates are presented in Table 7-1.

Table 7-1 Permissible discharge rates for the eastern and western sub-catchments

Sub-catchment	Total area (ha)	Positively drained area(ha)	QBar rate (l/s)	3 l/s/ha rate (l/s)
Eastern	10.79	3.66	**18.2**	11.01
Western	2.47	1.01	**5.0**	3.03

The 2025 National Standards for SuDS design stipulate that the permissible discharge rate for a site should be set at either the peak Qbar greenfield runoff rate of 3 l/s/ha, whichever is greater. 3 l/s/ha equates to lower flow rates in this instance, so the QBAR rates shown in Table 7-1 have been used to set the permissible discharge rates for each catchment.

7.3. Runoff destination

As per DEFRA (2025) SuDS Standards (Standard 1), the following runoff destination hierarchy is followed for the disposal of surface water from new developments, in order of priority:

1. Collection for non-potable use;
2. Infiltration to ground;
3. Discharge to a surface water body;
4. Discharge to a surface water sewer, or another piped surface drainage system;
5. Discharge to a combined sewer.

The following sections comment on the suitability of each of these measures in turn.

7.3.1. Collection for non-potable use

Some capture and reuse of rainfall at the Site is achievable for the proposed development.

7.3.2. Infiltration to ground

As evidenced by the soakaway test results (see Section 2.3.1), infiltration to ground is not viable at the Site. However, permeable paving remains a viable component of the drainage strategy by providing attenuation storage distributed across the development area.

7.3.3. Discharge to a surface water body

There are no surface water bodies in the vicinity of the western catchment.

The eastern catchment will discharge via gravity to the Copthorne Commons Ditch, which is located just to the north-east of the Site. This drainage ditch is classified as a 'Main River' by the EA. A Flood Risk Activity Permit (FRAP) will need to be applied for and approved by the EA prior to construction of the outfall/works within 8 m of the Main River.

The LiDAR DTM data have been used to estimate the invert level of this water feature to be 73.6m aOD. It is recommended that a more detailed topographical survey of this drainage receptor is undertaken prior to the detailed design of the Proposed Development.

7.3.4. Discharge to a surface water sewer

There are no public surface water sewer assets in the vicinity of the Site.

7.3.5. Discharge to a combined water sewer

The western catchment will discharge via gravity to an existing combined sewer located within Copthorne Bank to the west of the Site. Approval from the sewer operator would be required prior to the operation of this new discharge.

Thames Water's sewer records for the area are shown in Appendix D. Manhole 0801 is located within Copthorne Bank and serves a 150 mm diameter combined sewer. The cover level of this manhole is 79.36m aOD, and the invert is 77.1m aOD.

7.4. Attenuation storage requirements

In order for the eastern and western catchments to meet the permissible discharge rates, the provision of attenuation storage will be required.

The required attenuation storage volumes for each sub-catchment were calculated using Flow+ industry standard drainage design software, for a 6 hour event, and are presented in Table 7-2. The impermeable area values were uplifted by 12% in the calculations to account for urban creep and a small amount of runoff from residual green spaces. The design must allow for an appropriate allowance for climate change. For the Mole Management Catchment, the required climate change allowances are 35% and 40% for the 1 in 30 and 1 in 100 year events, respectively.

Table 7-2 Attenuation storage volume estimates

Sub-catchment	Attenuation storage volume range 1 in 100 year +40% climate change (m^3)	
	Minimum	Maximum
Eastern	3,177	4,214
Western	579	852

7.5. Proposed SuDS Management Train

A SuDS Management Train has been designed which comprises rainwater interception and re-use, source control techniques (permeable paving) green water conveyance infrastructure. In accordance with Civil Aviation Authority requirements, permanent water bodies (for example, ponds) have not been considered given the proximity of the Site to Gatwick Airport (i.e. due to the potential increased risk of aircraft bird strikes) but quick draining basins (which would only store water in rare storm events) have been considered.

The SuDS Management Train would ensure that the Proposed Development would: a) not result in an increase in surface water flood risk elsewhere; b) encourage rainwater interception and re-use; and c) provide water quality treatment benefits. The following sections describe the various components of the SuDS Management Train that will be delivered by the proposed development.

7.5.1. Source control (rainwater harvesting)

Rainwater harvesting tanks will be used within the residential and commercial units to capture and re-use roof runoff for non-potable purposes (e.g. for toilet flushing). This has the benefit of reducing both the demand for potable water and the volume of surface water runoff requiring disposal. Rainwater harvesting for each unit will be included as part of the detailed design of the Proposed Development.

It is difficult to accurately determine the volume of roof runoff that would be intercepted and re-used by each individual rainwater harvesting system (this will be a detailed design consideration). The

inclusion of rainwater interception and re-use systems in this way will, however, reduce the overall volume of runoff that will need to be stored by each subsequent element of the SuDS Management Train.

7.5.2. Source Control (permeable paving)

Permeable paving is suitable for use on private driveways, parking areas, local access roads, and pedestrian footpaths. In addition to attenuating runoff, permeable paving blocks have the capacity to infiltrate (to the sub-base) very high intensity rainfall events and are expected to manage the peak intensity associated with a short-duration (15-minute), summer profile, 1 in 100-year (+40% climate change) rainfall event at the Site.

The paving blocks would be constructed over gravel sub-grade layers, underlain by a geo-membrane. These gravel layers provide attenuation storage capacity and deliver water quality benefits, as microbial communities that develop within the sub-grade material are effective at breaking down hydrocarbons.

Table 7-3 summarises the potential attenuation storage volumes achievable through permeable paving in both the eastern and western catchments. A gravel sub-grade depth of 0.75 m and a void space ratio of 0.3 have been assumed in these calculations. Indicative permeable paving locations are shown in Figure 7-1.

Table 7-3 Attenuation storage provided by permeable paving for the eastern and western sub-catchments

Sub-catchment	Permeable paving area, m^2	Attenuation storage volume, m^3
Eastern	11,110	2,500
Western	3,800	855

7.5.3. Site control measures

To meet the attenuation storage requirements for the Eastern catchment, A detention basin will be placed at the north-eastern corner of the Site. From the basin, the water will drain via gravity to the Copthorne Commons Ditch (see Section 7.3.3). Details of the feature are provided in Table 7-5 below.

Table 7-4 Attenuation basin details (eastern catchment)

Level – top of storage unit, m aOD	Invert level, m aOD	Area, m^2	Mean depth of storage unit, m	Attenuation storage volume, m^3
76.25	75.20	2,309	0.75	1,732

The attenuation storage requirements for the western catchment have been met with the capacity afforded by the permeable paving feature only. However, an off-line attenuation will be placed in the western corner of the Site, near the Copthorne Bank, just before its discharge via gravity to the existing combined sewer located beneath Copthorne Bank (see Section 7.3.5). This will allow for the modulation of discharge rates without causing localised flooding. Details of the attenuation unit are provided in Table 7-5 below.

Table 7-5 Attenuation basin details (western catchment)

Level – top of storage unit, m aOD	Invert level, m aOD	Area, m^2	Depth of storage unit, m	Attenuation storage volume, m^3
79.6	78.85	243	0.75	182

A Hydro-Brake® (or similar flow control device) will be used to ensure that the permissible discharge rates for both sub-catchments is not exceeded under the 1 in 100-year, 6-hour duration event (with a 40% uplift for climate change).

Total attenuation storage requirements and provision for the western and eastern catchment are shown in Table 7-6 and Table 7-7, respectively. A conservative assumption has been made that the rainwater harvesting systems and conveyance swales will provide no attenuation.

Table 7-6 Total attenuation storage requirement and provision (eastern catchment)

Impermeable area, ha	Permissible discharge (QBAR) rate, l/s	Attenuation storage volume (1 in 100 year +40% climate change), m^3	Permeable paving attenuation storage volume, m^3	Detention basin storage volume, m^3	Total attenuation storage volume, m^3
3.66	18.2	**4,212**	2,500	1,732	**4,232**

Table 7-7 Total attenuation storage requirement and provision (western catchment)

Impermeable area, ha	Permissible discharge (QBAR) rate, l/s	Max. required attenuation storage volume (m^3)	Permeable paving attenuation storage volume, m^3	Sub-surface attenuation storage volume, m^3	Total attenuation storage volume, m^3
1.01	5.0	**852**	855	182	**1,037**

The next phase of drainage design work (i.e. the detailed design), will include a full drainage model. This will calculate total runoff volumes over the design storm events to demonstrate that there will be no exceedance in runoff volumes post-development.

The SuDS storage features described above will be designed to ensure they include a minimum of 300 mm of remaining freeboard depth under the design storm event (T30 +CCA). This may involve some tweaks to the dimensions stated above; this will be undertaken as part of the detailed design work.

7.6. Conveyance systems

Surface runoff at the Site will primarily be conveyed via a combination of an underground gravity-driven drainage system that follows the road network. The Site is not expected to require land raising/ lowering to accommodate a gravity-driven drainage system.

Indicative key node (manholes or inspection chambers) locations are included in the drainage strategy figure below (see Figure 7-1) along with current ground levels at each location (extracted from LiDAR data).

Additionally, where the levels allow, grassed channels/swales are recommended to transport runoff around the Site. These also contribute towards ecological targets for the development as well providing as water quality treatment functionality.

7.7. Exceedance routes

Due consideration needs to be given to the exceedance routes that could occur during events above the design standard of the various components of the proposed SuDS Strategy (i.e. surface water sewers, swales and the detention basin).

Figure 7-2 shows exceedance routes for two scenarios:

- Surcharging water from the proposed surface water sewers under storm conditions ranging from the 1 in 30-year event to the 1 in 100-year event plus climate change.

Under this scenario, water would surcharge from manholes/inspection chambers and be conveyed along the road surfaces to the detention basins. These exceedance flows would be shallow and contained within road kerbing. These exceedance routes have been calculated using the proposed stormwater drainage routes (Figure 7-1) and the existing LiDAR DTM data.

- Over-topping of the SuDS features under events well in excess of the 1 in 100 year plus 40% return period - which has been used for the feature design in this instance.

Under these extreme events, exceedance flows from the SuDS features will run off along the existing preferential surface water flow pathways (i.e. to the northeast and west).

Figure 7-1 Outline drainage strategy

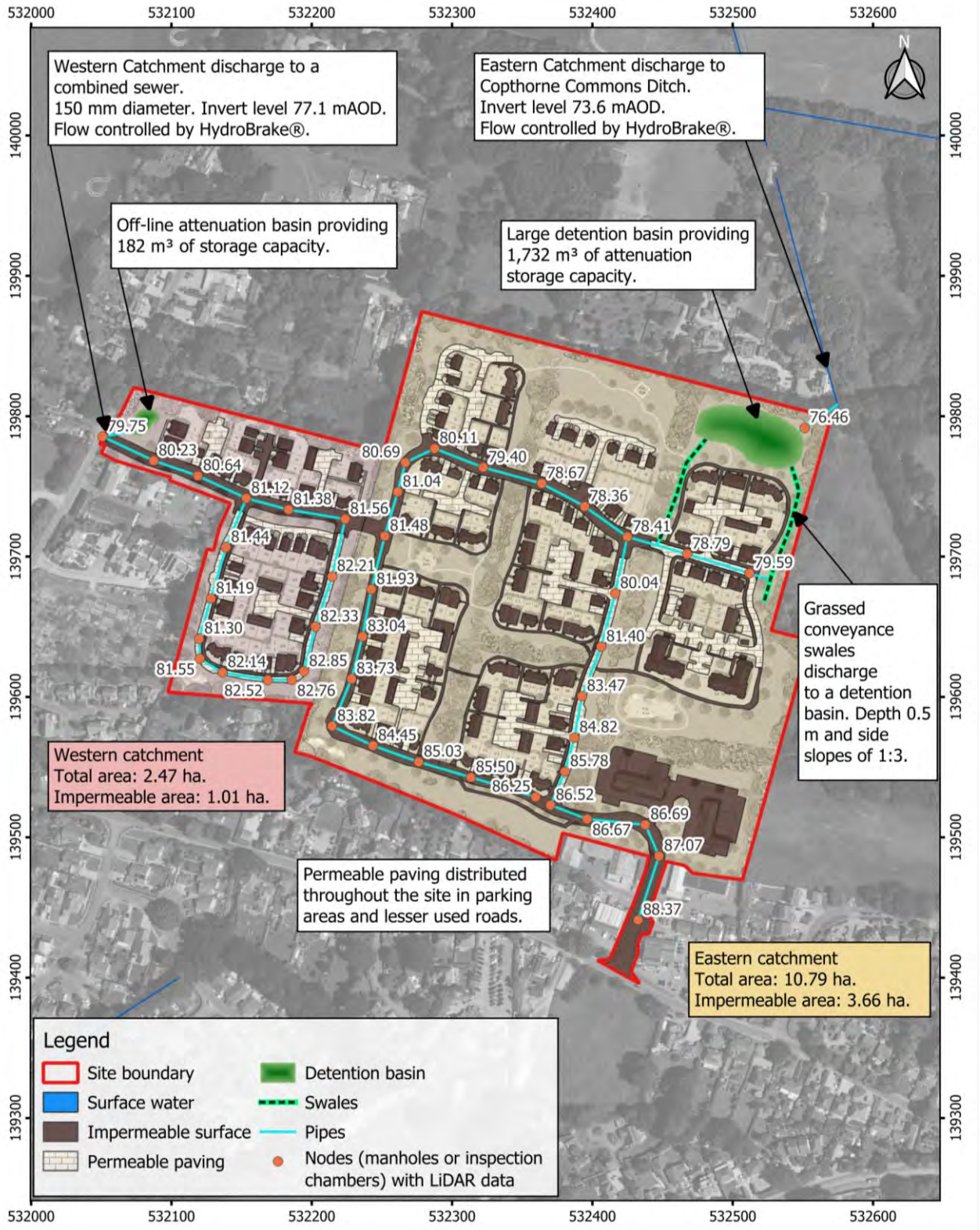


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Figure 7-2 Exceedance flow routes

7.8. Water quality

SuDS techniques can be used to effectively manage the quality of surface water flowing across a site. Different methods can be used to intercept pollutants and allow them to degrade or be stored in-situ without impacting the quality of water further downstream. Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (i.e. the 'first flush') should be adequately treated using SuDS.

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The proposed development will include residential dwellings, commercial buildings, low traffic roads and driveways. The CIRIA SuDS manual categorises runoff from residential dwellings as presenting a very low water quality hazard, runoff from low usage roads and residential driveways as presenting a low hazard rating, and runoff from commercial buildings as presenting a medium hazard rating (Table 7-8).

Table 7-8 Water quality hazard ratings (CIRIA, 2015)

Land use	Hazard level
Residential roof drainage	Very Low
Residential, amenity uses including low usage car parking spaces and roads, other roof drainage.	Low
Commercial uses including car parking spaces and roads (excluding low usage roads, trunk roads and motorways).	Medium
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemical and fuels (other than domestic fuel oil) are delivered, handled, stored used or manufactured, industrial sites.	High
Trunk roads and motorways	High

The CIRIA SuDS manual (CIRIA, 2015) advocates a qualitative approach to designing a SuDS scheme for a site with a low hazard rating. This should provide adequate controls on pollutants contained in runoff water.

As the proposed development is primarily residential in nature with a low hazard rating, hazard indices of 0.5 for total suspended solids (TSS), 0.4 for metals and 0.4 for hydrocarbons are considered applicable.

The measures detailed in Table 7-9 are examples which are suitable for inclusion in a drainage strategy for a residential development to mitigate a potential increase in sediment load within on-site and off-site runoff – note text in bold are measures included in this SuDS Strategy. Removal indices are included for each feature type relative to the specific pollutant.

Table 7-9 Mitigation indices for SuDS components (discharges to surface water)

Component Type	TSS	Metals	Hydrocarbons
Filter drain	0.4	0.4	0.4
Swale	**0.5**	**0.6**	**0.6**
Permeable paving	**0.7**	**0.6**	**0.7**
Detention basin	**0.5**	**0.5**	**0.6**
Pond	0.7	0.7	0.5

The sequence of permeable paving, swales and detention basins included within the SuDS Strategy for the proposed development will provide adequate treatment to mitigate the low hazard associated with runoff from the development.

Sediment traps (i.e. sumps within the inspection chambers of the final manhole upstream of each feature) will be used to facilitate the maintenance of these features and reduce the build-up of potentially polluted material.

All runoff from roads will pass through at least one water treatment feature prior to discharging to a watercourse (to be included at the detailed design phase).

7.9. SuDS maintenance

Inspection and long-term maintenance of SuDS components ensure efficient operation and prevents failure.

This section outlines the maintenance and management schedules for the proposed stormwater drainage system. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual. There are three categories of maintenance activities referred to in this report:

- **Regular maintenance** – tasks which are required to be undertaken on a weekly or monthly basis, or as required.
- **Occasional maintenance** – tasks which are required to be undertaken periodically, typically at intervals of three months or more.
- **Remedial maintenance** – tasks which are not required on a regular basis but are done when necessary.

This section is intended to give an overview of the operation and maintenance for the range of drainage features included within the surface water drainage strategy and in relation to typical/ standard details only.

Maintenance schedules for the proposed SuDS components are provided in the following tables. These requirements will be implemented following the completion of the proposed development, and will be undertaken either by the Lead Local Flood Authority, a private management company or by the local water company, subject to discussions regarding this responsibility. These schedules are not exhaustive and should be reassessed at regular intervals to determine if any additional maintenance requirements are required to preserve the performance and condition of the drainage system.

Table 7-10 Management and maintenance requirements for pipes and manholes

Maintenance schedule	Required action	Maintenance frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc	Monthly, or as required
	Inspect for evidence of poor operation	Monthly (during the first year), then half yearly
Occasional maintenance	High pressure water jet removal of silt build-up and avoid blockages, particularly at bends or changes in direction	Six monthly, or as required
	Remove or control tree roots where they are encroaching pipe runs, using recommended methods	As required
Remedial actions	Clear pipework and gully grates of blockages	As required
	Replace any damaged or failed pipes, gullies or manholes	As required

Table 7-11 Management and maintenance requirements for permeable paving

Maintenance schedule	Required action	Maintenance frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required.
	Stabilise and mow contributing and adjacent areas	As required

Maintenance schedule	Required action	Maintenance frequency
Occasional maintenance	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required - once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 7-12 Management and maintenance requirements for swales

Maintenance schedule	Required action	Maintenance frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Manage vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or as required
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	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

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Maintenance schedule	Required action	Maintenance frequency
		more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required

Table 7-13 Management and maintenance requirements for detention basins

Maintenance schedule	Required action	Maintenance frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc	Monthly, or as required
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start), or as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from outlets, forebays and main basin when required	Every 5 years, or as required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Table 7-14 Management and maintenance requirements for control devices

SuDS Device	Maintenance requirements	Maintenance frequency
Regular maintenance	Inspect/check pipework to ensure that the flow control is in good condition and operating as designed	Monthly
	Inspect for evidence of poor operation	Monthly, or as required

SuDS Device	Maintenance requirements	Maintenance frequency
Occasional maintenance	High pressure water jet removal of silt build-up	Six monthly, or as required
Remedial actions	Clear pipework of blockages	As required
	Replace the flow control if it becomes damaged	As required

7.10. Further SuDS considerations

Additional SuDS options that may be considered for the Site are as follows:

- Rainwater harvesting/water butts are primarily used to collect rainwater from impermeable areas and roofs for the use within development buildings and other miscellaneous usage. Due to the relatively small amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such as toilet flushing or garden maintenance, the volume of runoff which could be attenuated by rainwater harvesting has not been considered within the report. Cost in regard to rainwater harvesting is mainly due to the provision of a storage tank, pumps and pipework which is required for the system to be fully operational.
- Raingardens and ponds are additional attenuation features which could be located across the Site. These would also provide increased biodiversity and amenity benefits.

7.11. Foul drainage

A foul water connection will be made to the existing combined sewer network beneath Copthorne Road and Clay Hall Lane (see Appendix D).

A pre-planning application has been submitted to Thames Water to confirm that there is sufficient capacity within the public sewer network to receive foul water discharge from the proposed development. Thames Water responded on 3rd November 2025, confirming there is sufficient capacity for foul water discharge from the proposed development. This is based on 126 houses of the proposed development discharging via gravity to manhole TQ32394401 on a 150mm foul sewer along Borers Arm Yard and for 126 houses of the proposed development discharging via gravity to manhole TQ32390801 on a 150mm combined sewer along Copthorne Bank. Thames Water's response is presented in Appendix E.

7.12. Biodiversity and amenity

SuDS schemes present opportunities to enhance habitat for wildlife on-site and this often improves the biodiversity of the surrounding areas. Ponds, constructed wetlands and other surface water features are landscape assets that have amenity value and improve the aesthetics of a site more than conventional drainage systems. The use of a grassed detention basins and swales (with larger, more mature vegetation along the tops of the banks) will enhance the biodiversity and amenity value of the Site post-development. Ecological diversity should be enhanced by the use of native planting within each feature.

8. Conclusions

The flood risk assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Planning Policy Guidance to the National Planning Policy Framework (NPPF). The drainage strategy has been prepared in accordance with the DEFRA (2025) National Standards for SuDS and the requirements of West Sussex County Council as the Lead Local Flood Authority (LLFA).

The assessment has:

- Investigated all reasonably foreseeable potential risks of flooding to the Site.
- Considered outline design proposals and suggested mitigation measures against the potential risk of flooding determined to be present.
- Considered the impact the development may have elsewhere with regards to flooding.

The report concludes that:

- Following development, the majority of the Site's flood risk vulnerability classification would change from “Less vulnerable” to “More vulnerable”.
- The Site is located entirely in Flood Zone 1 and is not known to have flooded in the past from fluvial sources.
- Most of the Site has a negligible risk of surface water flooding. Small areas of the Site are at elevated risk of surface water flooding, and will be managed by the Site's Drainage Strategy.
- The Site has negligible risk of groundwater flooding, low risk of sewer flooding and it is not in an area at risk of flooding from a reservoir failure.
- The proposed development at the Site is appropriate according to the NPPF. Providing the implementation of the drainage strategy (see Section 7), the surface water flood risk at this Site will be reduced to an acceptable level.

9. References

Aqua Terra. (2025). *Land North of Borers Arms Road, Copthorne: Soakaway Testing. April 2025.*

CEH. (2025). *The Flood Estimation Handbook (FEH) Online Service, Centrefor Ecology & Hydrology, Wallingford, Oxon, UK.*

CIRIA. (2015). *The SuDS Manual V2. C753* .

DEFRA. (2010). *Press release on reservoir flood map release for public use.* https://www.gov.uk/government/news/reservoir-flood-maps-published.

DEFRA. (2025). *Non-Statutory Technical Standards for SuDS.*

Environment Agency. (2013). *Guidance on rainfall runoff management from developments.*

JBA. (2017). *Reigate & Banstead Borough Council, Mole Valley District Council and Tandridge District Council. Level 1 Strategic Flood Risk Assessment.*

UK Centre for Ecology & Hydrology. (2023). *Flood Estimation Handbook Web Service*. Retrieved from https://fehweb.ceh.ac.uk/GB/map

Appendix A Report conditions

Report Conditions

This report has been prepared by Aqua Terra Consultants Ltd. (Aqua Terra) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by Aqua Terra solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Aqua Terra at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology, and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

Where necessary and appropriate, the report represents and relies on published information from third party, publicly and commercially available sources which is used in good faith of its accuracy and efficacy. Aqua Terra cannot accept responsibility for the work of others.

Site investigation results necessarily rely on tests and observations within exploratory holes only. The inherent variation in ground conditions mean that the results may not be representative of ground conditions between exploratory holes. Aqua Terra take no responsibility for variation in ground conditions between exploratory positions.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, Aqua Terra may, by prior written agreement, agree to such release, if it is acknowledged that Aqua Terra accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. Aqua Terra accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual, or otherwise, against Aqua Terra except as expressly agreed with Aqua Terra in writing. Aqua Terra reserves the right to withhold and/ or negotiate the transference of reliance on this report, subject to legal and commercial review.

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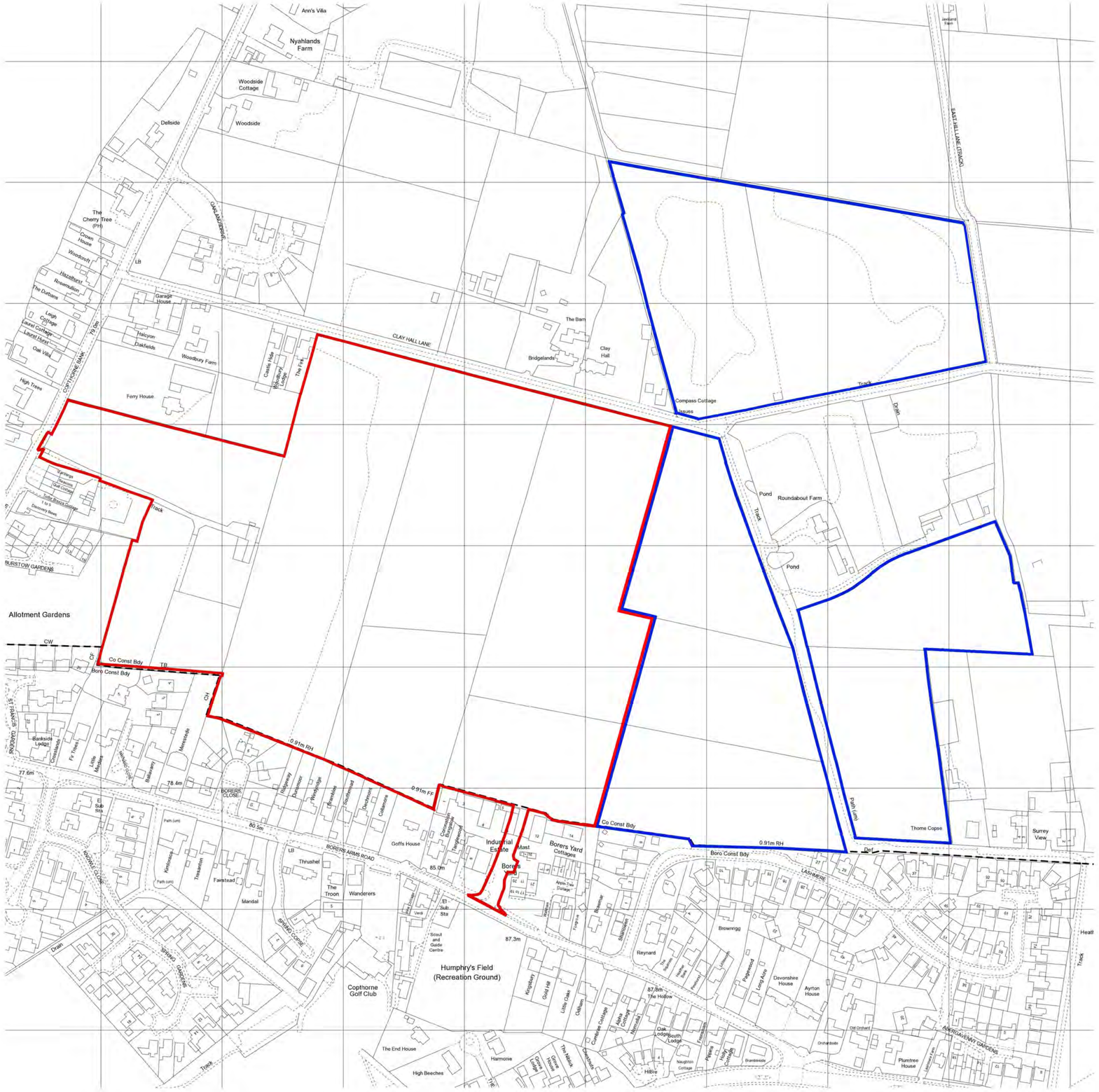
Appendix B Development plans



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0 20 40 60 80 100

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Reference: OI1342287
Centre coordinates: 532469 139698

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Fairfax
FAIRFAX AQUISITIONS LTD

project:

LAND NORTH OF BORERS ARMS ROAD, COPTHORNE.

title:

LOCATION PLAN

date: October '25 **scale:** 1:2500 @ A2

drawing number:	Rev.
2512/PL.01	D

Paul Hewett R.I.B.A.
CHARTERED ARCHITECT

Paul Hewett BA(Hons) DipArch(Hons) R.I.B.A.
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BN16 4HF
Tel: 01903 778701
email: hewett439@btinternet.com

N

Metres
0 10 20 30 40 50
1:1250

Clay Hall Lane
Copthorne Bank
Play Area
Track
Drain
Pond
Roundabout Farm
Borers Arms Road
Borers Yard
Beechey Way
St Francis Gardens
Mayfield Close
Spring Gardens
Spring Copse
Lasmere

Scale: 1 : 1250 @ A1 Drn By: PjH Date: Oct '25
Drg No: 2512/PL.08 Rev.J

Project:
LAND NORTH OF BORERS ARMS ROAD , COPTHORNE

Drawing Title:
ILLUSTRATIVE COLOURED MASTERPLAN

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Paul Hewett BA(Hons)DipArch(Hons)R.I.B.A.
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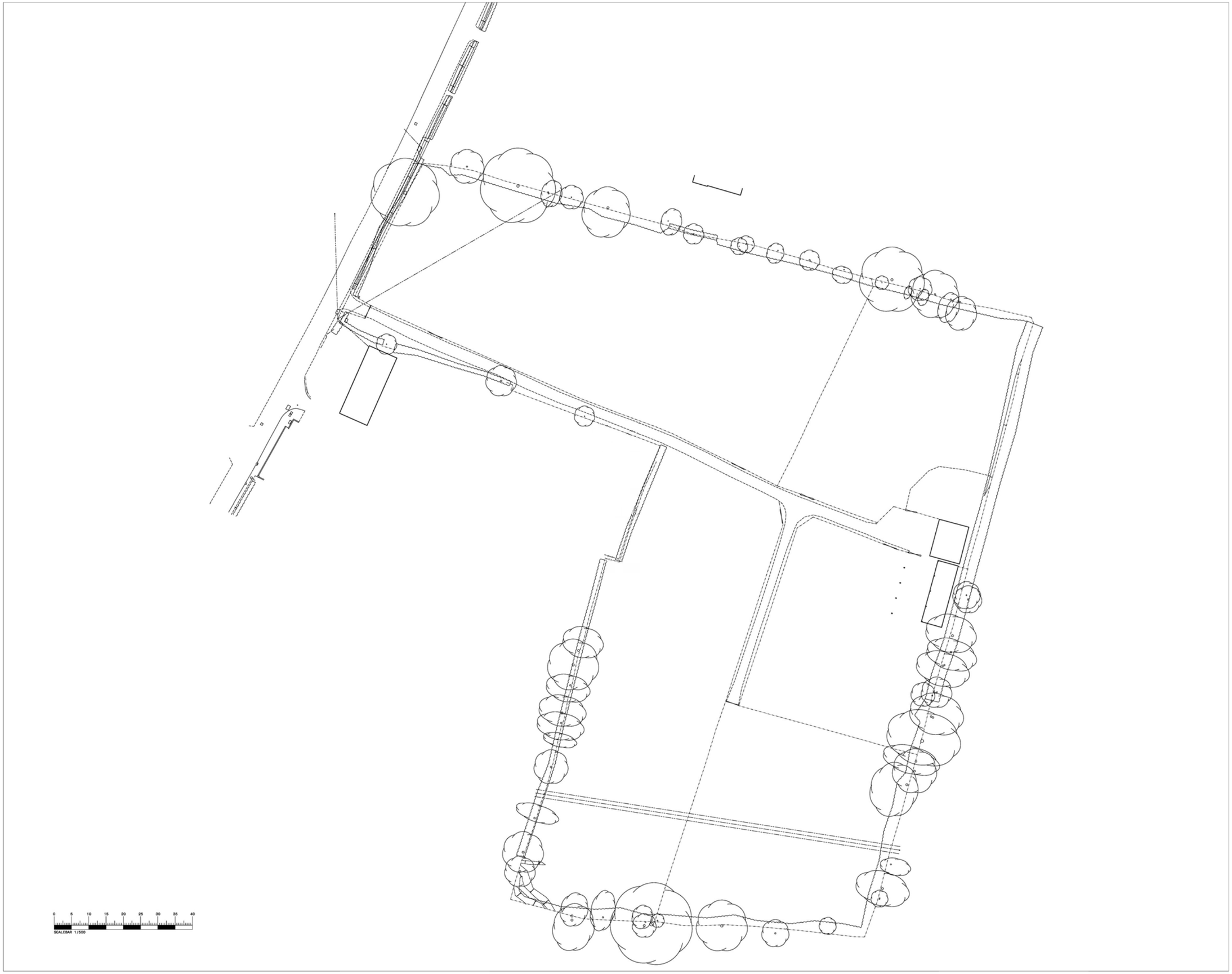
51 Foxdale Drive : The Dell : Angmering : West Sussex : BN16 4HF

Appendix C Topographic survey


0 5 10 15 20 25 30 35 40
SCALEBAR 1/500

Appendix D Sewer Asset Plans

Asset location search

Thames Water Property Searches

Apogee
Hall Park CourtHall Park Way
TELFORD
TELFORD
TF1 3PT

Search address supplied

Ferry House
Copthorne Bank
Copthorne
Crawley
RH10 3JF

Your reference 420882

Our reference ALS/ALS Standard/2019_4126042

Search date 12 December 2019

Keeping you up-to-date

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

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

0845 070 9148

Asset location search

Property Searches

Search address supplied: Ferry House, Copthorne Bank, Copthorne, Crawley, RH10 3JF

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 0845 070 9148, 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

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ3239SE
TQ3239SW
TQ3239NW

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.

The following quartiles have not been printed as they contain no assets:

TQ3239NE

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.

Following examination of our statutory maps, Thames Water has been unable to find

any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TQ3239SE	Sutton and East Surrey
TQ3239SW	South East
TQ3239NE	Sutton and East Surrey
TQ3239NW	Sutton and East Surrey

Sutton & East Surrey Water
London Road
Redhill
Surrey
RH1 1LJ

Tel: 01737 772 000
Fax: 01737 766 807
Website: www.waterplc.co.uk.

South East Water Ltd
Rocfort Road
Snodland
Kent
ME6 5AH

Tel: 0845 301 0845
Website: www.southeastwater.co.uk.

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.

