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Flood Risk and Drainage Strategy for
the Proposed Development at
Garages off Lower Higham Road,
Chalk, Gravesham, Kent

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Proposed Development at Garages off Lower
Higham Road, Chalk, Gravesham, Kent

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1 Scope of Appraisal

Herrington Consulting has been commissioned by **Stem Homes Ltd** to prepare a Flood Risk and Sustainable Drainage Assessment for the proposed development at **Garages off Lower Higham Road, Chalk, Gravesham, Kent, DA12 2NG**.

A Flood Risk Assessment (FRA) appraises the risk of flooding to development at a site-specific scale and recommends appropriate mitigation measures to reduce the impact of flooding to both the site and the surrounding area. New development has the potential to increase the risk of flooding to neighbouring sites and properties through increased rates of discharge from the site and as such, an assessment of the proposed site drainage can help to accurately quantify these rates. This assessment considers the practicality of incorporating Sustainable Drainage Systems (SuDS) into the scheme design and viability of managing foul effluent from the site to satisfy the requirements of the LPA/LLFA at the planning application stage.

This report has been prepared to supplement a full planning application and has been prepared in accordance with the requirements of both national and local planning policy. To ensure that due account is taken of industry best practice, reference has also been made to CIRIA Report C753 'The SuDS Manual' and any relevant local planning policy guidance. The surface water management strategy included within this report is not intended to constitute a detailed drainage design.

2 Background Information

2.1 Site Location and Existing Use

The site is located at Ordnance Survey (OS) coordinates 566941, 173015 off Lower Higham Road in Chalk, Kent. The site covers an area of approximately 540m² and currently comprises a set of lock up garages. The location of the site, in relation to the surrounding area, is shown in Figure 2.1 below.

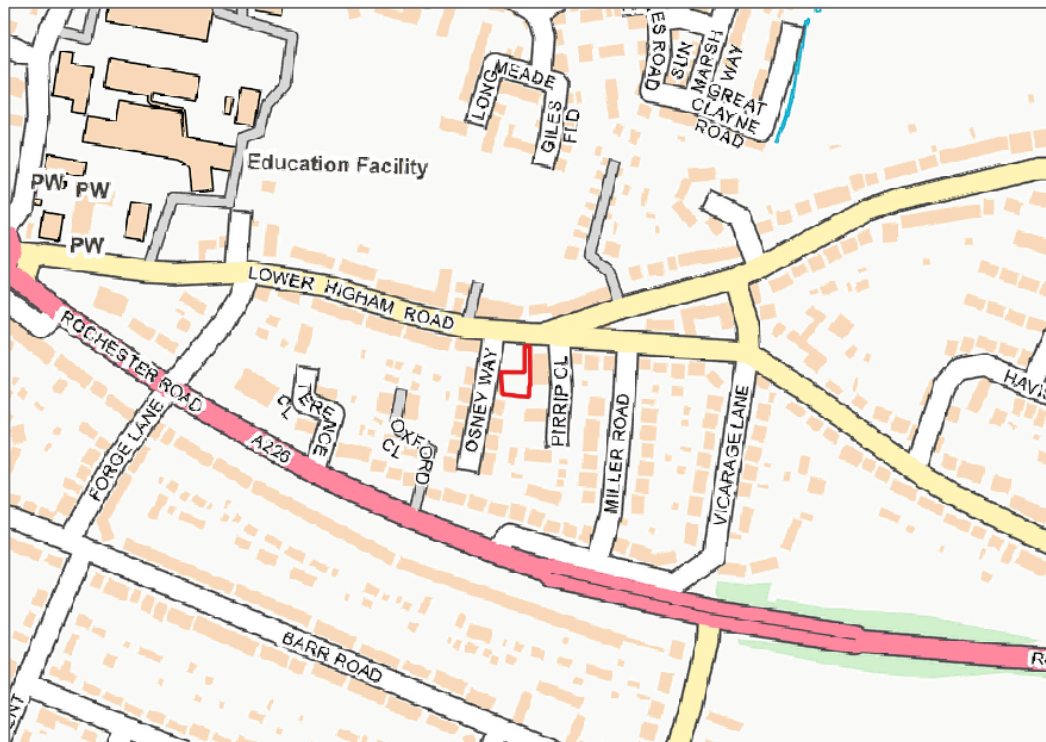


Figure 2.1 – Location map (contains OS data © crown copyright and database right 2021).

2.2 Site Geology and Topography

Reference to the British Geological Survey (BGS) data identifies that the geology at the site comprises Thanet Formation (sand) bedrock, with no overlying superficial deposits.

Reference to the site-specific topographic survey indicates that land levels at the site vary between 15.19m and 18.63m Above Ordnance Datum Newlyn (AODN). Land levels fall in a northerly direction.

2.3 Proposed Development

The development proposals comprise the construction of 3no. three-bedroomed dwellings and 1no. two-bedroomed dwelling on site with associated parking and garden (Figure 2.2).



Figure 2.2 – Proposed ground floor layout plan.

Further drawings of the proposed scheme are included in Appendix A.1 of this report.

2.4 Planning Policy and Context

For any new development situated within Flood Zones 2 and 3 of a main river or the sea, or for sites greater than 1ha in size, the National Planning Policy Framework (NPPF) requires a detailed FRA to be undertaken. Inspection of the Environment Agency's (EA) 'Flood Map for Planning' shows that the site is located within Flood Zone 1 and is smaller than 1ha in size. Consequently, a FRA would not typically be required.

However, Gravesham Borough Council (Local Planning Authority - LPA) were consulted to provide pre-application advice as part of the previously approved application onsite (Ref: 20201379), and as part of their response, the LPA stated that an FRA will be required. Consequently, this report has been prepared to accompany the planning application.

In addition to the above, the general requirement for all new development is to ensure that the runoff is managed sustainably, and that the development does not increase the risk of flooding at the site, or within the surrounding area. In the case of brownfield sites, drainage proposals are typically measured against the existing performance of the site, although it is preferable (where practicable) to provide runoff characteristics that are similar to greenfield behaviour.

The Non-statutory Technical Standards for Sustainable Drainage Systems (NTSS) specify criteria to ensure sustainable drainage is included within developments classified as 'major' as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010). In this instance, the proposed development is for the construction of 4no. residential units with a total floor space smaller than 1000m². As a result, the proposals are classified as 'minor' development and therefore, the NTSS will not apply.

Nonetheless, Policy CS18 of Gravesham Borough Council's local plan states that the council will seek to minimise the impact of drainage from new development on wastewater systems. In particular, the council will require that surface water run-off from all new development has, as a minimum, no greater adverse impact than the existing use; and require the use of sustainable drainage systems on all developments where technically and financially feasible.

2.5 Climate Change

The global climate is constantly changing but it is widely recognised that we are now entering a period of accelerating change. Over the last few decades there have been numerous studies into the impact of potential future changes in the climate and there is now an increasing body of scientific evidence which supports the fact that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during this century.

The nature of climate change at a regional level will vary. For the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall, and more frequent periods of long-duration rainfall (of the type responsible for the recent UK flooding), could be expected.

These effects will tend to increase the size of flood zones associated with rivers and the amount of flooding experienced from other inland sources. Consequently, the following section of this report takes into consideration the impacts of climate change and references the most contemporary guidance that is applicable to the development site.

Planning Horizon

To ensure that any recommended mitigation measures are sustainable and effective throughout the lifetime of the development, it is necessary to base the appraisal on climate change predictions that are commensurate with the planning horizon for the proposed development. The NPPF and supporting Planning Practice Guidance Suite state that residential development, such as the proposed development, should be considered for a minimum of 100 years.

Potential Changes in Climate

The recommended allowances for increases in peak rainfall are applicable nationally. These allowances, shown in Table 2.1 below, provide a range of values that correspond with the Central and Upper End percentiles (i.e., the 50th and 90th percentile respectively) over three-time epochs.

Allowance Category (applicable nationwide)	Total potential change anticipated for each epoch		
	2015 to 2039	2040 to 2069	2070 to 2115
Upper End	+10 %	+20 %	+40 %
Central	+5 %	+10 %	+20 %

Table 2.1 – Recommended peak rainfall intensity allowance for small and urban catchments (1961 to 1990 baseline).

Guidance published by the EA states that the 'upper end' allowance should be considered when designing SuDS. As the development subject to this FRA has a planning horizon of 100 years, a 40% increase in peak rainfall intensity has been used for the calculations in the outline surface water management strategy (refer to Section 5).

3 Potential Sources of Flooding

In determining whether the proposals for development are compliant with the NPPF, it is necessary to determine whether the development will be sustainable in terms of flood risk. Consequently, the main sources of flooding have been assessed below and summarised in Section 3.7.

3.1 Risk of Flooding from Rivers, Ordinary and Man-Made Watercourses

The EA's 'Flood Map for Planning' shows the site is situated in Flood Zone 1 (Figure 3.1). Inspection of OS mapping identifies that the closest watercourses to the site are within the Shorne and Higham Marshes, which are located approximately 250m to the north of the site. Aerial height data identifies that the site is elevated over 10m above these watercourses and consequently, the risk of flooding to the site from this source is considered to be *low*.

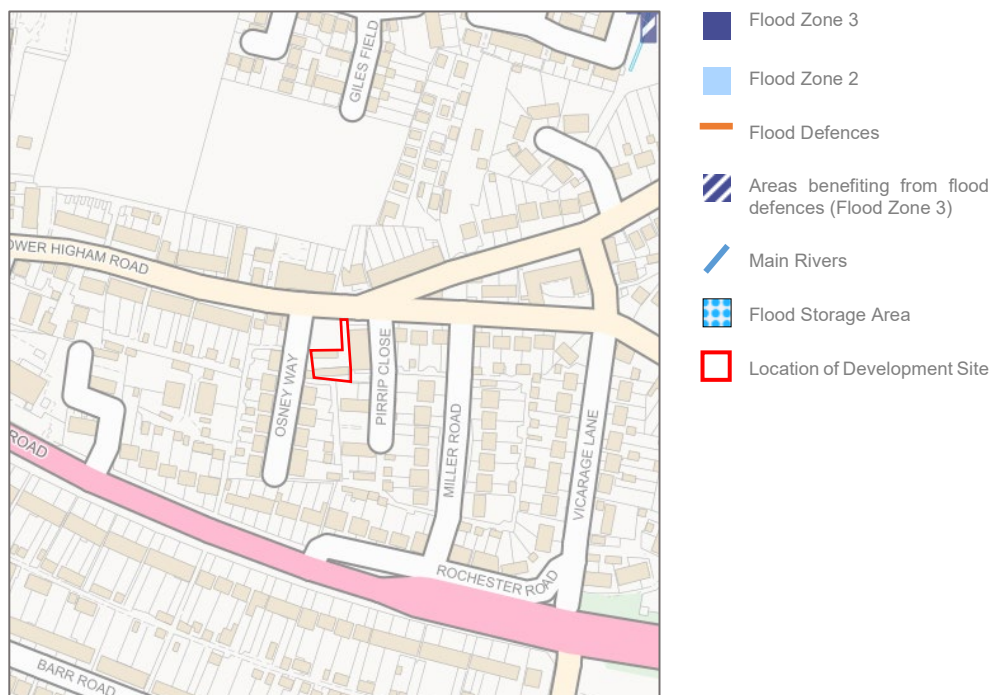


Figure 3.1 – EA's 'Flood Map for Planning' (© EA).

3.2 Risk of Flooding from the Sea

The site is located a significant distance inland and is elevated above predicted extreme tide levels. Consequently, the risk of flooding from this source is considered to be low.

3.3 Risk of Flooding from Overland Flow

Overland flooding typically occurs in natural valley bottoms as normally dry areas become covered in flowing water and in low spots where water may pond. This mechanism of flooding can occur almost anywhere, but is likely to be of particular concern in any topographical low spot, or where the pathway for runoff is restricted by terrain or man-made obstructions.

Inspection of the EA's 'Risk of Flooding from Surface Water' map (Figure 3.2) identifies that the site is located in an area at 'very low' risk of flooding from surface water. Furthermore, there are no records of flooding from surface water at the site contained within the SWMP. Consequently, it is considered that the risk of flooding from this source is *low*.

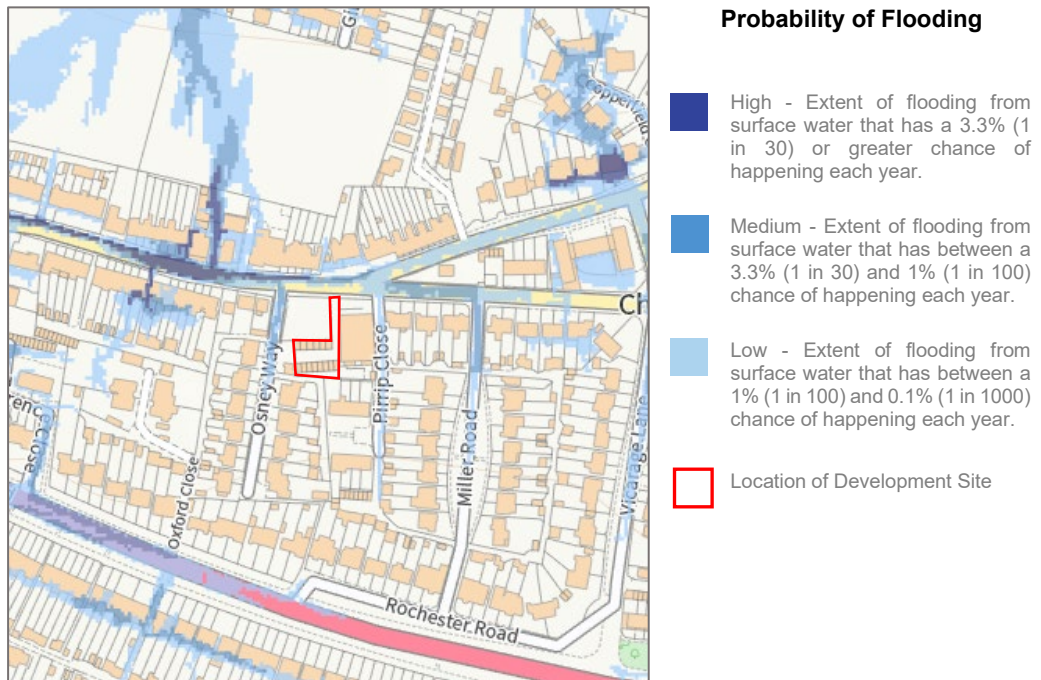


Figure 3.2 – EA's 'Flood Risk from Surface Water' map (© EA).

While the proposed development is at 'very low' risk of flooding from surface water, the access route into the site is, however, shown to be at 'low' to 'high' risk of flooding. To determine whether safe access will be available to the site, the hazard mapping outputs from the EA's 'Risk of flooding from Surface Water' maps for the low probability of occurrence event have been interrogated (Figure 3.3).

This mapping identifies that the hazard rating within Lower Higham Road heading east is 'low' and therefore **safe access will be available to the proposed development at all times**. However, as the hazard rating along Lower Higham Road to the west of the site is classified as 'low' to 'significant', access would not be available in this direction. It is recommended that the residents of the proposed development regularly check weather forecasts and the met office weather warnings. These warnings will ensure that the residents are aware of conditions which could result in flooding in the access road as access may not be available in a westerly direction along Lower Higham Road at the peak of an extreme rainfall event.

