

Flood Risk Assessment

Central Section Brookleigh Burgess Hill
Reserved Matters Application

Homes England

Project number: 60610807

January 2025

Quality information

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1. Introduction

1.1 Background

- 1.1.1 AECOM Limited (AECOM) have been appointed by Homes England (hereafter referred to as the 'Applicant') to prepare this Flood Risk Assessment (FRA), to support a Reserved Matters Application for the development of the Central Section (CS) of the Northern Arc Avenue (hereafter referred to as the 'Proposed Development').
- 1.1.2 The Application Site, located north of Burgess Hill, forms part of the allocated strategic Site for Brookleigh. This application relates to the delivery of the CS of the Northern Arc Avenue, connecting the Eastern Bridge Link Road (EBLR) and the Western Bridge Link Road (WBLR), designed as the primary service route of the future sustainable urban extension of Brookleigh. The route spans westward from the existing Isaac's Lane to the proposed 'Western Bridge', travelling via Cuckfield Road, and connecting the proposed Central Neighbourhood Centre of Brookleigh.
- 1.1.3 The Proposed Development represents the CS and is part of the wider Brookleigh Allocation development (Figure 1-1) for which an Outline Planning Application (Application Ref. DM/21/3279) was submitted by the Applicant in December 2018 (herein referred to as 'the OPA').
- 1.1.4 Paragraph 173 (footnote 59) of the National Planning Policy Framework¹ (NPPF) states that "a site-specific flood risk assessment is required for all development in Flood Zone 2 and 3". When a Site is located within Flood Zone 1, an FRA should be produced for: sites of 1ha or more; land which has been identified by the Environment Agency (EA) as having critical drainage problems; land identified in a Strategic Flood Risk Assessment (SFRA) as being at increased flood risk in the future; and/or land that could be subject to other sources of flooding, where its development would introduce a more vulnerable use.
- 1.1.5 The EA Flood Map for Planning (Rivers and Sea) (Figure 5-1) indicates that the Site is located within Flood Zone 1. The Site is 6 hectares (ha) in area, thus a site specific FRA is required to support the planning application to meet the requirements of the NPPF.
- 1.1.6 This FRA has been prepared in accordance with the NPPF¹ and the accompanying Planning Practice Guidance (PPG): Flood Risk and Coastal Change².

¹ Department for Levelling Up, Housing and Communities (2024) National Planning Policy Framework, available at <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. Accessed January 2024.

² Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2022) "Planning Practice Guidance: Flood Risk and Coastal Change", available at <https://www.gov.uk/guidance/flood-risk-and-coastal-change> accessed July 2023.

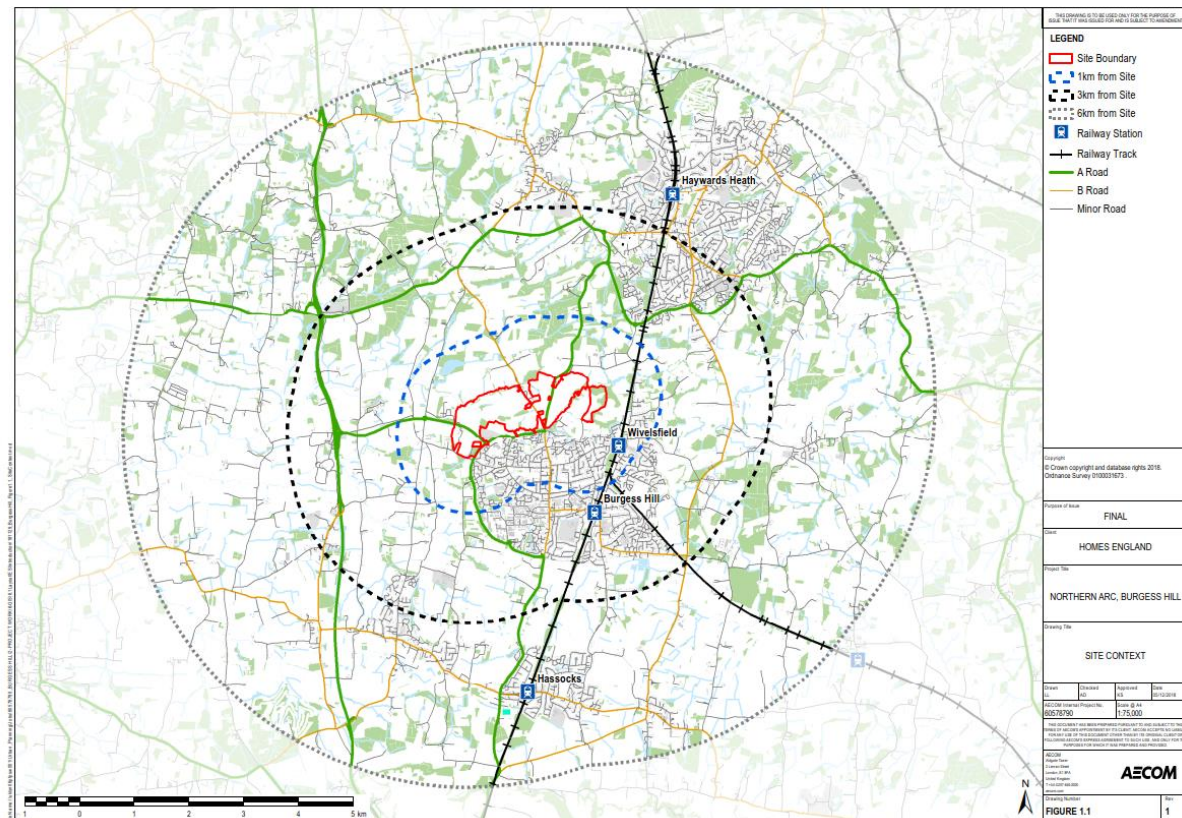


Figure 1-1: Brookleigh Allocation Outline Planning Application development boundary

1.2 Aims and Objectives

1.2.1 The aim of this report is to provide an FRA that assesses the flood risk to and from the Proposed Development. AECOM's approach to this FRA has involved a desk-based review of the best available information to establish the likely flooding sources and mechanisms for the Site, along with hydrological and hydraulic modelling to further assess the risk of fluvial flooding.

1.2.2 In satisfying the aim of the FRA, the following objectives have been completed:

- Gather desktop information relating to geology, topography and local water features that may influence the risk of flooding to the Proposed Development;
- Assess the risk of flooding from all sources (tidal, fluvial, surface water, groundwater, sewers and artificial sources) to and from the Proposed Development allowing for the effects of climate change over the lifetime of the development;
- Identify mitigation measures required to avoid or reduce potential adverse impacts on flood risk to the Proposed Development or elsewhere, and where possible identify measures to reduce the level of flood risk overall; and
- Produce a FRA report in accordance with the NPPF and PPG suitable to support a planning application.

1.3 Methodology

1.3.1 AECOM's approach to FRAs is based on the industry standard Source-Pathway-Receptor model. The Source-Pathway-Receptor model firstly identifies the causes or 'sources' of flooding to and from a development. This identification is based on a review of available information such as mapping, local conditions, and consideration of the effects of climate change. The nature and likely extent of flooding arising from any one source is considered, e.g., whether such flooding is likely to be localised or widespread.

- 1.3.2 As well as assessing flood risk from more obvious sources such as the sea, assessment of other flooding sources has been considered which includes fluvial (river) flooding, groundwater flooding, overwhelmed sewers and drainage systems, and from artificial sources such as reservoirs, canals, and lakes.
- 1.3.3 The presence of a flood source does not always imply a risk. For example, the presence of a sewer does not necessarily increase the risk of flooding unless the sewer is local to the development and ground levels encourage surcharged flows to accumulate. The exposure pathway or 'flooding mechanism' determines whether there is a risk of exposure to a flood source. If a flooding mechanism is not present, then potential risk from the associated flood source is considered to be negligible. If a flood source and flooding pathway are identified, then assessment of the flood risk to the receptor is determined by combining the probability of the flood event occurring with the severity of impact (or consequences) if the flood event were to occur. Receptors include any people or buildings which are connected to the source by a pathway.
- 1.3.4 The potential severity of the impact is determined through consideration of a combination of flood source type, flood mechanisms present, layout and design of the proposed receptor and vulnerability of the proposed receptor.
- 1.3.5 In summary, for a particular flood risk to exist, all the elements of the Source-Pathway-Receptor model must be present. Effective mitigation measures can be provided to reduce the magnitude of flood risk by removing one element of the model, such as a pathway. The incorporation of flood defences or flood resilience measures into building receptors and the provision of flood evacuation plans for users of a development are all strategies which, if utilised correctly, will reduce, or remove, the pathway element of flood risk.

2. Site Description

2.1 Location and Existing Use

- 2.1.1 The Site is located within the district of Mid Sussex, north of the town of Burgess Hill. The Site is 6 ha in area (to be confirmed), centred on OS NGR TQ 29981 20931. The Site is situated within an area of the Brookleigh Strategic Allocation and relates to the SC of the Northern Arc Avenue, connecting the Eastern Bridge Link Road (EBLR) and the Western Bridge Link Road (WBLR), designed as the primary service route of the future sustainable urban extension (SUE) of Brookleigh. The route spans westward from the existing Isaac's Lane to the proposed 'Western Bridge', travelling via Cuckfield Road, and connecting the proposed Central Neighbourhood Centre of Brookleigh.
- 2.1.2 The Site is currently predominantly greenfield, except for the existing highway (Cuckfield Road). The current land use is mainly agricultural and woodland in nature. The Copyhold Stream, a tributary of the River Adur East, is adjacent to the Site to the north and the River Adur (East) traverses to the south of the Site.
- 2.1.3 A plan showing the location of the Site in the context of the surrounding area is shown in Figure 2-1.

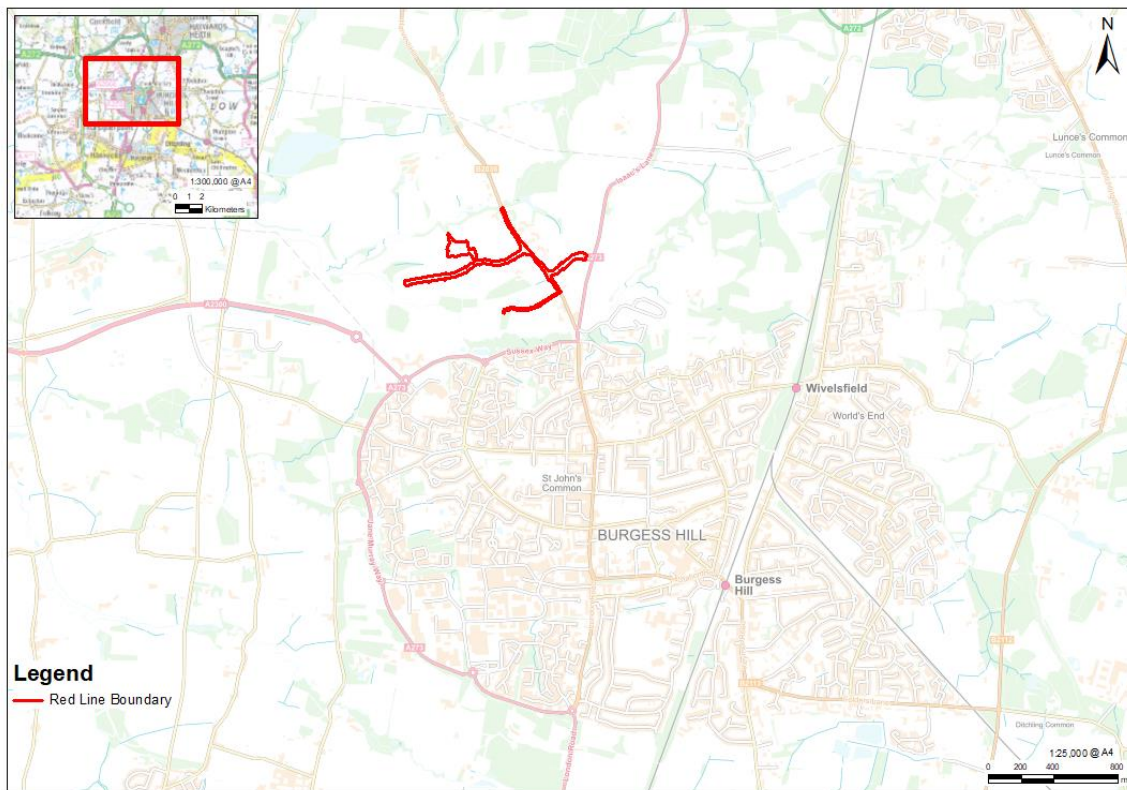


Figure 2-1: Location plan

2.2 Topography

Surrounding Topography

- 2.2.1 The Site is located within the Sussex Low Weald region, on the eastern border of West Sussex County. The eastern branch of the River Adur runs to the west and south of the Site. The topography is therefore dominated by the low-lying floodplains of the River Adur and tributaries, carved out of the underlying Wealden bedrock (Figure 2-2). Although surrounded by high ground to the north, a review of Ordnance Survey (OS) mapping contours indicates that the Site itself is relatively flat.

- 2.2.2 Several topographical surveys have been undertaken for both the wider Brookleigh development in the OPA and the CS Site. The most recent topographic survey data which has been used for all elements of the current design is contained within Appendix A.

The CS Site

- 2.2.3 The existing Cuckfield Road sits at approximately 24 m Above Ordnance Datum (AOD) to the south of the Copyhold Stream to 27.5 m AOD towards the southern extent of the Red Line Boundary. To the west of Cuckfield Road, the ground elevation gradually slopes towards the River Adur (East) which sits at approximately 16 – 17 m AOD. To the east of Cuckfield Road, the ground elevation slopes gently northeast to approximately 30m AOD.

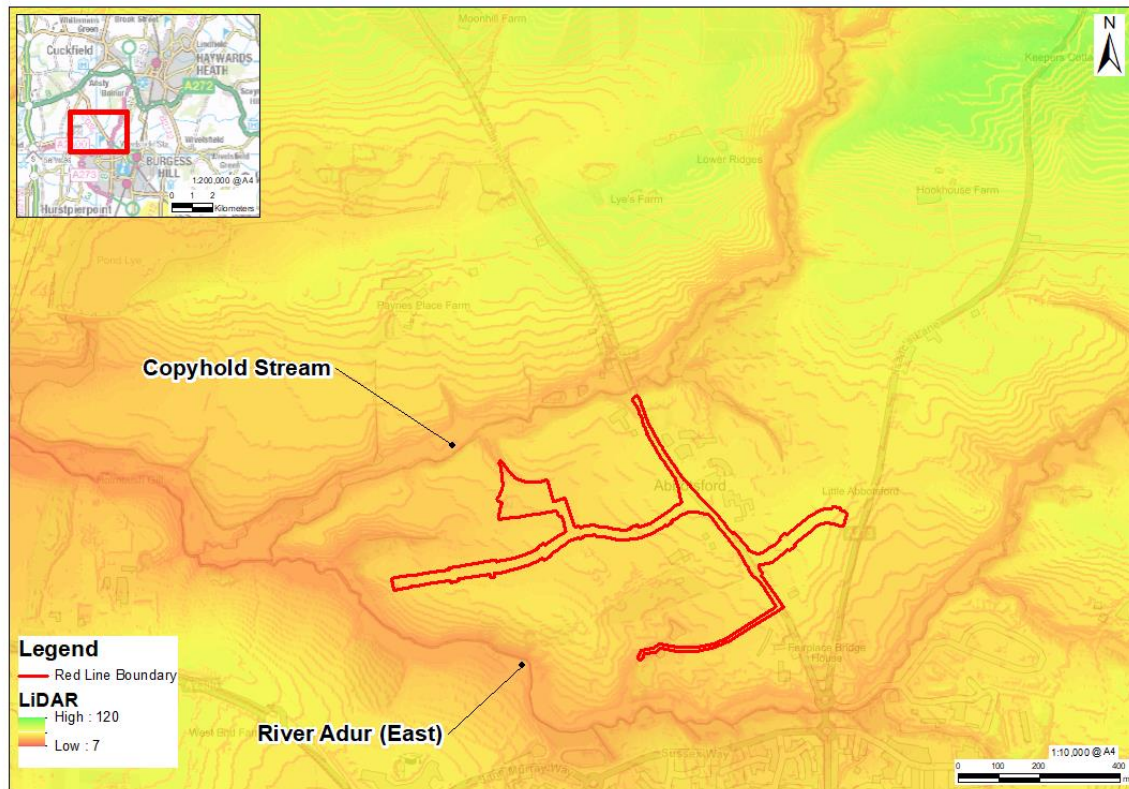


Figure 2-2: LiDAR of the Proposed Development and the surrounding area

2.3 Geology and Hydrogeology

- 2.3.1 The British Geological Survey³ (BGS) website identifies the bedrock of the Site is predominately sands and clays from the Wealden Group Formation of Cretaceous age. Table 2-1 provides a summary of the superficial and bedrock units underlying the Site.

Table 2-1: Geological Setting and Description

Geological Strata	Distribution	Formation Description
Bedrock		
Weald Clay Formation	Directly underlie the majority of the Site.	Mudstone
Weald Clay Formation	Localised elongated outcrop in the western part of the Site associated with the River Adur (East)	Clay-ironstone
Horsham Stone Member	Elongated outcrop in the northern part of the Site.	Sandstone
Superficial		

³ BGS Geology Viewer. BGS website. <https://geologyviewer.bgs.ac.uk/> accessed October 2023

Geological Strata	Distribution	Formation Description
Alluvium	Localised outcrop to the north of the Copyhold Stream	Clay, silt, sand and gravel. Can also contain peat and basal gravel.
River Terrace Deposits	Localised outcrops associated with the Copyhold Stream and River Adur (East)	Sand and gravel

2.3.2 According to the Soilscales maps⁴, soil conditions are described as ‘slowly permeable, seasonally wet, slightly acid but base rich loamy and clayey soils’ and ‘slightly acid loamy and clayey soils with impeded drainage’.

2.3.3 The Groundwater Aquifer Designation Map⁵ provides a summary of the hydrological properties of the anticipated geology underlying the Site (Table 2-2) and indicates the presence of aquifers within the Bedrock Superficial Deposits underlying the Site. As described by the EA:

- Principal and Secondary aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.
- Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers.
- Secondary Undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.

Table 2-2: EA Classification and Anticipated Aquifer Potential for Strata Underlying the Site

Geological Strata	Hydrogeological Significance	Anticipated Aquifer Potential
Weald Clay Formation	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.	Unproductive Strata
Weald Clay Formation		
Horsham Stone Member	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Has the potential to transmit water due to the permeable layers associated with the Secondary Aquifer.	Secondary A Aquifer
Alluvium	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Has the potential to transmit water due to the permeable layers associated with the Secondary Aquifer.	Secondary A Aquifer
River Terrace Deposits		

2.3.4 A Ground Investigation was carried out between August and October 2023. A more detailed description is provided within the Ground Investigation Report. Table 2-3 records the minimum and maximum depth to groundwater at selected boreholes in close proximity to the Proposed Development. The lowest minimum recorded level across these boreholes was 1.31 metres below ground level (mbgl) in the shallow installation at Borehole 2 near the River Adur (East).

Table 2-3: Ground Investigation Results for selected boreholes

Borehole ID	Installation Depth	Depth to water (mbgl)	
		Minimum	Maximum
BH02	Shallow	1.31	1.46
BH02	Deep	2.20	3.67
BH05	Shallow	1.52	1.52
BH05	Deep	1.60	1.83

⁴ Soilscales Viewer. LANDIS website. [LANDIS - Land Information System - Soilscales soil types viewer](https://landis.gov.uk/landis-soilscales-soil-types-viewer) accessed October 2023

⁵ BGS Aquifer Maps available via Defra Magic Map <http://magic.defra.gov.uk/MagicMap.aspx> accessed July 2023

Borehole ID	Installation Depth	Depth to water (mbgl)	
		Minimum	Maximum
BH08	Shallow	1.92	2.27
BH08	Deep	1.96	2.99
BH12	Shallow	1.98	2.31
BH12	Deep	5.31	5.51
BH15	Shallow	1.41	2.22
BH15	Deep	1.53	2.15
BH17	Shallow	1.36	2.20
BH17	Deep	1.68	2.58

2.4 Local Water Features

2.4.1 The following local water features in close proximity to the Proposed Development (Figure 2-3) have been identified through the EA Statutory Main River Map⁶, OS Open Rivers⁷ data and the inspection of OS 1: 10,000 mapping.

- The River Adur (East Branch), an EA Main River, flows to the west and south of the Site. The River Adur (East) drains a catchment area of approximately 167 km². The upper area of the catchment (the High Weald) is drained by a relatively dense network of small streams. Some of these small tributaries respond fairly rapidly to rainfall and run-off arrives at the River Adur relatively quickly;
- Copyhold Stream, a Lead Local Flood Authority (LLFA) Ordinary Watercourse and tributary of the River Adur (East), generally flows from north to south west to the north of Burgess Hill. The Stream flows from north east to south west in close proximity to the northern Masterplan Site boundary and directly adjacent and parallel with the CS. The Copyhold Stream forms a confluence with the River Adur approximately 60m north east of Western End north of the A2300;
- A number of small lakes/ ponds to the south of the Site at the Burgess Hill Golf Centre.

2.4.2 There is limited information available in regards to land drainage ditches and ponds within the Site boundary.

⁶ Environment Agency, Statutory Main River Map <https://www.data.gov.uk/dataset/4ae8ba46-f9a4-47d0-8d93-0f93eb494540/statutory-main-river-map> accessed October 2023

⁷ Ordnance Survey, OS Open Rivers <https://www.ordnancesurvey.co.uk/products/os-open-rivers> accessed October 2023

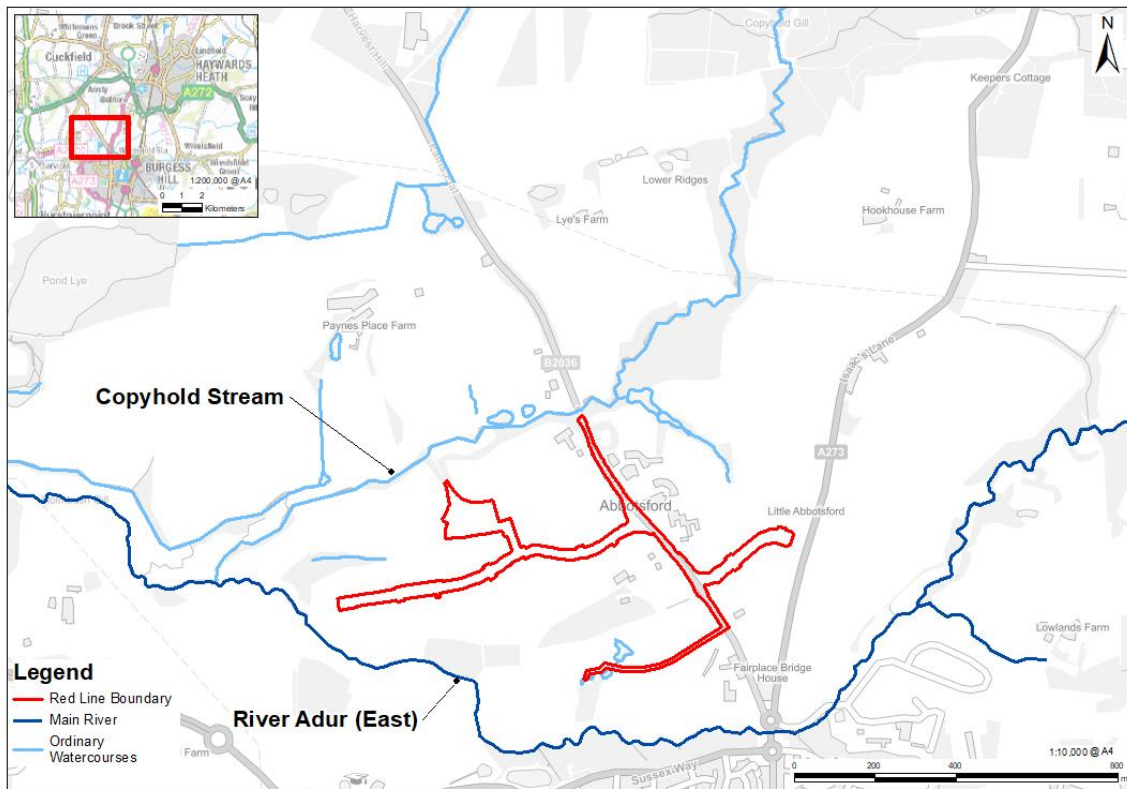


Figure 2-3: Local Water Features

2.5 Current Flood Risk Management

Flood Defences

- 2.5.1 Through a review of the AIMS Spatial Flood Defence Database⁸, natural high ground is present on both the left and right bank of the River Adur (East). There are no other formal flood defences in close proximity to the Site.

Flood Alert and Warning Areas

- 2.5.2 The Site is not located within a Flood Alert Area⁹ or a Flood Warning Area¹⁰.

⁸ 'AIMS Spatial Flood Defences including Standardised Attributes' available at: <https://www.data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes>, accessed October 2023.

⁹ Flood Alert Areas', available at: <https://environment.data.gov.uk/dataset/864c72de-d465-11e4-855f-f0def148f590>, accessed October 2023.

¹⁰ 'Flood Warning Areas', available at: <https://www.data.gov.uk/dataset/0d901c4a-6e1a-4f9a-9408-73e0c1f49dd3/flood-warning-areas>, accessed October 2023.

3. Development Proposals

3.1 Proposed Development

- 3.1.1 Brookleigh comprises a strategic site of 183.7 ha to the north of Burgess Hill, lying between Bedelands Nature Reserve on the east side of Burgess Hill and the Goddard's Green Wastewater Treatment Works to the west. The Site is located approximately 1.5 miles to the north of Burgess Hill town centre and lies in the District of Mid-Sussex in West Sussex. Burgess Hill is Mid-Sussex District's second largest town after Haywards Heath.
- 3.1.2 The Northern Arc Avenue has been aligned in response to the wider proposed development as secured at outline and consented in 2019, and in response to the Site constraints.
- 3.1.3 The CS continues from WBLR starting east of the Western Bridge and is formed of a 3m shared footpath and cycleway to the north side, a 2.75m verge, a 6.5m carriageway, a 2.75 verge and a 2m footway to the south side.
- 3.1.4 The Northern Arc Avenue includes a reconfiguration of the existing Cuckfield Road resulting in the realignment of the route and two proposed junctions. A more detailed description is provided within the Design and Access Statement and a selection of General Arrangement drawings are included in Appendix B.
- 3.1.5 West of Isaacs's Lane Junction, the road is formed of a 3m shared footpath and cycleway to the north side, a 2.75 verge, a 6.5m carriageway, a 2.75 verge and a section of the Green Super Highway consisting of a 3m segregated cycleway and a 2m footway to the south side.

Planning Context

- 3.1.6 Policy DP9 of the Mid Sussex District Plan¹¹ allocates the Brookleigh Site for a residential-led mixed use development comprising approximately 3,500 homes and associated new neighbourhood centres, including retail, education, health, employment, leisure, recreation, and community uses.

3.2 Proposed Development Lifetime

- 3.2.1 The PPG² indicates a development lifetime of at least 75 years is likely to form a starting point for assessment for a non-residential development.

3.3 Proposed Site Levels

- 3.3.1 The ground levels across the Site will be altered as part of the Proposed Development to allow for the two proposed junctions and the realignment of the Cuckfield Road.
- 3.3.2 The proposed ground levels do not vary significantly from those of the existing Site with the road being constructed at grade. The section of road from the WBLR gradually slopes upwards from 22.5mAOD to 28.5mAOD at the proposed junction onto Cuckfield Road. To the north of this junction, the ground levels vary between 28.5 and 29mAOD. To the south of the junction, the levels vary between 28 and 29mAOD. The levels drop to approximately 27.7mAOD at the proposed junction redevelopment towards Issacs Lane with the proposed road to the east varying in ground level from 29.5 – 30.5mAOD.

4. Planning Policy and Guidance

4.1 National Planning Policy

- 4.1.1 Section 14 of the NPPF¹ and the associated PPG² both advise how the planning process can take account of the risks associated with flooding. The main sources of flooding that are used to steer development at the planning stage are Main Rivers and the Sea. The predicted flood risk from these sources is shown on the EA's Fluvial and Coastal Flood Map for Planning (FMfP) which outlines three main zones of flood risk.
- 4.1.2 The EA Flood Map for Planning (Rivers and Sea) (Figure 5-1) indicates that the Site is located within Flood Zone 1.
- 4.1.3 Table 1 of the PPG² defines the EA Flood Zones as follows:
- Flood Zone 1 (Low Probability): Land having a less than 1 in 1,000 annual exceedance probability (AEP) of river or sea flooding (<0.1%) in any year;
 - Flood Zone 2 (Medium Probability): Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1% AEP); or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% - 0.1% AEP);
 - Flood Zone 3a (High Probability): Land having a 1 in 100 or greater annual probability (> 1% AEP) of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding (> 0.5% AEP); and
 - Flood Zone 3b (The Functional Floodplain): This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:
 - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
 - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). (The Functional Floodplain is not separately distinguished from Zone 3a on the Flood Map for planning).
- 4.1.4 Paragraph 173 (footnote 59) of the NPPF outlines that a site-specific FRA should be provided for all development located in Flood Zones 2 and 3, and for all sites that are greater than 1ha in Flood Zone 1. This FRA has been prepared in line with the requirements of the NPPF to meet this.

Sequential Test

- 4.1.5 Under the NPPF, the Sequential Test must be applied to all proposed development outside Flood Zone 1 (other than minor and permitted development or change of use). The NPPF states that: "The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding."
- 4.1.6 Where there are no reasonably available sites in Flood Zone 1 areas, Local Planning Authorities (LPAs) allocating land in Local Plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2 areas, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zone 1 or 2 areas should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.
- 4.1.7 As set out in paragraph 170 of the NPPF the Exception Test requires that:
- a. The development would provide wider sustainability benefits to the community that outweigh the flood risk; and,

- b. The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere and, where possible, will reduce flood risk overall.
- 4.1.8 Both elements of the test will have to be passed for development to be allocated or permitted.
- 4.1.9 Table 2 of the PPG², which presents flood risk vulnerability and flood zone compatibility, confirms that 'Less Vulnerable' Development is appropriate in Flood Zone 1 without the need for a Sequential or Exception Test.
- 4.1.10 The Brookleigh Site is allocated for development in the Mid Sussex District Plan¹¹ and it is considered that the Site has passed the Sequential Test as part of this allocation process.

Vulnerability Classification

- 4.1.11 The NPPF¹ considers the vulnerability of different types of development to flooding. The vulnerability classifications are detailed in Annex 3 of the NPPF.
- 4.1.12 Table 2 of the PPG² illustrates a matrix that identifies which vulnerability classifications are appropriate within each Flood Zone. The Cuckfield Road is a B class road, roads are not specifically listed in the vulnerability classifications. For the purposes of this assessment the Proposed Development is considered to be "Less Vulnerable" as it is most similar to the other development types (e.g. car parks) in the less vulnerable category and there are other access and evacuation routes for the new housing developments.

4.2 Regional Planning Policy

The West Sussex Plan (2017 – 2022)

- 4.2.1 The West Sussex Local Plan¹² sets out the vision for growth in the county, including how success in the area can be measured. One of the more relevant policies for the Proposed Development is to make areas of West Sussex a prosperous place by providing a sustainable and safe place to live for residents and providing children with the best start in life.
- 4.2.2 There are no matters of relevance to water resources, flood risk and drainage noted within the Plan however, in line with the NPPF, there is a presumption in favour of sustainable development.

West Sussex County Council Local Flood Risk Management Strategy (2013 – 2018)

- 4.2.3 The WSCC Local Flood Risk Management Strategy¹³ (LFRMS) 2013-2018 outlines the risks of flooding from surface water, groundwater and ordinary watercourses but also considers flooding from rivers and tidal sources. The strategy provides clarification on which authority is responsible for what in relation to the management of flood risk and sets out the role and responsibilities of WSCC as the LLFA. The review of the Draft LFRMS 2021-2026, which went out to public consultation in Autumn 2021, is currently paused, therefore at the time of assessment the 2013-2018 remains relevant to the Proposed Development.

West Sussex Preliminary Flood Risk Assessment (2011)

- 4.2.4 WSCC, in their role as LLFA, are responsible for undertaking the Preliminary Flood Risk Assessment¹⁴ (PRFA) report addressing local sources of flood risk, which are those solely from surface runoff, groundwater and ordinary watercourses, and in-combination effects. The PFRA is then used to inform the LFRMS which looks at all sources of flood risk. The aim of the PFRA is also to provide an assessment of local flood risk across the county, including information on past floods and the potential

¹¹ MSDC (2018) Mid Sussex District Plan <https://www.midsussex.gov.uk/media/3406/mid-sussex-district-plan.pdf>

¹² West Sussex County Council (2017) The West Sussex Plan https://www.westsussex.gov.uk/media/11856/the_west_sussex_plan.pdf

¹³ WSCC (2014) Local Flood Risk Management Strategy https://www.westsussex.gov.uk/media/1595/local_flood_risk_management_strategy.pdf

¹⁴ WSCC (2011) West Sussex Preliminary Flood Risk Assessment https://www.westsussex.gov.uk/media/1626/west_sussex_pfra.pdf

consequences of future floods. The report was published in 2011 with an addendum by WSCC in 2017¹⁴.

River Adur Catchment Management Plan (2009)

- 4.2.5 The role of Catchment Flood Management Plans (CFMPs) is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. The River Adur catchment is divided into nine distinct sub-areas which have similar physical characteristics, sources of flooding and level of risk. The Plan identifies the most appropriate approach to managing flood risk for each of the sub-areas and allocates one of six generic flood risk management policies.
- 4.2.6 The River Adur CFMP¹⁵ indicates Burgess Hill and the Proposed Development are located in Sub-area 2 – Burgess Hill and The Hassocks. The CFMP states *“there is currently a relatively low risk from river flooding in this sub-area, however a combination of surface water flooding, urban drainage problems and under capacity of local streams causes localised areas of combined fluvial and urban flooding. There is significant pressure for urban expansion and development in this sub-area. This development pressure combined with a future predicted increases in river flooding resulting from climate change are likely to cause a significant increase in flood risk for this sub-area”*.
- 4.2.7 Through policy option 4, it is the EA's vision to support economic and social sustainability by addressing the potential for greater flood risk in the future through taking action. Management activities will be developed to respond to the potential increases in flood risk.
- 4.2.8 Policy 4 - Areas of low, moderate, or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

“This policy will tend to be applied where the risks are currently deemed to be appropriately managed, but where the risk of flooding is expected to significantly rise in the future. In this case we would need to do more in the future to contain what would otherwise be increasing risk. Taking further action to reduce risk will require further appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options”.

West Sussex Policy for the Management of Surface Water¹⁶ (2018)

- 4.2.9 WSCC, as the LLFA, is required to provide consultation responses on the surface water drainage provisions associated with major development. This policy statement comprises 10 Sustainable Drainage Systems (SuDS) policies that set out the requirements that the LLFA has for drainage strategies and surface water management provisions associated with applications for development. The SuDS policies are summarised in Table 4-1 below.

Table 4-1 West Sussex SuDS Policies

Policy	Summary
SuDS Policy 1: Follow the drainage hierarchy	1. Surface runoff not collected for use must be discharged according to the following discharge hierarchy: • to ground, • to a surface water body, • to a surface water sewer, highway drain, or another drainage system, or • to a combined sewer where there are absolutely no other options, and only where agreed in advance with the relevant sewage undertaker. 2. The selection of a discharge point should be clearly demonstrated and evidenced.
SuDS Policy 2: Manage Flood Risk Through Design	1. The drainage scheme proposed is to: a. protect people and property on the development site from flooding; and, b. avoid creating any additional flood risk outside of the development in any part of the catchment, either upstream or downstream.

¹⁵ Environment Agency (2009). River Adur Catchment Flood Management Plan https://ww3.brighton-hove.gov.uk/sites/brighton-hove.gov.uk/files/SP0042%20AdurCFMP%20Main%20report%202008_0.pdf

¹⁶ WSCC (2018) West Sussex LLFA Policy for the Management of Surface Water https://www.horsham.gov.uk/data/assets/pdf_file/0019/65017/West-Sussex-Surface-Water-Management-Policy.pdf

Policy	Summary
	- Any drainage scheme must manage all sources of surface water, including exceedance flows and surface flows from offsite, provide for emergency ingress and egress and ensure adequate connectivity. - For large sites where development is to be phased, there will need to be a strategic site surface water management system that allows different parts of the site to be developed at different times while ensuring that each of the design criteria can be met.
SuDS Policy 3: Mimic Natural Flows and Drainage Flow Paths	- Drainage schemes should be designed to match greenfield discharge rates and follow natural drainage routes as far as possible; pumps should therefore not form part of drainage schemes. - Greenfield runoff should be calculated from the Institute of Hydrology 124 Method¹⁷ (IH124) or a similar approved method. SAAR (Standardised Annual Average Rainfall) and any other rainfall data used in run-off storage calculations should be based upon Flood Estimation Handbook (FEH) rainfall values.
SuDS Policy 4: Seek to Reduce Existing Flood Risk	- New development should be designed to take full account of any existing flood risk, irrespective of the source of flooding. - Where a site or its immediate surroundings have been identified to be at flood risk, all opportunities to reduce the identified risk should be investigated at an early stage and subsequently incorporated at the detailed design stage.
SuDS Policy 5: Maximise Resilience	- The design of the drainage system must account for the likely impacts of climate change and changes in impermeable area over the design life of the development. Appropriate allowances should be applied in each case. - A sustainable drainage approach which considers control of surface runoff at the surface and at source is preferred and should be considered prior to other design solutions. - Culverting an existing watercourse should only be considered if there is no feasible alternative.
SuDS Policy 6: Design to be Maintainable	- A drainage scheme Management and Maintenance Plan should be prepared which demonstrates the function of the drainage system and a schedule of activities, access points, outfalls, and any biodiversity considerations. - The Management and Maintenance Plan should also include an indication of the adopting or maintaining authority or organisation and may require inclusion within a register of drainage features.
SuDS Policy 7: Safeguard Water Quality	- When designing a surface water management scheme, full consideration should be given to the system's capacity to remove pollutants and to the cleanliness of the water being discharged from the site, irrespective of the receiving system. - Interception of small rainfall events should be incorporated into the design of the drainage system.
SuDS Policy 8: Design for Amenity and Multi-Functionality	Drainage design should from the outset consider opportunities for inclusion of amenity and biodiversity objectives and thus provide multi-functional use of open space with appropriate design for drainage measures within the public realm.
SuDS Policy 9: Enhance Biodiversity	Drainage design should from the outset consider opportunities for biodiversity enhancement, through optimising the scope for surface systems, consideration of connectivity to adjacent water bodies or natural habitats, and appropriate planting specification.
SuDS Policy 10: Link to Wider Landscape Objectives	Drainage design should from the outset consider opportunities to contribute to the wider landscape and ensure proposals are coherent with the surrounding landscape character area.

West Sussex LLFA Culvert Policy

- 4.2.10 The Culvert Policy¹⁸ is an explanation of the agreed West Sussex County Council (LLFA) and District Council policy regarding the culverting of ordinary watercourses, and a guide to good practice and design principles.
- 4.2.11 West Sussex Local Authorities are in general opposed to the culverting of watercourses because of the potential for adverse effect on flood risk and ecology. The Competent Authority will therefore adopt a precautionary principle and only approve an application to culvert an ordinary watercourse if there is

¹⁷ Marshall, D.C.W & Bayliss, A.C (1994) Institute of Hydrology Report No. 124 Flood estimation for small catchments

¹⁸ WSSC (unknown) West Sussex LLFA Culvert Policy https://www.westsussex.gov.uk/media/10342/llfa_culvert_policy.pdf

no reasonably practicable alternative or if the potential negative impact of culverting would be so minor that they would not justify a more costly alternative.

4.2.12 A culvert will not be considered until alternatives have been considered, for example:

- Clear span bridges.
- Revision of the site layout to incorporate an open watercourse that can be easily maintained; or
- Diverting the watercourse without loss of its hydraulic flow characteristics.

4.2.13 In all cases and where it is appropriate to do so, compensation in full is to be provided for any loss in storage capacity or habitat.

4.2.14 The removal of culverts is actively encouraged by the council when:

- Removing the culvert is physically possible, and no ecological or historical damage will result.
- Flood risk may be reduced and a more natural flow regime restored; or
- The local environment would be enhanced significantly.

4.3 Local Planning Policy

Mid Sussex District Plan 2014 – 2031

4.3.1 MSDC adopted the Mid Sussex District Plan¹¹ 2014-2031 as a Development Plan Document in March 2018. The Plan will shape the future of Mid Sussex up to 2031 by providing a framework for new development, employment growth, infrastructure, and measures to ensure the protection of the countryside.

4.3.2 The Plan seeks that development is viewed positively to help communities maintain a high quality of life, increase economic prosperity, and protect the environment to meet current needs and the needs of future generations.

4.3.3 There are 15 key strategic objectives that feed into the planning vision for the Mid Sussex district. One of the key district strategic objectives is *“to promote development that makes the best use of resources and increases the sustainability of communities within Mid Sussex, and its ability to adapt to climate change”*.

4.3.4 The relevant district wide policies with regards to flood risk and drainage include:

- **DP7: General Principles for Strategic Development at Burgess Hill** – The policy states *“All strategic development at Burgess Hill is required to support the general principles set out in the policy”*. There is however, no general principle that focuses specifically on flood risk or surface water management. The policy does however highlight *“strategic development will identify and respond to environmental, landscape and ecological constraints”*:
- **DP9: Strategic allocation to the north and north-west of Burgess Hill** - The Allocation-wide Phasing Strategy will “set out the proposed phasing of the Strategic Allocation Area, including the relevant land uses and infrastructure delivery for each phase, including:
 - *Appropriate landscaping and safe design of balancing ponds and water/drainage features.*
 - *Respond to ecological constraints, topography, flooding issues and landscaping features; and*
 - *Taking account of on-site flood plains and avoiding areas of current and future flood risk through a sequential approach to site layout to comply with Policy DP41: Flood Risk and recommendations in the Mid Sussex Strategic Flood Risk Assessment”*.
- **DP39: Sustainable Design and Construction** - All development proposals must *“seek to improve the sustainability of development and should, where appropriate and feasible, according to the type and size of development and location, demonstrate how the risks associated with*

future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience”.

- **DP41: Flood Risk and Drainage** – This proposal states:
 - *Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The District Council’s Strategic Flood Risk Assessment (SFRA) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs.*
 - *Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates.*
 - *Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. Arrangements for the long term maintenance and management of SuDS should also be identified..*
 - *For the redevelopment of brownfield sites, any surface water draining to the foul sewer must be disconnected and managed through SuDS following the remediation of any previously contaminated land.*
 - *SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.*
 - *The preferred hierarchy of managing surface water drainage from any development is:*
 - i. *Infiltration measures.*
 - ii. *Attenuation and discharge to watercourses; and if these cannot be met,*
 - iii. *Discharge to surface water only sewers.*
- Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies.

Burgess Hill Neighbourhood Plan (2015-2031)

- 4.3.5 The Burgess Hill Neighbourhood Plan¹⁹ was adopted in 2016 and aims to focus on community development and provide the framework to deliver benefits for residents, businesses, and visitors. The Plan provides clarity to communities, landowners, and other interested parties on how the town of Burgess Hill will improve and transform for the benefit of existing future and population.
- 4.3.6 There are no policies directly relating to water resources, flood risk and drainage; however, Core Objective 1 states the Plan aims to “*Promote sustainable and well-designed development in the right location taking into account the character and amenity of the local area*”.

Ansty, Staplefield & Brook Street Neighbourhood Plan (2015-2031)

- 4.3.7 The Ansty, Stapleford and Brook Street Neighbourhood Plan²⁰ was adopted in 2017 and aims to focus on community development and provide the framework to deliver benefits for residents, businesses, and visitors. The Plan establishes a vision for the future of the parish and sets out how that vision will be realised through planning and controlling land use and development change over the plan period 2015 to 2031.

¹⁹ Burgess Hill Town Council (2016) Burgess Hill Neighbourhood Plan 2015 – 2031 <https://www.midsussex.gov.uk/media/2759/burgess-hill-neighbourhood-plan.pdf>

²⁰ Ansty and Staplefield Parish Council (2017) Ansty, Staplefield and Brook Street Neighbourhood Plan 2015 – 2031 <https://www.midsussex.gov.uk/media/2728/ansty-staplefield-and-brook-street-parish-neighbourhood-plan.pdf>

- 4.3.8 There are no policies directly relating to water resources, flood risk and drainage; however, the plan notes that the Mid-Sussex Local District Plan covering the period to 2031 is a material consideration and has provided much of the strategic context for the neighbourhood plan.

Mid Sussex District Council Level 1 Strategic Flood Risk Assessment²¹

- 4.3.9 The MSDC Level 1 SFRA was completed in 2015 as an update to the 2008 SFRA. The SFRA should enable decision makers to fully understand the flood risk in the area by identifying the areas that are at risk from all forms of flooding, now and in the future, taking account of the impacts that climate change and development will have on flood risk in Mid Sussex. This SFRA forms part of the evidence used in the development of the Mid Sussex District Plan¹¹ 2014 – 2031 which provides a framework, vision and delivery strategy for development in the District and has informed the Sequential Test and Sustainability Appraisals.

4.4 Other Relevant Policy, Standards and Guidance

Water, People, Places

- 4.4.1 AECOM produced 'Water, People, Places²² - a guide for master planning sustainable drainage into developments' with LLFAs in South East England. The document considers designing SuDS that will deliver benefits, will be appropriate to site conditions and the incorporation of the master planning process.

Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)

- 4.4.2 The Non-Statutory Technical Standards for Sustainable Drainage Systems produced by Department for Environment, Food & Rural Affairs (DEFRA)²³ represent the current guidance for the design, maintenance, and operation of SuDS. The standards set out that peak runoff rates from development sites should be as close as is reasonably practicable to the greenfield rate but should never exceed the pre-development runoff rate.
- 4.4.3 The standards also set out that drainage systems should be designed so that flooding does not occur on any part of a site for a 1 in 30 year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100 year rainfall event.
- 4.4.4 It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.

Environment Agency Climate Change Guidance

- 4.4.5 In accordance with the PPG², it is recommended that the potential effects of climate change should be considered realistically for the lifetime of a proposed development.
- 4.4.6 The EA has updated its climate change guidance²⁴ setting out how risk management authorities can account for climate change within their flood and coastal erosion risk management investment decisions. This latest guidance published in February 2016 and updated in May 2022 uses UK Climate Projections (UKCP18) data, to produce more representative climate change allowances for England.
- 4.4.7 The current guidance includes predictions of anticipated change for:
- Peak river flow by river basin district;
 - Peak rainfall intensity;

²¹ MSDC (2015) Strategic Flood Risk Assessment Level 1 <https://www.midsussex.gov.uk/media/2609/strategic-flood-risk-assessment.pdf>

²² AECOM Ltd (2013) Water. People. Places - a guide for master planning sustainable drainage into developments

²³ Department for Environment, Food and Rural Affairs, (2015) Non-statutory Technical Standards for Sustainable Drainage Systems <https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf>

²⁴ Environment Agency (2022) Flood Risk Assessments: Climate Change Allowances <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

- Sea level rise; and
- Offshore wind speed and extreme height.

4.4.8 The allowances for peak rainfall and river flood flows will depend on the flood zone of the proposed development, the vulnerability classification and the expected lifetime. Allowances for river flow are further determined based on the management catchment area in which the Proposed Development is located. The CS is located within the Adur and Ouse Management Catchment.

Peak River Flow Allowances

4.4.9 The allowances for peak river flow are based on the river catchment (management) area and the epoch (a period of time). Table 4-2 provides the climate change allowances for peak river flow for the Adur and Ouse Management Catchment.

Table 4-2: Extract from Adur and Ouse Management Catchment peak river flow allowances²⁵.

Epoch	Central	Higher	Upper
2020s	16%	23%	40%
2050s	18%	28%	57%
2080s	37%	55%	107%

4.4.10 Hydraulic modelling for the River Adur (located to the south and west of the CS Site) and Copyhold Stream (located to the north of the CS Site) was undertaken as part of the OPA for the wider Brookleigh site. The upper end climate change allowance of 105% (based on previous climate change allowances) was used to assess flood risk from fluvial sources.

4.4.11 As the Proposed Development is located in Flood Zone 1 and classed as Low Vulnerability development the CS Site should be assessed using the Central Allowance (37%), therefore the modelled climate change flood water levels (presented in Table 5-1) provide a worst case scenario in terms of fluvial flooding over the lifetime to the development.

Peak Rainfall Intensity Allowances

4.4.12 The allowances for peak rainfall are based on the area and the epoch (a period of time) and are based on percentiles. A percentile describes the proportion of possible scenarios that fall below an allowance level. Table 4-3 provides the climate change allowances for peak river flow for the Adur and Ouse Management Catchment. EA guidance²⁴ indicates the upper end allowance should be used for developments with a lifetime beyond 2100.

Table 4-3: Extract from Adur and Ouse Management Catchment peak rainfall allowances²⁶.

Epoch	Central	Upper
2050s	20%	45%
2070s	25%	45%

4.4.13 The AECOM Regional Surface Water Masterplan²⁷, approved as part of the Outline Planning Application for Brookleigh, uses a climate change allowance of 40% which was accurate at the time of writing. Condition 22b of the OPA states that the surface water drainage design should “*demonstrate that the surface water drainage system will be able to cater for a 1 in 100 year storm event + 40% climate change*” therefore the 40% allowance will be used.

²⁵ 'Adur and Ouse Management', Environment Agency, available at: <https://environment.data.gov.uk/hydrology/climate-change-allowances/river-flow?mgmtcatid=3000>, accessed October 2023.

²⁶ 'Adur and Ouse Management', Environment Agency, available at: <https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3000>, accessed October 2023.

²⁷ AECOM (2021) Regional Surface Water Masterplan [60610807-ACM-XX-XX-RP-DR-10002]

5. Flood Risk to the Proposed Development

5.1 Overview

- 5.1.1 This section of the FRA assesses the flood risk posed to the Proposed Development from rivers and the sea; directly from rainfall on the ground surface; rising groundwater; overwhelmed sewers and drainage systems; and from reservoirs, canals and lakes and other artificial sources. Following the assessment of each source in turn, it identifies where further mitigation measures are needed.

5.2 Tidal Flooding

- 5.2.1 Tidal sources of flooding include seas and estuaries. Flooding from these sources can occur through overtopping of defences, breaching of defences and wave action.
- 5.2.2 The Site is not situated in a coastal location and none of the identified surface water features are tidally influenced. The Site is not at risk from tidal flooding therefore flooding from this source is not assessed further within this FRA.

5.3 Fluvial Flooding

- 5.3.1 Flooding from fluvial sources can occur through inundation of floodplains from watercourses, inundation of areas outside the floodplain due to the influence of bridges, embankments and other features that artificially raise water levels; overtopping of defences; breaching of defences; blockages of culverts; and blockages of flood channels, or flood corridors.

Historic Flooding

- 5.3.2 Historical records of flooding in Burgess Hill, noted in the River Adur CFMP¹⁵, show flood events occurred in 1974 (fluvial and road flooding), 1979, and 2004. It is not known if any of these flood events occurred in close proximity to the Site. The CFMP states that “a lack of channel capacity can cause localised fluvial flooding in Burgess Hill”. MSDC believe the existing B2036 highway bridge over the River Adur can act as a restriction to the flow, and historically the river has flooded over the bridge.

Fluvial Flood Risk

- 5.3.3 The River Adur (East) and the Copyhold Stream present a potential source of flooding to the Site. The EA's Flood Map for Planning shows that the Site is located within Flood Zone 1 (Figure 5-1), and thus at a low risk of flooding due to fluvial sources. From a review of the Flood Map for Planning, it is evident that the flood risk associated with both the River Adur (East) and Copyhold Stream is confined to areas within the channel and its immediate surroundings. Due to the topography of the Site being raised above the river channel level, there is no pathway to the Proposed Development.
- 5.3.4 Modelled flood levels for Copyhold Stream have been taken from the Hydraulic Modelling of the River Adur, Copyhold Stream and World's End Stream²⁸ (Base Study) undertaken by Stuart Michael Associates Limited in June 2017 (Appendix C).
- 5.3.5 Flood extent mapping using the model outputs has been undertaken and is presented in Figure 5-2. The mapping shows that the 1% AEP flood extent with a 105% climate change allowance does not extend into the Red Line Boundary apart from where the B2036 crosses the Copyhold Stream. Flood water levels for selected model nodes along the reach of the Copyhold Stream located upstream and downstream of this crossing are presented in Table 5-1. The modelled flood water levels for all the model nodes along Copyhold Stream are presented in Appendix D.

²⁸ Stuart Michael Associates Limited (2017) Hydraulic Modelling of the River Adur, Copyhold Stream and World's End Stream (Base Study)

- 5.3.6 Modelled flood water levels in proximity of the crossing range from 21.1 – 21.44m AOD for a 1% AEP (1 in 100) flood event. Water levels increase to 20.81 – 22.45m AOD when climate change (105%) is taken into account over the lifetime of the development. The topographic survey (Appendix A) shows the lowest elevation of the existing road at the crossing is 24.65m AOD. The maximum modelled fluvial level for the 1% AEP flood event with an allowance for climate change (105%) is 22.45m AOD, therefore the road is not at fluvial flood risk. The proposed works at this location will be contained within the existing highway corridor and will be limited to traffic calming measures so there will be no increase in impermeable area and therefore no increase in flood risk to the Proposed Development.
- 5.3.7 The upper end climate change allowance of 105% has been used in the modelling to assess flood risk from fluvial sources as opposed to the current allowance of 107%. Figure 5-2 shows the road is comfortably set back from the flood extent using the 105% climate change allowance, therefore the 2% increase is not expected to make a significant difference. The maximum modelled fluvial level for the 1% AEP flood event is 21.40m AOD and for the 1% AEP with an allowance for climate change (105%) is 22.45m AOD, as difference of 1.05m AOD. As described above, the lowest elevation of the existing road at the crossing is 24.65m AOD, therefore the increased climate change allowance of 107% is unlikely to increase the level to cause any flood risk to the road.

Table 5-1: Fluvial Modelled Levels (mAOD) for Copyhold Stream

Node Name	Return Period			
	4% AEP (1 in 25)	1% AEP (1 in 100)	0.1% AEP (1 in 1000)	1% AEP + 105% cc
CHS 20	21.16	21.40	21.99	22.45
CHS 19	21.18	21.44	21.99	22.45
CHS 18	21.00	21.14	21.17	21.46
CHS 17	21.02	21.19	21.47	20.81
CHS 16	20.97	21.13	21.39	21.52
CHS 15	20.92	21.10	21.38	21.52

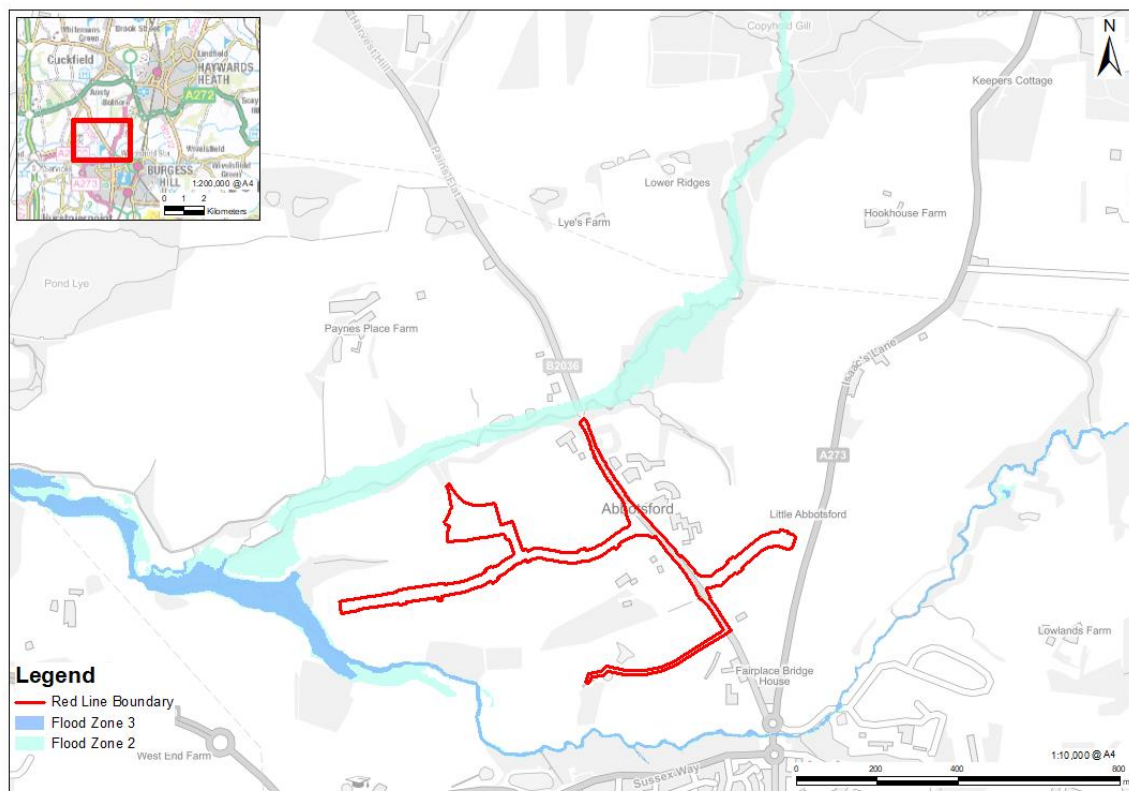


Figure 5-1: Environment Agency Flood Map for Planning

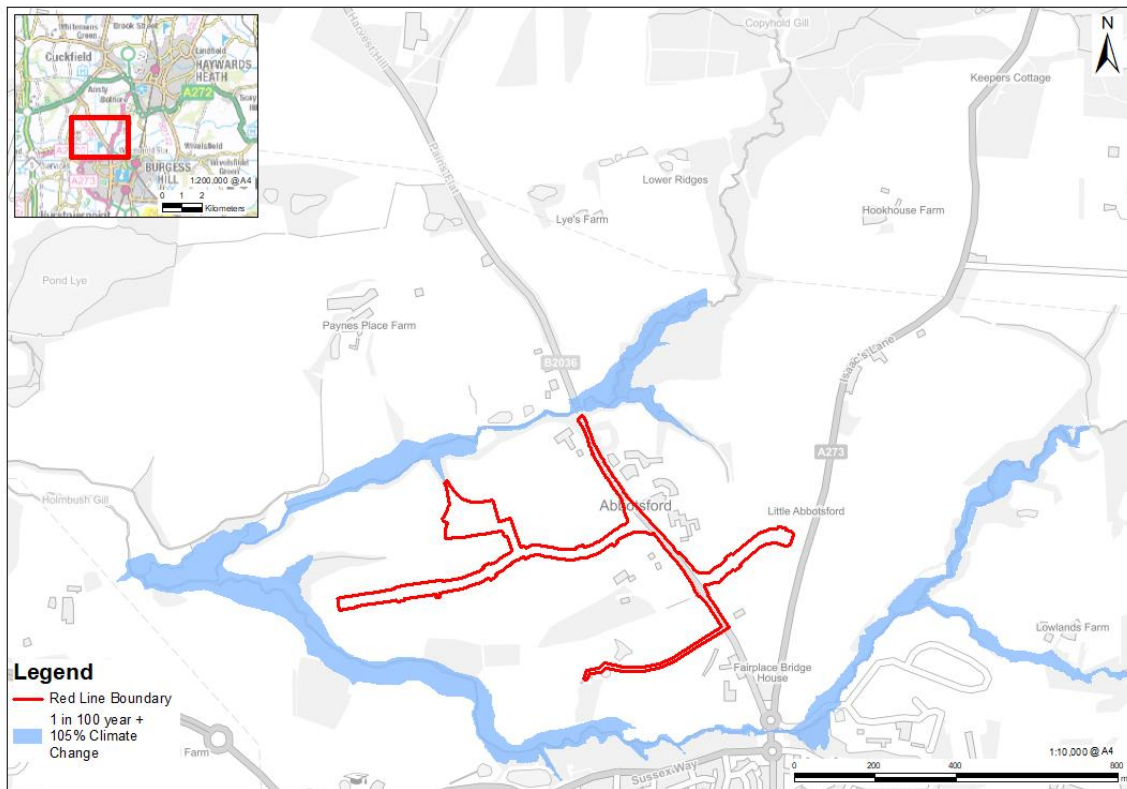


Figure 5-2: Mapped Flood Extent for the 100 year + 105% Climate Change Allowance (River Adur, Copyhold Stream and World's End Stream) (Base Study), 2017)

- 5.3.8 It has been assessed that fluvial flood risk to the Proposed Development is **Low** from the Copyhold Stream and **Very Low** from the River Adur (East), and no further mitigation is required.

5.4 Surface Water Flooding

- 5.4.1 Surface water flooding results from rainfall that fails to infiltrate into the ground and ponds or flows over the surface. This is exacerbated by low permeability urban development or low permeability soils and geology (such as clayey soils). Developments located on or adjacent to sites with steep slopes are often at greater risk.

Historic Flooding

- 5.4.2 The WSCC LFRMS¹³ indicates Burgess Hill is a residential area susceptible to surface water flooding due to being a heavily urbanised environment, with 2500 properties at risk. Information provided in the River Adur CFMP¹⁵ notes that Burgess Hill experiences flooding once or twice a year from surface water likely caused by under capacity or blockages in the urban drainage network. This is most severe in the east of the town where water is slow to drain away out to the west of the railway line. During some of the worst surface water flooding in 2004, approximately 8 houses and gardens were inundated to up to one metre with the water remaining for a few hours. In addition, a number of commercial buildings were affected and passage along one of the busy two east/west routes in the town was also difficult.
- 5.4.3 The EA hold no record of previous surface water flooding events affecting the Site; however, WSCC have identified historic records of isolated surface water flooding around Bridge Hall Farm located off Cuckfield Road¹¹.

Surface Water Flood Risk

5.4.4 The EA's Risk of Flooding from Surface Water²⁹ (RoFSW) map indicates areas at risk from surface water flooding when rainwater does not drain away through the normal drainage systems or soak into the ground, but instead lies on or flows over the ground. The RoFSW map (Figure 5-3) indicates that the majority of the Site is at very low risk of flooding from surface water. The EA delineates surface water risk into the four following categories:

- Very Low - each year, this area has a chance of flooding of less than 1 in 1,000 (<0.1%).
- Low - each year, this area has a chance of flooding of between 1 in 1,000 (0.1%) and 1 in 100 (1%).
- Medium - each year, this area has a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%); and
- High - each year, this area has a chance of flooding of greater than 1 in 30 (3.3%).

5.4.5 The Site areas affected generally correspond with the routes of the identified watercourses and minor drainage ditches present within the Site boundary. There are also some areas of surface water ponding associated with low topographical points across the Site. Areas at low to high risk of surface water flooding are included in Table 5-2. None of these flow paths cross the proposed road, therefore the surface water flow paths will not be affected by the Proposed Development.

Table 5-2: Surface Water Flooding Hotspots within the Site Boundary

Location	Risk of Flooding	Description
A) Cuckfield Road at the entrance to the Burgess Hill Golf Course	Low - High	Flow path on the eastern edge of the highway crosses Cuckfield Road.
B) Burgess Hill Golf Course	Low – High	Various surface water flow paths into the ponds with a flow path south to the River Adur (East).
C) Land to the south of the Copyhold Stream	Low - High	Various surface water flow paths and surface water pooling possibly associated with minor field drains. Flow path north to the Copyhold Stream and flow path west to the River Adur (East)

5.4.6 The Proposed Development will increase the impermeable area and therefore increase the rate of surface water runoff from the Site. In order to mitigate against possible flooding from this source it is proposed that SuDS measures would be incorporated into the design. The proposed drainage strategy for surface water management at the Site is outlined in Section 6.1.

5.4.7 It has been assessed that surface water flood risk to the Proposed Development is **Low**, with the embedded mitigation.

²⁹ Environment Agency (2019) "Learn more about flood risk", available at <https://check-long-term-flood-risk.service.gov.uk/map> accessed July 2023.

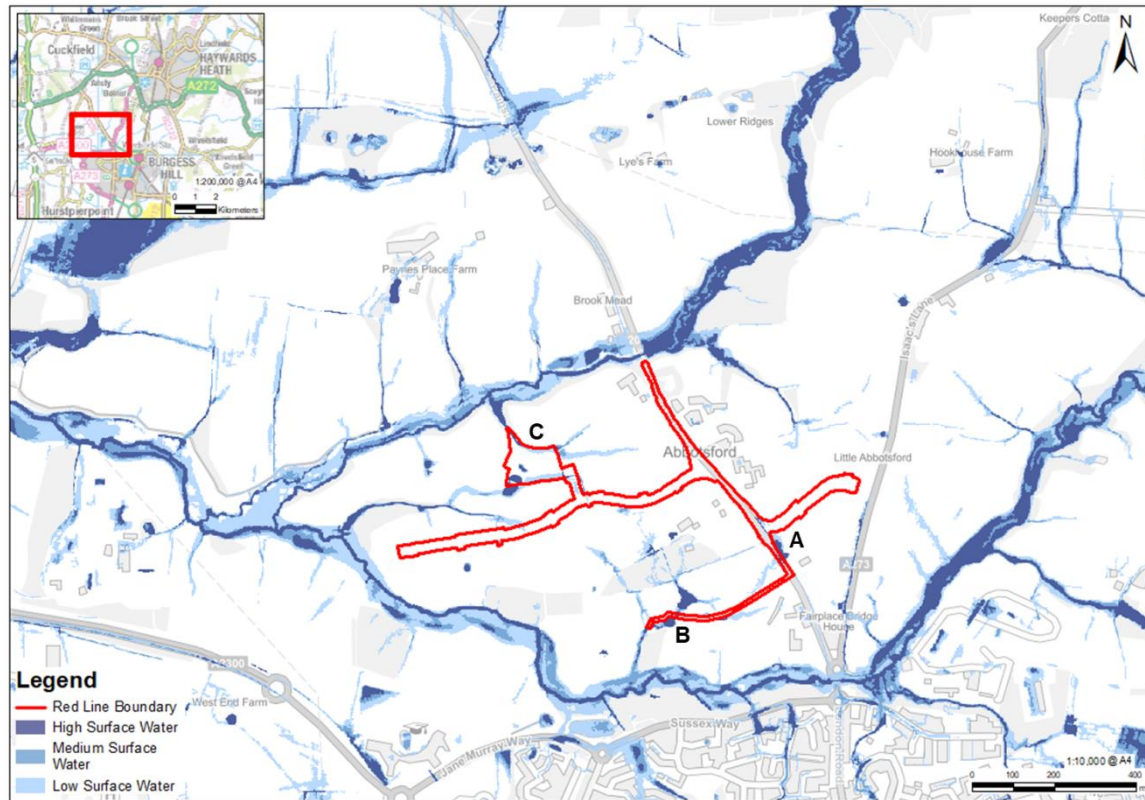


Figure 5-3: Environment Agency Risk of Flooding from Surface Water (October 2023)

5.5 Groundwater Flooding

- 5.5.1 Groundwater flooding can occur when the water table rises after prolonged rainfall and emerges at the ground surface. It is most likely to occur in low-lying areas underlain by permeable strata and can also occur in areas where groundwater levels are recovering after pumping has ceased for mining or industry, or where permeable strata are in connectivity with other flooding sources.
- 5.5.2 A review of the British Geological Survey (BGS) Viewer³⁰ identified no publicly available borehole logs located within the Site. BGS records to the south of the Site adjacent to the River Adur (East) show groundwater was encountered at 3 m below ground level (mbgl).
- 5.5.3 The Environmental Statement for the Outline Planning Application states the Copyhold Stream is likely to be in hydraulic continuity with groundwater within the superficial deposits of the Alluvium beneath the Site.
- 5.5.4 The MSDC SFRA²¹ contains no specific information on groundwater at the Site, however it indicates that the majority of the district is considered to have medium potential for groundwater flooding.
- 5.5.5 The presence of the Secondary A Aquifer beneath the Site presents a potential source of groundwater flooding to the Proposed Development. Groundwater vulnerability maps³¹ indicate the majority of the Site is unproductive. There is a localised outcrop of low vulnerability associated with the River Adur and Copyhold Stream. An outcrop of high vulnerability ground lies on the Cuckfield Road to the north of the Copyhold Stream.
- 5.5.6 The Site is predominately currently Greenfield with natural levels of infiltration and small existing areas of hardstanding along the Cuxham Road. The CS aims to follow the existing ground surface, with some areas being raised to account for surface drainage considerations and an amphibian / mammal crossing. As detailed in Section 2.3, a Ground Investigation recorded the highest groundwater level

³⁰ BGS Geology Viewer available via <https://mapapps2.bgs.ac.uk/geoindex/home.html> accessed October 2023

³¹ Groundwater Vulnerability Maps available via Defra Magic Map <http://magic.defra.gov.uk/MagicMap.aspx> accessed October 2023

across the boreholes in close proximity to the Proposed Development at 1.31m bgl in the shallow installation at Borehole 2 near the River Adur (East).

- 5.5.7 It has been assessed that groundwater flood risk to the Proposed Development is **Low**, and no further mitigation is recommended.

5.6 Sewer Flooding

- 5.6.1 Sewer flooding occurs when the sewer capacity becomes exceeded or where a blockage occurs causing the sewer to surcharge and flood.

Historic Flooding

- 5.6.2 The SFRA²¹ states that “the urban area of Burgess Hill is an area previously known to have experienced regular sewer flooding” while the LFRMS indicates “*The Worlds End area of Burgess Hill (north east part of the town) suffers from localised flooding problems resulting from overland flow and surcharging sewers during periods of heavy rainfall*”.
- 5.6.3 The Drainage Strategy and Maintenance Statement [60610807-ACM-XX-XX-RP-DR-000001] confirms there are currently no Southern Water sewers serving the Site.
- 5.6.4 There are no records of internal foul water flooding in the vicinity of the Site documented in the SFRA or PFRA¹⁴.
- 5.6.5 Given the rural nature of the Site location and limited infrastructure within the Site boundary, it is considered likely that the incidents of drainage infrastructure flooding are more related to the urbanised areas located within the wider vicinity in Burgess Hill and not the Site itself.
- 5.6.6 It has been assessed that sewer flood risk to the Proposed Development is **Low**, and no further mitigation is recommended.

5.7 Artificial Sources

- 5.7.1 Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs.

Flood Risk from Reservoirs

- 5.7.2 The Reservoir Act 1975 defines a large reservoir as one that holds over 25,000 cubic metres (m³) of water, although this is expected to be reduced to 10,000 m³ under a review into the safety legislation and regulation of reservoirs and is expected to be phased in by the EA once this comes into effect under the Flood and Water Management Act.
- 5.7.3 Reservoir failure can be particularly dangerous as it causes the release of large volumes of water at a high velocity, which can result in deep and widespread flooding. However, reservoir inspection and design procedures are very rigorous such that the probability of failure is generally regarded as extremely low.
- 5.7.4 In accordance with the EA's Longterm Flood Risk Map the Site is not located in an area at residual risk of failure or breach of a reservoir. In addition, the MSDC SFRA²¹ states that there have been no recorded incidents of reservoir flooding within the Burgess Hill area and the risk of flooding from this source is considered extremely unlikely due to the highly regulated nature of these structures. This further justifies the low risk of failure, and it has been assessed that the flood risk from reservoirs to the Proposed Development is **Very Low**, and no further mitigation is recommended.

Flood Risk from Canals

- 5.7.5 A review of Ordnance Survey mapping and aerial photography indicates that there are no canal systems within close proximity to the Site. It has been assessed that the flood risk from canals to the Proposed Development is **Very Low**, and no further mitigation is recommended.

5.8 Flood Risk During Construction

5.8.1 At this stage there are no details on the location of Site compounds or lay-down areas. Using the information gathered and reviewed as part of this assessment, it is considered that:

- There is a **Very Low** risk of flooding to operatives and machinery from tidal sources during construction.
- There is a **Low** risk of flooding to operatives and machinery from fluvial sources during construction.
- There is a **Medium** risk of flooding to operatives and machinery from pluvial sources (overland flow) during construction.
- There is a **Medium** risk of flooding to operatives and machinery from groundwater sources during construction where works are being undertaken below ground level. When works are being undertaken at ground level, the risk is **Low**. Groundwater may be encountered in excavations during construction of the any below ground structures at the Site, including construction of foundations, based on some of the groundwater levels encountered above. However, it is considered these can easily be dealt with through the use of a small pump and would not inflict groundwater flood risk to the Site during or after the construction phase.
- There is a **Low** risk of flooding to operatives and machinery from sewer sources during construction.

5.8.2 These risks will be considered and addressed further as part of the CEMP, once the construction details are known.

5.8.3 Mitigation measures are expected to include locating Site compounds and machinery in areas with the lowest probability of flooding and ensuring there is a procedure to evacuate the Site on receipt of a flood alert.

5.9 Summary of Flood Risk to the Proposed Development

5.9.1 Table 5-3 summarises the sources of flooding and their impact to the Proposed Development. It also identifies whether further mitigation is recommended.

Table 5-3: Summary of Flood Risk to the Proposed Development

Flood Mechanism	Source	Flood risk to the Proposed Development	Mitigation required?
Tidal	The Sea	None	No
Fluvial	Main River	Very Low	No
	Ordinary Watercourse	Low	No
Surface Water Flooding / Overland Flow	Runoff from surrounding land and hard surfaces	Low with embedded mitigation	No
Groundwater	Rising groundwater levels in the underlying geology	Low	No
Sewers	Surrounding public / private drainage systems	Low	No
Artificial Sources	Risk of flooding from reservoirs and canals	Very Low	No

6. Flood Risk from the Development

6.1 Fluvial Flood Risk

- 6.1.1 Based on the hydraulic modelling undertaken as part of the OPA and presented in Table 5-1, the CS Site remains in Flood Zone 1 over the lifetime of the Proposed Development. The risk of flooding from fluvial sources therefore remains low.
- 6.1.2 On the western section of the CS it is proposed to culvert a small section of an existing drainage ditch. This has potential to increase the risk of flooding should the capacity of the watercourse decrease or a blockage at the upstream end of the culvert occur. The proposed culvert will be designed in consultation with the LLFA, in line with requirements of the West Sussex Culvert Policy, and to ensure that the capacity of the ditch remains unchanged.

6.2 Surface Water Flooding

- 6.2.1 As the rainfall intensities and storm events are likely to increase under the climate change scenario, the risk of flooding from surface water, which is currently considered to be low, is expected to increase unless mitigation measures are included for the management of surface water drainage. Surface water drainage will be required to ensure that any increase in impermeable surface area compared to the existing site does not increase the risk of flooding from surface water, both on the Site and to the surrounding area. Therefore, design of the drainage infrastructure will need to take this into account in accordance with the NPPF and West Sussex policies.
- 6.2.2 A drainage strategy detailing how surface water runoff will be managed on-site post development is presented in Appendix E and summarised in Section 7. The strategy includes details on surface water attenuation, consideration of climate change, proposed restricted surface water run-off rates and discharge locations.
- 6.2.3 With the implementation of the Drainage Strategy for the Proposed Development the risk of flooding from surface water sources with consideration of climate change will remain a low risk.

6.3 Groundwater Flooding

- 6.3.1 The predicted increase in the wetness of winters and the intensity of storm events could impact groundwater level fluctuations across the Site, and possibly increase the level of the water table. As the likelihood of groundwater emergence under the climate change scenario is likely to increase, the potential for groundwater flooding to impact the Proposed Development may also increase.
- 6.3.2 The presence of hardstanding ground associated with the Proposed Development will create an impermeable barrier at the surface. This will prevent groundwater emergence across the Site. Therefore, the risk of groundwater flooding is considered to remain a low risk.

6.4 Sewer Flooding

- 6.4.1 It is difficult to precisely predict the impact of climate change on flooding from drainage infrastructure. However, with the projected increases in rainfall intensity, a greater amount of surface water runoff will be generated on site.
- 6.4.2 In order to account for this increase, new drainage systems will be required on site and will be designed to accommodate flows under climate change scenarios, incorporating SuDS where possible. A drainage strategy detailing how surface water runoff will be managed on-site post development is presented in Appendix E and summarised in Section 7.
- 6.4.3 The risk of flooding from drainage infrastructure will remain low over the lifetime of the Proposed Development.

6.5 Artificial Sources

- 6.5.1 The CS Site is not located in proximity to a canal and is outside the flood zone extents should a breach of a reservoir occur. The Proposed Development therefore will not increase the risk of flooding from these sources and the risk remains as Very Low.

7. Proposed Surface Water Drainage Strategy

- 7.1.1 The NPPF¹ highlights how built development can lead to an increased risk of flooding by increasing surface water runoff. Development often increases the area of impermeable surfaces thereby promoting rapid runoff to surface water sewers or watercourses rather than percolation into the ground. The effect can be to increase both total and peak water flows, contributing to flooding.
- 7.1.2 The proposed drainage is presented in the Drainage Strategy and Maintenance Statement [60610807-ACM-XX-XX-RP-DR-000001] (Appendix E) and summarised below.

Existing Drainage

- 7.1.3 The existing Site is predominantly greenfield, with the exception of the existing Cuckfield Road highway which is served by existing highway drainage systems. The main land uses are agriculture and woodland and there are currently no Southern Water sewers serving the Site.
- 7.1.4 Runoff from the majority of the existing Site drains towards the River Adur (East), to the south of the Site, and the Copyhold Stream, to the north of the Site.
- 7.1.5 The greenfield runoff rates for the Site were calculated as part of the drainage design for the OPA using the ReFH2 method, with a calculated Qbar of 7.9 l/s/ha. This greenfield run-off rate has been used to inform the drainage design for the CS.

Proposed Surface Water Runoff Rates

- 7.1.6 Surface water discharge from the development will be restricted at a controlled rate equating to the 1-year greenfield runoff rate for events up to a 1 year return period (100% Annual Exceedance Probability (AEP)), and the mean annual flood, (Qbar) for events up to a 100 year return period including a climate change allowance (40%) as set out in the AECOM Regional Surface Water Masterplan²⁷ in the OPA.
- 7.1.7 The area of impermeable surfacing will increase from the current greenfield condition as a result of the Proposed Development. Surface water runoff from the Site will therefore be restricted to 7.9 l/s/ha for flows generated from the impermeable areas of the CS into the drainage network.
- 7.1.8 As defined in the AECOM Regional Surface Water Masterplan, the wider Brookleigh Site was assessed and split into a number of drainage areas based on the existing Site topography and estimated surface water runoff from the developments proposed in each area. Each drainage area was then sub-divided into drainage networks, each of which was designed to serve one or more individual development plots.
- 7.1.9 For the Proposed Development, four drainage networks are required in order for the highway to be provided with sufficient surface water drainage. These are known as Network 4.3, Network 4.8, Network 5.6 and Network 9.7, and will cover the entire CS highway. The locations of these are shown on the drawings presented in Appendix E.
- 7.1.10 The discharge rate for the 100 year + 40% climate change event (Qbar) for each surface water drainage network serving the CS are shown in Table 7-1.

Table 7-1: Calculated Qbar and Post Development Discharge Rates for Phase 1

Drainage Network	Discharge Rate for 100 year + 40% climate change event – Qbar (l/s)	Post Development Discharge (l/s)
Network 4.3	5.96	5.96
Network 4.8	11.33	11.33
Network 5.6	4.09	4.09

Drainage Network	Discharge Rate for 100 year + 40% climate change event – Qbar (l/s)	Post Development Discharge (l/s)
Network 9.7	1.52	2.6

- 7.1.11 As set out in the Regional Surface Water Masterplan²⁷ it would be impractical to restrict the proposed discharge rate for Network 9.7 to the typically allowable rate, due to the very small size of the catchment and concerns that a flow rate this low could potentially contribute to blockages in the flow control device. Therefore, a higher flow rate restriction of 2.6 l/s has been agreed with MSDC and implemented into the design. The balance should be accommodated within the EBLR drainage network, such that the overall discharge rate complies with the allowable discharge rate for the EBLR drainage network and Network 9.7 as a whole. This rate is based on the minimum practical discharge restriction using a flow control device with an 80mm opening, as per WSCC standards.
- 7.1.12 Due to the proposed phasing of the Site, the maximum allowance discharge rate for Network 4.8 increases with future phases as the development of plots connecting into the network takes place. The rates shown in Table 7-1 are for Phase 1 only. The drainage infrastructure for Network 4.8 has been sized so that connections for Phases 2 to 4 can connect into the network without the requirement to increase capacity, subject to the discharge restrictions at each connection, as shown on drawings 60610807-ACM-04-XX-DR-DR-700145 to 700148, along with estimated attenuation storage requirements. The allowable discharge rates for the 100 year + 40% climate change event (Qbar) for future phases for Network 4.8 are 39.45 l/s (Phase 2) and 50.24 l/s (Phase 4).
- 7.1.13 The maximum allowable discharge rate for Network 5.6 also increases with future phases as the development of the secondary road connecting into the network takes place. The rates shown in Table 7-1 are for Phase 1 only. The drainage infrastructure for Network 5.6 has been sized so that connections for Phase 3 can connect into the network without the requirement to increase capacity. For Phase 3, the allowable discharge rate for the 100 year + 40% climate change event (Qbar) for Network 5.6 is 9.14 l/s.
- 7.1.14 Future development phases (Phases 2-4) are beyond the scope of the current CS Reserved Matters application. The discharge rates provided in this section are for information only.

Surface Water Volume

- 7.1.15 Attenuation for the Northern Arc Avenue CS shall be provided through SuDS features, including ponds, tree pits, and online storage in the form of oversized pipes beneath the carriageway. Table 7-2 shows the calculated storage volume required and the proposed SuDS features in each drainage network along with the outfall locations.
- 7.1.16 Storage has been designed to provide attenuation volumes for 1% AEP events plus a 40% climate change allowance. While allowance has been given for climate change, no allowance has been considered for urban creep in this case, as the CS is almost entirely made up of new carriageway and any associated infrastructure.

Table 7-2: Calculated storage volume in each drainage network

Network	Calculated volume (m ³)	SuDS features	Outfall Location
4.3	1061	Oversized pipes and tree pits	Outfalls to the Western Bridge Link Road surface drainage system and directly into bioretention areas in the verges.
4.8	9642	Highway and SuDS including pond, detention basin and tree pits.	The pond and detention basin outfall into a ditch within the ancient woodland to the North, which ultimately discharges into the Copyhold Stream. Other outfalls are directly into bioretention areas in the verges and directly into the main drain under the highway.
5.6	1218	Oversized pipes and tree pits	Outfalls directly into bioretention areas in the verges, directly into the main drain under the highway.
9.7	195	Oversized pipes and tree pits	Outfalls to the Eastern Bridge Link Road surface drainage system and directly into bioretention areas in the verges.

- 7.1.17 The proposed drainage layout and the inclusion of various SuDS features where conditions and space allow, including tree pits and attenuation ponds, are shown on the drawings presented in Appendix E.

Operation and Maintenance

- 7.1.18 The surface water drainage systems are to be offered for adoption subject to formal agreement with the respective authority. Drainage infrastructure serving exclusive highway infrastructure will be offered for adoption to the Highway Authority. SuDS features and drainage infrastructure in open space will be offered for adoption to MSDC. Future drainage infrastructure to and within the development plots not under the scope of the CS but for which connection points have been designed are intended to be adopted by Southern Water.

Attenuation Tank Maintenance

- 7.1.19 Attenuation tanks are usually buried structures, designed to store rainfall in order to mimic the behaviour of existing surface water runoff from their respective catchments. For the CS, they take the form of oversized concrete pipes. An example maintenance plan for buried drainage systems is included in Table 7-3.

Table 7-3: Operation and Maintenance Requirements for attenuation tanks

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. Consult the adopting authority and if required take remedial action.	After each and every storm event for 3 months following construction and then monthly.
	Remove debris from the catchment surface (where it may cause risks to performance)	Weekly during construction or as required. Minimum monthly.
	Remove sediment from pre-treatment structures.	Bi-annually (2x per year), or as required.
Remedial actions	Repair-rehabilitate inlets and outlets, including flow controls.	As required
Monitoring	Inspect / check all inlets / outlets to check they are in good condition.	Bi-annually
	Survey inside of tank/pipe for sediment build-up and remove if necessary	Prior to adoption or 1 year after completion of construction, whatever comes first. Additional internal surveys are recommended if the outlet suffers recurring silt build-up that indicates the tank/pipe may be holding silt.

8. Residual Flood Risk

8.1 Blockages in Surface Water Drainage

- 8.1.1 Failure, blockage and exceedance of design events for the drainage system are a potential risk to the Site and the surrounding area. The conceptual surface water drainage strategy provides storage for up to and including the 1% AEP storm event with a 40% allowance for climate change however, if a storm event was to occur that exceeds this capacity flooding from the drainage system would occur.
- 8.1.2 Regular maintenance of the drainage system should be undertaken to ensure that the system continues to perform as designed. Once operational highway infrastructure will be adopted by the Highway Authority (WSCC) and drainage infrastructure associated SuDS features will be adopted MSDC. It will be the responsibility of the Highways Agency to make sure that the SuDS features are regularly inspected and maintained to ensure their design standard is not compromised over the lifetime of the Proposed Development.
- 8.1.3 To manage the risk from exceedance flows, the drainage design will follow such guidance as CIRIA C635³² to provide flow paths such that any overland flow is directed towards the watercourses away from impacting the Proposed Development.

³² CIRIA (2006) Designing for exceedance in urban drainage - good practice (C635)

9. Summary and Conclusions

9.1 Overview

9.1.1 This FRA documents the assessment of flood sources to and from the Proposed Development. The FRA has considered the flood risk from the sea (tidal), inland sources (rivers and surface water), groundwater, sewers and reservoirs and has assessed these risks in accordance with policy and guidance specified.

9.1.2 The Proposed Development is part of the Brookleigh Strategic Site to the north of Burgess Hill.

9.2 Planning Policy

9.2.1 The development proposals are for the construction of the CS of the Northern Arc Avenue, with the route spanning westward from the existing Isaac's Lane to the proposed 'Western Bridge', travelling via Cuckfield Road, and connecting the proposed Central Neighbourhood Centre of Brookleigh. The entirety of the Site is located within Flood Zone 1.

9.2.2 Such development is considered to be "Less Vulnerable" (Table 2 of the PPG²). The Brookleigh Site is allocated for development in the Mid Sussex District Plan¹¹ and it is considered that the Proposed Development has passed the Sequential Test as part of this allocation process.

9.3 Flood Risk – To the Proposed Development

9.3.1 The following potential sources of flooding which could affect the Proposed Development have been considered and assessed as follows:

- The flood risk due to tidal sources is considered **Negligible**, as the Site is not situated in a coastal location and none of the identified surface water features are tidally influenced.
- The flood risk due to fluvial sources is considered **Low**, as the Site is located in Flood Zone 1.
- The flood risk due to surface water is considered **Low**, based on a review of the EA's Flood RoSWF map. Although the RoSWF map shows there to be a number of surface water flow paths through the Site, the increased surface water risk to the development will be managed through the Surface Water Drainage Strategy.
- The flood risk due to groundwater is considered **Low**, based on an assessment of the geology and hydrogeology.
- The flood risk due to sewers is considered **Low**, due to the fact that there are limited sewer networks at the Site
- The flood risk due to artificial sources is considered **Very Low**, due to there being no canals in proximity to the Site and the Site area being located outside of any inundation extents associated with reservoirs.

9.4 Flood Risk – From the Proposed Development

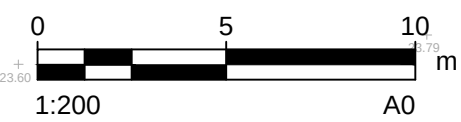
9.4.1 The impermeable area of the Site is expected to increase post development. A drainage strategy (Appendix E) has been produced to mitigate the risks of surface water run-off. A summary of the drainage strategy is as follows:

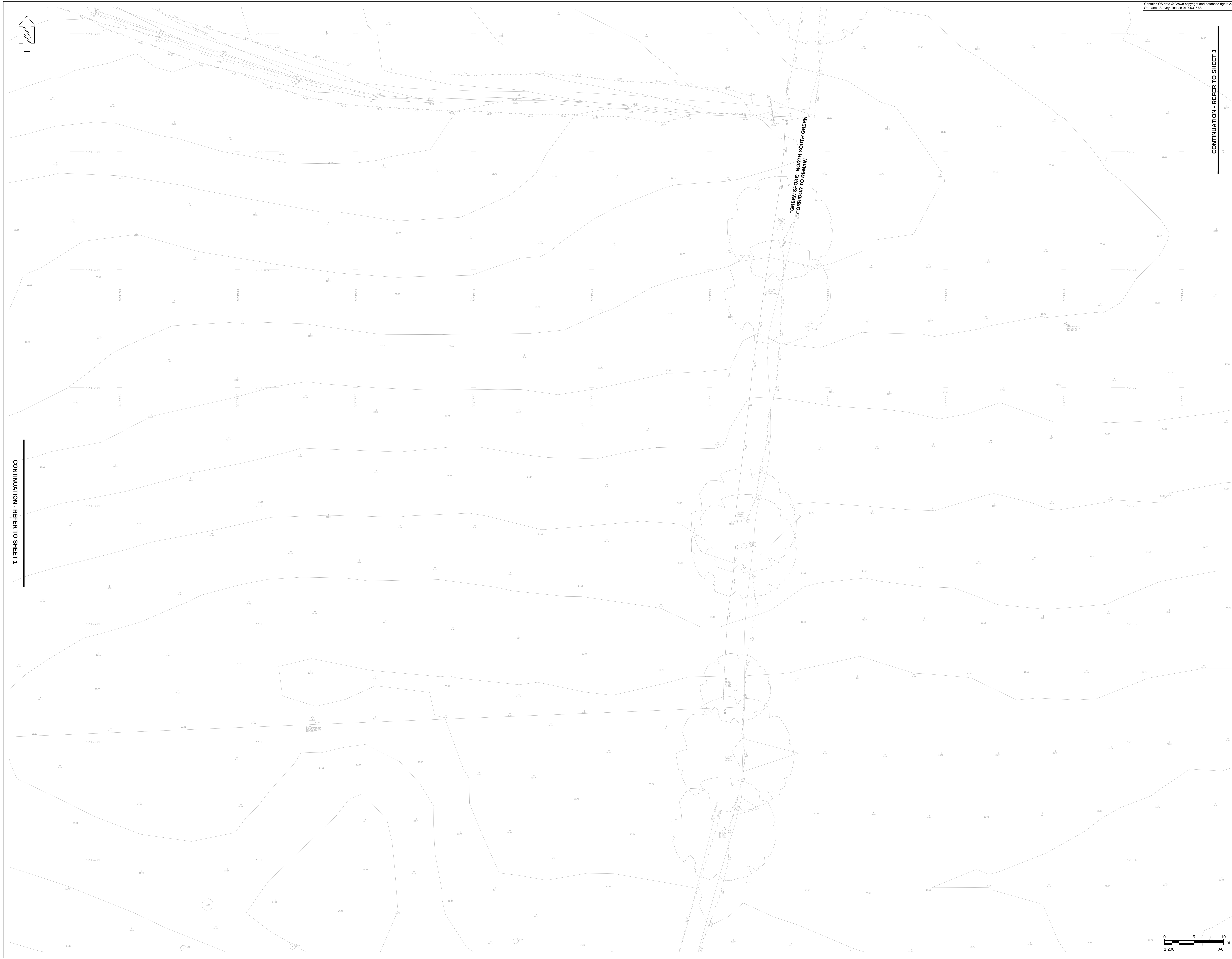
- Restriction of runoff from the Site will be restricted to 7.9 l/s/ha for flows into the drainage networks from the areas contributed by the development of the CS.
- Attenuation storage for the Site shall be provided through SuDS features, including ponds and tree pits, and online storage in the form of oversized pipes beneath the carriageway.
- Storage has been designed to provide attenuation volumes for up to and including the 1% AEP event plus a 40% climate change allowance.

9.5 Residual Flood Risk

- 9.5.1 The residual flood risks to the Proposed Development includes surface water blockages. Provided that the appropriate mitigation is undertaken as detailed in this FRA, the likelihood and impact of these risks occurring suggest that the residual risk of flooding to the Site is **Low**.

Appendix A – Topographic Survey





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PROJECT

Brookleigh -
Northern Arc avenue
Central Section

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Homes England

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- Highway design remains subject to Section 38 Technical Approval by Highway Authority
- Contours represent a continuation of the highway and regate the raised table junctions and islands which will be subject to Section 38 design development and technical approval

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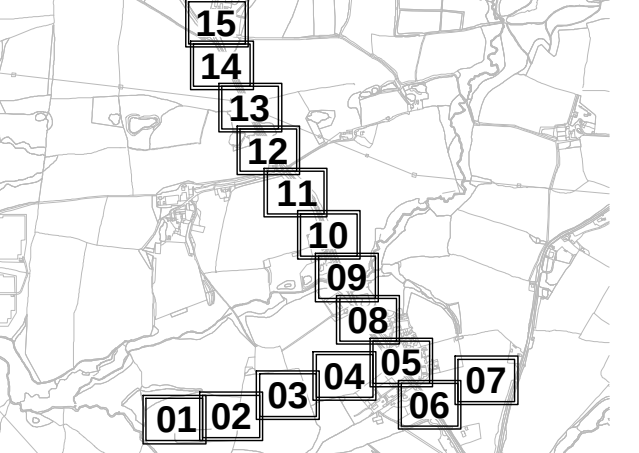
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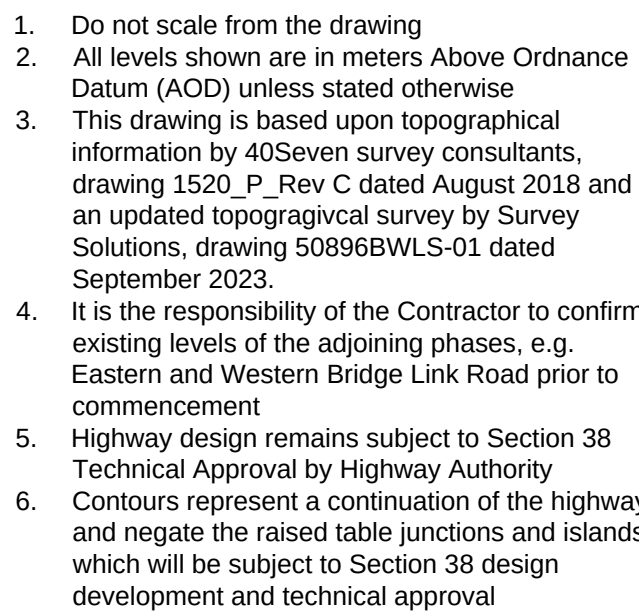
SHEET TITLE

ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 2

SHEET NUMBER

60610807-ACM-CS-ZZ-DR-LS-00-0102

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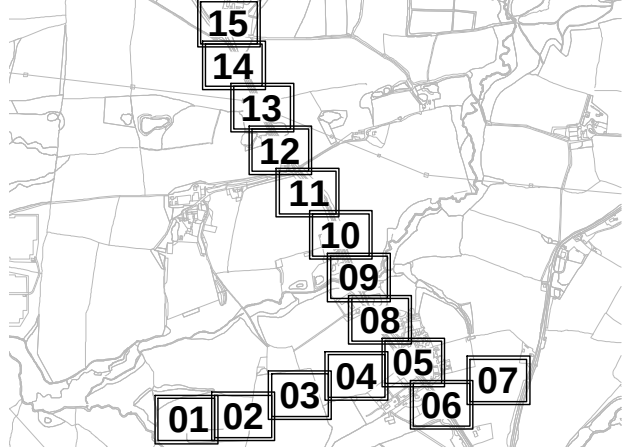
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IR	DATE	DESCRIPTION

KEY PLAN



PROJECT NUMBER

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SHEET TITLE

ADOPTABLE HIGHWAY
GENERAL ARRANGEMENT
SHEET 3

SHEET NUMBER

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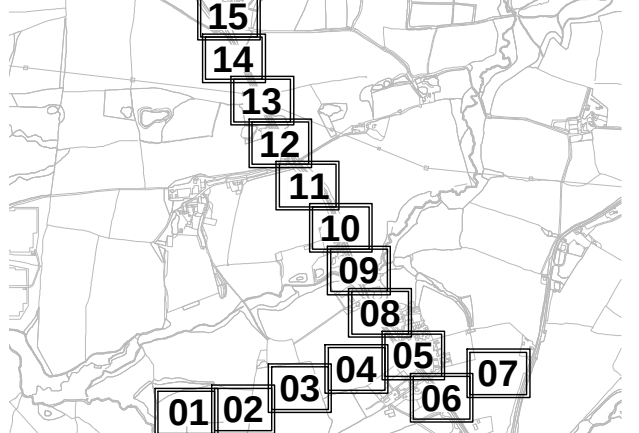
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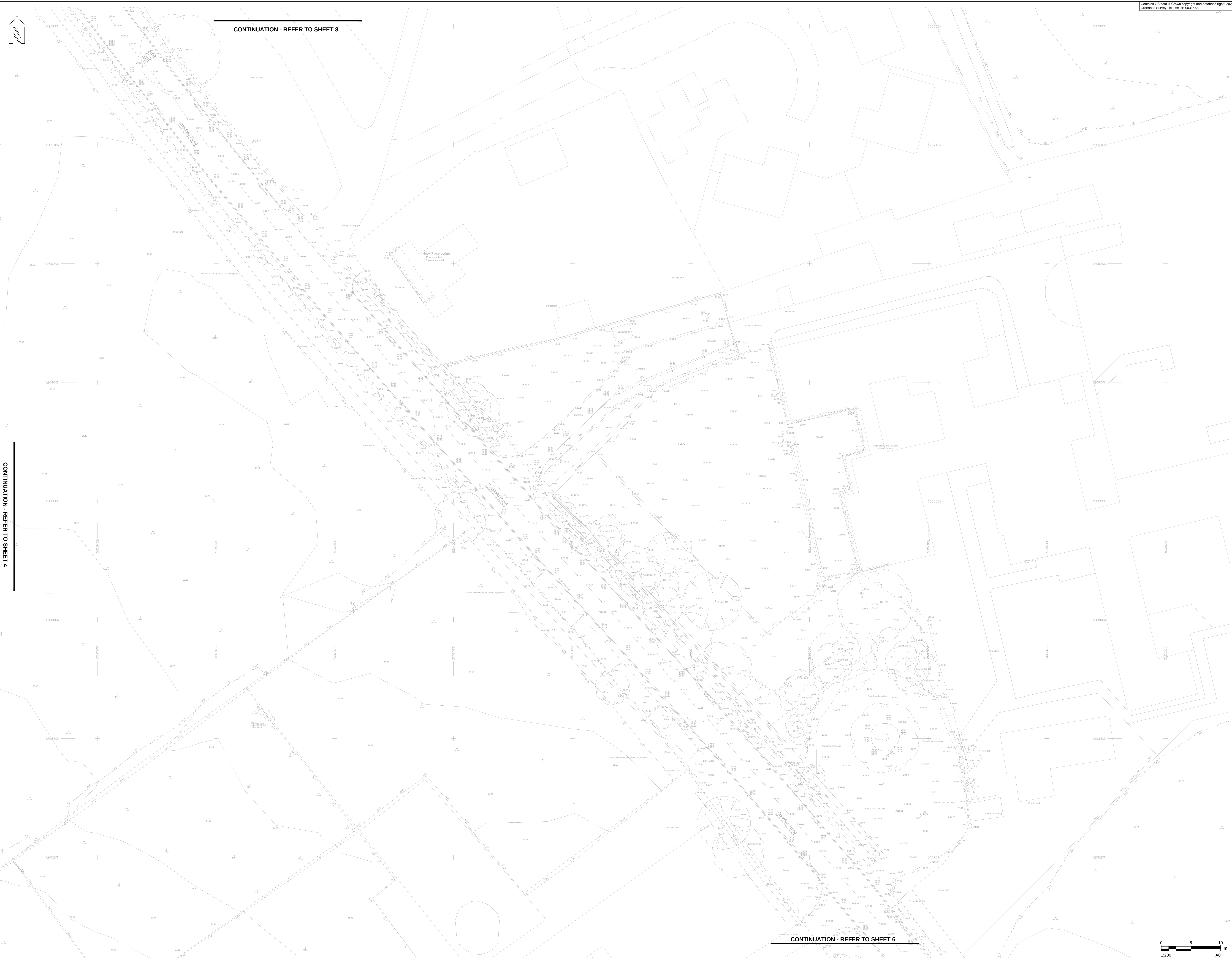
ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 4

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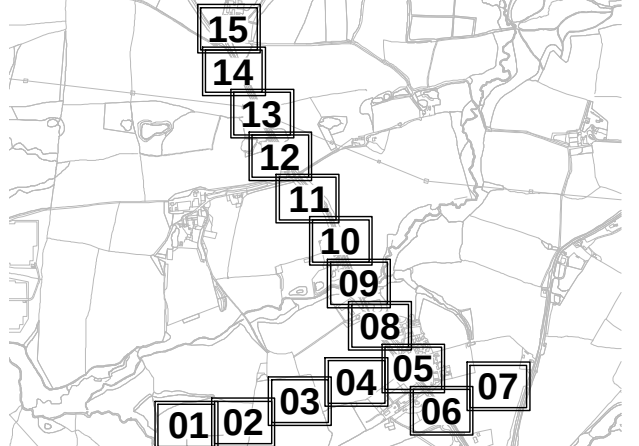
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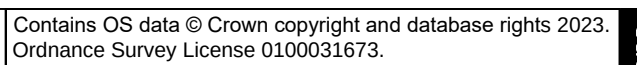
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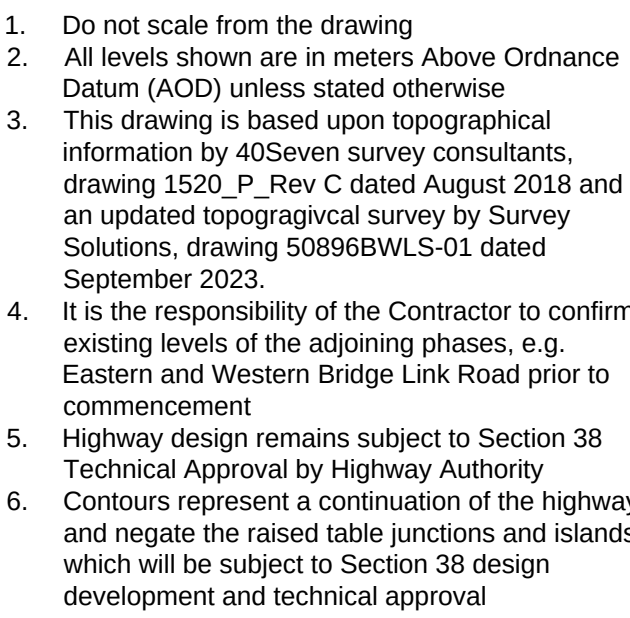
ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 5

SHEET NUMBER

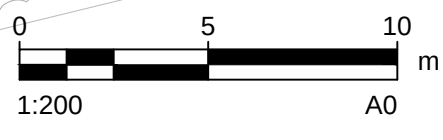
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- Highway design remains subject to Section 38 Technical Approval by Highway Authority
- Contours represent a continuation of the highway and reggae the raised table junctions and islands which will be subject to Section 38 design development and technical approval

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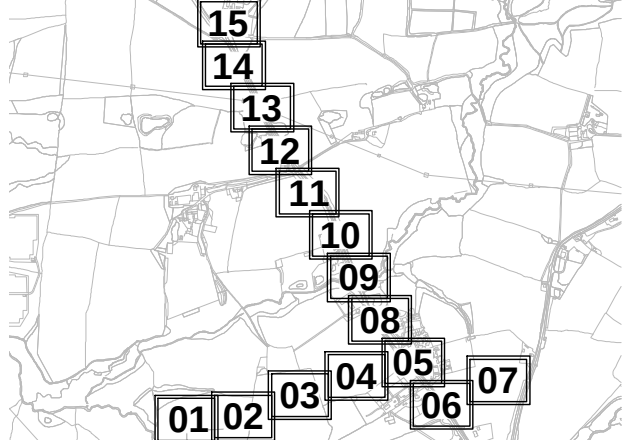
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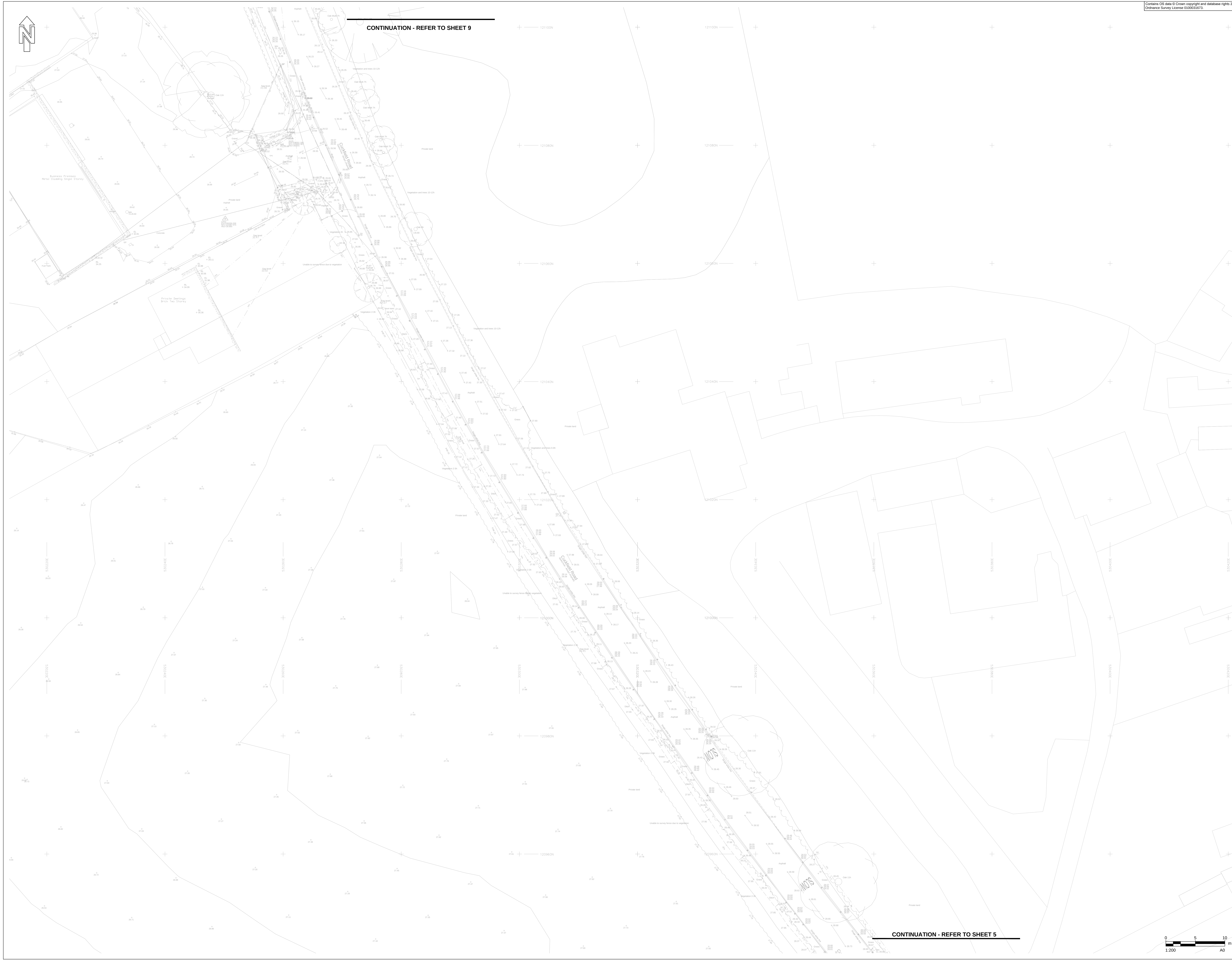
60610807

SHEET TITLE

ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 7

SHEET NUMBER

60610807-ACM-CS-ZZ-DR-LS-00-0107



CONTINUATION - REFER TO SHEET 9

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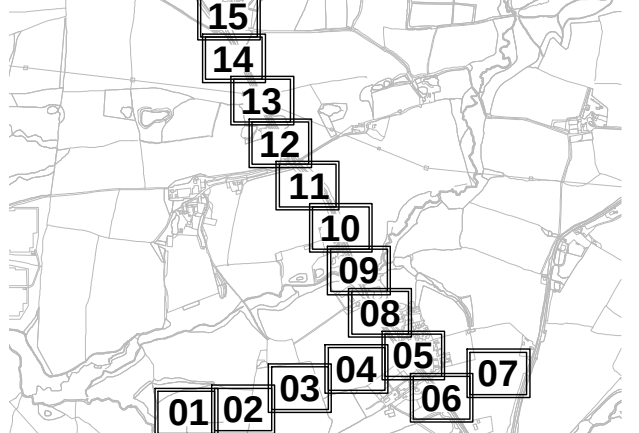
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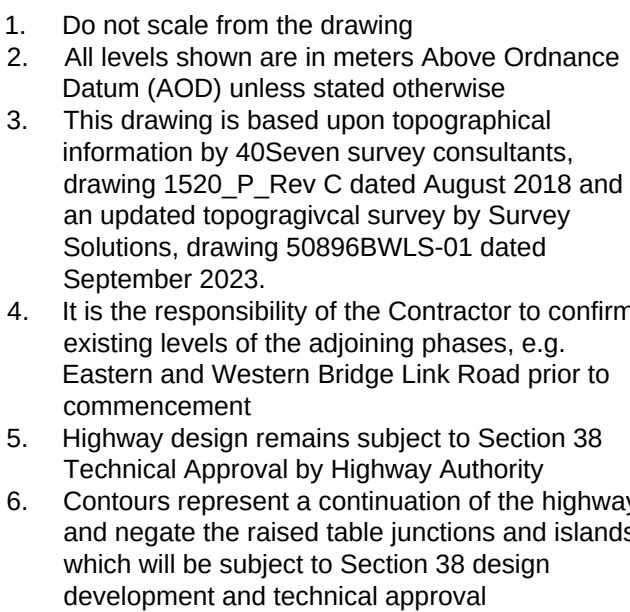
ADOPTABLE HIGHWAY
GENERAL ARRANGEMENT
SHEET 8

SHEET NUMBER

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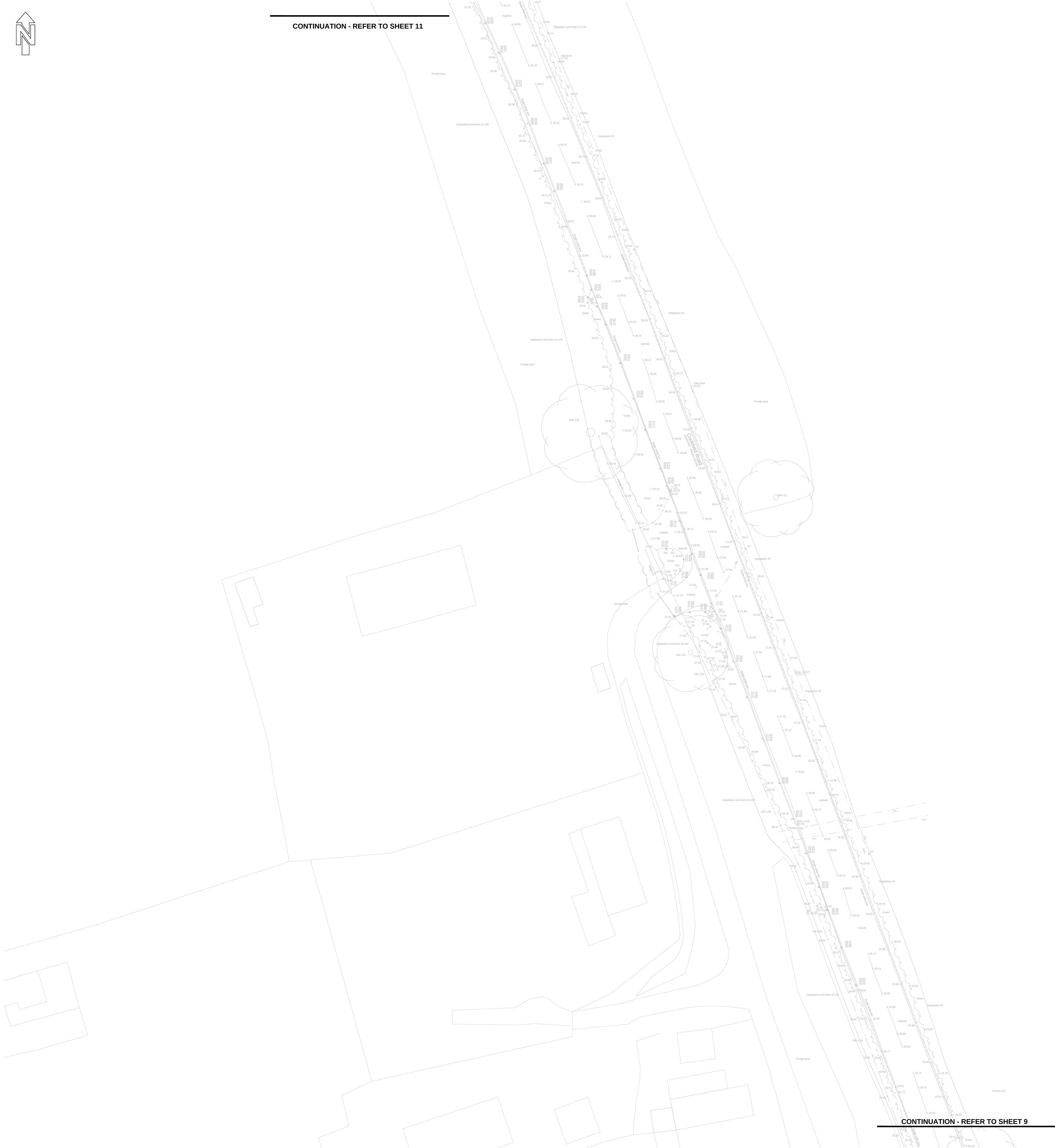
ADOPTABLE HIGHWAY
GENERAL ARRANGEMENT
SHEET 9

SHEET NUMBER

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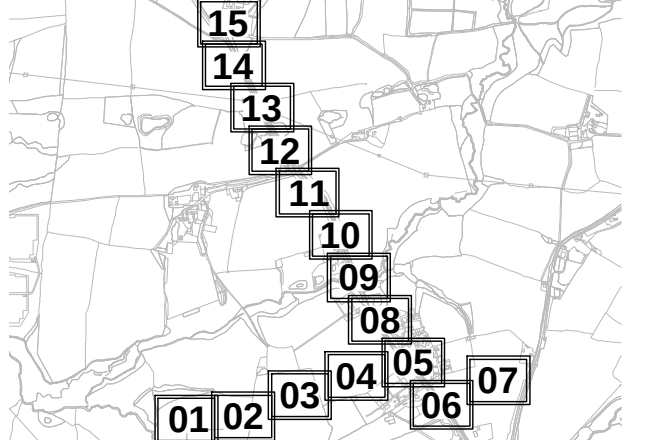
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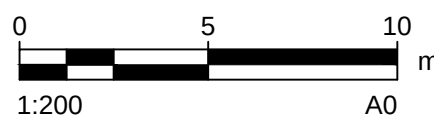
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ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 10

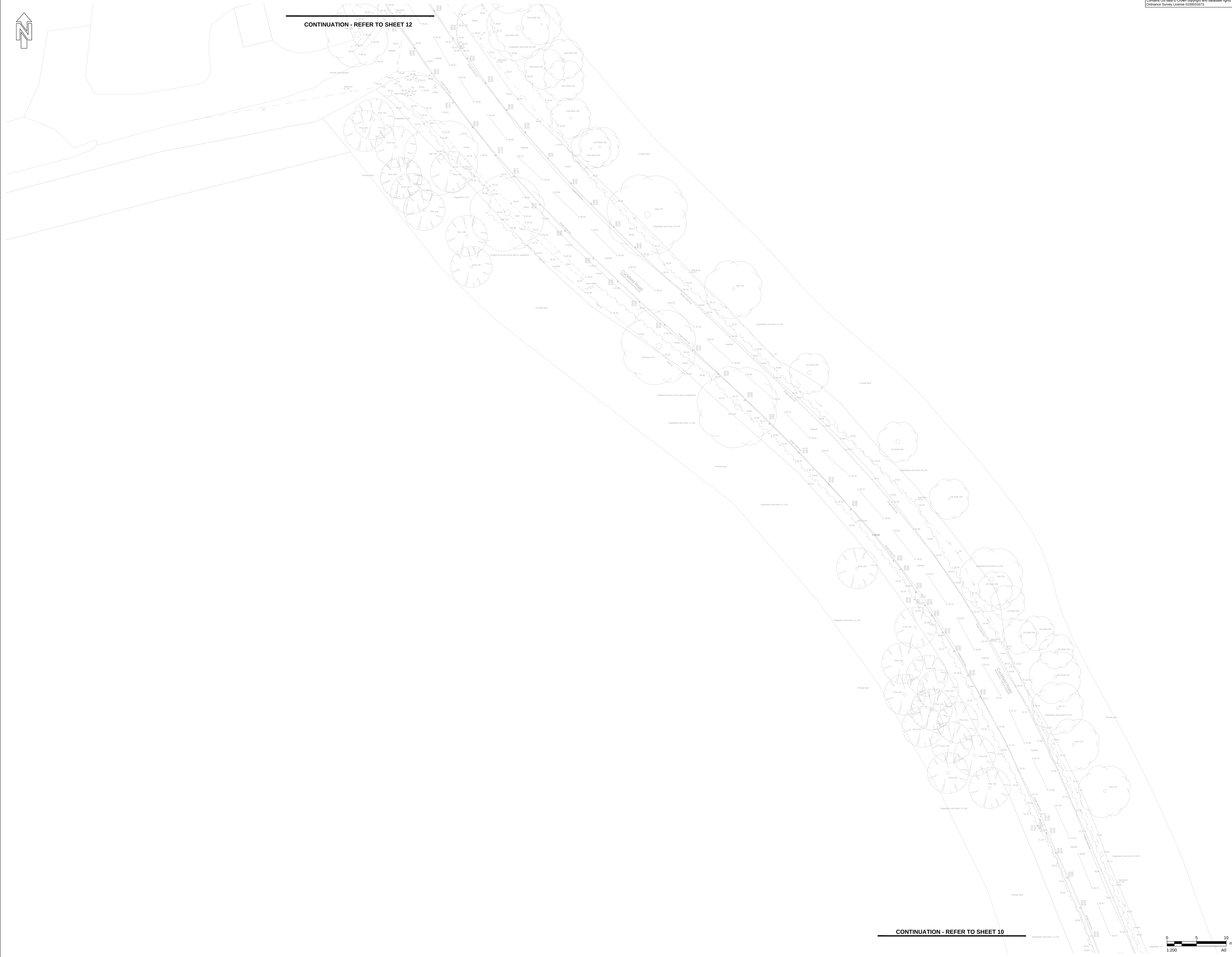
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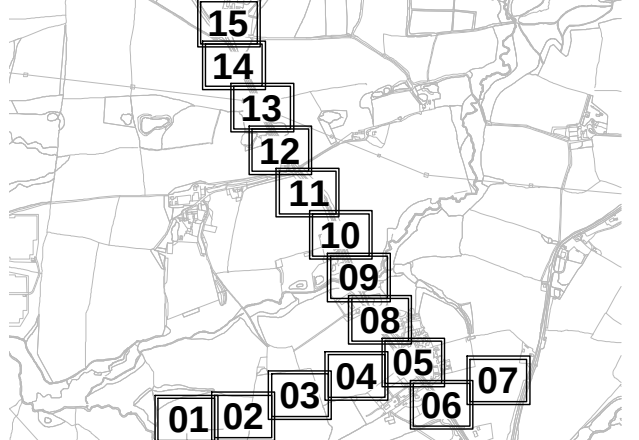
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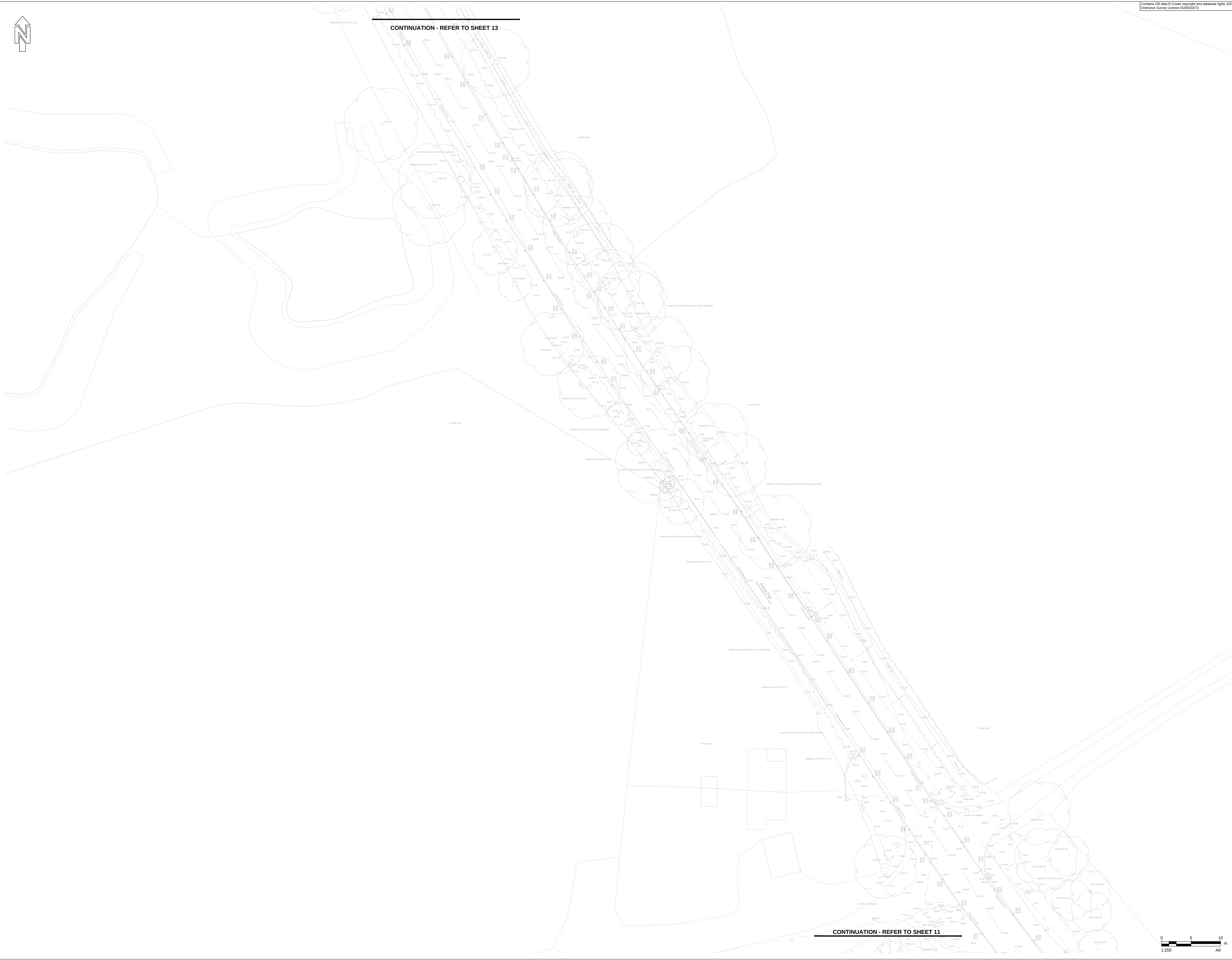
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SHEET TITLE

ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 11

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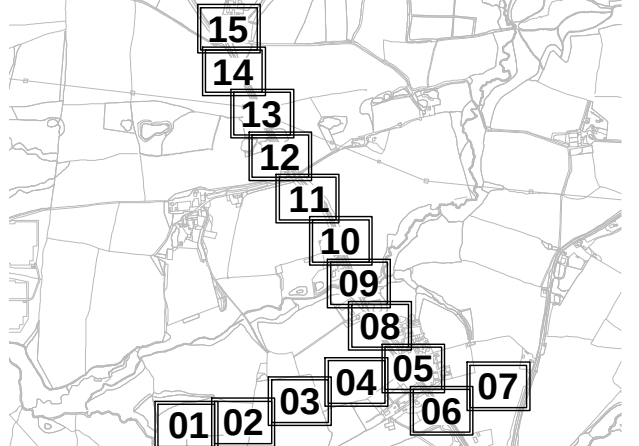
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SHEET TITLE

ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 12

SHEET NUMBER

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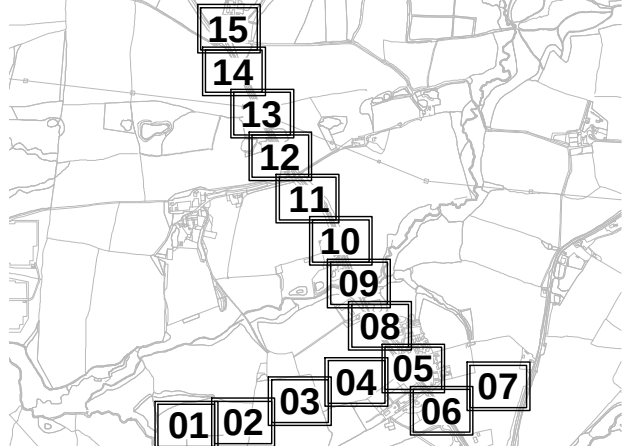
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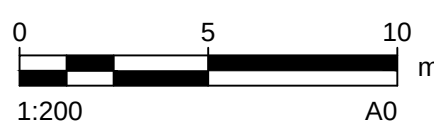
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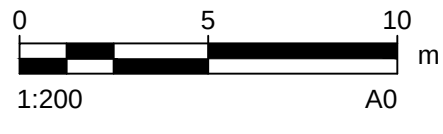
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ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 13

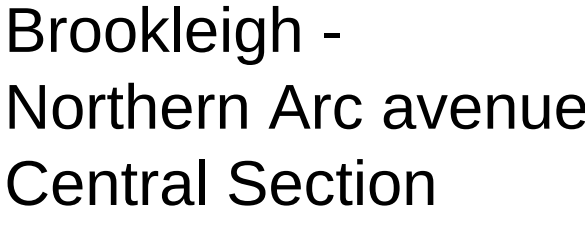
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4. It is the responsibility of the Contractor to confirm, as part of the adjoining phases, e.g. Eastern and Western Bridge Link Road prior to commencement
5. Highway design remains subject to Section 38 Technical Approval by Highway Authority
6. Contours represent a continuation of the highway design from the rail link. Contours and islands which will be subject to Section 38 design development and technical approval

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SHEET 14

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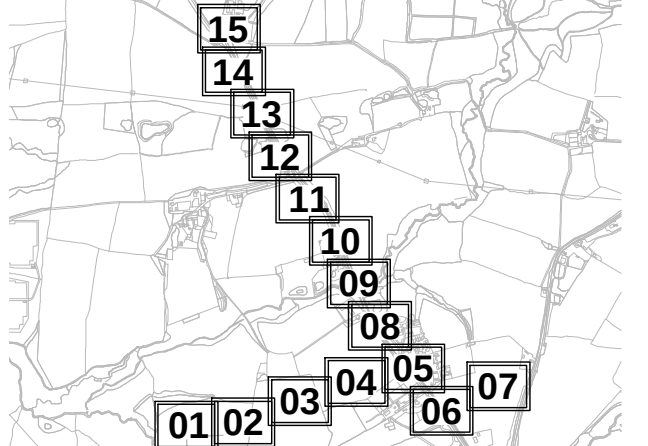
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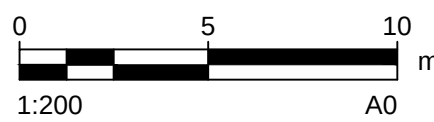
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ADOPTABLE HIGHWAY
TOPOGRAPHICAL SURVEY
SHEET 15

SHEET NUMBER

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CONTINUATION - REFER TO SHEET 14

Appendix B – General Arrangement Drawings