Asset location search

Property Searches

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/2019_4126042

TQ3239SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 532750,139250

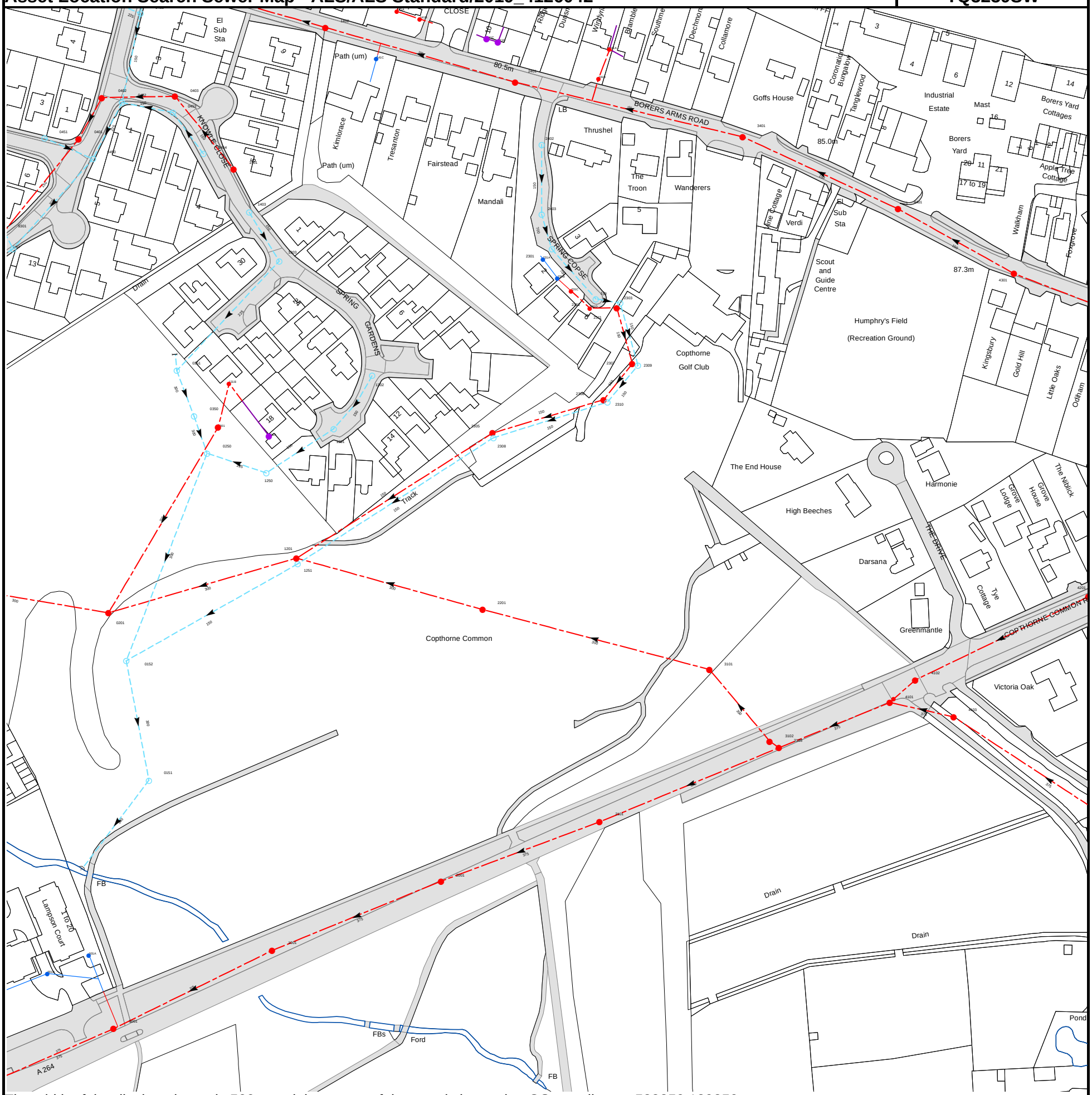
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual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

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
7304	92.35	91.22
7303	91.52	90.31
7301	91.45	89.05
7402	n/a	n/a
7401	90.25	89.02
7403	90.16	89.22
9101	n/a	n/a
7201	89.56	86.94
721A	n/a	n/a
7003	83.87	82.61
7302	92.47	91
7001	84.84	82.14
7305	93.1	92.04
7306	92.66	91
8204	90.41	n/a
8203	91.53	89.65
8202	91.65	89.89
8201	90.56	88.56
8001	86.13	83.94
8002	85.45	83.84
9001	86.48	85.27
9002	86.99	84.61
5101	78.31	75.66
5303	n/a	n/a
5304	88.25	87.56
5302	88.25	86.54
5403	88.61	87.16
5202	82.97	82
5401	88.55	87.25
5301	87.73	86.18
5404	88.34	86.86
5402	88.3	87.47
5201	83.89	81.92
6201	86.06	84.03
6001	79.51	77.63
6003	n/a	n/a
6403	88.98	88.09
6401	89.1	88.22
6002	81.59	80.41
6402	n/a	88.67
7002	82.68	80.82

Asset Location Search Sewer Map - ALS/ALS Standard/2019_4126042

TQ3239SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 532250,139250

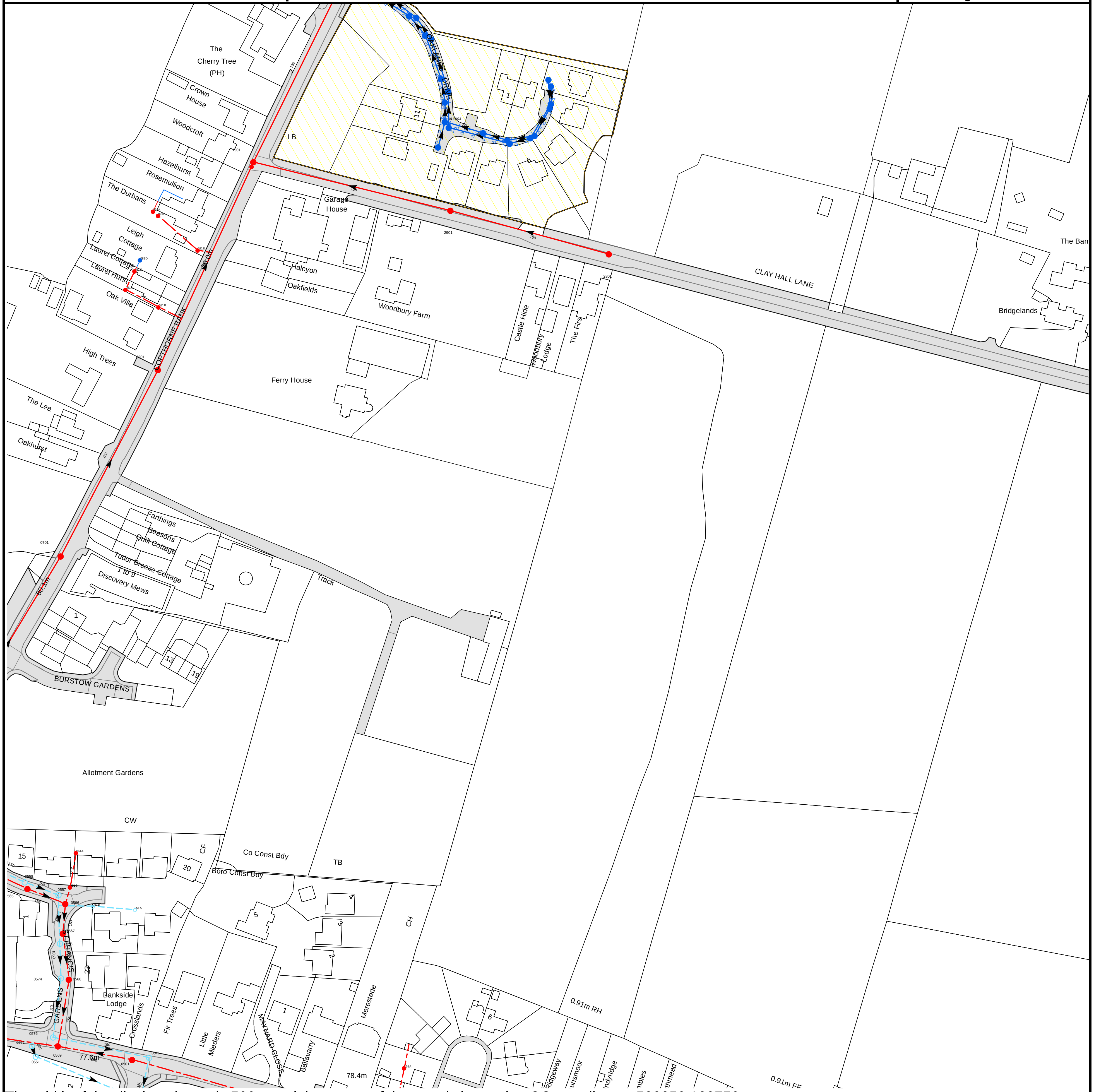
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual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