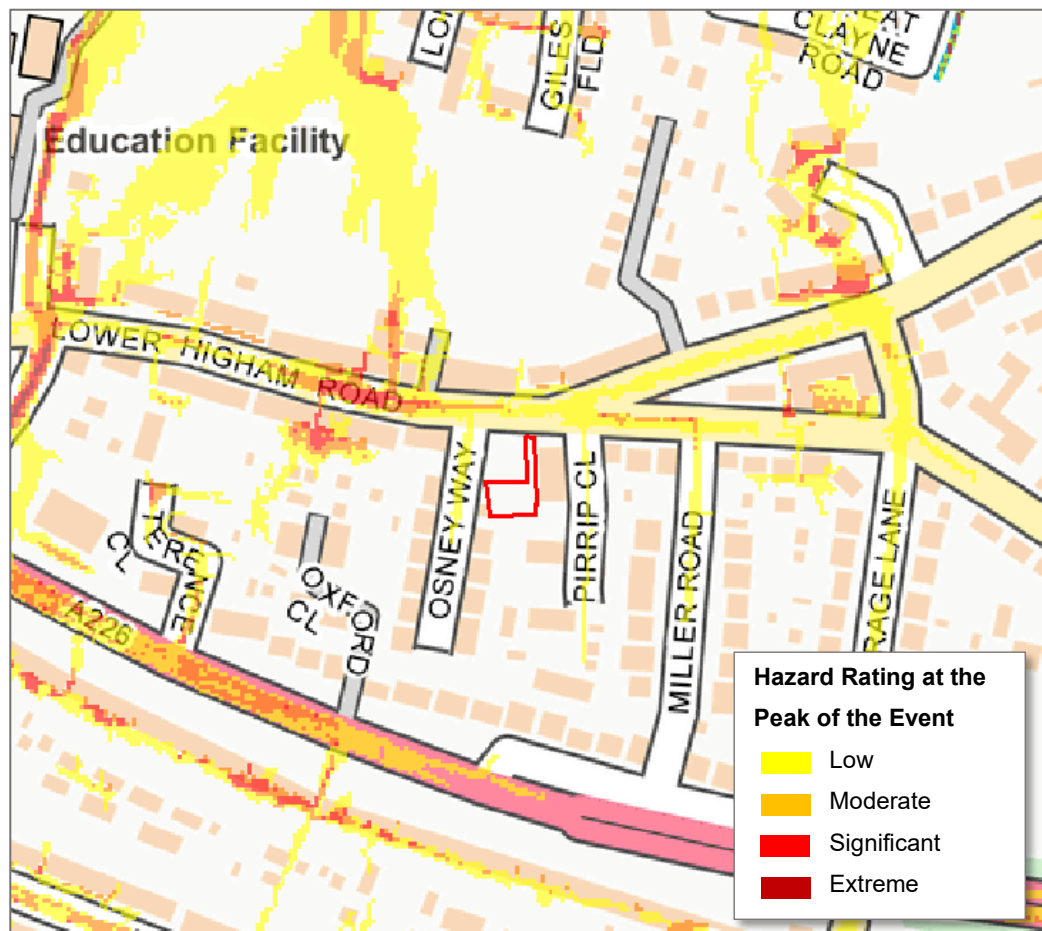


Figure 3.3 – Hazard mapping output from the EA's 'Risk of Flooding from Surface Water' maps for the 'low' probability event (© EA). Site boundary delineated in red.

3.4 Risk of Flooding from Groundwater

Water levels below the ground rise during wet winter months, and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land, as well as reactivating flow in 'bournes' (streams that only flow for part of the year).

The underlying geology in this area is Thanet Formation (sand), with no overlying superficial deposits. This bedrock geology can in certain circumstances be associated with groundwater emergence. However, in this case, aerial height data shows that land approximately 250m to the north of the site is over 10m below the site. Consequently, due to the topography of the site and surrounding area, it is considered that above ground flooding as a result of groundwater emergence is unlikely at this location, and it would more likely be in these lower lying areas that groundwater emergence would occur.

This assumption is supported by mapping contained within the SWMP which shows that there are no records of flooding at the site from groundwater in the past, and the detailed mapping on groundwater emergence provided as part of the Defra Groundwater Flood Scoping Study (May 2004), which shows that no groundwater flooding events were recorded during the very wet periods

of 2000/01 or 2002/03. Consequently, it is considered that the risk of flooding from this source is *low*.

3.5 Risk of Flooding from Sewers

In urban areas, rainwater is typically drained into surface water sewers or sewers containing both surface and wastewater known as “combined sewers”. Flooding can result when the sewer is overwhelmed by heavy rainfall, becomes blocked, or has inadequate capacity; this will continue until the water drains away.

Inspection of the asset location data provided by Southern Water (SW), as shown in Figure 3.4, identifies a foul sewer crossing the southeast corner of the site, as well as a separate surface water sewer within Lower Higham Road.

In the unlikely event that floodwater was to exit the sewer network in this area (i.e., following an extreme rainfall event, or due to a blockage) the topographic survey shows that land levels in Lower Higham Road are over 2m below the site and therefore floodwater would not be directed towards the site from the surface water sewer within the highway. If floodwater were to exit the foul sewers along the south east boundary of the site, floodwater would either be contained within the garden of the surrounding properties, or be directed to flow away from the site towards Lower Higham Road.

This is supported by the absence of any records within the SWMP of flooding from this source at the site. Consequently, the risk of flooding from this source is considered to be *low*.



Figure 3.4 – Asset location mapping provided by SW (a full scale copy can be found in Appendix A.2).

3.6 Risk of Flooding from Artificial Sources

Non-natural or artificial sources of flooding can include reservoirs, canals, and lakes, where water is retained above natural ground level. In addition, operational and redundant industrial processes including; mining, quarrying, sand and gravel extraction, may also increase the depth of floodwater in areas adjacent to these features.

The potential effects of flood risk management infrastructure and other structures also needs to be considered. For example; reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

Inspection of the OS mapping for the area shows that there are no artificial sources of flooding within close proximity to the site. In addition, the EA's 'Flood Risk from Reservoirs' map shows that the site is not located within an area considered to be at risk of flooding from reservoirs. Therefore, the risk of flooding from this source is considered to be *low*.

3.7 Summary of Flood Risk

From the analysis above, it can be seen that **the risk of flooding to the site from all sources is low and safe access is available at all times**. Notwithstanding this, to ensure that the development meets the requirements of the NPPF, the following sections of the report recommends mitigation measures, where appropriate, to ensure the risk of flooding offsite does not increase as a result of the proposals.

4 Existing Drainage

4.1 Existing Surface Water Drainage

SW has provided sewer mapping as part of their asset location data for the site and surrounding area. An extract of this mapping is provided in Figure 3.4 and shows that there is a foul sewer crossing the eastern boundary of the site and a separate surface water sewer in Lower Higham Road.

The existing site drainage has not been surveyed, but the topographical survey shows that the access road does not have a drainage system in place and rainwater landing on this part of the site would flow following the topography towards Lower Higham Road, where it will be intercepted by the drainage system in the road.

It is assumed that surface water runoff from the roofs of the garages and the area of hardstanding between the garages is intercepted by the gully shown in the topographical survey and in Figure 4.1, which is assumed to discharge into the public foul water sewer running to the east of the site.



Figure 4.1 – Existing gully on site discharging surface water runoff from the garages and the area of hardstanding.

Surface water runoff is discharged at an unrestricted rate from the existing site and this rate of discharge has been calculated for a range of rainfall events with varying return periods. These rates are outlined in Table 4.1 below. These hydrological calculations have been undertaken using the Modified Rational Method and synthetic rainfall data derived using the variables obtained from the Flood Estimation Handbook (FEH) online web service.

Return Period (years)	Peak runoff from the existing site (l/s)
2	9.4
30	20.8
100	22.3

Table 4.1 - Summary of peak runoff rates for the existing site.

The total volume of water discharged from the site for the 1 in 100-year, 6-hour duration event, has also been calculated and is summarised in Table 4.2 below.

Site Condition	Total Volume Discharged
Existing site (brownfield volume)	58.1 m ³

Table 4.2 – Total volume discharged from the 1 in 100-year +40%cc 6-hour duration event.

5 Sustainable Drainage Assessment

5.1 Site Characteristics

The important characteristics of the site, which have the potential to influence the surface water drainage strategy, are summarised in Table 5.1 below.

Site Characteristic	Development Site	
Total area of site	~538 m ²	
Current site condition	Developed (brownfield)	
Greenfield runoff rates (based on the FEH methodology and existing impermeable area)	1:1 yr = 0.33 l/s/ha Qbar = 0.39 l/s/ha 1:30 yr = 0.9 l/s/ha 1:100 yr = 1.25 l/s/ha	
Infiltration	Available with assumed rates ranging between 0.18m/hr and 0.036m/hr	
Current surface water discharge method	Assumed connection to the public foul sewer system	
Is there a watercourse nearby?	No	
Impermeable area	Existing ~ 538 m ²	Proposed 350 m ²

Table 5.1 – Site characteristics affecting rainfall runoff.

Reference to the tables above show the proposed development will decrease the impermeable area within the boundaries of the site. Consequently, this will decrease the rate and volume of surface water runoff discharged from the site. Notwithstanding this, it is recognised that the impacts of climate change should be considered as part of any new development and it is for this reason, that it is recommended that SuDS are considered.

5.2 Opportunities to Discharge Surface Water Runoff

Part H of the Building Regulations summarises a hierarchy of options for discharging surface water runoff from developments. The preferred option is to **infiltrate** water into the ground, as this deals with the water at source and serves to replenish groundwater. If this option is not viable, the next option is for the runoff to be discharged into a **watercourse**. The water should only be conducted into the **public sewer** system if neither of the previous options are possible.

The following opportunities for managing the surface water runoff discharged from the development site are listed in order of preference:

Water Re-Use – Water re-use systems should ideally be considered to reduce the reliance on the demand for potable water. However, such systems can rarely manage 100% of the surface water runoff discharged from a development, as this requires the yield from the building and hardstanding area to balance perfectly with the demand from the proposed development. Consequently, whilst rainwater recycling systems can be considered for inclusion within the scheme, an alternative solution for attenuating storm water will still be required.

Infiltration – The geology of the site is made up of Lewes Nodular Chalk with no overlying superficial geology. Chalk is assumed to have good infiltration, assumed rates have been taken from The CIRIA SuDS Manual (C753), with rates ranging between 0.18m/hr and 0.036m/hr. Discharging surface water via infiltration will be the most viable option to discharge surface water from the proposed site. Site-specific borehole logs have shown that there is no high groundwater within this area and that the underlying chalk is roughly 1.6m BGL. During the detailed design process, it will be necessary to undertake infiltration testing in accordance with the methodology outlined in BRE365 to confirm the rate of infiltration available at the site and finalise the design of the drainage system.

Discharge to Watercourses – There are no watercourses located near to the site. As a result, there is no opportunity to discharge surface water runoff from the development to an existing watercourse.

Discharge to Public Sewer System – If it is determined that infiltration is not sufficient to discharge to the ground, an alternative solution would be to discharge via a new connection to the surface water sewer system running along Lower Higham Road or the assumed existing connection to the foul water sewer running along the eastern boundary of the site. A more sustainable method of discharging surface water has already been identified; therefore, this method has been discounted for the development.

5.3 Constraints and Further Considerations

The key constraints that are relevant to this development are listed below:

- There is limited open space to incorporate SuDS that require very large areas of land, such as wetlands and large infiltration basins.
- Infiltration SuDS should not be constructed through contaminated material.
- Any infiltration features that result in a concentrated discharge of surface water runoff to the ground, such as soakaways, should not normally be located within 5m of any existing or proposed or pre-existing buildings.
- A minimum of a 1m unsaturated zone shall be maintained between the base of any infiltration SuDS and the maximum seasonal water table.

- During the detailed design stage, infiltration testing in accordance with the Digest BRE365 methodology should be undertaken to confirm the assumed infiltration rates.
- During the detailed design stage, a geotechnical engineer should be appointed to ensure that the direct discharge of surface water runoff into the chalk does not undermine the proposed foundations.
- An alternative SuDS strategy has been included within this report, in the event that infiltration-based SuDS are found to be unsuitable at the detailed design stage.

5.4 Proposed Surface Water Management Strategy

The drainage strategy set out below discusses each of the different elements of the proposed scheme, along with the results from a numerical drainage model constructed for the site, which can be used to demonstrate how the overall objectives can be achieved. This does not represent a detailed surface water drainage design; it is simply an assessment to demonstrate that the objectives and requirements of the NPPF can be met at the planning stage.

Two options for discharging surface water runoff have been provided within this report. Option 1 will utilise infiltration as the primary method of discharging all of the surface water runoff from the development. This option is considered the preferred option. Option 2 will specify a connection into the public surface water sewer. This option should only be utilised, if infiltration has been discounted during the detailed design, e.g. due to low infiltration rates or the risk of undermining the proposed foundations. Both options 1 & 2 will utilise water butts as a method of rainwater reuse.

Water Butts

To reduce the developments reliance on potable water supplies for external use, there is the potential to incorporate water butts within the private garden area. Typical sizes and dimensions of water butts are outlined below.

Typical house water butt options	Dimensions of a typical house water butt	Volume of storage provided (litres)
Type 1 (wall mounted – small)	1.22m high x 0.46m x 0.23m	100
Type 2 (standard house water butt)	0.9m high x 0.68m diameter	210
Type 3 (large house water butt)	1.26m high x 1.24m x 0.8m	510
Type 4 (column tank – very large)	2.23m high x 1.28m diameter	2,000

Table 5.2 – Estimated storage capacity of available water butts.

In this case, the demand for potable water from each of the gardens is likely to be relatively small and as a result, small wall mounted water butts (typical 100L units) are likely to be the most appropriate size for inclusion within the scheme.

It is recognised that each of the water butts will need to overflow into the main drainage system for the site, to ensure that in the event the water butt is full prior to the onset of the design rainfall event, water can be discharged away from the properties without increasing the risk of flooding.

Option 1

Permeable Surfacing in combination with a Geocellular Storage Crate Soakaway

Permeable surfacing can be specified across the proposed parking area. Surface water from the overflow of the water butts and the parking area will discharge into the granular sub-base of the permeable surfacing system. The granular sub-base should be lined with an impermeable layer to allow surface water to be stored within the sub-base.

Surface water from the granular sub-base will overflow into a geocellular storage crate soakaway, where it will be stored and infiltrated into the underlying geology. A summary of the Causeway Flow+ analysis for permeable surfacing and the geocellular storage crate soakaway is shown in Table 5.3 below.

Parameter	Value (1:100yr+40%cc event)	Value (1:100yr+40%cc event)
SuDS	Permeable surfacing 1	Geocellular storage crate
Total area draining to permeable surfacing, including an additional 10% allowance for urban creep	341 m ²	Overflow from the permeable surfacing
Area of SuDS	~ 194 m ²	8 m ²
Infiltration	Lined with impermeable membrane	0.036 m/hr
Depth of SuDS	400 mm	1.5m
Slope	1:1000	N/A
Porosity	0.3	0.95

Table 5.3 – Summary of permeable surfacing 1 and geocellular storage crate soakaway.

