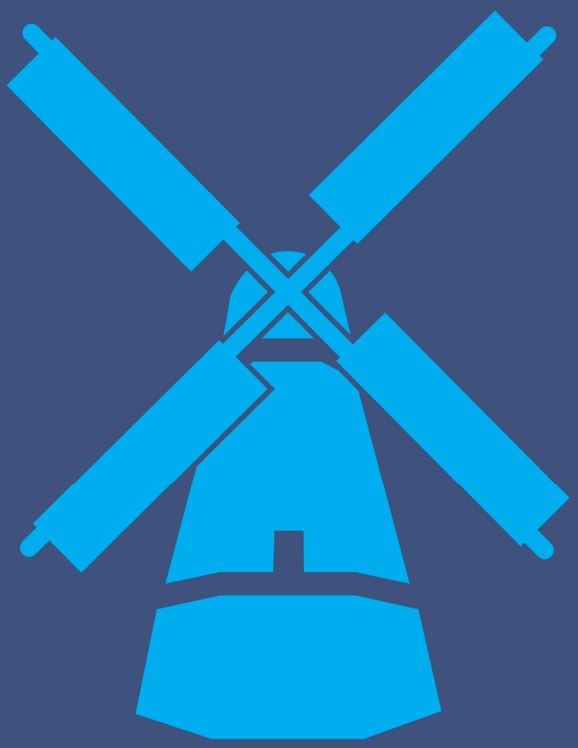
Stuart Michael Associates Ltd

Hindsland, Eastbourne Road Willingdon, East Sussex

Flood Risk Assessment and Drainage Strategy



March 2021

Danescroft (FREOF V Willingdon) LLP

Flood Risk Assessment and Drainage Strategy

Eastbourne Road, Willingdon

Prepared for
Danescroft (FREOF V Willingdon) LLP

by

Stuart Michael Associates Limited

March 2021

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ACRONYMS AND ABBREVIATIONS

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BGS	British Geological Society
CIRIA	Construction Industry Research and Information Association
DEFRA	Department for Environment, Food and Rural Affairs
DS	Drainage Strategy
EA	Environment Agency
ESCC	East Sussex County Council
FRA&DS	Flood Risk Assessment and Drainage Statement
ha	Hectares
ICP SUDS	Interim Code of Practice for Sustainable Drainage Systems
IDP	Pevensey and Cuckmere Water Level Management Board
IOH 124	Institute of Hydrology Report 124 'Flood Estimation for small catchments'
km	Kilometres
LLFA	Lead Local Flood Authority
LFRMS	Local Flood Risk Management Strategy
LPA	Local Planning Authority
m	Metres
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance to the National Planning Policy Framework
QBAR	Mean Annual Flood (Report No. 124 Flood Estimation for Small Catchments)
SAAR	Standard Annual Average Rainfall
SFRA	Strategic Flood Risk Assessment
SPZ	Source Protection Zone
SW	Southern Water
SUDS	Sustainable Drainage Systems
WDC	Wealden District Council

1.0 INTRODUCTION

1.1 Stuart Michael Associates Limited, consulting engineers, has prepared this Flood Risk Assessment and Drainage Strategy, hereafter referred to as the 'Report', on the instruction of Danescroft (FREOF V Willingdon) LLP, hereafter referred to as the 'Client'.

1.2 This Report supports an Outline Application, all matters reserved except for Access (excluding internal estate roads beyond the access to serve the Medical Centre Plot), for demolition of existing vacant dwelling and erection of up to 180 no. dwellings and a medical centre together with all parking, servicing and onsite open space, hereafter referred to as the 'Site'.

1.3 The existing Site comprises 6.48 hectares and was previously used as university playing fields with associated ancillary services.

Scope of Report

1.4 The FRA section of the Report focuses on assessing the practical flood risk issues at the Site as follows:

- Identification of all the potential sources of flooding at the Site from all sources (i.e. fluvial, pluvial, groundwater, surface water, etc.);
- Assessment of the existing flood risk at the Site and the potential impact on the proposals;

1.5 Consideration of the flood risk implications, taking into account the potential allowance for climate change over the lifetime of the development, and the identification of the measures to mitigate flood risk.

1.6 The purposes of the Report are:

- To confirm that the proposed development will not be subject to unacceptable flood risk or to show that flood risk can be managed acceptably;
- To demonstrate that the proposed development will not increase risk of flooding elsewhere.

Policy Context

1.7 The requirements and policies of East Sussex County Council (ESCC), Wealden District Council (WDC), The Pevensey and Cuckmere Water Level Management Board (IDB), Southern Water (SW) and the Environment Agency (EA) have been taken into account when considering flood risk at the Site.

1.8 The Report presents an assessment of flood risk in accordance with the National Planning Policy Framework (NPPF), July 2018 and its supporting Planning Practice Guidance (PPG) 'Flood Risk and Costal Change', both published by the Department of Communities and Local Government, and the Flood Risk Assessment – Climate Change Allowances guidance, February 2016.

1.9 The NPPF and supporting PPG provide guidance on how flood risk should be considered during planning and development processes. The requirement to protect both new and established development from increased risk of flooding forms an essential part of the guidance. Moreover, implementation of Sustainable Drainage Systems (SUDS) for new development is encouraged.

1.10 WDC is the Local Planning Authority (LPA), controlling flood risk and water environment issues, through policies and guidance presented in the Level 1 Strategic Flood Risk Assessment (SFRA), 2017.

1.11 ESCC, in its role as Lead Local Flood Authority (LLFA), is a statutory consultee for all major applications and advises on the suitability of Sustainable Drainage proposals. Water People Place, A guide for master planning sustainable drainage into developments, AECOM, 2013 outlines the process for integrating SuDS into developments as part of the initial planning and design process for all types of residential, commercial and industrial development. It has been developed through a partnership of south east LLFA's Authorities with the intention of providing a consistent SuDS approach in the wider south eastern area.

1.12 ESCC sets out its vision for SUDS implementation within its administrative boundaries along with the drainage approval process and its requirements in relation to SuDS in the Guide to Sustainable Drainage Systems in East Sussex, 2015. This guidance is also accompanied by a Surface Water Drainage Checklist for both outline and detailed planning applications to follow.

1.13 The Flood and Water Management Act, 2010, requires the EA to develop, maintain and apply a National Flood and Coastal Erosion Management Strategy. Similarly, the LLFA is required to develop a Local Flood Risk Management Strategy (LFRMS) for its area. East Sussex County Council's LFRMS for 2016-2026 identifies, at a strategic level, the priority flood risk areas.

1.14 Stuart Michael Associates Limited (SMA) submitted a SuDS pre app with ESCC and received a response on the 8th of October 2020. The pre application response outlined that the Site is included in a modelling project being currently undertaken in the Polegate Willingdon area to accurately assess the flood risk in this area. Alongside this, the pre app indicated the Site lies within the drainage district of the Pevensey and Cuckmere Water Level Management Board (IDB) and therefore the development needs to comply with the Byelaws set out by the Board.

1.15 After liaising with the IDB, the following where points were indicated as being crucial to the success of a Surface Water Management Strategy, alongside abiding by the IDP's byelaws:

- *The proposed impermeable area at the application site*
- *The proposed discharge rates for the drainage system and how they will be controlled*
- *How all forms of flood risk have been taken into account in the design of the drainage system – this includes how high groundwater will be managed, the consideration of offsite flows and how they have been taken into consideration. There appears to be highway drainage discharging into the watercourse/ditch bordering the site, this need to be taken into consideration and its path should not be obstructed*

1.16 The Eastbourne Area Surface Water Management Plan (2012) was produced as a strategic tool, to facilitate the local and coordinated management of surface water flood risk within the Eastbourne catchment area. This assists ESCC in helping to reduce the number of properties at risk of surface water flooding in Willingdon and the wider Eastbourne area.

1.17 Rainfall-runoff management for the Site will follow the procedures laid down by the Non-statutory Technical Standards (NTS) for sustainable drainage systems, which were published by the Department for Environment, Food and Rural Affairs (DEFRA) in March 2015. New climate change guidance published by the EA in February 2016 updates current guidance which supports the NPPF.

2.0 THE SITE

Location

2.1 The Site is located at Eastbourne Road, Willingdon, BN26 5BE (Grid ref: 558459E, 104149N), approximately 1.6km north of central Willingdon. The Site lies to the north east of the A2270 Eastbourne Road, between existing residential dwellings to the north and open agricultural land to the south east. On the south west side of Eastbourne Road are existing residential dwellings. A plan showing the location of the Site is attached as **Appendix A**.

2.2 The total red line area of the Site is 6.48ha and is currently occupied by one vacant dwelling adjacent to the Site access and a derelict playing field.

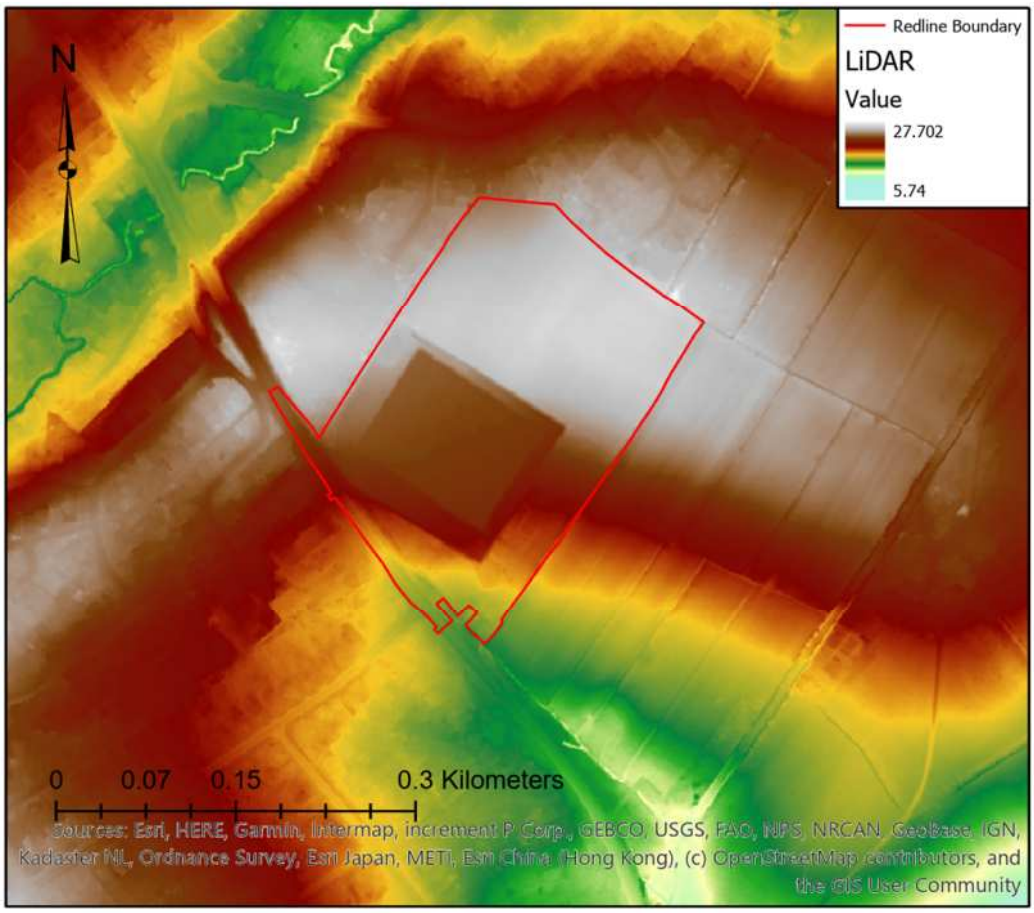
Topography

2.3 Topographical survey of the Site shows that the land falls in a south easterly direction with levels ranging from approximately 11.49mAOD and 21.20mAOD.

2.4 The topographical survey is included as **Appendix B.**

2.5 **Figure 1** below details the wider topographical area based on the Environment Agency's LiDAR Composite DTM 1m (2017) data.

Figure 1 - LiDAR Mapping Data



Geology and Hydrogeology

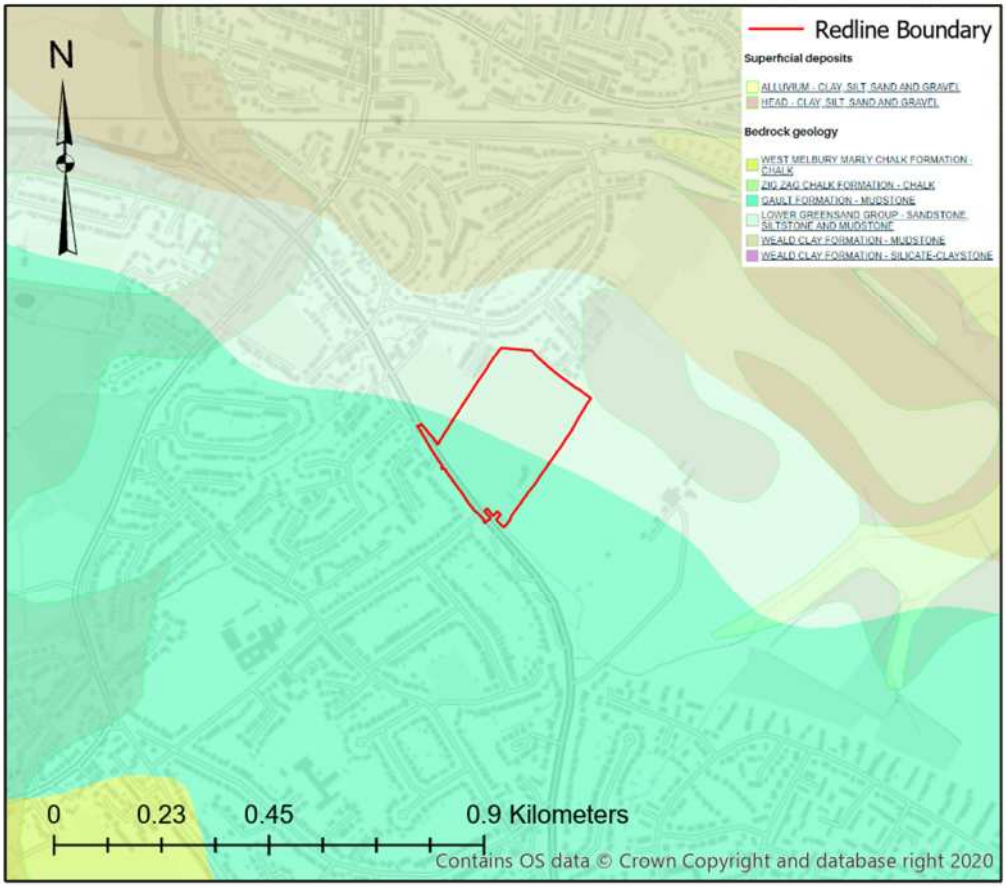
Geology and Soils

2.6 Information contained within 'Soilscapes' defines the site as "Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils" with impeded drainage. Surface water runoff is said to drain to the local stream network.

2.7 British Geological Survey (BGS) mapping indicates that the Site is underlain by a bedrock geology of Lower Greensand Group (Sandstone, Siltstone and Mudstone), and Gault Formation (Mudstone). BGS mapping indicates there are no superficial deposits present on Site.

2.8 Extracts from the BGS mapping tool are found below in **Figure 2.**

Figure 2 - BGS Mapping Data



DCE Intrusive Site Investigation

2.9 An intrusive ground investigation was conducted by Discovery Geotechnical & Environmental Engineers in August 2020.

2.10 The extract from the report describes the ground conditions as:

"*Topsoil comprising desiccated sandy CLAY overlying Lower Greensand Group comprising stiff and very stiff locally firm sandy CLAY in the north of the site becoming light orangish brown slightly clayey fine SAND in the centre of the site, and Gault Formation comprising firm locally soft slightly sandy CLAY in the south of the site. Localised Made Ground was encountered in the central and southern portions of the site, this was up to 1.8 m thick and predominantly SAND and GRAVEL, locally with high cobble and boulder content*."

2.11 Infiltration testing was undertaken at 5 locations across the site and all tests showed negligible infiltration potential. The ground investigation report states:

"*Poor Infiltration was recorded in the clay materials at the site. A preliminary infiltration rate of 3 x 10-6 m/s has been estimated for the materials encountered in SA203 (the Lower Greensand Group SAND) which indicates that soakaways may be feasible in these materials. However additional testing is recommended across the central portion of the site where the Lower Greensand Group was encountered as SAND to verify the preliminary findings*."

2.12 Groundwater monitoring was also undertaken over a period of eight months.

"*Groundwater was encountered in 1 No. location during fieldwork as slight seepage in TP110 at 3.6 m bgl. Subsequent monitoring recorded groundwater in 6 No. wells at between 0.81 and 3.95 m bgl. Assessment of the readings indicates groundwater is generally dipping from north to south across the site, with localised perched groundwater within the Made Ground across the central portion of the site.*"

2.13 Extracts from the ground investigation are included as **Appendix C**.

Hydrogeology

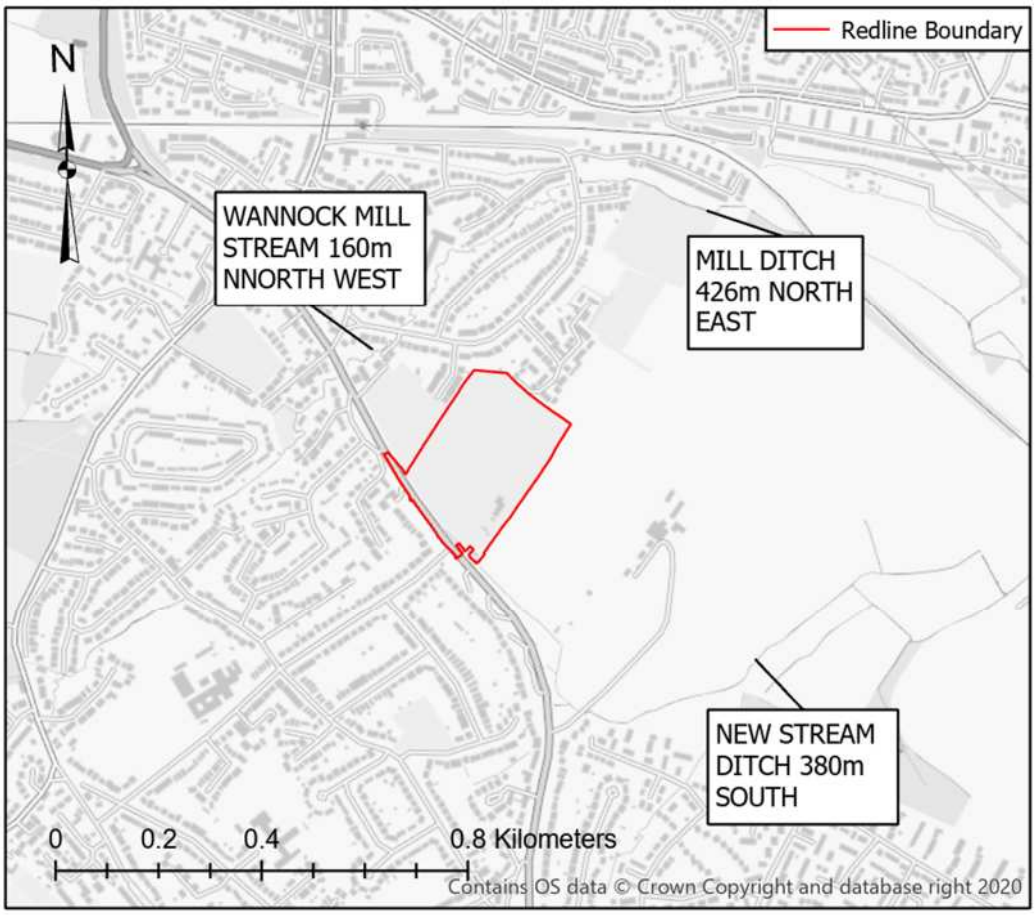
2.14 UK Government DEFRA mapping indicates that the Site is:

- Not located within a Nitrate Vulnerable Zone;
- Not within a Drinking Water Safeguard Zone for surface water;
- Not located within a Groundwater Source Protection Zone (SPZ);
- Underlain by a Principal bedrock aquifer of high permeability in the northern region of Site. The southern region of the Site is indicated to be underlain by an unproductive aquifer with unproductive permeability.

