



TOP LANE, STOURTON

Wiltshire, BA12 6QA

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

Project No 25-373-60

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Control Sheet

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1 INTRODUCTION

1.1 Background

1.1.1 Calibro Consultants have been appointed to undertake a flood risk and surface water drainage strategy for the erection of two affordable houses at Top Lane Farm, Stourton, Wiltshire.

1.1.2 The National Planning Policy Framework (NPPF) requires that the planning system takes full account of flood risk. This requires that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- The development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;
- It incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- Any residual risk can be safely managed;
- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

1.1.3 Footnote 63 of the NPPF states that a site-specific FRA will be required for proposals:

- a) that are greater than 1 hectare (ha) in area within Flood Zone 1;
- b) that are located in Flood Zones 2 and 3;
- c) in an area within Flood Zone 1 which has critical drainage problems;
- d) in an area within Flood Zone 1 identified in a Strategic Flood Risk Assessment (SFRA) as being at flood risk now or in the future;
- e) in an area in Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

1.1.4 The site is under 1ha, falls within Flood Zone 1 and is not shown to be at risk of flooding from any other mapped sources of flooding. The site therefore does not meet any of the criteria to require a site-specific FRA, however given the potentially vulnerable nature of the site occupiers and to ensure a robust assessment, a proportionate FRA has been undertaken.

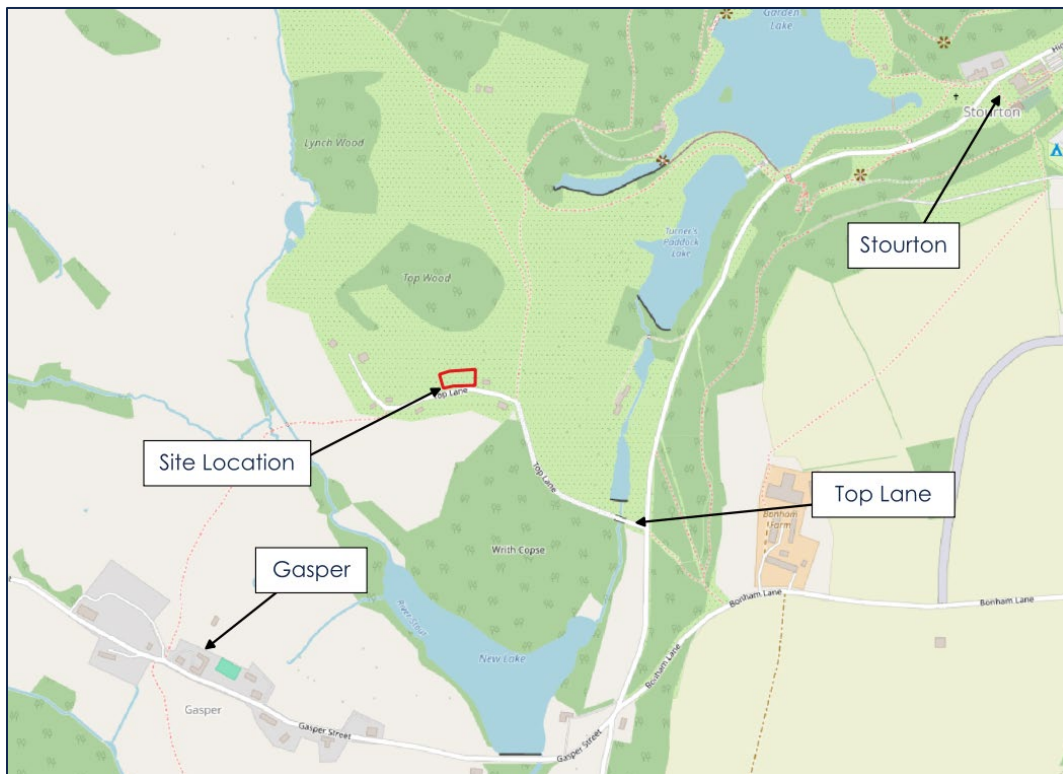
1.1.5 This assessment considers the risks of all types of flooding to the site for the lifetime of the development and assesses if there would be an impact of flooding to third parties.

2 EXISTING AND PROPOSED SITE

2.1 Site Description

- 2.1.1 The site is located to the southwest of the village of Stourton, Wiltshire and to the northeast of the hamlet of Gasper, Wiltshire. Access to the site is available via Top Lane to the south of the site. The approximate coordinates at the centre of the site are 376740, 133510 and the nearest postcode is BA12 6QA. Figure 2-1 shows the site location.

Figure 2-1 Site Location



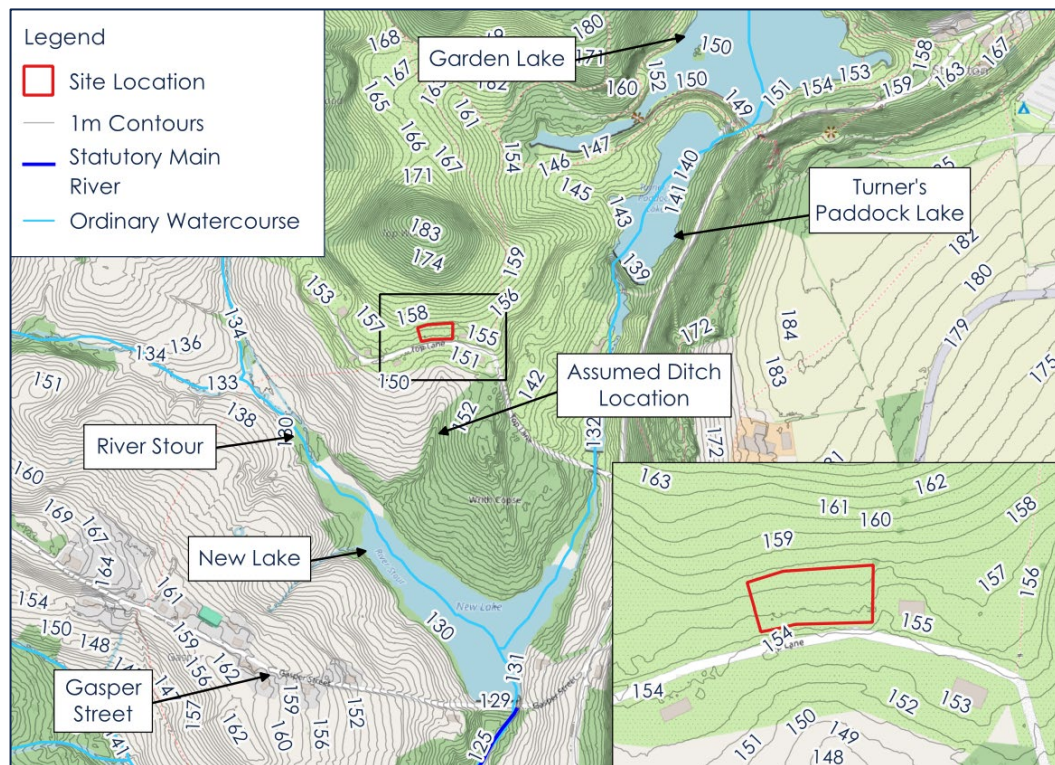
- 2.1.2 The site redline boundary measures approximately 1,400m² in area.
- 2.1.3 The existing site is comprised of greenfield land.
- 2.1.4 A location plan is provided in Appendix A.

2.2 Hydrology and Topography

- 2.2.1 The nearest watercourse to the site is the River Stour, which is located approximately 240m west of the site at its closest point. The River Stour is designated as an Environment Agency (EA) Statutory Main River from the south of Gasper Street to the south of the site, as shown in Figure 2-2. Upstream of this location, it is classified as an Ordinary Watercourse.

- 2.2.2 There are multiple online water features located to the south and northeast of the site, it is understood that the online features are reservoirs. The reservoirs running from upstream to downstream are named as follows; Garden Lake, Turner's Paddock Lake and New Lake. The locations of the online features and watercourses are shown in Figure 2-2.
- 2.2.3 In absence of a site-specific topographic survey, readily available LiDAR data has been used to determine the elevations of the site and surrounds.
- 2.2.4 The site lies part way up a slope that falls to the south, towards New Lake. The southern boundary of the site is situated at approximately 154mAOD. The northeastern corner of the site is situated at approximately 157mAOD with the northwestern corner of the site at approximately 158mAOD, as demonstrated by Figure 2-2.

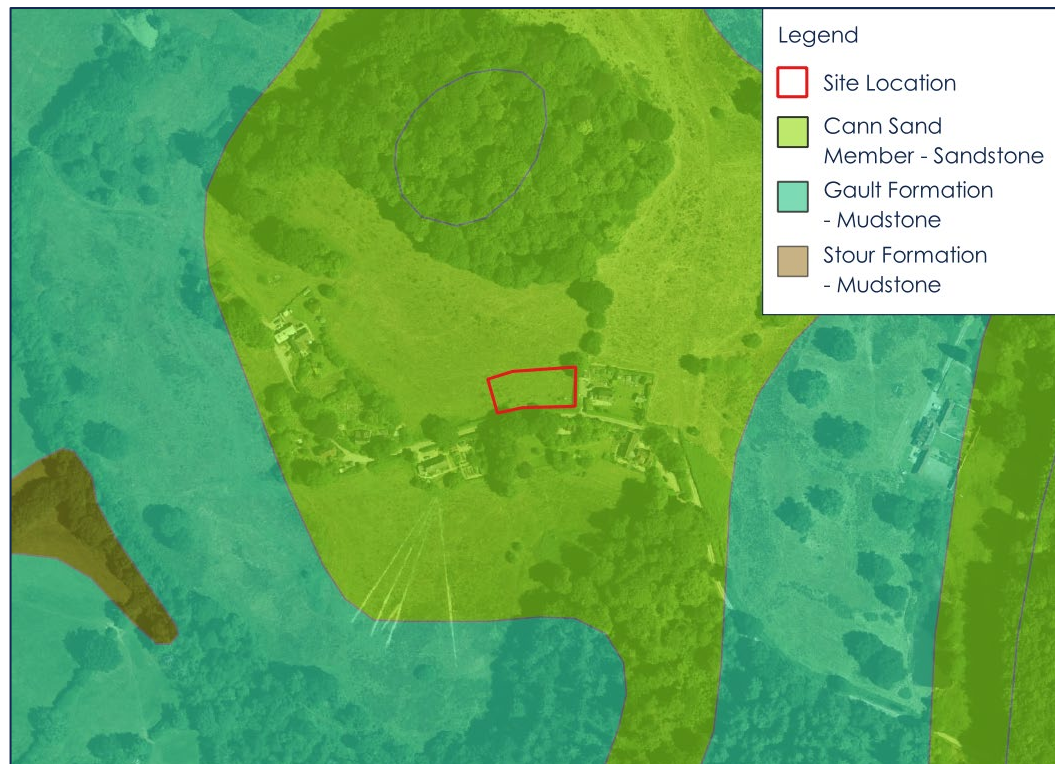
Figure 2-2 Topography and Hydrology



2.3 Geology and Soils

- 2.3.1 Data held by the British Geological Survey (BGS) shows that the entirety of the site is underlain by 'Cann Sand Member – Sandstone' bedrock but close to the transition with 'Gault Formation – Mudstone'. There is also a bedrock of 'Stour Formation – Mudstone' approximately 260m southwest of the site.
- 2.3.2 Figure 2-3 shows the bedrock geology at the site.

Figure 2-3 BGS Bedrock Geology



- 2.3.3 BGS data shows that there is a band of '*Head – Clay, Silt, Sand and Gravel*' superficial deposits located approximately 250m southwest of the site. Additionally, there are '*Alluvium – Clay, Silt, Sand and Gravel*' deposits located under New Lake to the south of the site. Figure 2-4 shows the superficial deposits near the site.
- 2.3.4 The BGS Hydrogeology aquifer classification (625k) records the geology under the site and immediate surrounding areas being underlain by a '*Moderately productive aquifer*'.
- 2.3.5 No springs are identified by relevant OS mapping within the vicinity of the site or the transition between geologies adjacent.
- 2.3.6 SoilScapes mapping shows the site to be entirely within an area of '*Freely draining slightly acid loamy soils*'.
- 2.3.7 The BGS Parent Material European Soil Bureau Description dataset places the site on a layer of sand to sandy loam soils, with a transition to clay to clayey loam soils downslope of the site. The latter coincides with the Gault Formation bedrock with the former coinciding with the Cann Sand Member bedrock.

Figure 2-4 BGS Superficial Geology



2.4 Site Proposals

- 2.4.1 The proposals are for the construction of two affordable homes with associated infrastructure and landscaping on land adjacent to Top Lane, Stourton, Wiltshire.
- 2.4.2 The proposed site layout also includes areas put aside for Biodiversity Net Gain (BNG) purposes. These areas would mimic a greenfield site.
- 2.4.3 Access to the site would be via Top Lane, to the south of the site.
- 2.4.4 The proposed site layout is included in Appendix B.

2.5 Recorded Flooding

- 2.5.1 The EA 'Recorded Flood Outlines' dataset shows that there are no nearby recorded flood outlines near the site.
- 2.5.2 A search of British Hydrological Society's Chronology of British Hydrological Events yielded no relevant flood records.

3 FLOOD RISK ASSESSMENT

3.1 National Planning Policy Framework (NPPF)

3.1.1 In accordance with the NPPF, this FRA considers the following sources of flooding:

1. Tidal Flooding – from the sea;
2. Fluvial Flooding – from rivers and streams;
3. Surface Water Flooding – from intense rainfall events;
4. Groundwater flooding – from elevated groundwater levels or springs;
5. Flooding from sewers – from existing sewer systems; and
6. Artificial sources – from reservoirs, canals etc.

3.2 Fluvial and Surface Water Flooding

3.2.1 The site lies within Flood Zone 1 and as per Section 2.2, it is elevated well above the River Stour and adjacent online water features. Therefore, it is assessed as being at **Low** risk of fluvial flooding.

3.2.2 According to the EA's Risk of Flooding from Surface Water (RoFSW) mapping including the projected impacts of climate change, the site is at **Very Low** risk of surface water flooding, as shown in Figure 3-1.

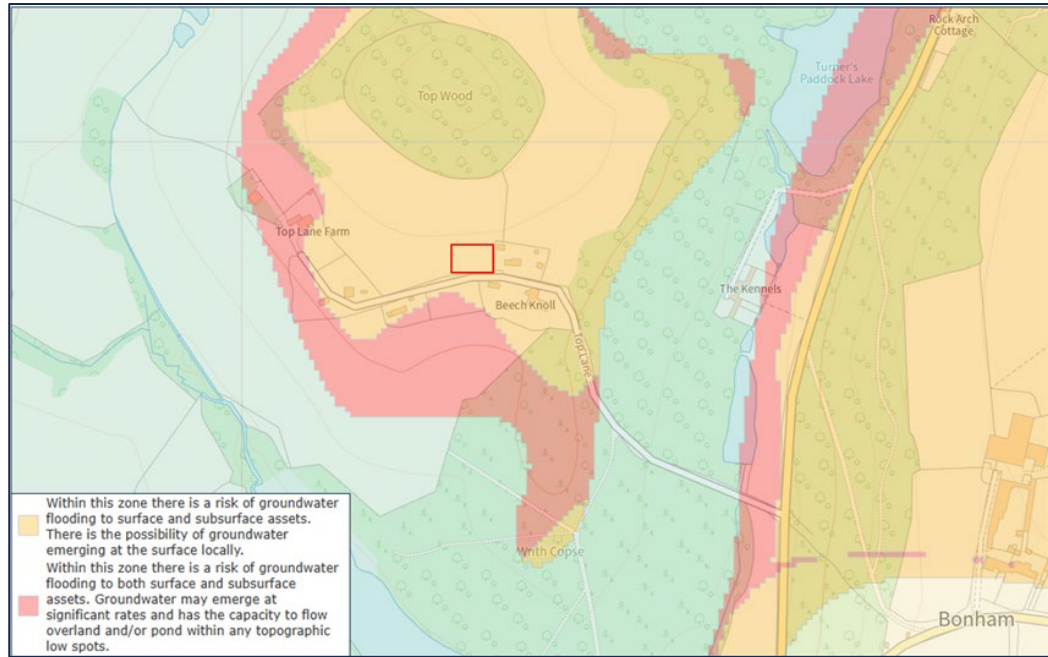
Figure 3-1 RoFSW with Climate Change



3.3 Groundwater Flooding

- 3.3.1 As mentioned in Section 2.3, the bedrock beneath the site and surrounding area is classified as a *'Moderately productive aquifer'*.
- 3.3.2 There are no boreholes or wells at or in the vicinity of the site which can be used to assess the groundwater levels.
- 3.3.3 Relevant OS mapping indicates that there are no springs near the site, suggesting that groundwater is unlikely to emerge as springs near the site.
- 3.3.4 The Wiltshire SFRA and its accompanying online data viewer provides mapping on the groundwater emergence risk, split into five categories.
- 3.3.5 The mapping has identified the site as being within an area where there is a *'risk of groundwater flooding to surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally'*. This is the fourth out of the five categories (Medium – High risk) and is shown in Figure 3-2, along with the location of the site.
- 3.3.6 To the south of the site is an area which has been classified as land where there is a risk of *'groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots'*. This is the fifth category, which has the highest risk.
- 3.3.7 The SFRA states that the Groundwater Emergence map, as shown in Figure 3-2, *'is suitable for general broad-scale assessment of the groundwater emergence in an area but is not explicitly designed for assessment at the scale of a single property. The dataset also shows the risk of emergence of groundwater rather than the actual flood risk from groundwater flooding'*.

Figure 3-2 SFRA Groundwater Mapping



- 3.3.8 Due to the presence of this groundwater flood risk, the Sequential Test may be triggered, as the SFRA states in Section 3.2.4 that 'other sources of flooding also need to be considered as part of the Sequential Test. This includes reservoir and groundwater flooding'.
- 3.3.9 Comparison of the SFRA mapping with the information provided in Section 2.3 of this report shows that the area of groundwater risk is confined to the sandstone bedrock that underlies the site and its surrounds.
- 3.3.10 In addition, as detailed in Section 2.2, the site itself slopes from approximately 158mAOD on the northern boundary of the site to 154mAOD in the southeast corner of the site.
- 3.3.11 The wider surrounds of the site slope steeply from approximately 187mAOD within Top Wood, 170m north of the site, down to approximately 128mAOD on the floodplain of the River Stour, approximately 270m south of the site as shown in Figure 2-2.
- 3.3.12 Given the steep nature of the topography, it is likely that any runoff from the site would flow down the hillside towards the River Stour and New Lake to the south of the site.
- 3.3.13 Appendix R of the Wiltshire SFRA shows areas where the presence of the groundwater flood zone would trigger the application of the Sequential Test. However, due to issues with the resolution of the mapping, it cannot be determined if the site falls within the groundwater flood zone. Wiltshire Council, as the Lead Local

Flood Authority (LLFA) were approached and asked to provide a higher resolution image of this mapping but have not responded to the request.

- 3.3.14 The SFRA states that, due to the unavailability of groundwater flood risk mapping for the country, the 1 in 1,000 year (Low) Risk of Flooding from Surface Water (RoFSW) mapping can be used to identify the key topographic flow paths for the potential flow route of any groundwater flooding, as a proxy dataset. This should be used alongside groundwater flood alert areas and the Recorded Flood Outlines to identify those areas which could be most at risk of groundwater flooding.
- 3.3.15 As shown in Figure 3-1, there is no surface water flood risk at the site, with the surface water flow path starting approximately 30m to the south of the site.
- 3.3.16 Furthermore, there are no recorded flood outlines near the site according to the Recorded Flood Outlines dataset and no flood alert areas which covers the site.
- 3.3.17 Consequently, the proposals are at **Low** risk of groundwater flooding.

3.4 Other Sources of Flooding

- 3.4.1 The site is in a rural setting and therefore unlikely to be served by a strategic sewer network of sufficient capacity to cause significant flooding in the event of blockage. Therefore, site is at **Negligible** risk of sewer flooding.
- 3.4.2 The site lies outside the extent of flooding predicted in the event of reservoir breach and is therefore at **Negligible** risk of reservoir flooding.

4 DRAINAGE STRATEGY

4.1 Approaches

- 4.1.1 There are three proposed approaches to drainage at the site, with the first approach comprising of utilising a drainage field to the south of the site, the second approach utilises a nearby ditch to the south of the site as a discharge location (see Figure 2-2 for the location of the ditch) and the third approach consists of the manual emptying of a cesspool at the site.
- 4.1.2 The above approaches are hereafter referred to as Approaches 1-3.
- 4.1.3 Approaches 1 and 2 propose to use a package treatment plant in order to treat foul drainage from the site before discharging the effluent.
- 4.1.4 Approach 3 utilises a cesspool which will be manually emptied and have no discharge.
- 4.1.5 The parking areas are proposed to be formed from permeable block paving and drain to the ground, mimicking existing site conditions. The edges of the permeable block paving located closest to the proposed dwellings will be lined with an impermeable geotextile wrap to mitigate against foundation instability.
- 4.1.6 The sheds adjacent to the parking bays are proposed to be fitted with green roofs and discharge into the permeable block paving via downpipes.
- 4.1.7 Water butts could be fitted to downpipes where space allows, with their overflows discharging to the permeable surfacing or raised bed planters, where relevant.
- 4.1.8 The drainage approaches have been compiled to address the requirements of the National Standards for Sustainable Drainage (SuDS).

4.2 National Standard 1: Runoff Destination

- 4.2.1 The National Standards for SuDS includes a drainage hierarchy, which requires that surface water runoff should be managed as high up the following list as practically possible:
- Priority 1 – collect for non-potable use, or then;
 - Priority 2 – into the ground (infiltration), or then;
 - Priority 3 – to a surface water body, or then;
 - Priority 4 – to a surface water sewer, highway drain or another piped surface water drainage system, or then;
 - Priority 5 – to a combined sewer.

- 4.2.2 To achieve Priority 1, water butts can be attached to downpipes where space allows. It is standard for these to be fitted with a controlled overflow to prevent them filling and overspilling. This overflow would then discharge into the remaining drainage system, described below. The water butts can be attached in all three approaches to drainage detailed in this reporting section.
- 4.2.3 As the storage capacity of water butts cannot be relied upon and they cannot collect all runoff from the site, an additional discharge destination would be required.
- 4.2.4 For Approach 1, the likely infiltration rates of the soil and the permeability of the bedrock beneath the field to the south of the site means that infiltration is assessed as being viable, meaning Priority 2 can be pursued at this stage.
- 4.2.5 For Approach 2, if it is deemed that infiltration techniques, and therefore Approach 1 is unviable, it is proposed to discharge runoff generated from the site to a nearby ditch to the south of the site, thus achieving Priority 3.
- 4.2.6 In the event that discharging from a package treatment plant is deemed unviable, it is proposed to utilise Approach 3. This approach has no discharge location for runoff.
- 4.2.7 The above should be revisited during the detailed design process or upon receipt of more detailed ground investigations at the site.

4.3 National Standard 2: Management of Everyday Rainfall

- 4.3.1 All runoff would be routed through SuDS features, comprising of either the drainage field, green roofs, permeable block paving or filtration media contained within the SuDS features. Where space allows, runoff would be routed through rainwater harvesting features such as water butts.
- 4.3.2 Rainwater downpipes will enter the above at the surface, so as to activate the filtration media.
- 4.3.3 The surface area of the permeable surfacing is greater than the impermeable areas draining to it and the surface shall be unlined, therefore the standard is met.

4.4 National Standard 3: Management of Extreme Rainfall and Flooding

- 4.4.1 The design storm event applied by the drainage strategy is the 1 in 100 year +4% event commensurate with a residential development (therefore applying the upper end allowance for the 2070s epoch) in the Dorset Management Catchment.
- 4.4.2 Approaches 1 to 3 would be designed to accommodate runoff from the design event.

4.5 National Standard 4: Water Quality

- 4.5.1 The existing site is understood to currently discharge in an uncontrolled manner.
- 4.5.2 The proposals would include filtration media, in the form of green roofs and permeable parking areas.
- 4.5.3 The water quality requirements for the site would be provided by the above filtration media.
- 4.5.4 Approach 1 would consist of a drainage field to the south of the site which would provide further filtration.
- 4.5.5 Approach 2 would consist of a connection to a ditch to the south of the site, the connection to the ditch would likely be partially facilitated by a filter drain which would provide further filtration.
- 4.5.6 Approach 3 would contain all runoff, with no filtration needed.
- 4.5.7 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. To provide adequate treatment, the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices.
- 4.5.8 Surface water runoff from '*residential roofs*' are considered by Table 26.3 of the SuDS Manual to present a Very Low hazard to water quality (see Table 4-1). The access and parking are considered to be '*Individual property driveways*', with a Low pollution hazard level.
- 4.5.9 Table 26.3 of the SuDS Manual provides SuDS mitigation indices for various SuDS methods discharging to the ground or to surface water bodies, as summarised in Table 4-1 and Table 4-2 respectively to represent Approach 1 and 2.
- 4.5.10 This shows that the green roofs (bioretention system) and permeable surfacing (filter strip) will provide sufficient mitigation of the likely pollutants expected. It should be noted that to follow a conservative approach, the parking is presumed to be a filter strip for discharges to surface waters and an infiltration trench for discharges to groundwater, rather than constructed permeable pavement, which has higher mitigation potential. Properly layered and constructed permeable block paving provides enhanced mitigation but is not confirmed at this stage.

Table 4-1 Water Quality Indices – Approach 1 (as per C753 The SuDS Manual)

Land Use		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Residential Roofs	Pollution Hazard	Very Low	0.2	0.2	0.05
	Mitigation Indices – bioretention	-	0.8	0.8	0.8
	Mitigation Indices – infiltration trench	-	0.4	0.4	0.4
Individual Property Driveways	Pollution Hazard	Low	0.5	0.4	0.4
	Mitigation Indices – infiltration trench	-	0.4	0.4	0.4

Table 4-2 Water Quality Indices – Approach 2 (as per C753 The SuDS Manual)

Land Use		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Residential Roofs	Pollution Hazard	Very Low	0.2	0.2	0.05
	Mitigation Indices – bioretention system	-	0.8	0.8	0.8
	Mitigation Indices – filter strip	-	0.4	0.4	0.5
Individual Property Driveways	Pollution Hazard	Low	0.5	0.4	0.4
	Mitigation Indices – filter strip	-	0.4	0.4	0.5

4.6 National Standard 5: Amenity

- 4.6.1 Given the nature and scale of the development, this standard is not entirely relevant. However, the green roofs would provide some amenity and visual benefits through their planting, which would complement the proposed tree planting.

4.7 National Standard 6: Biodiversity

- 4.7.1 The green roofs would be planted which would encourage biodiversity.
- 4.7.2 Additionally, the proposed site layout includes for a designated BNG area to the west of the proposed dwellings.

4.8 National Standard 7: Design for Construction and Maintenance

- 4.8.1 Maintenance of the proposed drainage infrastructure is essential for their operation. The maintenance responsibility will lie with the site owner and would be subject to manufacturers requirements. The proposed maintenance activities outlined below in Table 4-3 has been sourced from the CIRIA SuDS Manual.

Table 4-3 Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Green Roofs Maintenance	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc. And replace as necessary	Quarterly
	Inspect inlets and outlets for blockages	Quarterly
	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years
Permeable Paving (block paving shown, depends	Brushing and vacuuming	Annually, typically after leaf fall
	Removal of weeds	As required

Maintenance Schedule	Required Action	Typical Frequency
on preferred surfacing)	Remedial action to any depressions, rutting or broken blocks, replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 – 15 years or as required if infiltration performance is reduced
	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth	Three-monthly, 48hrs after large storms in the first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually
	Removal of weeds	As required

5 SUMMARY

- 5.1.1 The proposals are for the erection of two affordable houses, landscaping and associated infrastructure on land adjacent to Top Lane, Stourton, Wiltshire.
- 5.1.2 The existing site is understood to be a greenfield site, therefore the proposed layout includes areas put aside for BNG purposes which would mimic the existing site conditions.
- 5.1.3 The site is in Flood Zone 1 and outside of the mapped risk of flooding from surface water area.
- 5.1.4 Assessment of the groundwater flood risk maps have shown the site may potentially be impacted by groundwater flood risk, and therefore trigger the need for the Sequential Test. Therefore, an assessment into the groundwater flood risk has been carried out.
- 5.1.5 Analysis of the bedrock geology, hydrogeology, topography, surface water flooding and relevant OS mapping has been undertaken, and the site has been assessed as being at a **Low** risk of groundwater flooding.
- 5.1.6 The site is assessed as having a **Low** risk from other sources such as sewers and artificial sources.
- 5.1.7 There are three proposed drainage approaches. Approach 1 consists of a drainage field located to the south of the site. Approach 2 consists of a connection to a nearby ditch to the south of the site, and Approach 3 consists of the manual emptying of a cesspool at the site. The approach for the site will be determined at the detailed design stage.
- 5.1.8 The proposed layout includes green roofs on sheds to the front of the dwellings. The parking areas to the front of the dwellings are proposed to be formed from permeable block paving.
- 5.1.9 The above features provide sufficient mitigation to the likely pollutants expected for both discharges to surface waters and ground water as per the CIRIA SuDS Manual.
- 5.1.10 The edges of the permeable block paving located closest to the dwellings would be wrapped in an impermeable geotextile wrap in order to mitigate against foundation instability.
- 5.1.11 This Flood Risk Assessment shows that the development will be safe for its lifetime and therefore meets the requirements of the NPPF.

APPENDICES

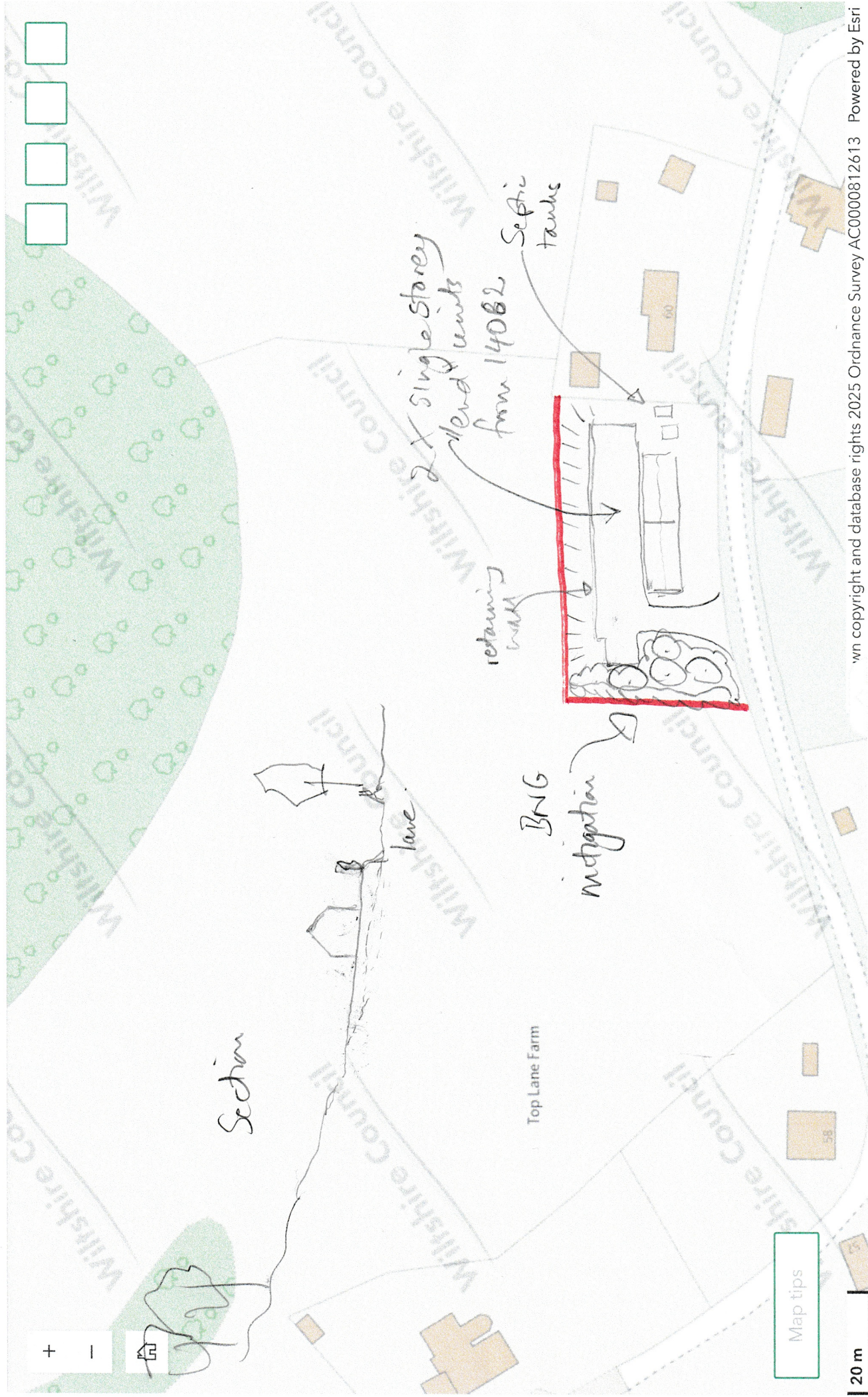
APPENDIX A

Site Location Plan

Wiltshire Planning Explorer

Enter an Address, Postcode, or Plannin...

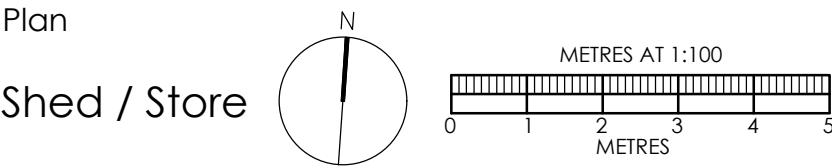
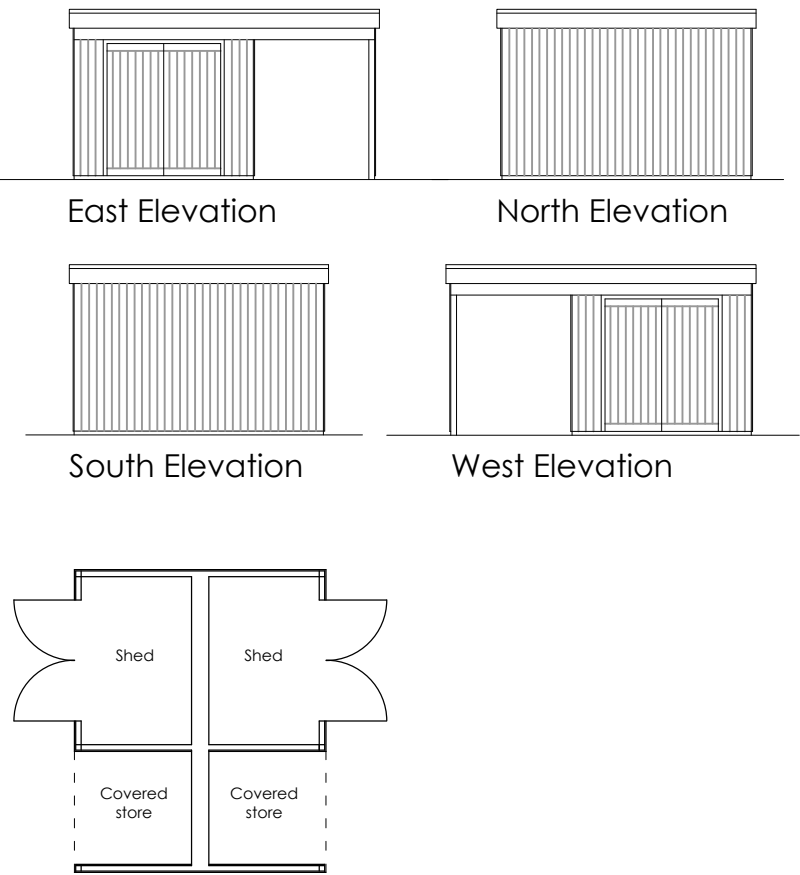
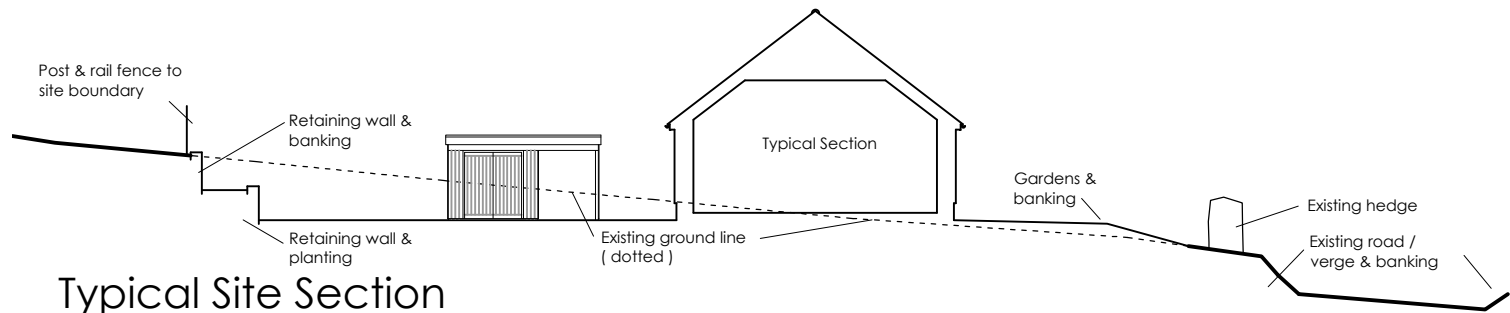
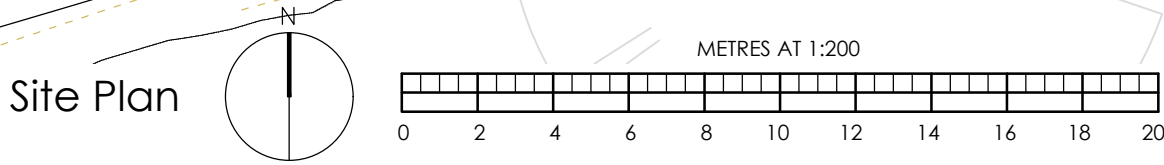
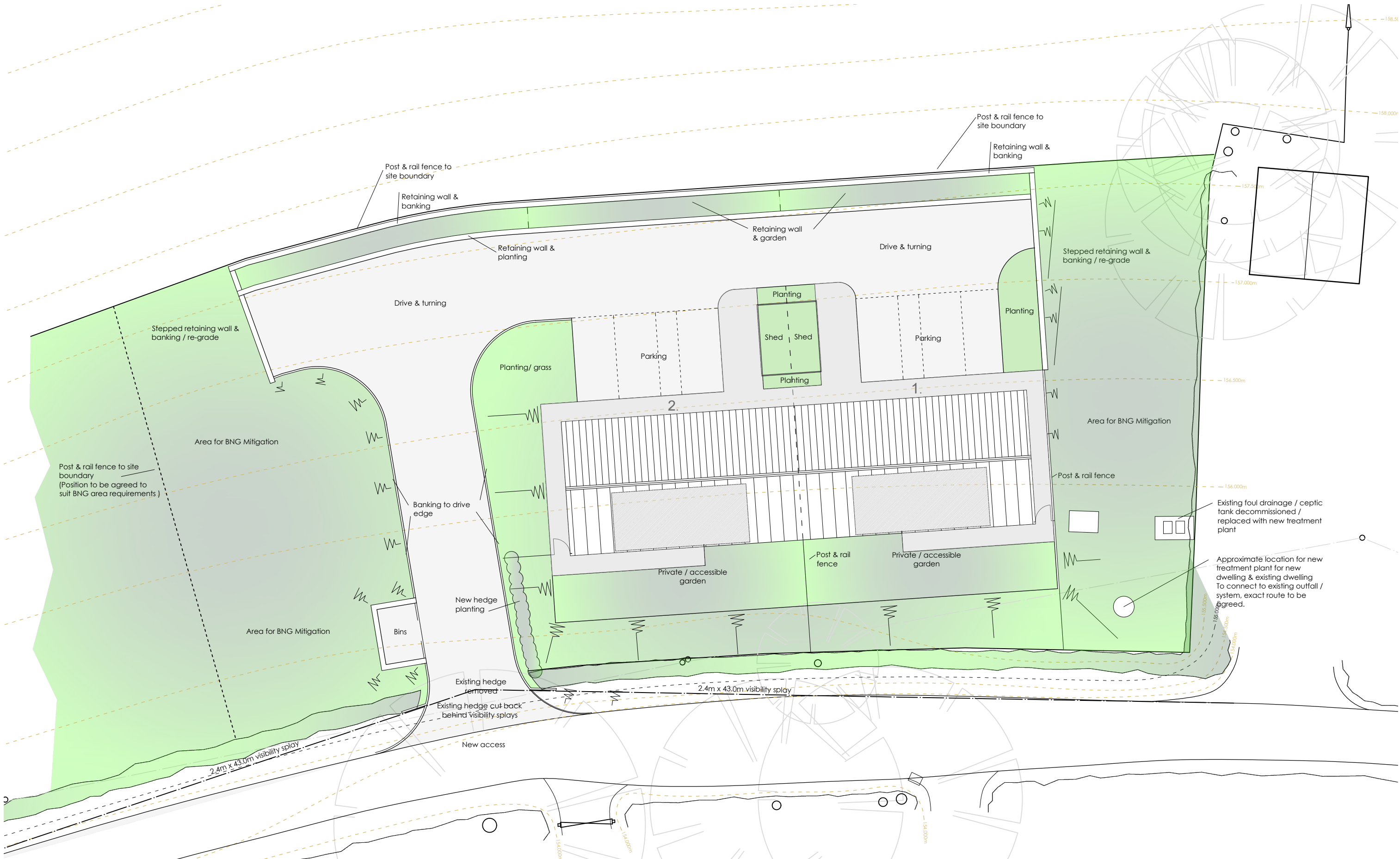




APPENDIX B

Proposed Site Layout

Rev	Drn	Date	Description



MATERIALS
Roof - Green / Sedum
Walls - Timber boarding, left to weather silver grey
Joinery - Timber, left to weather silver grey

BRIMBLE LEA			
Chartered Planning Consultants & Architects			
Unit 3, Kingsmead Business Park, Gillingham, Dorset, SP8 5FB			
T (01747) 823232		www.brimblelea.com	
PROJECT	Land at Top Lane, Stourton, BA12 6QA.		
DRAWING	Proposed Site Plan		
SCALE	1:100, 1:200@ A2		
DRAWING ORIGINATOR MA		DRAWING No.	REVISION
DATE	May 2025	25035 - Sk1 B	



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