From the table above and the results of the hydraulic model (Appendix A.4), it has been demonstrated that the proposed SuDS are able to accommodate all of the surface water runoff from the site before infiltrating into the ground.

Option 2

Permeable Surfacing

For this option, surface water runoff from the roof of the properties, the overflow from the water butts and rain landing on the permeable surfacing layer will be collected and discharged into a granular Type 3 sub-base. Surface water runoff will be stored within this sub-base and discharged using an orifice plate into the public surface water sewer. The proposed sub-base will be lined with a impermeable textile to prevent surface water runoff from infiltrating. A summary of the Causeway Flow+ analysis for permeable surfacing is shown in Table 5.4 below. An indicative drainage layout plan can be seen in Appendix A.4.

Parameter	Value (1:100yr+40%cc event)
SuDS	Permeable surfacing 1
Total area draining to permeable surfacing	341 m ²
Area of permeable surfacing	~ 194 m ²
Sub-base depth	400 mm
Porosity	0.3
Flow control device	41mm orifice plate @ invert level

Table 5.4 – Summary of permeable surfacing 2.

Runoff rates have been calculated for a range of annual return probabilities, including the 100 year return period event with a 40% increase in rainfall intensity to account for future climatic changes. These values are summarised in Table 5.5 for a range of return periods.

Return Period	Pre-Development Discharge Rates (l/s)	Post-Development Discharge Rates +cc (l/s)
1 in 2yr	9.4	0.9
1 in 30yr	20.8	1.6
1 in 100yr	22.3	1.9

Table 5.5 – Summary of the pre-and post-development discharge rates for the proposed site.

Based on the tables above and the results of the hydraulic drainage model, it is evident that the proposed SuDS will be able to accommodate all of the surface water runoff from the proposed development. Additionally, the proposed SuDS will provide a significant betterment when compared to the existing site development.

5.5 Management and Maintenance

For any surface water drainage system to operate as originally designed, it is necessary to ensure that it is adequately maintained throughout its lifetime. Therefore, over the lifetime of a development there is a possibility that the performance of the system could be reduced or could fail if it is not correctly maintained. This is even more important when SuDS form a part of the surface water management system, as these require a more onerous maintenance regime than a typical piped network.

The key requirements of any management regime are routine inspection and maintenance. When the development is taken forward to the detailed design stage, an 'owner's manual' will need to be prepared. This should include:

- A description of the drainage scheme.
- A location plan showing all of the SuDS features and equipment, such as flow control devices etc.
- Maintenance requirements for each element, including any manufacturer-specific requirements.
- An explanation of the consequences of not carrying out the specified maintenance.
- Details of who will be responsible for the ongoing maintenance of the drainage system.

For the SuDS recommended by this assessment, the most obvious maintenance tasks will be the regular brushing and cleaning of the permeable surfacing and desilting of the geocellular storage crate soakaway. General maintenance schedules have been included within the Appendix A.5 of this report which demonstrate the maintenance requirements of the proposed SuDS.

For developments such as this, that to some extent rely on the ongoing inspection and maintenance of SuDS, it will be necessary to ensure that measures are in place to maintain the system for the lifetime of the development. For this site, a management company should be appointed to ensure the regular maintenance of the proposed SuDS over its lifetime.

5.6 Sensitivity Testing and Residual Risk

When considering residual risk, it is necessary to consider the impact of a flood event that exceeds the design event, or the implications if the proposed drainage system were to become blocked.

For the water butts, a small amount of localised flooding could occur if the overflows from these features were to become blocked. Given the small catchment area draining to each of these features, the volume of floodwater will be small, and is unlikely to present a risk to the properties or occupants.

During an exceedance event, surface water would slowly fill up the granular sub-base of the permeable surfacing and the geocellular storage crate soakaway until it overflows. For the permeable surfacing across the parking area (1), kerbing or edging should be installed to provide additional storage for water to pond at the surface until it is able to infiltrate into the ground.

Based on the analysis above it is therefore concluded that the proposed drainage system outlined within this strategy will not result in an increased risk of flooding to properties at the site or within the surrounding area.

6 Foul Water Management Strategy

6.1 Background

The objective of this foul water management strategy is to ensure a viable solution is available for managing foul effluent discharged from the proposed development site.

In general, there are two methods for draining effluent from proposed developments. The preferred solution is a connection to the public sewer network, which is controlled by the sewerage undertaker. If there are no sewers near to the development site or there are particular reasons why a connection to the public sewer system would not be possible i.e., topography, cost, environmental concerns, then the use of package treatment systems or cesspits is permitted.

The EA's "Binding Rules" control the use of package treatment systems and require the development to connect to the public sewer system if the site boundary is located within 30m of an existing sewer (plus an additional 30 meters for every proposed unit). In this case, the proposed development, the foul sewer crosses the eastern boundary of the site and there is assumed to be an existing connection. Therefore, the use of package treatment systems is unlikely to be considered appropriate for this development.

6.2 Sewer Connection

As indicated in Figure 4.1, there is an existing public foul sewer to the east of the site. It is anticipated that the proposed development will connect into the existing sewer network using the existing connection, as shown in Figure 6.1 below. Using Sewers for Adoption 7th Edition, the estimated design peak flow rate for the proposed development is 16,000l/day (0.19 l/s).

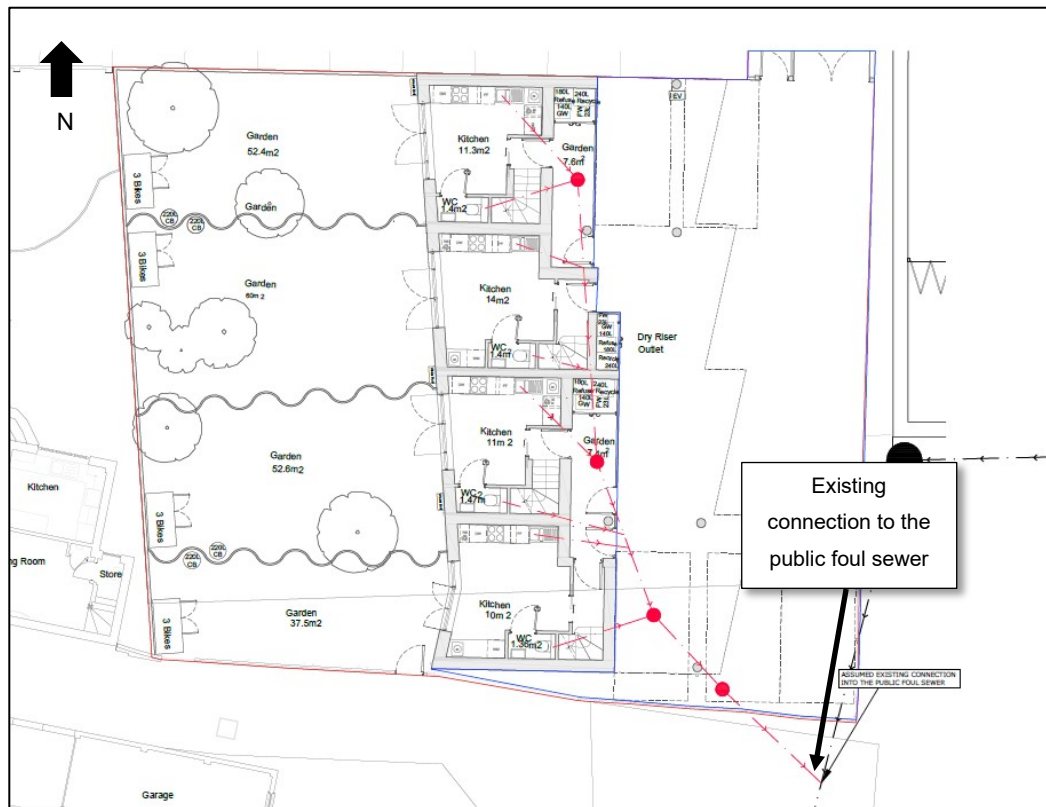


Figure 6.1 – Proposed connection the foul sewer network.

It is recommended that a sewer capacity check is undertaken at the detailed design stage to allow the sewerage undertaker to confirm whether there is sufficient capacity within the existing public foul sewer and to confirm whether the proposed increase in the discharge rate from the new development is acceptable.

6.3 The Water Industry Act

The Water Industry Act 1991 provides developers with a mechanism for connecting to the public sewerage infrastructure. The type of connection depends on the type and location of the sewers in relation to the site and third-party land.

For any new connections or increase in flow rates from any pre-existing connections, it will be necessary for the developer to complete a Section 106 application.

As part of the Section 106 process, it is necessary to determine whether the existing sewer network requires any upgrades to accommodate effluent from the development site. If upgrades to the sewerage system are required these will be requisitioned under the same application. In this case, it is likely additional offsite works will be required and these will therefore be included within the Section 106 application. It is acknowledged that the cost of a new connection and any additional works which are required to upgrade the public sewer system (to accommodate the additional foul effluent from the development) can be charged to the developer.

6.4

Summary

The opportunities for managing foul effluent discharged from the development site have been analysed and it is concluded that the assumed existing connection to the public sewer system, located to the east of the site, is likely to present the most viable solution.

Following the award of planning permission, a full detailed design of the site layout and foul drainage system will be required as part of the Section 106 application, which will require the liaison with the sewer undertaker to approve the changes to the existing connection, which may result in necessary upgrades. These upgrades are likely to be economically proportionate to the size of the development, however, it is recognised that a solution for managing foul waste from the proposed development will be available.

7 Conclusions and Recommendations

The overarching objective of this report is to appraise the risk of flooding at Lower Higham Road, Chalk to ensure that the proposals for development are acceptable in this location and that the risk of flooding offsite will not increase as a result of the development. This report has therefore been prepared to appraise the risk of flooding from all sources and to provide a sustainable solution for managing the surface water runoff discharged from the development site, in accordance with the NPPF and local planning policy.

The risk of flooding has been considered for a wide range of sources and it has been identified that the risk to the proposed development is low, and safe access is available at all times. Notwithstanding this, as access may not be available in a westerly direction during an extreme rainfall event, it is recommended that the residents sign up to the Met Office Weather Warnings and regularly check weather forecasts to ensure they are aware of conditions which could result in flooding to the west of the site.

To minimise the impact that the building could have with respect to an increase in surface water runoff, the opportunities for managing surface water at the site have been further analysed. It is concluded that the most viable solution for managing all of the surface water runoff discharged from the proposed development will be via infiltration to the ground. If during the detailed design stage infiltration has been discounted, an alternative drainage strategy has been included within this report. This alternative strategy will discharge surface water runoff via a connection into the public surface water sewer.

To contain surface water on site and allow it to infiltrate, water butts in conjunction with two permeable surfacing systems and a geocellular storage crate soakaway have been proposed. These systems will allow storm water to be stored before gradually infiltrating into the underlying ground. With the inclusion of the proposed SuDS, the proposed development will meet the requirements of the NPPF and local planning policy.

Details of the typical maintenance and management requirements for each element of the drainage system have been provided to ensure that the proposed drainage solution can be maintained and will continue to operate in perpetuity. It is, however, recommended that an "owner's manual" containing additional product specific maintenance requirements is produced as part of the detailed design for the site.

The sustainable management of foul water has been considered. The most viable solution to manage foul water from the proposed site is via an existing connection which is assumed to connect to the public foul water sewer running along the eastern part of the site.

In conclusion, it is evident that the development is at low risk of flooding and a sustainable solution for managing the surface water runoff and foul water discharged from the proposed development

at Lower Higham Road, Chalk is available. Consequently, the proposals will meet the requirements of the NPPF and local planning policy.

8 Appendices

Appendix A.1 – Drawings

Appendix A.2 – Southern Water Asset Location Data

Appendix A.3 – Indicative Drainage Layout Plan Option 1

Appendix A.4 – Indicative Drainage Layout Plan Option 2

Appendix A.5 – Surface Water Management Calculations Option 1

Appendix A.6 – Surface Water Management Calculations Option 2

Appendix A.7 – Maintenance Schedules

Appendix A.8 – Site Investigations

Appendix A.9 – Indicative Foul Drainage Layout Plan

Appendix A.1 – Drawings

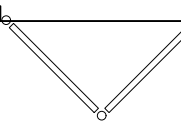


Scale: 1:50



Site Boundary

Parish Hall



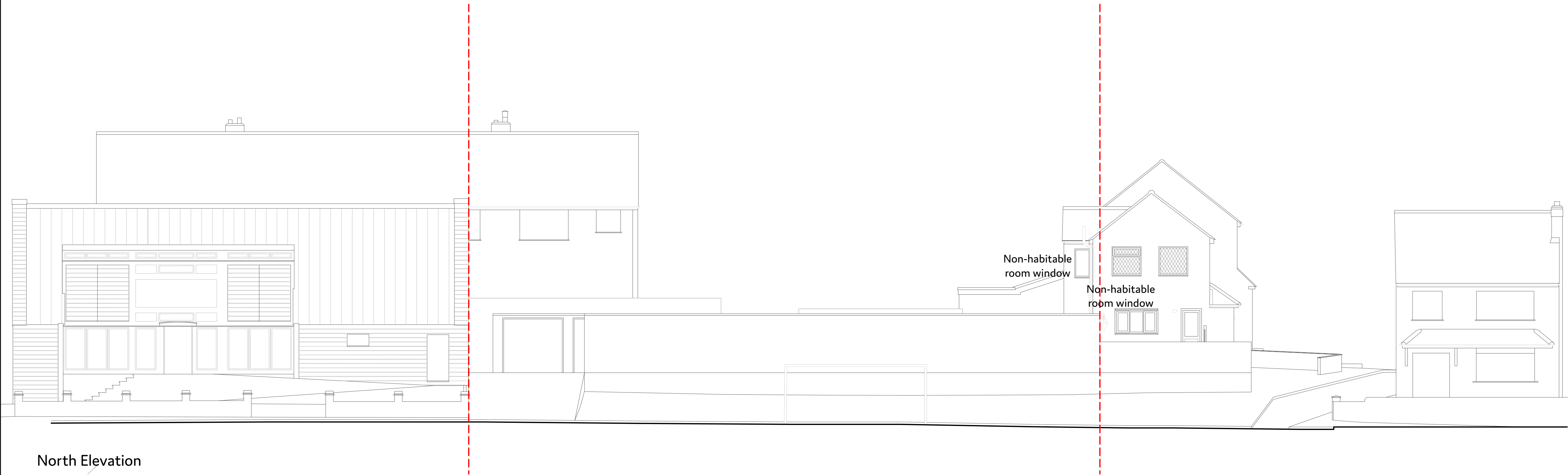
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Drawing Name Existing Ground Floor Plan	Drawing No. 010	Revision -
Status Planning	Scale 1:50 at A1	North

Site Boundary



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Drawing Name Existing North & South Elevations	Drawing No. 020	Revision -
Status Planning	Scale 1:100 at A1	North