Watercourses

2.15 The Topographical survey indicates that there are ditches located within the Site boundary spanning the south eastern Site boundary and adjacent to the southern Site boundary, running along the A2270 Eastbourne Road in a southern direction. The watercourses on the eastern and southern boundaries of the site are classified by the EA as ordinary watercourses and eventually drain into the Mornings Mill Stream (Main River). The Wannock Mill Stream is located 160m north west of the Site, the New Stream Ditch is located approximately 380m south of Site, and Mill Ditch is located 426m north east of Site, as shown in **Figure 3 below.**

Figure 3 - Main Watercourses within a 500m Radius



Drains and Sewers

Wastewater Sewers

2.16 Southern Water sewer records indicate the presence of foul water sewers adjacent to the northern and southern Site boundary.

Surface Water Sewers

2.17 Southern Water sewer records indicate the presence of a surface water sewer that runs adjacent to the northern Site boundary.

2.18 A copy of the Southern Water sewer records is presented as **Appendix D**.

Stuart Michael Associates Site Investigation

2.19 Stuart Michael Associates visited the Site on 18th of September 2020 to survey the drainage regime on Site. The ditch along the south eastern boundary, classified as an ordinary watercourse by the EA, enters a culverted section adjacent to the existing buildings on site via a headwall. The ditch is exceedingly overgrown and the invert level of the pipe could not be determined however by lifting the cover of the first manhole on the culvert a 300mm diameter pipe was observed heading towards the headwall. The culvert is circa 1.5m deep and outfalls via another headwall into a ditch adjacent to the gated access. The culverted section of the watercourse also drains the playing field and the roofs and hardstanding's of the existing buildings.

2.20 The ditch along the southern boundary starts within the land to the west of the substation and is culverted beneath the access to the substation and the driveway serving the playing fields.

2.21 A drawing showing the existing onsite drainage arrangements is presented within **Appendix E.**

Site Sensitivity

2.22 According to UK DEFRA mapping, the Site is located within four SSSI (Site of Special Scientific Interest) Impact Risk Zones (IRZ), designated to assess planning applications for likely impacts on the SSSIs/SACs/SPAs.

2.23 The IRZs are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks posed by development proposals to SSSIs, Special Areas of Conservation (SACs), and Special Protection Areas (SPAs).

2.24 The Site is located within the IRZ's of Willingdon Down (1.2km south of Site), Folkington Reservoir (1.8km west of Site), Wilmington Downs (2.6km west of Site) and the Pevensey Levels 2.8km north west of Site).

2.25 The Pevensey Levels is grazing marsh with internal ditches which covers 4300 hectares between Eastbourne and Bexhill-on-Sea and outfalls to the sea at Pevensey. The Site is key target of the Pevensey and Cuckmere Water Level Management Board's Biodiversity Action Plan, April 2018.

2.26 Measures to mitigate against the effects of runoff from the proposed development are discussed in further detail in later sections of the Report.

Local Plan

2.27 The Site is included within the WDC 2019 Strategic Land Availability Assessment (SLAA), a report that assesses all sites submitted to the Council for consideration for development.

2.28 The Site is included in the SLAA under reference number **180/1510,** listed as 'Deliverable' for the intended residential development.

2.29 The Site forms part of a wider allocation for a mix of uses in the adopted Wealden Core Strategy 2013 (Policy WCS4 – strategic Development Location 4 – SD4).

3.0 DEVELOPMENT PROPOSALS

3.1 The development proposal is for an Outline Application, all matters reserved except for Access (excluding internal estate roads beyond the access to serve the Medical Centre Plot), for demolition of existing vacant dwelling and erection of up to 180 no. dwellings and medical centre together with all parking, servicing and onsite open space.

3.2 The proposed Site layout is included as **Appendix F**.

Vulnerability Classification

3.3 Table 2 of the PPG provides a detailed list of the types of development falling into the vulnerability classifications. This list provides guidance on the various uses and their subsequent flood risk vulnerability classification.

3.4 As per Table 2, the '*More Vulnerable'* classification applies to both the proposed residential development and medical centre.

Lifetime of development

3.5 In accordance with the PPG, the residential development should be considered for a minimum of 100 years.

4.0 FLOOD RISK ASSESSMENT

Coastal Flooding

4.1 The Site is located inland at an elevation in excess of 10mAOD and is within an area not shown to be at risk from coastal flooding.

Fluvial Flooding

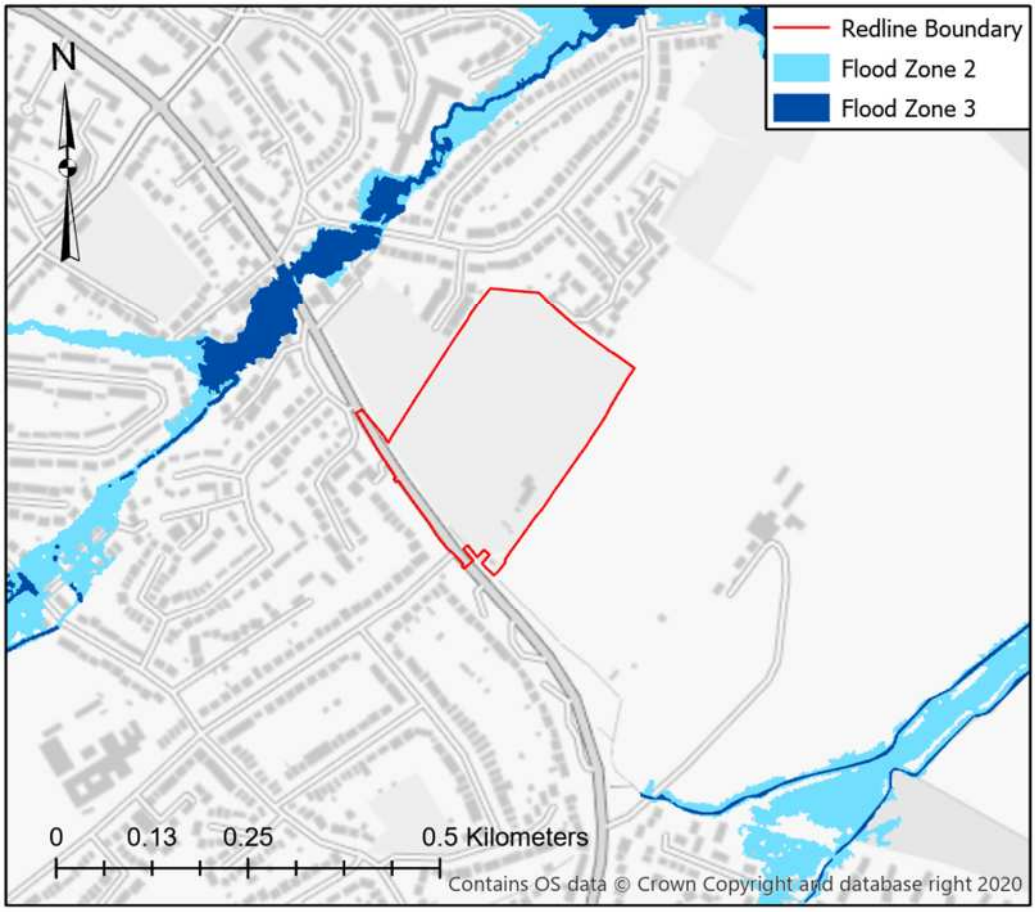
4.2 Maps of Flood Zones, published on the UK government website, are the main constraints used to inform the LPA when to consult the EA and the LLFA on flood risk in development control decisions.

4.3 The Zones refer to the probability of flooding and this varies depending on the source of flooding being fluvial or coastal. Flood Zones 1,2 and 3 refer to low, medium and high risk of flooding. These zones for fluvial risks of flooding correspond to the Annual Exceedance Probabilities (AEP) of less than 0.1%, in the range of 0.1-1% and greater than 1% in any given year, respectively.

4.4 An extract from the Government Flood Map is presented within **Figure 4**.

4.5 **Figure 4** indicates that the entirety of the Site is within Flood Zone 1.

Figure 4 - EA Flood Zones Mapping



Existing Flood Modelling

4.6 Wealden District Council has partnered with Eastbourne Borough Council to develop a fluvial flood model to accurately map flood risk in Polegate and Willingdon. This includes detailed modelling of the watercourse on the eastern boundary of the proposed development site.

4.7 At the point of writing this Report, this modelling work was still at collection of channel survey stage. This Report will be further updated as and when the results of this modelling work have been completed and released into the public domain.

Groundwater Flooding

4.8 Groundwater flooding occurs where groundwater levels rise sufficiently to intersect the ground surface and flow onto low-lying areas. Generally,

groundwater flooding may be a problem where developments are situated over permeable soils or rocks.

4.9 The WDC SFRA Groundwater Flooding Map indicates that the Site lies within a wider area of groundwater concern. However, there is no records or anecdotal evidence to suggest that the Site has flooding historically as a result of groundwater flooding.

4.10 The SFRA mapping is included within **Appendix G**.

4.11 Figure 5: Groundwater Flood Risk within the ESCC Pre App obtained by SMA on the 8th of October 2020 shows that the northern section of the Site falls within an area shown to have 'Limited potential for groundwater flooding to occur'. The southern section of Site is not indicated to be at risk from groundwater flooding.

4.12 'Figure 6: Drainage Risk Areas' within the ESCC Pre App obtained by SMA on the 8th of October 2020 shows the Site falls within three drainage risk area classifications, which are spatial groupings intended to inform the preparation of drainage strategies with development proposals.

4.13 The northern section of Site lies within Risk Area 1 (Improvements upon greenfield runoff rates should be discussed with LLFA), whilst the central band and western section of the Site lies within Risk Area 2 (Infiltration is unlikely, ensure an outfall can be secured) and the southern section falls within Risk Area 3 (Infiltration techniques are likely to be inappropriate). The classifications indicate that due to a different degree of groundwater flood risk across the Site, infiltration techniques of surface water management are unlikely to be feasible across Site.

4.14 The ESCC Pre App is reproduced in **Appendix H.**

Surface Water Flooding

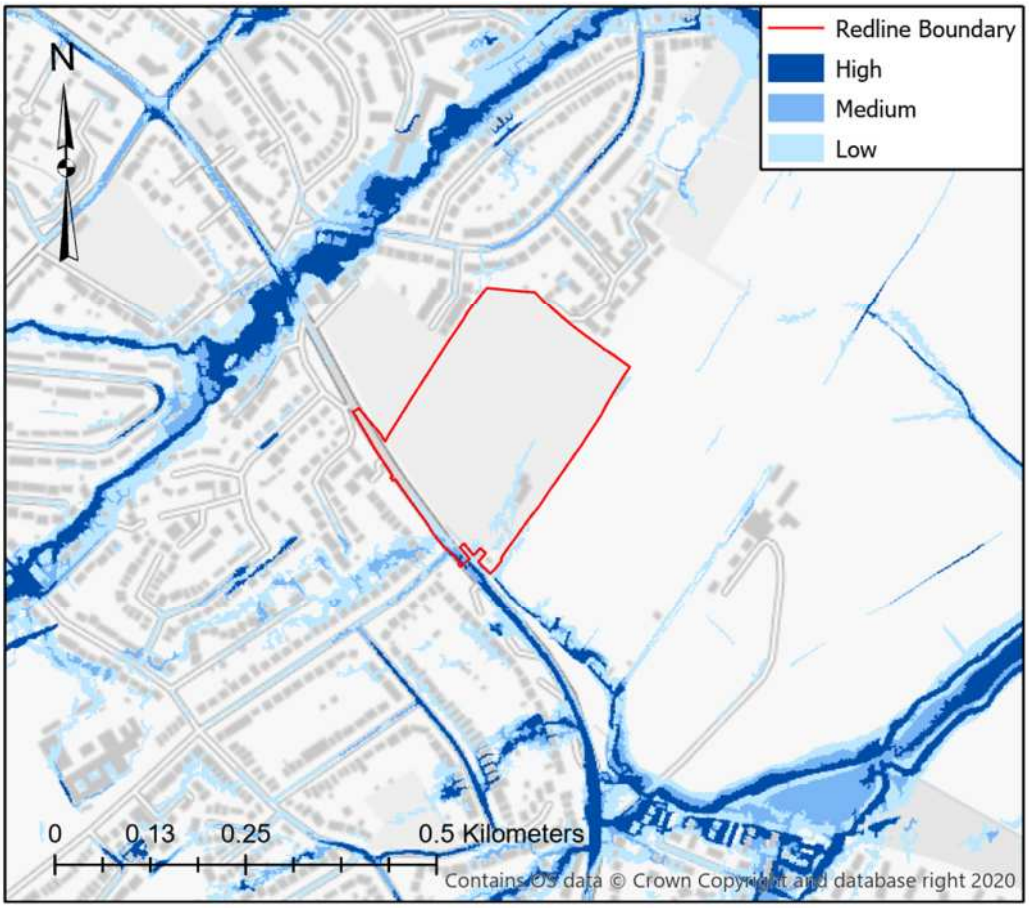
4.15 Surface Water Flooding occurs when the intensity of rainfall exceeds ground infiltration. Typically, this happens where the ground surface is impermeable, such as roads and paved areas within urban development and where there are impermeable soils, such as clay. The risk of flooding from surface water runoff is greater in locations that are situated adjacent to sloping land, within natural valleys and/or are within local depressions.

4.16 The EA map 'Risk of Flooding from Surface Water' (RoFSW) indicates that the majority of the Site lies within an area at a very low risk of surface water flooding. A small area within the southern region of Site is indicated to be at a low risk.

4.17 The overall risk from surface water flooding is therefore considered to be low.

4.18 The Risk of Flooding from Surface Water flood map is reproduced below in **Figure 5.**

Figure 5 - Risk of Surface Water Flood Map Data



Flooding from Reservoirs

4.19 The Government map 'Flood Risk from Reservoirs' shows that the Site is not within an area at risk of reservoir flooding.

Flooding from Infrastructure Failure

4.20 Where infrastructure retains, transmits or controls the flow of water, flooding may occur if there is a structural, hydraulic, geotechnical, mechanical or operational

failure. There are three main categories of infrastructure associated with this mechanism of flooding:

- Failure of infrastructure designed to store or carry water (e.g. dam break, canal leak, burst water mains).
- Failure of infrastructure designed to protect an area from flooding (e.g. breached flood defences, flap valve or penstock failure, pumping station failure).
- Failure of a pipe, bridge or culvert due to blockage.

4.21 There is minimal existing drainage infrastructure on Site and the risk of flooding from infrastructure failure is considered to be low.

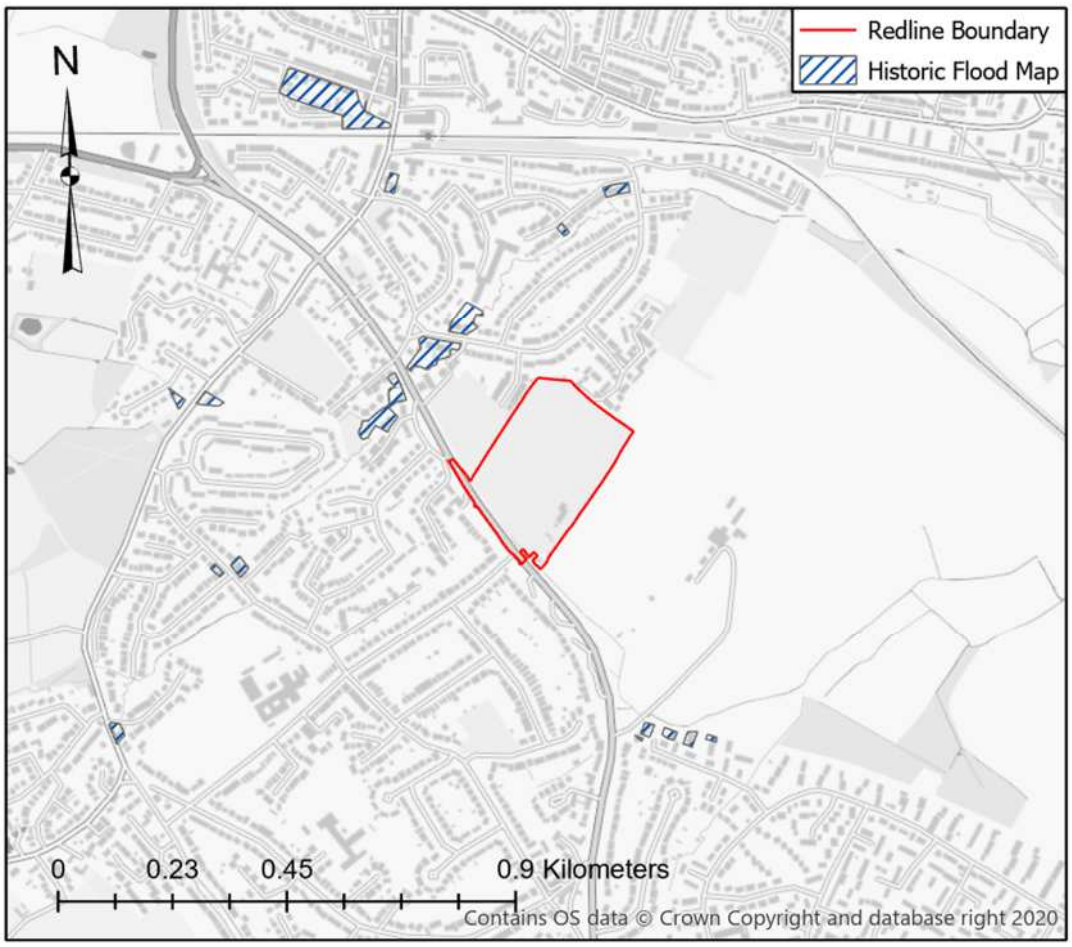
Historical Flooding

4.22 Table 6.1 of the WDC Level 1 SFRA, 2017 indicates that the Willingdon district has been subject to 34 historic flooding incidents from 1852 to 2016.