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
241C	n/a	n/a
1402	n/a	n/a
141B	n/a	n/a
0455	77.5	75.32
141A	n/a	n/a
3103	76.17	74.47
4101	77.31	74.83
4401	85.83	83.38
4102	77.81	76.08
4103	77.89	74.96
4301	87.21	85.03
4201	80.81	79.13
0001	72.48	70.36
001A	n/a	n/a
1001	72.67	70.72
2001	74.02	71.77
2101	75.07	72.92
0151	72.84	71.72
3102	76.16	74.16
3101	n/a	n/a
0152	73.58	72.13
0201	73.64	71.74
2201	74.51	73.06
1251	74	72.95
1201	74	72.95
1250	73.87	73.3
0250	73.93	72.85
2308	76.56	74.8
131A	n/a	n/a
2305	76.56	74.98
1301	n/a	73.54
0301	73.85	72.73
0350	73.8	72.92
2310	77.56	75.93
2306	77.56	76.03
131B	n/a	n/a
1302	n/a	73.77
0351	74.01	73.33
2309	78.74	76.24
2307	78.74	76.65
231D	n/a	n/a
2311	79.47	77.12
2303	79.47	76.51
2302	79.29	76.33
231C	n/a	n/a
231B	n/a	n/a
1303	n/a	74.04
231A	n/a	n/a
2301	79.07	76.76
2403	79.21	76.79
1403	n/a	74.25
1401	75.15	73.94
0450	74.41	72.81
0454	74.99	74.1
2402	80.07	78.72
0401	74.36	72.09
3401	84.23	81.64
0453	75.13	73.42
0452	75.05	73.15
0402	74.95	72.38
0403	75.41	73.32
2401	80.37	78.05
241B	n/a	n/a
141C	n/a	n/a
241A	n/a	n/a
241D	n/a	n/a
0352	73.89	72.06
001B	n/a	n/a
0451	74.17	73.18

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 Map - ALS/ALS Standard/2019_4126042 | **TQ3239NW**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 532250,139750

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.

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
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
151A	n/a	n/a
0501	77.68	75.13
0575	n/a	n/a
0568	n/a	77.2
051A	n/a	n/a
051B	n/a	n/a
051C	n/a	n/a
061A	n/a	n/a
0801	79.36	77.1
081B	n/a	n/a
081A	n/a	n/a
081C	n/a	n/a
081D	n/a	n/a
2801	77.79	76.41
081E	n/a	n/a
091B	n/a	n/a
091A	n/a	n/a
2901	78.27	76.07
1901	78.67	75.62
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
0551	77.38	75.96
0569	n/a	n/a
0552	77.5	76.46
0576	n/a	n/a
0574	n/a	n/a
0556	n/a	n/a
0567	n/a	77.63
0566	n/a	77.8
0557	n/a	78.65
0565	n/a	n/a
0558	n/a	n/a
0701	80.04	77.76

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

ALS/ALS Standard/2019_4126042

0 40 80 160 240 320
Meters

Scale:	1:6966
Width:	1946m
Printed By:	Njaishan
Print Date:	12/12/2019
Map Centre:	532379,139672
Grid Reference:	TQ3239NW

Comments:

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

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

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

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.

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate 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 level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. 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 present on the plan, please contact a member of Property Insight on 0845 070 9148.

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 14 days from due 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. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. 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'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. 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 not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

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 0121 345 1000 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**	**Cheque**
Call **0845 070 9148** quoting your invoice number starting CBA or ADS / OSS	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	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if the Ombudsman finds that you have suffered actual loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Web site: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Appendix E Thames Water capacity check

Rebekah Wain

Aqua Terra Consultants Ltd
14 Museum Place
Cardiff
CF10 3BH

Wastewater pre-planning
Our ref DS6150002/DTS53586

03 November 2025

Pre-planning enquiry: Confirmation of sufficient capacity (foul water)

Site Address: Land West of Roundabouts Farm, Clay Hall Lane, Copthorne, RH10 3JE

Dear Rebekah,

Thank you for providing information on your proposed development of 252 houses. 126 houses to discharge via gravity into manhole TQ3239**4401** on a 150mm foul sewer along Borers Arms Road. 126 houses to discharge via gravity into manhole TQ3239**0801** on a 150mm combined sewer along Copthrone Bank.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3 and the National SuDS Standards, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

National SuDS Standards, Standard 1.2: Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

priority 1: collected for non-potable use
priority 2: infiltrated to ground
priority 3: discharged to an above ground surface water body
priority 4: discharged to a surface water sewer, or another piped surface water drainage system
priority 5: discharged to a combined sewer

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

Where disposal of surface water is other than to a public sewer, then the applicant shall ensure that approval for the discharge has been obtained from the appropriate authorities.

Capacity at STW?

The receiving network is served by Crawley STW. Please visit our website for updates on the site specific upgrades.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connections.

Please see our FAQ's leaflet for additional information.

If you have any further questions, please contact us.

Yours sincerely,

Jiahang Yu
Adoptions & Pre-Planning Engineer
Developer Services