Site Boundary

East Elevation

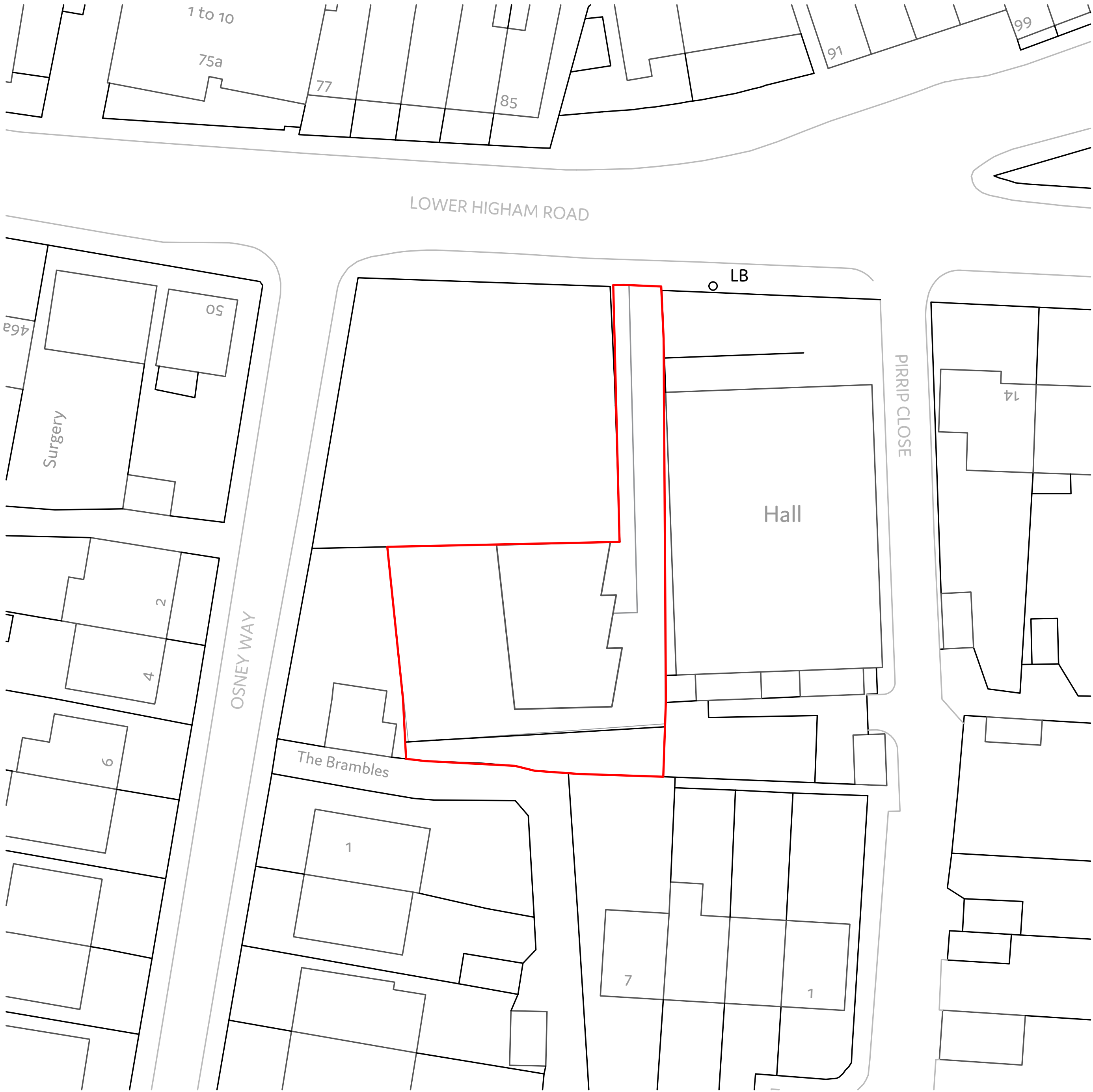
West Elevation

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Drawing Name Block Plan	Drawing No. 002	Revision -
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Site Boundary

Parish Hall

Outline of building above

East Elevation

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Drawing Name Proposed Ground Floor Plan	Drawing No. 100	Revision -
Status Planning	Scale 1:50 at A1	North ⬆



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Status Planning	Scale 1:50 at A1	North 



Scale: 1:50



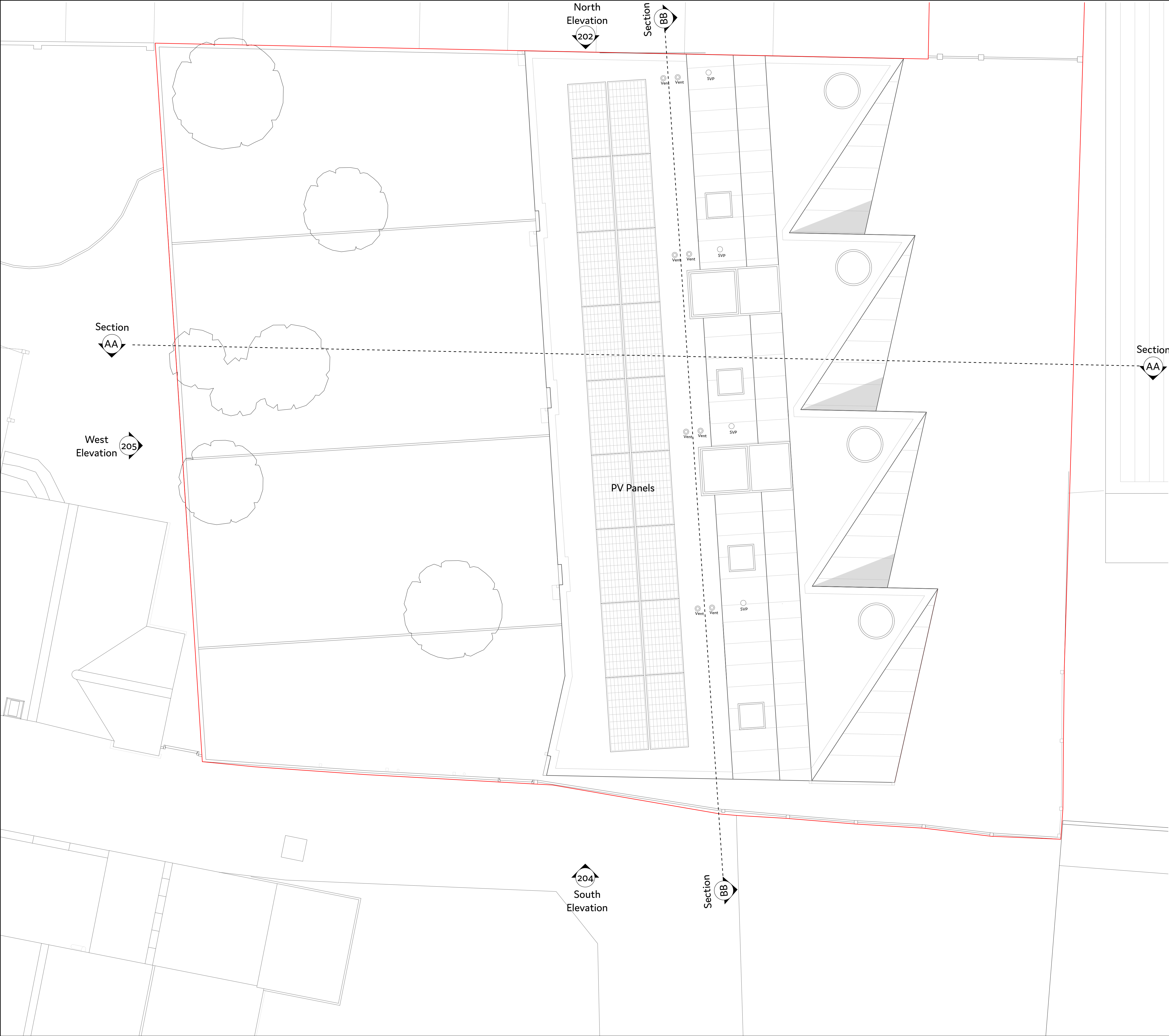
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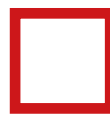
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Drawing Name Proposed Second Floor Plan	Drawing No. 102	Revision -
Status Planning	Scale 1:50 at A1	North ⬆



Scale: 1:50

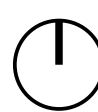


 Site Boundary

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Drawing Name Proposed Roof Plan	Drawing No. 103	Revision -
Status Planning	Scale 1:50 at A1	North 

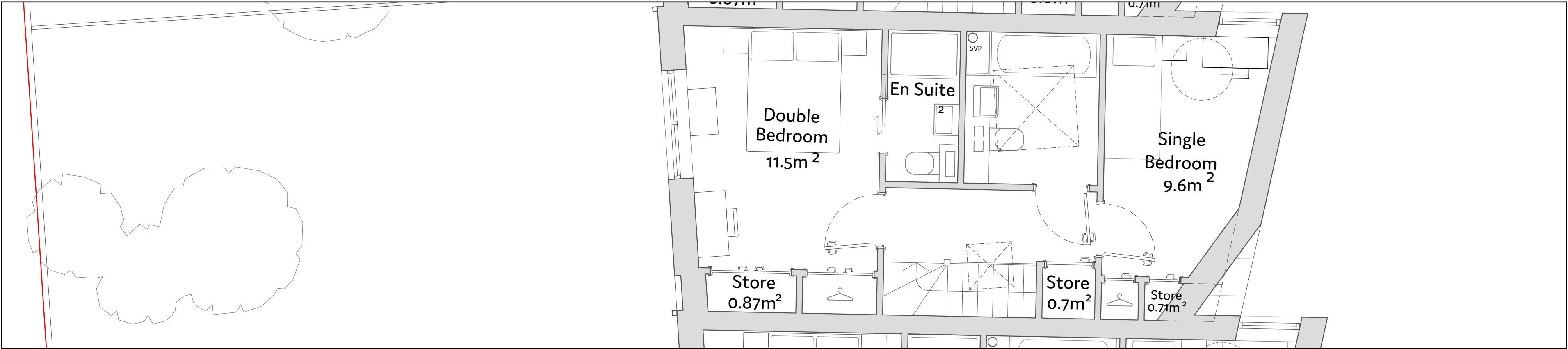
Site Boundary



Ground Floor Plan



First Floor Plan



Second Floor Plan



Roof Plan

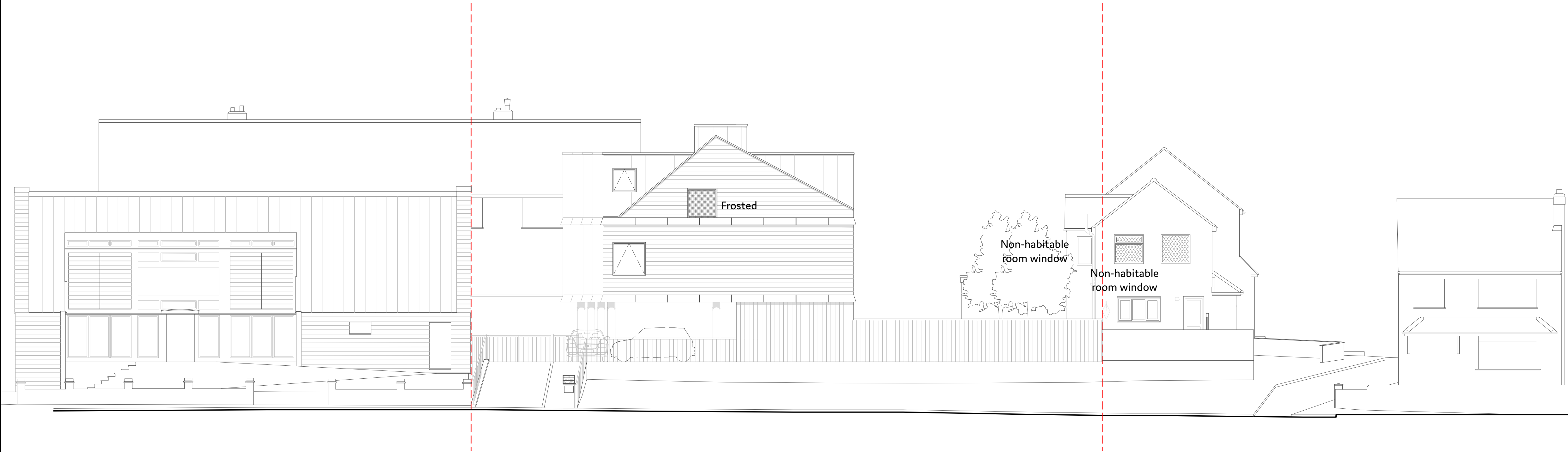
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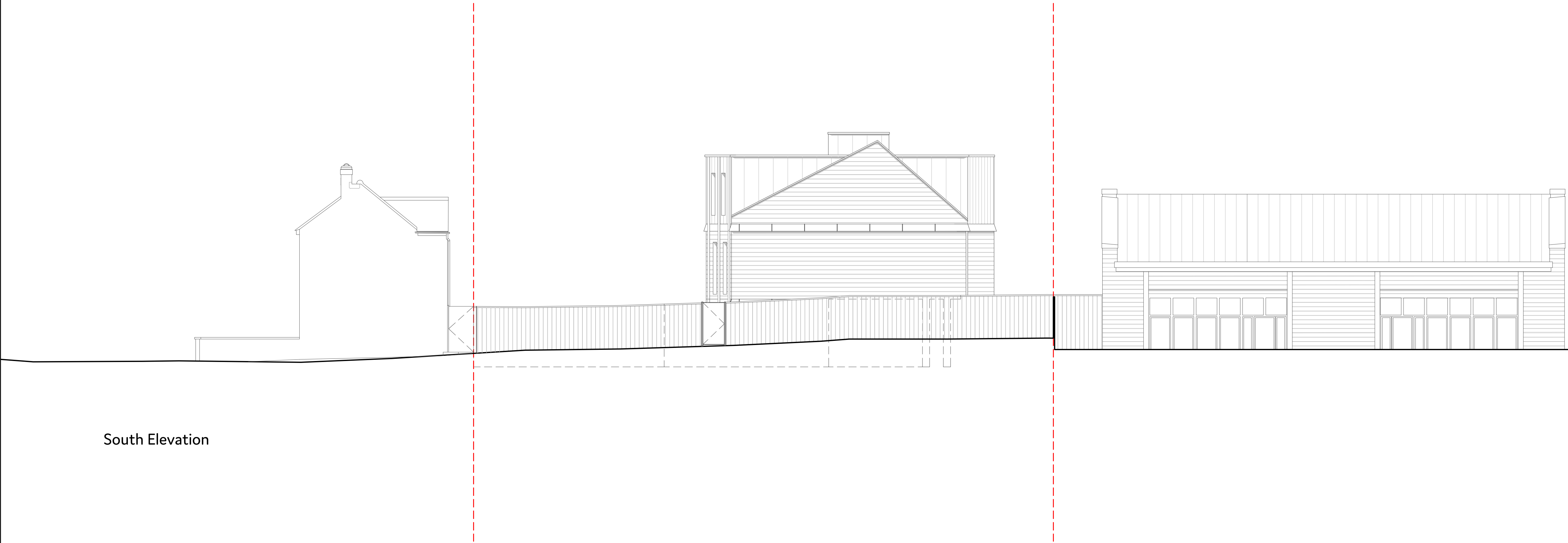
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Drawing Name Proposed House 1 Floor Plans	Drawing No. 104	Revision -
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Site Boundary