4.23 The EA 'Historic Flood Map' is a GIS layer showing individual recorded flood outlines since 1946 from river, sea and groundwater springs in England. The mapping shows no historical outlines within the Site boundary.

4.24 The historic flood map is reproduced below in **Figure 6**.

Figure 6 – Historic Flood Map



5.0 SURFACE WATER DRAINAGE STRATEGY

Discharge Destination

5.1 In order to ensure that surface water runoff from a developed site does not have a detrimental impact on the downstream catchment it is important to prioritise where surface water runoff is discharged, control how fast the runoff is discharged and also control how much runoff is discharged from the Site.

5.2 As the Site is predominantly greenfield, it is proposed to employ Sustainable Drainage Systems (SuDS) measures to ensure surface water is managed effectively.

5.3 Any development presents an opportunity to incorporate SuDS, which might include infiltration techniques or attenuation of flows to protect receiving sewers or watercourses. The choice of methods is dependent upon ground conditions and availability of suitable areas within the particular scheme layout.

5.4 The development proposals will incorporate SuDS to dispose of surface water runoff. The guidance given in the CIRIA report C753 'The SuDS Manual' will be followed during the design of the proposed sustainable drainage solution. Runoff will be managed both at source and across the Site as a whole.

5.5 Water is a valuable resource and opportunities should first be sought to reuse runoff on Site once it has been appropriately treated. Following this, the destination for surface water runoff that is not collected for reuse (rainwater harvesting) should be prioritised as set out in Requirement H3 Part 3 of the Building Regulations Approved Document H (2002 Edition), which states:

(3) Rainwater from a system provided pursuant to sub-paragraphs (1) and (2) should discharge to one of the following listed in order of priority:

(a) an adequate soakaway or some adequate infiltration system; or, where this is not reasonably practicable,

(b) a watercourse; or, where that is not reasonably practicable,

(c) a sewer

5.6 This guidance is replicated in the PPG which states:

"Generally, the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain or another drainage system;
- To a combined sewer."

Water Quantity

5.7 A set of Non-statutory Technical Standards (NTS) for sustainable drainage systems was published by DEFRA in March 2015. These set out the recommended procedures for rainfall runoff management for developments in various terms including peak flow control, volume control and flood risk within the development.

Peak Flow Control

5.8 NTS states in Section (**S2**); for greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1-year rainfall rate and the 1 in 100-year rainfall event should never exceed the peak greenfield rate for the same return period.

Peak Volume Control

5.9 In Section (**S4**), the NTS states; where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event should never exceed the Greenfield runoff volume for the same event.

Existing Discharge Rates

5.10 The Site under its existing conditions is considered Greenfield.

5.11 Runoff rates for the existing of the Site have been calculated using the HR Wallingford UK SUDS FEH online tool, provided in **Table 1** below and at **Appendix I.**

Return Period 1 in X year	Greenfield Discharge Rate (l/s)
1	36.10
QBAR	42.47
30	97.68
100	135.47

Table 1: Existing Runoff Rates

Surface Water Drainage Strategy

5.12 In accordance with the discharge destination hierarchies of the Building Regulations H3 and the PPG an assessment of the suitability of the Site to utilise infiltration drainage techniques has been undertaken.

5.13 Geology beneath the proposed Site is underlain by a bedrock geology of Lower Greensand Group (Sandstone, Siltstone and Mudstone), and Gault Formation (Mudstone). Due to the underlying geology, the ESCC Drainage Risk Areas classifications across Site and the presence of local ditch and watercourse networks on Site, infiltration methods of surface water disposal is considered to be unfeasible.

5.14 In line with Part 3 of the Building Regulations, discharge of surface water runoff from the proposed development will follow existing arrangements. Runoff will be discharged into the ditch located within the south east corner of the Site.

5.15 The primary form of attenuation will be provided within a retention basin located adjacent to the outfall. Further attenuation will be provided throughout the Site in the form of porous paving and swales.

5.16 In compliance with the NTS, the drainage systems across the Site will be designed so that the surface water runoff from the proposed development is contained within the drainage network, with no flooding for all storms up to, and including, the 1 in 30-year event. Furthermore, the drainage system will be designed so that flooding to any new buildings does not occur during a 1 in 100-year rainfall event, including a +40% allowance for climate change.

5.17 Flows resulting from rainfall in excess of a 1 in 100-year rainfall event will be managed in exceedance routes along the roads and into the open space following the natural slope in the direction of the attenuation basin to minimise the risks to people and property.

5.18 The surface water drainage strategy for the Site is presented within **Appendix J**.

Development Runoff

5.19 In order to comply with both the peak flow and volume discharge requirements of the NTS and to ensure that flood risk is not increased further downstream, discharge for the Site will be restricted to the 1 in 1 year Greenfield runoff rate for all storms up to and including the 1 in 100year +40% climate change event.

5.20 A comparison of pre and post-development runoff rates is provided in **Table 2** below which demonstrates that the proposed drainage strategy complies with NTS requirements.

Return Period 1 in X year	Pre-development Runoff Rates (l/s)	Post-development Runoff Rates (l/s)
1	36.10	18.5
QBAR	42.47	18.5
30	97.68	18.5
100	135.47	18.5
100 + 40% cc	N/A	18.5

Table 2: Pre and Post-development Runoff Rates

5.21 The proposed peak runoff from the Site will be restricted to the 1 year greenfield event flow rate calculated as 5.57l/s/ha based on 36.10l/s over 6.48 ha.

5.22 Based on a proposed development impermeable area of 3.3ha (including a 10% allowance for urban creep) the peak runoff rate from Site has been calculated as 18.5l/s.

Preliminary Storage Volume Estimates

5.23 The proposed impermeable area of the Site has been calculated as 3.0ha.

5.24 Preliminary storage volumes have been calculated based on this impermeable area and an allowance of 10% increase for urban creep.

- Q30 1,000m^3
- Q100 1,800m^3
- Q100+40% 2,700m^3

Storage Volumes Provided

5.25 The required attenuation storage has been provided with the surface water network and SuDS systems across the Site, and a total of 2700m^3 of storage can be provided on Site:

- Attenuation Basin 800m^3
- Swales 950m^3
- Porous Paving 450m^3
- Adoptable Sewers 500m^3

Climate Change

5.26 New climate change guidance published by the EA in February 2016 updates current guidance which supports the NPPF. According to new guidance, for the period up to 2115, peak rainfall intensities could increase up to 40%.

5.27 A 40% allowance for climate change will be considered, to help minimise vulnerability and provide resilience to flooding in the future, for the 1 in 100-year rainfall event.

Interception Storage (Delivery and Compliance)

5.28 Interception is defined as the capture and retention on Site of the first 5mm of the majority of all rainfall events.

5.29 The benefits of designing for interception are:

- Runoff characteristics from the Site will more closely reflect Greenfield runoff behaviour (where runoff will not occur for the majority of small rainfall events) and this will help to protect the morphology and ecology of the receiving water body.
- The pollution load to any receiving surface water body that could potentially be associated with the total runoff volume from all such small events will be retained on Site where it will have more time to biodegrade and/or be acted on by natural treatment processes within the SuDS system.

5.30 CIRIA 753 'The SuDS Manual' outlines that Interception can be delivered using a combination of processes such as rainwater harvesting, infiltration and evapotranspiration. Furthermore, 'very high levels of compliance with Interception are achievable through the use of pervious pavements' because 'during small events, the water soaks into the pervious surface and is released back into the atmosphere through evaporation once the rainfall has stopped'.

5.31 As infiltration has already been excluded due to the underlying soils, interception storage for the development will be provided via evapotranspiration using temporary shallow ponding within the soil or upper aggregate layers of the proposed porous paving SuDS system.

Exceedance Design

5.32 Very high rainfall intensities can overwhelm pipe-based drainage systems for brief periods, whereas SuDS tend to have longer-duration critical storm events. In all cases, there will be events that cause flooding at points in the network if the storm event exceeds the design event.

5.33 To mitigate against the effects of exceedance flooding the final layout of the Site will provide exceedance flow management systems that will place residential buildings outside of exceedance flow pathways. SuDS should be incorporated at low spots within the development to convey flows away from people, property and critical infrastructure.

5.34 The exceedance flow routes drawing for the Site is presented within **Appendix J**.

Surface Water Management & Treatment Train

5.35 In accordance with CIRIA Report C753: The SuDS Manual, a "SuDS Management Train" process will be undertaken to assure that the proposed drainage strategy mimics the natural catchment of the Site as closely as possible.

5.36 The proposed Management Train (**Table 3**) will provide appropriate levels of risk management to protect the receiving water body.

SuDS Component	Interception	Primary Treatment	Secondary Treatment	Tertiary Treatment
Porous Pavements	Y	Y		
Swales	Y	Y	Y	
Retention Basin (Pond)		Y	Y	Y

Table 3: SuDS Management Train

5.37 Source control techniques will be incorporated into the drainage strategy to ensure that storm water runoff is managed as close to source as possible.

Source control (Porous Car-Parks/Permeable surfaces)

5.38 Porous pavements are structures that allow rainwater to infiltrate through the surface layer and into the underlying sub-structure, where it will be temporarily stored before discharging into the nearest sewer.

5.39 As runoff percolates through the sub-layers, pollutants and contaminates are filtered out by the surfacing layer and biological process in the sub-base.

5.40 Porous pavements are built as an alternative to impermeable surfaces and therefore require no extra development space for their construction.

5.41 It is proposed, where possible, to provide permeable pavements within communal parking areas.

5.42 The permeable pavements will be designed to accommodate the volume of runoff for all storms up to and including the 100 year event plus a 40% allowance for climate change.

Retention Basins (Pond)

5.43 Retention basins are permanently wet landscaped depressions that provide both attenuation and treatment of surface water runoff.

5.44 Attenuation storage is provided above the permanent pool of water at the base of the retention basin. Runoff from rainfall events are retained by a flow control device and treated within the pool of water.

5.45 The standing pool of water helps settle out particulate pollutants and residual fine silts. The larger the storm event, the more time is provided for treatment to occur.

Swales

5.46 Swales are shallow, flat bottomed, vegetated open channels designed to convey, treat and attenuate surface water runoff. In addition, runoff collected by the system ponds temporarily on the surface and then filters through the vegetation and underlying soils.

5.47 Swale channels are broad and shallow and covered by vegetation as a means to encourage low flow velocities to facilitate sedimentation and filtration through the root and soil matrix providing effective pollutant removal.

Water Quality

5.48 **Table 4** details the pollution hazard indices for the residential development on Site as stated by CIRIA C753. The indices range from 0 (no pollution hazard for this contaminant type) to 1 (high pollution hazard for this contaminant type).

Land Use	Pollution Hazard	Total Suspended solids (TSS)	Metals	Hydro-carbons
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.5	0.4	0.4

Table 4: Pollution Hazard indices for different land use classifications

5.49 To deliver adequate treatment, selected SuDS components must have a total pollution index (for each contaminant type) that equals or exceeds the pollution hazard index. The proposed SuDS components for the Site, and their mitigation indices, are produced in **Table 5.**

5.50 A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

Land Use	Total Suspended solids (TSS)	Metals	Hydro-carbons
Permeable Pavement	0.7	0.6	0.7
Retention Basin (Pond)	0.25	0.25	0.3
Swales	0.25	0.3	0.3
Total	**1.2**	**1.15**	**1.3**

Table 5: Indicative SuDS mitigation indices for residential discharges to surface waters

5.51 It is considered that sufficient pollution treatment is provided within the proposed SuDS Management Train, minimising risk to water quality and to the receiving water bodies from the Site.

5.52 Management and maintenance schedules for the proposed SuDS features on-site are included within **Appendix K**.

6.0 WASTEWATER DRAINAGE STRATEGY

6.1 Southern Water (SW) sewer records indicate that there is an existing public foul sewer located south of the southern Site boundary, within highway land south of the A2270 Eastbourne Road.

6.2 It is proposed to provide a new 225mm sewer from the Site into the sewer located at, or downstream of manhole reference 3902.

6.3 The proposed drainage strategy drawing is included within **Appendix J**.

6.4 SW has confirmed through the pre-application process that there is currently insufficient capacity within this sewer to accept the proposed foul water flows from the development at this location.

6.5 SW has confirmed that:

> *"Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.*
>
> *Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided."*

6.6 The most practical point of connection for the Site is at manhole reference 3902. The existing sewer at this manhole is shown on Southern Water records to be a 225mm pipe; the equivalent diameter to that which will be coming from the proposed development.

6.7 It is therefore considered that foul water capacity can be provided to serve the development at the proposed connection point within a suitable time frame from planning permission being approved.

6.8 Southern Water correspondence is included as **Appendix L**.

6.9 Southern Water's Developer Services have previously advised that the site is located within their Regional Forecast growth area, and sewer upgrade works providing improved capacity for the area are due to be completed in 2022. The upgrade works will provide sufficient capacity for the proposed development.

7.0 SUMMARY & CONCLUSIONS

Flooding

7.1 This Report presents an assessment of flood risk in accordance with the guidelines set out in National Planning Policy Framework (NPPF) and its National Planning Policy Guidance (PPG). It also refers to, and complies with, DEFRA standards, the policies of East Sussex County Council (ESCC), Wealden District Council (WDC) and the Environment Agency (EA).

7.2 The Report demonstrates that the proposed residential development would be at a low risk of flooding, lying in Flood Zone 1, with safe access maintained to the Site at all times. Additionally, the proposal would not create an unacceptable increase in flood risk elsewhere.

7.3 The Report confirms that the Site is suitable for the proposed development and complies with the WDC, ESCC, EA and NPPF policies.

Surface Water Drainage

7.4 The Report shows that the SuDS methods proposed will attenuate and filter flow in a manner that will mimic the existing drainage regime. Surface water runoff from the proposed development will employ the following proposed components:

7.5 Porous paving is proposed for communal parking areas.

- A retention basin located in the south western corner of the Site for primary attenuation storage and tertiary water treatment.
- Swales used throughout the development adjacent to access road for conveyance, treatment and storage of surface water.
- Porous paving located within communal parking areas where feasible.

Sewerage

7.6 A Southern Water wastewater sewer is located within the A2270 Eastbourne Road to the south of the Site. A Gravity connection from the Site to the aforementioned sewer is proposed.

Conclusion

7.7 This report confirms that developing the Site would not increase the risk of flooding within the Site, or elsewhere, and that there is a satisfactory strategy, incorporating sustainable drainage techniques, for the disposal of surface water runoff, and wastewater, from the proposed development.

Site Location Plan

Appendix A



Site Area:
69,158m2
6.915 hectares
17.087 acres
744,410sqft

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REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	STATUS:
												Planning

CLIENT:	Danescroft (FREOF V Willingdon) LLP	PROJECT:	Hindsland, Eastbourne Road Willingdon, East Sussex
SCALE:	1:1250 (A1 ORIGINAL)	DRAWING:	Location Plan
DRAWN: RDB DATE: 01/03/21	20089	LP01	–

architecture planning masterplanning

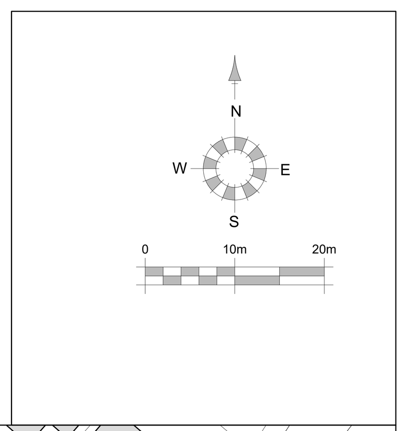
Broadmede House, Farnham Business Park,
Weydon Lane, Farnham, Surrey GU9 8QT.
info@osparchitecture.com www.osparchitecture.com
Tel: 01252 267878

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Topographical Survey

Appendix B





REV.	DATE	REVISIONS:	By	REV.	DATE	REVISIONS:	By	REV.	DATE	REVISIONS:	By	STATUS:

Planning

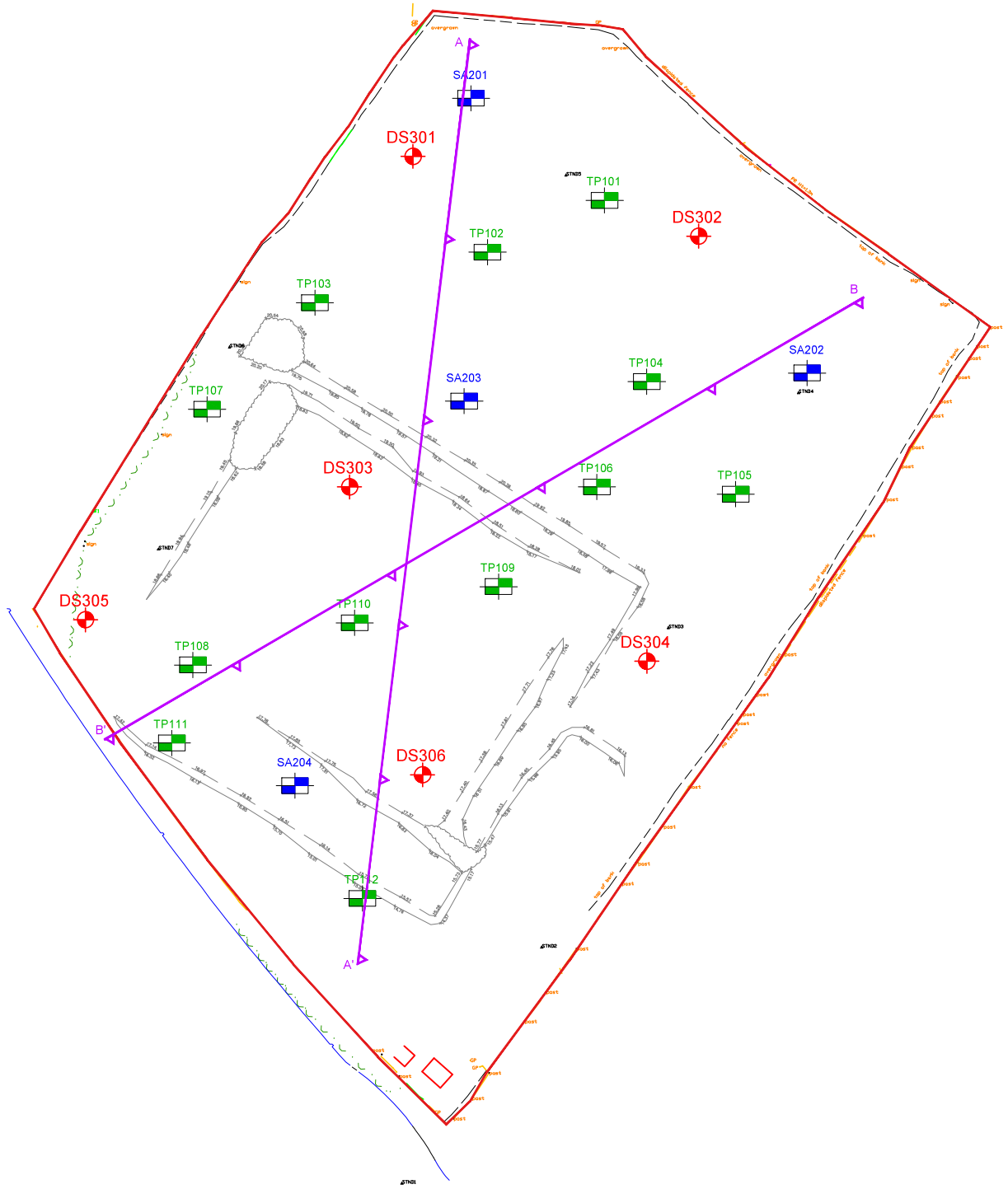
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SCALE:	1:500 (A0 ORIGINAL)	DRAWING:	Site Survey
DRAWN: - DATE: 01.03.21	20089	SS01	

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Ground Investigation Extracts

Appendix C



General notes

Positions are as surveyed to National Grid coordinates following completion of intrusive investigation works.

