Prepared on behalf of Exeter College
In support of the promotion of
Grove Farm, Robertsbridge

BIDWELLS

ROTHER DRAFT LOCAL PLAN (REGULATION 18) WRITTEN REPRESENTATIONS

Quality Assurance

Site name:	Land at Grove Farm (Phase 2), Robertsbridge
Client name:	Exeter College
Type of report:	Written Representations
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Date	July 2024
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Date	July 2024

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1.0 Introduction

1.1 These written representations have been prepared by Bidwells on behalf of Exeter College. Exeter College are the owners of land hereafter referred to as 'Land at Grove Farm (Phase 2), Robertsbridge', outlined in red in **Figure 1**. The site comprises circa 4.01ha, whilst the opportunities and constraints plan attached within **Appendix 2** identifies a core developable area of 1.7ha. The remaining land within the north and south of the site could be reserved for open space and amenity.

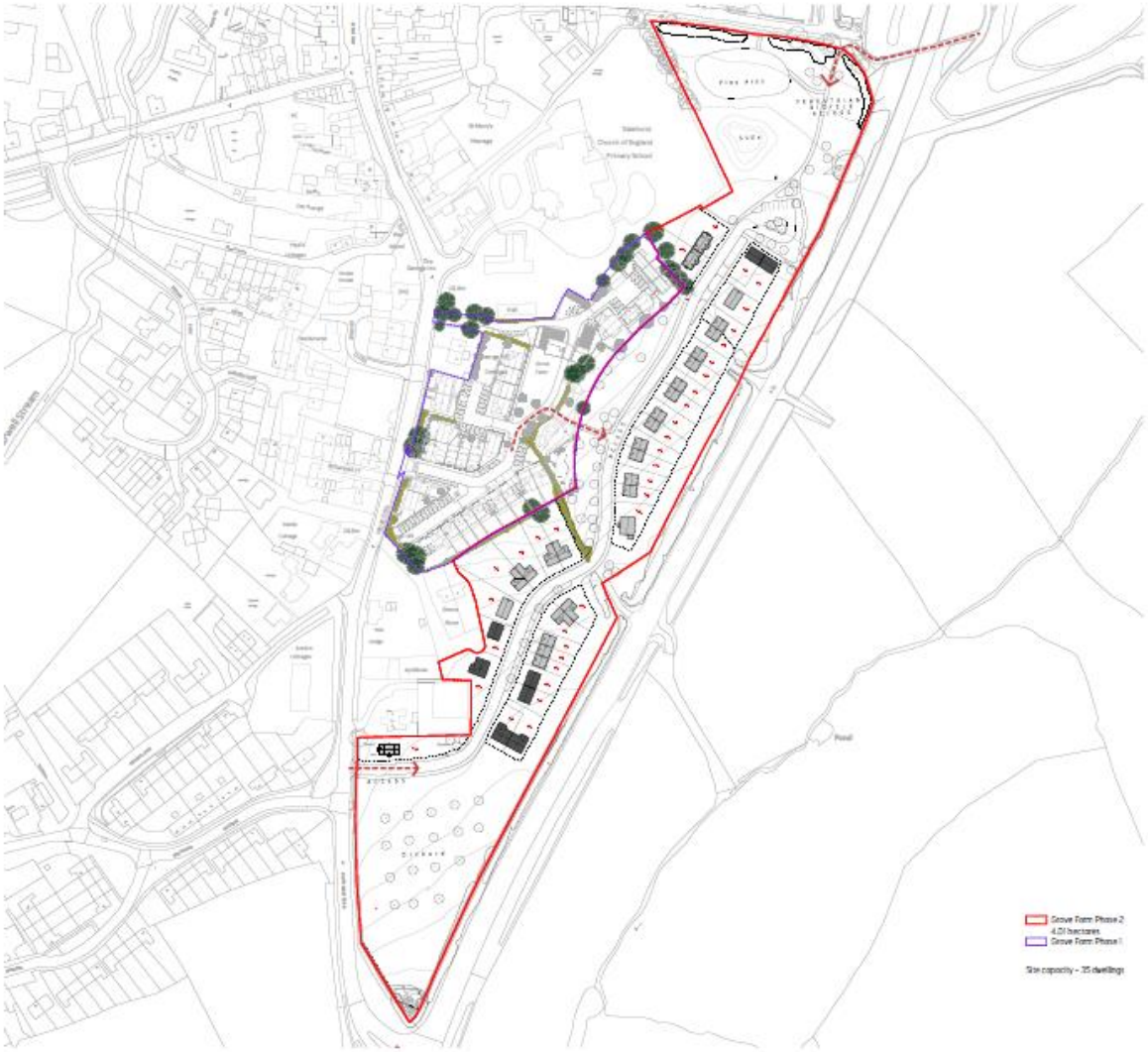


Figure 1: Grove Farm Phase 1 (Purple) and Phase 2 (Red)

1.2 The area edged in purple in **Figure 1**, is known as 'Grove Farm Phase 1'. This parcel of land has extant planning permissions granted in 2018/2019 for up to 30no. dwellings, which are soon to be developed.

1.3 Exeter College is now promoting Land at Grove Farm (Phase 2), Robertsbridge (i.e. the site to which these representations relate) for new housing and associated development (open space, drainage etc.) as a natural extension to the Grove Farm Phase 1 site. Access rights through Grove Farm Phase 1 have been retained.

1.4 Turnberry Planning Limited previously submitted Land at Grove Farm (Phase 2), Robertsbridge as part of Rother Council's Call for Sites in December 2020. The site was subsequently assessed, under reference 'SAL0022 Land at Grove Farm (Phase 2) Robertsbridge' in the Housing and Economic Land Availability Assessment (HELAA) Draft (Regulation 18) Version – April 2024 and was not discounted. Phase 1 is identified within the same assessment, under reference 'SAL0004 Grove Farm, Robertsbridge'.

1.5 We have therefore responded to the Draft Rother Local Plan 2040 (Regulation 18) consultation questions of relevance to the development of this site, in support of the site becoming allocated.

2.0 Our Comments

Chapter 2: Vision Overall Priorities and Objectives

Vision

Q1 – What are your views on the Council's Vision?

2.1 We **support** the overall vision of the Draft Local Plan set out on page 19 of the Regulation 18 version, because we acknowledge the Council's recognition of the need to balance competing planning policy objectives. In particular, we support the vision that by 2040 '*Bold solutions will have successfully addressed the climate and biodiversity emergencies and the housing crisis while protecting the High Weald National Landscape'.*

2.2 At paragraph 2.3, the draft Local Plan goes onto state:

> *Our complex challenges require bold solutions. The Plan must seek to maximise housing delivery in a manner that is appropriate for the protected national landscape and habitat areas which form much of its context. The Plan must also futureproof policy to build in flexibility as national policy and the economy changes.*

2.3 The development of land to which these representations relate would help to address the housing crisis and maximise housing delivery, so we support the Plan's intention to futureproof policy and contain in-built flexibility.

Overall Priorities

Q2 – What are your views on proposed twin Overall Priorities to be 'Green to the Core' and 'Live Well Locally'.

2.4 We ***support*** the Twin Overall Priorities that have been identified to meet the Local Plan's vision. The priorities, set out below, balance the needs of housing to support residents and protecting the High Weald Area National Landscape:

> *Overall Priority 1 – Green to the Core: Being Green to the Core means considering the impact of all planning decisions on the climate emergency, the biodiversity crisis and the High Weald Area National Landscape.*
>
> *Overall Priority 2 – Live Well Locally: means considering, when making all planning decisions, the goal of creating*
>
> - *Healthy, sustainable and inclusive communities that support residents across the age spectrum in terms of housing, access to jobs, services and facilities.*
> - *'Connected and compact neighbourhoods' in our towns with 'village clusters' in our rural locations, where people can meet most of their daily needs within a*

reasonable distance of their home, with the option to walk, wheel, cycle (active travel) or use public transport.

- *New development that creates places that are not just visually appealing, but also inspire and foster a sense of belonging, identity, and shared experience.*

2.5 Prioritising housing needs accords with the NPPF which provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner. At paragraph 11, the NPPF sets out that plans should apply a presumption in favour of sustainable development and that strategic policies should, as minimum, provide for objectively assessed needs for housing and other uses.

Q3 – What are your views on the key issues (listed at paragraph 2.13) that have been identified and is there anything significant missing?

2.6 Under its Twin Overall Priorities, the Local Plan outlines 10 key planning issues, which directly feed into the Strategic Spatial Objectives. Among others, we outline specific ***support*** for the following issue which recognises the importance of meeting local demand for housing:

- *Meeting the overall local demand and need for housing (including affordable and specialist need) and associated growth – taking a landscape and sustainability led approach across the district.*

2.7 Seeking to meet the overall demand and need for housing aligns with the new government's plans to reintroduce mandatory housing targets across each local planning authority in England by autumn of this year. Cognisant of this, Rother Council should be aiming to meet its housing needs in full.

Strategic Spatial Objectives

Q4 – What are your views on the Council's objectives for the Local Plan?

2.8 We ***support*** the 10 Strategic Spatial Objectives set out in the Draft Local Plan. In particular, Spatial Objective 4 which seeks to *'Respond to the housing crisis and help facilitate the delivery of housing to meet the needs of different groups in the community, ensuring a variety of high-quality sustainable, zero carbon ready dwellings that meet the needs and income levels of Rother's wider population for their lifetime'.*

2.9 It is also worth noting that the development of land to which these representations relate is also compatible with Spatial Objective 2 which seeks to '*preserve the historic landscape character of the High Weald National Landscape and protected habitat areas of Rother*' and Spatial Objective 7 which seeks to '*focus growth in sustainable locations across the district, or places that can be made sustainable through supporting infrastructure and community facilities.'* Done well, development has the capability to reinforce local distinctiveness and character and have an overall positive townscape and visual impact.

Chapter 3: Green to the Core

Proposed Policy GTC8: Biodiversity Net Gain

Q22 - What are your views on the Council's proposed policy for Biodiversity Net Gain?

Q23 – What are your views on the Council going above the national minimum requirement of 10%?

2.10 We ***note*** that the proposed policy wording states that all qualifying development proposals must deliver at least 20% a measurable biodiversity net gain attributable to the development and that this is higher than the minimum mandatory threshold of 10%.

2.11 Whilst we note that the consultation document doesn't currently appear to be supported by evidence to support why this additional requirement is proposed, we anticipate that the development of the site subject of these representations could be accompanied by suitable proposals to achieve the proposed biodiversity net gain requirement, making use of the northern and southern land parcels within the site, and if necessary use of extended land within Exeter Colleges ownership, on the eastern side of the A21. Comparable to other potentially suitable sites within Robertsbridge, shown in Figure 2, we draw attention to the favourable extent of available land within the ownership of Exeter College which shows that this policy aspiration as currently drafted could be met through the allocation and development of this site.

Proposed Policy GTC9: High Weald National Landscape (AONB)

Q25 - What are your views on the Council's proposed policy for the High Weald National Landscape?

2.12 The proposed Policy GTC9 states:

> *All development within or affecting the setting of the High Weald National Landscape (AONB) shall conserve and enhance its distinctive landscape character, ecological features, settlement plan and scenic beauty, having particular regard to the impacts on its character components, as set out in the latest version of the High Weald AONB Management Plan.*
>
> *Development within the High Weald National Landscape should be small-scale, in keeping with the landscape and settlement pattern, and designed in a way that reflects its nationally-designated status as landscape of the highest quality, following the guidance in the High Weald AONB Housing Design Guide and Colour Study. Major development should not take place in the AONB save in exceptional circumstances as outlined at paragraph 183 of the NPPF.*

2.13 We ***note*** the proposed conservation of the High Weald National Landscape and agree with the principle that all development within the National Landscape should be in keeping with the landscape and settlement pattern.

2.14 We consider that the development of land to which these representations relate could be allocated for residential purposes in the emerging Plan and developed for residential uses in a manner compatible with this policy in principle and such that it does not have a significant adverse impact on the purposes for which the High Weald National Landscape has been designated.

2.15 Notwithstanding the sensitivity of the National Landscape, the NPPF also supports the sustainable development of rural areas. In particular, 83 of the NPPF states that in rural areas planning policies should identify opportunities for villages to grow and thrive, especially where this will support local services. The NPPF at paragraph 11 also states, inter alia, that plans should apply a presumption in favour of sustainable development, which for plan-making, means that all plans should promote a sustainable pattern of development that seeks to meet the development needs of their area. We therefore consider that the presence of the High Weald National Landscape should not present an in-principle reason to restrict growth where sensitively achievable and in line with the evidence.

Chapter 4: Live Well Locally

Proposed Policy LWL1: Compact Development

Q27 - What are your views on the Council's proposed policy on compact development?

2.16 We ***note*** that the proposed Policy GTC9 sets out prescribed density ranges for new residential development, dependent on a sites location, as follows:

> *d. Village areas (with development boundaries): 25-45 dph*
>
> *e. Countryside areas (including villages and hamlets without development boundaries): in the instances where residential development is supported by policies in this plan, the density should reflect the existing character of the area.*

2.17 In general, we agree to the principle of proposing indicative densities to inform the efficient use of land, however, we ***object*** to the wording of the proposed policy as it currently stands on the basis that it is too prescriptive and lacks flexibility to take account of individual locational circumstances. The appropriate density for development on a site should be considered on a case-by-case basis taking into account the specificities of the sites location, context, and wider design-related policies and should not be bounded to pre-determined ranges.

2.18 We therefore suggest that the wording is amended to enable greater flexibility to allow for smaller or greater quanta of development, where appropriate.

Chapter 5: Development Strategy and Principles

Preferred Spatial Development Options

Q51 – What are your views on the Council's preferred spatial development options?

2.19 The Council has considered a series of potential spatial development options (SDO's 1-12), and these have individually undergone a Sustainability Appraisal. These are detailed in the Development Strategy Background Paper which forms part of the Draft Local Plan Evidence Base.

2.20 With respect to the land to which these representations relate, the following options appear to be compatible with the further sustainable growth of Robertsbridge:

- ***SDO10: A21 Corridor*** *– Development along the A21 within an identified corridor of settlements, with opportunities for growth. Opportunities for sustainable travel through enhanced bus services and cycle track along this corridor.*
- ***SDO4: Sustainable Development Growth*** *– prioritise new development on the edge of sustainable settlements, providing major development and extending settlement boundaries where appropriate.*
- ***SD011: Growth in the settlements with train stations*** *– development around train stations in settlements served by them.*

2.21 The Development Strategy concludes that the most appropriate spatial development options to take forward as Rother's proposed development strategy is a combination of the following options:

- *Brownfield intensification and redevelopment within sustainable settlements (SDO6)*
- *Bexhill greenfield growth on the northern and western edges of the built-up area of Bexhill to create new compact, connected communities (SDO3A)*
- *Hastings Fringes urban growth (SDO5)*
- *Radial settlement network connected to Bexhill and Hastings (SDO2)*
- *Village clusters centre around Rye and Battle (SDO1)*
- *Sustainable settlement growth (SDO4) with longer term, a focus on the A21 Corridor (SDO10).*

2.22 Spatial Development Options 3B, 7, 8, 9 and 12 are explicitly discounted at paragraph 10.5 of the Background Paper. SDO11 is not outlined as either being taken forward or discounted, however, the vision for Northern Rother (see paragraph 2.37) would appear to suggest that it has been taken forward, which we would ***support.***

2.23 We ***support*** Spatial Development Option 04 and the approach to focus growth in settlements that score highest with regards to sustainability, which as outlined in paragraph 2.42 includes Robertsbridge. This would be fundamentally in line with NPPF paragraph 11 which states that all plans should promote a sustainable pattern of development. The development of land to which these representations relate would be compatible with this preferred Spatial Development Option.

2.24 We ***support*** the principle of SDO10, however, we do not consider that this should be limited to longer-term growth only. We are supportive of this option's aspiration to anticipate and respond to long-term requirements but this should be in recognition of existing suitable opportunities along the A21 to deliver sustainable growth on deliverable sites in the shorter-term, for example at Robertsbridge. The development of such sites should not be delayed unnecessarily, especially when such sites are available now.