North Elevation



South Elevation

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Drawing Name Proposed North & South Elevations	Drawing No. 200	Revision -
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Site Boundary

East Elevation

West Elevation

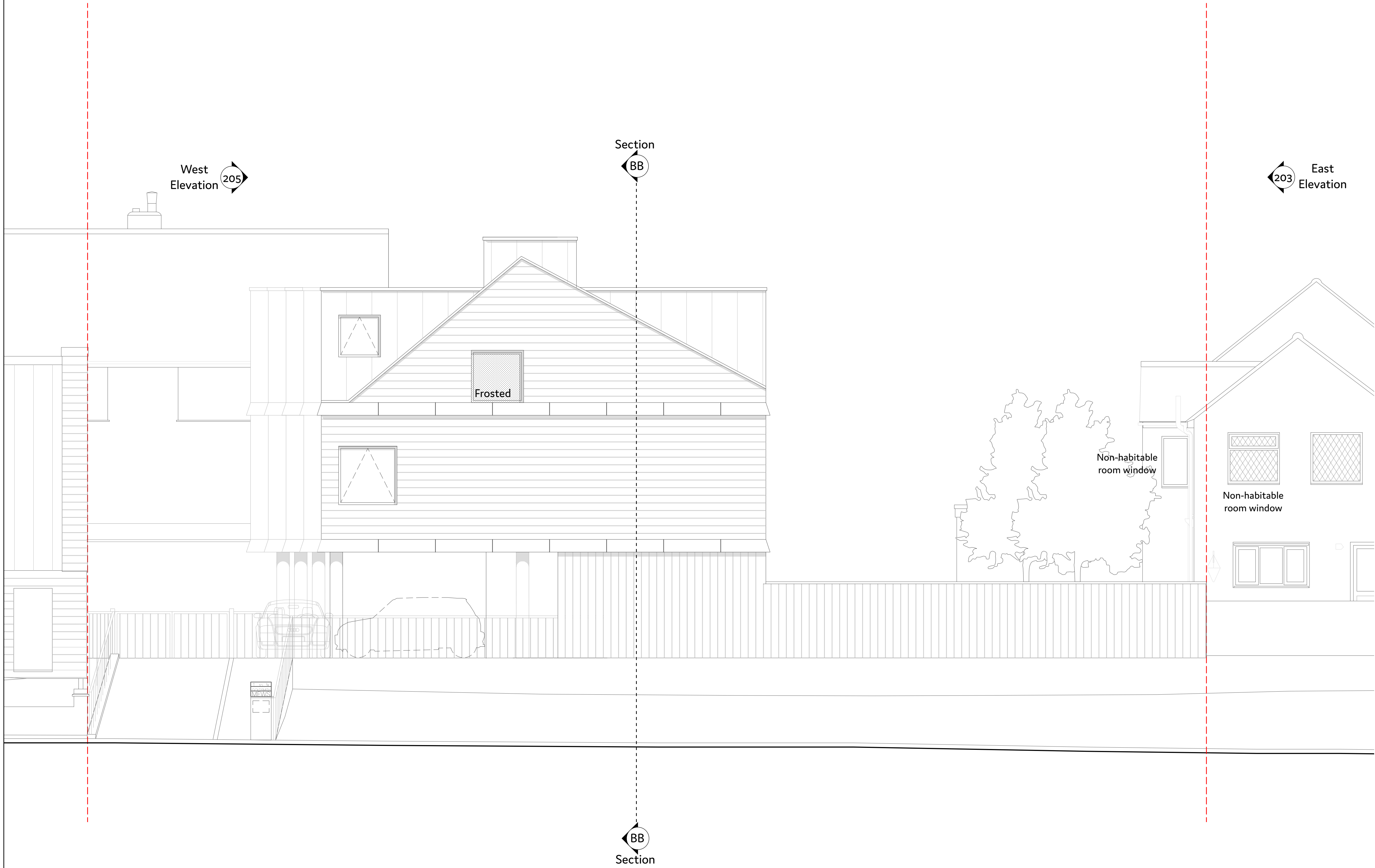
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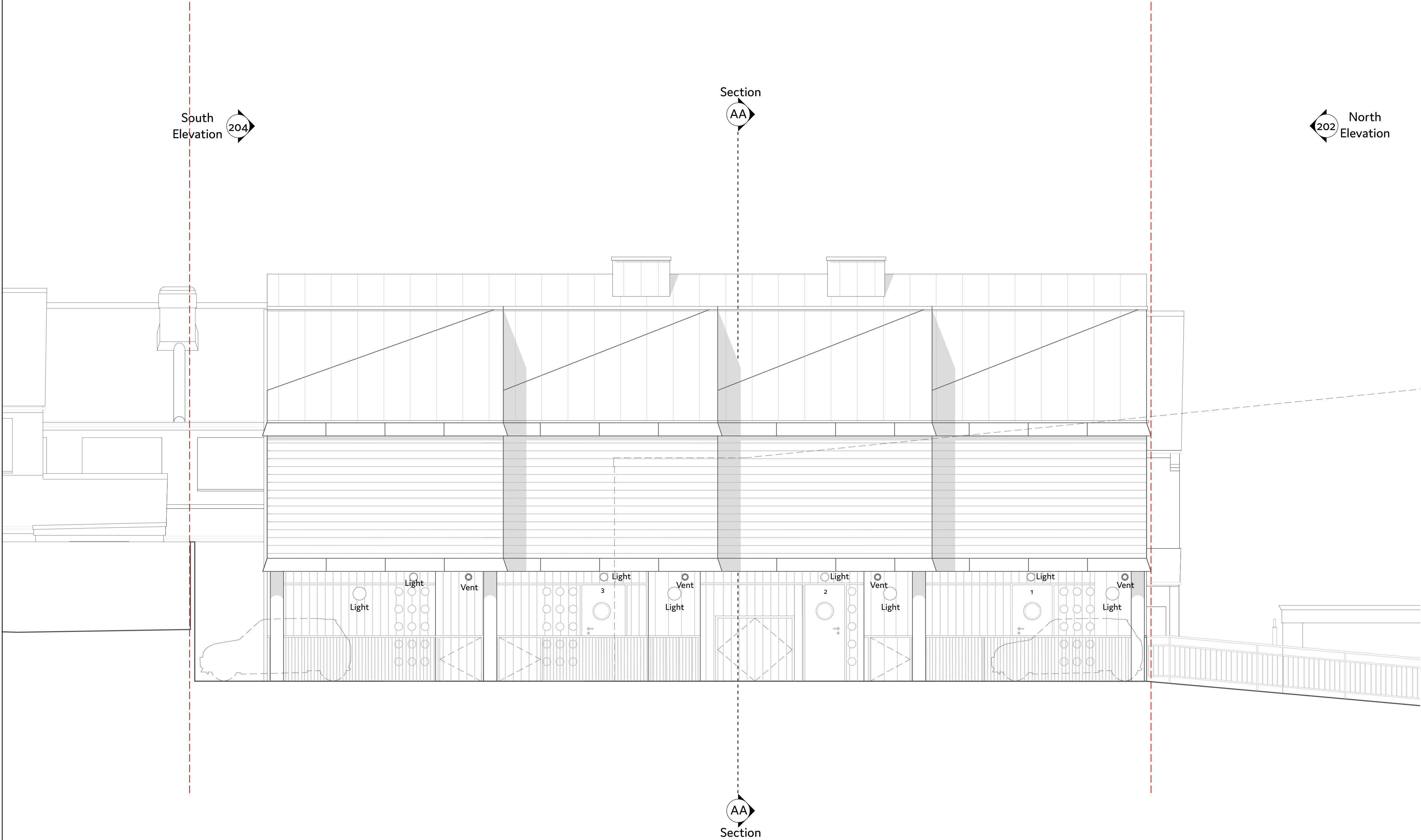
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Drawing Name Proposed North Elevation	Drawing No. 202	Revision -
Status Planning	Scale 1:50 at A1	North

Site Boundary

South
Elevation 204

Section
AA

North
Elevation 202



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Site Boundary

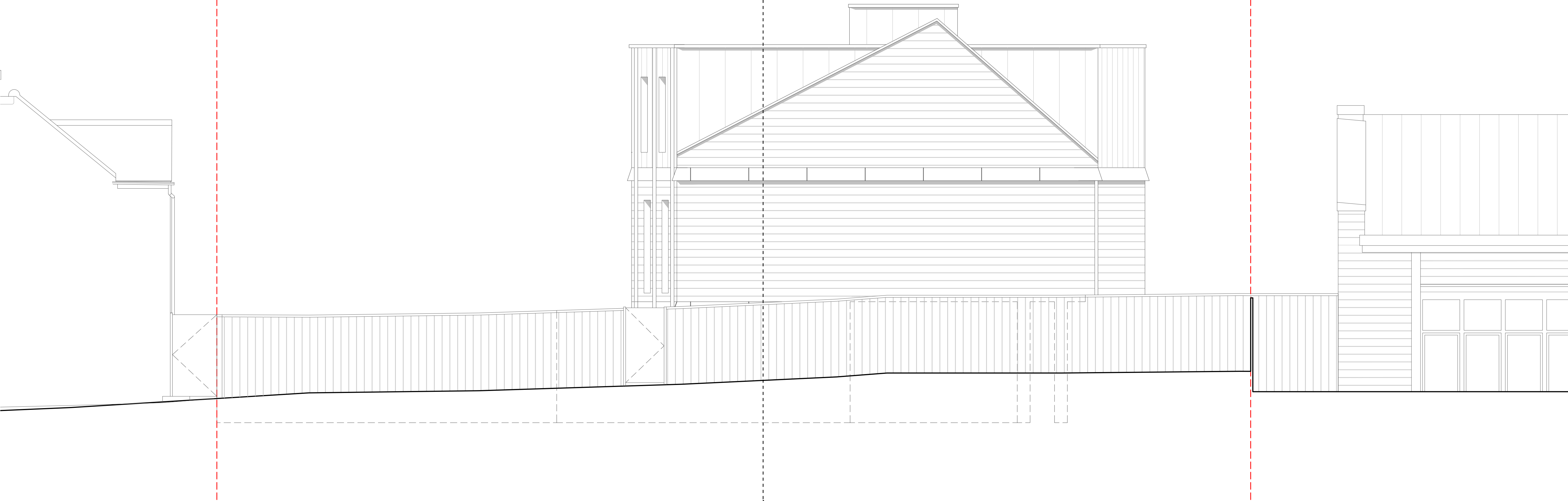
East
Elevation



Section



West
Elevation



Section

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Drawing Name Proposed South Elevation	Drawing No. 204	Revision -
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Site Boundary

North
Elevation



Section



South
Elevation



Section

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Status Planning	Scale 1:50 at A1	North