Limited topographic data shown was recorded during location pick up survey.

Legend to symbols

TP105 DCE Trial Pit

SA202 DCE Soakaway Pit

DS304 DCE Dynamic Sample Borehole

Site Boundary

Cross Section Line

Revision	Description

Title

AS BUILT INVESTIGATION POSITIONS

Project

EASTBOURNE ROAD
LOWER WILLINGDON

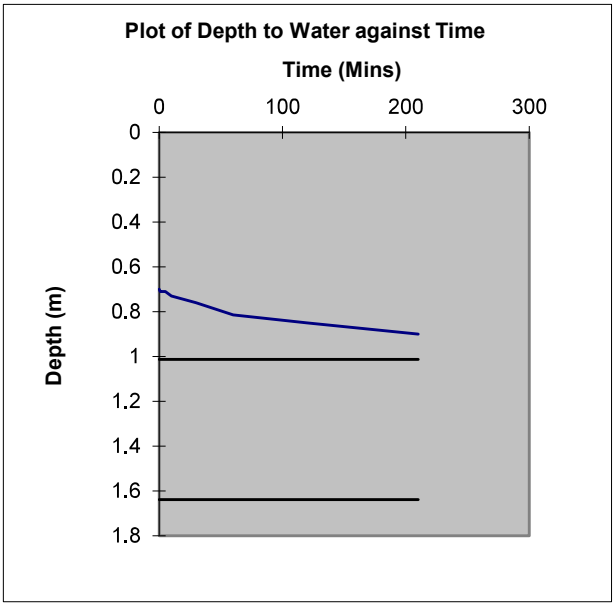
Client

Danescroft (FREOF V Willingdon) LLP

Discovery
Geotechnical & Environmental Engineers

Date	Drawing No.	Scale
14/09/2020	20055J-02-01	NTS
Drawn By	Checked by	Sheet Size
MF	CG	A3

Z:\20055J Danescroft Eastbourne\Drawings\20055J-02-01 As Built.dwg



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.7
1	0.71
2	0.71
5	0.71
10	0.73
30	0.76
60	0.815
120	0.85
210	0.9

Trial Pit No: SA201

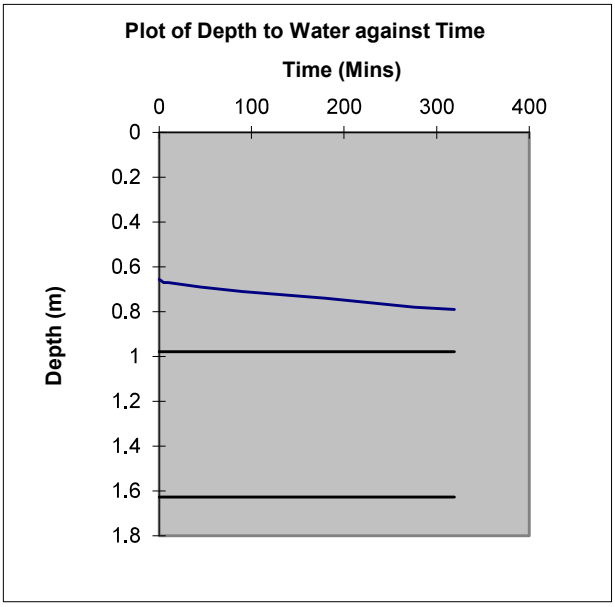
Date: 10/08/2020

Test Details

Length of Trial Pit **a** (m):	2.1
Width of Trial Pit **b** (m):	0.5
Depth of Trial Pit **D** (m):	1.95
Test Strata:	
Maximum Effective Depth (m)	0.7
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.65625
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	
Outflow Area ((Ap50) m2)	4.3
Soil Infiltration rate ((f)m/s)	Too low to calculate

Remarks: 1000 litres emptied into pit. Some infiltration during filling.
Insufficient infiltration to calculate infiltration rate.

Soakaway Test	**Project** **Eastbourne Road**	**Contract** **20055J**
Discovery Geotechnical & Environmental Engineers	**Willingdon**	**Figure** **SA201**



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.655
1	0.66
2	0.66
3	0.665
5	0.67
10	0.67
45	0.69
90	0.71
180	0.74
276	0.78
319	0.79

Trial Pit No: SA202

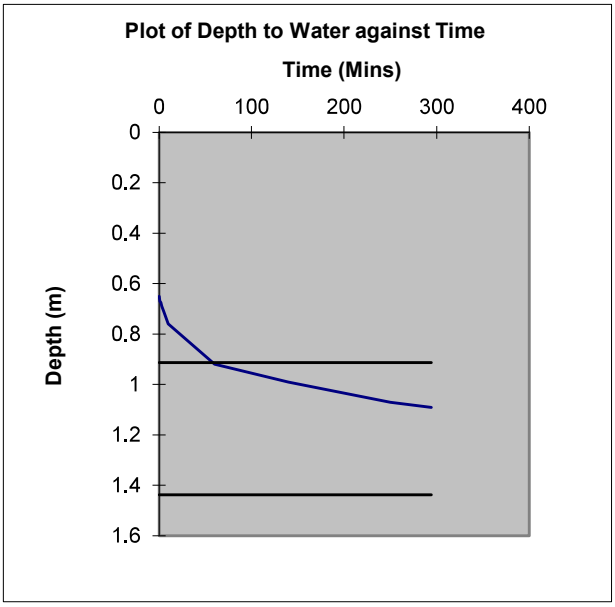
Date: 10/08/2020

Test Details

Length of Trial Pit **a** (m):	2.2
Width of Trial Pit **b** (m):	0.45
Depth of Trial Pit **D** (m):	1.95
Test Strata:	
Maximum Effective Depth (m)	0.655
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.641025
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	
Outflow Area ((Ap50) m2)	4.42175
Soil Infiltration rate ((f)m/s)	Too low to calculate

Remarks: 1000 litres emptied into pit. Some infiltration during filling.
Insufficient infiltration to calculate infiltration rate.

Soakaway Test	**Project** **Eastbourne Road**	**Contract** **20055J**
Discovery Geotechnical & Environmental Engineers	**Willingdon**	**Figure** **SA202**



Trial Pit No:	SA203
Date:	10/08/2020

Test Details

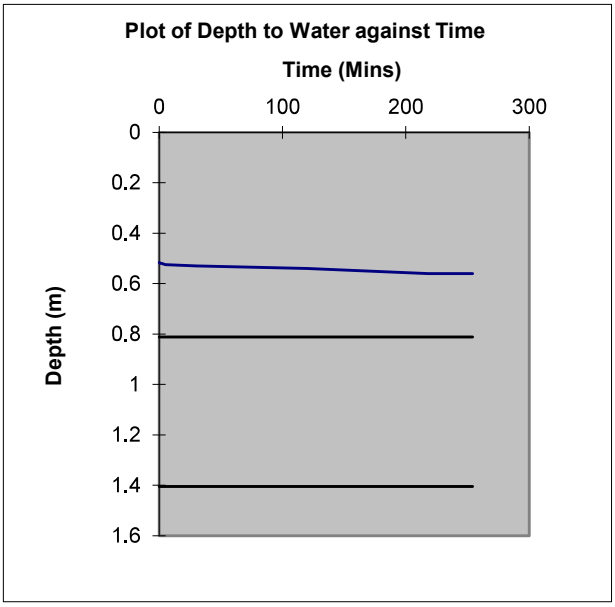
Length of Trial Pit **a** (m):	2.1
Width of Trial Pit **b** (m):	0.5
Depth of Trial Pit **D** (m):	1.7
Test Strata:	
Maximum Effective Depth (m)	0.65
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.55125
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	
Outflow Area ((Ap50) m2)	3.78

Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.65
1	0.67
2	0.675
3	0.69
5	0.71
10	0.76
60	0.92
140	0.99
250	1.07
294	1.09

Soil Infiltration rate ((f)m/s) Too low to calculate

Remarks: 1000 litres emptied into pit. Some infiltration during filling.
Insufficient infiltration to calculate infiltration rate.

Soakaway Test	**Project** **Eastbourne Road**	**Contract** **20055J**
Discovery Geotechnical & Environmental Engineers	**Willingdon**	**Figure** **SA203**



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.515
1	0.52
2	0.52
5	0.525
30	0.53
120	0.54
218	0.56
254	0.56

Trial Pit No: SA204

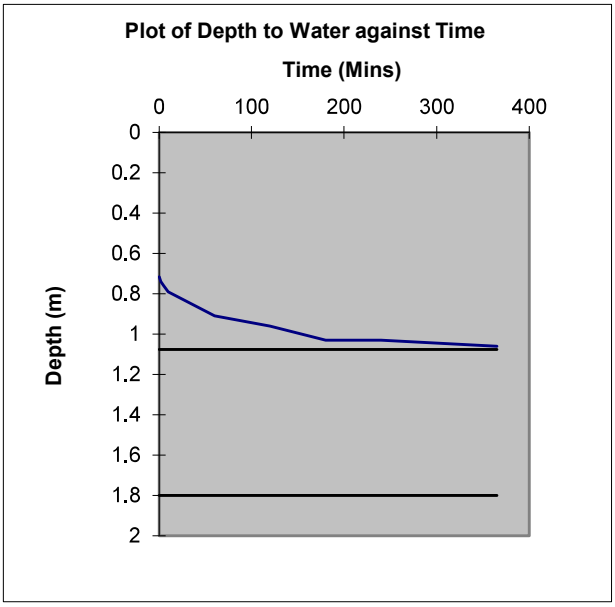
Date: 10/08/2020

Test Details

Length of Trial Pit **a** (m):	2.3
Width of Trial Pit **b** (m):	0.5
Depth of Trial Pit **D** (m):	1.7
Test Strata:	
Maximum Effective Depth (m)	0.515
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.681375
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	
Outflow Area ((Ap50) m2)	4.468
Soil Infiltration rate ((f)m/s)	Too low to calculate

Remarks: 1000 litres emptied into pit. Some infiltration during filling.
Insufficient infiltration to calculate infiltration rate.

Soakaway Test	**Project** **Eastbourne Road**	**Contract** **20055J**
Discovery Geotechnical & Environmental Engineers	**Willingdon**	**Figure** **SA204**



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.715
2	0.74
5	0.76
10	0.79
60	0.91
120	0.96
180	1.03
240	1.03
365	1.06

Trial Pit No: TP105

Date: 11/08/2020

Test Details

Length of Trial Pit **a** (m):	1.8
Width of Trial Pit **b** (m):	0.6
Depth of Trial Pit **D** (m):	2.16
Test Strata:	
Maximum Effective Depth (m)	0.715
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.7803
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	
Outflow Area ((Ap50) m2)	4.548
Soil Infiltration rate ((f)m/s)	Too low to calculate

Remarks: 2000 litres emptied into pit. Some infiltration during filling.
Insufficient infiltration to calculate infiltration rate.

Soakaway Test	**Project** **Eastbourne Road**	**Contract** **20055J**
Discovery Geotechnical & Environmental Engineers	**Willingdon**	**Figure** **TP105**

GAS AND GROUNDWATER MONITORING DATA

Discovery Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	MF
Date:	27-Aug-20
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit

1010 - 1013 mb

Ground Surface Conditions

Dry grass

Atmospheric Pressure Trend Over Previous 24hrs

Gradual rise from 1002 mb (Gatwick Airport)

Weather Conditions

Cool, overcast, dry

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	1.3	1.3	19.8	19.8	0.0	0.0	2.0	0.0	122	0.0	0.0	NR	NR	1013	2.92	4.99	
DS302	0.00	42	0.0	0.0	0.0	1.8	1.8	13.3	13.3	0.0	0.0	26.0	26.0	123	0.0	0.0	NR	NR	1012	3.87	5.00	
DS303	0.00	42	0.0	0.0	0.0	1.5	1.5	17.9	17.9	0.0	0.0	2.0	0.0	134	0.0	0.0	NR	NR	1010	-	2.49	
DS304	0.00	42	0.0	0.0	0.0	1.8	1.8	19.2	19.2	0.0	0.0	0.0	0.0	125	0.0	0.0	NR	NR	1011	2.73	3.02	
DS305	0.00	42	0.0	0.0	0.0	0.7	0.7	16.3	16.3	0.0	0.0	7.0	7.0	122	0.0	0.0	NR	NR	1010	3.59	4.92	
DS306	0.00	42	2.2	2.2	59.7	9.4	9.4	8.4	8.4	10.0	0.0	76.0	76.0	125	0.0	0.0	NR	NR	1011	2.89	5.00	
DS306A	0.00	42	11.6	11.6	>>>	23.6	23.6	0.0	0.0	0.0	0.0	2.0	0.0	125	0.0	0.0	NR	NR	1011	1.56	2.05	

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	CG
Date:	23-Sep-20
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit

1010 - 1013 mb

Ground Surface Conditions

Dry grass

Atmospheric Pressure Trend Over Previous 24hrs

Gradual fall from 1016 mb to 1010 mb (Gatwick Airport)

Weather Conditions

Warm, Sunny, dry

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	1.7	1.5	19.6	19.6	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1011	3.11	4.98	
DS302	0.00	42	0.0	0.0	0.0	1.3	1.3	15.7	17.0	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1012	3.95	4.99	
DS303	0.00	42	0.0	0.0	0.0	1.7	1.7	17.0	17.0	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1011	-	2.49	
DS304	0.00	42	0.0	0.0	0.0	1.1	1.1	20.5	20.5	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1010	2.91	3.02	(Possibly trapped water)
DS305	0.00	42	0.0	0.0	0.0	0.6	0.6	17.1	17.1	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1011	3.88	4.91	
DS306	0.00	42	1.8	1.7	36.0	16.0	16.0	11.0	11.0	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1011	3.03	4.99	
DS306A	0.00	42	16.4	16.0	>>>	28.6	28.6	0.0	0.0	0.0	0.0	NR	NR	180	0.0	0.0	NR	NR	1011	1.99	2.05	(Possibly trapped water at base of pipe)

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	IR
Date:	20-Oct-20
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit	Ground Surface Conditions
1000 - 1001 mb	Dry Grass
Atmospheric Pressure Trend Over Previous 24hrs	**Weather Conditions**
Gradual fall from 1014 - 998 mb (Gatwick Airport)	Sunny, Dry

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	1.9	1.9	16.1	16.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1000	2.25	4.97	
DS302	0.00	42	0.0	0.0	0.0	4.1	4.1	1.2	1.2	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1000	3.67	4.99	
DS303	0.00	42	0.0	0.0	0.0	2.8	2.8	18.2	18.2	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1001	DRY	2.47	
DS304	0.00	42	0.0	0.0	0.0	3.5	3.5	13.0	13.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1001	2.05	3.01	
DS305	0.00	42	0.0	0.0	0.0	1.0	1.0	15.2	15.3	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1001	3.51	4.87	
DS306	0.00	42	5.3	5.3	>	24.3	24.3	0.0	0.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1001	2.56	4.98	
DS306A	0.00	42	20.2	20.2	>	31.1	31.1	8.8	8.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1001	DRY	2.06	

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	IR
Date:	11-Dec-20
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit	Ground Surface Conditions
980 to 983 mb	Wet grassland
Atmospheric Pressure Trend Over Previous 24hrs	**Weather Conditions**
Falling from 992 to 985 mb (Gatwick Airport)	Raining

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	4.2	4.1	3.4	3.4	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	981	1.38	4.87	
DS302	0.00	42	0.0	0.0	0.0	0.2	0.2	20.0	20.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	980	1.71	5.00	
DS303	0.00	42	0.0	0.0	0.0	1.4	1.4	19.1	19.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	982	1.68	2.48	
DS304	0.00	42	0.0	0.0	0.0	1.9	1.9	10.8	10.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	981	0.81	3.02	
DS305	0.00	42	0.0	0.0	0.0	3.1	3.1	6.6	6.6	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	982	2.97	4.85	
DS306	0.00	42	9.2	9.2	>>>>	25.7	25.7	8.3	8.3	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	983	1.90	4.99	
DS306A	0.00	42	31.9	31.9	>>>>	27.7	27.7	0.0	0.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	983	1.98	2.16	

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery
Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	IR
Date:	08-Jan-20
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit	Ground Surface Conditions
1012 to 1014 mb	Damp grassland
Atmospheric Pressure Trend Over Previous 24hrs	**Weather Conditions**
Rising and falling from 1009 to 1010 mb (Gatwick Airport)	Sunny and cold

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	2.1	1.2	11.3	13.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1014	1.34	4.87	
DS302	0.00	42	0.0	0.0	0.0	1.1	1.1	19.1	19.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1014	0.63	5.00	
DS303	0.00	42	0.0	0.0	0.0	0.9	0.9	20.1	20.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1013	1.66	2.49	
DS304	0.00	42	0.0	0.0	0.0	2.3	2.3	13.6	13.6	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1012	0.66	3.05	
DS305	0.00	42	0.0	0.0	0.0	3.7	3.7	3.1	3.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1012	3.72	4.77	
DS306	0.00	42	10.7	10.7	>>>>	44.5	39.0	5.3	5.3	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1013	1.79	4.88	
DS306A	0.00	42	27.9	27.9	>>>>	32.1	32.1	0.0	0.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1012	1.88	1.94	

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery
Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	CT
Date:	01-Feb-21
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit: 989 - 992 mb

Ground Surface Conditions: Damp grassland

Atmospheric Pressure Trend Over Previous 24hrs: Falling from 993 - 982 mb (Gatwick Airport)

Weather Conditions: Sunny and cold

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	2.9	2.1	3.3	11.2	0.0	0.0	1.0	0.0	180	0.0	0.0	NR	NR	991	1.27	4.87	Silty
DS302	0.00	42	0.0	0.0	0.0	0.6	0.4	17.9	18.7	0.0	0.0	3.0	0.0	180	0.0	0.0	NR	NR	989	1.53	5.00	
DS303	0.00	42	0.0	0.0	0.0	0.8	0.8	20.1	20.1	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	991	1.46	2.49	
DS304	0.00	42	0.0	0.0	0.0	2.0	2.0	16.6	16.6	0.0	0.0	1.0	0.0	180	0.0	0.0	NR	NR	992	0.51	3.05	
DS305	0.00	42	0.0	0.0	0.0	3.0	2.7	5.8	8.2	0.0	0.0	3.0	1.0	180	0.0	0.0	NR	NR	991	2.80	4.84	Silty
DS306	0.00	42	8.9	8.9	>>>>	24.9	24.9	3.2	3.2	0.0	0.0	1.0	0.0	180	0.0	0.0	NR	NR	991	2.05	4.94	
DS306A	0.00	42	23.4	23.4	>>>>	27.7	27.6	0.0	0.0	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	991	1.86	2.01	

Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

GAS AND GROUNDWATER MONITORING DATA

Discovery Geotechnical & Environmental Engineers

SITE	Eastbourne Road, Willingdon
PROJECT No.	20055J
Carried Out by:	IR
Date:	03-Mar-21
Instrument Details	GFM-430 & Dip Meter

Atmospheric & Ground Conditions

Atmospheric Pressure Variations During Visit: 1019 - 1024 mb

Ground Surface Conditions: Damp grassland

Atmospheric Pressure Trend Over Previous 24hrs: Rising and falling from 1022 to 1020 mb (Gatwick Airport)

Weather Conditions: Raining

Well No.	Cover Height (m agl)	Well Diameter (mm)	CH4 (% v/v)		CH4 Steady LEL (%)	CO2 (% v/v)		O2 (% v/v)		H2S (ppm)		CO (ppm)		Duration (secs)^	Flow Rate (l/hr)	Differential Pressure (Pa)	PID (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Depth of Pipe (m bgl)	COMMENTS
			Peak	Steady		Peak	Steady	Min	Steady	Peak	Steady	Peak	Steady				Peak	Steady				
DS301	0.00	42	0.0	0.0	0.0	0.5	0.5	18.8	18.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1019	1.22	4.87	Silty
DS302	0.00	42	0.0	0.0	0.0	0.2	0.2	20.9	20.9	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1020	1.51	5.00	
DS303	0.00	42	0.0	0.0	0.0	1.0	1.0	20.3	20.3	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1020	1.73	2.49	
DS304	0.00	42	0.0	0.0	0.0	2.7	2.7	17.8	17.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1022	0.53	3.05	
DS305	0.00	42	0.0	0.0	0.0	2.0	1.8	6.8	9.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1020	2.97	4.85	Silty
DS306	0.00	42	3.4	3.4	98.1	38.3	38.3	9.7	9.8	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1022	1.99	4.96	
DS306A	0.00	42	18.2	15.9	>>>>	22.4	22.0	1.8	3.5	0.0	0.0	0.0	0.0	180	0.0	0.0	NR	NR	1024	1.75	2.03	

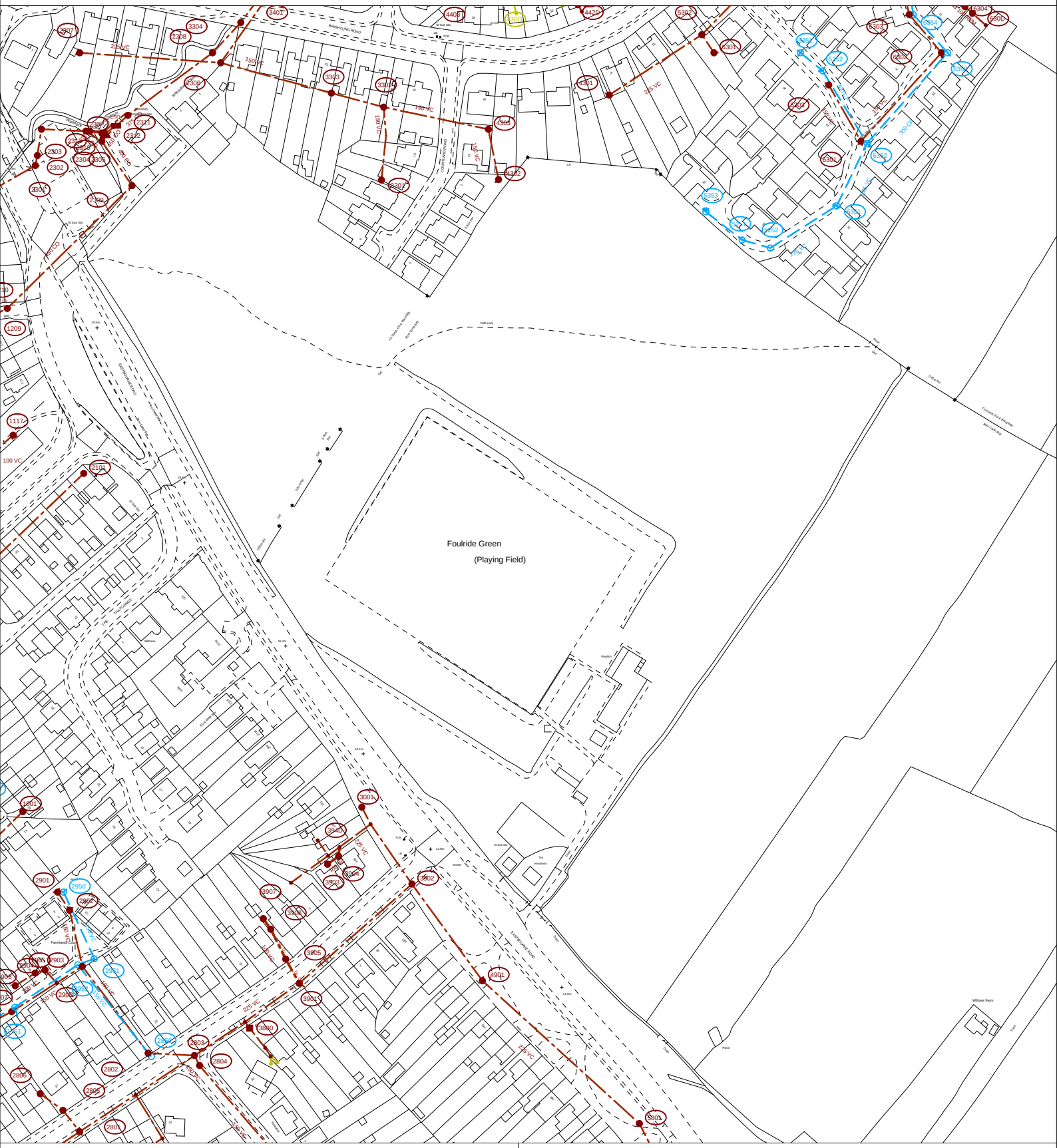
Notes: NR = Not Recorded ^ For measurement of gas concentrations > = Above LEL WST = Water Sample Taken GL = Ground Level

IMS 061

Southern Water Sewer Records

Appendix D

SOUTHERN WATER



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

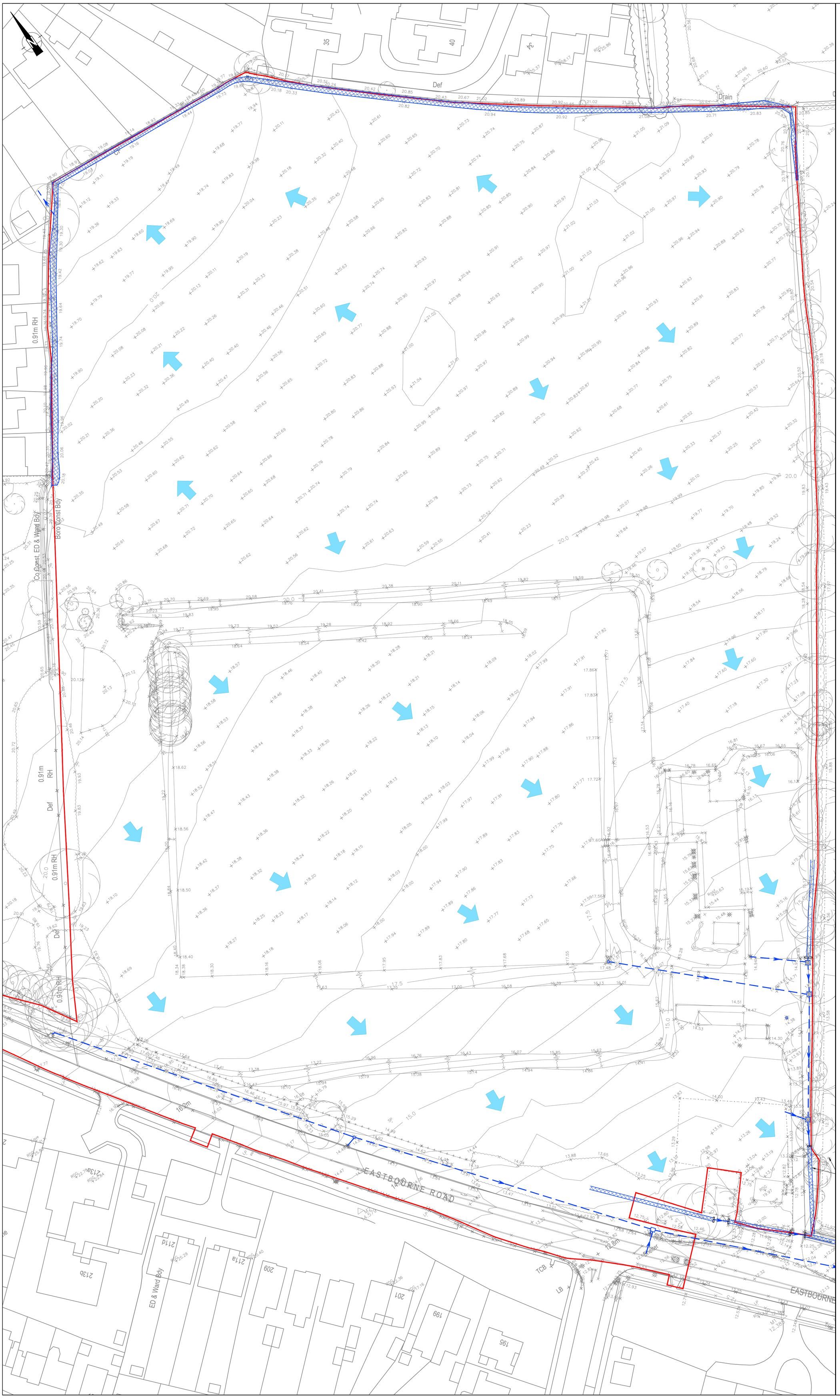
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Southern Water

O.S. REF: TQ5804SW	Scale: 1:2500	Printed By: Mercy	Date: 17-11-2020
Sewer Plot		Site Plan	
WARNING: BAC pipes are constructed of Bonded Asbestos Cement		Requested By:	
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement			

Existing Drainage Regime

Appendix E



KEY

- SITE BOUNDARY
- EXISTING OVERLAND FLOW ROUTE
- EXISTING SURFACE WATER DRAIN
- DITCH

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DANESCROFT

JOB TITLE
EASTBOURNE ROAD
WILLINGDON

DRAWING TITLE
EXISTING DRAINAGE CATCHMENTS AND OVERLAND FLOW ROUTES

DATE	DRAWN	CHECKED	ISSUE CHECKBOX
FEB 21	JOK		

DRAWING No.	REV	SCALE
6554.402		1:500 @ A1

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KEY

SITE BOUNDARY

EXISTING SURFACE WATER DRAIN

DITCH

MANHOLE (SILTED)
CL 14.81

GULLY
(OVERGROWN)
(UNABLE TO SURVEY)

INDICATIVE LOCATION OF OVERGROWN DITCH. CLEARANCE AND FURTHER SURVEY REQUIRED

HEADWALL (SILTED)

MANHOLE
CL 14.99

MANHOLE
CL 14.66

MANHOLE
(UTL)

MANHOLE
CL 13.40

HEADWALL (SILTED)
CL 13.00
IL 11.90

CONNECTION TBC







Rev	Description	Drn	Chk	Date
A	MINOR UPDATES	JOK		24.02.21

REVISIONS

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DANESCROFT

JOB TITLE

EASTBOURNE ROAD
WILLINGDON

DRAWING TITLE

EXISTING DRAINAGE ARRANGEMENTS

DATE	DRAWN	CHECKED
SEPT 20	JOK	TSW

DRAWING No	REV	SCALE
6554.400	A	1:250 @ A1

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Constructionline

Development Proposals

Appendix F

Site Plan Legend

Site Area 2.109Ha (5.21 Acres)

- Application Site Boundary Line
- Medical Centre Boundary Line
- Retained Trees/ Hedgerow
- Proposed Trees
- 4BA — Dwelling Reference (Example Shown)
- Plot XX — Plot Number
- 1 — Allocated Parking 2.5m x 5m
- Un1 — Unallocated Parking 2.5m x 5m
- V1 — Visitors Parking 2.5m x 5m
- 1.8m Brick Wall
- 1.8m Timber Fence
- Shed/Cycle Store
- RCP — Refuse Collection Point
- Bin Store
- Affordable Rented
- Affordable Shared Ownership
- HVcable/Easement Underground
- Water Main Easement
- Area for drainage
- Garden Areas

Indicative Coloured Site Layout
Hindsland, Eastbourne Road
Willingdon, East Sussex

20089 / C101

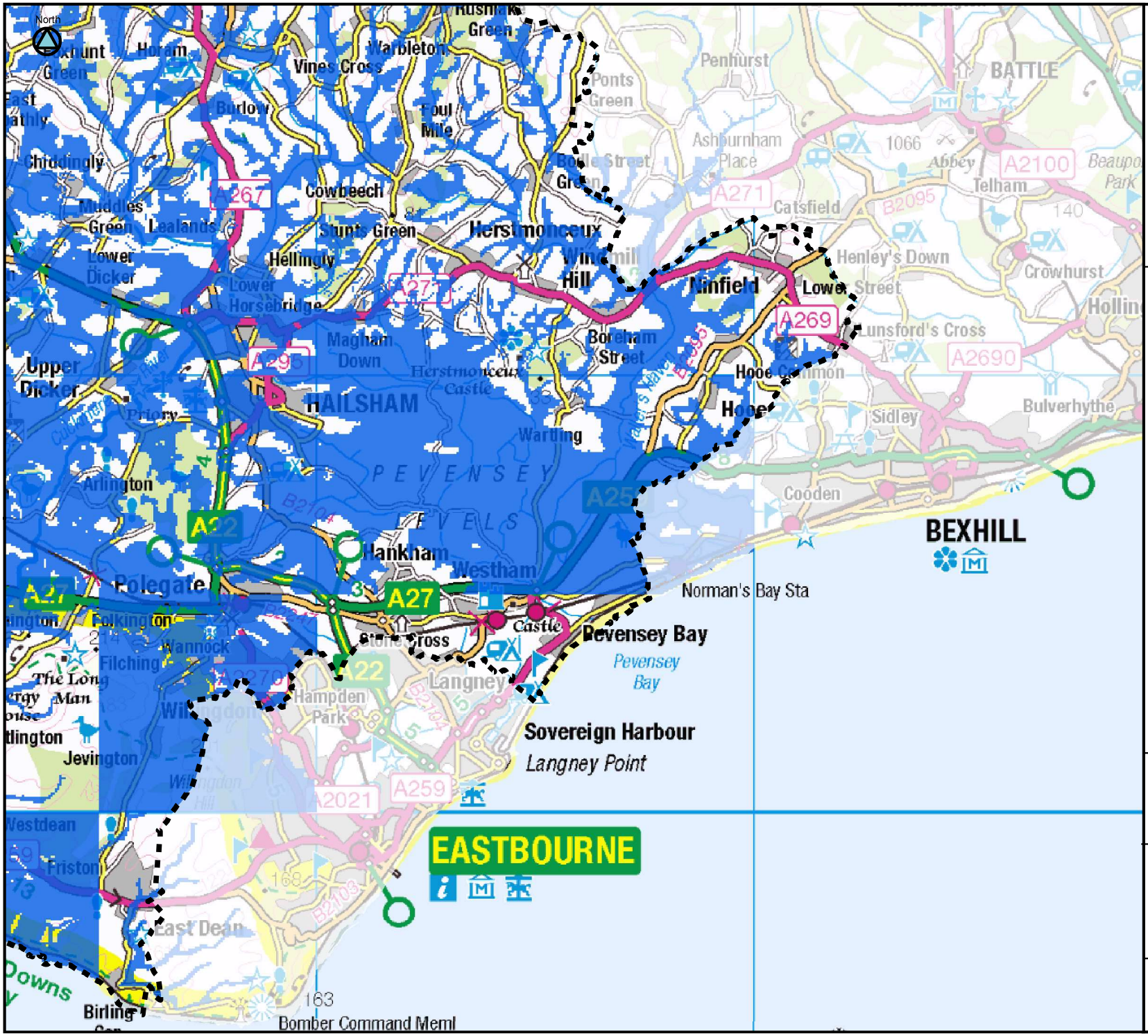
Scale 1:500 @ A0 March 2021

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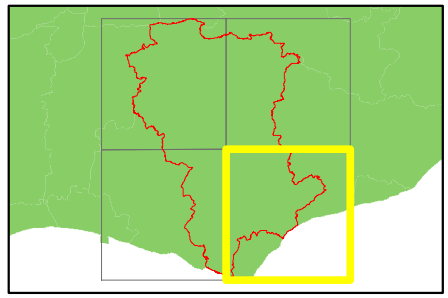
OSP Architecture, Broadmede House, Farnham Business Park, Weydon Lane, Farnham, Surrey, GU9 8QT Tel: 01252 267878 . www.osparchitecture.com

SFRA Flood Maps

Appendix G



Key Plan



Legend

- Wealden Boundary
- Groundwater concern

0 1.25 2.5 5 km

WEALDEN DISTRICT COUNCIL

LEVEL 1 SFRA: APPENDIX F GROUNDWATER MAPPING

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Information regarding modelled and histprical flood risk is constantly changing. Users should consult the Environment Agency for the lastest flood risk information relating to specific planning applications.

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JBA consulting

Wealden District Council

East Sussex County Council Pre-Application Correspondence

Appendix H

08/10/2020

Drainage Report

Site name: Eastbourne Road, Willingdon, BN26 5DU

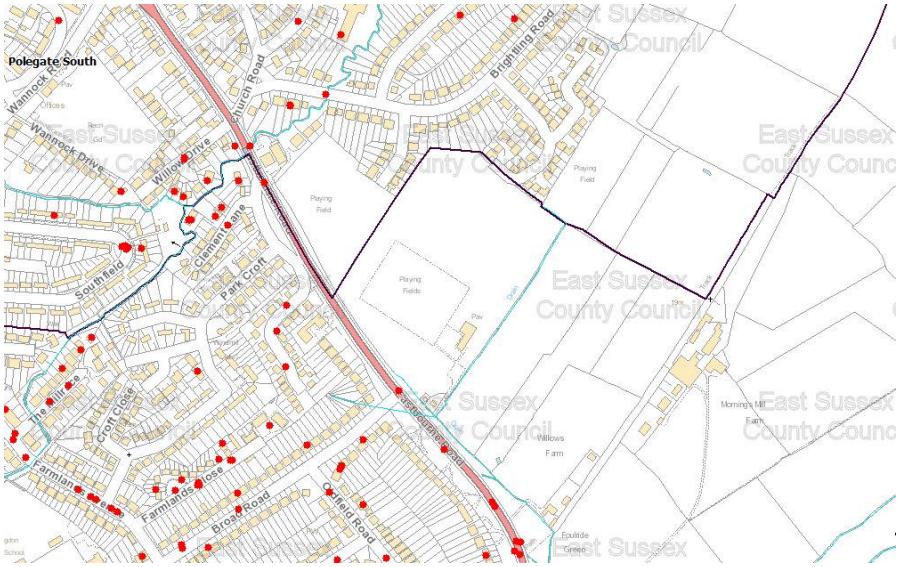
ESCC Reference: SUD/PRE/PC/WD/20/017

Flood Risk

Flood Risk	Is any part of the site at risk?	Where to obtain additional information
Fluvial/Coastal	No	Environment Agency
Surface water	Yes	Environment Agency
Groundwater	Yes	British Geological Survey

The site's location in Flood Zone 1 does not mean that there is no fluvial flood risk to it as there are some ordinary watercourses on the site, it just means that it has not been mapped. Wealden District Council has partnered with Eastbourne Borough Council to develop a fluvial flood model to accurately map flood risk in Polegate and Willingdon. This includes detailed modelling of the watercourse on the development site. This modelling work is still at collection of channel survey stage.

The map below shows the flood incidents recorded in our database in the vicinity of the development site.



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Figure 1: Recorded Flood Incidents

The table below provides details of the recorded flood incidents within the vicinity of the site.

Date	Source of flooding	Description
03/03/2010	Unknown	Unknown
23/02/2010	Unknown	Pavements outside property flooded & front garden of house
Unknown	FOUL/COMBINED, Curtilage and highway or open space flooded	Unknown
Unknown	FOUL/COMBINED, curtilage and highway or open space flooded	Unknown
Unknown	FOUL/COMBINED, curtilage flooding	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	SURFACE WATER	Unknown
Unknown	FOUL/COMBINED	Unknown
Unknown	FOUL/COMBINED	Unknown

Date	Source of flooding	Description
Unknown	FOUL/COMBINED	Unknown
Unknown	SURFACE WATER	Unknown
Unknown	FOUL/COMBINED	Unknown
02/03/2010	Unknown	Garden flooded
11/10/2010	Unknown	drains blocked
01/07/1993	Pluvial	Collapse of stream bank
01/11/1994	FOUL/COMBINED	Blocking of watercourse by rubbish.
01/01/1995	FOUL/COMBINED	Flooding. Fire Brigade
01/01/1995	FOUL/COMBINED	Flooding. Fire Brigade
01/01/1995	FOUL/COMBINED	Flooding Sandbags required
01/01/1995	FOUL/COMBINED	Sandbags req
01/03/1995	FOUL/COMBINED	Road flooded outside shops in Farmlands Way
01/03/1995	SURFACE WATER	Sandbags
01/03/1995	FOUL/COMBINED	Sandbags req
01/03/1995	SURFACE WATER	Flooding Sandbags req. Stream Flooding through garden.
01/11/1997	Pluvial according to SFRA 2008	Sandbags, surcharging from foul sewer
01/11/1997	Pluvial according to SFRA 2008	Surface flooding to garden run off from rec
01/01/1998	Pluvial according to SFRA 2008	Sandbags req
01/01/1998	Pluvial according to SFRA 2008	Sandbags req
01/06/1999	Pluvial according to SFRA 2008	Run off onto adjoining land
01/12/1999	Pluvial according to SFRA 2008	Sandbags req
01/02/2000	Pluvial according to SFRA 2008	Surface flooding of Garden
01/03/2000	Pluvial according to SFRA 2008	ditch blocked
01/06/2000	Pluvial according to SFRA 2008	Sandbags req
01/06/2000	Pluvial according to SFRA 2008	Sandbags req

Date	Source of flooding	Description
01/11/2000	Pluvial according to SFRA 2008	Sandbags req
01/01/2001	Pluvial according to SFRA 2008	Garage falling away into stream.
01/04/2002	Pluvial according to SFRA 2008	Complaint re rubbish/debris in main river
01/04/2002	Pluvial according to SFRA 2008	water ponds in rear garden
01/05/2002	Pluvial according to SFRA 2008	stream at rear blocked by doors debris and soil
01/04/2004	Pluvial according to SFRA 2008	manhole in footpath alongside library overflowing
01/06/2004	Pluvial according to SFRA 2008	channel blocked
01/08/2004	Pluvial according to SFRA 2008	Tree fallen across watercourse at into garden
01/12/2004	Pluvial according to SFRA 2008	Flooding in rear garden, suspected piped ditch when estate built
01/04/2005	Pluvial according to SFRA 2008	Youths putting debris in stream
01/05/2005	Pluvial according to SFRA 2008	Found land drain in rear garden
01/10/2005	Pluvial according to SFRA 2008	garden flooded again
01/10/2006	Pluvial according to SFRA 2008	Damp in property, possible underfloor
01/02/2007	Pluvial according to SFRA 2008	SW flooding to front garden- sandbags requested
01/01/2008	Pluvial according to SFRA 2008	Flooding in front and rear garden during heavy rain
01/01/2008	Tidal	Sandbags req
15/11/2010	Drainage: highway culvert	blocked drain outside property
01/09/1991	Fluvial	Watercourse fenced in and in need of maintenance
01/11/1991	Unknown	Flooding of gardens
01/06/1993	Pluvial	Flooding of garden. Broken water pipe
01/01/1994	Ground Water	Flooding of road on occasion. Broken pipes found by CCTV
01/02/1994	Pluvial	Groundwater in gardens
01/05/1994	Sewer	Unknown
01/12/1994	SURFACE WATER	Sandbags req

Date	Source of flooding	Description
01/12/1994	FOUL/COMBINED	Flooding from road and foul sewer.
01/01/1995	SURFACE WATER	Flooding Fire Brigade
01/01/1995	FOUL/COMBINED	Flooding under properties
01/01/1995	FOUL/COMBINED	Flooding to garden reoccurring problem
01/03/1995	FOUL/COMBINED	Sandbags req
01/03/1995	SURFACE WATER	Manhole covers lifting. Raw sewage into street
01/03/1995	FOUL/COMBINED	Foul surcharging across the garden.
01/01/1997	FOUL/COMBINED	Blocked culvert
01/11/1997	FOUL/COMBINED	Flooding to back garden
01/11/1997	FOUL/COMBINED	Sandbags - surface flooding to garden run off
01/11/1997	Pluvial according to SFRA 2008	Foul surcharging not above ground level
01/06/1998	Pluvial according to SFRA 2008	A22 flooded
01/01/1999	Pluvial according to SFRA 2008	Flooding off highway
01/11/2000	Pluvial according to SFRA 2008	Foul sewer surcharging due to water enter the manhole
01/02/2001	Pluvial according to SFRA 2008	Water ponding in rear garden after heavy rain
01/03/2001	Pluvial according to SFRA 2008	sw ponding reported in rear garden after heavy rain
01/10/2001	Pluvial according to SFRA 2008	Flooding from overflowing gutter
01/11/2002	Pluvial according to SFRA 2008	sw ponds in drive
01/11/2002	Pluvial according to SFRA 2008	rear garden lays wet most of time
01/01/2009	Pluvial according to SFRA 2008	watercourse surcharging in rear garden
01/01/2009	Pluvial according to SFRA 2008	Unknown
01/11/2009	Pluvial according to SFRA 2008	water off footway runs into front garden
11/02/2012	Unknown	Humanitarian or Assistance - Flooding
23/08/2012	Unknown	Humanitarian or Assistance - Flooding
09/11/1997	FOUL	curtilage flooding, unusable sanitation

Date	Source of flooding	Description
29/09/2005	FOUL	Curtilage flooding
30/11/2009	FOUL	Pollution, highway flooding
Unknown	Pluvial according to SFRA 2008	Unknown
Unknown	Pluvial according to SFRA 2008	Unknown
26/08/2011	Sewer- Foul	Unknown
04/11/2013	Sewer- Surface Water	Unknown
13/11/2013	Sewer- Foul	Unknown
15/10/2014	Unknown	Unknown
28/07/2014	Surface water- highway gully	Blocked gully is overflowing and flooding garden during heavy rainfall. It is currently 3ft away from the house.
08/08/2008	FOUL	Curtilage flooding
21/08/2008	FOUL	Curtilage, agricultural flooding
26/02/2010	FOUL	Curtilage flooding, unusable sanitation
Unknown	Unknown	Flooded gardens
Unknown	Pluvial	Damage to properties
Winter 2000	Pluvial	A2270 flooded, road closed
01/01/1995	Unknown	Sandbags required
01/01/1995	Unknown	Sandbags required
01/01/1995	Unknown	Flooding Sandbags required
01/03/1995	Unknown	Flooding
01/03/1995	Unknown	Sandbags req
01/11/1997	Unknown	Sandbags required
01/11/1997	Unknown	Sandbags required
01/11/1997	Surface Water	Surface flooding to garden run off from rec owned by Polegate T.C-Mr White485726
01/01/1998	Unknown	Sandbags required

Date	Source of flooding	Description
01/01/1998	Unknown	Sandbags required
01/06/1999	Surface Water	Run off onto adjoining land, Farmlands Court - Developer installs land drains
01/12/1999	Unknown	Sandbags required
01/02/2000	Surface Water	Surface flooding of Garden - former watercourse filled, historically
01/03/2000	Unknown	Work carried out by WDC to open up ditch
01/06/2000	Unknown	Sandbags required
01/06/2000	Unknown	Sandbags required
01/11/2000	Unknown	Sandbags required
01/04/2002	Unknown	water ponds in rear garden - advised installation of shallow land drain if problem is of sufficient concern
Unknown	Pluvial according to SFRA 2008	Unknown
Unknown	Pluvial according to SFRA 2008	Unknown
26/01/2010	Surface Water	When it rains the rain floods down and totally misses the gulley there. Apparently, it requires some sort of redirecting so that the falling rain goes into the gulley
01/02/2010	Unknown	Drain needs to be cleared.
26/08/2011	Sewer- Foul	Unknown
05/11/2012	Surface water- highway gully	The storm drain outside No. 71 is blocked, producing a large pool of water around the drain. This is bubbling up and running down the road into the front garden, causing severe flooding. Threatening the house.
Unknown	Groundwater	Groundwater in gardens, Owners advised to land drain gardens
31/08/2011	Surface water-highway gully	Gully/drain unable to cope with heavy rain water. Water running down the close.
11/11/2013	Unknown	Road flooded with standing water. Cars are having to use the opposite side of the road.
28/07/2014	Surface water- highway gully	Road is flooding due to heavy rain. Two road drains

Date	Source of flooding	Description
		blocked.
1997?	Pluvial	gardens flooded. Works carried out to prevent re-occurrence
01/01/1994	Surface Water - Drainage	Flooding of road on occasion.
01/02/1994	Groundwater	Groundwater in gardens, Owners advised to land drain gardens
01/12/1994	Unknown	Sandbags required
01/01/1995	Surface Water	Flooding to garden reoccurring problem
01/03/1995	Unknown	Sandbags req
01/03/1995	Foul	Manhole covers lifting. Raw sewage into street
01/11/1997	Foul	Foul surcharging not above ground level. SW alerted
01/11/1997	Surface Water	SW ponding in rear garden
01/11/1997	Surface Water	Sandbags - surface flooding to garden run off from Tott Yew Rec
01/06/1998	Surface Water	A22 flooded-ESCC advised although no problem reported to them
01/01/1999	Surface Water	Flooding off highway
01/11/2000	Foul	Foul sewer surcharging due to water enter the manhole. Southern Water have fitted a non-return valve. However, the problem appears to be persisting.
01/02/2001	Surface Water	Water ponding in rear garden after heavy rain. Agreed that the owner will pump water into surface water sewer when needed.
06/01/2015	Surface water - drainage ditch/highway gully	Road flooded and water overflowing onto cycle path. Grips and gullies cleared.
11/11/2013	Drainage	Drain is blocked with lots of bags filled with dog faeces. Small amount of water is collecting here and running down the road during heavy rainfall as a result
13/11/2013	Drainage	Road drainage issues
28/07/2014	Drainage	Gully requires clearance as overflowing and flooding

Date	Source of flooding	Description
		garden, during heavy rainfall. 3ft from house
28/07/2014	Surface Water	Customer reports a lot of water in road that could come into the house
28/07/2014	Drainage	Two drains blocked and the road is flooding due to the storm and heavy rain. Drains need clearing as weeds are growing out.
12/08/2014	Drainage	Gullies appear to be blocked as the rain water is not running away after rainfall.
26/01/2010	Surface Water	Problem outside 67 St John's Road Polegate. When it rains, floods and totally misses the gulley.
02/03/2010	Surface Water	There is fresh water going off route and it goes into his garden, causing flooding.
31/08/2011	Drainage	gully was missed recently as a car was parked over it and it caused flooding on Friday
08/09/2011	Drainage	When it rained last week the gully or drain could not cope with the water A few months ago all the others were cleared except this one
19/10/2012	Surface Water	Water running down the road and causing flooding in the general area
05/11/2012	Surface Water - Drainage	The storm drain outside number 71 is blocked. There is a big pool of water around the drain which is bubbling and then running down the road. Because of this my front garden is now severely flooded
12/02/2016	Drainage	drains are blocked here, causing a lot of flooding when it rains. Blocked with silt
13/01/2016	Surface Water - Drainage	blocked drains and water flowing down road
08/01/2016	Surface Water - Drainage	drains being blogged, as mud from the verge goes in the drains. Roads have major flooding problems
06/01/2016	Drainage	Reporting blocked gully. Surface water is flooding customers garden and says there is now rising damp in their front bedroom
26/08/2015	Surface Water	water flooding across the road. The culvert that runs underneath this road needs unblocking

Date	Source of flooding	Description
26/08/2015	Surface Water - Drainage	The road outside our home has just flooded again, right up over the grass verge. Drains are blocked with rubbish and debris in this area.
25/08/2015	Surface Water - Drainage	torrential downpour has caused drains to overflow flooding the interior through toilet and shower. Storm Drain blocked with rubbish. Combined water system.
14/08/2015	Surface Water	Drain regularly overwhelmed in heavy rain. Flooding threatening houses lower than road level.
28/07/2014	Drainage	Gully requires clearance as overflowing and flooding garden, during heavy rainfall. 3ft from house
28/07/2014	Surface Water - Drainage	Two drains blocked and the road is flooding due to the storm and heavy rain.
11/07/2014	Surface Water	3 curb stones need raising to stop rainwater over-flowing from road onto driveway and allow it to reach nearby drain.
Unknown	Unknown	Flooding of the grass verge and road outside 11 Farmlands Close after rain.
05/01/2018	Drainage	Customers report of a blocked drain.
15/03/2018	Drainage	This drain is blocked so when it rains carriageway around it floods, particularly difficult for cyclists to negotiate.
03/04/2018	Surface Water	A number of residents/drivers have reported to me that the bend outside 89 Southfield, Polegate are flooded during rain.
04/04/2018	Drainage	Please inspect drains on Foulride Green, for any which are blocked. Customer reporting 3 blocked.
19/01/2018	Surface Water	Customer called to report that there are areas of the pavement which flood causing difficulty in accessing their properties.
31/01/2018	Surface Water	Rain water is flooded the footway and verge which they have to walk on water.
23/05/2018	Surface Water	The water is gathering on large puddles and flooding a residents driveway.

Date	Source of flooding	Description
01/12/2018	Unknown	Flooding blocking one lane.

Please note that our records only provide a snapshot of the flood history in the area, as the majority of incidents were compiled after the County Council was established as the Lead Local Flood Authority in 2010. Therefore, other risk management authorities, such as the Environment Agency, the Local Planning Authority and Southern Water may hold additional records.

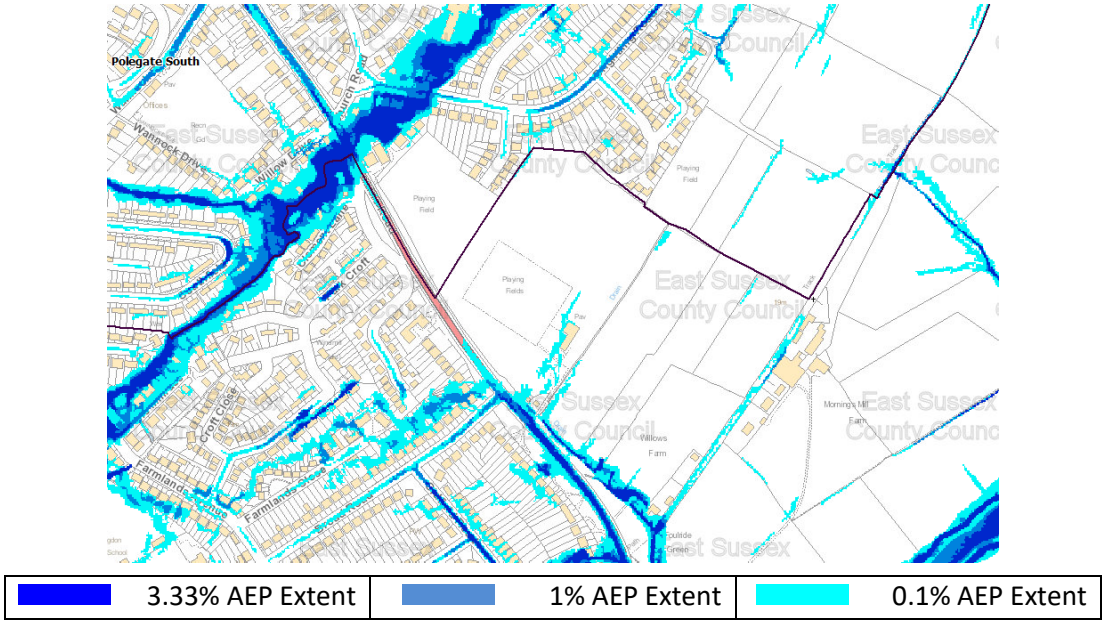
The surface water management strategy should include information on how the potential impacts of local flood risk sources on the proposed drainage arrangements have been considered and mitigated where necessary. Local flood risk sources include surface water, groundwater, sewer and ordinary watercourse flood risk.

Surface Water Flood Risk

The Environment Agency's surface water flood mapping shows the predicted surface water flood risk at the development site, and the table below gives the corresponding maximum flood depth:

Table 1: Surface Water Flood Depths

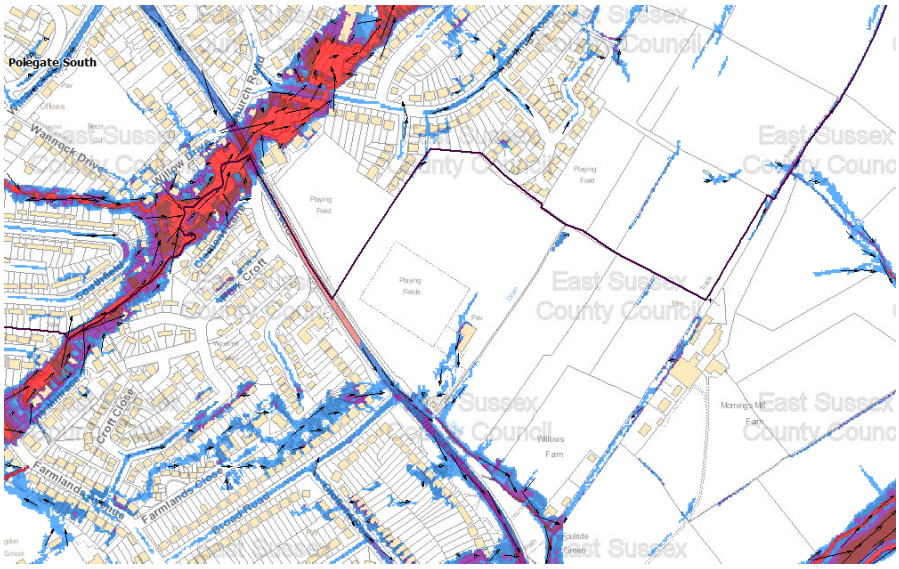
Flood Event	Maximum Depth
3.33% AEP (1 in 30 year)	N/A
1% AEP (1 in 100 year)	0.48
0.1% AEP (1 in 1000 year)	0.64



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Figure 2: Surface Water Flood Risk

The map below shows predicted depths and flow direction of surface water for the 0.1% AEP (1 in 1000) event:



	0.00 – 0.15m		0.15 – 0.30m		0.30 – 0.60m
	0.60 - 0.90m		> 0.90 m		

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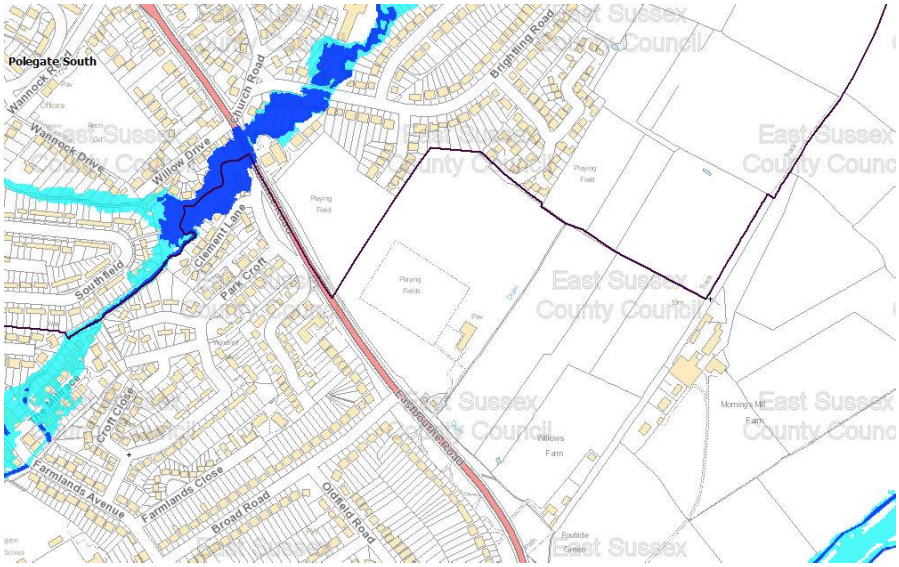
Figure 3: 0.1% AEP depth and flow direction

Further information can be viewed online on at the Environment Agency's pages on the GOV.UK website.

There is a small surface water flow path that runs partly through the site. This should be taken into account when designing the site layout and levels as to ensure the flood risk is not increased both on and off the site.

Fluvial and Coastal Flood Risk

The Environment Agency's mapping shows that the property is not in the vicinity of Flood Zone 2 and Flood Zone 3 and therefore probably at lower risk of flooding from fluvial and tidal sources.



Flood Zone 3	Flood Zone 2

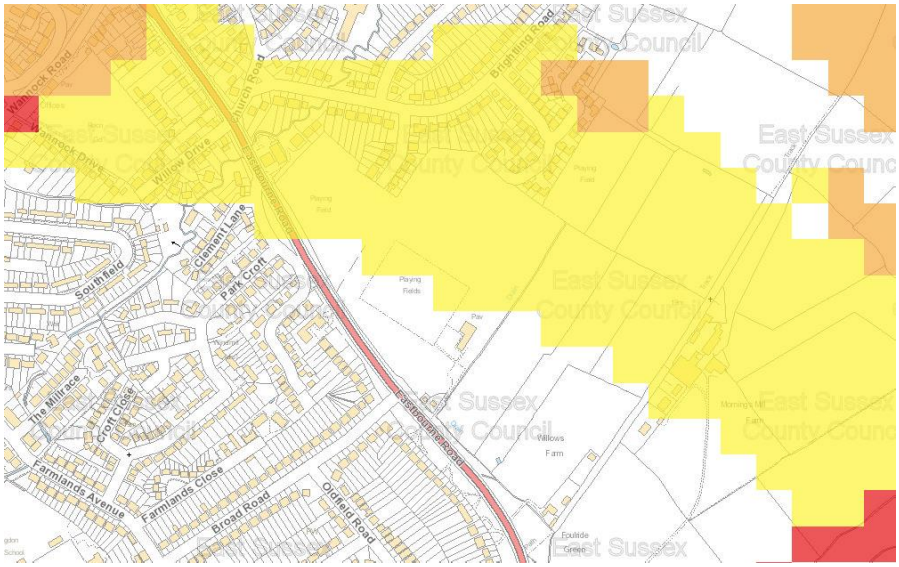
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Figure 4: Fluvial and Coastal Flood Risk

Further information can be viewed online at the Environment Agency's pages on the GOV.UK website.

<u>Groundwater Flood Risk</u>

Mapping from the British Geological Survey shows that there is limited potential for groundwater flooding to occur to the site.



Limited potential for groundwater flooding to	Potential for groundwater flooding of property situated below ground	Potential for groundwater flooding to occur at

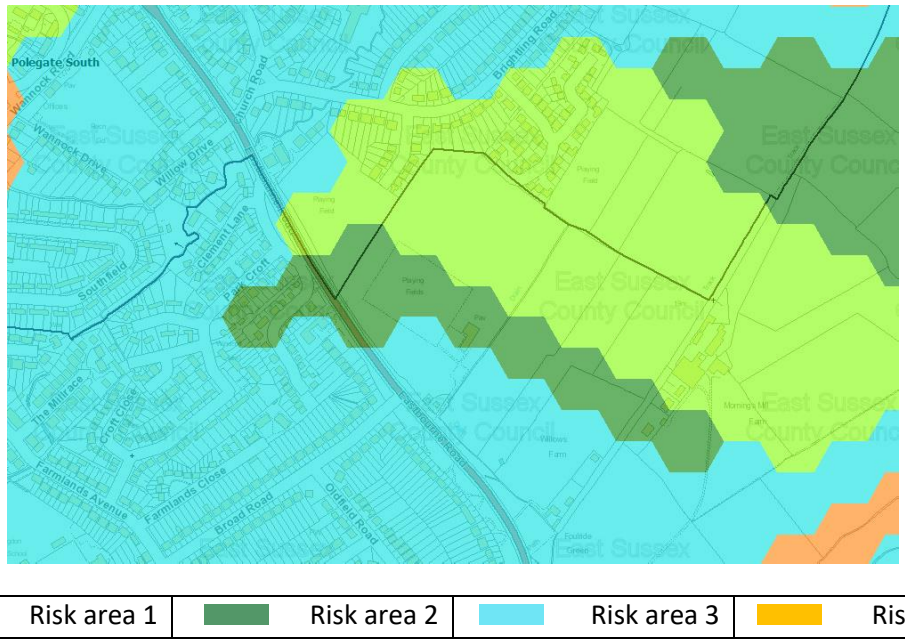
occur	level	surface

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Figure 5: Groundwater Flood Risk

Drainage Considerations

The council has carried out county wide analysis to classify East Sussex into four areas of broad drainage characteristics or Drainage Risk Areas (DRA). These spatial groupings are intended to inform the preparation of drainage strategies with development proposals, so that appropriate SuDS techniques are implemented in the county.



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Figure 6: Drainage Risk areas

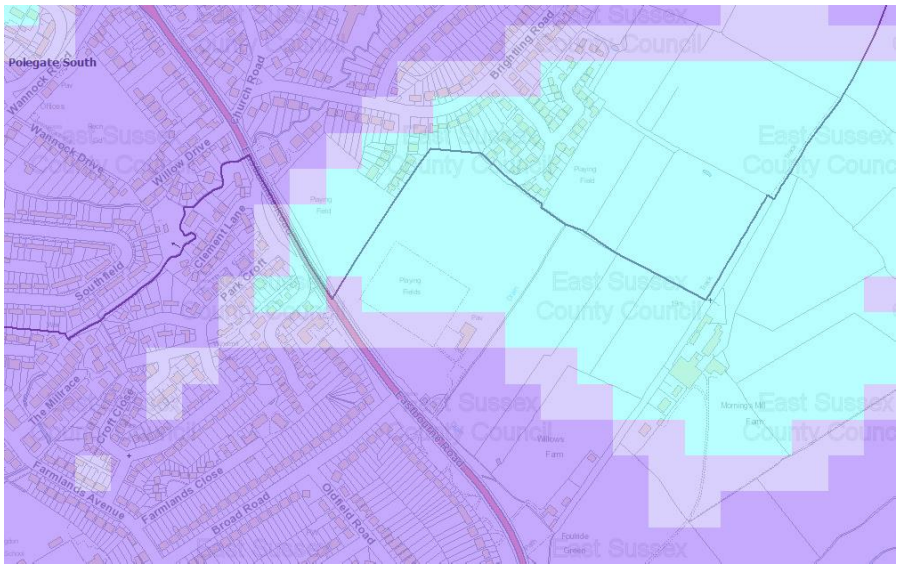
The site is shown to be within risk group 1, 2 and 3. The site may also the contain aspects of other DRA categories.

The LLFA requirements for each DRA are provided in Table 2 below.

Table 2: Drainage Risk Area Guidance

DRA Number	Colour	Guidance
1		Improvements upon greenfield runoff rates should be discussed with LLFA
2		Infiltration is unlikely, ensure an outfall can be secured
3		Infiltration techniques are likely to be inappropriate
4		Robust evidence is required to show the applicability of infiltration on site

Figure 7 below outlines the estimated water table depth for the site, based on data from the British Geological Survey. The legend contains the British Geological Survey advice for each groundwater depth band.



	>5m below surface	Observations of seasonal variations in groundwater level recommended
	3m – 5m below surface	Determine seasonal variations in groundwater level
	<3m below surface	Determine seasonal variations in groundwater level

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Figure 7: Depth to Groundwater

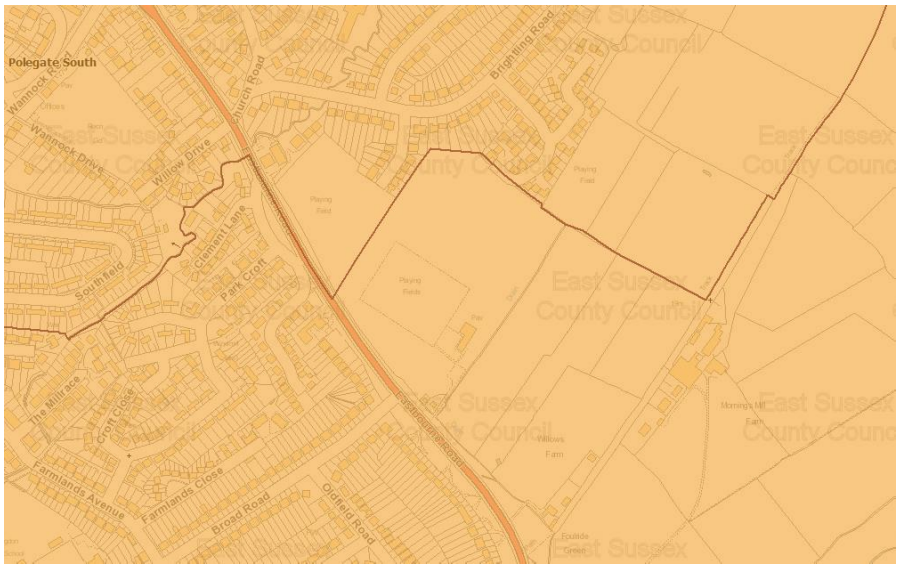
The map indicates that the water table varies across the site. Therefore, any proposals to use infiltration techniques within the drainage design will require infiltration testing to be completed in accordance with BRE365 at locations to and comparable depths of the proposed infiltration features.

Groundwater levels can vary throughout the year. These variations should be determined with groundwater monitoring to be completed between the autumn and spring when we would expect

groundwater levels to be at their highest. We would typically expect a 1m unsaturated zone between the base of the drainage structure and the highest recorded groundwater level.

Figure 8 below outlines the estimated ground stability for the site, based on data from the British Geological Survey. The legend contains the British Geological Survey advice for each ground stability band.

The BGS data indicates that {there is a significant potential for geohazard. Therefore, any proposals to use infiltration should consider the impacts that may have on ground stability.



	Potential for Geohazard	Before installing infiltration SuDS consider the potential for or consequences of infiltration or ground stability
	Significant potential for Geohazard	Only install infiltration SuDS if the potential for or consequences of infiltration are considered no to be considerate
	Very significant constraints are indicated	Only install infiltration SuDS if the potential for or consequences of infiltration are considered no to be considerate

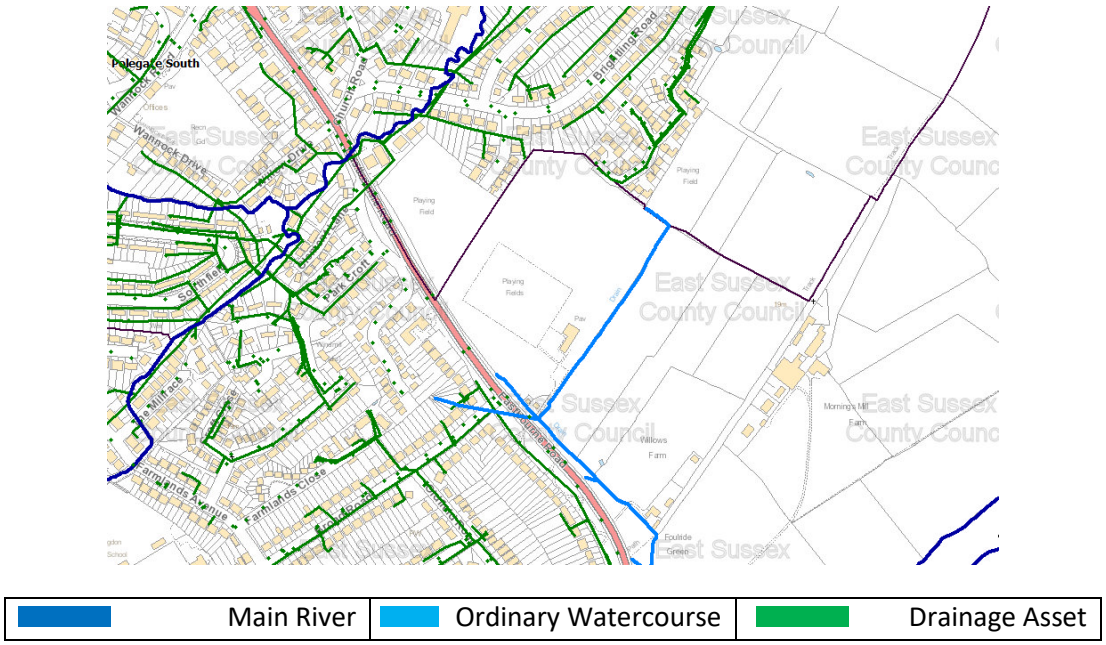
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Figure 8: Ground Stability

The information provided is guidance only. All development proposals must undertake the necessary site surveys to confirm the drainage constraints or opportunities. For further information on drainage strategy requirements, please refer to the ESCC Guide to Sustainable Drainage Systems in East Sussex and the Local Flood Risk Management Strategy. The 'surface water drainage checklist' available on our website lists the information we expect to be submitted in support of a planning application

Watercourses and Drainage Assets

Watercourses and drainage assets in the vicinity of the property are shown below.



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Figure 9: Watercourses

If any ordinary watercourses lie within the site boundary, any planned works to the watercourse map require a separate Ordinary Watercourse Consent from ESCC.

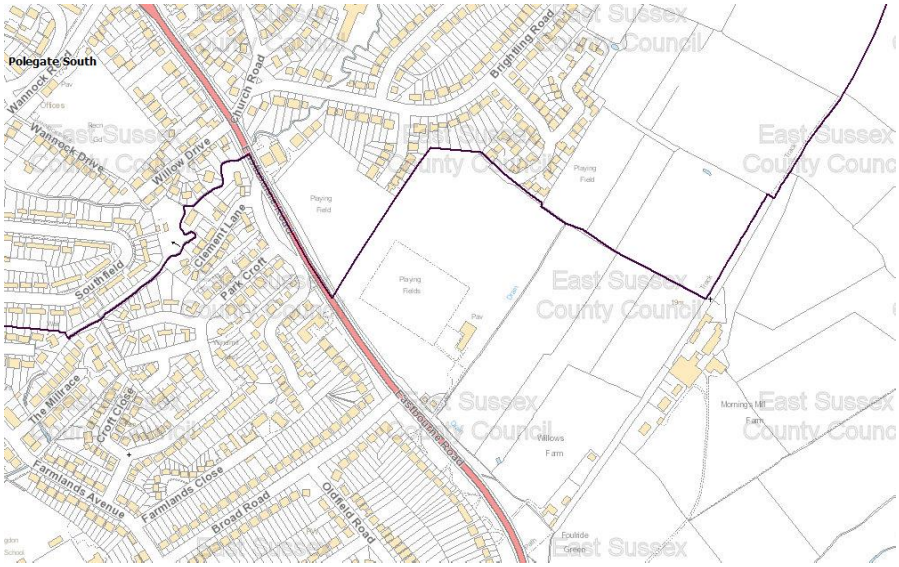
If a main river lies within the site boundary, any planned works to this watercourse may require an Environmental Permit (formerly Flood Defence Consent) from the Environment Agency. Contact the EA for enquiries at enquiries@environment-agency.co.uk

To connect into existing surface water and foul water systems, agreement must be obtained from Southern Water. Please refer to Southern Water for details on the capacity of the existing sewer system and applications for a new connection to the existing sewer system.

There is an ordinary watercourse that runs along the Eastern boundary of the site.

Water Quality and Landfill

Figure 10 below shows the ecological status of adjacent waterbodies, as defined by the Water Framework Directive and any historic landfill sites.



High Ecological Status	Good Ecological Status	Moderate Ecological Status
Poor Ecological Status	Bad Ecological Status	Historic Landfill Site

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Figure 10: Water Quality and Landfill

If the site is adjacent to a sensitive waterbody, as defined by the Water Framework Directive, the Quality of water discharged from the site is likely to be a key consideration. Contact the EA for enquiries at enquiries@environment-agency.co.uk for further information.

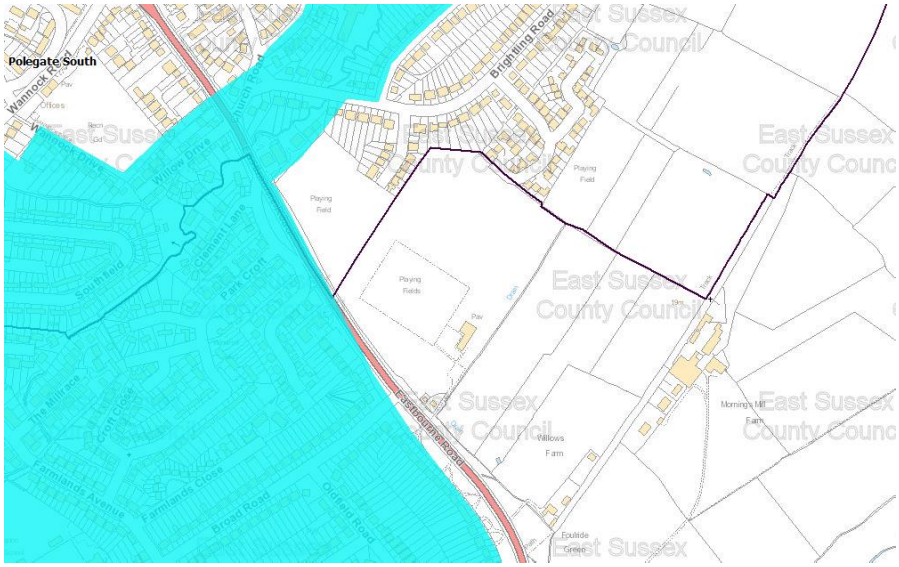
If the site is in the vicinity of a historic landfill the EA may have additional comments on the associated water quality risks.

Investigations

ESCC has undertaken a broad range of investigations into historic flooding and drainage issues including section 19 reports, Land Drainage Investigations and Surface Water Management Plans. Figure 11 below illustrates the location of these investigations.

Where a significant flood event has occurred and the responsibility for managing the risk is unclear; ESCC may undertake a formal investigation under Section 19 of the Flood and Water Management Act 2010. The published report aims to identify the responsible party and proposed response to the incident. To address less severe, localised flooding, ESCC may undertake a Land Drainage Investigation.

The Surface Water Management Plans (SWMP) in ESCC identified several risk 'hotspots'. If the site is adjacent to a hotspot, please refer to the full SWMP document for more information.



Land Drainage Investigation	SWMP Hotspot	Section 19 Investigation

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Figure 11: Previous investigations

If the site is adjacent to any Section 19 Reports, Land Drainage Investigations or SWMP hotspots, please contact the Flood Risk Management Team at watercourse.consenting@eastsussex.co.uk

The site is on the board of a surface water hot spot.

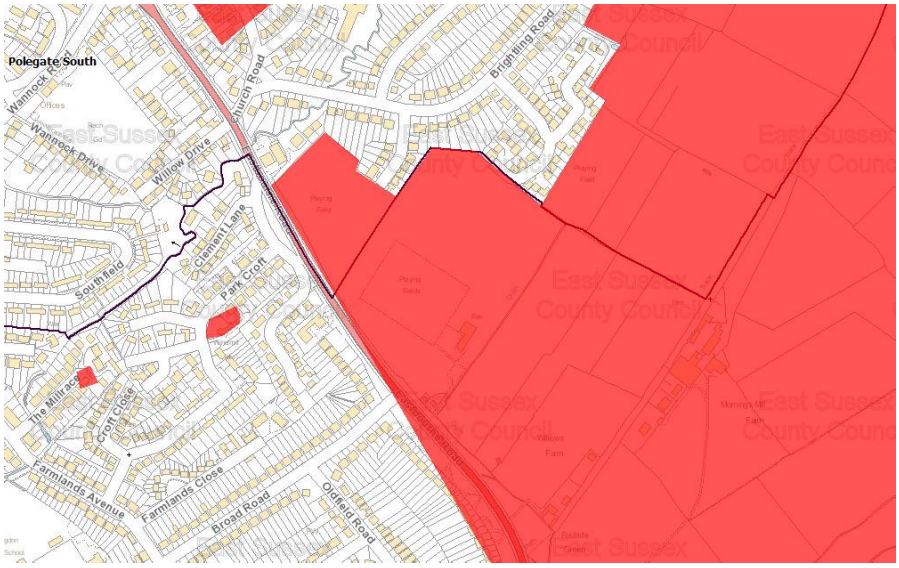
Other Information

The site lies with administrative area of the Pevensey and Cuckmere Water Level Management Board. Additional requirements may need to be taken into consideration. Please contact the below relevant authority for further information.

Upper Medway Internal Drainage Board	enquiries@medwayidb.co.uk
Romney Marshes Area Internal Drainage Board	info@rmaidb@co.uk
Cuckmere and Pevensey Water Level Management Board	planning@wlma.org.uk
East Sussex County Council LLFA	Watercourse.consenting@eastsussex.gov.uk

The site is located within the catchment of the Pevensey and Cuckmere Water Level Management Board and the western boundary of the site is located within its internal drainage district. Therefore the Byelaws of the Board apply to any development on this site which changes the impermeable areas. A surface water discharge consent in accordance with Byelaw 3 maybe be required further details and guidance are available on https://www.wlma.org.uk/pevensey-cuckmere/development/.

Figure 12 below shows any known archaeological sites adjacent to the site. If there is an adjacent site, it is highly likely that information on the location and extent of heritage assets will be required, as well as the archaeological potential of the area. It is recommended to investigate the level of information required by contacting East Sussex Historic Environment Record (HER) at country.HER@eastsussex.gov.uk

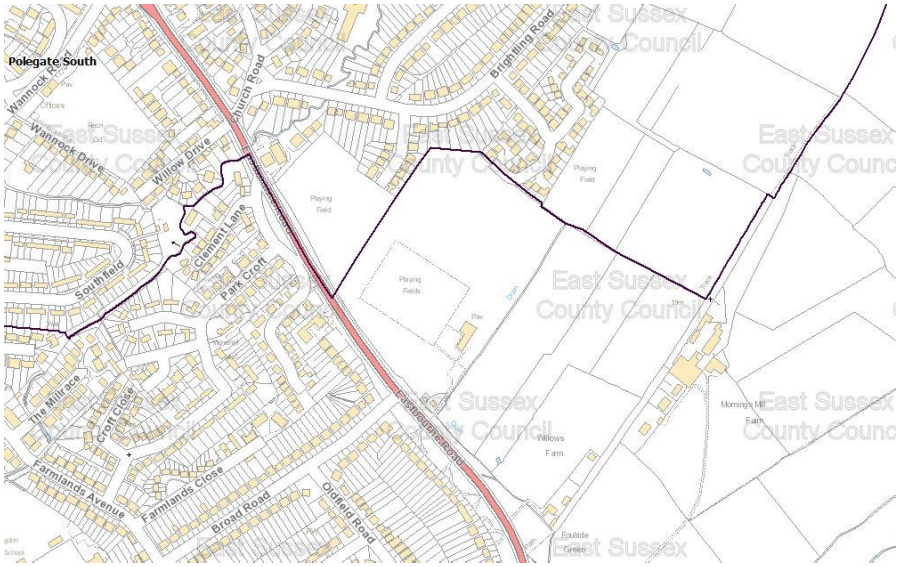


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Figure 12: Archaeology

The entire site is within the boundary of an archaeological site that extends beyond the development.

East Sussex contains area of international, national and local importance for biodiversity. The below Figure 13 illustrates the location of RAMSAR sites, Sites of Specific Scientific Interest (SSSI), Special Areas of Conservation (SAC) and Special Protection Areas (SPA).



RAMSAR	SSSI	SAC	SPA

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Figure 13: Biodiversity

ESCC policy states that the development should provide net gain in biodiversity where possible. Therefore Sustainable Drainage Systems (SuDS) should be designated as multifunctional features, which ensure that biodiversity can be compensated and/or enhanced.

Further information can be found in the Guide to Sustainable Drainage Systems in East Sussex.

Surface Water Calculations

Appendix I

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James O'Kelly
Site name:	Eastbourne Road
Site location:	Willingdon

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

Site Details

Latitude:	50.81525° N
Longitude:	0.24790° E
Reference:	1954364488
Date:	Feb 25 2021 15:13

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	6.48

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.405
Q_{MED} (l/s):	
Q_{BAR} / Q_{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	809	827
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):		42.47
1 in 1 year (l/s):		36.1
1 in 30 years (l/s):		97.68
1 in 100 year (l/s):		135.47
1 in 200 years (l/s):		158.83

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Greenfield Runoff Volume

FEH Data

Return Period (years)	100
Storm Duration (mins)	360
Site Location	GB 558650 103650 TQ 58650 03650
C(1km)	-0.024
D1(1km)	0.381
D2(1km)	0.319
D3(1km)	0.457
E(1km)	0.306
F(1km)	2.441
Areal Reduction Factor	1.00
Area (ha)	6.480
SAAR (mm)	827
CWI	118.648
SPR Host	40.190
URBEXT (1990)	0.2810

Results

Percentage Runoff (%)	48.62
Greenfield Runoff Volume (m^3)	2401.044

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Drainage Strategy Drawing
Exceedance Flow Routes Drawing

Appendix J

KEY

- SITE BOUNDARY
- FOUL WATER SEWER
- SURFACE WATER SEWER
- TANKED POROUS PAVING

SURFACE WATER STORAGE VOLUMES	
RETENTION BASIN	800m³
SWALES	950m³
TANKED POROUS PAVING	450m³
ADOPTABLE SEWERS	500m³
	2700m³

SURFACE WATER DRAINAGE STRATEGY

1. THE 1 YEAR GREENFIELD RUNOFF RATE HAS BEEN CALCULATED AS 5.57l/s/ha USING FEH RAINFALL DATA.
2. BASED ON A PROPOSED DEVELOPMENT IMPERMEABLE AREA OF 3.3ha (WHICH INCLUDES A 10% ALLOWANCE FOR URBAN CREEP) THE PEAK RUNOFF RATE FROM SITE HAS BEEN CALCULATED AS 18.5l/s.
3. SURFACE WATER RUNOFF IS TO FOLLOW EXISTING ARRANGEMENTS AND WILL DISCHARGE TO THE EXISTING DITCH LOCATED IN THE SOUTH EASTERN CORNER OF THE SITE.
4. STORAGE VOLUMES REQUIRED CALCULATED AS 2700m³ FOR THE 100 YEAR PLUS 40% ALLOWANCE FOR CLIMATE CHANGE STORM EVENT.
5. ATTENUATION STORAGE IS TO BE PROVIDED WITHIN A RETENTION BASIN, SWALES AND POROUS PAVING, ALONG WITH THE STORAGE AVAILABLE WITHIN THE ADOPTABLE SEWER NETWORK.

TANKED PERMEABLE PAVING SYSTEM FOR PARKING AREAS TO PROVIDE ATTENUATION STORAGE 120m³ AND TREATMENT OF RUNOFF AT SOURCE

TANKED PERMEABLE PAVING SYSTEM FOR PARKING AREAS TO PROVIDE ATTENUATION STORAGE 120m³ AND TREATMENT OF RUNOFF AT SOURCE

ROADSIDE SWALE SYSTEM 0.6–0.8m DEEP WITH 1 IN 3 SIDE SLOPES PROVIDING 300m³ OF ATTENUATION STORAGE THROUGHOUT THE DEVELOPMENT

ADOPTABLE SURFACE WATER TANK SEWER PROVIDING 100m³ OF ATTENUATION STORAGE VOLUME

SUDS REED–BED SYSTEM FOR TREATMENT OF RUNOFF FROM CAR PARK IN ACCORDANCE WITH UK GOVERNMENT REQUIREMENTS 150m³ OF ATTENUATION STORAGE

PENSTOCK CHAMBER TO ENABLE ISOLATION OF SUDS REED–BED SYSTEM

ATTENUATION BASIN SEDIMENT FOREBAY

TOTAL AVALABLE STORAGE WITHIN ATTENUATION BASIN = 650m³

FLOW CONTROL CHAMBER (HYDRO–BRAKE) OR SIMILAR APPROVED DISCHARGE RESTRICTED TO 18.5 l/s FOR ALL STORM DURATIONS AND RETURN PERIODS

Medical Centre Land 5951m2 (1.47 acres)

Medical Centre 25,000sqft over a maximum of three storey's

TANKED PERMEABLE PAVING SYSTEM FOR PARKING AREAS TO PROVIDE ATTENUATION STORAGE 170m³ AND TREATMENT OF RUNOFF AT SOURCE

SWALE 0.8m DEEP WITH 1 IN 3 SIDE SLOPES PROVIDING 850m³ OF ATTENUATION STORAGE

TANKED PERMEABLE PAVING SYSTEM FOR PARKING AREAS TO PROVIDE ATTENUATION STORAGE 40m³ AND TREATMENT OF RUNOFF AT SOURCE

SWALE CHECK DAM

SWALE INLET FROM SURFACE WATER SEWER OR HIGHWAY DRAIN

EXISTING ORDINARY WATERCOURSE TO BE RETAINED

PERMANENT VOLUME OF WATER TO BE RETAINED WITHIN THE ATTENUATION BASIN FOR BIO–DIVERSITY AND ECOLOGICAL ENHANCEMENT

2.0m WIDE ACCESS AND MAINTENANCE TRACK

PARKING AND TURNING AREA FOR SUDS MAINTENANCE VEHICLE

OUTFALL INTO EXISTING WATERCOURSE TO BE LOCATED ENTIRELY WITHIN THE SITE BOUNDARY

EXISTING ORDINARY WATERCOURSE

COURTLAND ROAD

EASTBOURNE ROAD

THE THATCHINGS

Withane

Pond

Farmlands Court

El Sub Sta

Co Const. ED & Ward Bdy

Born Const Bdy

Drain

Ditch

0.91m RH

Def

CF

TH

Constructionline

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DANESCROFT

JOB TITLE
EASTBOURNE ROAD
WILLINGDON

DRAWING TITLE
DRAINAGE STRATEGY

DATE	DRAWN	CHECKED
FEB 21	JOK	TSW
DRAWING No.	SCALE	SIZE
6554.401	1:500	A0

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KEY

- SITE BOUNDARY
- FOUL WATER SEWER
- SURFACE WATER SEWER
- EXCEEDANCE ROUTE

Medical Centre Land 5951m2
(1.47 acres)

Medical Centre
25,000sqft over a maximum of three storey's

Possible boundary dispute - based on

COURTLAND ROAD

EASTBOURNE ROAD

THE THATCHINGS

Farmlands Court

Pond

Withane

El Sub Sta

Brook

Co Const. ED & Ward Bdy

Born Const Bdy

Drain

Def

0.91m RH

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DANESCROFT

JOB TITLE
EASTBOURNE ROAD
WILLINGDON

DRAWING TITLE
EXCEEDANCE ROUTES

DATE	DRAWN	CHECKED
FEB 21	JOK	TSW

DRAWING No	REV	SCALE	@
6554.403		1:500	A0

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Constructionline

SUDS Maintenance Schedules

Appendix K

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Table 20.15 Operation and maintenance requirementsfor pervious pavements

Maintenance Schedule	Required action	Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying.	As required - once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required.
	Rehabilitation of surface and upper sub-structure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging).
Monitoring	Initial inspection.	Monthly for three months after installation.
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Anually.
	Monitor inspection chambers	Anually.

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Table 23.1 Operation and maintenance requirements for ponds and wetlands

Maintenance Schedule	Required action	Frequency
Regular maintenance	Remove litter and debris	Monthly (As required)
	Cut the grass - public areas.	Monthly (during growing season).
	Cut the meadow grass.	Half yearly (spring, before nesting season, and autumn).
	Inspect marginal and bankside vegetation and remove nuissance plants (for first 3 years).	Monthly (at start, then as required).
	Inspect inlets, outlets, banksides, structures, pipework etc fir evidence of blockage and/or physical damage.	Monthly
	Inspect water body for signs of poor water quality.	Monthly (May - October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices eg penstock	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface).	Annually
	Remove 25% of bank vegetation from waters edge to a minimum of 1m above water level.	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract).	Annually
	Remove sediment from forebay.	1-5 years, or as required.
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years (or as required)

Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%.	With effective pre-treatment, this will only be required rarely, eg every 25-50 years.
Remedial actions	Repair of erosion or other damage.	As required.
	Replant where necessary.	As required.
	Aerate pond when signs of euthrophication are detected.	As required.
	Realignment of rip-rap or other damage.	As required.
	Repair / rehabilitation of inlets, outlets and overflows.	As required.

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Table 17.1 Operation and maintenance requirements for swales

Maintenance Schedule	Required action	Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required).
	Cut grass - to retain grass height within specified design range.	Monthly (during growing season), or as required.
	Manage other vegetation and remove nuissance plants.	Monthly (at start, then as required).
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly (or when required).
	Inspect vegetation coverage	Monthly (for 6 months, quarterly for 2 years, then half yearly)
	Inspects inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required.	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding.	As required.
	Re-level uneven surfaces and reinstate design levels.	As required.
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface.	As required.
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip.	As required.
	Remove and dispose of oils or petrol residues using safe standard practices.	As required.

Southern Water Correspondence

Appendix L

from Southern Water

Scott Collis
Stuart Michael Associates
Coombe House
Coombe Square
Thatcham
Berkshire
RG19 4JF

Your ref

Our ref
DS_CC_PPE-121137

Date
30 November 2020

Contact
Tel 0330 303 0119

Dear Mr Collis,

Level 1 Capacity Check Enquiry: 6654 - Eastbourne Road, Willingdon, East Sussex, BN26 5DQ.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of **4.25 l/s** for the above development at manhole reference TQ5803**3902**. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at manhole reference TQ5904**5301** which is located approximately **1.1 km** North-East of the proposed development site.

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the “New Connections Services Charging Arrangements”. We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing West Sussex BN13 3NX Registered in England No. 2366670

Alternatively, New Appointees and Variations (NAVs), also known as ‘inset’ companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk/

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

Should it be necessary to contact us please quote our above reference number relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,



Joff Edevane
Growth Planning Lead
Business Channels

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