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Land north of Balcombe Road, Haywards Heath: Outline Drainage Strategy

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Land north of Balcombe Road, Haywards Heath: Outline Drainage Strategy

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1. Introduction

1.1. Instruction

Aqua Terra Consultants Ltd (Aqua Terra) was instructed by Fairfax Acquisitions Ltd (the Client) on behalf of SDP to provide an Outline Drainage (SuDS) Strategy to support a residential led development on a parcel of land north of Balcombe Road, Haywards Heath (the Site).

1.2. Background

The SuDS Strategy is to support an outline planning application for the erection of up to 125 dwellings, together with the provision of landscaping, open space, and associated development works, with access from Balcombe Road. An illustrative masterplan depicting the proposed development was provided to Aqua Terra which is included as Figure 3-1.

1.3. Scope

This report provides an outline SuDS strategy to mitigate the potential increase in runoff and deterioration in water quality as well as providing amenity and biodiversity benefits as a result of the proposed development. The scope of work undertaken for this assessment includes the following:

- Review of the baseline hydrology, hydrogeology and flood risk for the Site;
- Review of national, regional and local guidance and policies on surface water management;
- Details of the proposed development and outline planning application;
- Estimated surface water runoff rates and preliminary attenuation storage requirements;
- Assessment of potential surface water runoff destinations;
- An appraisal of potentially feasible SuDS features for the Site; and,
- An outline SuDS strategy for managing surface water runoff from the proposed development.

1.4. Data Sources

The information and assessments in this report are predominantly based on secondary data analyses associated with both the Site itself and the surrounding land area. The main sources of data utilised in this assessment are summarised below:

- The proposed development plans as provided by the Client;
- LiDAR Digital Terrain Model (DTM) data obtained through data.gov.uk (DeFRA, 2020-22);
- Environment Agency (EA) flood risk data (Flood map for planning) obtained through data.gov.uk (Environment Agency, 2025);
- Soilsmap soil mapping (Cranfield Soil and AgriFood Institute, 2024);
- British Geological Survey (BGS) 1:50,000 scale mapping and borehole logs (British Geological Society, 2025);
- Hydrological descriptor data from the Flood Estimation Handbook (FEH) website (CEH, 2025);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018);
- Mid Sussex Strategic Flood Risk Assessment Level 1 (aegaea, 2024);
- West Sussex Preliminary Flood Risk Assessment (West Sussex County Council, 2011);
- West Sussex Local Flood Risk Management Strategy: 2015 - 2030 (West Sussex County Council, 2025); and,
- Land north of Balcombe Road, Farm: Flood Risk Assessment (Aqua Terra Consultants Ltd, 2025).

1.5. Limitations

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

2. Site setting

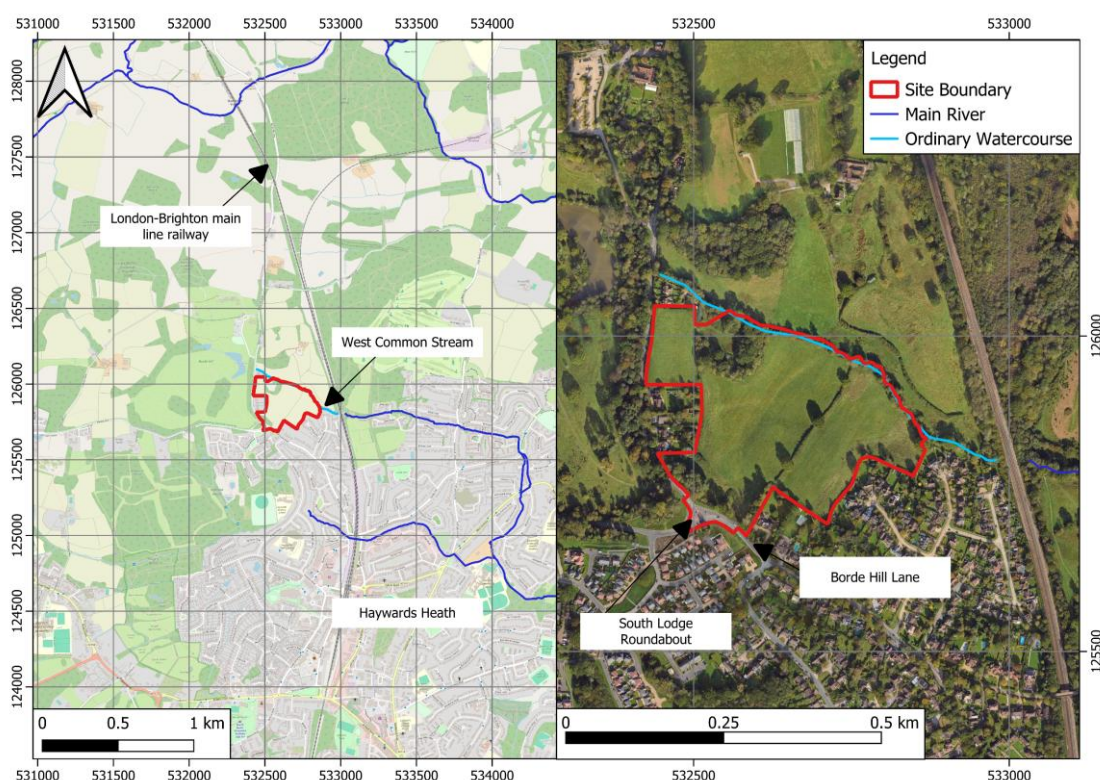
The following section collates and presents available information pertinent to the Site and its local environs.

2.1. Site location and description

The Site is located on the outskirts of Haywards Heath as shown in Figure 2-1, between Borde Hill Lane and the London-Brighton main railway line. The National Grid Reference for the approximate centre of the Site is 532685, 125872.

The Site currently comprises predominantly agricultural land with small areas of woodland and covers an approximate area of 9.4 ha. There is a small watercourse (West Common Stream) located along the northern boundary of the Site, flowing north-west to south-east.

Figure 2-1 Site location



Contains Open Street Map data © OpenStreetMap and Bing Aerial imagery © Microsoft

2.2. Topography and current drainage arrangements

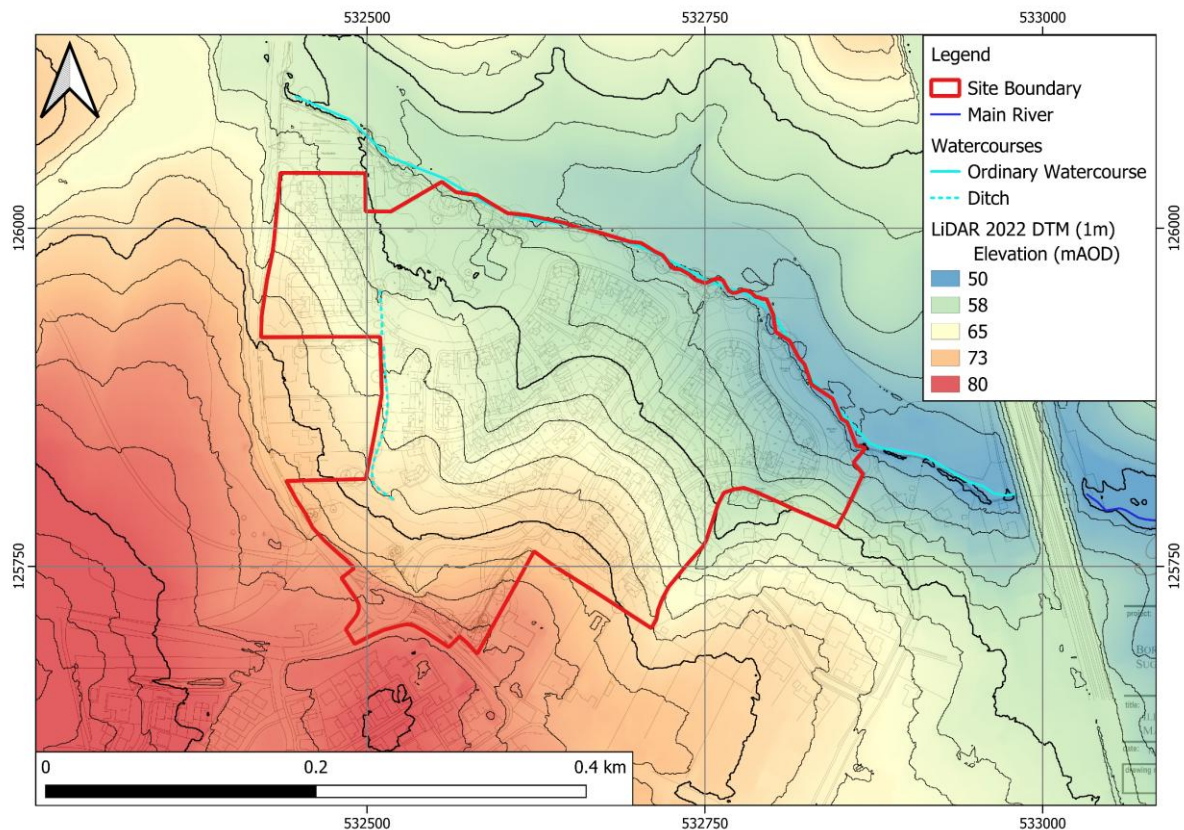
Figure 2-2 presents LiDAR topographical data. Ground elevations in the area around the Site slope generally north-eastwards. The ground elevation at the Site falls from approximately 76.0m above Ordnance Datum (m aOD) in the southwest to a minimum of approximately 50.7m aOD in the northeast, where West Common Stream leaves the Site. Topographic survey was completed for the Site by Marvin & Partners Limited in 2023 and is provided in Appendix B.

At present, the Site does not have a formal drainage system and surface water runoff will either infiltrate or flow overland with the topography towards West Common Stream. Figure 2-3 shows the

surface water flood risk areas across the Site which give a good indication of the likely drainage paths across the Site. The Flood Risk Assessment describes these flow paths and mitigation measures to ensure that the development will remain safe during its lifetime.

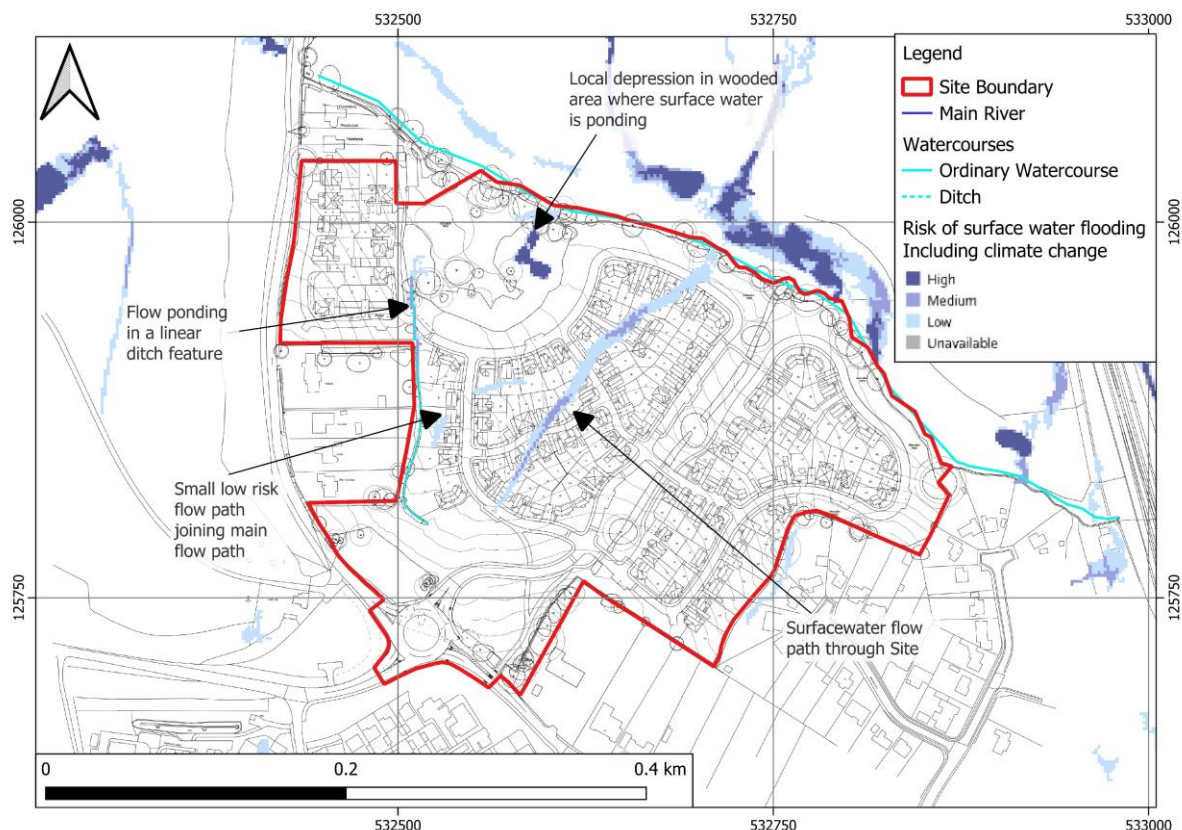
Public sewer asset plans (see Appendix C) confirm that there are no existing public sewers crossing the Site. The nearest accessible foul sewer is in Balcombe Road to the south of the Site, however it is understood that works are in progress for Borde Hill Estate to for sewerage connection works which will include foul water rising main adjacent to South Lodge Roundabout.

Figure 2-2 Existing ground elevations from LiDAR data



Contains Open Street Map data © OpenStreetMap

Figure 2-3 Risk of flooding from surface water



2.3. Soils, geology and hydrogeology

2.3.1. Published soils and geology

A review of British Geological Survey (BGS) 1:50,000 scale mapping (Reigate, Sheet 286) indicates the geological sequence underlying the Site is as follows:

- Soils: Slightly acid loamy and clayey soils with impeded drainage across the Site.

Superficial geology (see Figure 2-4): None across the majority of the Site, a narrow band of Head Deposits (clay, silt and gravel) runs across the northern boundary and north-eastern corner, following the path of the watercourse.

- Solid geology (see Figure 2-5): Predominantly the Wadhurst Clay Formation (mudstone) across the northern half of the Site. The Cuckfield Stone Bed (sandstone) lies across the southern half of the Site, with small areas of the Upper Tunbridge Wells Sand (sandstone and siltstone) and Lower Tunbridge Wells Sand (sandstone, siltstone and mudstone).

There are no historical borehole logs within the Site based on the BGS database, however borehole TQ32NW9 is located 700m to the southeast, on the Upper Tunbridge wells sands confirms layers of Clay & Sandstone, Blue Clay, Sandy Clay and Sandstone & Clay to a depth of 30.5m. Water was struck at a depth of 26.2m, with the rest level rising to 23.2m.

Figure 2-4 Superficial deposits

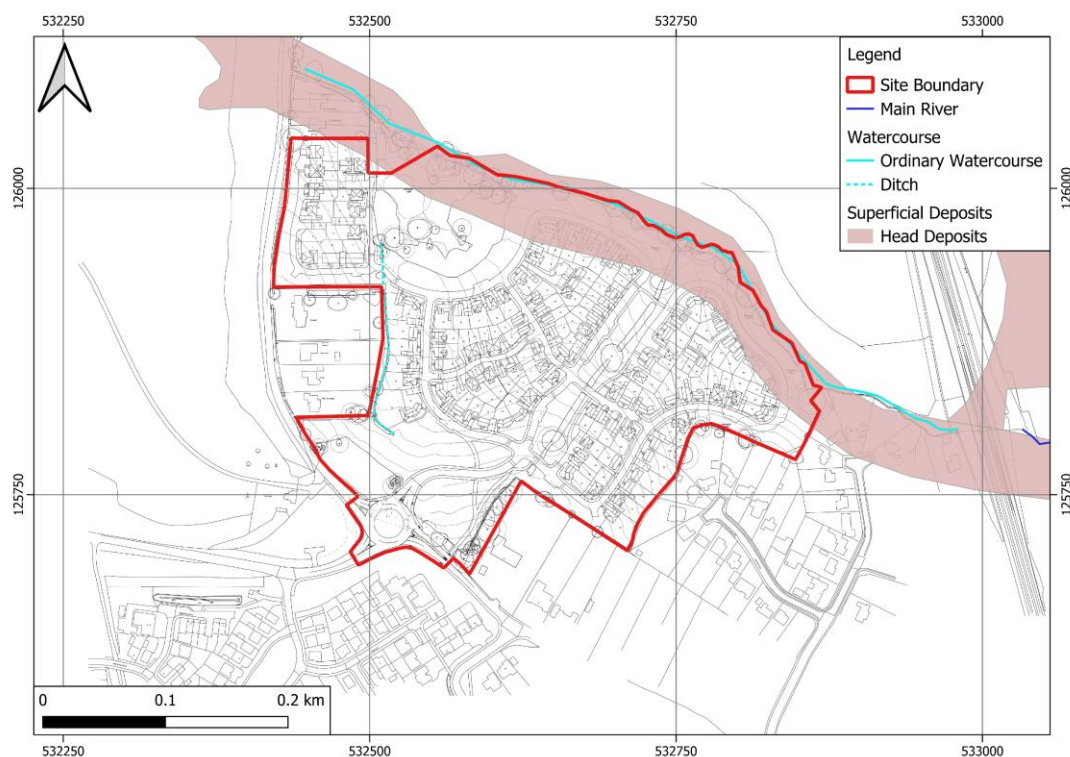
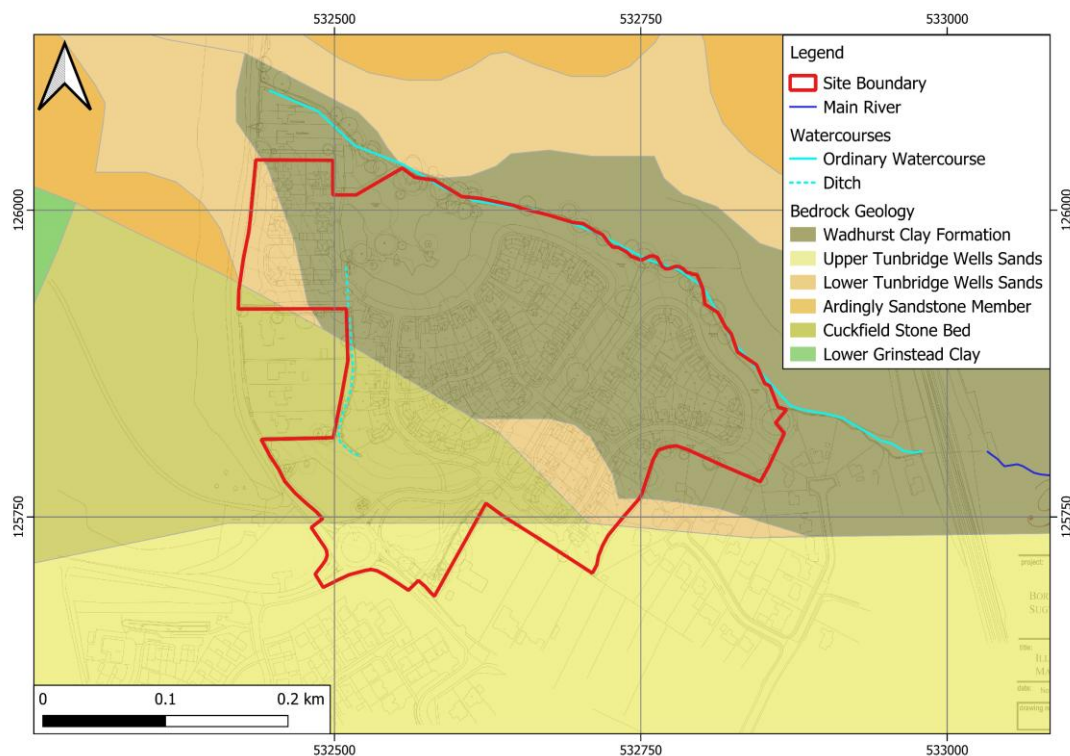


Figure 2-5 Bedrock Geology



2.3.2. Hydrogeology

The Head Deposits, along the northern boundary of the Site, are classified as a Secondary (undifferentiated) aquifer. The Cuckfield Stone Bed, Upper Tunbridge Wells Sand and Lower Tunbridge Wells Sand, across the southern half of the Site, are classified as Secondary A aquifers. The Wadhurst Clay Formation which covers the northern half of the Site is classified as unproductive strata.

Mapping indicates that the southern half of the Site is designated as high Groundwater Vulnerability. The land along West Common Stream is classified as having low Groundwater Vulnerability

The Water Framework Directive (WFD) classifies the Adur and Ouse Hastings Beds groundwater body as having an overall, quantitative and chemical rating of good in 2022. The Site does not lie within a source protection zone.

2.4. Hydrology

Hydrological descriptors for the Site are provided in Table 2-1.

Table 2-1 Hydrological point descriptors

Descriptor	Value
NGR	TQ 532625 125852
BFIHOST19	0.437
PROPWET	0.36
SAAR6190	829 mm

There are several ponds and lakes in the surrounding area, the closest being Robertsmere Lake 70m west of the Site, on West Common Stream. West Common Stream, an Ordinary watercourse as it passes along the boundary of the Site, is classified as a Main River downstream of the railway line, and flows into Scrase Stream approximately 2km downstream of the Site.

The Site lies within the Scrase Bridge Stream at Haywards Heath water body, which is classified under the WFD as having an ecological rating of moderate in 2022 and a chemical rating of 'fail'. Reasons for not achieving a good ecological status are due to physical modifications and pollution from waste water, and for chemical status due to failing levels of mercury and it's compounds and polybrominated diphenyl ethers (PBDE).

3. Proposed development

The Proposed Development comprises the erection of up to 125 dwellings, together with the provision of landscaping, open space, and associated development works, with access from South Lodge Roundabout.

An illustrative masterplan of the proposed development has been supplied to Aqua Terra and is presented in Figure 3-1 and in Appendix D.

Figure 3-1 Illustrative masterplan



Source: Paul Hewett (November 2025)

4. Sustainable Drainage (SuDS) Strategy

The NPPF stipulates that all new developments must be “safe, without increasing flood risk elsewhere”. The National Standards for Sustainable Drainage Systems (HM Government, 2025) expand on these principles by setting a clear hierarchy for runoff destinations and defining seven technical standards covering runoff control, management of everyday and extreme rainfall, water quality, amenity, biodiversity and consideration of structural design, construction and long-term maintenance.

The proposed drainage design is described under Section 4.1 with subsequent sections covering each of the 7 standards that are required to be demonstrated for all SuDS schemes.

4.1. Proposed Drainage Design

An outline SuDS Strategy has been drafted and includes at source controls through porous paving acting as attenuation storage on some of the low traffic and communal parking areas, leading to three detention basins, located throughout the Site before discharging to West Common Stream at the 50% AEP greenfield runoff rate for all storm events up to the design storm.

4.1.1. Assessment of catchment areas

The Site has been split into catchments (see Figure 4-1) based on topography and the layout of the development. The positively drained area for each sub-catchment has been calculated as follows:

Positively drained area =

- Public adoptable areas (such as roads, footpaths) +
- 1.1* Private non-adoptable areas (roofs, driveways and paths) +
- Footprint of key Suds features (such as detention basins) +
- 0.3*Remaining greenfield area (excluding large open public areas) +

This ensures that urban creep (at 10%) is accounted for in non-adoptable impermeable areas, and an allowance for greenfield runoff that may be intercepted by the drainage network. Figure 4-2 shows the proposed adoptable and non-adoptable areas on Site, along with proposed permeable paving (located only on adoptable areas).

In order to mitigate potential surface water flood risk identified within the Flood Risk Assessment, runoff from the full southern catchment is proposed to be captured via additional gullies within the road network. Therefore the full remaining greenfield area (rather than 30%) has been assumed to ensure there is sufficient capacity within the receiving storage elements for this additional runoff.

Appendix E provides details of how the positively drained area has been calculated for each catchment. ReFH2 hydrographs representing the greenfield areas have been applied to each catchment upstream of respective key SuDS features.

The total positively drained area for the Site is 5.71 ha

Figure 4-1 Urban catchments

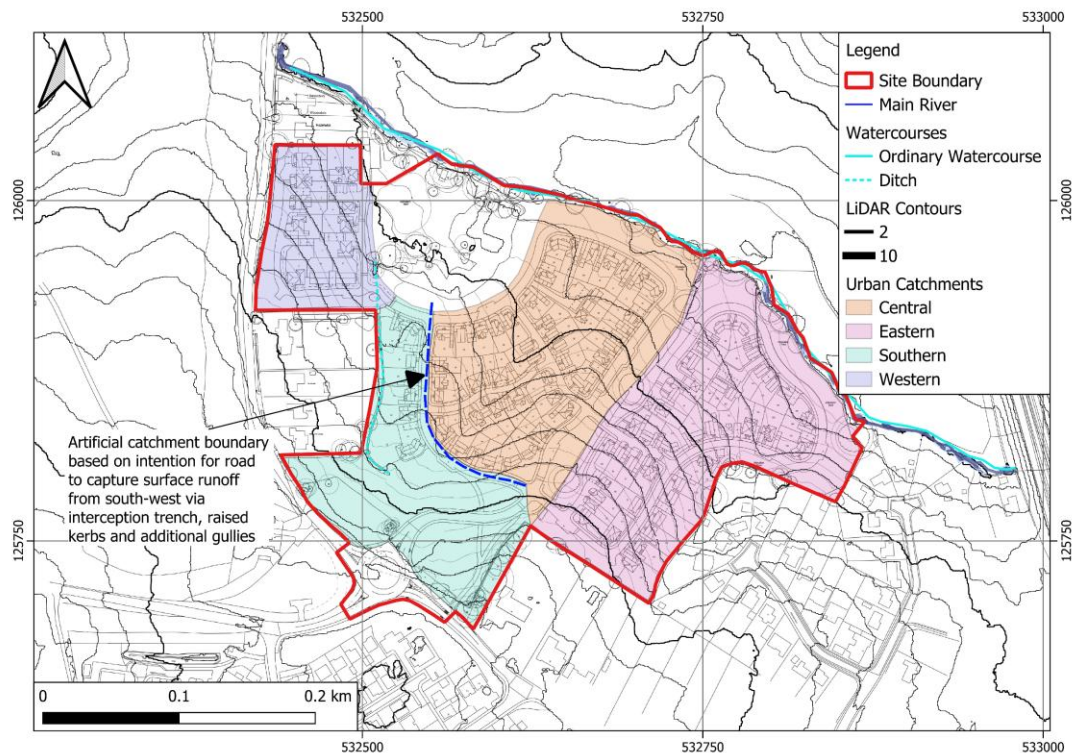
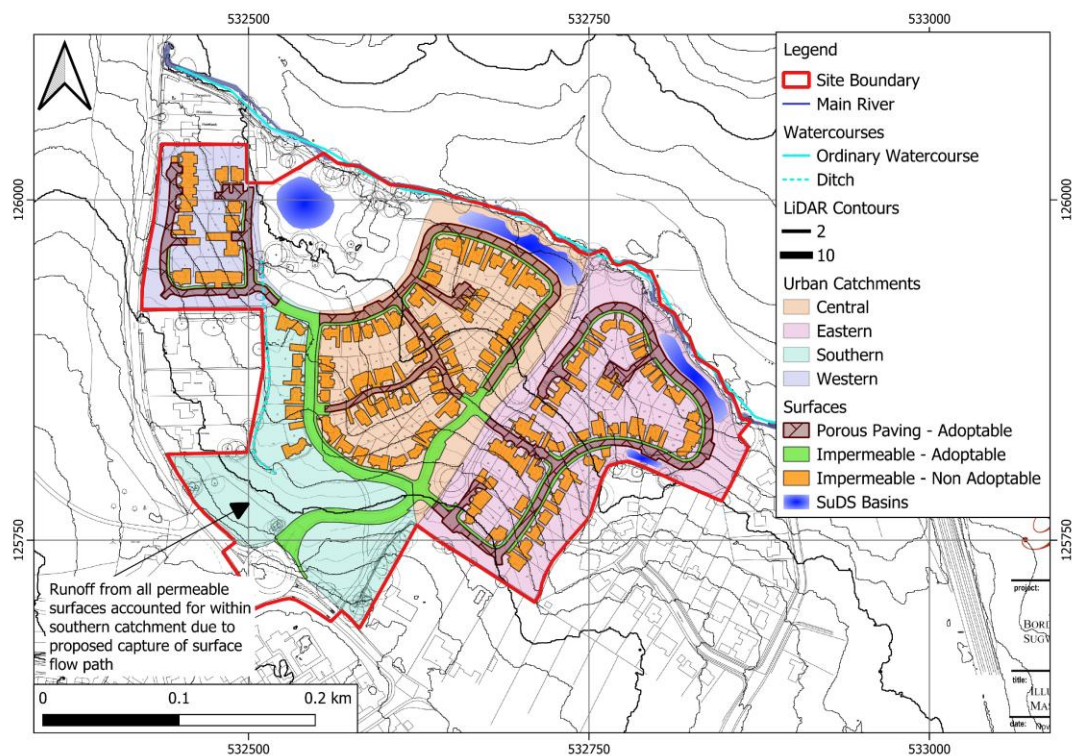


Figure 4-2 Adoptable and non-adoptable areas on Site



4.1.2. Proposed storage and control elements

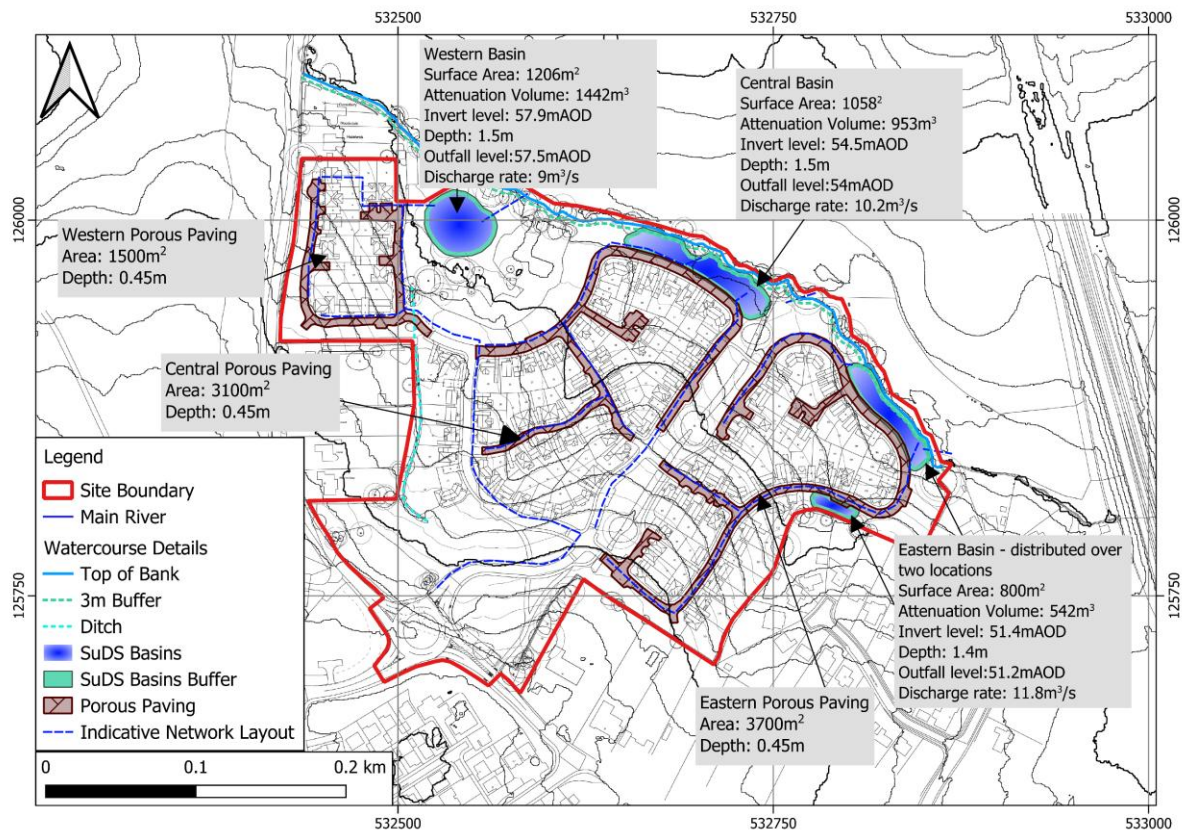
Porous paving has been proposed for low traffic roads and communal parking areas (as indicated in Figure 4-4). Areas of porous paving have been assumed to have a 35% porosity and a depth of 0.45m. Orifices have been used as flow controls on the porous paving areas to limit flow rates passing onto downstream detention basins. At this stage in the design, porous paving areas have been amalgamated and therefore the orifice dimensions presented in the hydraulic calculations may not be representative of what will be required when areas of porous paving are sub-divided to enable stepped storage areas accounting for the slope of the Site. As part of the detailed design orifices smaller than 0.05m in diameters must be robustly protected from blockage risk as per the National SuDS Standards. It is proposed that the porous paving could be left un-lined to allow any potential infiltration to occur, as nearby boreholes suggest depth to groundwater is significant. Infiltration is however likely to be limited due to the Wadhurst Clay underlying the northern portion of the Site.

Four detention basins are proposed. The eastern catchment is served by two detention basins of which the upper basin will feed into the lower basin. A single basin has been used to represent the joint capacity of both these basins within the outline drainage calculations. A single detention basin serves the central catchment. The western detention basin serves both the southern and western catchments. Detention basins have been designed with an overall depth of 1.5m, with the exception of the eastern basins which have depth of 1.4 for the northern of the two basins, and 1.2 for the other, and side slopes of 1:3. Each basin includes a hydrobrake to control discharge to West Common Stream.

As the layout plans for the Site progress, the required storage could be distributed over additional features such as rain gardens or tree pits adjacent to the larger roads to comprise a "SuDS train" within the Site.

Figure 4-3 details the location and key properties of SuDS features. A 3m easement has been provided around each basin and from the top of bank for West Common Stream. The easement between the basins and the stream are a total of 3m, not a combined easement of 6m as access can be shared. A detailed assessment of outfall invert levels has been undertaken in Section 4.2.3. Details of the modelled scheme in the form of a Causeway Flow report are provided in Appendix F.

Figure 4-3 Properties of key SuDS features



4.1.3. Performance calculation parameters

Causeway Flow has been used to model the proposed drainage design using a source control approach – therefore not all details have been provided but rather the model has been used to confirm that the overall storage provision on Site is sufficient.

For each sub-catchment four inflows have been considered:

1. Rainfall landing directly on porous paving areas, and an equal contribution from neighbouring impermeable surfaces (such as residential roofs). This is routed to the detention basins via a porous paving storage unit.
2. Rainfall landing on remaining impermeable surfaces that have not been assumed to be able to be routed via a porous paving storage unit. This is routed direct to the detention basin
3. Rainfall landing directly on the detention basin
4. A ReFH2 hydrograph routed direct to the detention basin representing runoff from 30% of the permeable surfaces within the catchment (Note this is 100% for the 'southern' catchment as described in Section 4.1.1).

The assumption that each porous paving area can accept up to an equal contribution from adjacent impermeable surfaces is considered acceptable at the outline drainage stage.

Key model parameters are as follows:

- Model run for the 50%, 3.3% and 100% AEP events with a 40% and 45% allowance for climate change for the 3.3% and 100% AEP events respectively, representing the upper end peak rainfall climate change allowance for the Adur and Ouse Management Catchment

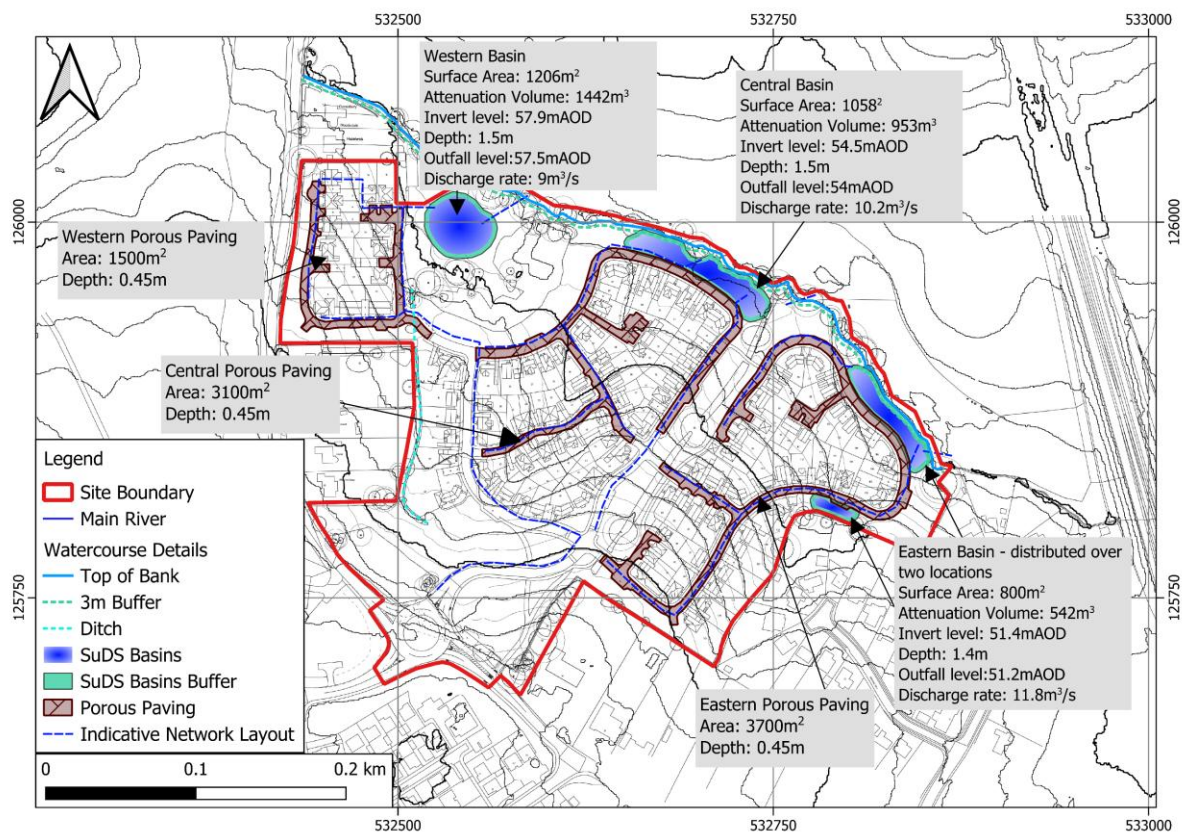
- FEH22 rainfall profiles used, with full range of storm durations from 15 minutes to 1,440 minutes
- Volumetric runoff coefficient set to 1 for both winter and summer storms to represent capture of all runoff from impermeable surfaces
- Additional storage value set to 0
- No infiltration has been assumed for any of the SuDS features

The results from the modelling are presented under the relevant standards, with a detailed output report from Causeway Flow presented in Appendix F.

4.1.4. Feasibility of design

Whilst the performance calculations undertaken provide a simplified representation of the proposed drainage system, in particular with reference to the exclusion of the piped network and relevant invert / cover levels, slopes across the Site are sufficient that a gravity fed system should be possible across the Site and no pumping has been proposed. Figure 4-4 details likely cover levels along proposed drainage routes based on topography, and proposed invert levels for basins and outfalls to demonstrate that the design is feasible. Further assessment of the proposed outfall locations is presented in Section 4.2.4.

Figure 4-4 Proposed cover levels and basin invert / outfall levels



4.2. Standard 1: Runoff Destinations

Surface water runoff must be disposed of according to a hierarchy of destinations as follows:

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

The suitability of each of these options is discussed below.

4.2.1. Water re-use

Water re-use (i.e. the use of water butts or more sophisticated tank systems to capture rainwater for re-use) could be implemented at the Site. These sites collect water from clean surfaces (such as rooftops) for (generally non-potable) use on Site.

Rainwater harvesting is particularly useful at Sites with a low infiltration potential and limited space for attenuation features. It also has wider sustainability benefits with regards to lowering the water supply demand. It is anticipated that water re-use will be incorporated as part of the detailed drainage design however they have not been included in the outline strategy to ensure the system has sufficient capacity.

4.2.2. Infiltration to ground

The majority of the Site, and in particular the lower slopes of the Site where the main infiltration basins would be required, if infiltration were to be feasible, is underlain by Wadhurst Clay. It is therefore considered that infiltration alone will not be sufficient for discharging surface runoff. There is potential that SuDS features in the southern portion of the Site, underlain by Cuckfield Stone Bed and Upper Tunbridge Wells Sands may have some infiltration potential, and therefore it is proposed that all features are unlined to maximise this potential. The detailed design should include infiltration testing in these regions to determine a likely infiltration rate for inclusion in the detailed assessment.

The current assessment has conservatively assumed no infiltration in order to ensure that storage features are suitably sized if infiltration is found not to be feasible, even in small quantities.

4.2.3. Discharge to surface water body

Discharge of runoff at restricted rates to West Common Stream along the northern boundary of the Site is a feasible destination for surface runoff from the Site. Three separate discharge outfalls are proposed, one for each detention basin. A condition survey of the stream should be undertaken to confirm that water can freely flow within the stream without obstruction.

Figure 4-5 to Figure 4-7 show cross-section profiles through each proposed basin location. This demonstrates that the proposed elevations for each basin will allow discharge to West Common stream. The eastern basin is fairly tight, with requirements for banking the lower edge of the basin, therefore the detailed design should assess the potential for including additional attenuation features higher within the catchment to reduce the storage requirements for the detention basin.

Any connection to the West Common Stream is likely to require Ordinary Watercourse Consent.

Figure 4-5 Cross-section profile through western basin

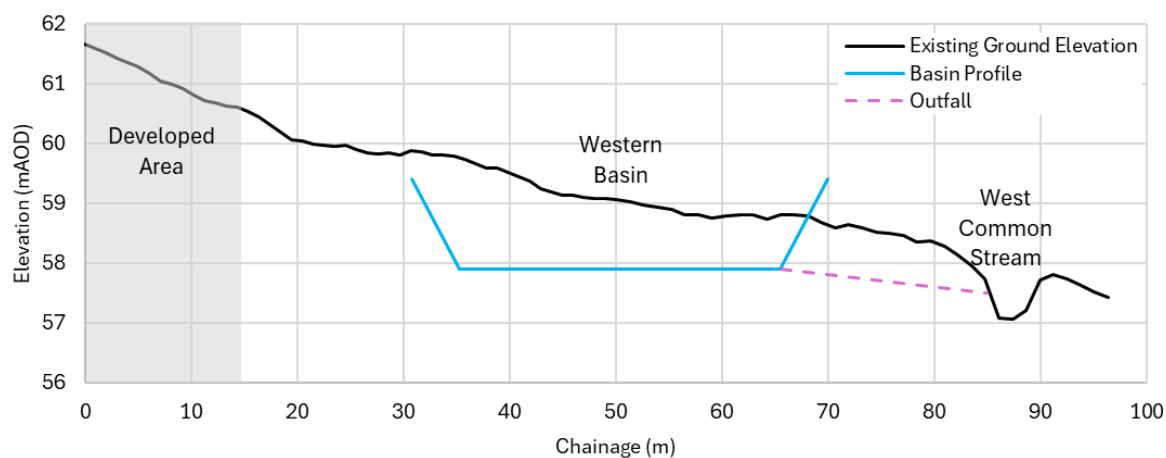


Figure 4-6 Cross-section profile through central basin

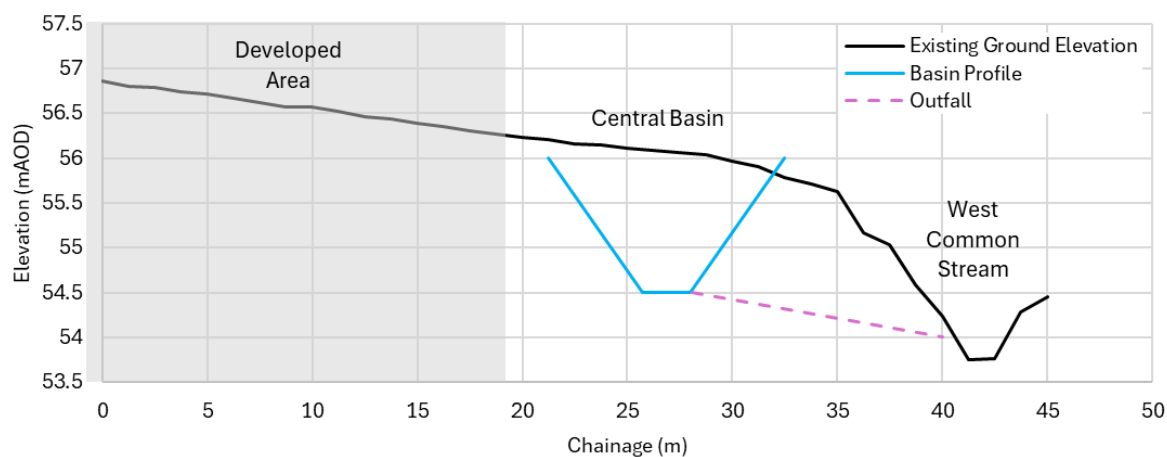
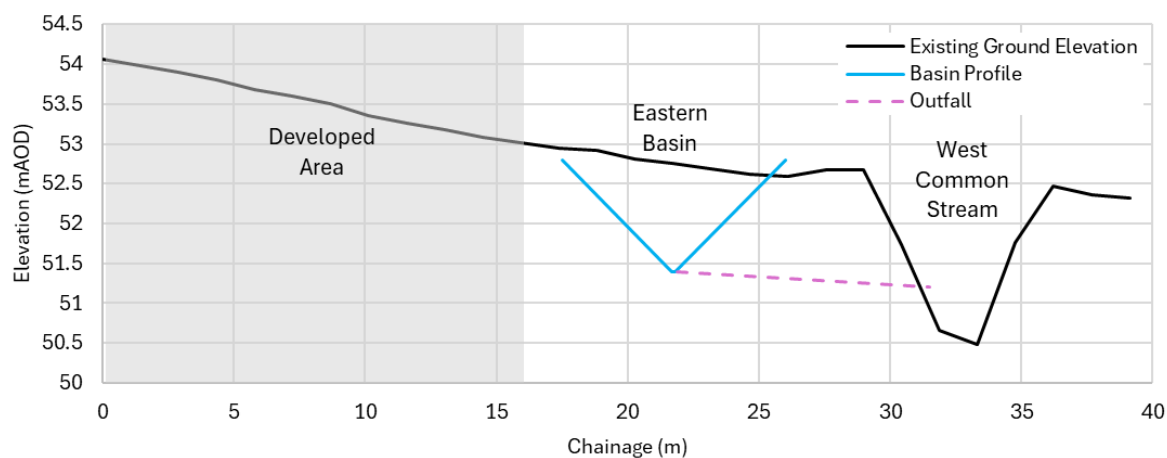


Figure 4-7 Cross-section profile through eastern basin



4.2.4. Discharge to surface water drains and/or combined drain

Given the likely feasibility of discharging to a surface water body, this option would unlikely be used in this instance.

4.3. Standard 2: Management of everyday rainfall

Drainage schemes should ensure that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems. Runoff from positively drained surfaces, for at least 5mm of rainfall must either be collected for use, infiltrated into the ground, or else captured, conveyed and stored within SuDS features where these features will naturally absorb or retain runoff and therefore not discharge off the Site.

Due to infiltration not being possible / extremely limited on Site, managing the first 5mm of rainfall through infiltration alone is not possible.

The National SuDS standards state that compliance with standard 2 can be assumed for unlined permeable surfaces, for all soil types, which drain an adjacent impermeable area if the additional impermeable area is no greater than the permeable area. This is a constraint that has been used within the drainage design and therefore all flow draining via the porous paving features is deemed to be compliant.

Detention basins with a flat unlined base, where there is not specific provision for routing low flows directly to the outlet can be assumed to comply where the drained impermeable surface area is up to 5 times the vegetated detention basin surface area receiving the runoff for any soil type. Table 4-1 summarises the assessment of management of everyday rainfall for the remaining surfaces that do not drain to porous paving. This demonstrates that the detention basins alone are not sufficient to meet Standard 2. The residual non-compliant surfaces sum to 10,048m² (1.00ha), 32% of the total impermeable surfaces on Site.

Rainwater harvesting systems, compliant to BS EN 16941 will be provided for each residential property that does not drain to porous paving to address the 32% of the Site which is currently non-compliant. At the detailed design stage detailed calculations, including details of proposed rainwater harvesting systems will need to be provided to demonstrate compliance with Standard 2. If rainwater harvesting systems alone are not sufficient to address the remaining 232% of the Site, additional measures such as increasing the base of detention basins, or including swales along property frontages could be incorporated into the design.

Table 4-1 Management of everyday rainfall

Catchment	Impermeable surfaces not draining to porous paving (m ²)	Detention basin surface area (at base level) (m ²)	5 x Detention Basin area (m ²)	Residual 'non-compliant' surface area
Eastern	3462	8	40	3427
Central	6411	212	1060	5351
Southern & Western Combined	4850	716	3580	1270

4.4. Standard 3: Management of extreme rainfall and flooding

4.4.1. Greenfield runoff rates and volumes

The total positively drained area for the Site is 5.71 ha. The ReFH2 method (Using FEH22 rainfall model) has been utilised to estimate the greenfield runoff rates for the Site (see Figure 4-8).

Figure 4-8 Greenfield Runoff Rates

Pre-development discharge

Site Makeup: Greenfield

Greenfield Method: ReFH2

FEH filename: C:\Users\maryf\Aquaterra

Region: England, Wales, NI

Include Baseflow: ☐

Positively Drained Area (ha): 5.710

Betterment (%): 0

Return Period (years)	Q (l/s)
2	31.0
30	76.4
100	98.6

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

Due to infiltration not being feasible on the Site, the volume of runoff discharged from the proposed development for the 1% AEP, 6 hour rainfall event will be greater than the volume of greenfield runoff for the same rainfall event. Therefore the peak allowable discharge rate from the development for all events up to and including the 1% AEP with Climate change is the 50% AEP greenfield runoff rate (31.0 l/s) based on the National Standards for SuDS.

The Greenfield runoff volume for the Site for the 1% AEP, 6 hour storm duration event has also been calculated and is presented in Figure 4-9.

Figure 4-9 Greenfield Runoff Volume

Pre-development discharge

Site Makeup: Greenfield

Greenfield Method: ReFH2

FEH filename: C:\Users\maryf\Aquaterra

Region: England, Wales, NI

Include Baseflow: ☐

Positively Drained Area (ha): 5.710

Return Period (years): 100

Storm Duration (mins): 360

Betterment (%): 0

Runoff Volume (m³): 1103

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

4.4.2. Performance assessment

The principal SuDS features have been modelled using Causeway Flow software to ensure there is sufficient storage volume within the system and discharge rates can be limited to the 50% AEP greenfield runoff rates.

Table 4-2 and Table 4-3 summarise the model results at the SuDS features for the 3.3% AEP +40% and 1% AEP + 45% scenarios. This confirms that, based on the parameters described above, the proposed drainage scheme will be able to attenuate and discharge runoff to greenfield runoff rates for the 3.3% AEP + 40% and close to greenfield (31.3 l/s compared to 31.0 l/s) for the 1 in 100 +45% scenarios.

Detailed model outputs are provided in Appendix F. It should be noted that the model aims to only replicate the key storage features within the proposed scheme.

Table 4-2 Summary of 1 in 30 year + 40% climate change model results

Feature name	Critical storm	Peak water depth (m aOD)	Peak outflow (l/s)	Flood Risk Status
Eastern Porous Paving	240 Min: Winter	1.13	10.6	OK
Eastern Drainage Basin	960 Min: Summer	1.26	11.8	OK
Central Porous Paving	240 Min: Winter	1.20	9.5	OK
Central Basin	1440 Min: Summer	1.22	10.2	OK
Western Porous Paving	180 Min: Winter	1.06	6.6	OK
Western Basin	1440 Min: Summer	1.09	9.0	OK
Total Discharge			31.0	

Table 4-3 Summary of 1 in 100 year + 45% climate change model results

Feature name	Critical storm	Peak water depth (m aOD)	Peak outflow (l/s)	Flood Risk Status
Eastern Porous Paving	360 Min: Winter	1.24	10.6	Flood risk
Eastern Drainage Basin	960 Min: Summer	1.46	12.1	Flood risk
Central Porous Paving	240 Min: Winter	1.31	9.6	Flood risk
Central Basin	1440 Min: Summer	1.47	10.2	Flood risk
Western Porous Paving	2180 Min: Winter	1.17	7.0	Flood risk
Western Basin	2160 Min: Summer	1.50	9.0	Flood risk
Total Discharge			31.3	

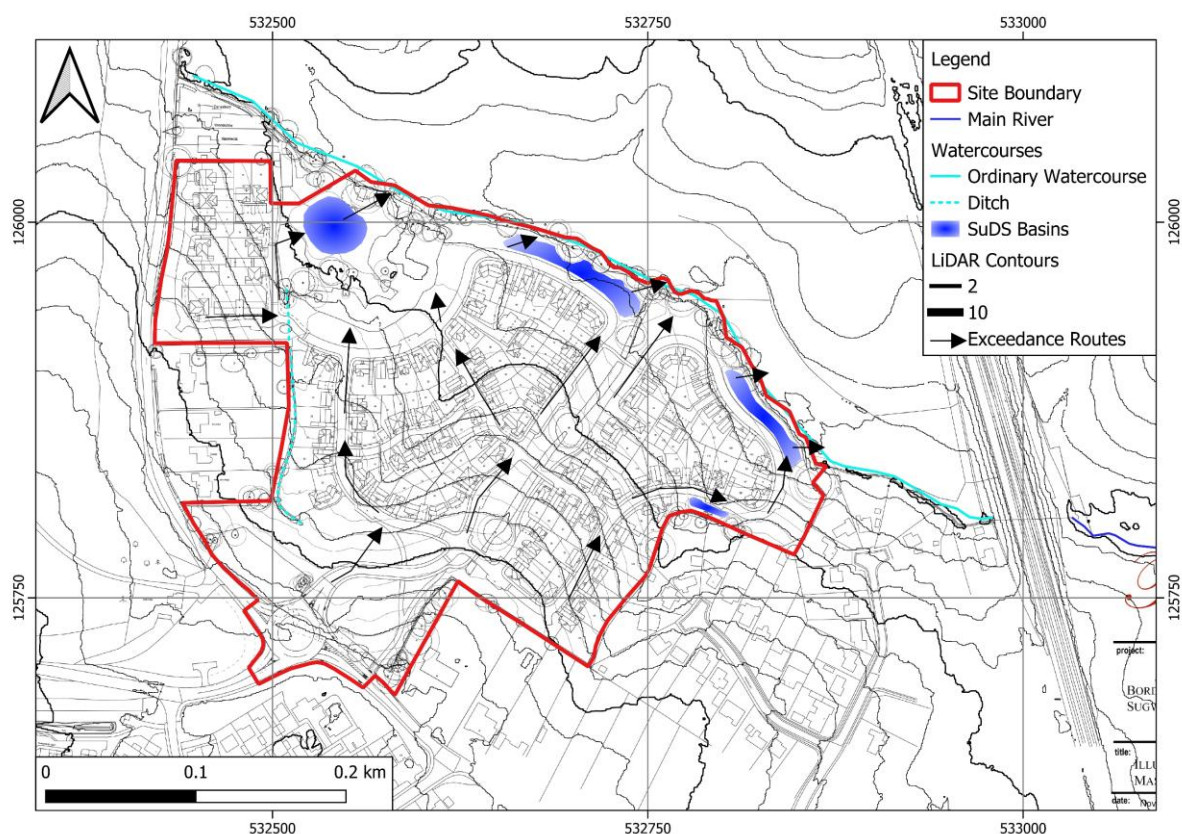
4.4.3. Exceedance flow paths

Whilst the strategy has aimed to ensure no flooding during the extreme 1 in 100 year + 45% climate change scenario, there is always a residual risk that flooding may occur for example due to more extreme events or blockage of structures. Under these conditions, exceedance flows will be designed to follow the existing preferential surface water flow paths towards the north of the Site, via the road network. Raised kerbs or bunds will be created along roads to direct flows where required. Flow will

be directed away from the main access roads, and where already on the road, directed towards the nearest downslope green space to ensure that safe access is maintained for emergency services.

Very high level exceedance flow directions are illustrated in Figure 4-10 based on topographic data. A more detailed analysis of exceedance flows will be undertaken during as part of the detailed drainage strategy.

Figure 4-10 Exceedance flow routes



4.5. Standard 4: Water Quality

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

The proposed development will primarily consist of residential dwellings, low traffic roads and driveways. The CIRIA SuDS manual categorises runoff from residential dwellings as presenting a very low water quality hazard and runoff from low usage roads and residential driveways as presenting a low hazard rating (see Table 4-4).

Table 4-4 Water quality hazard ratings (CIRIA, 2015)

Land use	Hazard level
Residential roof drainage	Very low
Residential, amenity uses including low usage car parking spaces and roads, other roof drainage . Non-residential car parking with infrequent change (<e.g. schools, offices, i.e. < 300 traffic movements/day)	Low
Commercial uses including car parking spaces and roads (e.g. hospitals, retail, excluding low usage roads, trunk roads and motorways)	Medium
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemical and fuels (other than domestic fuel oil) are delivered, handled, stored used or manufactured, industrial sites	High
Trunk roads and motorways	High

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

As the proposed development is predominantly residential in nature with a low hazard rating, hazard indices of 0.5 for Total Suspended Solids (TSS), 0.4 for Metals and 0.4 for Hydrocarbons are considered applicable.

The measures detailed in Table 4-5 are examples which are suitable for inclusion in a drainage strategy for a residential development to mitigate a potential increase in pollutant load within on-site and off-site runoff – note text in bold are measures included in this SuDS Strategy. Removal indices are included for each feature type relative to the specific pollutant.

Table 4-5 Mitigation indices for SuDS components

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

The inclusion of detention basins within the SuDS strategy for the Site will provide adequate treatment to mitigate the low hazard associated with runoff from the development provided all runoff flows through at least one of these components (as per the outline strategy), and most passing through both permeable paving and detention basins.

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

4.6. Standard 5 & 6: Amenity and Biodiversity

SuDS schemes present opportunities to enhance habitat for wildlife on-site and this often improves the biodiversity of the surrounding areas. Ponds, constructed wetlands and other surface water

features are landscape assets that have amenity value and improve the aesthetics of a site more than conventional drainage systems.

The use of grassed detention basins will enhance the biodiversity and amenity value of the Site post-development. Ecological diversity should be enhanced by the use of native planting within/around each feature – further details of this will be provided in the detailed drainage strategy and landscape reports.

4.7. Standard 7: Design of drainage for construction, operation, maintenance, decommissioning and structural integrity

The Construction (Design and Management) Regulations 2015 include requirements for designers to take account of the health and safety risks associated with the construction, operation and maintenance and decommissioning of the drainage system to minimise these risk as far as reasonably practicable.

SuDS features should be built and operated in accordance with guidance outlined in the CIRIA SuDS Manual.

The drainage design can be delivered as a gravity fed system which reduces the reliance on mechanical systems and the cost of operation.

4.7.1. Maintenance Schedules

Inspection and long-term maintenance of SuDS components ensure efficient operation and prevents failure. Management of the surface water drainage system will be undertaken by a Management Company.

This section outlines the maintenance and management schedules for the proposed drainage system. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual (CIRIA, 2015). There are three categories of maintenance activities referred to in this report, although not all are required for each SuDS feature:

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

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

Maintenance schedules for the proposed SuDS components are provided in the following tables. These schedules are not exhaustive and should be reassessed at regular intervals to determine if any additional maintenance requirements are required to preserve the performance and condition of the drainage system.

Table 4-6 Maintenance for pipes and manholes

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

Table 4-7 Maintenance for detention basins

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

Maintenance schedule	Required action	Frequency
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Table 4-8 Maintenance for control devices

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect/check pipework to ensure that the flow control is in good condition and operating as designed	Monthly
	Inspect for evidence of poor operation	Monthly, or as required
Occasional maintenance	High pressure water jet removal of silt build-up	Six monthly, or as required
Remedial actions	Clear pipework of blockages	As required
	Replace the flow control if it becomes damaged	As required

4.8. Further SuDS considerations

The detailed design strategy should include:

- Assessment of individual porous paving areas, and respective additional contributing areas, with stepped sub-base to ensure minimal slope across each area.
- Means of ensuring that small orifices (< 0.05 diameter) are robustly protected from blockage
- Filter drains and or tree/pits / rain gardens along the main access road in the southern section to promote interception of the first 5 mm of rainfall.
- Infiltration testing in the southern section of the Site (over the Cuckfield Stone Bed and Upper Tunbridge Wells Sands) to determine if any infiltration is likely to be possible, in particular to promote the interception of the first 5 mm of rainfall.
- Consideration of rainwater harvesting calculations to support interception of the first 5mm of rainfall, particularly where runoff from roofs is unable to discharge into adjoining porous paving areas.

5. Foul Drainage

Foul water from the proposed development will be managed through a connection to the public foul sewerage network. A capacity check has been undertaken with Southern Water (see Appendix C) which has indicated that there is currently inadequate capacity within the foul sewerage network, however Southern Water aims to provide capacity within 24 months following planning approval.

As noted in Section 2.2 works are currently underway for Borde Hill Estate (see Appendix C) to provide a connection for Borde Hill Gardens. This includes a foul water rising main passing through the Site boundary north of South Lodge Roundabout. It is proposed that foul water will discharge from the Site to this rising main, although due to topography this will be required to be pumped. The Southern Water assessment has been based on an assumed pump rate of 6.0 l/s discharged to manhole reference TQ32256602 located on Balcombe Road.

A formal S106 application will be required to be completed and approved by Southern Water prior to a connection being made. No surface water will be discharged into the foul sewer network.

6. Conclusions

This report provides an Outline SuDS Strategy for the Site, a previously undeveloped, 'greenfield' area located to the north of Haywards Heath. The Site currently drains overland towards West Common Stream along the northern boundary of the Site.

It is not considered that infiltration will be feasible on the Site due to the limited permeability of the underlying Wadhurst Clay. Discharge to West Common Stream along the northern boundary of the Site has therefore been proposed. A greenfield 50% AEP discharge rate has been proposed for all events as it is not possible to limit discharge volumes to greenfield volumes.

The potential increase in rainfall intensity due to climate change needs to be considered when designing drainage strategies. A design lifespan of 100 years has been assumed for the development, based upon the EA guidance rainfall increases of 40% and 45% have been applied to the 1 in 30 year and 1 in 100 year events respectively.

The proposed Outline SuDS scheme comprises of storage within porous paving areas in the upper catchment and detention basins prior to discharge to watercourses. Orifices are used to control outflow from the porous paving areas, and hydrobrakes at the detention basins. For the 3.3% AEP with climate change scenario discharge has been limited to the 50% AEP greenfield runoff rate. For the 1% AEP with climate change, discharge is slightly in exceedance of the 50% greenfield runoff even (31.3 l/s compared to 31.0 l/s).

The Site is not expected to require land raising / lowering to accommodate a gravity driven drainage system as there is a suitable gradient over the Site.

The detailed drainage design should consider the potential for incorporating additional SuDS features such as tree pits along the main access road, and addition swales along frontages to provide a SuDS train giving additional upstream storage and increased amenity and biodiversity benefits. The detailed drainage design will also need to incorporate additional interception features to ensure that the first 5mm of rainfall for the majority of Sites is retained on Site. This is likely to require rainwater harvesting systems at a minimum.

Foul drainage is expected to discharge to the existing sewer network. A pre-planning capacity check has been completed with Southern Water for connection to a sewer to the west of the Site, indicating that whilst there is currently not adequate capacity, they would aim to provide this capacity within 24 months following planning approval. It is understood that works are currently being undertaken to provide a connection Borde Hill Estate to the west of the Site which it may be possible to connect into. Foul drainage will require pumping due to the topography of the Site.

7. References

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Report Conditions

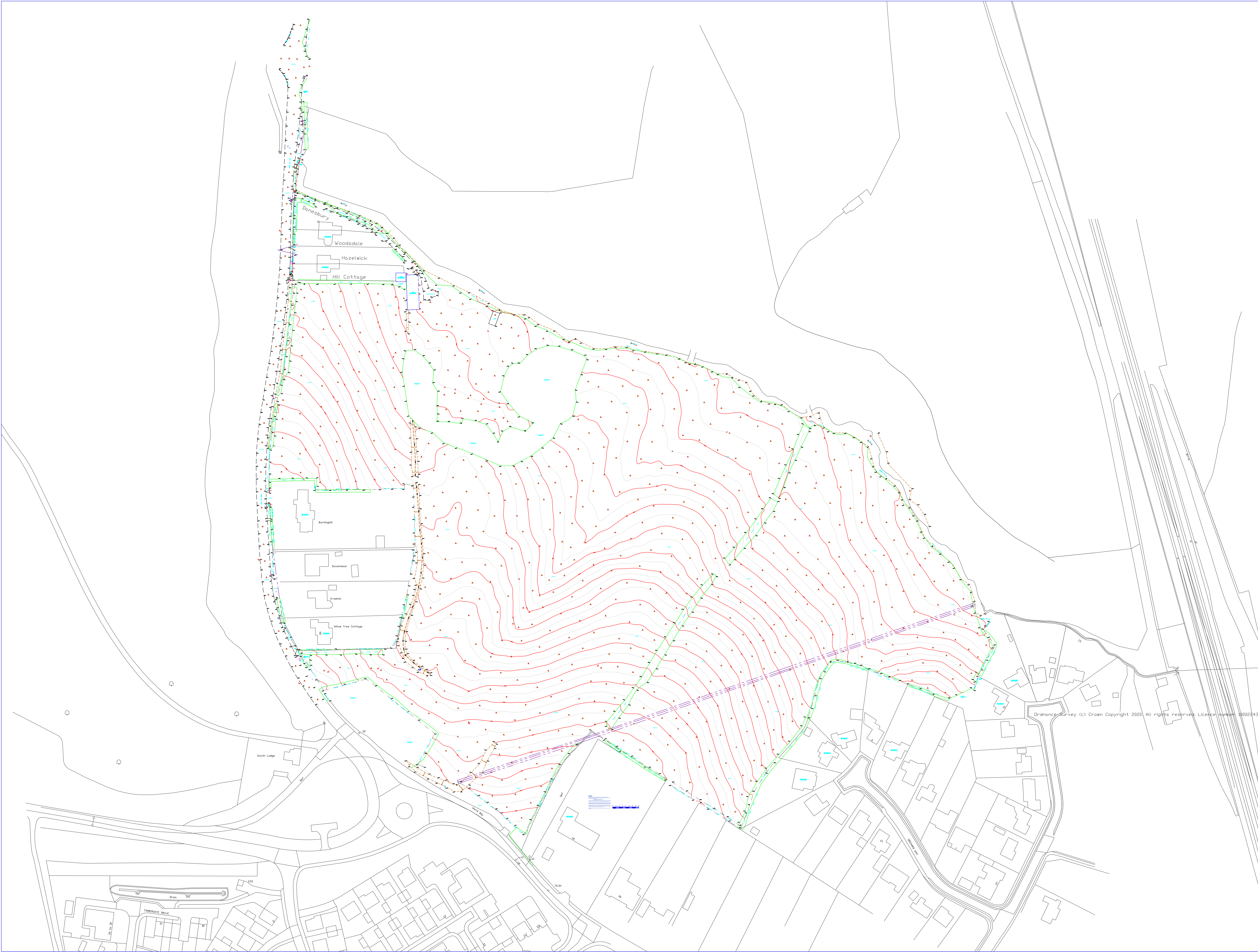
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Surveyed by: S Smith

Plotted by: P Marvin

Drawn by: Acad

Legend

AGU

Air Conditioning Unit

AV

Air Valve

BC

Barrier Control

BOL

Bollard

BTB

British Telecom Junction Box

BTM

British Telecom Manhole

CL

Cover Level

CTV

Cable TV

ELCP

Electricity Cable Pit

EM

Electricity Cable Marker

EP

Electricity Pole

ER

Earth Rod

FM

Fine Hydrant

FP

Flag Pole

G

Gully

GV

Gas Valve

IB

Illuminated Bollard

TL

Twert Level

JB

Junction Box

LB

Letter Box

LC

Lamp Column

MB

Manhole

MRK

Concrete Marker

O/F

Outfall

PE

Peeding Eye

RMP

Rainwater Pipe

SC

Stop Cock

SP

Sign Post

SV

Sluice Valve

TCB

Telephone Kiosk

TL

Traffic Light

TLC

Traffic Light Cover

TW

Ticket Machine

TP

Telegraph Pole

UTR

Unable To Raise

UTS

Unable To Survey

VC

Vent Column

WM

Water Meter

WO

Wash Out

WMP

Waste Water Pipe

Data

i)

Trees shown thus 9/6/200 indicates

HT. in metres/Spn. dia in metres

Trunk dia. in millimetres

ii)

Trees shown thus 9/66/200 indicates

HT. in metres/Spn. dia in metres

Trunk dia. in millimetres

iii)

Grid : Metric and oriented to north

iv)

Levels : Metric and based on OS GPS DATA

Situated on Survey station 1

Value: 56.514m

Client

FAIRFAX

Site

BORDE HILL LANE

SUGWORTH

HAYWARDS HEATH

AP

Marvin & Partners Limited

Plestor House

Farnham Road

West Liss

Hampshire GU33 6JQ

Tel : 01428 751888

Email: paul@maplimited.com

Date

JULY 2023

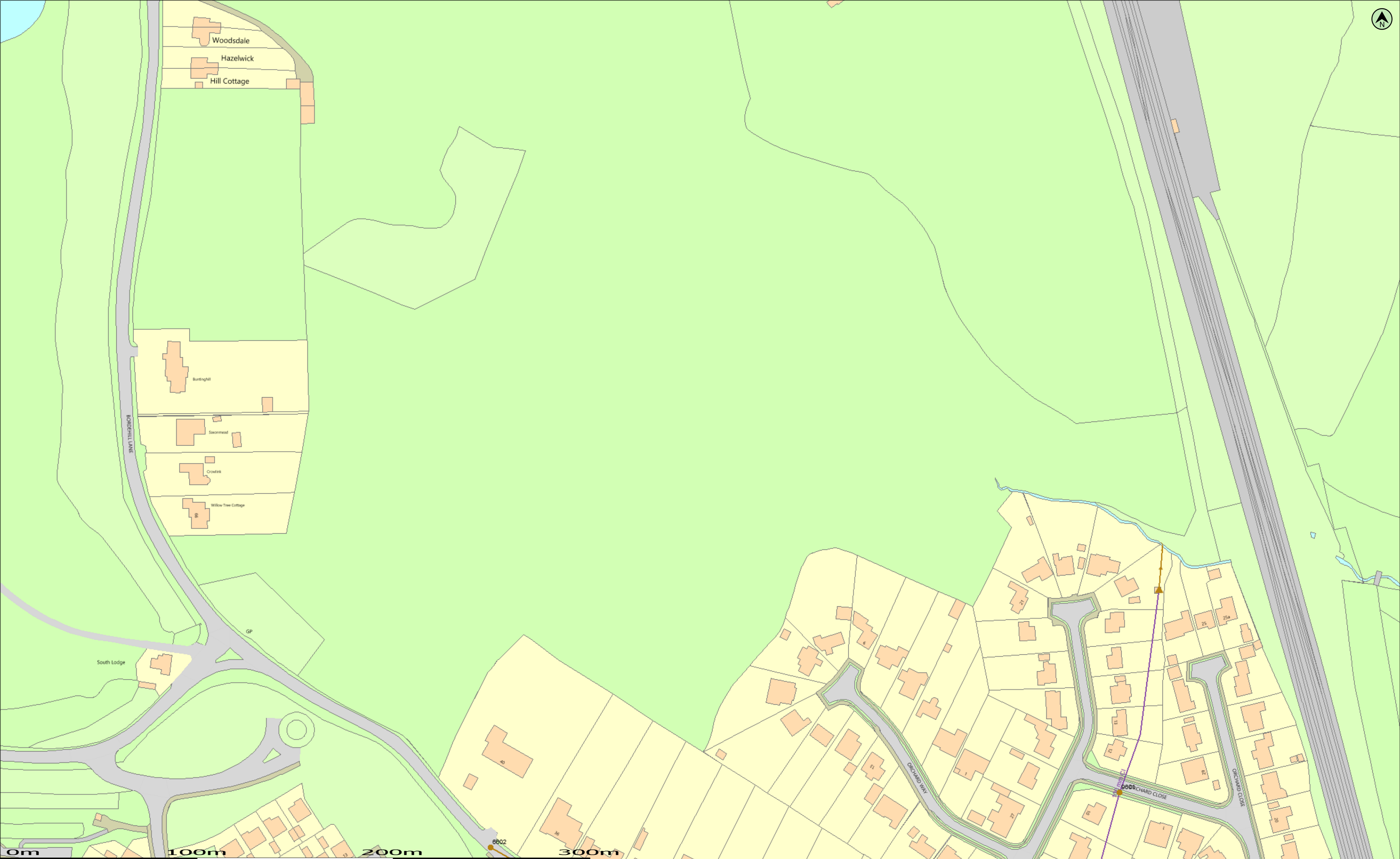
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23/6025

Checked By



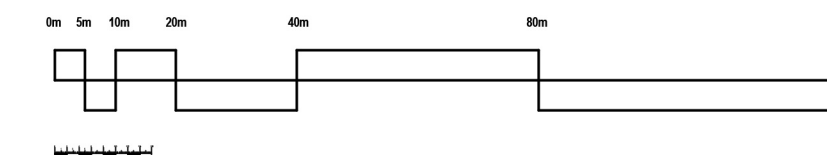
(c) Crown copyright and database rights 2020 Ordnance Survey 100031673 Date: 04/08/20 Scale: 1:1250 Map Centre: 532710,125868 Data updated: 15/06/20 Our Ref: 422739 - 1 Wastewater Plan A2

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

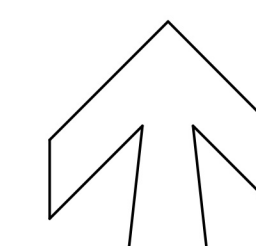
WARNING: BAC pipes are constructed of Bonded Asbestos Cement.
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

tomclark@ridge.co.uk
Boredehill Lane Sugw





NORTH



FAIRFAX ACQUISITIONS LTD

project:

Land North of:

BALCOMBE ROAD,
HAYWARDS HEATH

title:

ILLUSTRATIVE MASTERPLAN
B&W

date: Nov '25

scale: 1:1250 @ A1

drawing number:
2508/PL.08

Rev.	
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Paul Hewett R.I.B.A.

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CHARTERED ARCHITECT

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Survey Notes

This survey was carried out in accordance with the specification guidelines in The RICS Surveys of Land, Buildings and Utility Surveys at Scales of 1:500 and Larger. Planimetric accuracies expected:

The scales quoted are at which the survey was carried out NOT at which it is reproduced.
Any dimensions that require greater accuracy should be specifically measured on site.

Tree species are identified by use of reference books and whilst the surveyor has taken reasonable care to ensure that they are identified correctly Marvin & Partners recommend that an Arboriculturist should be commissioned if the species are critical to the project.

All drainage connectivity is done by visual inspection and soundings, and assumed to be a straight line between man entry points, unless it has been specifically requested that all connections to be proven on site by use of electrodedetection.

All drainage details are recorded from the surface. No Confined Space entry by survey personnel.

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Table C-1: Catchment area calculations (all areas in hectares)

Catchment	Total Area	Impermeable (non-adoptable area – roofs, driveways)	Impermeable (adoptable areas – roads, pavements, communal parking)	Increase for urban creep (10% of non-adoptable areas)	SuDS Footprint	Total impermeable area	Remaining permeable area	30% estimate of permeable area to drain to network	Total positively drained area
	A	B	C	D = B*0.1	E	F = C+D+E	G= A-F	H = G*0.3	I = F + H
Eastern	2.74	0.48	0.48	0.05	0.08	1.09	1.65	0.49	1.58
Central	2.62	0.53	0.53	0.06	0.11	1.26	1.36	0.41	1.67
Southern	1.77	0.09	0.29	0.01	N/A	0.38	1.39	1.39*	1.77
Western	0.97	0.20	0.20	0.02	N/A	0.40	0.56	0.18	0.69
Western SuDS Basin (not within Western Catchment)					0.12	0.12			0.12
Total									5.71

* Full catchment assumed to drain to drainage network

Design Settings

Rainfall Methodology	FEH-22	Time of Entry (mins)	5.00	Connection Type	Level Soffits	Enforce best practice design rules	✓
Return Period (years)	100	Maximum Time of Concentration (mins)	30.00	Minimum Backdrop Height (m)	0.200		
Additional Flow (%)	0	Maximum Rainfall (mm/hr)	50.0	Preferred Cover Depth (m)	1.200		
CV	1.000	Minimum Velocity (m/s)	1.00	Include Intermediate Ground	✓		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	499	1350	749	1500	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Template	Freeform Carrier	Shape	Circular	Barrels	1	Auto Increment (mm)	75	Follow Ground	x
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Available Diameters (mm)

100	150
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Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
✓	Western Porous Paving	0.340	5.00	50.000	Manhole	Adoptable	1200	-17.867	83.820	1.425	48.575
✓	Western Additional Impermeable surfaces	0.070	5.00	50.000	Manhole	Adoptable	1200	11.938	82.847	1.350	48.650
✓	Western Basin	0.121		49.000	Junction			-1.687	56.691	1.500	47.500
✓	Eastern Porous Paving	0.740	5.00	50.000	Manhole	Adoptable	1200	72.036	82.847	1.500	48.500
✓	Eastern Additional Impermeable surfaces	0.260	5.00	50.000	Manhole	Adoptable	1200	104.152	82.968	1.425	48.575
✓	Eastern Basin	0.080		49.000	Junction			91.500	60.241	1.500	47.500
✓	Central Porous Paving	0.630	5.00	50.000	Manhole	Adoptable	1200	24.978	30.414	1.575	48.425
✓	Central Additional Impermeable surfaces	0.520	5.00	50.000	Manhole	Adoptable	1350	64.637	30.789	1.575	48.425
✓	Central Basin	0.110		49.000	Junction			44.564	6.038	1.500	47.500
✓	Southern Impermeable surfaces	0.380	5.00	50.000	Manhole	Adoptable	1350	24.641	73.524	1.500	48.500

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Min DS IL (m)
✓ 3.000	Western Porous Paving	Western Basin	31.588	0.600	Colebrook-White	48.575	47.500	1.075	29.4	225	Circular	5.22	50.0	47.500
⚠ 5.000	Western Additional Impermeable surfaces	Western Basin	29.492	0.600	Colebrook-White	48.650	47.500	1.150	25.6	225	Circular	5.19	50.0	47.500
✓ 6.000	Eastern Porous Paving	Eastern Basin	29.831	0.600	Colebrook-White	48.500	47.500	1.000	29.8	300	Circular	5.17	50.0	
⚠ 7.000	Eastern Additional Impermeable surfaces	Eastern Basin	26.011	0.600	Colebrook-White	48.575	47.500	1.075	24.2	300	Circular	5.14	50.0	

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)	Notes
✓ 3.000	Western Porous Paving	Western Basin	2.422	96.3	61.4	1.200	1.275	1.200	1.275	0.340	0.0	131	2.562	
? 5.000	Western Additional Impermeable surfaces	Western Basin	2.594	103.1	12.6	1.125	1.275	1.125	1.275	0.070	0.0	53	1.779	Upstream Depth is less than the specified minimum
✓ 6.000	Eastern Porous Paving	Eastern Basin	2.889	204.2	133.7	1.200	1.200	1.200	1.200	0.740	0.0	177	3.072	
? 7.000	Eastern Additional Impermeable surfaces	Eastern Basin	3.209	226.8	47.0	1.125	1.200	1.125	1.200	0.260	0.0	92	2.550	Velocity is more than 3 m/s Upstream Depth is less than the specified minimum

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Min DS IL (m)
✓ 2.000 Central Porous Paving		Central Basin	31.270	0.600	Colebrook-White	48.425	47.500	0.925	33.8	300	Circular	5.19	50.0	
? 1.000 Central Additional Impermeable surfaces		Central Basin	31.867	0.600	Colebrook-White	48.425	47.500	0.925	34.5	375	Circular	5.17	50.0	
? 4.000 Southern Impermeable surfaces		Western Basin	31.249	0.600	Colebrook-White	48.500	47.500	1.000	31.2	375	Circular	5.16	50.0	47.500

US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)	Notes
Central Porous Paving	Central Basin	2.713	191.8	113.8	1.275	1.200	1.200	1.275	0.630	0.0	167	2.825	
Central Additional Impermeable surfaces	Central Basin	3.095	341.9	94.0	1.200	1.125	1.125	1.200	0.520	0.0	134	2.655	Velocity is more than 3 m/s Downstream Depth is less than the specified minimum
Southern Impermeable surfaces	Western Basin	3.251	359.0	68.7	1.125	1.125	1.125	1.125	0.380	0.0	110	2.526	Velocity is more than 3 m/s Upstream Depth is less than the specified minimum Downstream Depth is less than the specified minimum

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	31.588	29.4	225	Circular	50.000	48.575	1.200	49.000	47.500	1.275
5.000	29.492	25.6	225	Circular	50.000	48.650	1.125	49.000	47.500	1.275
6.000	29.831	29.8	300	Circular	50.000	48.500	1.200	49.000	47.500	1.200
7.000	26.011	24.2	300	Circular	50.000	48.575	1.125	49.000	47.500	1.200
2.000	31.270	33.8	300	Circular	50.000	48.425	1.275	49.000	47.500	1.200
1.000	31.867	34.5	375	Circular	50.000	48.425	1.200	49.000	47.500	1.125
4.000	31.249	31.2	375	Circular	50.000	48.500	1.125	49.000	47.500	1.125

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
3.000	Western Porous Paving	1200	Manhole	Adoptable	Western Basin	Junction
5.000	Western Additional Impermeable surfaces	1200	Manhole	Adoptable	Western Basin	Junction
6.000	Eastern Porous Paving	1200	Manhole	Adoptable	Eastern Basin	Junction
7.000	Eastern Additional Impermeable surfaces	1200	Manhole	Adoptable	Eastern Basin	Junction
2.000	Central Porous Paving	1200	Manhole	Adoptable	Central Basin	Junction
1.000	Central Additional Impermeable surfaces	1350	Manhole	Adoptable	Central Basin	Junction
4.000	Southern Impermeable surfaces	1350	Manhole	Adoptable	Western Basin	Junction

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
Western Porous Paving	-17.867	83.820	50.000	1.425	1200	Manhole	Adoptable		0	3.000	48.575	225 Circular
Western Additional Impermeable surfaces	11.938	82.847	50.000	1.350	1200	Manhole	Adoptable		0	5.000	48.650	225 Circular
Western Basin	-1.687	56.691	49.000	1.500		Junction			1 2 3	5.000 4.000 3.000	47.500 47.500 47.500	225 Circular 375 Circular 225 Circular

Simulation Settings

Storm Durations

Pre-development Discharge Rate

Node Southern Impermeable surfaces ReFH2 Dynamic Hydrograph

Applies to All storms

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	716.0	716.0	1.500	1206.0	1232.5

Node Eastern Porous Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.300	Width (m)	370.000	Slope (1:X)	150.0	Inf Depth (m)
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	536	Length (m)	10.000	Depth (m)	0.450	

Node Eastern Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Side Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Porosity	1.00	Invert Level (m)	47.600	Time to half empty (mins)	1200
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Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	8.0	8.0	0.400	200.0	200.4	1.400	800.0	805.1

Node Central Porous Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.300	Width (m)	310.000	Slope (1:X)	150.0	Inf Depth (m)
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	480	Length (m)	10.000	Depth (m)	0.450	

Node Central Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Side Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Porosity	1.00	Invert Level (m)	47.500	Time to half empty (mins)
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Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	212.4	212.4	1.500	1058.0	1067.2

Other (defaults)

Entry Loss (manhole)	0.250	Exit Loss (manhole)	0.250	Entry Loss (junction)	0.000	Exit Loss (junction)	0.000	Apply Recommended Losses	x	Flood Risk (m)	0.300
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Results for 2 year Critical Storm Duration. Lowest mass balance: 98.43%

Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Western Porous Paving		124	49.391	0.816	24.7	31.2645	0.0000	SURCHARGED
15 minute summer	Western Additional Impermeable surfaces		10	48.709	0.059	12.9	0.0665	0.0000	OK
480 minute summer	Western Basin		424	47.812	0.312	32.9	239.4627	0.0000	OK
240 minute summer	Eastern Porous Paving		168	49.395	0.895	46.7	80.0316	0.0000	SURCHARGED
15 minute summer	Eastern Additional Impermeable surfaces		10	48.668	0.093	47.8	0.1049	0.0000	OK
360 minute summer	Eastern Basin		368	48.140	0.640	27.5	75.5758	0.0000	OK
240 minute summer	Central Porous Paving		164	49.393	0.968	39.8	65.9926	0.0000	SURCHARGED
15 minute summer	Central Additional Impermeable surfaces		10	48.568	0.143	95.5	0.2042	0.0000	OK
480 minute winter	Central Basin		472	48.016	0.516	26.2	184.6726	0.0000	OK
15 minute summer	Southern Impermeable surfaces		10	48.630	0.130	69.9	0.1865	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	Western Porous Paving	3.000	Western Basin	5.8	1.804	0.060	0.6955	
15 minute summer	Western Additional Impermeable surfaces	5.000	Western Basin	12.9	2.406	0.125	0.2512	
480 minute summer	Western Basin	Hydro-Brake®		8.8				383.6
240 minute summer	Eastern Porous Paving	6.000	Eastern Basin	9.4	0.396	0.046	1.1446	
15 minute summer	Eastern Additional Impermeable surfaces	7.000	Eastern Basin	47.7	1.048	0.210	1.1524	
360 minute summer	Eastern Basin	Hydro-Brake®		11.8				330.0
240 minute summer	Central Porous Paving	2.000	Central Basin	8.5	1.727	0.044	1.1969	
15 minute summer	Central Additional Impermeable surfaces	1.000	Central Basin	95.6	3.260	0.280	1.1487	
480 minute winter	Central Basin	Hydro-Brake®		10.2				408.3
15 minute summer	Southern Impermeable surfaces	4.000	Western Basin	69.8	4.078	0.194	0.6076	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.60%

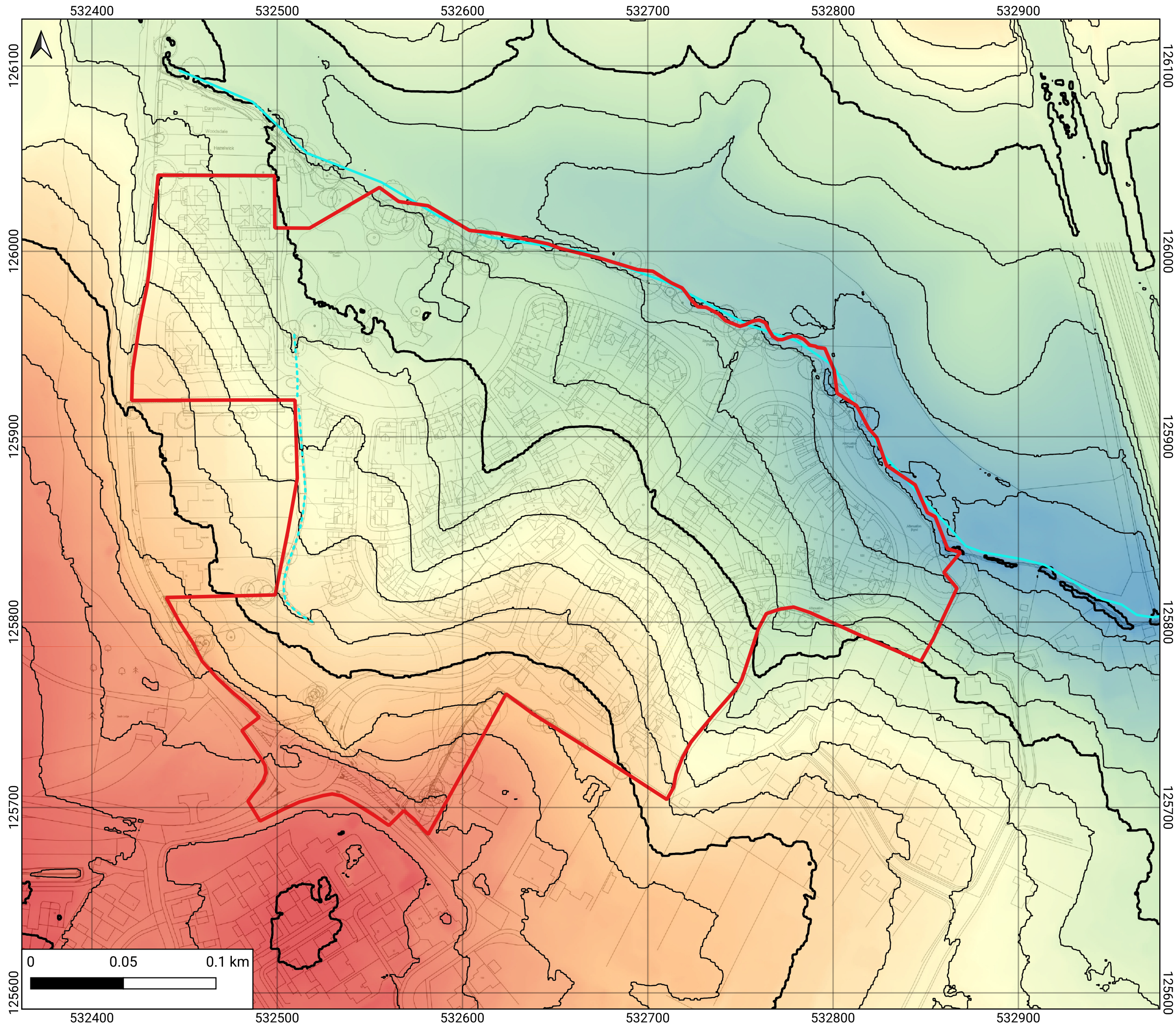
Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Western Porous Paving		176	49.632	1.057	51.0	158.1464	0.0000	SURCHARGED
15 minute summer	Western Additional Impermeable surfaces		9	48.758	0.108	45.8	0.1221	0.0000	OK
1440 minute summer	Western Basin		1350	48.591	1.091	48.1	975.7278	0.0000	OK
240 minute winter	Eastern Porous Paving		236	49.626	1.126	90.1	379.6645	0.0000	SURCHARGED
15 minute summer	Eastern Additional Impermeable surfaces		10	48.786	0.211	169.9	0.2384	0.0000	OK
960 minute summer	Eastern Basin		960	48.759	1.259	36.2	366.2581	0.0000	OK
240 minute winter	Central Porous Paving		232	49.625	1.200	76.7	317.1950	0.0000	SURCHARGED
15 minute summer	Central Additional Impermeable surfaces		10	48.754	0.329	339.4	0.4701	0.0000	OK
1440 minute summer	Central Basin		1440	48.723	1.223	41.7	681.3364	0.0000	OK
15 minute summer	Southern Impermeable surfaces		10	48.759	0.259	248.7	0.3706	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	Western Porous Paving	3.000	Western Basin	6.6	2.126	0.069	0.7027	
15 minute summer	Western Additional Impermeable surfaces	5.000	Western Basin	45.9	2.887	0.445	0.6765	
1440 minute summer	Western Basin	Hydro-Brake®		9.0				1244.5
240 minute winter	Eastern Porous Paving	6.000	Eastern Basin	10.6	0.456	0.052	1.6240	
15 minute summer	Eastern Additional Impermeable surfaces	7.000	Eastern Basin	168.7	2.524	0.744	1.6040	
960 minute summer	Eastern Basin	Hydro-Brake®		11.8				1197.6
240 minute winter	Central Porous Paving	2.000	Central Basin	9.5	1.781	0.049	1.4823	
15 minute summer	Central Additional Impermeable surfaces	1.000	Central Basin	337.8	3.888	0.988	3.2564	
1440 minute summer	Central Basin	Hydro-Brake®		10.2				1464.3
15 minute summer	Southern Impermeable surfaces	4.000	Western Basin	248.5	4.946	0.692	1.7548	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Western Porous Paving	176	49.748	1.173	65.7	218.8448	0.0000	FLOOD RISK
2160 minute summer	Western Additional Impermeable surfaces	2100	48.996	0.346	5.6	0.3909	0.0000	SURCHARGED
2160 minute summer	Western Basin	2100	48.996	1.496	54.5	1436.1240	0.0000	OK
360 minute winter	Eastern Porous Paving	352	49.739	1.239	85.3	526.4743	0.0000	FLOOD RISK
15 minute summer	Eastern Additional Impermeable surfaces	10	49.243	0.668	221.8	0.7553	0.0000	SURCHARGED
960 minute summer	Eastern Basin	960	48.962	1.462	45.5	511.8915	0.0000	OK
240 minute winter	Central Porous Paving	236	49.738	1.312	98.6	439.8261	0.0000	FLOOD RISK
15 minute summer	Central Additional Impermeable surfaces	10	49.579	1.153	443.0	1.6507	0.0000	SURCHARGED
1440 minute summer	Central Basin	1440	48.972	1.472	53.4	923.6047	0.0000	OK
2160 minute summer	Southern Impermeable surfaces	2100	48.996	0.496	38.1	0.7093	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	Western Porous Paving	3.000	Western Basin	7.0	2.206	0.072	0.7056	
2160 minute summer	Western Additional Impermeable surfaces	5.000	Western Basin	5.6	0.345	0.054	1.1729	
2160 minute summer	Western Basin	Hydro-Brake®		9.0				1592.7
360 minute winter	Eastern Porous Paving	6.000	Eastern Basin	10.6	0.446	0.052	2.1007	
15 minute summer	Eastern Additional Impermeable surfaces	7.000	Eastern Basin	218.2	3.099	0.962	1.8317	
960 minute summer	Eastern Basin	Hydro-Brake®		12.1				1591.5
240 minute winter	Central Porous Paving	2.000	Central Basin	9.6	1.865	0.050	2.1721	
15 minute summer	Central Additional Impermeable surfaces	1.000	Central Basin	440.9	3.998	1.290	3.5148	
1440 minute summer	Central Basin	Hydro-Brake®		10.2				1562.0
2160 minute summer	Southern Impermeable surfaces	4.000	Western Basin	38.1	0.950	0.106	3.4467	



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D2.2: LiDAR Elevations

Legend

Site Boundary

Main River

Watercourses

Ordinary Watercourse

Ditch

LiDAR 2022 DTM (1m)

Elevation (mAOD)

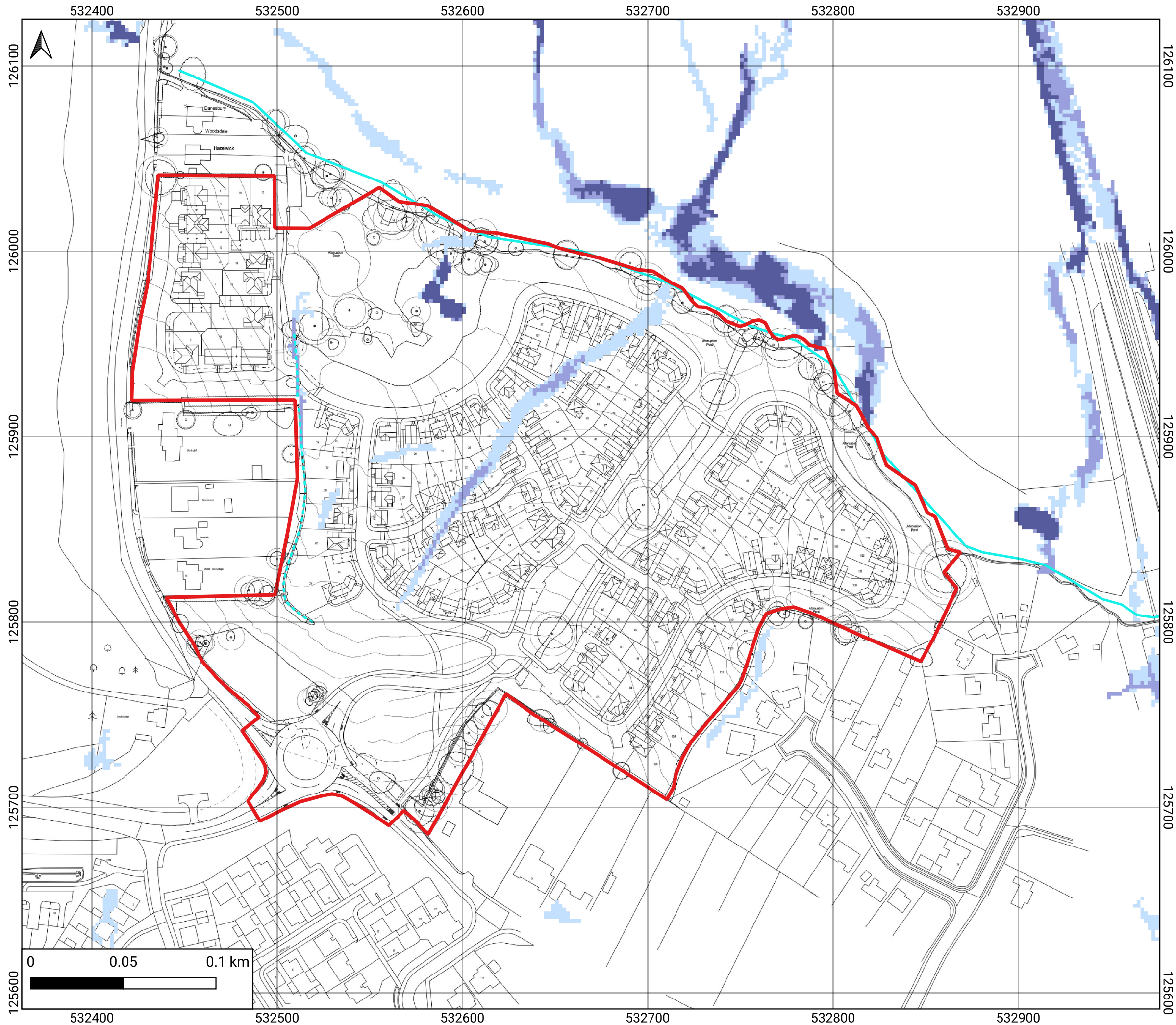
50

58

65

73

80



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D2.3: Surface Water Flood Risk

Legend

Site Boundary

Main River

Watercourses

Ordinary Watercourse

Ditch

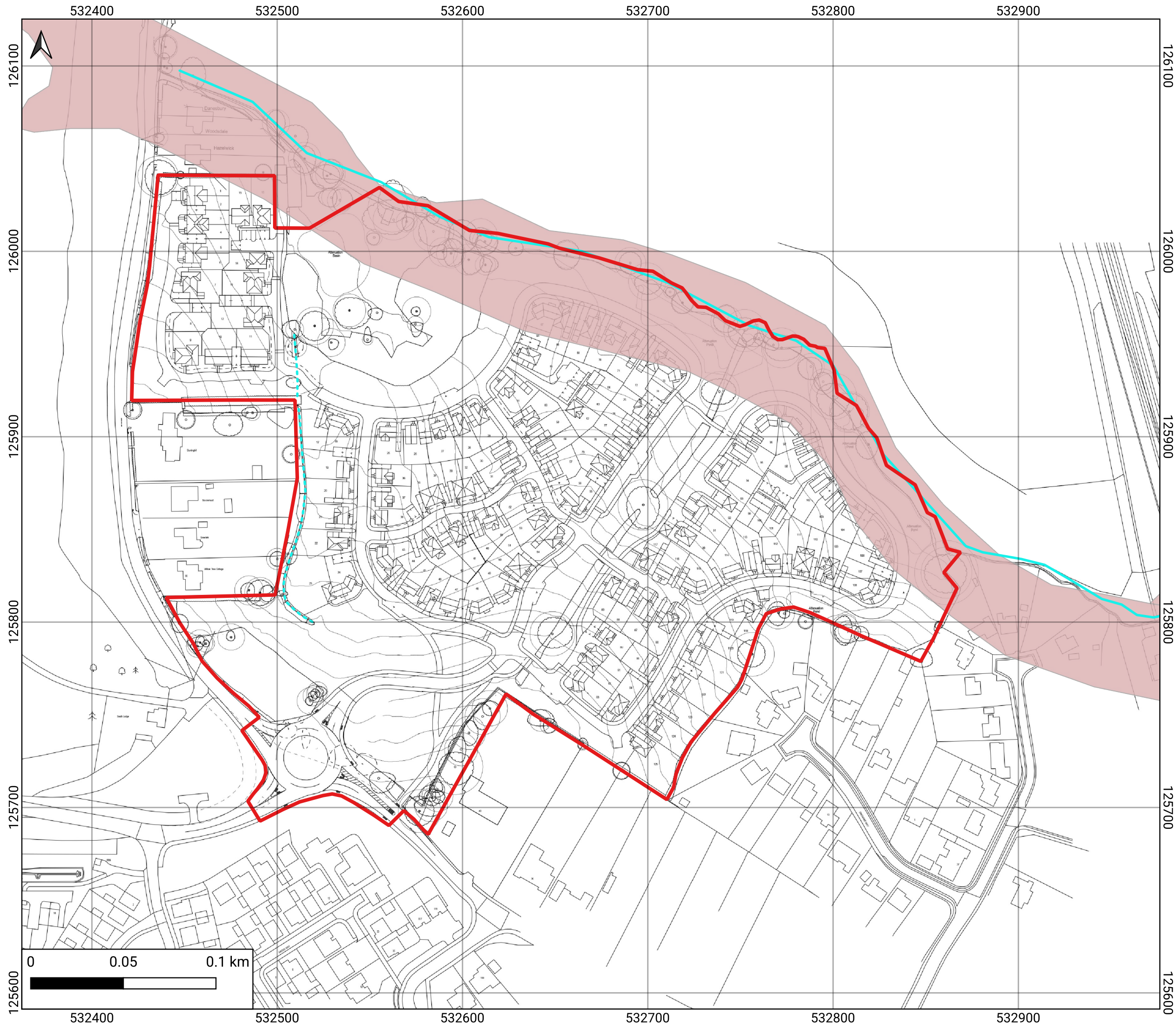
Risk of Surface Water Flooding Including Climate Change

High

Medium

Low

Unavailable



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D2.4: Superficial Deposits

Legend

Site Boundary

Main River

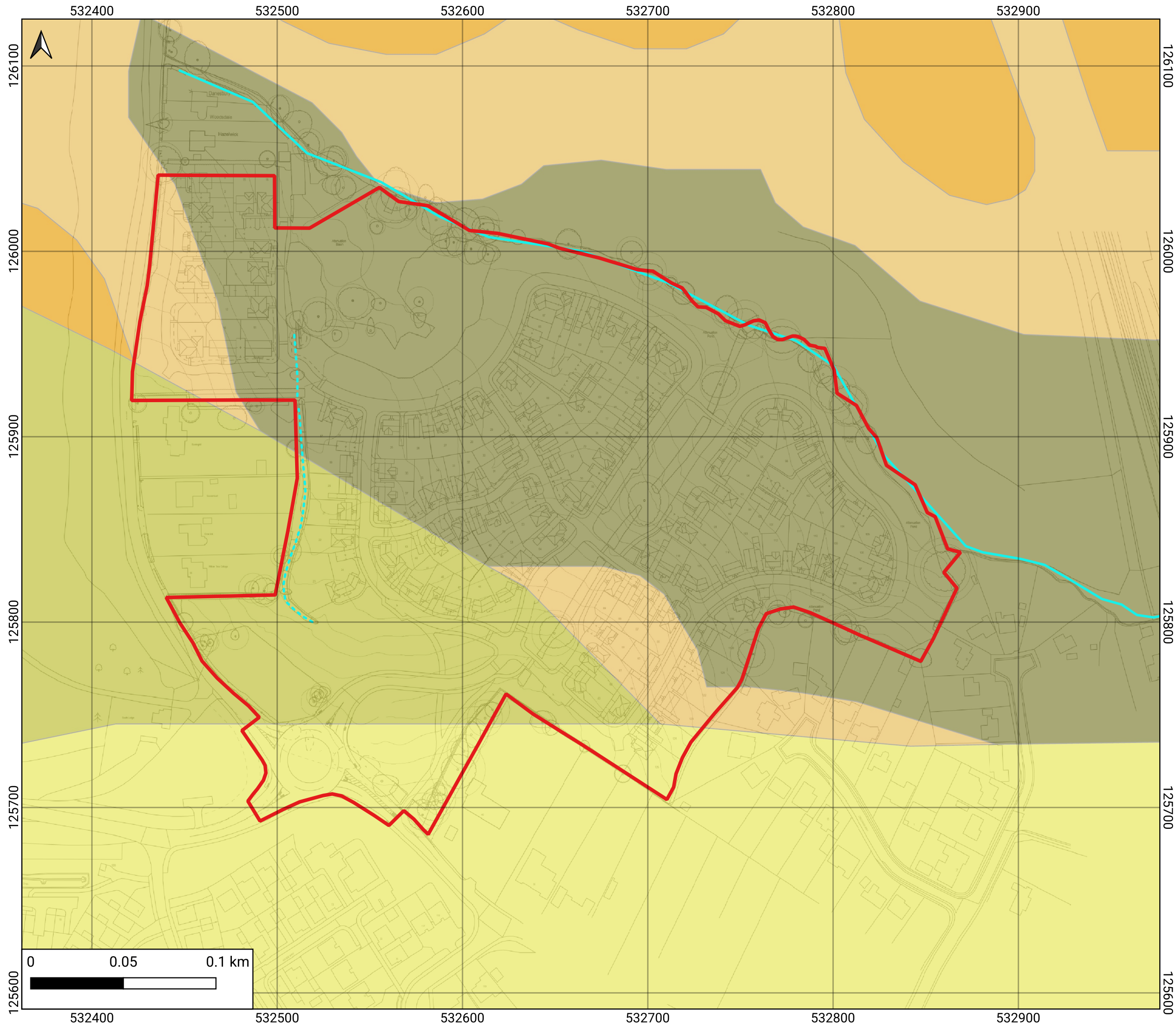
Watercourses

Ordinary Watercourse

Ditch

Superficial Deposits

Head Deposits



Land North of Balcombe Road: Outline Drainage Study

P25012_R2_D2.5: Bedrock Geology

Legend

Site Boundary

Main River

Watercourses

Ordinary Watercourse

Ditch

Bedrock Geology

Wadhurst Clay Formation

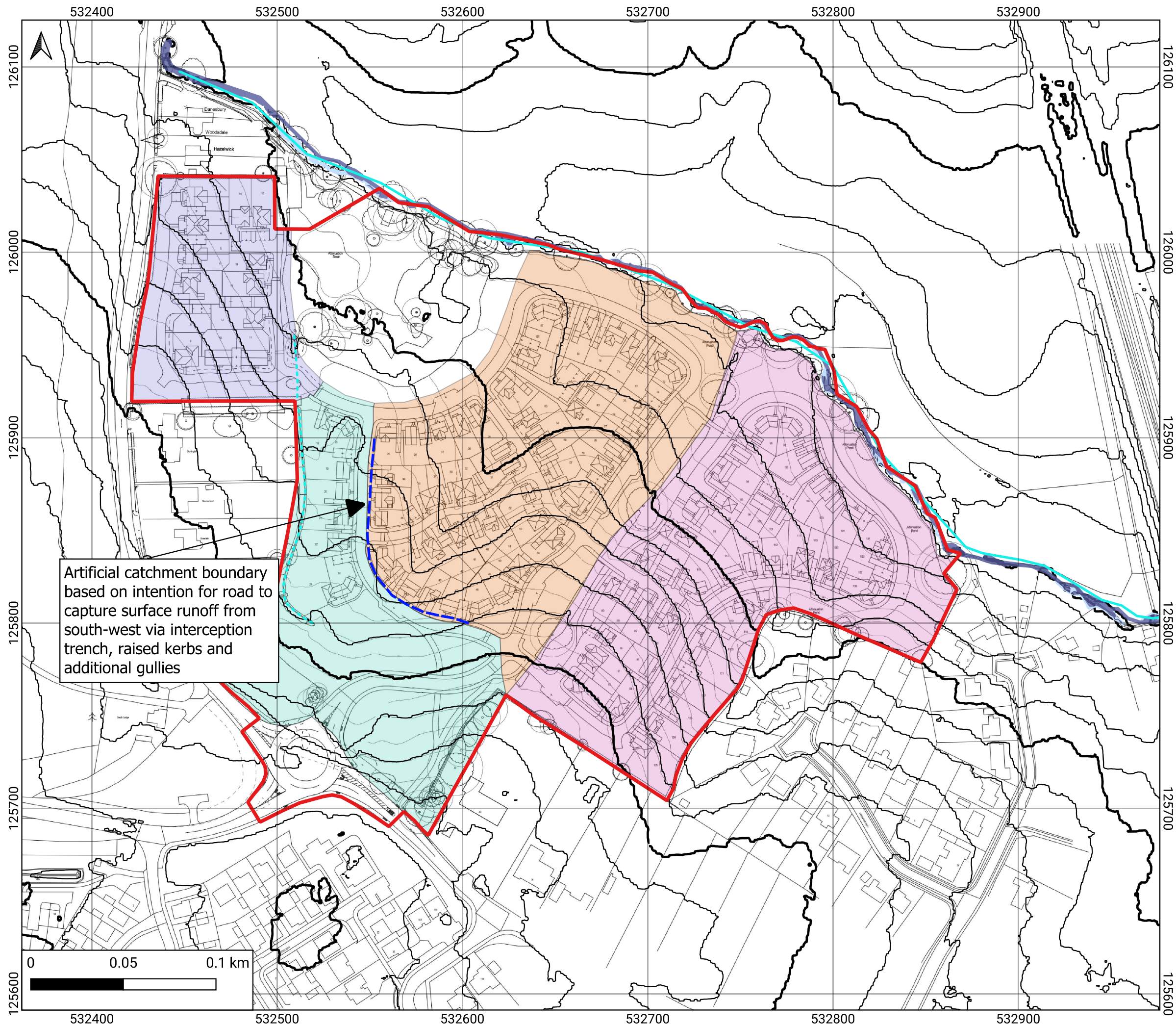
Upper Tunbridge Wells Sands

Lower Tunbridge Wells Sands

Ardingly Sandstone Member

Cuckfield Stone Bed

Lower Grinstead Clay



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D4.1: Urban catchments

Legend

Site Boundary

Main River

Watercourses

Ordinary Watercourse

Ditch

LiDAR Contours

2

10

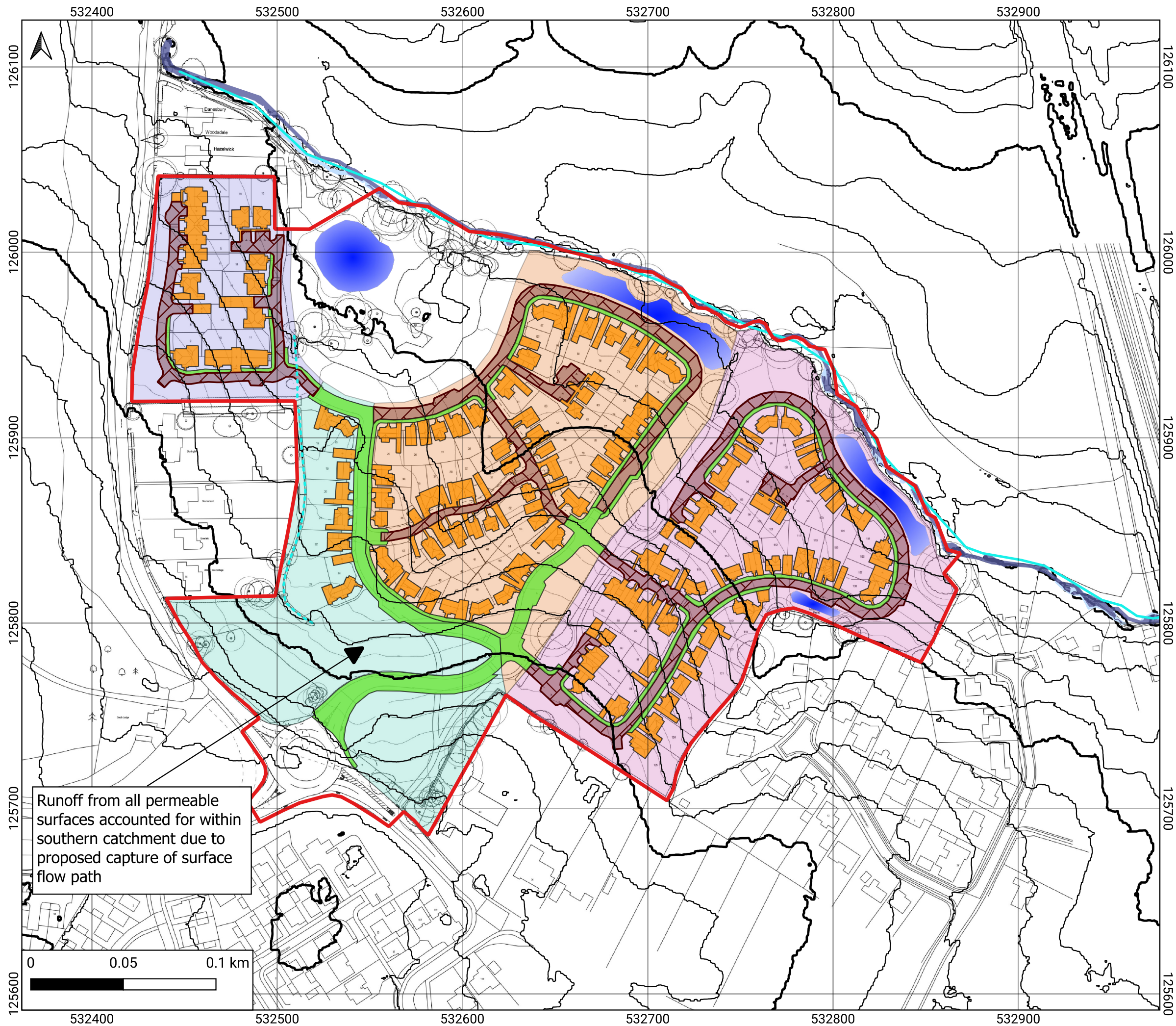
Catchments

Central

Eastern

Southern

Western



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D4.2: Adoptable and Non-Adoptable areas on Site

Legend

Site Boundary

Main River

Watercourses

Ordinary Watercourse

Ditch

Catchments

Central

Eastern

Southern

Western

LiDAR Contours

2

10

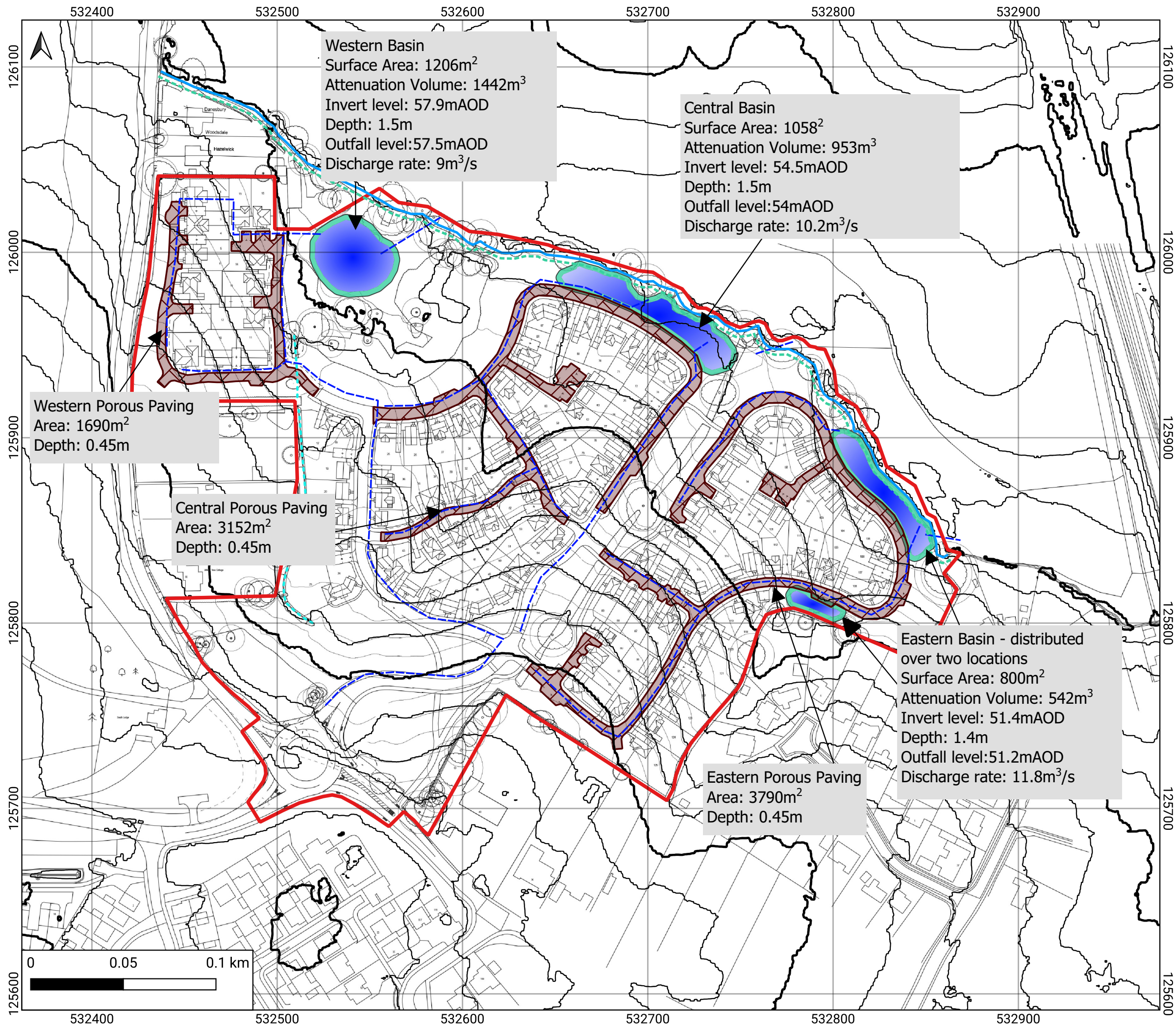
Surfaces

Impermeable - Adoptable

Impermeable - Non Adoptable

Porous Paving

SuDS Basins

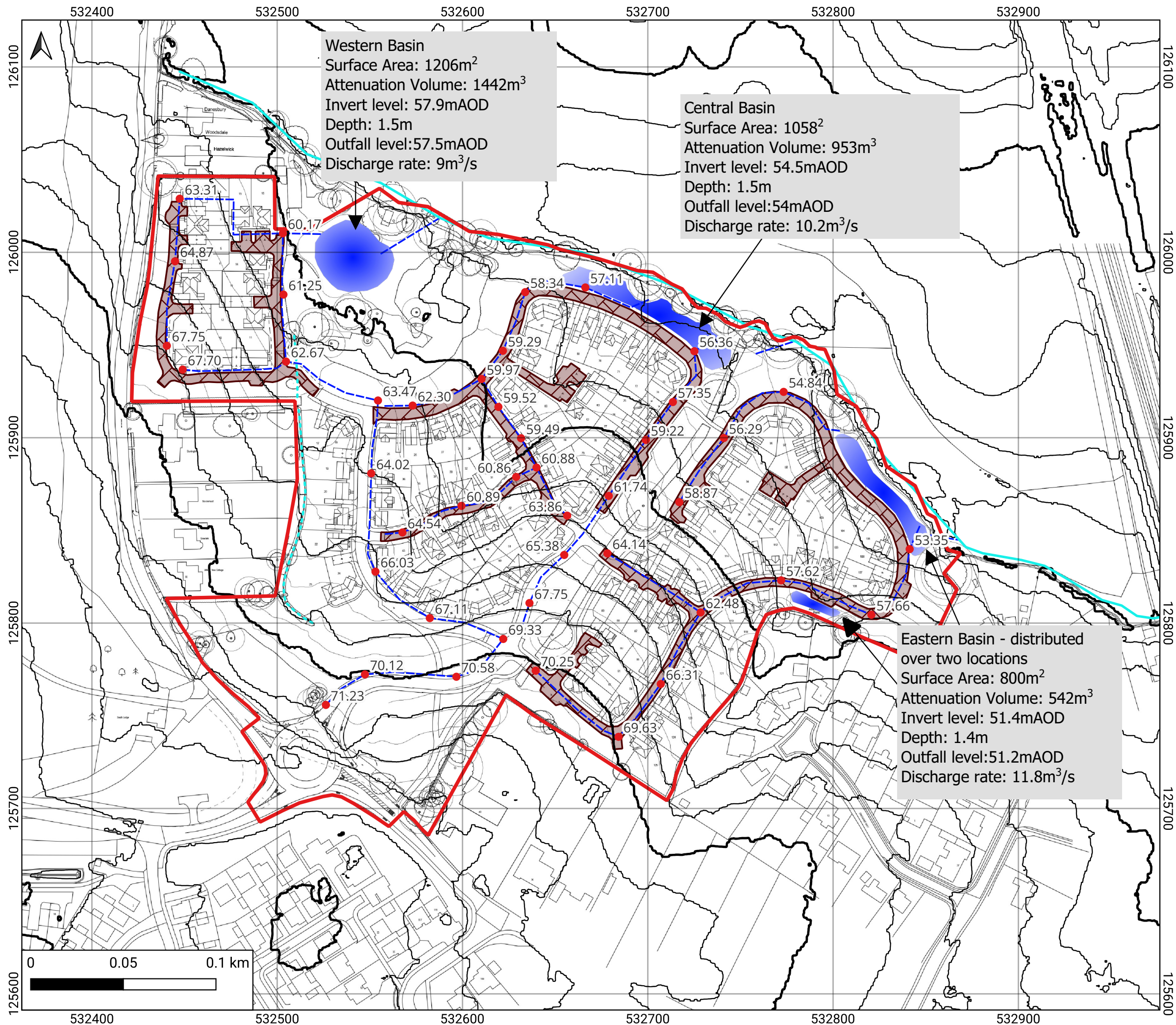


Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D4.3: Properties of Key SuDS Features

Legend

- Site Boundary
- Main River
- Watercourse Details
 - Top of Bank
 - 3m Buffer
 - Ditch
- LiDAR Contours
 - 2
 - 10
- SuDS Basins
- SuDS Basins Buffer
- Porous Paving
- Indicative Network Layout

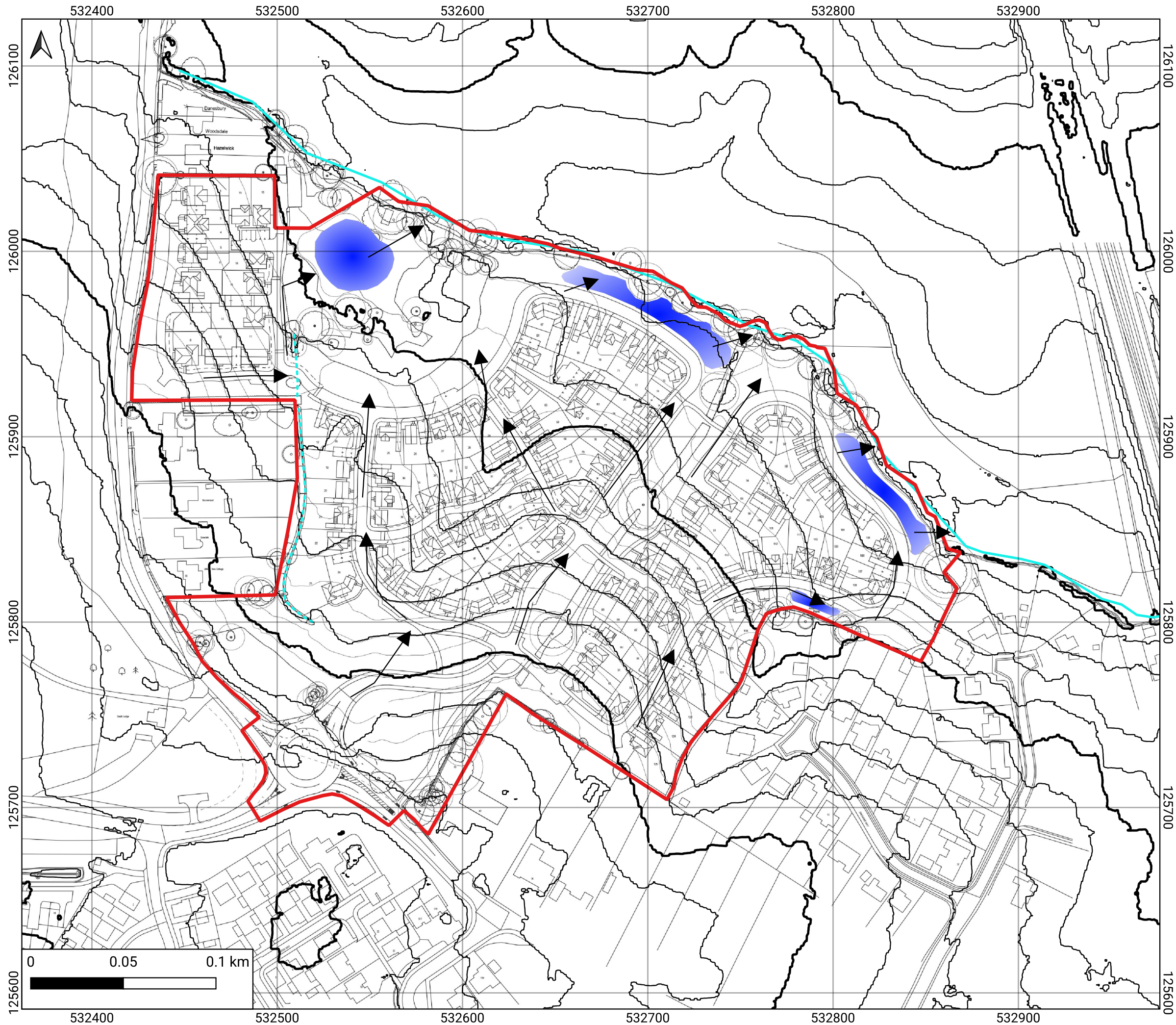


Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D4.3: Proposed Cover Levels

Legend

- Site Boundary
- Main River
- Watercourses**
 - Ordinary Watercourse
 - Ditch
- LiDAR Contours**
 - 2
 - 10
- SuDS Basins
- Porous Paving
- Indicative Network Layout
- Indicative Levels



Land North of Balcombe Road: Outline Drainage Strategy

P25012_R2_D4.10: Exceedance Flow Routes

Legend

-  Site Boundary
-  Main River
- Watercourses**
 -  Ordinary Watercourse
 -  Ditch
- LiDAR Contours**
 -  2
 -  10
-  SuDS Basins
-  Exceedance Routes