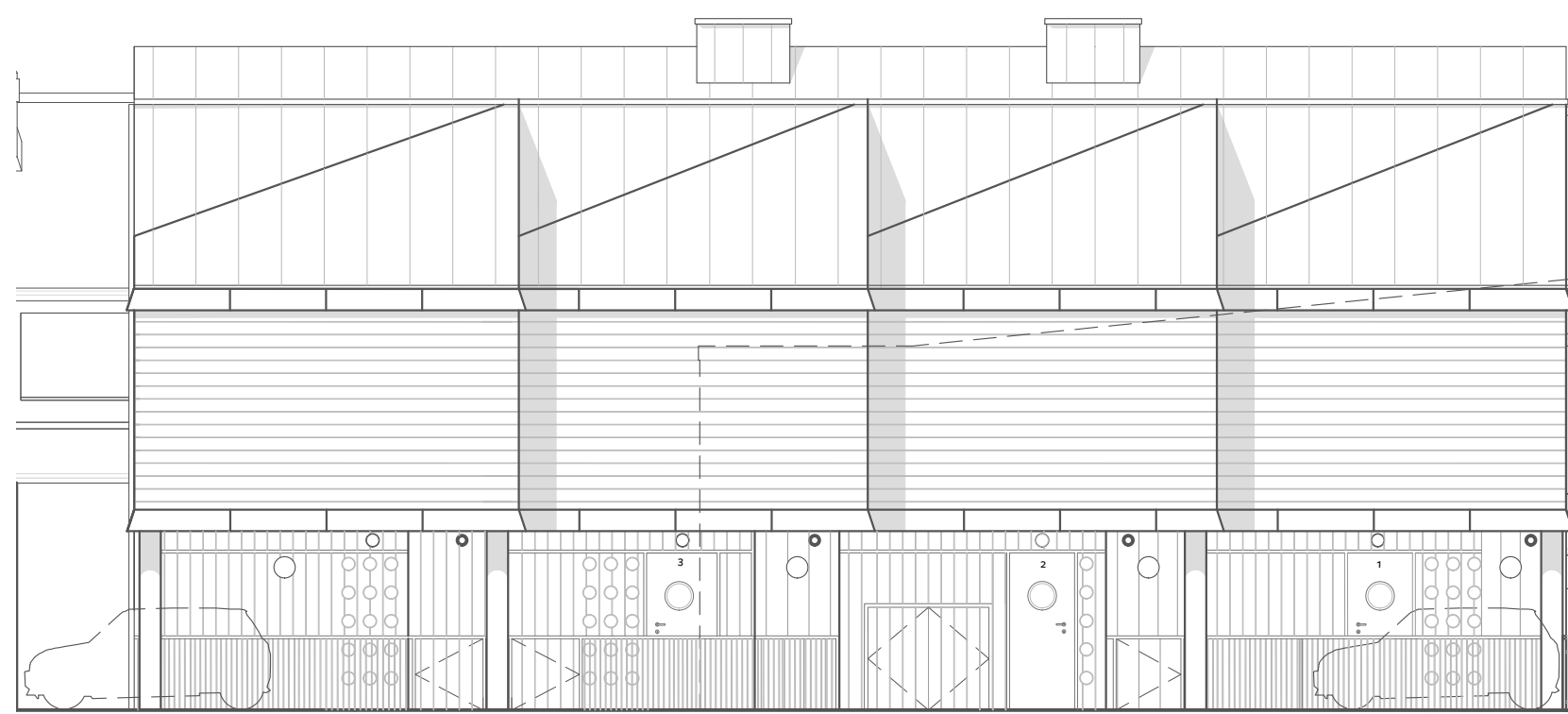
Site Boundary



North Elevation



South Elevation



East Elevation



West Elevation

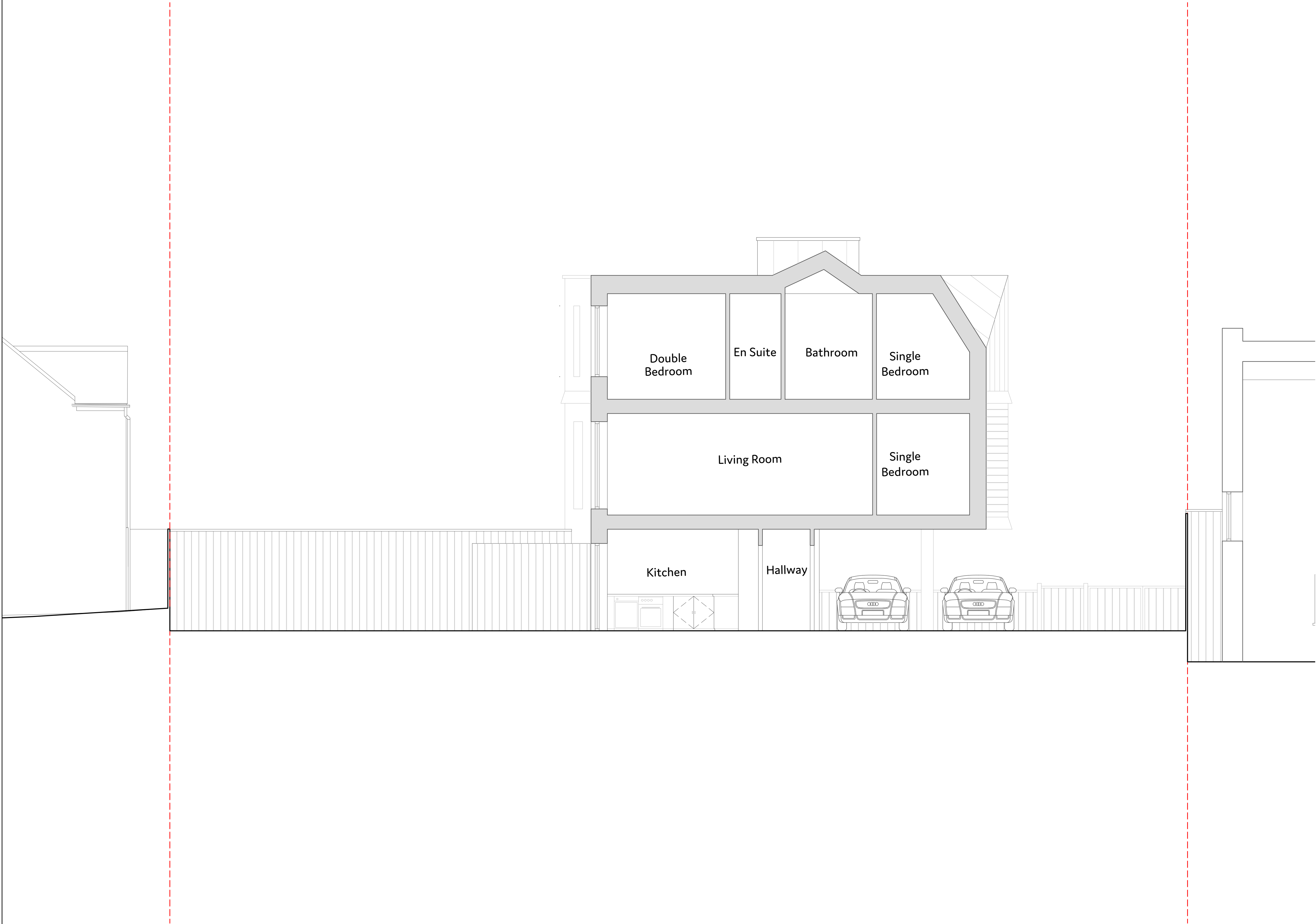
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Drawing Name Proposed Elevations	Drawing No. 206	Revision -
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Drawing Name Proposed Section AA	Drawing No. 300	Revision -
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Drawing Name	Drawing No.	Revision
Proposed Section BB	301	-
Status	Scale	North
Planning	1:50 at A1	

Appendix A.2 – Southern Water Asset Location Data

Order received: 16 June 2021
Order completed: 17 June 2021

Drainage and water enquiry

Commercial

Order reference: LS/U1607732

Your reference: SF30296505000 TF/DA032-2.

Search address:

Land adjoining The Brambles Osney Way
Gravesend
Kent
DA12 2NB

Ordered by:

Searchflow
42 Kings Hill Avenue
West Malling
Kent
ME19 4AJ

For enquiries regarding the information provided in this report, please contact the LandSearch team:

Tel: 0330 303 0276

Email: searches@southernwater.co.uk

Web: www.southernwater.co.uk

LandSearch
Southern Water Services
Southern House
Capstone Road
Chatham
Kent
ME5 7QA

What you need to know about...

Private sewer transfer

On 1 October 2011, ownership of private sewers and lateral drains changed in accordance with The Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The contents of this search may not reflect these changes.

For further information please visit our website: www.southernwater.co.uk/sewer-ownership-changes.

Records searched

The following records were searched in compiling this report: the Map of Public Sewers, the Map of Waterworks, water and sewerage records, the Register of Properties subject to Internal Foul Flooding, the Register of Properties subject to Poor Water Pressure and the Drinking Water Register. Should the property not fall entirely within Southern Water's region, a copy of the records held by the relevant water company was searched.

Competition in the non-household retail market

From April 2017 non-household customers in England can choose their retailer. 'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

The 'wholesale' part of the water industry was not opened for competition in April 2017. This means Southern Water continues to look after the pipes and infrastructure for all its customers across Kent, Sussex, Hampshire and the Isle of Wight.

Moving

There can be a lot to do and remember when you're moving. Whether you are moving within our area, moving into our area or moving out of the area please let your retailer know.

Your order summary

Maps

1.1	Where relevant, please include a copy of an extract from the public sewer map.	Map provided
1.2	Where relevant, please include a copy of an extract from the map of waterworks	Map provided

Drainage

2.1	Does foul water from the property drain to a public sewer?	No
2.2	Does surface water from the property drain to a public sewer?	No
2.3	Is a surface water drainage charge payable?	No
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	Yes
2.4.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?	No
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	No
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	No
2.6	Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
2.7	Has any sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
2.8	Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?	No
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	See answer

Water

3.1	Is the property connected to mains water supply?	No
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	No
3.3	Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
3.4	Is the property at risk of receiving low water pressure or flow?	No
3.5	What is the classification of the water supply for the property?	See answer
3.6	Is there a meter installed at this property?	No
3.7	Please include details of the location of any water meter serving the property.	See answer

Charging

4.1.1	Who is responsible for providing the sewerage services for the property?	Southern Water
4.1.2	Who is responsible for providing the water services for the property?	Southern Water
4.2	Who bills the property for sewerage services?	See answer
4.3	Who bills the property for water services?	See answer

Your order summary continued

Other Information

5.1	Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?	No
-----	---	----

Supplementary questions

6.1	Is there a wayleave / easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?	Information unavailable
6.2	On the copy extract from the public sewer map, please show manhole covers, depth and invert levels where information is available.	Map provided

Maps

Public sewer map

Q. 1.1: Where relevant, please include a copy of an extract from the public sewer map.

A.: A copy of an extract from the public sewer map is provided.

Guidance Notes:

The Water Industry Act 1991 defines public sewers as those which the Company has responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purpose 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.

Map of waterworks

Q. 1.2: Where relevant, please include a copy of an extract from the map of waterworks.

A.: A copy of an extract of the map of waterworks is provided.

Guidance Notes:

Assets other than vested water mains may be shown on the plan for information only.

The Company is not responsible for private supply pipes connecting the property to the public water main and does not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

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.

Drainage

Foul water

Q. 2.1: Does foul water from the property drain to a public sewer?

A.: The Company's records indicate that foul water from the property does not drain to the public sewerage system.

Guidance Notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

The copy extract will show known public sewers in the vicinity of the property. It should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.

Surface water

Q. 2.2: Does surface water from the property drain to a public sewer?

A.: The Company's records indicate that surface water from the property does not drain to the public sewerage system. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance Notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

The copy extract will show known public sewers in the vicinity of the property. It should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

In some cases company records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Company.

If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse.

Surface water drainage charge

Q. 2.3: Is a surface water drainage charge payable?

A.: Records confirm that a surface water drainage charge is not applicable at this property. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance Notes:

Where surface water from a property does not drain to the public sewerage system no surface water drainage charges are applicable.

If on inspection the buyer finds that the property is not connected for surface water drainage, the buyer should contact their retailer.

Public sewers within the boundary of the property

Q. 2.4: Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

A.: The public sewer map included indicates that there is a public sewer, disposal main or lateral drain within the boundaries of the property. However, from 1 October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may further prevent or restrict development of the property.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public sewer within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

Please note if the property was constructed after 1 July 2011 any sewers and/or lateral drain within the boundary of the property are the responsibility of the householder.

Public pumping station within the boundary of the property

Q. 2.4.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

A.: The public sewer map included indicates that there is no public pumping station within the boundaries of the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a pumping station within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public sewers near to the property

Q. 2.5: Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

A.: The public sewer map indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the property.

Guidance Notes:

From 1 October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

The presence of a public sewer within 30.48 metres (100 feet) of a building within the property can result in the local authority requiring a property to be connected to the public sewer.

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest public sewer.

Public pumping station near to the property

Q. 2.5.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

A.: The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance Notes:

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest pumping station.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public adoption of sewers and lateral drains

Q. 2.6: Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records indicate that the sewers serving the development, of which this property forms part, are not the subject of an application for adoption under Section 104 of the Water Industry Act 1991. Where the property is part of an established development it would not normally be subject to an adoption agreement under Section 104 of the Water Industry Act 1991.

Guidance Notes:

This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.

Any sewers and/or lateral drains within the boundary of the property are not the subject of an adoption agreement and remain the responsibility of the householder. Adoptable sewers are normally those situated in the public highway.

Building over a public sewer, disposal main or drain

Q. 2.7: Has the sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

A.: There are no records in relation to any approval or consultation about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

Guidance Notes:

Buildings or extensions erected over a sewer in contravention of Building Control may have to be removed or altered.

From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have approved or been consulted about any plans to erect a building or extension on the property or in the vicinity of these.

Risk of flooding due to overloading public sewers

Q. 2.8: Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?

A.: The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership. It is therefore possible that a building may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

Guidance Notes:

A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.

"Internal flooding" from the public sewers is defined as flooding, which enters a building or passes below a suspended floor.

For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

"At Risk" properties are defined as properties that have suffered or are likely to suffer internal flooding from the public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the sewerage undertaker's reporting procedure.

Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included.

Buildings may be at risk of flooding but not identified where flooding incidents have not been reported to the sewerage undertaker.

Public sewers are defined as those for which the sewerage undertaker holds statutory responsibility under the Water Industry Act 1991.

It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the sewerage undertaker. This report excludes flooding from the private sewers and drains and the sewerage undertaker makes no comment upon this matter.

Sewage treatment works

Q. 2.9: Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

A.: The nearest sewage treatment works is 0.73 kilometres North of the property. The name of the sewage treatment works is GRAVESEND WTW, which is the responsibility of Southern Water Services, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX.

Guidance Notes:

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.

The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.

It should be noted that there may be a private sewage treatment works closer than the one detailed above that have not been identified.

Water

Connection to mains water supply

Q. 3.1: Is the property connected to mains water supply?

A.: Records indicate that the property is not connected to mains water supply and water is therefore likely to be provided by virtue of a private supply.

Guidance Notes:

The situation should be checked with the current owner of the property.

Details of private supplies are not kept by the water undertaker.

Water mains, resource mains or discharge pipes

Q. 3.2: Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

A.: The map of waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.

Guidance Notes:

The boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public water main within the boundary of the property may restrict further development within it.

Water undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the water undertaker or its contractors needing to enter the property to carry out work.

Adoption of water mains and services pipes

Q. 3.3: Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance Notes:

This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to the mains water supply.

Risk of low water pressure or flow

Q. 3.4: Is the property at risk of receiving low water pressure or flow?

A.: Records confirm that the property is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.

Guidance Notes:

"Low water pressure" means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal.

The reference level of service is a flow of 9 litres/minute at a pressure of 10 metres head on the customer's side of the main stop tap (mst). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap.

The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served.

For two properties, a flow of 18 litres/minute at a pressure of 10 metres head on the customers side of the mst is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or Institute of Plumbing handbook.

Water companies include properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Refer to list below:

Abnormal demand: This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected. Companies exclude properties which are affected by low pressure only on those days with the highest peak demands. During the year companies may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance: Companies exclude low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.

One-off incidents: This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as PRVs or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration: Properties affected by low pressures which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

Water hardness

Q. 3.5: What is the classification of the water supply for the property?

A.: The water supplied to the property has an average water hardness of 241 mg/l calcium carbonate which is defined as "Hard" by Southern Water.

Guidance Notes:

The hardness of water depends on the amount of calcium in it – the more it contains, the harder the water is.

There is no UK or European standard set for the hardness of drinking water. More information on water hardness can be found on the Drinking Water Inspectorates' website: <http://www.dwi.gov.uk/>

Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table explains how to convert mg/l calcium and mg/l calcium carbonate classifications.

To convert from:	to Clark degrees	to French degrees	to German degrees
mg/l calcium	multiply by 0.18	multiply by 0.25	multiply by 0.14
mg/l calcium carbonate	multiply by 0.07	multiply by 0.10	multiply by 0.056

Water meters

Q. 3.6: Is there a meter installed at this property?

A.: According to our records there is no meter installed at the property.

Guidance notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including water meter reading.

Where the property is not served by a water meter and the customer wishes to consider this method of charging they should contact their water retailer.

Water meter location

Q. 3.7: Please include details of the location of any water meter serving the property.

A.: Records indicate that the property is not served by a water meter.

Additional meter information

No further information.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including water meter reading.

Where the property is not served by a water meter and the customer wishes to consider this method of charging they should contact their water retailer.

Charging

Sewerage undertakers

Q. 4.1.1: Who is responsible for providing the sewerage services for the property?

A.: Southern Water is responsible for providing the sewerage services for the property.

Guidance Notes:

The 'wholesale' part of the water industry did not open for competition in April 2017. This means that Southern Water continues to operate the network of pipes, mains and treatment works.

As a wholesaler, Southern Water sells sewerage services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact Southern Water to report internal sewer flooding.

Water undertakers

Q. 4.1.2: Who is responsible for providing the water services for the property?

A.: Southern Water is responsible for providing the water services for the property.

Guidance Notes:

The 'wholesale' part of the water industry did not open for competition in April 2017. This means that water undertakers continue to operate the network of pipes, mains and treatment works.

As a wholesaler, water undertakers sell water services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact water undertakers to report leaks.

Sewerage bills

Q. 4.2: Who bills the property for sewerage services?

A.: If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

Water bills

Q. 4.3: Who bills the property for water services?

A.: If you wish to know who bills the water services for this property then you will need to contact the current owner. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

Other information

Trade effluent consents

Q. 5.1: Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?

A.: The trader operating at this commercial property does not hold either a Trade Effluent Consent, or an acknowledgement of a trade effluent discharge, as issued by Southern Water.

Guidance Notes:

Please note, any existing consent is dependent on the business being carried out at the property and will not transfer automatically upon change of ownership.

Any change of ownership from the current incumbent of a property will require the negotiation of a new trade effluent consent or a new acknowledgement between the new incumbent and Southern Water.