Overall Spatial Development Strategy

Q54 – What are your views on the Council's proposed spatial development strategy and proposed minimum targets for housing and employment growth?

Housing Need

2.25 On page 112, the draft Local Plan sets out the overall Spatial Development Strategy. This states:

> *The Council will meet the local need for all forms of housing, jobs, facilities and services by strengthening Rother's pattern of development through a landscape-led spatial development strategy that focuses on the 'Live Well Locally' concept. To achieve this, a minimum of [5,158 to 7,287]* dwellings, at an average rate of [258 to 364]* per year…will be constructed by the end of the Plan period in 2040.*
>
> **The final housing and employment target will be minimum figures. For the Regulation 18 consultation, the overall housing and employment figures are presented as a range, with the lower figure representing the totals of the "identified sites" (current allocations and sites with planning permission), and the upper figure representing the identified sites plus the total capacity of "potential additional sites" (sites identified in the daft HELAA as being potentially suitable, available, and achievable for development during the Local Plan period). Therefore, the range is subject to change (either by an increase or reduction).*

2.26 It is understood that using the national standard method, Rother's minimum local housing need (LHN) figure is 733 dwellings per year (2023 Base Date). This is in contrast to the adopted Core Strategy target of 355 dwellings per annum, and significantly exceeds the delivery rates of housing delivery between 2011-2028 which averages at 219 net additional dwellings per year.

2.27 The Housing and Economic Land Availability Assessment (HELAA) (Draft Regulation 18 Version – April 2024) forms part of the evidence base underpinning the Draft Local Plan. At paragraph 2.5 it states '*the HELAA will determine the amount of land available for residential development and the resulting number of dwellings that could be accommodated in Rother over the plan period, in line with NPPF paragraph 67. This figure may be compared to the minimum local housing need (LHN) figure defined using the standard method calculation'.*

2.28 The HELAA goes onto state at paragraph 7.7:

> *it is clear that in terms of dwellings numbers, insufficient potential has been identified to meet the local housing need (LHN) figure, calculated using the standard method calculation set out in the NPPF (discussed in section 2 above). The current standard method calculation identifies a need for **14,660 dwellings** over the 20-year period of the new Local Plan (2020- 2040) (733 dwellings per annum). In contrast, as shown in Figure 4, the potential identified in the HELAA plus dwellings already constructed plus a windfall projection is between **5,158 and 7,287 dwellings** over the 20-year period.*

2.29 The current evidence base, therefore, indicates a significant shortfall in sites, as summarised in **Table 1**.

		2020-2040
Housing Need		**14,660**
Housing Supply	Identified sites	5,158 (35.2% of need)
	Potential additional sites	2,129
	Total housing supply	**7,287 (49.7% of need)**
Housing Shortfall		**7,373-9,512**

Table 1: Housing Need vs Supply

2.30 We ***note*** that the housing supply doesn't propose to meet the LHN in full, which means that the Council should progress with the Plan on the basis of the higher housing need figures, *as a minimum*. Not factoring in the 'potential addental sites' would put the housing supply at 35.1% of the housing need. This would be at conflict with the overarching vision of the Local Plan and its Twin priorities and Spatial Objectives which we endorse. It would also fail to support the Government's objective of significantly boosting the supply of homes.

2.31 On the basis that the Council is unable to meet its LHN, it is important that the Council plans to allocated additional land to increase its supply position, and/or work existing sites to ensure that more efficient use of land could be used where appropriate, such as the Land at Grove Farm (Phase 2), Robertsbridge, which is attributed an indicative capacity of 35 dwellings but could deliver more. At the very least, additional sites that have not been discounted within the Council's own HELAA, such as the one to which these representations relate, should, be considered favourably and taken forward as an allocation within the emerging Local Plan where they are available and deliverable.

2.32 'SAL0022: Land at Grove Farm (Phase 2), Robertsbridge', the site to which these representations relate, counts towards one of the 'potential additional sites' outlined in **Table 1**. Within the HELAA this site is assessed as being potentially suitable, potentially available and potentially deliverable, subject to further assessment or investigation. The initial assessment states '*While it is located within the High Weald National Landscape (HWNL), the site has few other environmental constraints and could form a logical extension to the permitted development, in a sustainable location within walking distance of services and public transport links in Robertsbridge'*.

2.33 Further detail on the suitability and development capacity of this site are provided in **Chapter 3**. To summarise this is one example of a site which should be taken forward as an allocation within the emerging Local Plan in order to increase the Council's Housing Supply Position which currently falls significantly behind housing need.

Proposed Development Strategy

2.34 Having established the housing targets for the Local Plan period, the Draft goes that the focus for growth will be in the following broad locations:

- *West and North Bexhill to consolidate Bexhill as the most sustainable town, within the capacities of the existing transport network;*
- *clusters of villages based around the towns of Battle and Rye which act as key transport hubs;*

- *settlements on radial routes connected to the main urban areas of Bexhill and Hastings, allowing sensitive development in locations that rely on the larger towns for services and facilities;*
- *development at Hastings Fringes, providing sensitive growth; urban intensification and redevelopment across the district in appropriate and sustainable brownfield site locations;*
- *sensitive development in other rural settlements of the district; and*
- *in the longer-term, sensitive growth along the A21 Corridor.*

Delivering the Spatial Strategy

2.35 Rother's proposed development strategy has been split into five spatial sub-areas, which align with the focus areas of growth presented above. Each of these spatial sub-areas has their own vision statement and identified distribution of development. The five sub-areas comprise:

- Bexhill;
- Hastings Fringes and settlements that radially link to Hastings;
- Battle and its cluster of connected settlements;
- Rye and its cluster of connected settlements; and
- Northern Rother – the settlements in the north-east of the district.

2.36 In all five-sub areas there is open countryside, which relates to those areas outside of villages with development boundaries and includes farmland, woodland, hamlets and scattered development.

Vision for Northern Rother

Q68 – What are your views on the vision for Northern Rother?

2.37 We ***support*** the vision for the Northern Rother sub-area which states [Bidwells' emphasis in bold]:

> *Northern Rother's rural settlements and communities will continue to thrive, through **small-scale sensitive residential development and growth in villages to create sustainable forms of development** and protect and enhance the landscape character and scenic beauty of the High Weald National Landscape. This will ensure that health and wellbeing and community cohesion is maintained and improved.*
>
> *While inevitably most rural residents have no choice but to travel primarily by car, connectivity between rural settlements and the Hastings-London rail line will be enhanced through promoting and improving sustainable and active transport infrastructure including walking, wheeling and cycling, enabling communities to lead healthy and active lifestyles.*
>
> *The two stations at Etchingham and Robertsbridge will continue to act as transport hubs for wider villages in Northern Rother. **There are opportunities for sensitive development***

***in the short term, where sustainable and related to an existing settlement**. Also, the area will continue to be served by the smaller Stonegate station.*

Longer term (over a 30-year timeframe), the delivery of significant improvements to create a sustainable transport corridor, including bypasses to Flimwell and Hurst Green could open up opportunities for future development along the A21 corridor.

2.38 However, we consider that the policy wording '*through small-scale sensitive residential development and growth in villages'* should be amended to also support sustainable expansions of existing villages where appropriate. This would align with the intention of Spatial Development Option 4 which is centre on prioritising new development on the edge of sustainable settlements and extending settlement boundaries where appropriate.

Q69– What are your views on the distribution and opportunities for growth in settlements within the sub-area in figures 29, 30 & 31?

2.39 We further ***support*** the classification of Robertsbridge as a Settlement of 'Good Sustainability' and as one of the most sustainable rural villages in the district in the settlement study.

2.40 **Table 2** (Fig 29 of the Plan) identifies potential for an additional 305 dwellings to be delivered in the village of Robertsbridge. This includes 178 dwellings on sites either allocated or with planning permission (shown in purple in **Figure 2**), and an additional 127 dwellings across sites assessed as being potentially available, potentially suitable and potentially achievable within the HELAA (shown in orange in **Figure 2**).

Figure 29: Northern Rother Settlements Development Strategy: Housing: Summary

Settlement Area	Identified Level of Housing Growth	Potential Additional Level of Housing Growth	Total Potential Housing Growth (Identified + Additional)
Etchingham	0	16	16
Robertsbridge	178	127	305
Ticehurst	15	26	41
Burwash	37	6	43
Flimwell	9	108	117
Hurst Green	26	38	64
Staplecross	0	16	16
Burwash Common	12	9	21
Total Growth	277	346	623

Table 2: Northern Rother Settlements Development Strategy: Housing: Summary

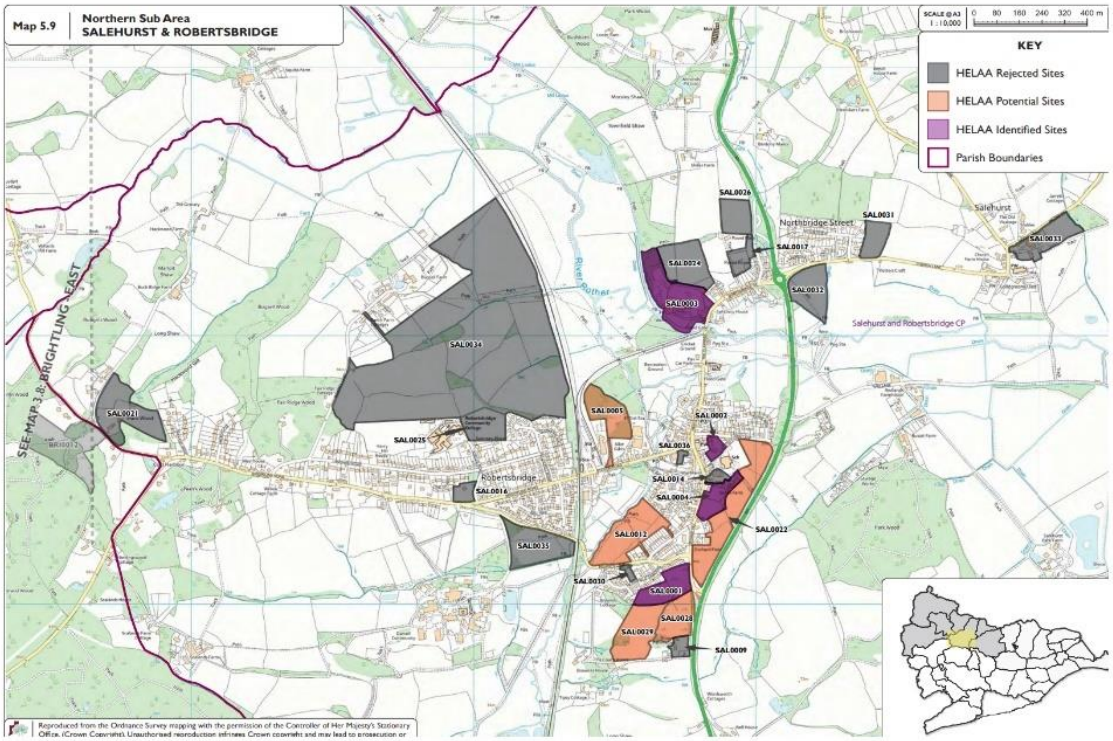


Figure 2: Salehurst & Robertsbridge HELAA Sites

2.41 The number of sites identified in orange in Figure 2 above appears to reflect the numbers suggested in Table 2, reflecting a mix of available sites around Robertsbridge. Note that the Grove Farm (Phase 2), Robertsbridge appears to be the largest of these HELAA Potential Sites and therefore has the potential to accommodate not only the largest number of homes but also onsite biodiversity net gain in accordance with the Council's emerging 20% aspiration. The site would form a natural extension of the already consented and deliverable Phase 1 scheme immediately to the west and would mesh with the existing settlement in a sustainable manner, offering sustainable transport links into the heart of Robertsbridge.

2.42 We ***support*** the distribution of growth across the sub-areas set out in Figure 29 of the Local Plan, which prioritises growth in Robertsbridge. As outlined in the Settlement Study, Robertsbridge is the highest scoring settlement in sustainability terms outside of Bexhill, and Rye and the most sustainable rural village in the district, alongside Northbridge Street. Given the extent of the identified housing shortfall in the emerging Plan, there should be no doubt that sites considered "potentially suitable" on the edge of settlements, such as the Land at Grove Farm (Phase 2), Robertsbridge, should be upgraded to form part of the "Identified Level of Housing Growth" to help boost the supply of deliverable housing land in the district.

Q70 – What are your views on the potential sites identified in the draft HELAA that could accommodate more growth in Northern Rother?

2.43 For the reasons set out in Chapter 3, we ***support*** SAL0022: Land at Grove Farm. Development on this site would form a logical extension to the adjacent Phase 1 will benefits from planning permission and will soon be developed. The owner of both sites is a major institutional landowner who has best interests in ensuring a positive legacy on the site.

2.44 Given the extent of the identified housing shortfall in the emerging Plan, there should be no doubt that sites considered "potentially suitable" on the edge of settlements, such as the Phase 2 Land at Grove Farm, should be upgraded to form part of the "Identified Level of Housing Growth" to help boost the supply of deliverable housing land in the district.

2.45 The HELAA identifies the site as having an estimated development potential of 35 dwellings. The accompanying illustrative masterplan has been informed by technical evidence to demonstrate the site's deliverability. It shows a potential development layout of 35 dwellings – note however that this would be at a density of only 21 dwellings per hectare within the core development area (i.e. not the areas in the north or south identified as sensitive landscape) (1.7ha), and so there is clearly the potential for the density of development to be optimised. This would help the Council boost the supply of housing on sites considered favourably by its own evidence base.

Q71 – What are your views on a potential 30-year vision for the A21 transport corridor?

2.46 As outlined at paragraph 2.19, we support the 30-year vision for the A21 transport corridor and the proposed sustainable travel improvements, however, we do not consider that this should be limited to longer-term growth along this corridor should be unnecessarily delayed. There are already suitable opportunities along the A21 to deliver sustainable growth in the shorter-term, for example at Robertsbridge.

Proposed Policy DEV3: Development Boundaries

Q82 – What are your views on the Council's approach to development boundaries?

2.47 Proposed Policy DEV3: Development Boundaries states:

> *Development boundaries define the area within sustainable settlements where development will be permitted, provided it is consistent with this Local Plan.*
>
> *Priority shall be given to reuse of brownfield sites, in order to make efficient use of previously developed land in sustainable settlements. Some greenfield development will be necessary in order to deliver housing and employment need, but this will be limited to inside development boundaries.*
>
> *In the countryside (that is, outside of defined development boundaries), development shall be limited to that which accords with specific Local Plan policies or that for which a countryside location is demonstrated to be necessary. Brownfield development will be prioritised, in order to make efficient and sustainable use of previously developed land.*

2.48 As outlined in **Table** 1, there is currently, a significant shortfall in the availability of land for housing and the district is unable to achieve its Local Housing Need target. Even when factoring in potential sites from the HELAA, the district still has a significant undersupply.

2.49 We, therefore, ***support*** the review of each settlement's boundary, as outlined in paragraph 5.119 of the Draft Local Plan. In the context of the land to which these representations relate, it is considered that the A21 to the east already forms a logical and defined boundary which a revised settlement boundary could follow. The masterplan for the site to which these representations

relate, attached within **Appendix 1**, demonstrates an indicative edge of development in order with the opportunities and constraints of this site, which a revised settlement boundary in this location could follow.

3.0 SAL0022: Land at Grove Farm (Phase 2), Robertsbridge

3.1 The land to which these representations relate is identified as 'SAL0022: Land at Grove Farm (Phase 2), Robertsbridge', in the Draft Housing and Economic Land Availability Assessment (HELAA) and is shown in **Appendix 1**. Within Robertsbridge, we consider this to be a suitable, available, and deliverable site, capable of being delivered within the short-term.

3.2 The site comprises circa 4.01ha, whilst the opportunities and constraints plan attached within **Appendix 2** identifies a core developable area of 1.7ha. The remaining land within the north and south of the site could be reserved for open space and amenity.

3.3 The site was assessed during the preparation of the Draft Local Plan. A summary of the Council's site assessment is provided in **Table 2**. The residential capacity of the site was estimated by the Council to be 35 dwellings. The site is situated adjacent to 'SAL0004: Grove Farm, Robertsbridge' which already benefits from planning permission (RR/2022/1850/P & RR/2022/283/P) and is soon to be delivered. Access rights through SAL004 into SAL0022 have been retained.

SAL0022: Land at Grove Garm (Phase 2), Robertsbridge	
Site size (hectares)	4.04
Summary of Environmental Constraints	The site is within the High Weald National Landscape. The northern field is within an Archaeological Notification Area and there is a Conservation Area to the north-west. A public footpath crosses the site.
Site Assessment	This is a large site comprising a network of fields on the eastern edge of Robertsbridge, bordered by the A21 on its eastern boundary. Grove Farm Site A (SAL0004) lies to the west, which is allocated and permitted for residential development. While it is located within the High Weald National Landscape (HWNL), the site has few other environmental constraints and could form a logical extension to the permitted development, in a sustainable location within walking distance of services and public transport links in Robertsbridge. Development could potentially be accommodated across the central part of the site without causing harm to the landscape and character of the HWNL, with the northern and southern-most fields remaining undeveloped as these are more sensitive in landscape terms. The achievement of a safe vehicular access requires further consideration. Initial Highway Authority comments suggest access would need to be from George Hill, with Fair Lane used only for pedestrian and cycle access, and that a Transport Assessment and Travel Plan would be required.
Estimated Development Potential	Residential: 35 dwellings

Table 3: Draft Housing and Economic Land Availability Assessment (HELAA) - SAL0022

3.4 In response to the Council's assessment, Bidwells on behalf of Exeter College have commissioned further detailed assessment of the site in order to determine the sites capacity and development potential. This has included input from the following consultants and has informed an indicative masterplan attached within **Appendix 1**:

- Landscape – Bidwells LLP
- Drainage – Motion
- Transport – Motion
- Architecture – Brooks Murray Architects

3.5 Whilst the masterplan has been prepared to show how 35 dwellings could be accommodated on the central parcel of the site, in accordance with the Council's HELAA, it is evident from the masterplan that this area could suitably deliver a higher quantum of development in a manner that is compliant with other design policies in the plan and respectful of local character. The masterplan provides only an indicative starting point for what could be achieved on the site.

3.6 The indicative masterplan has been informed by a detailed assessment of the site's opportunities and constraints. These are illustrated on the relevant plan attached within **Appendix 2**.

Context

3.7 The site comprises three agricultural fields, currently under pasture grazed by cattle. They are located between the existing settlement edge (together with Grove Farm Phase 1) and the A21. The site follows the western slope of a spur which gains in elevation to the south, from c25m AOD to c40mAOD.

3.8 The topography falls away to the west, towards George Hill/High Street, into the valley of the Darwell Stream. It then rises beyond the railway, providing opportunities for longer-distance views from the settlement (e.g. from the Village Hall car park and Bellhurst Road) and potentially from parts of its countryside setting. From here, the site is seen to form part of the immediate backcloth to the village.

3.9 In short-range views, however, the site is screened by the built-up area, except where it forms the frontage to George Hill and Fair Lane. The terrain also falls to the north towards the Rother Valley, with elevated countryside beyond, visible from the northern part of the site. In addition, a section of its boundary on Fair Lane adjoins the Conservation Area.

Site Boundaries

3.10 The site boundaries are defined as follows:

- To the north by a dense outgrown hedgerow, with occasional mature trees, along Fair Lane, a narrow residential road;

- To the south-west by a managed hedgerow along the elevated part of George Hill.

- To the east/south-east by the A21 (Robertsbridge Bypass), a busy trunk road. This runs at ground-level around its junction with George Hill, before descending northwards into cutting. The road corridor is densely vegetated by semi-mature trees, effectively forming a linear woodland, with a managed hedgerow also forming the site frontage.

- To the west by the curtilage of properties on George Hill, including the distinctive telephone exchange; by Grove Farm Phase 1, now vacant and visibly overgrown, including derelict farm buildings, two of which are close to – and visible from – the site, defined by gappy hedgerows; and by the curtilage of Salehurst CoE Primary School, which is defined by semi-mature trees.

3.11 The site is sub-divided by two field boundaries defined by managed hedgerows/occasional trees. Its external boundaries are also defined mainly by hedgerows, except for the curtilage of the primary school (defined by trees) and the vicinity of the telephone exchange (defined by post-and-wire fencing).

3.12 A PRoW is shown on OS mapping as crossing the site to the south-east of the primary school (and continuing across the A21). Whilst the route is identifiable from the A21, its access from Fair Lane was not, on a recent site visit.

Relationship to High Weald National Landscape

3.13 The site is located within the High Weald National Landscape (HWNL, formerly AONB). This designation washes over the built-up area. Built development is therefore not necessarily inconsistent with the "special qualities" of the NL. However, it implies that this is a landscape of intrinsically high sensitivity.

3.14 Not all parts of the NL are as sensitive as others. The village has already been enlarged by areas of 20thC residential development at Bishop's Lane, Willow Bank and beyond the station (on either side of Brightling Road). This development has been insufficient to result in Robertsbridge being excluded from the designated area.

3.15 Grove Farm Phase 1 has already been consented and awaits development. The Capacity Study undertaken by Rother DC for the Market Towns and Villages Landscape Assessment does not rule out the ability of the site to accommodate further development, and assesses the Grove Farm area as being of "Moderate" capacity. The influence of "urban fringe clutter" is cited as a detracting factor.

3.16 The Capacity Study also notes "the scope to redefine the village edge" and to "enclose or remove intrusive farm buildings". By way of mitigation and potential benefits, the Study cites the need to "retain a green corridor between the A21 and the village edge", and to "create new field structure and strengthen character". The visibility of the "higher part of the area" in "distant views" is also noted.

Redefining the Village Edge

3.17 Much of this part of the village edge is weakly defined, including unattractive buildings (e.g. the telephone exchange) or vacant land (the Phase 1 site). The associated curtilages have an ad-hoc character that allows a degree of visual permeability.

3.18 The perimeter of the school is the exception, being strongly defined by tree cover. The site's frontage onto Fair Lane is reasonably well defined by a hedgerow/trees, providing screening in short-range views.

3.19 The settlement edge to the east of Fayre Meadow is strongly defined by woodland. This influence continues southwards along the A21 corridor as associated landscaping has matured, to the extent that a perception of woodland now provides a backcloth to the village and a logical settlement edge.

3.20 As a result, a green corridor between the A21 and the village edge – as noted in the Capacity Study - already exists (except in a publicly accessible form). There is therefore an opportunity to acknowledge this as part of any development, without necessarily compromising the capacity of the site, as shown on the illustrative masterplan attached within **Appendix 1**.

Responding to Visual Sensitivity

3.21 The most visually sensitive parts of the site are considered to be:

- The area south of the telephone exchange, due to its relative elevation and openness in views from George Hill and the west; and
- the area adjacent to the school perimeter, due to its proximity to the Conservation Area boundary and its potential visibility from the wider countryside to the north.

3.22 In accordance with the Councils assessment, the masterplan currently shows these two areas retained as open greenspace. Restricting the majority of the built development to the central part of the would mean that development would be:

- seen beyond and in association with the Phase 1 development;
- screened by Phase 1, the properties to the east of George Hill and their vegetated curtilage; and/or
- seen in front of the wooded A21 corridor as an extension of the settlement up to an existing "edge feature" in the landscape.

3.23 It should be noted, however, that the precise extent of this greenspace will be a matter of detailed design. Subject to further detailed assessment, a logical transition from greenspace to built development may allow some incursions into these areas (such as the southern area which offers potential for a new sensitive introduction to the southern side of Robertsbridge), coupled with a robust landscape feature such as a woodland block linking to the A21 corridor

Greenspace and Vegetation Structure

3.24 The northern and southern edges of this development parcel could be defined by new woodland belts, which over time would reduce its visibility and provide connectivity with the existing vegetation buffer along the A21 corridor which is to be retained. The northern belt would also connect with the tree cover around the school site, and restore what appears to have previously been a hedgerow across the site. In combination with an extension of built development, the southern woodland belt could also help to screen the telephone exchange.

3.25 The two existing hedgerows across the site, together with the perimeter hedgerows and landscaped curtilage of the Phase 1 site, could also be maintained for landscape/biodiversity purposes - although other constraints are acknowledged (e.g. the gas main easement).

3.26 The proposed masterplan contains two significant areas of open green space to the north and south of the site. The green spaces could be planted and managed to provide enhanced biodiversity and recreational use, with pedestrian access provided off George Hill and Fair Lane. An opportunity may exist to provide a pedestrian link between them, alongside the A21 corridor, connecting northwards to the footbridge. There may be an opportunity for considering dual-use of the northern space with the school (e.g. for nature studies).

Vehicular Access

3.27 Technical assessments to date have indicated two feasible means of vehicular access into the site. The first is via the Phase 1 site, as shown in **Appendix 1**. This is considered the most desirable option from a landscape perspective, since it would use the junction on George Hill that will have already been created.

3.28 An alternative is to access the site via a new vehicular access further south on George Hill. It is considered that an access in this location could be sensitively designed, so as to protect the integrity of the potential open space and minimise visual impact.

3.29 The illustrative masterplan proposes an additional pedestrian / cycle access to the north of the site, via Fair Lane. This would provide a convenient connection to the existing dwellings and facilities in the north of the village whilst also providing a direct link to the existing footbridge over the A21.

Flood / Drainage

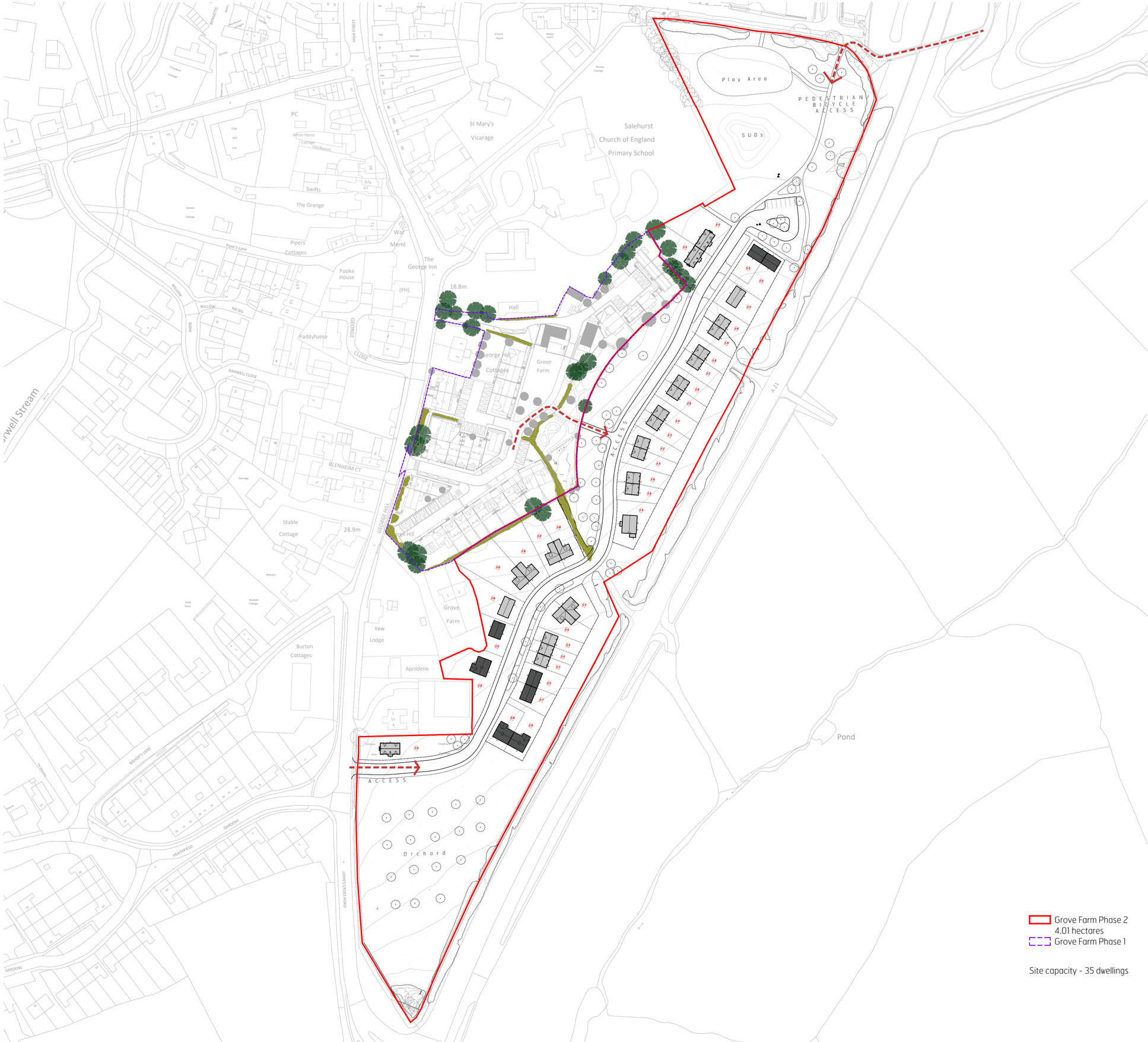
3.30 A Flood Risk and Drainage Statement has been prepared to inform the illustrative masterplan for the site. As detailed in the Statement, attached within **Appendix 3**, flood risk is very low from all sources and no part of the site influenced by the development is expected to be affected by flooding.

3.31 Based on an indicative capacity, a drainage strategy has been put forward for the proposed development that utilises SuDS that offer multiple benefits and can incorporate landscape and amenity benefits into the scheme.

Summary

3.32 In summary, an indicative masterplan has been prepared showing potential for at least 35 dwellings to be accommodated on the central area of the site, respectful of the site's constraints and sensitivities. Through careful design, it is considered that the site holds potential to deliver a higher quantum of development than shown whilst still reinforcing local distinctiveness and character and contributing towards a more visually attractive entrance into Robertsbridge from the south. Safe and suitable access to the site is achievable via two potential access points with potential for an additional pedestrian/cycle access from the north. It has also been demonstrated a workable drainage strategy for the site is achievable and that flood risk is very low from all sources.

APPENDIX 1
INDICATIVE MASTERPLAN



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REV.	AMENDMENT	BY:	DATE
A	Masterplan development	VN	22.07.24
B	Constraints removed	VN	23.07.24
C	Phase 1 identified on the drawing	VN	23.07.24
C	Title block amended	VN	23.07.24

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CLIENT:
The Rector and Scholars of Exeter College

JOB:
Land at Grove Farm, George Hill
Robertsbridge
TN32 5BY

DRAWING TITLE:
Illustrative Phase 2 Masterplan

SCALE:
1:1000 @ A1 / 1:2000 @ A3

DATE:
July 2024

STATUS:
FEASIBILITY

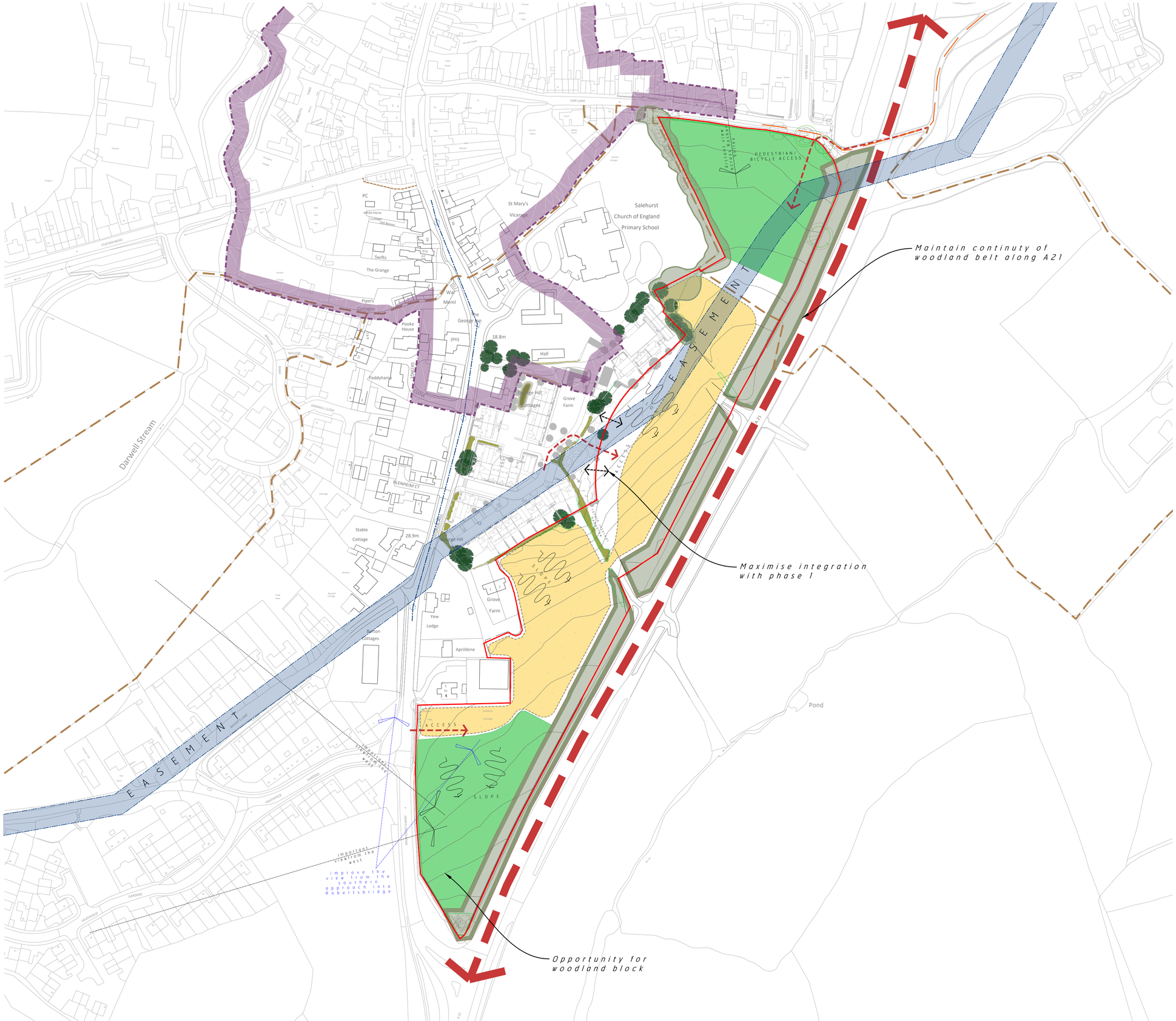
DRAWING NUMBER:	REV:	ISSUED BY:
1282-100	D	VN

G:\1282 - Robertsbridge Phase 2\3. DRAWINGS\3.1 CAD\3.1.2 SHEETS\1282 - 100 - Proposed Masterplan.dwg

APPENDIX 2

OPPORTUNITIES AND CONSTRAINTS PLAN

REV.	AMENDMENT	BY:	DATE
A	amended with client comments	VN	23.07.24
B	amended colours	VN	23.07.24
C	Open space and developable area amended to avoid overlapping	VN	23.07.24



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CLIENT:
The Rector and Scholars of Exeter College

JOB:
Land at Grove Farm, George Hill
Robertsbridge
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DRAWING TITLE:
Opportunities and Constraints site plan with phase 1

SCALE:
1:1250 @ A1 / 1:2500 @ A3

DATE:
July 2024

STATUS:
FEASIBILITY

DRAWING NUMBER:	REV:	ISSUED BY:
1282-002	C	VN

G:\1282 - Robertsbridge Phase 2\3. DRAWINGS\3.1 CAD\3.1.3 SHEETS\1282 - 002 - Constraints plan.dwg

APPENDIX 3
FLOOD RISK AND DRAINAGE STATEMENT

Site: Grove Farm Phase 2
Prepared by: Phil Allen
Approved by: Neil Jaques
Date: 23 July 2024

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1.0 Introduction

1.1 This Flood Risk and Drainage Statement has been prepared on behalf of Exeter College (Oxford) as part of a written representation submission so that the 4.013 ha Phase 2 site at Grove Farm can be considered in the emerging Rother District Council (RDC) Local Plan.

1.2 It is understood that RDC have identified the site as a potential Local Plan site, with the expectation that the site can deliver circa 35 units. It is upon this quantum of housing that this Flood Risk and Drainage Statement has based its assessment of surface water attenuation requirements.

1.3 Following Motion providing technical support for the Phase 1 Grove Farm site, the site's geo-environmental characteristics have been revisited to understand what local flood risk constraints exist, if any, and what options exist for surface water discharge.

1.4 With this in mind, this study has taken the proposed development masterplan for the Phase 2 Grove Farm site and assessed it for surface water discharge. Options for surface water attenuation and discharge have been investigated based on the existing available infrastructure and the opportunities and constraints that are present.

1.5 This Flood Risk and Drainage Statement follows the guidance set out in:

- The 2021 National Planning Policy Framework (NPPF)
- Technical Guidance to the National Planning Policy Framework
- CIRIA SuDS Manual 2015 (C753)
- Environment Agency Rainfall Runoff Management for Developments.
- Non-Statutory Technical Standards for SuDS (NSTS)

2.0 The Proposed Development

2.1 As discussed above, the proposed development seeks to provide circa. 35 dwellings and the illustrative masterplan for the development can be seen in Appendix A of thus report.

2.2 It can be seen that the proposed site layout looks to deliver the proposed quantum of housing in the central part of the site, with the northern part of the site being reserved for a LEAP (Local Equipped Area of Play) and a SuDS basin. The southern part of the site is predominantly reserved for landscaping.

3.0 Site Description

3.1 The Phase 2 Grove Farm site is located on the southeast side of the East Sussex village of Robertsbridge, east of George Hill and immediately west of the A21, which bounds the entire eastern side of the site. The site is currently greenfield; ground cover is predominantly grassland used for grazing and the three fields that make up the site are separated by hedgerows.

3.2 The total site area defined by the redline boundary is 4.013 ha, although the developable area is much smaller.

3.3 The Salehurst C of E Primary School bounds the north-western site boundary of the site and the northern extent of the site borders onto Fair Lane, which is a residential street that leads to the High Street and the centre of Robertsbridge.

3.4 The central-western boundary of the site bounds on the Phase 1 site, beyond which is George Hill.

3.5 There are no ditches or watercourses on the site or on the site boundaries.

4.0 Topography

4.1 Contours and spot heights can be seen in the illustrative development masterplan in Appendix A and it is those levels to which the below discussion refers.

4.2 The site generally slopes from the southeast to the northwest. The highest site levels of approximately 41.90 metres Above Ordnance Datum (mAOD) are in the southern corner of the site's red line boundary. The lowest site levels are on the northern boundary with Fair Lane, where levels are approximately 25.00 mAOD.

4.3 There is also a noticeable crossfall across the site from west to east and ground levels fall steeply towards George Hill in the western-most parts of the site, with the eastern side of the site having more moderate, steadier crossfalls.

5.0 Geology

5.1 The British Geological Survey (BGS) online 1:50,000 Geoindex Mapping identifies that the underlying solid geology is made up of the Ashdown Formation (an interbedded Sandstone and Siltstone).

5.2 The BGS online Geoindex mapping does not list the superficial deposits in the area. Defra's Magic Map online application provides information on the soilscape in England and lists the local soils as 'slightly acid loamy and clayey soils with impeded drainage'.

5.3 The nearest borehole record to the site (TQ72SW16) lies to the west of George Hill opposite the southern part of the site. This shows that under a shallow topsoil layer (0.30m) is stiff brown sandy CLAY from 0.30m below ground level (BGL) to 1.10mBGL, then very stiff grey brown CLAY from 1.10mBGL to 2.00mBGL, then soft fine-grained silty SANDSTONE from 2.00mBGL to the base of the borehole at 7.00mBGL. The full BGS borehole record can be seen in Appendix B.

6.0 Hydrogeology

6.1 Groundwater SPZ's are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.

6.2 SPZ's show the risk of contamination to groundwater from any activities that might cause pollution in the area. The closer the activity to the source of abstraction, the greater the risk. The maps show three main zones; inner - Zone 1; outer - Zone 2 and; total catchment - Zone 3.

6.3 Defra's Magic Map online application shows that the site is not within a SPZ.

6.4 The aquifer maps on Defra's Magic Map online application have revealed that the site is underlain by a 'Secondary A' Aquifer.

7.0 Ground Conditions and Infiltration Potential

7.1 BRE365 soakage tests were carried out by LEAP Environmental in 2016 on the Phase 1 Grove Farm site and their test report can be seen in Appendix C. This study showed that infiltration would not be viable on site due to only a 40mm drop in water levels over a four-hour period, thus soakage figures could not be ascertained for the site.

7.2 Groundwater levels were also found to be relatively high.

7.3 As such, this review of drainage options for the Phase 2 Grove Farm site has precluded infiltration as an option for surface water discharge.

8.0 Existing Drainage Regime

8.1 The Phase 2 Grove Farm site is currently greenfield and has no formal drainage associated with the site.

8.2 During a site visit and inspection, no drainage ditches within or on the field boundaries were apparent and, as noted above, there are no watercourses or other open water bodies present nearby.

8.3 The existing public sewers around the site were investigated. Asset Location Plans were obtained from Southern Water, and these can be viewed in Appendix D.

8.4 Southern Water's Asset Location Plans show that there is a paucity of surface water sewers in Robertsbridge and there are only public foul sewers in the area. This includes George Hill to the west of the site and Fair Lane to the north, which has a 150mm diameter VC foul sewer that commences at node 9602 with an invert level of 23.26 mAOD. Node 9602 is adjacent to the northern boundary of the proposed development's red line boundary.

8.5 While the sewers listed above are noted as public gravity foul sewers, noting that there are no surface water sewers in Robertsbridge it is suspected that there may also be some surface water connection to this network.

9.0 Flood Risk

9.1 Flooding can arise from a variety or combination of sources. These may be natural or artificial and may be affected by climate change. These are discussed, below.

Flooding from Rivers and the Sea

9.2 A review of the Environment Agency's Flood Map for Planning (Appendix E) shows that the entire site is located within Flood Zone 1 (less than 1 in 1,000 annual probability of flooding from rivers or the sea).

Flood Risk Vulnerability and Appropriateness of Residential Development

9.3 The NPPF classifies residential development as being 'more vulnerable'. Table 3 of the Technical Guidance to the NPPF (next page) states that 'more vulnerable' development is appropriate in Flood Zone 1. Therefore, the proposed residential development is appropriate in this location in flood risk terms.

Table 3 of the NPPF - Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

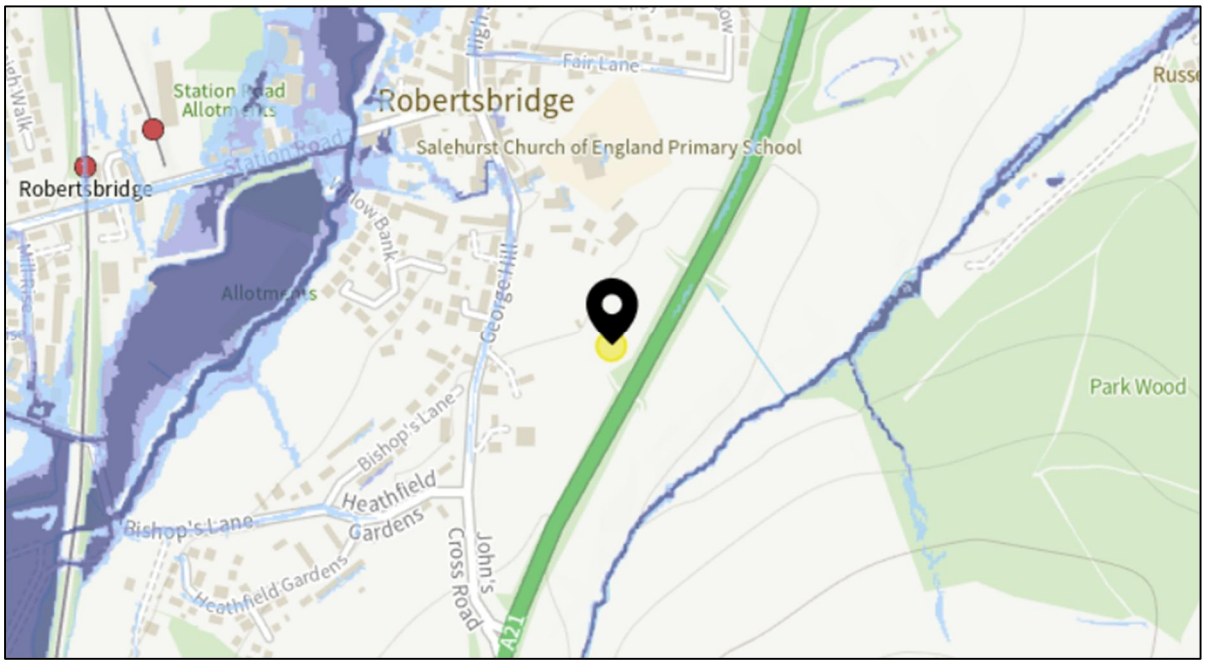
✓ Development is appropriate

✗ Development should not be permitted.

Surface Water Flood Risk

9.4 The EA's Risk of Flooding from Surface Water (RoFSW) Map can be seen in Figure 9.1, below. The RoFSW map shows that the site is at 'very low' risk of surface water flooding (outside of the modelled 1 in 1,000-year rainfall event).

Figure 9.1: Environment Agency RoFSW Map for Robertsbridge Area



9.5 Therefore, the site is at very low risk of flooding from surface water.

Groundwater Flooding

9.6 The risk of groundwater flooding is dependent on local geological and hydrogeological conditions at any given time. Groundwater levels rise during wet winter months and fall again in the summer when rainfall is low and extractions are higher. In very wet winters, rising groundwater levels can reactivate flow in ephemeral streams and springs that only flow for part of the year or even lead to the flooding of normally dry land.

9.7 Although groundwater levels are thought to be fairly shallow in the area, because the site is underlain by clay soils, which are hydraulically unproductive, the proposed development is not considered to be at risk of groundwater flooding.

Flooding from Infrastructure Failure

9.8 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse, siltation, blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

9.9 Typically, sewer systems are constructed to accommodate rainstorms with a 30-year return period or less, depending on their age. Consequently, rainstorm events greater than 1 in 30-years would be expected to result in a surcharge of some parts of the sewer system. In fact, due to most gullies being poorly maintained and often partially blocked with silt, leaves and other debris, their capacity is often estimated to be closer to the 1 in 10-year storm.

9.10 As the site is undeveloped, there is no drainage infrastructure currently in place, thus there is no current flood risk from infrastructure failure or any infrastructure that may be of concern to the proposed development site.

9.11 Looking forward, drainage for any development coming forward on this site must be designed in accordance with Sewers for Adoption, The Design and Construction Guidance (DCG), Building Regulations Approved Document Part H and BS EN 752. This will minimise the future risk of flooding due infrastructure failure.

9.12 SuDS used in the drainage for the site should also comply with the requirements of the SuDS Manual, the NPPF, and any local standards that apply. This includes a robust management and maintenance regime that ensures any SuDS, attenuation features, and flow controls continue to work at their optimum design capacity.

Flooding from Artificial sources

9.13 The EA provides a map showing the maximum potential flood extent, in the event that all reservoirs with a capacity of greater than 25,000 cubic metres were to fail and release the water they hold. The map shows that the site would not experience flooding in this scenario. There are no other significant artificial waterbodies in proximity of the site (such as canals). It is, therefore, concluded that the site is not at risk of flooding from artificial sources.

Future Flood Risk & Climate Change

9.14 The 2021 NPPF and the supporting Technical Guidance document sets out how flood risk should be considered over the lifetime of a development. This requires an increase in flood risk due to climate change to be taken into account. Both peak river flows and rainfall intensity should be assessed.

Peak River Flows

9.15 Because the site is not close to any watercourses or near to any flood zones, increases in future peak river flows do not need to be considered.

2022 NPPF Climate Change Predictions

9.16 Grove Farm lies within the Rother Management Catchment. The peak rainfall climate change allowances for this management ctahcment are as follows in Table 9.1:

Table 9.1: Climate Change Predictions for the Rother Management Catchment

1 in 30-year Rainfall Event	Central Allowance	Upper End Allowance
2050's epoch	20%	40%
2070's epoch	20%	40%
1 in 100-year Rainfall Event	**Central Allowance**	**Upper End Allowance**
2050's epoch	20%	45%
2070's epoch	25%	45%

9.17 For residential development, which could have a lifespan of up to 100 years, the 2070's epoch should be used and the NPPF advises that for developments with a lifetime beyond 2100, flood risk assessments should assess the upper end allowances for both the 1% and 3.3% annual exceedance probability events.

9.18 Therefore, for the Phase 2 Grove Farm site, the climate change increase predictions that should be applied to discussions of surface water flood risk, including the hydraulic modelling and the drainage strategy for the site, are 40% for the 1 in 30-year rainfall event and 45% for the 1 in 100-year rainfall event.

9.19 With the climate change increase predictions outlined above, it is unlikely that surface water flood risk will increase on the site to the extent that the development would become inappropriate due to limited capacity in the proposed drainage strategy. The site has no areas of surface water flood risk that originate on site. The intervention of the proposed surface water drainage strategy, which will be designed to attenuate and sustainably discharge surface water from the 1 in 100-year + 45% rainfall event, means that this area of surface water flood risk will be attenuated and will not pose a risk of inundation to the proposed development (or neighbouring areas).

10.0 Drainage Statement

Sustainable Drainage Overview

10.1 Current planning policy and EA guidance requires developments to employ SuDS wherever feasible. Careful design of SuDS features can ensure that a development's surface water drainage closely reflects the natural hydrology of the pre-developed site.

10.2 SuDS will attenuate and treat surface water run-off quantities at the source (source control) in line with current guidance and best practice.

10.3 The key benefits of SuDS are as follows:

- Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g., roads);
- Improving amenity through the provision of open green space;
- Improving biodiversity through increased areas for wildlife habitat; and
- Enabling a natural drainage regime that recharges groundwater (where possible).

10.4 SuDS provide a flexible approach to drainage, with a wide range of components from rainwater gardens and filter strips to large-scale basins or ponds. The individual techniques should be used where possible in a management train that mimics the natural pre-developed pattern of drainage.

Greenfield Runoff Rate

10.5 The greenfield runoff rate for the site has been calculated following the IH124 method as outlined in the document 'Rainfall run-off management for urban developments' (Defra/Environment Agency, SC030219, 2013).

10.6 The IH124 method, which is made available through HR Wallingford's UKSuDS online calculator, uses the developable area of a site (excluding any large parkland areas being allocated as public open space that will remain unmodified) to calculate the greenfield runoff. This accounts for all the pervious and impervious areas that may contribute to the surface water runoff from a development.

10.7 Therefore, the greenfield runoff rates have been calculated using HR Wallingford's UKSuDS online calculator and these are presented in Table 10.2, below. The greenfield runoff rates have been calculated from the current impermeable areas associated with the circa 35-unit development masterplan, which total 6,680m^2.

10.8 The full greenfield runoff calculations can be seen in Appendix F.

Table 10.2: Greenfield Runoff Rate/Volume – Total Developable Area

Return Period	1 in 1	1 in 30	1 in 100	QBAR
Discharge Rate (l/s)	3.32	8.99	12.47	3.91

10.9 The calculated QBAR greenfield runoff rate of 3.91 l/s provides a runoff rate equal to 5.85 l/s/ha.

10.10 This figure will guide the acceptable runoff rate from the positively drained areas of the proposed development's layout.

The Drainage Hierarchy

10.11 To deliver SuDS benefits and ensure that a development reduces overall flood risk, there is an established hierarchy of surface water drainage methods that should be considered. The most preferable and sustainable are at the top and the least preferable and least sustainable at the bottom.

10.12 The drainage hierarchy is a sequential check that intends to ensure that all practical and reasonable measures are taken to manage surface water as high up the hierarchy (with '1' being the highest) as possible, and that the amount of surface water managed at the bottom of the hierarchy is minimised. The PPG to the NPPF states that "*Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable*".

10.13 The drainage hierarchy presented in the NPPF and Building Regulations Part H presents only four tiers of drainage options. This has been expanded on and adopted by others and now can be viewed as the following:

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release
5. Discharge rainwater direct to a watercourse

6. Discharge rainwater to a surface water sewer/drain

7. Discharge rainwater to the combined sewer

8. Discharge rainwater to the foul sewer

10.14 The first two tiers of the drainage hierarchy ensure that surface water is retained within the site boundary and does not increase flood risk to others. This is always the most preferable method of surface water management.

10.15 The next six tiers of the hierarchy provide regional control, but with decreasing levels of pollution removal and reduced potential for amenity and habitat creation.

10.16 Within the lower six tiers of the drainage hierarchy, there must be some form of flow restriction, so that off-site surface water discharge is reduced, as much as is reasonably practicable. This requires on-site storage facilities, which may include ponds, swales, subsurface storage tanks and System C (non-infiltration) permeable paviours with flow control devices. Again, methods that provide the most potential for amenity and pollution removal should be favoured.

10.17 The drainage strategy for the proposed development on the Grove Phase 2 site will use the highest available tiers of the drainage hierarchy, noting the infrastructure opportunities and constraints that have been highlighted in the earlier parts of this report.

Drainage Strategy Overview

10.18 It is proposed that a development on this site should use rainwater butts on all properties, for interception and rainwater harvesting that residents can use for non-potable uses around the home and garden. This achieves the first tier of the drainage hierarchy.

10.19 The topography of the site and the limited breadth of the developable part of the site restricts the use of a number of 'online' and source-control SuDS. Consequently, the circa 35-unit proposed development layout has been allocated a SuDS approach that uses impermeable surfaces and traditional piped drainage in the most constrained part of the site, which drains to the SuDS basin that is shown in the northern part of the illustrative development masterplan in Appendix A.

10.20 Hydraulic modelling of the illustrative masterplan layout and circa. 35-unit scheme has been carried out in MicroDrainage's Network hydraulic modelling module, which has enabled a full assessment of the attenuation requirements and practicable discharge rates that can be achieved.

10.21 Based on the 0.668 ha of impermeable areas that must be positively drained, the requisite size of the SuDS basin was assessed, with a key factor being the proposed discharge rate for surface water from the site.

10.22 As noted in this technical note, BRE365 soakage testing carried out on the Grove Farm site in 2016 showed that infiltration would not be viable. Therefore, a development in this location requires a positive outfall as infiltration is not viable.

10.23 It has been discussed that there are no drainage ditches, watercourses or open water bodies on this site or available on the site boundaries. The Southern Water Asset Location Plans in Appendix D also failed to indicate any public surface water sewers, not only in the vicinity of the site, but largely within the whole of Robertsbridge.

10.24 The lack of infiltration and surface water outfalls (natural or man-made) mean that the 2nd, 5th and 6th tiers of the drainage hierarchy are not available to the development.

10.25 As such, the only viable option for surface water discharge at this time would be to propose a connection to the public foul sewer in Fair Lane, which the site can drain to by gravity following the proposed SuDS basin.

10.26 It is with this in mind that the proposed development's surface water discharge rate has been set. Even though Table 10.2, above, showed the proposed 35-unit development's QBAR greenfield to be 3.91 l/s, Motion have

considered a discharge rate based upon this to be too high to make connecting and discharging to the public foul sewer a viable option. As such, it is proposed to reduce surface water runoff rates even further to 2 l/s, which is only 50% of the greenfield runoff rate.

10.27 While representing a significant betterment over the greenfield runoff rate for the development's impermeable areas, a runoff rate of 2 l/s makes a connection to the public foul sewer viable and without potential capacity issues.

10.28 Using a surface water discharge rate of just 2 l/s, the proposed development's drainage was designed to consider the latest climate change requirements (detailed above) and LLFA requirements with regards to runoff coefficients (CV of 1.0) and this allowed the proposed SuDS basin to be appropriately sized.

10.29 It is currently proposed to provide a SuDS basin that offers 860m^3 of surface water attenuation. It will be 1.703m deep, 727m^2 in area and will have 1-in-4 side slopes. The SuDS basin can be designed to have a permanently wetted base and be populated with plants of local provenance to provide a feature that offers amenity and biodiversity benefits. Along with the water quantity and quality benefits the SuDS basin will provide, the amenity and biodiversity advantages mean that the suggested drainage strategy can deliver all four SuDS pillars.

10.30 Outflow from the SuDS basin will be controlled with a Hydrobrake and the subsequent connection to the Southern Water foul sewer in Fair Lane can be explored at the appropriate development juncture.

10.31 This summarises the proposed approach to drainage strategy on the Phase 2 Grove Farm site. The drainage proposals employ the 1st, 3rd and 8th tiers of the drainage hierarchy, which are the highest available to the site and the proposed development, thus represent the most sustainable approach to surface water drainage and SuDS.

MicroDrainage Hydraulic Modelling

10.32 The drainage strategy outlined above has been designed in MicroDrainage's Network hydraulic modelling module. The developable area of 0.668 ha and the SuDS basin area of 0.074 ha have been taken into account as contributing to the development's surface water inputs.

10.33 Impermeable areas such as roofs, roads, driveways and footpaths have been modelled using a percentage of impervious area factor (PIMP) of 100%. A runoff coefficient (CV) value of 1.0 has been applied to all summer and winter storms.

10.34 The results of the MicroDrainage hydraulic modelling for the proposed development can be seen in Appendix G.

10.35 The results of the hydraulic modelling show that the drainage strategy as outlined above can attenuate and discharge all surface water generated in the 1 in 100-year + 45% rainfall event, with a maximum discharge rate 2.0 l/s, which is just 50% of the QBAR greenfield runoff rate for the site. This will actually provide protection to the local area in terms of surface water flood risk

10.36 As the site is brought forward, further modelling should take place to account for urban creep and exceedance flows.

11.0 Foul Water Drainage

11.1 The peak foul flow rate from the proposed development has been calculated based on Southern Water's foul sewerage modelling criteria. In summary, the calculation is based on the foul flow element, plus an allowance for misconnected surface water. While this is unlikely, it provides a precautionary approach.

11.2 Based on Southern Water's foul sewerage modelling criteria, the calculated design foul flows from the proposed development are 0.26 l/s.

11.3 The ability to make this connection, along with the capacity of the existing 150m diameter foul sewer in Fair Lane, and any required network reinforcement will be explored with Southern Water at the appropriate project juncture. It has already been noted from the surface water strategy discussion (and shown in the asset location plans in Appendix D) that the site can connect to the public foul sewer in Fair Lane by gravity and it is this foul connection point that should be pursued as the development is brought forward.

12.0 Surface Water Runoff Quality

12.1 The NPPF states that development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.

12.2 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. With regards to the proposed development, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments, which would be achieved using catchpits and silt traps throughout the drainage network.

12.3 With regards to the property driveways and the access road, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from residential car parking and low traffic roads as 'low'. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1.

12.4 Table 26.2 of the CIRIA SuDS Manual provides pollution hazard indices for different land use classifications. The land use classification that requires consideration for the low traffic roads and parking areas on the site is in Table 12.1 below.

Table 12.1: Excerpt from Table 26.2 of CIRIA SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, homezones and general access roads) with less than 300 traffic movements per day.	Low	0.5	0.4	0.4

12.5 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

12.6 Table 26.3 of the CIRIA SuDS Manual provides indicative SuDS mitigation indices for each SuDS type. Table 12.2, below, which is an excerpt from Table 26.3, shows the mitigation index for a SuDS basin.

Table 12.2: Pollution Mitigation Indices for a SuDS Basin

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basins	0.5	0.5	0.6

12.7 The mitigation indices for a SuDS basin exceed those of the highest pollution hazard index figures from Table 12.1 for all contaminant types. This demonstrates that the SuDS Basin can provide sufficient pollution mitigation for the proposed development's expected pollutant loads and that the site's surface water runoff can be mitigated to the required quality.

13.0 Summary and Conclusion

13.1 This Flood Risk and Drainage Statement has been prepared on behalf of Exeter College (Oxford) as part of a written representation submission so that the Phase 2 site at Grove Farm can be considered in the emerging RDC Local Plan.

13.2 Flood risk is very low from all sources and no part of the site influenced by the development is expected to be affected by flooding. This is supported by the information in the EA's Flood Map for Planning and their RoFSW maps.

13.3 The emerging development plans have been assessed to understand how surface water can be managed using the highest available tiers of the drainage hierarchy so that flood risk does not increase in the local area and, if possible, can be reduced over the existing situation.

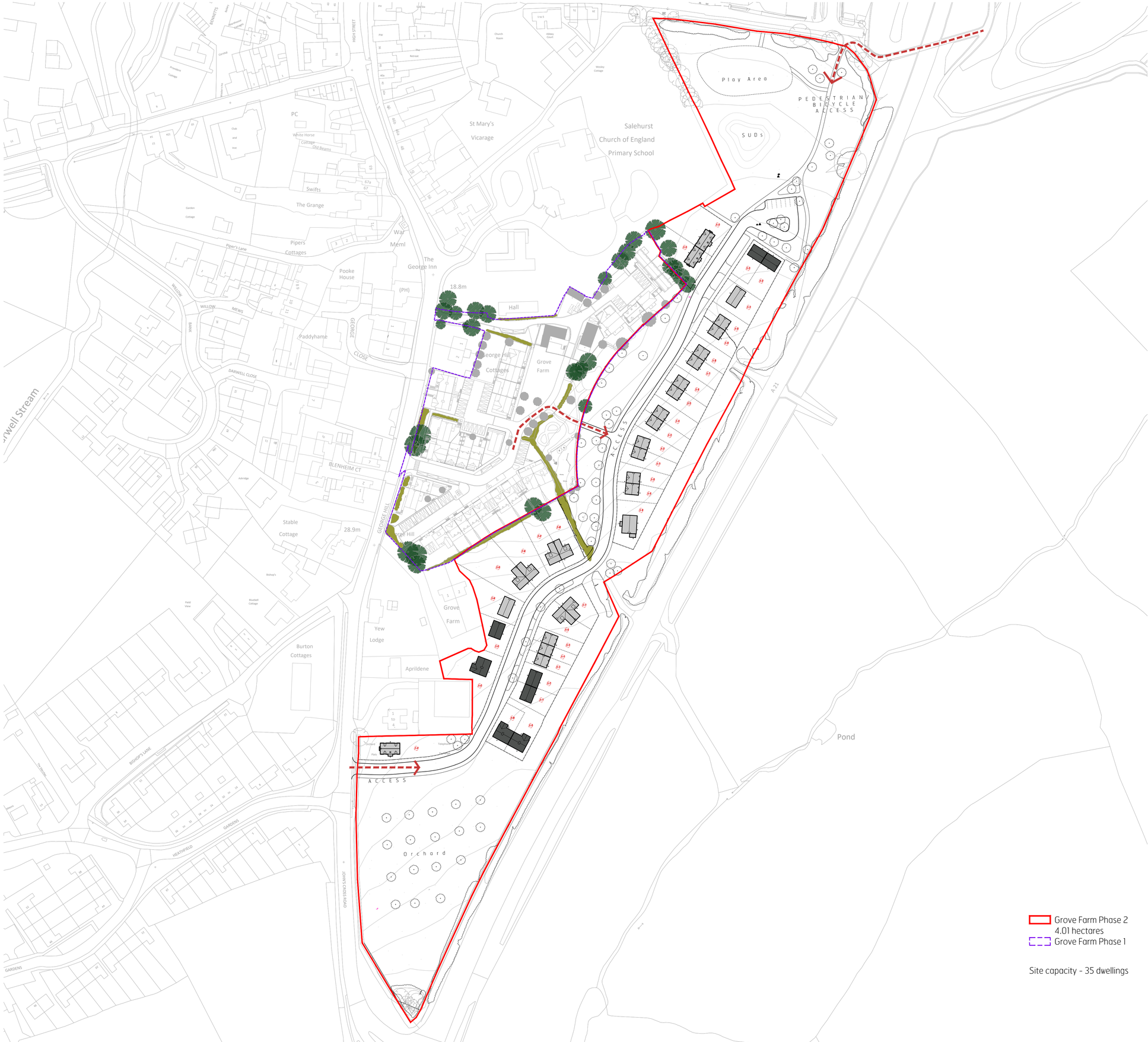
13.4 With that in mind, the illustrative masterplan has provided space for a SuDS basin that can attenuate a 1 in 100-year + 45% rainfall event, without flooding, while discharging at only 50% of the site's greenfield runoff rate.

13.5 This approach has been taken so that the proposed surface water connection to the public foul sewer in Fair Lane, which is the highest available tier of the drainage hierarchy, is possible at a rate of just 2 l/s. With the proposed design foul flows from the development of 0.26 l/s, it is proposed that the overall discharge rate from the site to the public foul sewer in Fair Lane will not represent an untenable additional flow rate. The ability to make this connection, along with the capacity of the existing foul sewer and any required network reinforcement will be explored with Southern Water at the appropriate project juncture.

13.6 Therefore, in accordance with the specific requirements of the NPPF and its PPG in relation to SuDS, a drainage strategy has been put forward for the proposed development that utilises SuDS that offer multiple benefits and can incorporate landscape and amenity benefits into the scheme. The SuDS scheme can be developed further as the development is brought forward to offer further benefits. The ability to provide a SuDS-led drainage strategy that can discharge by gravity, in conjunction with the site's very low flood risk, means that the proposed development can be positively considered for inclusion in the RDC's emerging Local Plan.

Appendix A

Illustrative Development Masterplan



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REV.	AMENDMENT	BY:	DATE
A	Masterplan development	VN	22.07.24
B	Constraints removed	VN	23.07.24
C	Phase 1 identified on the drawing	VN	23.07.24
C	Title block amended	VN	23.07.24

Brooks Murray Architects
41 Tabernacle Street, London, EC2A 4AA
+44 (0)2077399955 admin@brooksmurray.com

brooks murray

CLIENT:
The Rector and Scholars of Exeter College

JOB:
Land at Grove Farm, George Hill
Robertsbridge
TN32 5BY

DRAWING TITLE:
Illustrative Phase 2 Masterplan

SCALE:
1:1000 @ A1 / 1:2000 @ A3

DATE:
July 2024

STATUS:
FEASIBILITY

DRAWING NUMBER:	REV:	ISSUED BY:
1282-100	D	VN

G:\1282 - Robertsbridge Phase 2\3. DRAWINGS\3.1 CAD\3.1.2 SHEETS\1282 - 100 - Proposed Masterplan.dwg

Appendix B

BGS Borehole Log TQ72SW16

PAGE: 3

DATE: 04.09.89

LOCATION

ROBERTSBRIDGE - SURREY

BOREHOLE 2

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
Sandy TOPSOIL		0.00				0.30		
Stiff brown sandy CLAY		0.30				0.80		
				U100	1.00			--976 /2 / 1.0U
Very stiff grey brown CLAY		1.10						
				D	1.50	0.90		--976 /2 / 1.5D
				SPT	2.00		75	- Blows for 375mm
Soft fine grained silty SANDSTONE.....		2.00		D	2.00			--976 /2 / 2.0D
				SPT	3.50		78	- Blows for 375mm
				D	3.50			--976 /2 / 3.5D
						5.00		
				SPT	5.00		60	- Blows for 300mm
				D	5.00			--976 /2 / 5.0D
				SPT	6.50		57	- Blows for 300mm
		7.00						Borehole remained dry

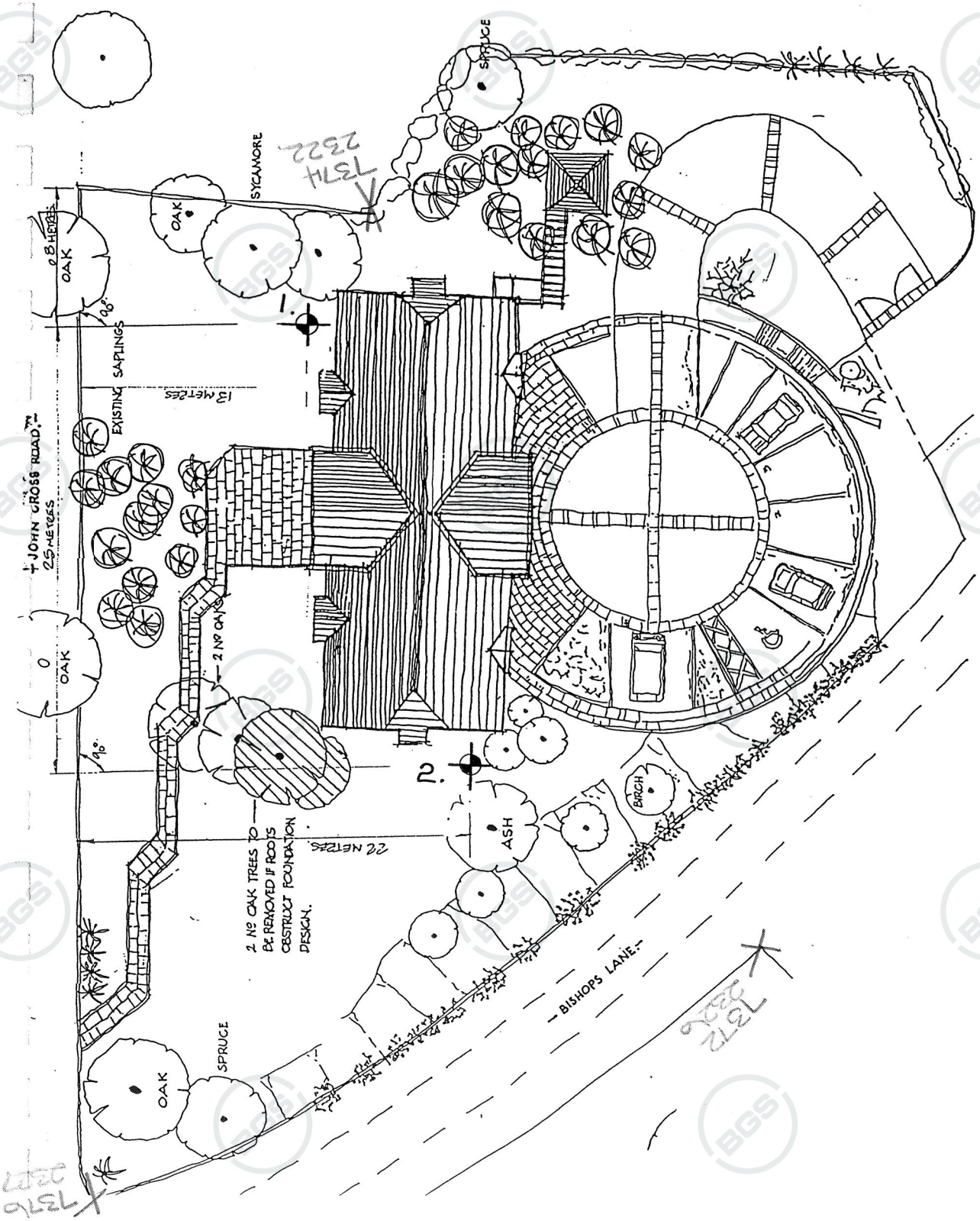
TERRAMECH INVESTIGATIONS LIMITED
183 LONG LANE TILEHURST READING

REMARKS:

U100=100mm dia. UNDISTURBED SAMPLE U38=38mm dia. UNDISTURBED SAMPLE D=SMALL DISTURBED SAMPLE
B=BULK SAMPLE W=WATER SAMPLE SPT=STANDARD PENETRATION TEST CPT=CONE PENETRATION TEST

PAGE: 1	LOCATION	BOREHOLE LAYOUT
DATE: 04.09.89	ROBERTSBRIDGE - SURREY	

BOREHOLE LAYOUT



Appendix C

LEAP Environmental BRE365 Soakage Test

Morwenna McKay

[redacted]

8th September 2016

Our ref. TH/16/LP1231

Dear Morwenna,

Re: Grove Farm, George Hill, Robertsbridge, East Sussex
Trial Pit Soakage Testing

1. Introduction

Leap Environmental Ltd (hereafter referred to as LEAP) has been appointed by Croudace Homes Ltd to undertake trial pit soakage testing at the site referred to as Grove Farm, George Hill, Robertsbridge. In addition, it was requested that the existing ditches on site were inspected and photographed. The instruction to carry out the works was received from Morwenna McKay in an email dated 11th August 2016.

2. Site Details

The site comprises an irregular shaped plot of land located to the east of George Hill, Robertsbridge, centred on the approximate National Grid reference TQ 7385 2339. The site is bounded by residential properties to the north, south and west, and by open fields to the east. A primary school is also located to the north of the site.

The ground surface across the site generally sloped gently to moderately towards the north west. Various farm buildings were present over the northern part of the site, together with outbuildings present on the eastern boundary. The remainder of the site was given over to undeveloped fields with hedgerow boundaries.

Leap Environmental Ltd
Kent Regional Office
Spelmonden Old Oast, Spelmonden Farm, Goudhurst, Kent, TN17 1HE
tel/fax +44 (0) 1580 211605
www.leapenvironmental.com
Head Office The Atrium, Curtis Road, Dorking, Surrey, RH4 1XA

The geology of the site has been ascertained by reference to British Geological Survey data. The site is mapped as being underlain by the Ashdown Formation which comprises interbedded fine sandstone and siltstone, together with subordinate horizons of shale.

The Hydrogeology of the site has been ascertained from Environment Agency Groundwater Vulnerability mapping. The underlying Lambeth Group deposits are classified as a Secondary A aquifer. The site does not lie within a Source Protection Zone with respect to potable groundwater.

3. Fieldwork

The fieldwork was carried out on 26th August 2016.

The intrusive works comprised the excavation of four trial pits (designated SA1 to SA4) by means of a mechanical excavator to depths of between 1.5m and 3m below ground level. Falling head soakage testing was carried out within each of the pits in general accordance with BRE 365, although refilling was not possible within the timeframe available. The trial pits were set out by LEAP at locations indicated by the client.

It is noted that trial pit SA1 was located to an alternate positions due to the presence of suspect asbestos tile within the near surface soils at the original location.

Each of the trial pits were excavated through a surface cover of topsoil some 150mm to 400mm in thickness. Beneath the topsoil, each of the pits passed down into silty clay and clayey silt with occasional thin beds of siltstone and ironstone to depths of between 1.5m and in excess of 3m below ground level. Underlying the clay and silt deposits, where penetrated, the trial pits encountered mudstone and siltstone to the full depth of investigation. It is noted that due to the strength of these deposits, trial pits SA2 and SA3 were terminated at depths of 1.5m and 2.8m, respectively. The undisturbed soils are considered to be representative of the Ashdown Formation deposits predicated on the published geology map.

Each of the trial pits remained dry during excavation. A groundwater level of 3.56m was recorded within a well located adjacent to the western site boundary.

All of the pits remained stable during excavation.

4. Soakage

A single soakage test was undertaken within each of the trial pits in general accordance with BRE365[1] within the underlying Ashdown Formation deposits. A summary of the test results are appended to this report.

With a maximum of 40mm drop in water level over a period of 4 hours, no significant soakage was recorded within any of the trial pits.

It is therefore considered that the underlying deposits will not be suitable for discharge of surface water to traditional soakaways. There is the possibility that deep borehole soakaways could be feasible at the site. However, this will be dependant on the nature and spacing of any fissures within the underlying Ashdown Formation. In addition, a groundwater level of 3.56m was recorded on the western boundary of the site which could limit potential soakage and need to be agreed with the Environment Agency.

Alternatively, consideration could be given to the use of peak flow storage tanks connected via attenuated drainage pipes to mains surface water drainage or open water courses, if available.

In the event that soakaways are adopted, designers should refer to the Environment Agency Pollution Prevention Guidance Notes (PPG) which sets out the legal requirements and good practice for minimising risk of pollution to groundwater. In addition, the local authority and water company will need to be consulted.

[1] Building Research Establishment Digest 365: 2007. Soakaway Design

5. Ditch Inspection

An inspection of the drainage ditches was also carried out at the same time as the intrusive works. A plan of the ditches, together with flow direction and ground slopes, is included as Figure 2, and photographs of the site are included as Figures 3 and 4.

Where present, the ditches were found to be relatively narrow (up to 1m) and shallow (generally between 0.5m and 0.7m deep). No water was noted within any of the ditches with only damp soils being found in small sections in the south eastern extent of the site; these were generally associated with shaded areas with cover from dense overhanging vegetation (hedges, agricultural shed and low trees). In general, the ditches, where present, were undefined, located beneath or immediately adjacent to boundary hedges and were partially overgrown. It is noted that the inspection was preceded by a period of hot dry weather. The ditches appeared to be culverted across field access, although overgrowth limited visibility of the majority of these areas.

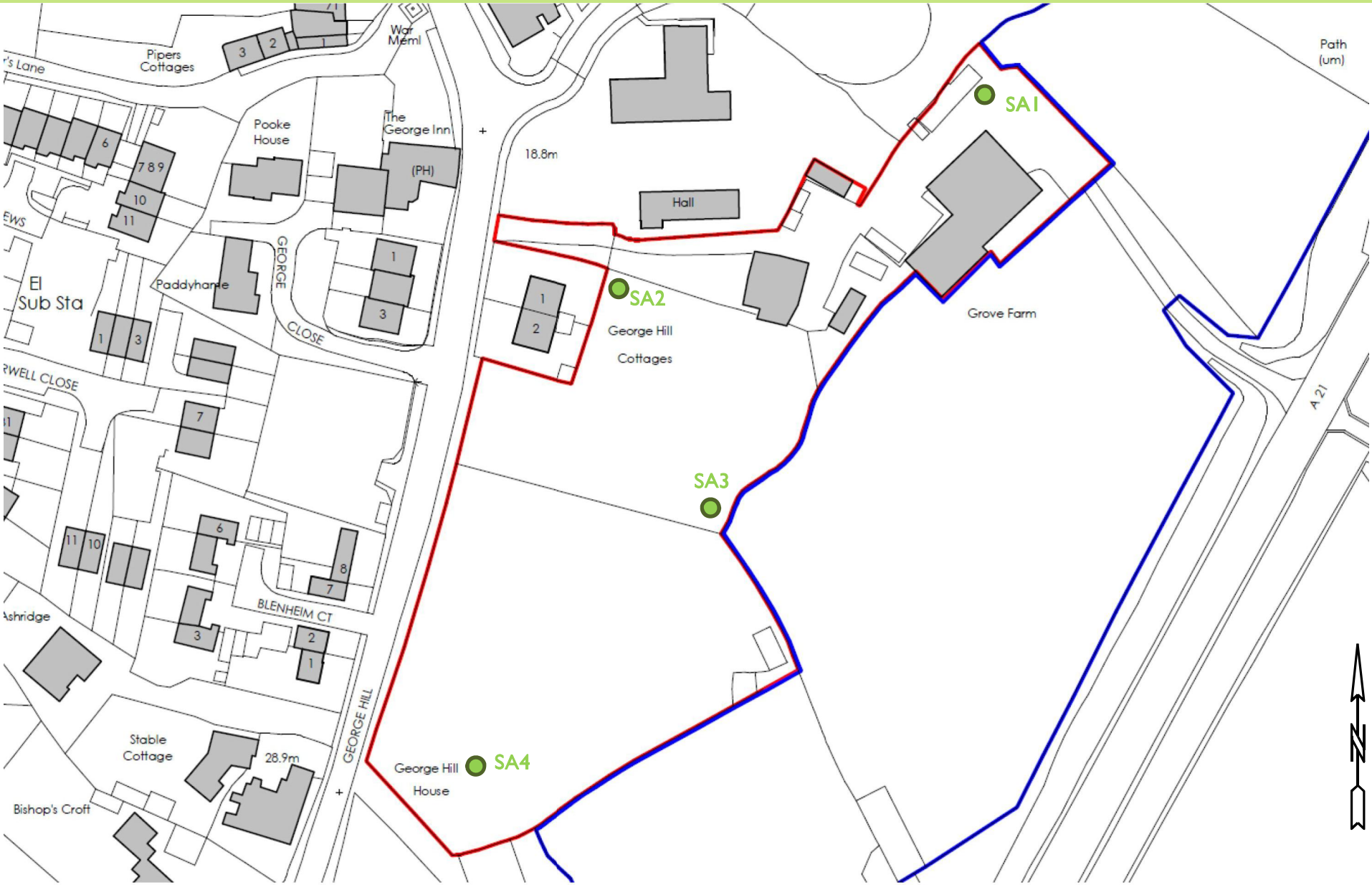
In general, surface water flow is anticipated to lead down the access track towards George Hill. Although not observed due to the absence of surface water run-off, flows are likely to enter a gully drain at the end of the track adjacent to the footpath adjoining George Hill. Surface water flows from the east-west ditch between the two fields are likely to discharge informally onto George Hill.

A dry pond was recorded beyond the south eastern site boundary. A shallow indeterminate ditch issued from the pond onto the site and is considered to be an overflow channel.

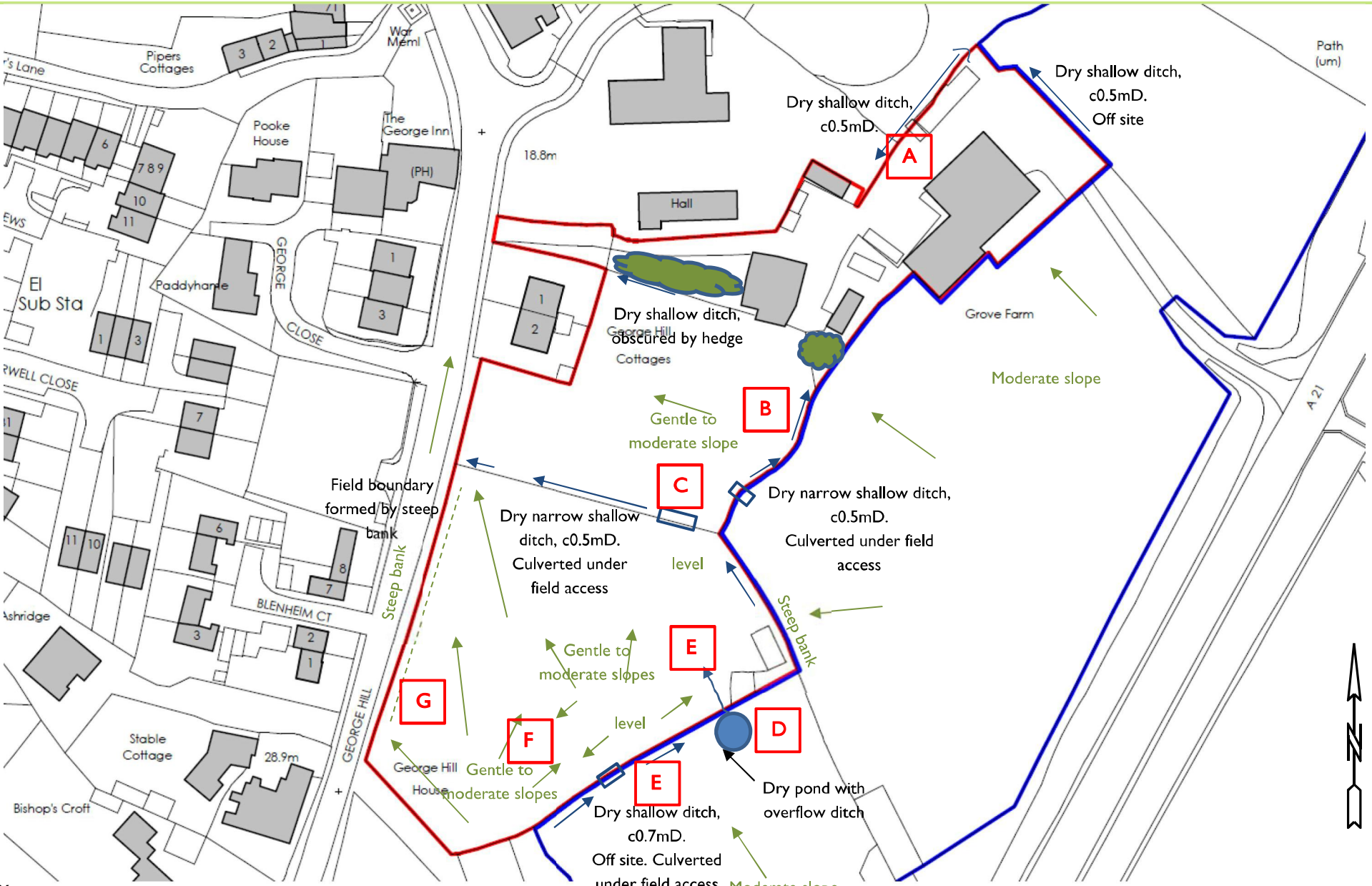
Please do not hesitate to contact us if you need any clarification on the above.

Yours sincerely,

Tim Howard



leap environmental	Client:	Croudace Homes	Date:	26/08/2016	Project ID:	LP1231
	Project:	Grove Farm, Robertsbridge	Title:	Soakage Test Location Plan	Fig. No.:	1



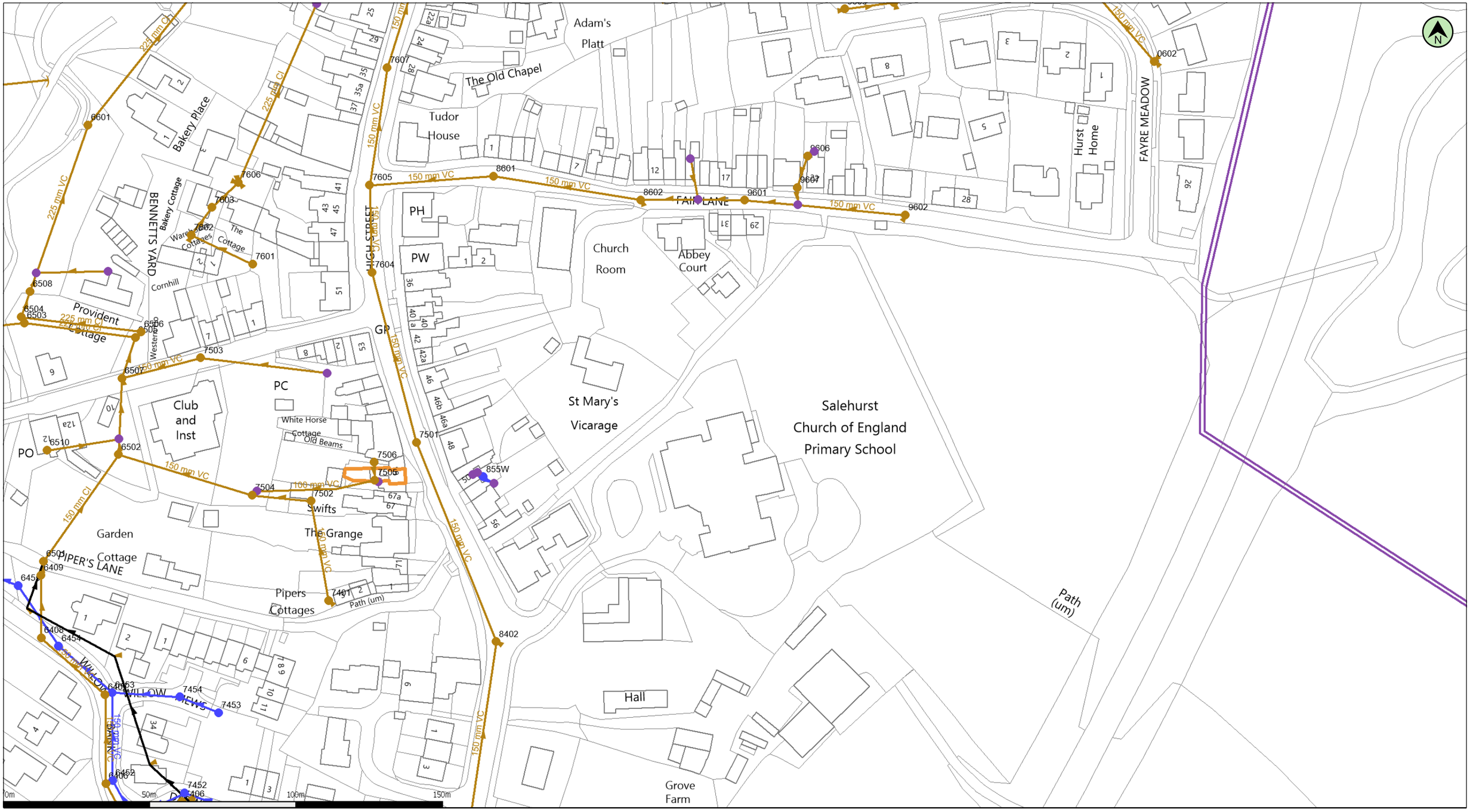
KEY

- Culvert at field access
- Flow direction of ditch
- Approximate slope direction
- A — Photograph

leap environmental	Client:	Croudace Homes	Date:	26/08/2016	Project ID: LP1231
	Project:	Grove Farm, Robertsbridge	Title:	Ditch Condition Plan	Fig. No.: 2

Appendix D

Southern Water Asset Location Plan



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Wastewater Plan A3
Powered by digdat

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WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

pallen@motion.co.uk

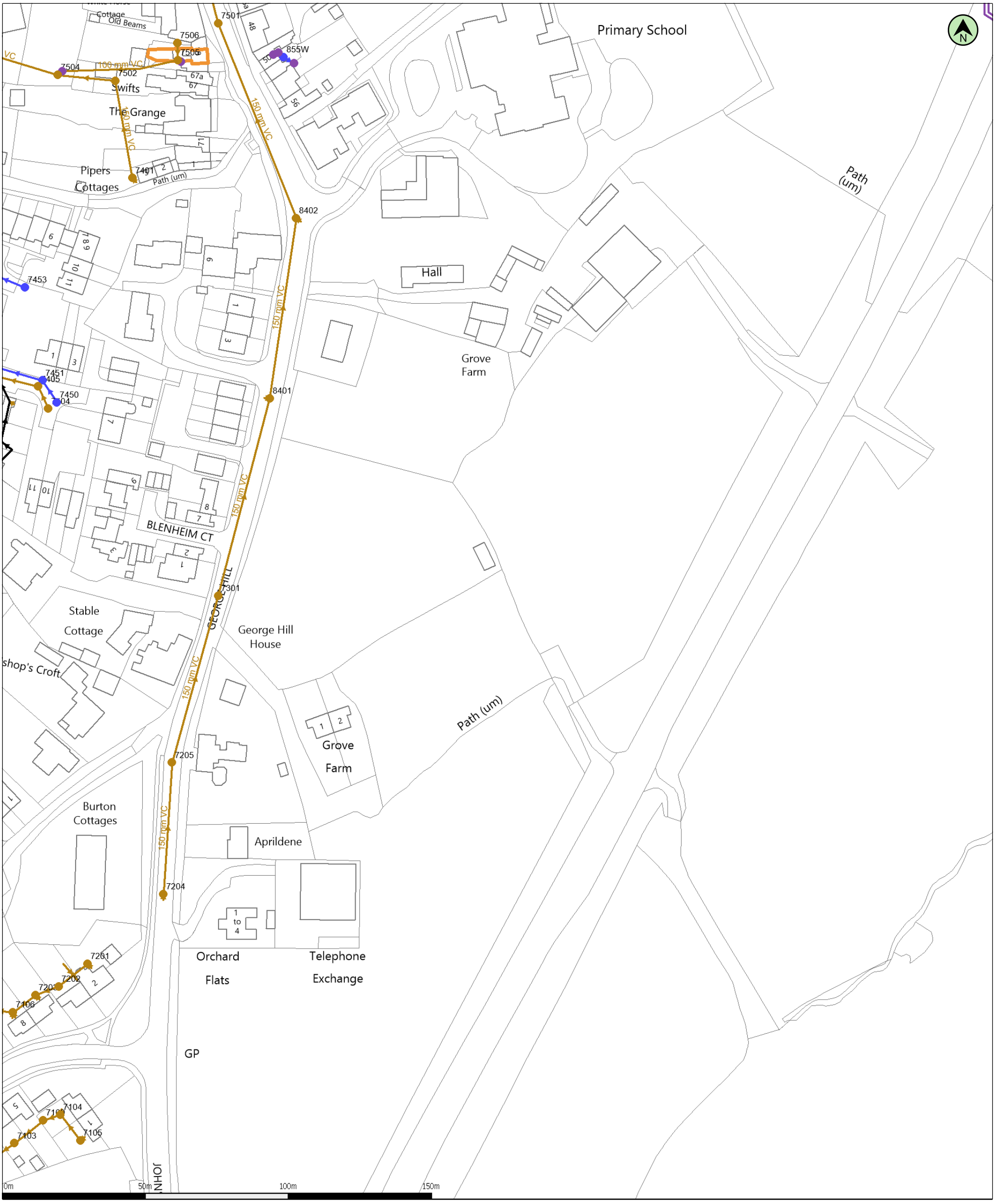
1birob

WATER for LIFE
from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0602	F	22.62	20.59	
6406	F	15.85	13.45	
6407	F	13.74	12.22	
6408	F	12.60	11.23	
6409	F	12.07	10.36	
6501	F	11.22	10.21	
6502	F	0.00	0.00	
6503	F	10.85	8.81	
6504	F	10.84	7.93	
6505	F	11.84	0.00	
6506	F	11.81	0.00	
6507	F	12.17	9.79	
6508	F	0.00	0.00	
6510	F	0.00	0.00	
6601	F	10.38	7.65	
7401	F	15.00	13.52	
7406	F	17.97	16.18	
7501	F	0.00	15.84	
7502	F	0.00	13.00	
7503	F	12.72	11.62	
7504	F	13.94	12.59	
7505	F	0.00	0.00	
7506	F	0.00	0.00	
7601	F	0.00	11.00	
7602	F	11.41	8.61	
7603	F	0.00	8.43	
7604	F	16.22	14.60	
7605	F	14.48	12.87	
7606	F	11.55	8.49	
7607	F	12.23	0.00	
8402	F	18.83	17.01	
8601	F	17.71	16.24	
8602	F	21.02	19.54	
9601	F	23.54	22.07	
9602	F	24.74	23.26	
9603	F	18.73	17.00	
9604	F	18.73	16.90	
9606	F	0.00	0.00	
9607	F	0.00	0.00	
6452	S	15.85	14.45	
6453	S	13.89	0.00	
6454	S	12.72	10.54	
6455	S	11.75	9.95	
7452	S	17.96	16.64	
7453	S	16.64	15.12	
7454	S	15.52	14.13	
855W	S	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert



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Map Centre: 573888,123340

Date: 15/01/22

Our Ref: 756790 - 1

Wastewater Plan A3

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Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

pallen@motion.co.uk

Grove FArm

from Southern Water

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WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
7103	F	0.00	0.00	
7104	F	33.36	32.42	
7105	F	34.06	32.72	
7106	F	31.69	30.55	
7109	F	0.00	0.00	
7201	F	31.26	30.40	
7202	F	0.00	30.60	
7203	F	31.77	30.79	
7204	F	32.64	31.15	
7205	F	31.31	29.69	
7301	F	27.63	26.14	
7401	F	15.00	13.52	
7404	F	20.03	17.78	
7405	F	19.23	16.96	
7501	F	0.00	15.84	
7502	F	0.00	13.00	
7504	F	13.94	12.59	
7505	F	0.00	0.00	
7506	F	0.00	0.00	
8401	F	25.13	23.38	
8402	F	18.83	17.01	
7450	S	20.22	18.55	
7451	S	19.22	17.57	
7453	S	16.64	15.12	
855W	S	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix E

Environment Agency Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
1birob	**573918/123332**	**23 Jul 2024 10:42**

Your selected location is in flood zone 1, an area with a low probability of flooding.

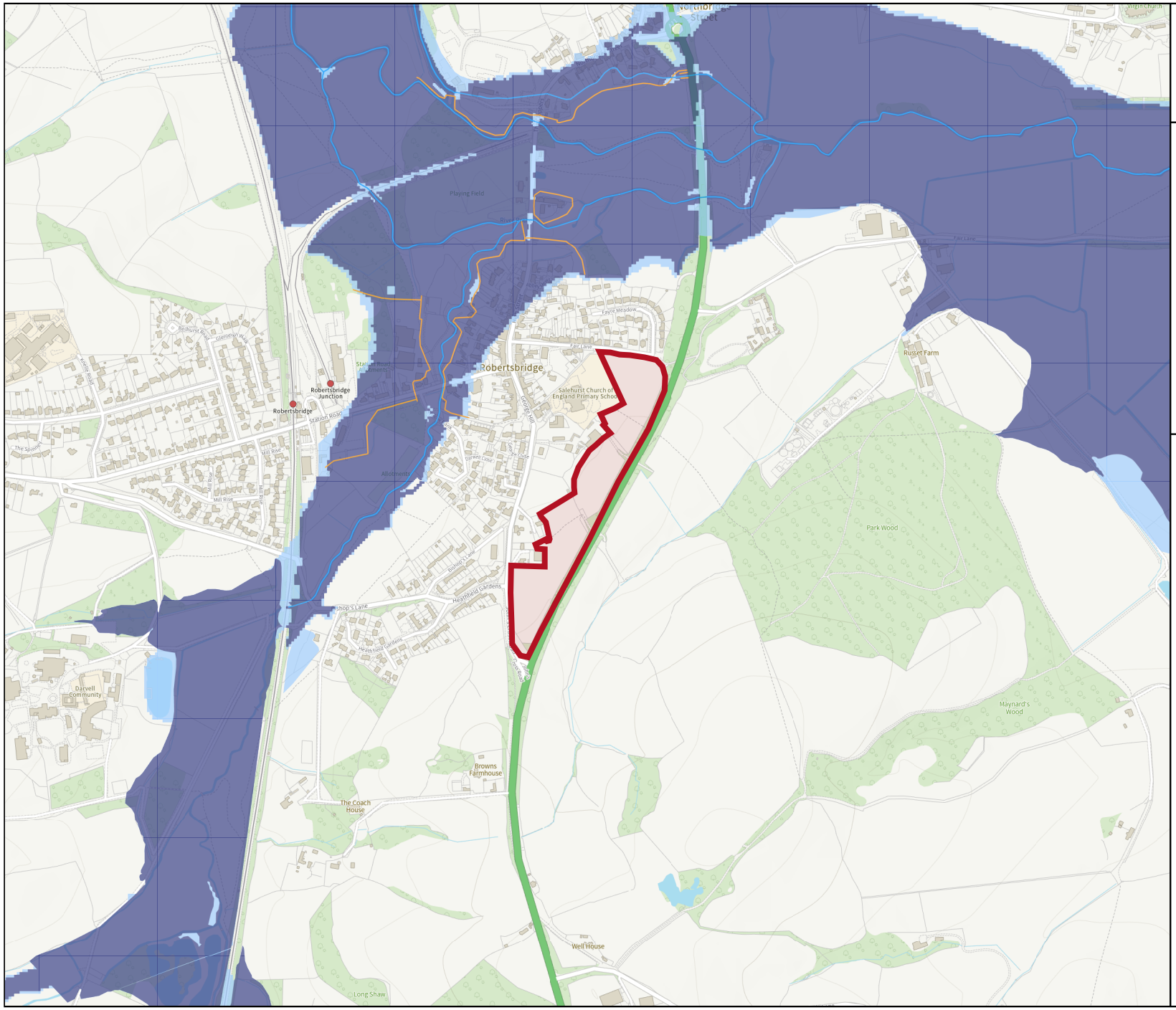
You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
1birob

Location (easting/northing)
573918/123332

Scale
1:10000

Created
23 Jul 2024 10:42

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 100 200 300m

Appendix F

UKSuDS Greenfield Runoff Rate Calculation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Phil Allen
Site name:	1birob
Site location:	Robertsbridge

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

Site Details

Latitude:	50.98427° N
Longitude:	0.47711° E
Reference:	1874116221
Date:	Jul 23 2024 09:14

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.668

Methodology

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

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	825	825
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.91	3.91
1 in 1 year (l/s):	3.32	3.32
1 in 30 years (l/s):	8.99	8.99
1 in 100 year (l/s):	12.47	12.47
1 in 200 years (l/s):	14.62	14.62

Appendix G

MicroDrainage Network Hydraulic Modelling Module Outputs

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.441	4-8	0.297	8-12	0.003

Total Area Contributing (ha) = 0.742

Total Pipe Volume (m³) = 39.535

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	31.696	0.542	58.5	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	47.870	0.818	58.5	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	46.251	0.791	58.5	0.084	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	41.754	0.714	58.5	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	40.949	1.365	30.0	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	42.575	1.470	29.0	0.059	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	43.343	0.900	48.2	0.051	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	44.878	0.702	63.9	0.079	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.008	40.680	0.694	58.6	0.077	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.009	45.856	0.782	58.6	0.093	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.010	32.034	1.711	18.7	0.074	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	100.00	5.40	35.900	0.029	0.0	0.0	0.0	1.32	23.3	10.5
1.001	100.00	5.87	35.283	0.069	0.0	0.0	0.0	1.71	68.1	24.8
1.002	100.00	6.32	34.465	0.153	0.0	0.0	0.0	1.71	68.1	55.3
1.003	100.00	6.65	33.599	0.231	0.0	0.0	0.0	2.06	145.6	83.3
1.004	100.00	6.89	32.885	0.309	0.0	0.0	0.0	2.88	203.6	111.5
1.005	100.00	7.13	31.520	0.368	0.0	0.0	0.0	2.93	207.3	132.9
1.006	100.00	7.41	29.975	0.419	0.0	0.0	0.0	2.62	288.9	151.3
1.007	100.00	7.74	29.075	0.499	0.0	0.0	0.0	2.27	250.7	180.0
1.008	100.00	8.02	28.373	0.576	0.0	0.0	0.0	2.37	261.8	207.9
1.009	100.00	8.35	27.679	0.668	0.0	0.0	0.0	2.37	261.8	241.3
1.010	100.00	8.47	26.897	0.742	0.0	0.0	0.0	4.20	464.4	267.8

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.011	32.034	1.711	18.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.011	100.00	8.60	25.186	0.742	0.0	0.0	0.0	4.20	464.4	267.8

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.017	0.017	0.017
	User	-	100	0.005	0.005	0.022
	User	-	100	0.007	0.007	0.029
1.001	User	-	100	0.026	0.026	0.026
	User	-	100	0.014	0.014	0.040
1.002	User	-	100	0.025	0.025	0.025
	User	-	100	0.008	0.008	0.033
	User	-	100	0.011	0.011	0.044
	User	-	100	0.009	0.009	0.054
	User	-	100	0.018	0.018	0.072
	User	-	100	0.013	0.013	0.084
1.003	User	-	100	0.015	0.015	0.015
	User	-	100	0.039	0.039	0.055
	User	-	100	0.010	0.010	0.064
	User	-	100	0.007	0.007	0.071
	User	-	100	0.006	0.006	0.078
1.004	User	-	100	0.013	0.013	0.013
	User	-	100	0.013	0.013	0.026
	User	-	100	0.013	0.013	0.038
	User	-	100	0.031	0.031	0.069
	User	-	100	0.009	0.009	0.078
1.005	User	-	100	0.040	0.040	0.040
	User	-	100	0.009	0.009	0.050
	User	-	100	0.010	0.010	0.059
1.006	User	-	100	0.009	0.009	0.009
	User	-	100	0.042	0.042	0.051
1.007	User	-	100	0.010	0.010	0.010
	User	-	100	0.009	0.009	0.019
	User	-	100	0.010	0.010	0.028
	User	-	100	0.051	0.051	0.079
1.008	User	-	100	0.034	0.034	0.034
	User	-	100	0.012	0.012	0.046
	User	-	100	0.010	0.010	0.056
	User	-	100	0.007	0.007	0.063
	User	-	100	0.014	0.014	0.077
1.009	User	-	100	0.030	0.030	0.030
	User	-	100	0.011	0.011	0.042
	User	-	100	0.013	0.013	0.055
	User	-	100	0.038	0.038	0.093
1.010	User	-	100	0.074	0.074	0.074
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.742	0.742	0.742

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.011		25.000	23.475	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.350		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 11, DS/PN: 1.010, Volume (m³): 7.4

Unit Reference	MD-SHE-0059-2000-1700-2000
Design Head (m)	1.700
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	59
Invert Level (m)	26.897
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	2.0	Kick-Flo®	0.527	1.2
Flush-Flo™	0.257	1.5	Mean Flow over Head Range	-	1.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	0.800	1.4	2.000	2.2	4.000	3.0	7.000	3.8
0.200	1.4	1.000	1.6	2.200	2.2	4.500	3.1	7.500	4.0
0.300	1.4	1.200	1.7	2.400	2.3	5.000	3.3	8.000	4.1
0.400	1.4	1.400	1.8	2.600	2.4	5.500	3.4	8.500	4.2
0.500	1.3	1.600	1.9	3.000	2.6	6.000	3.6	9.000	4.3
0.600	1.3	1.800	2.1	3.500	2.8	6.500	3.7	9.500	4.4

Storage Structures for Storm

Tank or Pond Manhole: 11, DS/PN: 1.010

Invert Level (m) 26.897

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	272.8	1.703	737.1

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	1.470	0.560	0.000	2.030
1.001	2	2.733	1.903	0.000	4.637
1.002	3	3.320	1.839	0.000	5.159
1.003	4	2.376	2.951	0.000	5.328
1.004	5	2.958	2.895	0.000	5.852
1.005	6	1.640	3.009	0.000	4.649
1.006	7	2.183	4.787	0.000	6.970
1.007	8	2.755	4.957	0.000	7.712
1.008	9	3.188	4.493	0.000	7.681
1.009	10	3.179	5.065	0.000	8.244
1.010	11	2.438	3.538	827.843	833.819
1.011	12	2.310	3.538	0.000	5.848
Total		30.550	39.535	827.843	897.928

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 20.000	Cv (Summer) 1.000
Region	England and Wales	Ratio R 0.350	Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	1	+0%	100/15 Summer				35.948	-0.102
1.001	2	15 Summer	1	+0%	100/15 Summer				35.344	-0.164
1.002	3	15 Summer	1	+0%	30/15 Summer				34.556	-0.134
1.003	4	15 Summer	1	+0%	100/15 Summer				33.699	-0.199
1.004	5	15 Summer	1	+0%	100/15 Summer				32.983	-0.202
1.005	6	15 Summer	1	+0%	30/15 Summer				31.626	-0.194
1.006	7	15 Summer	1	+0%	30/15 Summer				30.095	-0.255
1.007	8	15 Summer	1	+0%	30/15 Summer				29.216	-0.235
1.008	9	15 Summer	1	+0%	30/15 Summer				28.522	-0.226
1.009	10	15 Summer	1	+0%	30/15 Summer				27.839	-0.215
1.010	11	1440 Summer	1	+0%	1/240 Summer				27.425	0.153
1.011	12	60 Winter	1	+0%					25.192	-0.369

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.22			4.9	OK	
1.001	2	0.000	0.16			10.4	OK	
1.002	3	0.000	0.34			22.2	OK	
1.003	4	0.000	0.24			32.9	OK	
1.004	5	0.000	0.23			43.6	OK	
1.005	6	0.000	0.27			51.8	OK	
1.006	7	0.000	0.22			58.6	OK	
1.007	8	0.000	0.30			68.4	OK	
1.008	9	0.000	0.33			78.0	OK	
1.009	10	0.000	0.37			89.8	OK	
1.010	11	0.000	0.00			1.5	SURCHARGED	
1.011	12	0.000	0.00			1.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000
Region	England and Wales	Ratio R	0.350
Cv (Summer)	1.000		
Cv (Winter)	1.000		

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	30	+40%	100/15 Summer				35.998	-0.052
1.001	2	15 Summer	30	+40%	100/15 Summer				35.490	-0.018
1.002	3	15 Summer	30	+40%	30/15 Summer				35.214	0.525
1.003	4	15 Summer	30	+40%	100/15 Summer				33.833	-0.066
1.004	5	15 Summer	30	+40%	100/15 Summer				33.131	-0.054
1.005	6	15 Summer	30	+40%	30/15 Summer				32.084	0.264
1.006	7	15 Summer	30	+40%	30/15 Summer				30.610	0.260
1.007	8	15 Summer	30	+40%	30/15 Summer				30.030	0.580
1.008	9	15 Summer	30	+40%	30/15 Summer				29.289	0.541
1.009	10	15 Summer	30	+40%	30/15 Summer				28.445	0.391
1.010	11	1440 Winter	30	+40%	1/240 Summer				28.284	1.012
1.011	12	1440 Winter	30	+40%					25.194	-0.367

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.74			16.6	OK	
1.001	2	0.000	0.62			40.4	OK	
1.002	3	0.000	1.28			83.2	SURCHARGED	
1.003	4	0.000	0.93			126.7	OK	
1.004	5	0.000	0.90			171.4	OK	
1.005	6	0.000	1.02			198.0	SURCHARGED	
1.006	7	0.000	0.83			218.1	SURCHARGED	
1.007	8	0.000	1.03			237.0	SURCHARGED	
1.008	9	0.000	1.10			262.8	SURCHARGED	
1.009	10	0.000	1.22			294.7	SURCHARGED	
1.010	11	0.000	0.00			1.8	SURCHARGED	
1.011	12	0.000	0.00			1.8	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000
Region	England and Wales	Ratio R	0.350
Cv (Summer)	1.000		
Cv (Winter)	1.000		

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	100	+45%	100/15 Summer				36.707	0.657
1.001	2	15 Summer	100	+45%	100/15 Summer				36.449	0.940
1.002	3	15 Summer	100	+45%	30/15 Summer				36.181	1.491
1.003	4	15 Summer	100	+45%	100/15 Summer				34.653	0.754
1.004	5	15 Summer	100	+45%	100/15 Summer				34.034	0.849
1.005	6	15 Summer	100	+45%	30/15 Summer				32.905	1.085
1.006	7	15 Summer	100	+45%	30/15 Summer				31.459	1.109
1.007	8	15 Summer	100	+45%	30/15 Summer				30.909	1.458
1.008	9	15 Summer	100	+45%	30/15 Summer				30.056	1.308
1.009	10	15 Summer	100	+45%	30/15 Summer				28.975	0.921
1.010	11	1440 Winter	100	+45%	1/240 Summer				28.595	1.324
1.011	12	1440 Winter	100	+45%					25.194	-0.366

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.94			21.0	SURCHARGED	
1.001	2	0.000	0.68			44.6	SURCHARGED	
1.002	3	0.000	1.44			93.6	SURCHARGED	
1.003	4	0.000	0.98			133.4	SURCHARGED	
1.004	5	0.000	0.91			173.2	SURCHARGED	
1.005	6	0.000	1.05			202.2	FLOOD RISK	
1.006	7	0.000	0.85			225.7	FLOOD RISK	
1.007	8	0.000	1.12			257.8	FLOOD RISK	
1.008	9	0.000	1.24			295.7	SURCHARGED	
1.009	10	0.000	1.44			347.0	SURCHARGED	
1.010	11	0.000	0.00			2.0	FLOOD RISK	
1.011	12	0.000	0.00			2.0	OK	

BIDWELLS