Supplementary questions

Wayleaves and easements

Q. 6.1: Is there a wayleave / easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?

A.: Records relating to wayleaves / easements are not available for inclusion in this report.

Guidance notes:

This question relates only to private agreements between Southern Water acting in a private capacity and a landowner. Such contracts may often be part of a conveyance or land transfer, or a deed of grant of easement.

If there is no formal easement, then a sewer or water main may have been constructed following the service of notice under the provisions of the Public Health Act 1936, Water Act 1945, Water Act 1989 or Water Industry Act 1991 as applicable. The Company does not hold copies of these notices. However, in the absence of evidence to the contrary there is a legal presumption that all matters were properly dealt with. All rights and obligations relating to sewers and water mains are now covered by the Water Industry Act 1991.

Where rights exist at the boundary of the property, but we are not sure of the exact correlation, we will answer "Yes" to this question.

A documentary right can exist even if the physical asset itself has not yet been laid, or has been moved, or removed. Likewise the position of the right and of the asset may differ. You may also find that an asset is protected both with contractual rights and statutory rights. Please consult your solicitor as to why this may happen, and its effects.

We refer to "defined" assets for the following reasons: Often a contract may give Southern Water an express right to install and maintain assets within an area but without stating the exact position or route of such assets. Also, the law may imply rights where none have been mentioned specifically in a related contract, such as a conveyance. Finally, rights may come into being through long use. In any of these cases the rights are undefined, and although Southern Water may need to rely on them from time to time, as we cannot map the rights accurately, we will answer "No" to this question.

Information obtainable from physical inspection (including Trial Bore Holes) overrides information contained in the report.

Any error in answering this question is not to be regarded as a waiver of Southern Water's rights or title, or an agreement or representation that Southern Water is prepared to vary or discharge any of its rights or title.

Manholes

Q. 6.2: On the copy extract from the public sewer map, please show manhole covers, depth and invert levels where information is available.

A.: A copy of an extract from the public sewer map is included which shows manhole cover, depth and invert levels where the information is available.

Guidance Notes:

The Water Industry Act 1991 defines public sewers as those which the Company has responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purpose 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.

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The copy extract will show known public sewers in the vicinity of the property.

DISCLAIMER: These replies and information, including that shown on the enclosed plan(s), are given on the distinct understanding that neither the Company nor any of its representatives is legally liable for its accuracy or for any action or omission to act whatsoever by anyone on the strength of that information, save as to obvious error. In particular, any person proposing to construct or excavate on land on the basis of information hereby provided should carry out all necessary on-site investigations.

Appendix one: Terms and expressions

"the 1991 Act" means the Water Industry Act 1991(i);

"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000(ii);

"the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001(iii);

"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act(iv);

"bond" means a surety granted by a developer who is a party to an adoption agreement;

"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;

"calendar year" means the twelve months ending with 31 December;

"discharge pipe" means a pipe from which discharges are made or are to be made under Section 165(1) of the 1991 Act;

"disposal main" means (subject to Section 219(2) of the 1991 Act) any outfall pipe or other pipe which:

- (a) is a pipe for the conveyance of effluent to or from any sewerage disposal works, whether of a sewerage undertaker or of any other person; and
- (b) is not a public sewer;

"drain" means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or any buildings or yards appurtenant to buildings within the same curtilage;

"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid;

"financial year" means the twelve months ending with 31 March;

"lateral drain" means:

- (a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or
- (b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act(v);

"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act(vi);

"maintenance period" means the period so specified in an adoption agreement as a period of time:

- (a) from the date of issue of a certificate by a sewerage undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and
- (b) until the date that private sewer or lateral drain is vested in the sewerage undertaker;

"map of waterworks" means the map made available under section 198(3) of the 1991 Act(vii) in relation to the information specified in subsection (1A);

"private sewer" means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a sewerage undertaker;

"public sewer" means, subject to Section 106(1A) of the 1991 Act(viii), a sewer for the time being vested in a sewerage undertaker in its capacity as such, whether vested in that undertaker:

- (a) by virtue of a scheme under Schedule 2 to the Water Act 1989(ix);
- (b) by virtue of a scheme under Schedule 2 to the 1991 Act(x);
- (c) under Section 179 of the 1991 Act(xi); or
- (d) otherwise;

"public sewer map" means the map made available under Section 199(5) of the 1991 Act(xii);

"resource main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of:

- (a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or
- (b) giving or taking a supply of water in bulk;

"sewerage services" includes the collection and disposal of foul and surface water and any other services which are required to be provided by a sewerage undertaker for the purpose of carrying out its functions;

"sewerage undertaker" means the company appointed to be the sewerage undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated;

"surface water" includes water from roofs and other impermeable surfaces within the curtilage of the property;

"water main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water undertaker, which is used or to be used by a water undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;

"water meter" means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises;

"water supplier" means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;

"water supply zone" means the names and areas designated by a water undertaker within its area of supply that are to be its water supply zones for that year; and

"Water undertaker" means the company appointed to be the water undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated.

In this report, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

- (i) 1991 c.56.
- (ii) S.I. 2000/3184. These Regulations apply in relation to England.
- (iii) S.I. 2001/3911. These Regulations apply in relation to Wales.
- (iv) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
- (v) Various amendments have been made to Sections 102 and 104 by section 96 of the Water Act 2003.
- (vi) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
- (vii) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
- (viii) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
- (ix) 1989 c.15.
- (x) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (xi) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (xii) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.

Appendix two: A guide to new development

The information contained below is for general guidance only. It is recommended that Southern Water's Developer Services department be contacted for further details concerning new infrastructure development.

Wastewater information

Sewer requisitions

It may be necessary for a developer to request that Southern Water provides a public sewer to connect a development site to the existing public system. The developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development served by the new sewer.

Sewer diversions

If a public sewer crosses private land, it may be possible for the landowner/developer to request the sewer be diverted. In the majority of cases Southern Water will allow the developer to undertake this work under close supervision. Whether Southern Water or the developer undertakes the diversionary works the costs are the responsibility of the developer.

Building-over sewers

Public sewers are afforded statutory protection and consequently there is no right to build over or in close proximity to a public sewer. If an existing public sewer either crosses a development site or is located in close proximity to a development site it is essential that a developer contact Southern Water.

Sewer connections

A developer can serve notice on Southern Water that it wishes to make a connection to the public sewerage system. The developer must provide 21 days' notice and the work will be supervised by Southern Water.

Water information

Water requisitions

It may be necessary for a developer to request that Southern Water provides both:

- (a) A public water main to connect a development site to the existing public system and,
- (b) On-site public water mains to serve the individual properties.

In both cases the developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development.

It is possible for the developer to lay the on-site mains themselves under a Self-Lay Agreement. Further details are available from Southern Water.

Water main diversions

The building over or in close proximity to public water mains is not permitted. A developer must request that Southern Water undertakes a diversion of a water main that is affected by a development.

Water connections

A developer can request a new connection to a public water main. This work will be undertaken by Southern Water.

Contact us

For specific information on Southern Water's Developer Services service, including details on how to contact the right person, please visit our website: www.southernwater.co.uk/developers-and-builders-overview.

Appendix three: Terms and conditions

The Customer the Client and the Purchaser are asked to note these terms, which govern the basis on which this drainage and water report is supplied.

Definitions

"The Company" means the water service company operating within the Southern Water drainage area that provides information to Southern Water for this commercial search Report.

"Order" means any request completed by the Customer requesting the Report.

"Report" means the drainage and/or water report prepared by The Company in respect of the Property.

"Property" means the address or location supplied by the Customer in the Order.

"Customer" means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.

"Client" means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.

"Purchaser" means the actual or potential purchaser of the Property including their mortgage lender.

1.0 Agreement

- 1.1 Southern Water agrees to supply the Report subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client.
- 1.2 The Customer and Client agree that the placing of an Order for a Report indicates their acceptance of these terms.

2.0 The Report

Whilst Southern Water will use reasonable care and skill in producing the Report, it is provided to the Client on the basis that they acknowledge and agree to the following:

- 2.1 The information contained in the Report can change on a regular basis so Southern Water cannot be responsible to the Client for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.
- 2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.
- 2.3 The information contained in the Report is based upon the accuracy of the address supplied by the Customer or Client.
- 2.4 The Report provides information as to the location and connection of existing services, and details of trade effluent consents. It should not be relied upon for any other purpose. The Report may contain opinions or general advice to the Customer and the Client and Southern Water cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.
- 2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes.

3.0 Liability

- 3.1 Southern Water shall not be liable to the Client for any failure defect or non-performance of its obligations arising from any failure of or defect in any machine, processing system or transmission link or anything beyond Southern Water's reasonable control or the acts or omissions or any party for whom Southern Water is not responsible.
- 3.2 Where a Report is requested for an address falling within a geographical area where Southern Water and another Company separately provide water and sewerage services, then it shall be deemed that liability for the information given by Southern Water or the Company as the case may be will remain with Southern Water or the Company as the case may be in respect of the accuracy of the information supplied. Where Southern Water is supplying information which has been provided to it by another Company for the purposes outlined in this agreement, Southern Water will therefore not be liable in any way for the accuracy of that information.
- 3.3 Where the Customer sells this Report to a Client (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) Southern Water or the Company as the case may be shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss or damage whatsoever (save to the extent provided by clause 3.4) and the Customer shall indemnify Southern Water in respect of any claim (other than a claim covered by clause 3.4) by the Client.
- 3.4 Southern Water shall accept liability for death or personal injury arising from its negligence.
- 3.5 The entire liability of Southern Water or the Company as the case may be in respect of all causes of action arising under or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall not exceed £2,000,000 (two million pounds); and Southern Water or the Company as the case may be shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss of profit, loss of goodwill, loss of reputation, loss of business or any indirect, special or consequential loss, damage or other claims, costs or expenses.

4.0 Copyright and confidentiality

- 4.1 The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client. The copyright and any other intellectual property rights in the Report shall remain the property of Southern Water. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided.
- 4.2 The Customer or Client is entitled to make copies of the Report (other than any maps contained in the, or attached to the Report, where no copying is permitted).
- 4.3 The Customer and Client agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.
- 4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.
- 4.5 The Customer and the Client agree to indemnify Southern Water or the Company as the case may be against any losses, costs, claims and damage suffered by Southern Water or the Company as the case may be, as a result of any breach by either of them of the terms of paragraphs 4.1 to 4.4 inclusive.

5.0 Payment

- 5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by Southern Water, without any set off, deduction or counterclaim. Unless the Customer or Client has an account with Southern Water for payment for Reports, payments for Reports must be received in full by Southern Water before the Report is produced. For Customers or Clients with accounts, payment terms will be as agreed with Southern Water.

6.0 General

- 6.1 If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.
- 6.2 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.
- 6.3 Nothing in this notice shall in any way restrict your statutory or any other rights of access to the information contained in the Report.

These Terms and conditions are available in larger print for those with impaired vision.

Appendix four: Complaints procedure

When we get it wrong

You deserve the highest standard of service from us, but sometimes we make mistakes. If we do, please let us know and we will investigate and review your concerns.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us, you can ask us to escalate the issue internally or take your complaint to an independent third party.

How you contact us

Firstly please call us and we will try to sort out your problem straight away.

You can call us between 8am and 5pm, Monday to Friday on 0330 303 0276 (individual consumers);

Email us at searches@southernwater.co.uk; or

Write to us at LandSearch, Southern Water Services, Southern House, Capstone Road, Chatham, Kent, ME5 7QA.

What you can expect

You will receive a full, fair and courteous response from someone who can effectively deal with your problem.

If we can remedy the problem straight away we will do it but if we cannot immediately resolve your problem we will keep you informed of actions being taken.

The process

We will try to resolve any telephone contact or complaint at the time of the call, however, if that isn't possible, we will take the details of your complaint and we will investigate and get back to you within 10 working days.

We will respond to written complaints within 10 working days of the date received, but we will always aim to respond more quickly. Depending on the scale of investigation required, we will keep you informed of the progress and update you with new timescales if necessary.

If you are still not satisfied with our response or action we will refer the matter to a Senior Manager for resolution. At your request we will liaise with a third party representative acting on your behalf.

Our commitment to you

If we do not respond to your complaint within 10 working days of receipt of your contact, we will compensate you in line with Southern Water's Customer services — Guaranteed standards of service for business customers.

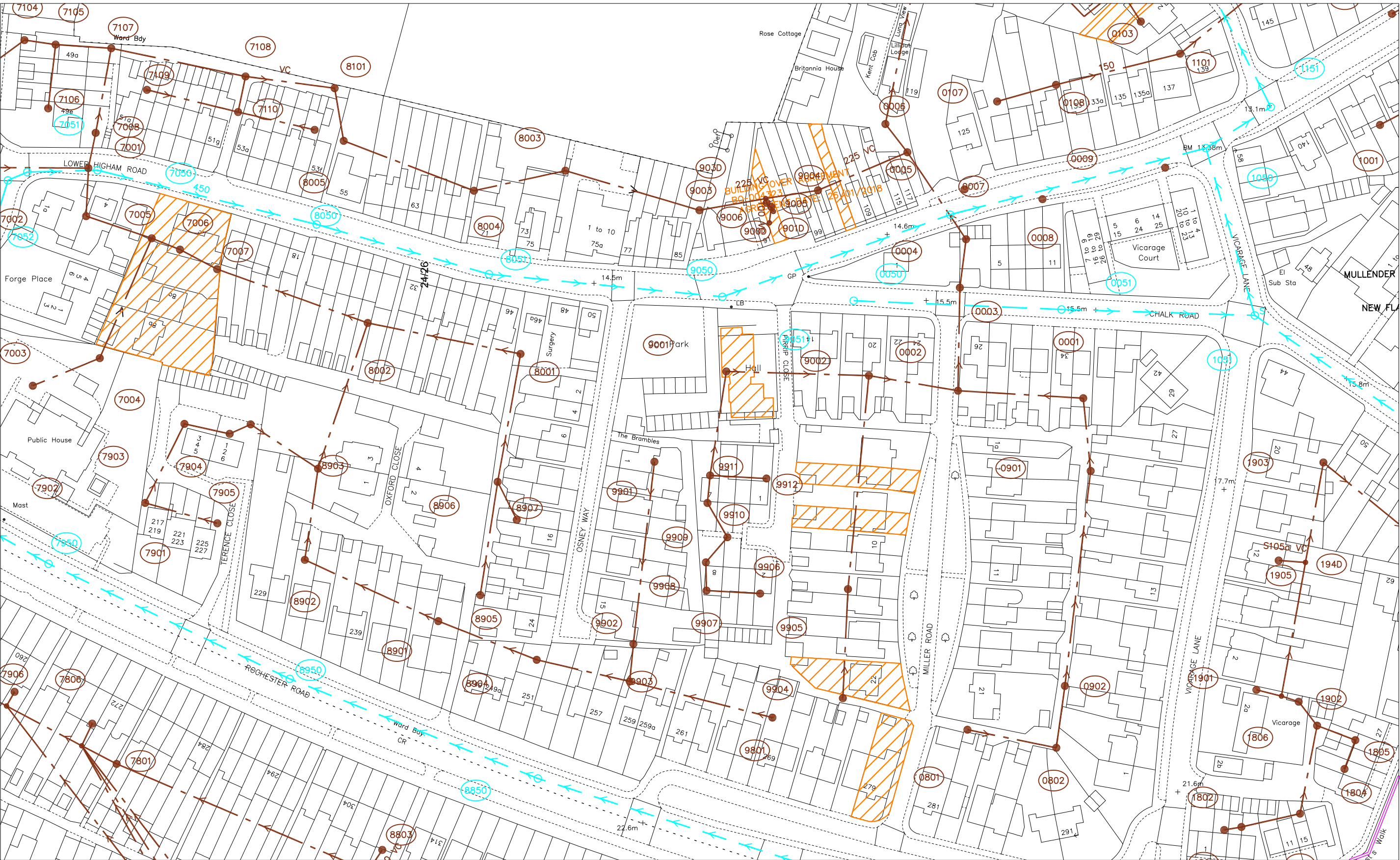
If we find your complaint to be justified, or we have made any errors that substantially change the outcome in your search result, we will refund the search fee. We will also provide you with a revised search and undertake the necessary action to put things right as soon as practically possible. You will be kept informed of the progress of any action required.

If you remain dissatisfied

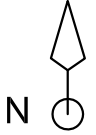
While we aim to resolve your complaint first time, in the event that we are unable to resolve the issue to your satisfaction, ultimately you can contact a third party. Please make sure that you have followed the process above first, if not, your complaint will be passed back to us.

SEWER RECORDS PAGE 1 OF 2

173140



172852

566703	O.S. REF. TQ6672NE	Drawn by: sharmash	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement	 
	Title: Land adjoining The Brambles	Scale: 1:1250		
567174		Date: 17/06/2021	Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.	

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
0001X			UNK	UNK	CIRC	8004X			UNK	UNK	CIRC												
0002X			UNK	UNK	CIRC	8005X			UNK	UNK	CIRC												
0003X			UNK	UNK	CIRC	8006X			UNK	UNK	CIRC												
0004X			UNK	UNK	CIRC	8050X			UNK	UNK	CIRC												
0005X			UNK	UNK	CIRC	8051X			UNK	UNK	CIRC												
0006X			UNK	UNK	CIRC	8101X			UNK	UNK	CIRC												
0050X			UNK	UNK	CIRC	8803X			100	VC	CIRC												
0051X			UNK	UNK	CIRC	8850X			UNK	UNK	CIRC												
0103X			100	UNK	CIRC	8901X			UNK	UNK	CIRC												
0107X			UNK	UNK	CIRC	8902X			UNK	UNK	CIRC												
0108X			150	UNK	CIRC	8903X			UNK	UNK	CIRC												
0801X			UNK	UNK	CIRC	8904X			UNK	UNK	CIRC												
0802X			UNK	UNK	CIRC	8905X			UNK	UNK	CIRC												
0901X			UNK	UNK	CIRC	8906X			UNK	UNK	CIRC												
0902X			UNK	UNK	CIRC	8907X			UNK	UNK	UNK												
1001X			UNK	UNK	CIRC	8950X			UNK	UNK	CIRC												
1050X			UNK	UNK	CIRC	9001X			UNK	UNK	CIRC												
1051X			UNK	UNK	CIRC	9002X			UNK	UNK	CIRC												
1101X			UNK	UNK	CIRC	9004X			225	VC	CIRC												
1105X			UNK	UNK	CIRC	9005X			100	VC	CIRC												
1151X			UNK	UNK	CIRC	9006X			100	VC	CIRC												
1801X			UNK	UNK	CIRC	900DX			UNK	UNK	CIRC												
1802X			UNK	UNK	CIRC	901DX			100	VC	CIRC												
1803X			UNK	UNK	CIRC	9050X			UNK	UNK	CIRC												
1804X			UNK	UNK	CIRC	9051X			UNK	UNK	CIRC												
1805X			UNK	UNK	CIRC	9801X			UNK	UNK	CIRC												
1806X			UNK	UNK	CIRC	9901X			UNK	UNK	CIRC												
1901X			UNK	UNK	CIRC	9902X			UNK	UNK	CIRC												
1902X			UNK	UNK	CIRC	9903X			UNK	UNK	CIRC												
1903X			UNK	UNK	CIRC	9904X			UNK	UNK	CIRC												
1905X			UNK	VC	CIRC	9905X			UNK	UNK	CIRC												
190DX			UNK	UNK	CIRC	9906X			UNK	UNK	CIRC												
194DX			UNK	UNK	CIRC	9907X			UNK	UNK	CIRC												
7001X			UNK	UNK	CIRC	9908X			UNK	UNK	CIRC												
7002X			UNK	UNK	CIRC	9909X			UNK	UNK	CIRC												
7003X			UNK	UNK	CIRC	9910X			UNK	UNK	CIRC												
7004X			UNK	UNK	CIRC	9911X			UNK	UNK	CIRC												
7005X			UNK	UNK	CIRC	9912X			UNK	UNK	CIRC												
7006X			UNK	UNK	CIRC																		
7007X			UNK	UNK	CIRC																		
7008X			UNK	UNK	CIRC																		
7050X			450	UNK	CIRC																		
7051X			450	UNK	CIRC																		
7052X			300	UNK	CIRC																		
7104X			UNK	UNK	CIRC																		
7105X			UNK	UNK	CIRC																		
7106X			UNK	UNK	CIRC																		
7107X			UNK	UNK	CIRC																		
7108X			UNK	VC	CIRC																		
7109X			UNK	UNK	CIRC																		
7110X			UNK	UNK	CIRC																		
7801X			UNK	UNK	CIRC																		
7806X			UNK	UNK	UNK																		
784DY			UNK	UNK	CIRC																		
7901X			UNK	UNK	CIRC																		
7902X			UNK	UNK	CIRC																		
7903X			UNK	UNK	CIRC																		
7904X			UNK	UNK	CIRC																		
7905X			UNK	UNK	CIRC																		
7906X			UNK	UNK	UNK																		
790DX			UNK	UNK	CIRC																		
7950X			UNK	UNK	CIRC																		
8001X			UNK	UNK	CIRC																		
8002X			UNK	UNK	CIRC																		
8003X			UNK	UNK	CIRC																		

25/26

LINE STYLES / COLOURS

Brown	—	Foul
	—	Foul Syphon Sewer
	—	Foul Vacuum Main
	—	Foul Rising Main
Red	—	Combined
	—	Combined Syphon Sewer
	—	Combined Rising Main
Orange	—	Lateral Drain
	—	Building Over Agreement Area
Dark Blue	—	Treated Effluent
Purple	—	Sludge
	—	Sewer Catchment
	—	Section 104 Area
Light Blue	—	Surface Water
	—	Surface Water Rising Main
Yellow	—	Private
Green	—	Access Shaft
	—	Decommissioned

MATERIALS

AK	Alkathene
BAC	Bonded Asbestos Cement
BRC	Brick (Common)
BRE	Brick (Engineering)
CC	Concrete Box Culvert
CI	Cast Iron
CO	Concrete (In-Situ)
CP	Concrete (Pre-Cast)
CSB	Concrete Segments (bolted)
CSU	Concrete Segments (unbolted)
DI	Ductile Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry in regular Courses
MAR	Masonry in random Courses
PE	Polyethylene
PF	Pitch Fibre
PP	Polypropylene
PVC	Polyvinyl Chloride
RPM	Reinforced Plastic Matrix
SI	Spun Iron
ST	Steel
VC	Vertical Clay
XXX	Other
ZZZ	Unknown

Manhole (SW)
Manhole (F&C)
Lamp hole (SW)
Lamp hole (F&C)
Pumping Station (SW)
Pumping Station (F&C)
Side entry manhole (SW)
Side entry manhole (F&C)
Blind shaft (SW)
Blind shaft (F&C)
Ejector station (SW)
Ejector station (F&C)
Watertight door (SW)
Watertight door (F&C)
Flushing ch. Min-e (SW)
Flushing ch. Min-e (F&C)
Flushing ch. No-e (SW)
Flushing ch. No-e (F&C)
Demarcation Chamber

LEGEND - SEWERS

Washout (SW)
Washout (F&C)
Rodding Eye (SW)
Rodding Eye (F&C)
Gauging point (SW)
Gauging point (F&C)
Intercept chamber (SW)
Intercept chamber (F&C)
Storm Tank (SW)
Storm Tank (F&C)
Vortex chamber (SW)
Vortex chamber (F&C)
Label ellipse
Dummy/S24 manhole
Outfall
Penstock chamber
Damboards
Storm Overflow
Backdrop manhole

Other (s)
Other
Change in sewer (s)
Change in sewer
Reflex valve
Flap valve
Cascade
Anode
Valve
Closed Valve
Air Valve
Hatch box (SW)
Hatch box (F&C)
Direction arrow
Emptying valve
Catchpit
Soakaway
Inlet
Balancing Pond

Wastewater treatment works
Marine treatment works
Outfall headworks
Vent
Vent column
Tidal storage tank
Blank end
Head of Public Sewer
Micro Pumping Station

SHAPES (S)

A	Arched	R	Rectangular
B	Barrel	S	Square
C	Circular	T	Trapezoidal
E	Egg	U	U Shape
H	Horseshoe	X	Other

NODE REFERENCING SYSTEM

1st digit:	hundred metre easting identifier
2nd digit:	hundred metre northing identifier
3rd digit:	sewer type identifier
4th digit:	next sequential node

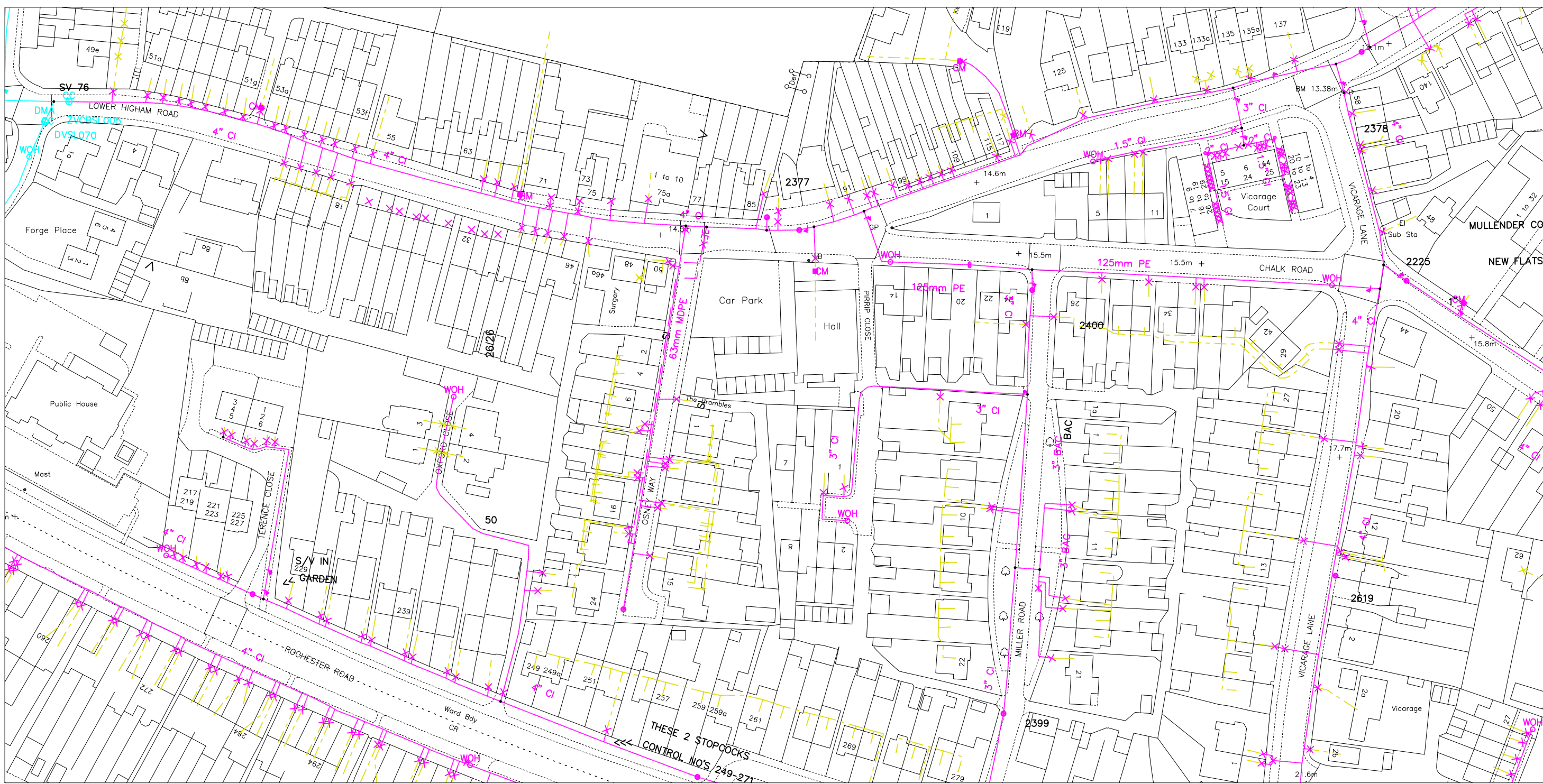
Drawn by: sharmash

Title: Land adjoining The Brambles

Date: 17/06/2021



173117



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966995

567181

LEGEND - MAINS

	Distribution Main / Communication pipe		Clockwise closing valve
	Trunk Main		Fire Hydrant
	Raw water main		Washout
	Non potable		Washout hydrant
	Abandoned main		Meter
	Proposed Main		Capped end
	Fire main		Emptying plug
	Non SWS		Stopcock
	Sluice valve		Leak Noise Correlator Survey Point
	Closed valve		Anode
	Air valve		Telemetry cable
	Butterfly valve		Access point / hatchbox
	Pressure reducing valve		
	Reflux valve		
	Motorised valve		

MATERIALS

	Dialysis machine		Alkathene
	Break pressure tank		Cast iron
	Change node		Spun (grey) iron
	Pumping station		Concrete
	Booster station		Ductile iron
	Insertion Flow Meter Point		Bonded Asbestos Cement
	Water tower		Glass reinforced plastic
	Service reservoir		Glass reinforced epoxy
	Water Supply Works		(Unplasticised) Polyvinyl chloride
	Bore hole / Well		Polyethylene
	Intake		Steel
	Customer site		Concrete segments bolted
	Swab insertion point		Concrete segments unbolted
			Galvanised iron
			Ductile sleeve
			Concrete pre-stressed
			High performance polyethylene
			Unknown

AK	
CI	
SI	
CO	
DI	
BAC	
GRP	
GRE	
PVC	
PE	
ST	
CSB	
CSU	
GI	
DS	
CPS	
HPE	
??	

Drawn by: sharmash

Scale: 1:1250

Date: 17/06/2021

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd. accept no responsibility in the event of inaccuracy. The actual positions of pipes should be determined on site.

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O.S.Ref: TQ6672NE

TITLE: Land adjoining The Brambles



WARNING: BAC pipes are constructed of Bonded Asbestos Cement

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement