



**The Civil Engineering Practice**

11 Tungsten Building  
George Street  
Fishergate  
Sussex  
BN41 1RA

T. 01273 424 424  
E. [design@civil.co.uk](mailto:design@civil.co.uk)  
[www.civil.co.uk](http://www.civil.co.uk)

## **Flood Risk Assessment**

Proposed residential development at

**North Site Newgate Lane, Fareham**

On behalf of

**Fareham Land LP**

April 2019

## Document History and Status

Project Number 23013

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29 May 2018	1.0	Steve Doughty	Bava Sathan CEng MICE FIHE	Stuart Magowan IEng MICE
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8 April 2019	2.2	Martin Kempshall CEng MICE	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE

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## **1 Non Technical Summary**

- 1.1 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework on behalf of Fareham Land LP in support of an Outline Planning Application for the demolition of existing buildings and development of up to 75 dwellings, open space, vehicular access from Newgate Lane and associated ancillary infrastructure, with all matters except access to be reserved on land between Newgate Lane and Newgate Lane East, Fareham.
- 1.2 This Assessment is to be read in conjunction with all planning, architectural and other reports that accompany the Outline Planning Application for the proposed development.
- 1.3 The site is located in Flood Zone 1.
- 1.4 The type of development proposed is classified as more vulnerable and suitable in Flood Zones 1 and 2.
- 1.5 The proposed development will incorporate a sustainable drainage system which will discharge surface water at the existing greenfield runoff rate into the existing watercourses.
- 1.6 Sufficient storage can be provided on site to cater for all storm return periods up to and including the 1:100 year rainfall event with a 40% allowance for climate change.
- 1.7 The exact nature of the storage will be confirmed at detailed design stage but can be accommodated using a variety of methods such as permeable paving, voided subbase and cellular tanks.
- 1.8 Foul drainage will be discharged via a foul pumping station into the existing public foul sewer beneath Newgate Lane.
- 1.9 This report concludes that the proposed development is suitable at this location and there are no significant flooding or drainage risks.



## **2 Planning Policy Context**

### **2.1 National Planning Policy Framework**

2.1.1 National Planning Policy Framework aims to reduce flood risk through development opportunities. The policy framework aims to ensure flood risks and the predicted effects of climate change have been taken into account and appropriate measures put in place to ensure that:

- The development is safe
- Where possible the flood risk overall is reduced
- Increased flood risk does not occur elsewhere
- Appropriate mitigation measures are employed to deal with these effects and risks

### **2.2 Lead Local Flood Authority**

2.2.1 Hampshire County Council became a Lead Local Flood Authority under the Flood and Water Management Act 2010 and were given a series of new responsibilities to coordinate the management of local flood risk.

2.2.2 As part of their role Hampshire County Council have produced the following documents

- Local Flood Risk Management Strategy dated July 2013
- Preliminary Flood Risk Assessment dated April 2011

2.2.3 All documents have been reviewed in the preparation of this report.

### **2.3 Fareham Borough Council**

2.3.1 Fareham Borough Council issued a Strategic Flood Risk Assessment (SFRA) as part of the Partnership for Urban South Hampshire dated 2016.

### **2.4 Local Planning Policy**

2.4.1 Fareham Borough Council adopted the Local Plan Core Strategy in August 2011 and the Local Plan 2015-2026 on 8 June 2015.

2.4.2 The following policies are of specific relevance to the Flood Risk Assessment.

2.4.3 **Policy CS15** Sustainable Development and Climate Change states that *‘The Borough Council will promote and secure sustainable development by directing development to locations with sustainable transport options, access to local services, where there is a minimum negative impact on the environment or opportunities for environmental enhancement. Development must not prejudice the development of a larger site.*

*This will be achieved by:*

- *Ensuring that the scale and density of the proposal makes an efficient use of land. With a minimum of 60dph within areas with high multi-modal transport accessibility and good access to a range of social, environmental and economic infrastructure, taking account of the character of the location.*
- *Ensuring that there is sufficient capacity available, or will be made available, in existing infrastructure to meet the needs of the new development including adequate land and funding for waste management. Avoiding unacceptable levels of flood risk and proactively managing surface water through the promotion of sustainable drainage techniques.’*

2.4.4 **Policy DSP2** Environmental Impact states that *‘development proposals should not, individually, or cumulatively, have a significant adverse impact, either on neighbouring development, adjoining land, or the wider environment, by reason of noise, heat, liquids, vibration, light or air pollution (including dust, smoke, fumes or odour).*

*Development should provide for the satisfactory disposal of surface and waste water and should not be detrimental to the management and protection of water resources.’*

### 3 Existing Site

#### 3.1 Site Location

- 3.1.1 The development site is located on land to the east of Newgate Lane, Fareham at Ordnance Survey reference SU 571 033. The nearest postcode is PO14 1BA.



- 3.1.2 A copy of the site location plan is located in Appendix 1 at the rear of this report.

#### 3.2 Site Description

- 3.2.1 The site is approximately 3.95ha in area and currently undeveloped.
- 3.2.2 Existing ground levels are at their highest at approximately 9.8m AOD at the north eastern site boundary and their lowest at approximately 8.4m AOD at the southwest site boundary.
- 3.2.3 The site is bounded on its north, south and east by agricultural land and to the west side by Newgate Lane.
- 3.2.4 The River Alver passes through the western part of the site. There are also existing watercourses along the northern and eastern site boundaries.
- 3.2.5 The River Alver is classified as Main River.

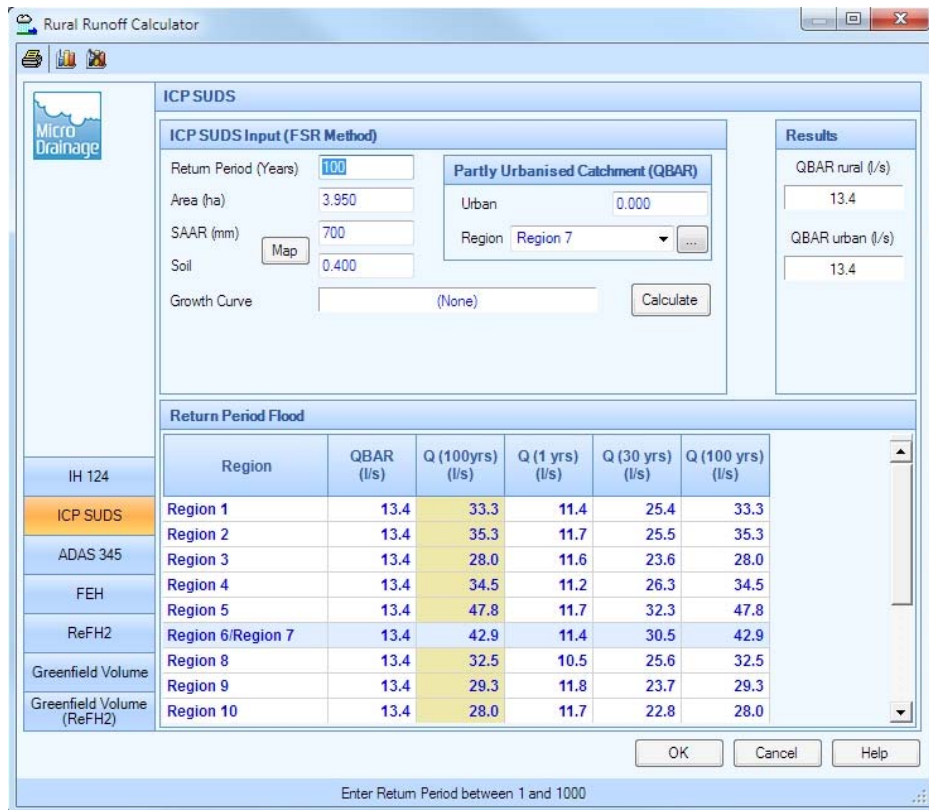
3.2.6 A copy of the existing site layout plan is located in Appendix 2 at rear of this report.

### 3.3 Existing Drainage

3.3.1 The site is currently in agricultural use and has no positive surface water drainage infrastructure. Rainfall currently discharges via overland flow routes directly into the existing watercourses on the site.

3.3.2 The existing greenfield runoff rate has been established using XP Solutions Microdrainage.

3.3.3  $Q_{bar}$  has been established at 13.4l/s and the 1:100 year peak runoff at 42.9l/s. The equivalent greenfield runoff rates are 3.4l/s/ha and 11l/s/ha respectively.



3.3.4 There is a 225mm diameter public foul sewer located approximately 3m beneath Newgate Lane adjacent to the southwest corner of the site.

3.3.5 A copy of the sewer records are located in Appendix 3 at the rear of this report.

### 3.4 Geology and Groundwater

- 3.4.1 The British Geological Survey borehole log data confirms clay substrata.
- 3.4.2 Water strikes were recorded at between 1m and 5m below ground level and are likely to be perched water tables within the clay substrata.
- 3.4.3 The “Magic Map” available from DEFRA confirms that the site is located above a minor aquifer classified as having high vulnerability.
- 3.4.4 Copies of the geological borehole data are located in Appendix 4 at the rear of this report.

## **4 Flood Zone and Flood History**

### 4.1 Flood Zone

- 4.1.1 The Environment Agency's Product 4 data confirms that the site is located in Flood Zone 1 and is not at risk of flooding from rivers or the sea from anything less extreme than a 1:1000 year flood event.

### 4.2 Flood History

#### 4.2.1 Environment Agency

- 4.2.1.1 The Environment Agency map of historic flood incidents does not identify any historic flooding recorded at or in the wider vicinity of the proposed development site.

#### 4.2.2 Hampshire County Council

- 4.2.2.1 Neither the Preliminary Flood Risk Assessment (PFRA) dated June 2011 nor the Local Flood Risk Management Strategy dated July 2013 identify any specific flood incidents in the immediate vicinity of the site.

#### 4.2.3 Fareham Borough Council

- 4.2.3.1 The Strategic Flood Risk Assessment (SFRA) as part of the Partnership for Urban South Hampshire dated 2016 does not identify any specific flood incidents within the vicinity of the site.

## **5 Flooding Potential**

### **5.1 Tidal Flooding**

5.1.1 The site is located 3.30km from the coast and is not at risk from tidal flooding.

### **5.2 Fluvial Flooding**

5.2.1 The area of the proposed site is within Flood Zone 1 and is not at risk of flooding from rivers or the sea from anything less extreme than a 1:1000 year flood event.

### **5.3 Groundwater Flooding**

5.3.1 Borehole logs hosted on the British Geological Survey website confirm that groundwater has been recorded between 2m and 5m below ground level.

5.3.2 Figure 7 of the Hampshire Groundwater Management Plan shows the site to be within a 1km square grid having between 25-50% probability of being affected by groundwater flooding.

5.3.3 There is no indication in the Preliminary Flood Risk Assessment or other available flood maps of groundwater flooding affecting the site.

### **5.4 Overland Flow**

5.4.1 The surface water flood map provided by the Environment Agency confirms that the vast majority of the site is at very low risk of flooding from overland flows.

5.4.2 There are areas along the western section of the site along the alignment of the River Alver which are indicated as being at low medium and high risk of flooding from surface water.

5.4.3 This is not however replicated in the fluvial flood mapping and there are no records of any overland surface water flow affecting the site.

5.4.4 Drainage features including all ditches and overland flow routes are to be maintained as existing at current capacities.

5.4.5 Copies of correspondence received from the Environment Agency together with flood maps are included in Appendix 5 at the rear of this report.

## 5.5 Flood Routing

- 5.5.1 The natural route for flood waters to dissipate, should any ever occur on the site, is towards the River Alver which is located adjacent to the western boundary and flows through the western side of the site.
- 5.5.2 A plan showing the existing flow paths is located in Appendix 6 at the rear of this report.



## 6 Development Proposals

### 6.1 Description

- 6.1.1 The development proposals are for the demolition of existing buildings and development of up to 75 dwellings, open space, vehicular access from Newgate Lane and associated ancillary infrastructure.
- 6.1.2 The combined roof area of the buildings and external hard standing areas is anticipated to be approximately 30% of the total site area at approximately 1.19ha.
- 6.1.3 A copy of the Illustrative Master Plan is located in Appendix 7 at the rear of this report.

### 6.2 Drainage Strategy

- 6.2.1 There are short sections of public surface water sewers to the west of Newgate Lane. These discharge into the River Alver.
- 6.2.2 Based upon the clay geology of the area it is anticipated that discharge of surface water runoff by infiltration will not be sufficient to meet current guidance and National Planning Policy Framework.
- 6.2.3 For the purposes of the Outline Planning Application a drainage strategy based on a restricted discharge to the onsite watercourses has been progressed with confirmation that suitable storage can be provided on site.
- 6.2.4 The surface water drainage system will be designed to comply with National Planning Policy Framework and its supporting guidance documents including the Non Statutory Technical Standards for SuDS.
- 6.2.5 As previously noted the  $Q_{bar}$  greenfield runoff rate for the site is 3.4l/s/ha. With an impermeable area of approximately 1.19ha this equates to an equivalent  $Q_{bar}$  greenfield runoff rate for a developed area of approximately 4l/s.
- 6.2.6 Such low levels of restriction are impractical and in accordance with the Environment Agency guidance as noted in their Rainfall runoff management for Developments (Report – SC030219) a restriction of 5l/s is proposed for the 1:100 year +40% rainfall event.

- 6.2.7 Preliminary calculations have been prepared in order to establish the required storage for a 1:100 year storm including an additional 40% increase in rainfall intensity to account for future climate change.
- 6.2.8 In accordance with the guidance document supporting the Non Statutory Technical Standards for SuDS an allowance for Urban Creep of 10% for increase to impermeable area has also been included in the preliminary design for the drainage system. This is based on the proposed residential development density of 22 dwellings per hectare.
- 6.2.9 A total approximate volume of 1,085m<sup>3</sup> of storage will be required to store the surface water runoff generated by the development with a restricted discharge rate of 5l/s.
- 6.2.10 The proposed surface water drainage strategy will incorporate the combined use of sustainable drainage techniques such as swales and shallow landscaped depressions or filter strips and French drains.
- 6.2.11 Sufficient storage can be provided on site to cater for all storm return periods up to and including the 1:100 year rainfall event with a 40% allowance for climate change.
- 6.2.12 The exact nature of the storage will be confirmed at detailed design stage but can be accommodated using a variety of methods such as permeable paving, voided subbase, cellular tanks and ponds.
- 6.2.13 The drainage proposals will be further clarified at detailed design stage subject to further site investigations and testing and will be designed to comply with National Planning Policy Framework and its supporting guidance documents including the Non Statutory Technical Standards for SuDS.
- 6.2.14 A copy of the preliminary surface water storage calculations is located in Appendix 8 at the rear of this report.
- 6.3 Foul Water
- 6.3.1 Foul drainage will be discharged via a foul pumping station into the existing public foul sewer beneath Newgate Lane.

## 6.4 Water Quality

- 6.4.1 The proposed development is for residential use only. In accordance with CIRIA SuDS Manual 2015 (Report C753) the pollution hazard level for such types of development are considered low. Where surface water runoff is to be discharged into watercourses the SuDS components are only required to control potential contaminants for the frequent low intensity rainfall events as the natural high volume of flows within the receiving water body during a high-intensity rainfall event is likely to dilute any contaminants within the water body.
- 6.4.2 The surface water drainage scheme will include mitigation to ensure water quality before the discharge point will be treated and any pollution risk mitigated prior to its discharge to the receiving water body.
- 6.4.3 Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types and uses and defines runoff from roofs to be at very low risk potential for pollution.
- 6.4.4 Runoff from driveways of individual properties, low trafficked roads and residential parking are considered to be at low risk potential for pollution.
- 6.4.5 The following table summarises the anticipated pollution index from the proposed development.

<b>Land Use</b>	<b>Pollution hazard level</b>	<b>Total suspended solids (TSS)</b>	<b>Metals</b>	<b>Hydro-carbons</b>
Residential roofs	Very Low	0.2	0.20	0.05
Property driveways, low trafficked roads and residential parking	Low	0.5	0.4	0.4

### **Pollution Hazard Indices**

- 6.4.6 Where multiple drainage components are used in series the individual mitigation index of secondary and tertiary components is lowered due to reduced performance associated with primary treatment. In accordance with Tables 26.3 and 26.4 of The SuDS Manual the mitigation indices for the different drainage components are shown in the following table.

<b>SuDS Type</b>	<b>Total suspended solids (TSS)</b>	<b>Metals</b>	<b>Hydro-carbons</b>
Filter Strip	0.4	0.4	0.5
Permeable Paving	0.7	0.6	0.7
Swale	0.5	0.6	0.6
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5

#### **Mitigation Indices**

- 6.4.7 The proposed drainage strategy will incorporate measures to meet or exceed the water quality target requirements and therefore complies with the Water Framework Directives for discharge of runoff into controlled waters.
- 6.4.8 The site will be maintained by the operator. An outline drainage maintenance schedule is located in Appendix 9 at the rear of this report.

## 7 Safe Development

### 7.1 Site Location

- 7.1.1 The site is located entirely in Flood Zone 1.
- 7.1.2 With reference to Table 2 (Flood Risk Vulnerability Classification) and Table 3 (Flood Risk Vulnerability and Flood Zone Compatibility) of the Technical Guidance to the National Planning Policy Framework the proposed development is classified as more vulnerable and is considered suitable in Flood Zones 1 and 2.

### 7.2 Flood Routing

- 7.2.1 The natural route for flood waters to leave the site if any ever occur is either through the River Alver to the west of the site or towards the existing ordinary watercourses on the eastern boundary of the site.
- 7.2.2 The surface drainage system will be designed to account for the topography of the site and maintaining the natural flow routes. The surface water drainage system will be designed to cater for the 1:100 year rainfall event including an allowance for climate change. There are no proposed changes to the natural flow routes thus retaining exceedance flow from the undeveloped part of the site as current.

### 7.3 Risk to Others

- 7.3.1 The proposed surface water drainage system will be designed to current standards incorporating SuDS elements providing treatment, attenuation and storage which will minimise runoff leaving the site during times of heavy rain.
- 7.3.2 Allowance has been made for 40% increase in rainfall intensities which is in accordance with the latest figures published by the Environment Agency and in accordance with the requirements under the National Planning Policy Framework.
- 7.3.3 Allowance has been made for Urban Creep accounting for future property owners extending their houses or adding to the impermeable areas.
- 7.3.4 The proposed drainage system will incorporate treatment prior to final discharge destination thus mitigating the risk of pollution from the site.

- 7.3.5 Foul flows from the residential development will be discharged to the public sewer beneath Newgate Lane subject to negotiation with Southern Water.
- 7.3.6 The risk of flooding to others due to the development proposals is negligible.

## **8 Conclusions**

- 8.1 The site is located within Flood Zone 1.
- 8.2 The type of development proposed is classified as more vulnerable and suitable in Flood Zones 1 and 2.
- 8.3 The site is not at risk of flooding from tidal or fluvial sources or at significant risk of flooding from groundwater.
- 8.4 There are areas within the western section of the site along the alignment of the River Alver which are indicated as being at low, medium and high risk of flooding from surface water.
- 8.5 The site layout master plan includes public open spaces in the vicinity of the River Alver and no residential dwellings or associated infrastructure are proposed within these areas.
- 8.6 There are no recorded instances of historic flooding at or in the wider vicinity of the proposed development site.
- 8.7 Surface water runoff generated by the proposed development can be attenuated onsite for all rainfall events up to the 1:100 year event including an allowance for climate change and an additional allowance for future increase in impermeable areas.
- 8.8 Foul drainage will be discharged via a foul pumping station into the existing public foul sewer beneath Newgate Lane.
- 8.9 In terms of flood risk planning the proposed development is safe and suitable at this location and is considered appropriate.

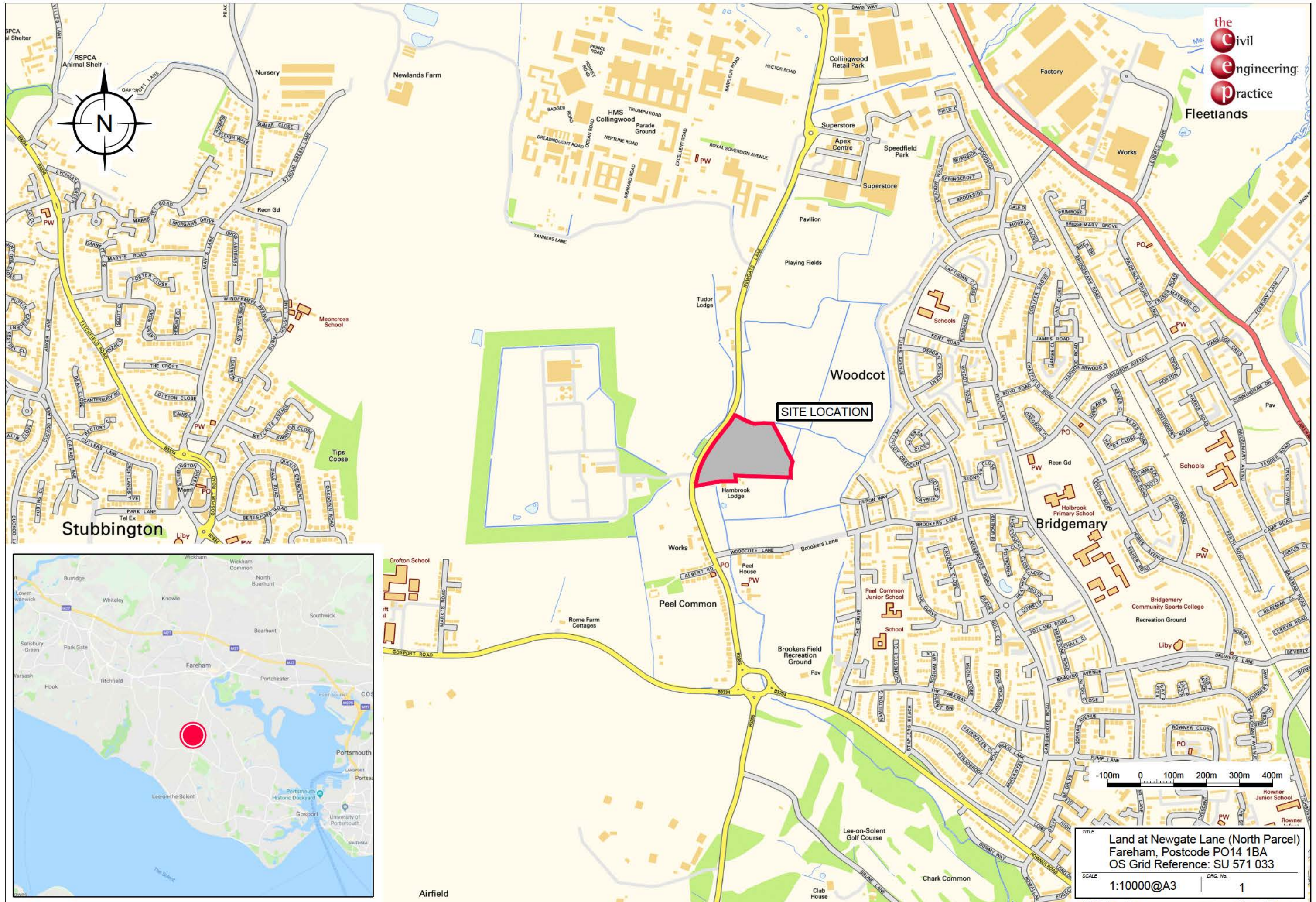
## **9 List of Appendices**

Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout Plan
Appendix 3	Sewer Records
Appendix 4	BGS Geological Borehole Data
Appendix 5	Environment Agency Product 4 Information and Flood Maps
Appendix 6	Existing Flow Path Plan
Appendix 7	Illustrative Master Plan
Appendix 8	Preliminary Surface Water Storage Calculations
Appendix 9	Outline Drainage Maintenance Schedule



**Appendix 1**  
**Site Location Plan**





**SITE LOCATION**

TITLE Land at Newgate Lane (North Parcel)  
Fareham, Postcode PO14 1BA  
OS Grid Reference: SU 571 033

SCALE 1:10000@A3 DRG. No. 1

Airfield



## **Appendix 2**

### **Existing Site Layout Plan**



**Appendix 3**  
**Sewer Records**







0901X	5.94	5.04	450	CIRC	6354X	9.598	8.688	150	UNK	7610X	7611X	9.957	8.947	UNK	CIRC
0902X	7.66	4.63	225	CIRC	6401X	9.773	8.193	150	UNK	7650X	7651X	9.957	8.947	UNK	CIRC
0903X			225	CIRC	6402X	9.636	7.616	225	UNK	7652X	7653X	9.936	8.706	UNK	CIRC
1501X	6.72		450	UNK	6403X	9.464	7.584	300	UNK	7701X	7702X			UNK	CIRC
1502X	6.91		300	UNK	6404X	9.598	7.326	300	UNK	7703X	7704X			UNK	CIRC
1503X			300	UNK	6405X	9.556		300	UNK	7705X	7706X			UNK	CIRC
1601X	7.45	3.82	225	UNK	6406X	9.64		150	UNK	7707X	7708X			UNK	CIRC
1701X	7.72	4.05	225	UNK	6450X	9.64		225	UNK	7801X	7802X	9.031	8.421	UNK	CIRC
1702X	7.75	3.94	225	UNK	6501X	9.851	7.761	225	UNK	7803X	7804X	9.336		UNK	CIRC
1801X	7.67	4.5	225	UNK	6502X	9.666	7.636	300	UNK	7805X	7806X	9.315		UNK	CIRC
1901X			225	UNK	6503X	9.93	9.2	100	UNK	7807X	7808X			UNK	CIRC
1902X			100	UNK	6504X			100	UNK	7809X	7810X			UNK	CIRC
2001X	9.532	7.872	150	UNK	6505X			150	UNK	7850X	7851X	7.989	7.149	UNK	CIRC
2002X	9.333		150	UNK	6506X			225	UNK	7852X	7853X	9.112	7.482	UNK	CIRC
2003X	9.555	7.985	150	UNK	6507X			375	UNK	7854X	7855X	9.356	8.266	UNK	CIRC
2004X	9.884		600	UNK	6508X			375	UNK	7856X	7857X	9.204		UNK	CIRC
2005X			600	UNK	6509X			300	UNK	7858X	7859X	9.204		UNK	CIRC
2006X			600	UNK	6510X			300	UNK	7860X	7861X	9.204		UNK	CIRC
2007X			600	UNK	6511X			375	UNK	7862X	7863X	9.204		UNK	CIRC
2008X			600	UNK	6512X			375	UNK	7864X	7865X	9.204		UNK	CIRC
2009X			600	UNK	6513X			375	UNK	7866X	7867X	9.204		UNK	CIRC
2010X			600	UNK	6514X			375	UNK	7868X	7869X	9.204		UNK	CIRC
2011X			600	UNK	6515X			375	UNK	7870X	7871X	9.204		UNK	CIRC
2012X			600	UNK	6516X			375	UNK	7872X	7873X	9.204		UNK	CIRC
2013X			600	UNK	6517X			375	UNK	7874X	7875X	9.204		UNK	CIRC
2014X			600	UNK	6518X			375	UNK	7876X	7877X	9.204		UNK	CIRC
2015X			600	UNK	6519X			375	UNK	7878X	7879X	9.204		UNK	CIRC
2016X			600	UNK	6520X			375	UNK	7880X	7881X	9.204		UNK	CIRC
2017X			600	UNK	6521X			375	UNK	7882X	7883X	9.204		UNK	CIRC
2018X			600	UNK	6522X			375	UNK	7884X	7885X	9.204		UNK	CIRC
2019X			600	UNK	6523X			375	UNK	7886X	7887X	9.204		UNK	CIRC
2020X			600	UNK	6524X			375	UNK	7888X	7889X	9.204		UNK	CIRC
2021X			600	UNK	6525X			375	UNK	7890X	7891X	9.204		UNK	CIRC
2022X			600	UNK	6526X			375	UNK	7892X	7893X	9.204		UNK	CIRC
2023X			600	UNK	6527X			375	UNK	7894X	7895X	9.204		UNK	CIRC
2024X			600	UNK	6528X			375	UNK	7896X	7897X	9.204		UNK	CIRC
2025X			600	UNK	6529X			375	UNK	7898X	7899X	9.204		UNK	CIRC
2026X			600	UNK	6530X			375	UNK	7900X	7901X	9.204		UNK	CIRC
2027X			600	UNK	6531X			375	UNK	7902X	7903X	9.204		UNK	CIRC
2028X			600	UNK	6532X			375	UNK	7904X	7905X	9.204		UNK	CIRC
2029X			600	UNK	6533X			375	UNK	7906X	7907X	9.204		UNK	CIRC
2030X			600	UNK	6534X			375	UNK	7908X	7909X	9.204		UNK	CIRC
2031X			600	UNK	6535X			375	UNK	7910X	7911X	9.204		UNK	CIRC
2032X			600	UNK	6536X			375	UNK	7912X	7913X	9.204		UNK	CIRC
2033X			600	UNK	6537X			375	UNK	7914X	7915X	9.204		UNK	CIRC
2034X			600	UNK	6538X			375	UNK	7916X	7917X	9.204		UNK	CIRC
2035X			600	UNK	6539X			375	UNK	7918X	7919X	9.204		UNK	CIRC
2036X			600	UNK	6540X			375	UNK	7920X	7921X	9.204		UNK	CIRC
2037X			600	UNK	6541X			375	UNK	7922X	7923X	9.204		UNK	CIRC
2038X			600	UNK	6542X			375	UNK	7924X	7925X	9.204		UNK	CIRC
2039X			600	UNK	6543X			375	UNK	7926X	7927X	9.204		UNK	CIRC
2040X			600	UNK	6544X			375	UNK	7928X	7929X	9.204		UNK	CIRC
2041X			600	UNK	6545X			375	UNK	7930X	7931X	9.204		UNK	CIRC
2042X			600	UNK	6546X			375	UNK	7932X	7933X	9.204		UNK	CIRC
2043X			600	UNK	6547X			375	UNK	7934X	7935X	9.204		UNK	CIRC
2044X			600	UNK	6548X			375	UNK	7936X	7937X	9.204		UNK	CIRC
2045X			600	UNK	6549X			375	UNK	7938X	7939X	9.204		UNK	CIRC
2046X			600	UNK	6550X			375	UNK	7940X	7941X	9.204		UNK	CIRC
2047X			600	UNK	6551X			375	UNK	7942X	7943X	9.204		UNK	CIRC
2048X			600	UNK	6552X			375	UNK	7944X	7945X	9.204		UNK	CIRC
2049X			600	UNK	6553X			375	UNK	7946X	7947X	9.204		UNK	CIRC
2050X			600	UNK	6554X			375	UNK	7948X	7949X	9.204		UNK	CIRC
2051X			600	UNK	6555X			375	UNK	7950X	7951X	9.204		UNK	CIRC
2052X			600	UNK	6556X			375	UNK	7952X	7953X	9.204		UNK	CIRC
2053X			600	UNK	6557X			375	UNK	7954X	7955X	9.204		UNK	CIRC
2054X			600	UNK	6558X			375	UNK	7956X	7957X	9.204		UNK	CIRC
2055X			600	UNK	6559X			375	UNK	7958X	7959X	9.204		UNK	CIRC
2056X			600	UNK	6560X			375	UNK	7960X	7961X	9.204		UNK	CIRC
2057X			600	UNK	6561X			375	UNK	7962X	7963X	9.204		UNK	CIRC
2058X			600	UNK	6562X			375	UNK	7964X	7965X	9.204		UNK	CIRC
2059X			600	UNK	6563X			375	UNK	7966X	7967X	9.204		UNK	CIRC
2060X			600	UNK	6564X			375	UNK	7968X	7969X	9.204		UNK	CIRC
2061X			600	UNK	6565X			375	UNK	7970X	7971X	9.204		UNK	CIRC
2062X			600	UNK	6566X			375	UNK	7972X	7973X	9.204		UNK	CIRC
2063X			600	UNK	6567X			375	UNK	7974X	7975X	9.204		UNK	CIRC
2064X			600	UNK	6568X			375	UNK	7976X	7977X	9.204		UNK	CIRC
2065X			600	UNK	6569X			375	UNK	7978X	7979X	9.204		UNK	CIRC
2066X			600	UNK	6570X			375	UNK	7980X	7981X	9.204		UNK	CIRC
2067X			600	UNK	6571X			375	UNK	7982X	7983X	9.204		UNK	CIRC
2068X			600	UNK	6572X			375	UNK	7984X	7985X	9.204		UNK	CIRC
2069X			600	UNK	6573X			375	UNK	7986X	7987X	9.204		UNK	CIRC
2070X			600	UNK	6574X			375	UNK	7988X	7989X	9.204		UNK	CIRC
2071X			600	UNK	6575X			375	UNK	7990X	7991X	9.204		UNK	CIRC
2072X			600	UNK	6576X			375	UNK	7992X	7993X	9.204		UNK	CIRC
2073X			600	UNK	6577X			375	UNK	7994X	7995X	9.204		UNK	CIRC
2074X			600	UNK	6578X			375	UNK	7996X	7997X	9.204		UNK	CIRC
2075X			600	UNK	6579X			375	UNK	7998X	7999X	9.204		UNK	CIRC
2076X			600	UNK	6580X			375	UNK	8000X	8001X	9.204		UNK	CIRC
2077X			600	UNK	6581X			375	UNK	8002X	8003X	9.204		UNK	CIRC
2078X			600	UNK	6582X			375	UNK	8004X	8005X	9.204		UNK	CIRC
2079X			600	UNK	6583X			375	UNK	8006X	8007X	9.204		UNK	CIRC
2080X			600	UNK	6584X			375	UNK	8008X	8009X	9.204		UNK	CIRC
2081X			600	UNK	6585X			375	UNK	8010X	8011X	9.204		UNK	CIRC
2082X			600	UNK	6586X			375	UNK	8012X	8013X	9.204		UNK	CIRC
2083X			600	UNK	6587X			375	UNK	8014X	8015X	9.204		UNK	CIRC
2084X			600	UNK	6588X			375	UNK	8016X	8017X	9.204		UNK	CIRC
2085X			600	UNK	6589X			375	UNK	8018X	8019X	9.204		UNK	CIRC
2086X			600	UNK	6590X			375	UNK	8020X	8021X	9.204		UNK	CIRC
2087X			600	UNK	6591X			375	UNK	8022X	8023X	9.204		UNK	CIRC
2088X			600	UNK	6592X			375	UNK	8024X	8025X	9.204		UNK	CIRC
2089X			600	UNK	6593X			375	UNK	8026X	8027X	9.204		UNK	CIRC
2090X			600	UNK	6594X			375	UNK	8028X	8029X	9.204		UNK	CIRC
2091X			600	UNK	6595X			375	UNK	8030X	8031X	9.			



## **Appendix 4**






### **BGS Geological Borehole Data**




### Borehole Scans


Click on a borehole to view scan.


#### Borehole depth

-  0 - 10m
-  10 - 30m
-  30m+
-  Unknown
-  Confidential or Restricted

[More on boreholes](#)

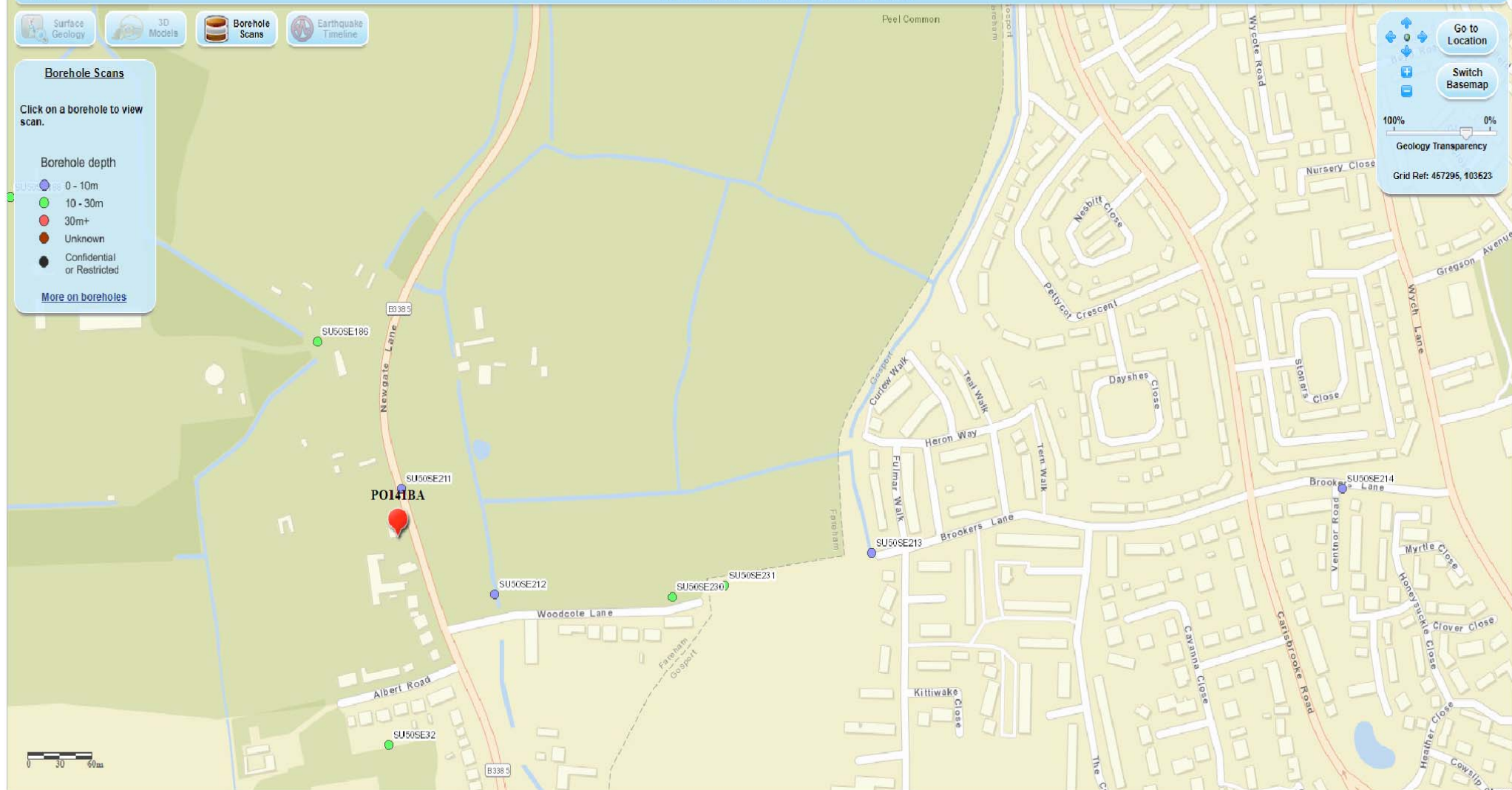
 [Go to Location](#)

 [Switch Basemap](#)

100%  0%

Geology Transparency

Grid Ref: 457295, 103523



<b>Holst Soil Engineering Limited</b>						Borehole No. <b>ah2</b>	
Contract No. <b>F3523</b>		<b>BOREHOLE LOG</b>		Sheet <b>1</b> of <b>1</b>			
Location <b>Gosport</b>		Client <b>Southern Water Authority</b>		Chainage		Ground Level	
Method of Boring <b>Percussion</b>		Diameter of Borehole <b>150mm</b>		Date <b>21.12.76</b>			
Handwritten: <b>SU50SE 212</b>		Handwritten: <b>5710.0303</b>					
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
<b>TOPSOIL</b>		0.30					
Firm grey brown mottled clayey sandy SILT with some flint gravel		1.10					
Medium dense silty SAND and flint GRAVEL in a clayey matrix		3.20			2.50	"15"	
Firm grey and orange brown mottled silty CLAY with occasional flint fragments.		5.00			3.50		
<p>Type of Sample</p> <p>Is S.P.T. <input type="checkbox"/> Undisturbed</p> <p>Ic. C.P.T. <input checked="" type="checkbox"/> Vane</p> <p>O Jar <input checked="" type="checkbox"/> Water</p> <p>● Bulk <input checked="" type="checkbox"/> Piezometer</p>		<p>Remarks (Observations of Ground Water etc.)</p> <p>Groundwater struck at 1.10m depth casing depth 1.00m                  Sealed by casing at 3.50m depth                  Standpipe installed at 4.00m depth                  Standing water level at 0.30m depth</p>					

SU50SE 230

Sampling		Properties			Strata						
Depth	Type	Strength kN/m <sup>2</sup>	w %	SPT N	Description	Depth	Level	Legend			
					Topsoil.	G.L.	8.4				
0.5-1.0	U(50)					0.4	8.0				
1.0	D				Firm-stiff brown sandy CLAY with abundant chalk and flint fragments.						
1.5-2.0	U(20)	95	22	22		1.7	6.7				
2.0	D				Firm-stiff light brown mottled grey very silty CLAY.						
2.4	W			22		2.7	5.7				
2.5-3.0	U(12)	120		22							
3.0	D				Firm-stiff dark grey very silty sandy CLAY becoming very sandy towards base.						
3.5-4.0	U(10)	75	18								
4.0	D					4.5	3.9				
4.5	D			28							
5.0-5.5	D.S			14	Dense/very dense dark grey clayey very silty SAND.						
6.0-6.5	U(20)	22	26								
6.5	D				Stiff grey fissured silty CLAY present 9.5-10.0.						
6.5-7.0	D.S			39							
7.5	D										
8.0-8.5	D.S			65							
9.0	D										
9.3-9.8		85		26							
				26							
9.8-10.3	D.S			74	Continued from 10.0.	10.0	-1.6				
<b>Drilling</b>					<b>Ground Water</b>						
Type	From	To	Size	Fluid	Struck	Behaviour	Sealed	Date	Hole	Cased	Water
Shell and Auger.	G.L.	10.0	0.15		4.50	Rose to 2.4 in 1 hour	-	2.9.75	-	-	-
						Ingress throughout borehole.		2.9.75	15.0	14.0	14.2
								12.9.75	Piezometer	1.65	
<b>Remarks</b>											
<b>Borehole Record</b>					<b>Project</b>				<b>Contract</b>		
exploration associates					Hampshire County Council Fareham - Gosport Relief Road				S1259/4		
									<b>Borehole</b> 37		
									Sheet 1 of 2		

3050SE 230

Sampling		Properties			Strata						
Depth	Type	Strength kN.m <sup>2</sup>	w %	SPT N	Description	Depth	Level	Legend			
10.8	D				Continued from 10.0.  Dense/very dense dark grey mottled light grey green clayey very silty SAND tending to very sandy SILT in part.	10.0	-1.6				
11.0-11.5	U(25)	240	25								
11.5-12.0	D.S			90							
12.5	D										
13.0-13.5	U(30)		23								
14.3	D										
14.5-15.0	U(30)	150	25								
15.0	D				End of Borehole.	15.0	-6.6				
<b>Drilling</b>					<b>Ground Water</b>						
Type	From	To	Size	Fluid	Struck	Behaviour	Sealed	Date	Hole	Cased	Water
Shell and Auger.	10.0	15.0						31.10.75	Piezometer		1.35
								30.12.75	Piezometer		0.94
								29.1.76	Piezometer		1.07
<b>Remarks</b> Piezometer installed to 15.0.											
<b>Borehole Record</b>					<b>Project</b> Hampshire County Council Fareham - Gosport Relief Road				<b>Contract</b> S1259/4		
<b>exploration associates</b>									<b>Borehole</b> 37 Sheet 2 of 2		

EX 1

SU50SE 231

Sampling		Properties			Strata						
Depth	Type	Strength kN/m <sup>2</sup>	w %	SPT N	Description	Depth	Level	Legend			
0.5-1.0	U(20)				Topsoil.	G.L.	8.4				
1.0	D				Soft - firm light brown becoming brown silty sandy CLAY with abundant gravel towards base. Carbonaceous inclusions present in upper regions.	0.4	8.0				
1.5-2.0	U(38)	45	19								
2.0	D					2.3	6.1				
2.2	W										
2.5-3.0	U(15)	140	25		Medium dense/dense light brown slightly clayey sandy SILT with silty SAND.						
3.0	D										
3.5-4.0	D.S			14							
4.5-5.0	D.S			18							
5.5-6.0	D.S			22	Dense/very dense grey clayey very silty SAND with occasional laminated clay zones.	5.0	3.4				
6.5-7.0	D.S			40							
7.3	D										
7.5-8.0	U(30)	290	20								
8.0-8.5	D.S			34							
9.5-10.0	D.S			17	Continued from 10.0.	10.0	-1.6				
<b>Drilling</b>					<b>Ground Water</b>						
Type	From	To	Size	Fluid	Struck	Behaviour	Sealed	Date	Hole	Cased	Water
Shell and Auger.	G.L	10.0	0.15		2.50	Medium ingress		3.9.75	-	-	-
						Ingress throughout borehole.					
<b>Remarks</b>											
<b>Borehole Record</b>					<b>Project</b> Hampshire County Council Fareham - Gosport Relief Road.				<b>Contract</b> S1259/4		
<b>exploration associates</b>									<b>Borehole</b> 38 Sheet 1 of 2		

SU50SE231

Sampling		Properties			Strata						
Depth	Type	Strength kN/m <sup>2</sup>	w %	SPT N	Description	Depth	Level	Legend			
					Continued from 10,0.	10,0	-1,6				
10,3	D	200	20		Very stiff dark grey mottled grey with occasional light grey veins very silty sandy CLAY, tending to clayey silt and sand in part.						
10,5-11,0	U(25)		21								
11,0	D	20									
11,5	D	20									
12,0-12,5	U(25)										
12,5	D										
13,0	D										
13,5-14,0	U(35)	240	25								
14,0	D										
14,5-15,0	U(35)	300	23								
15,0	D		23		End of Borehole.	15,0	-6,6				
<b>Drilling</b>					<b>Ground Water</b>						
Type	From	To	Size	Fluid	Struck	Behaviour	Sealed	Date	Hole	Cased	Water
Shell and Auger.	10,0	15,0	0,15								
<b>Remarks</b>											
<b>Borehole Record</b>					<b>Project</b> Hampshire County Council Fareham - Gosport Relief Road				<b>Contract</b> S1259/4		
<b>exploration associates</b>									<b>Borehole</b> 38 Sheet 2 of 2		

**Appendix 5**  
**Environment Agency Product 4 Information**  
**and Flood Maps**

# Flood map for planning

Your reference  
**Newgate Lane**

Location (easting/northing)  
**457269/103238**

Created  
**25 May 2018 11:51**

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

## **This means:**

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

## **Notes**

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

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

The Open Government Licence sets out the terms and conditions for using government data.  
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



## Flood map for planning









Your reference  
**Newgate Lane**

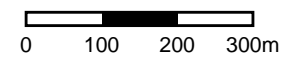
Location (easting/northing)  
**457269/103238**

Scale  
**1:10000**

Created  
**25 May 2018 11:51**



-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area



Basic view  Detailed view

Location



Flood risk from rivers or the sea

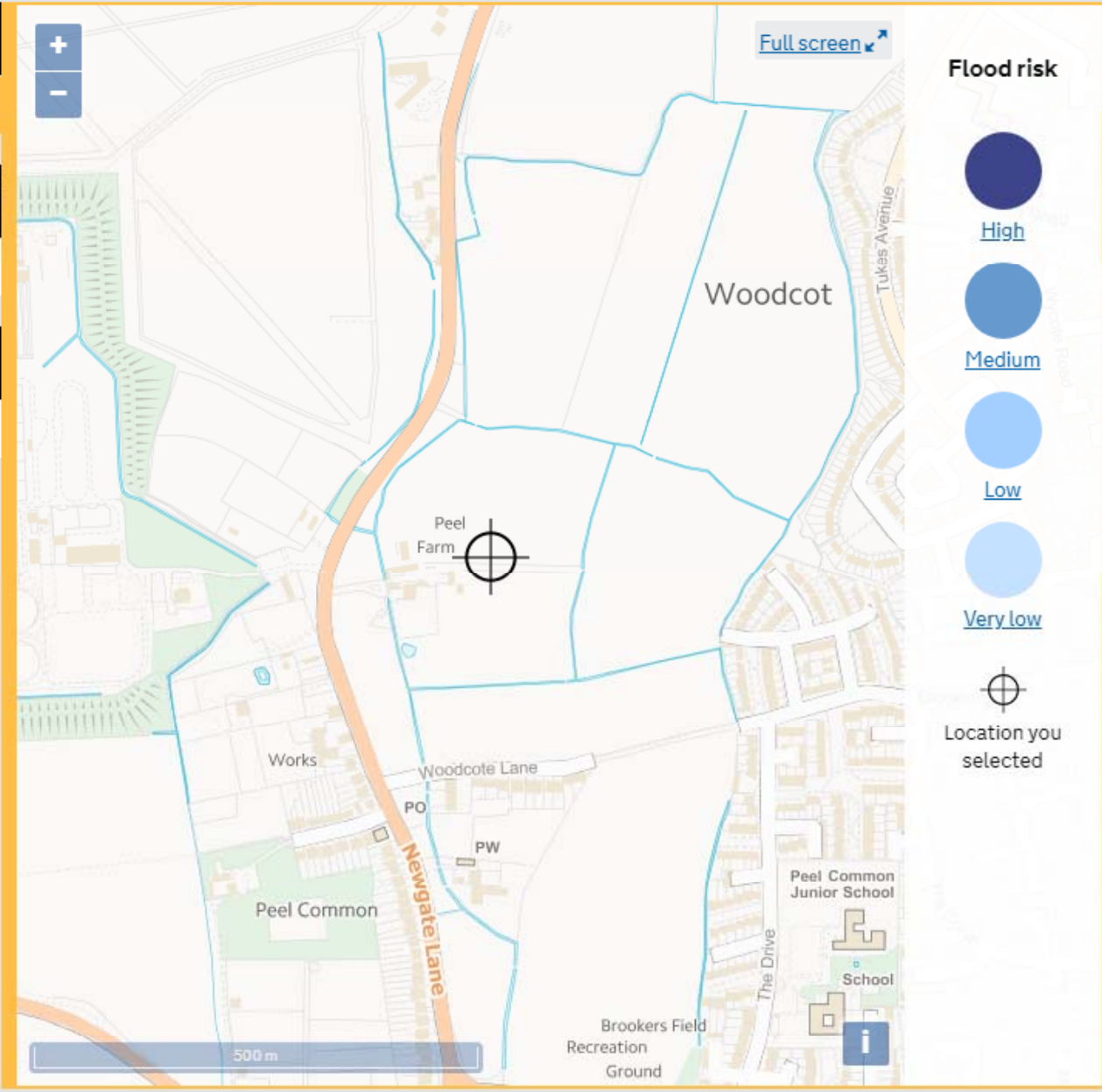
Extent of flooding

Flood risk from surface water

Extent of flooding

Flood risk from reservoirs

Extent of flooding



Flood risk



High



Medium



Low



Very low



Location you selected

Risk of flooding from Surface Water - Newgate Lane, created 21 March 218



Scale 1:3,467



Likelihood of flooding from Surface Water

- High ( $\geq 3.3\%$ )
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low



Likelihood of flooding from Surface Water

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.



Basic view  Detailed view

Location



Flood risk from rivers or the sea

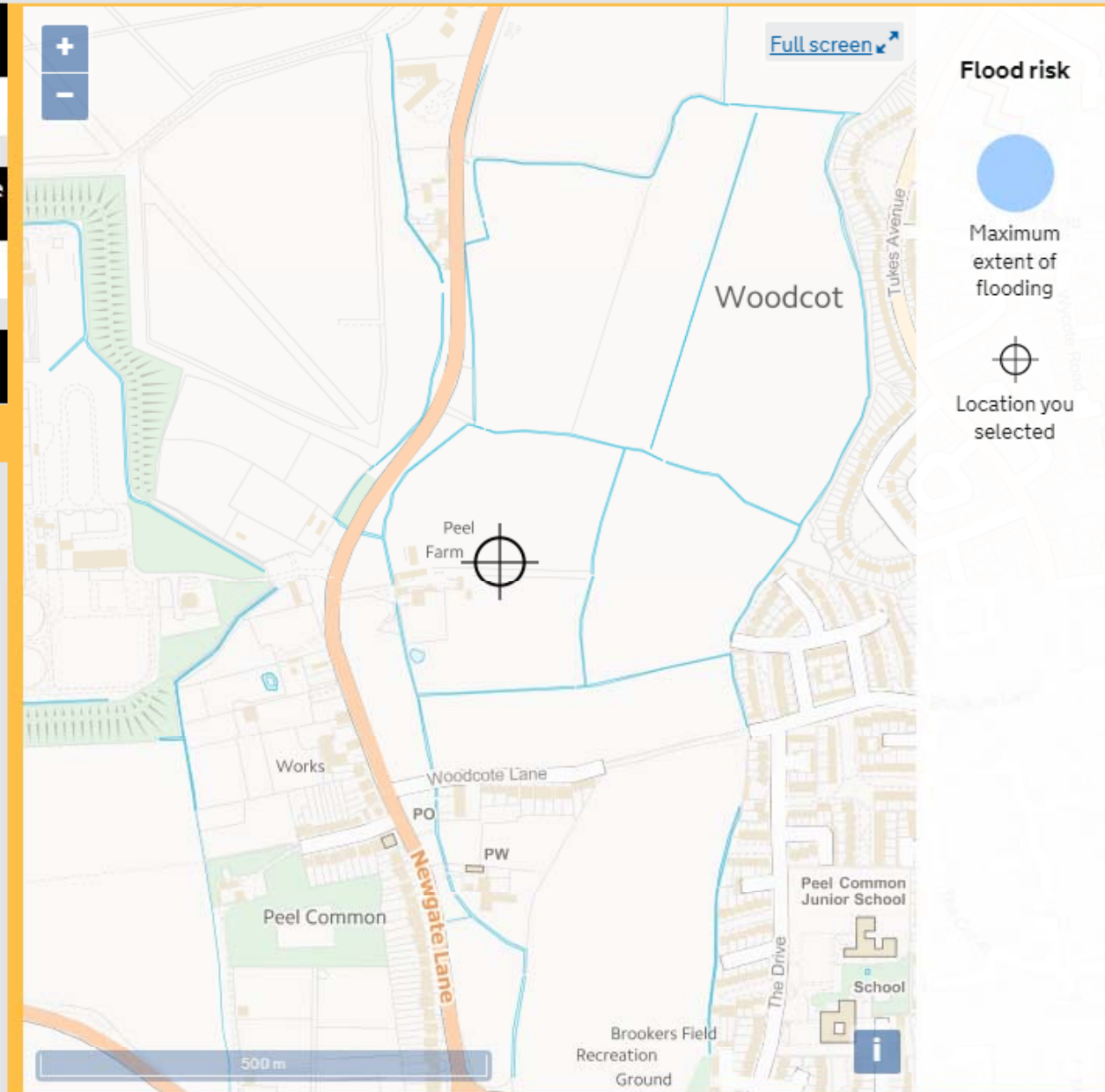
Extent of flooding

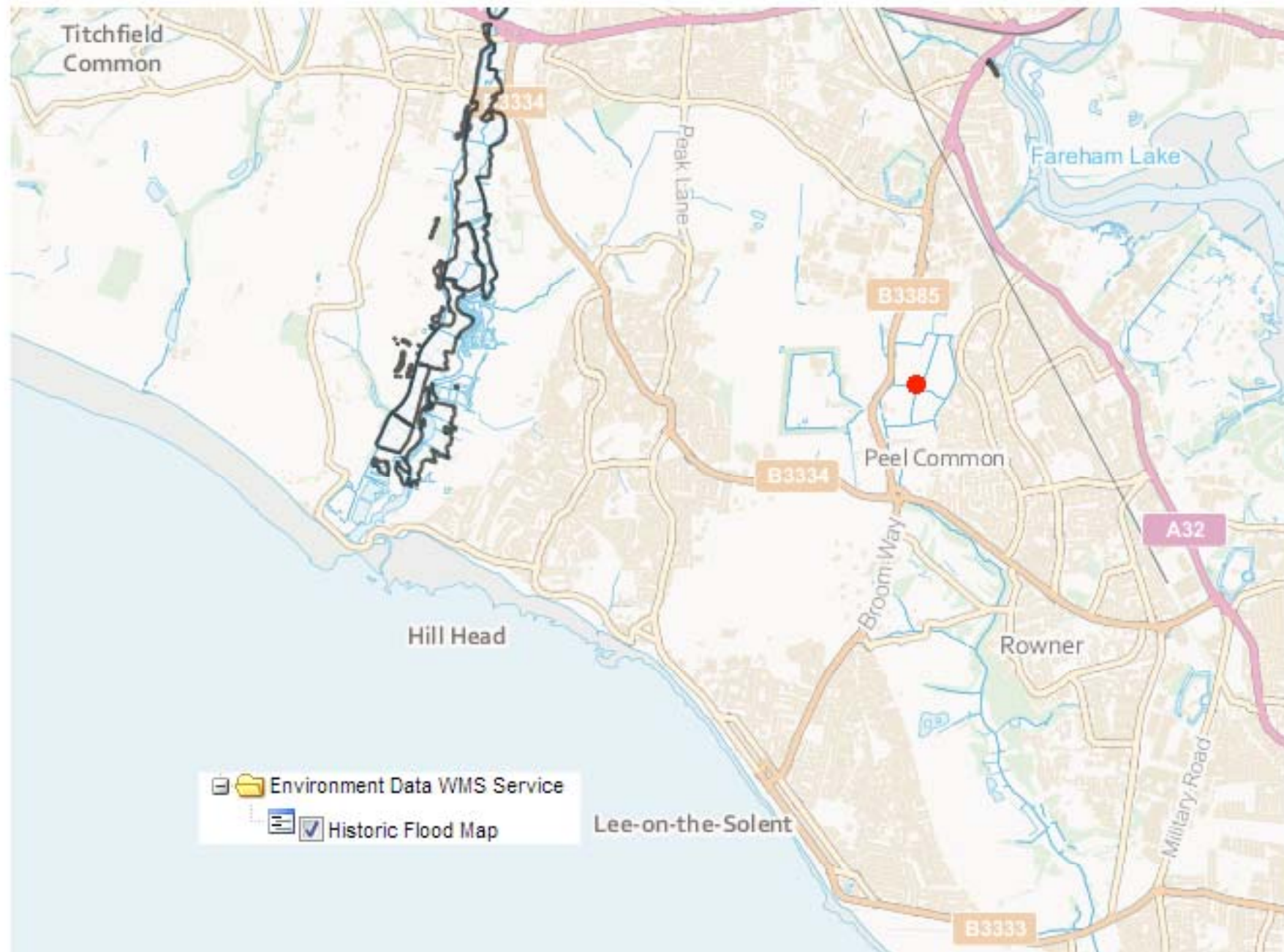
Flood risk from surface water

Extent of flooding

Flood risk from reservoirs

Extent of flooding







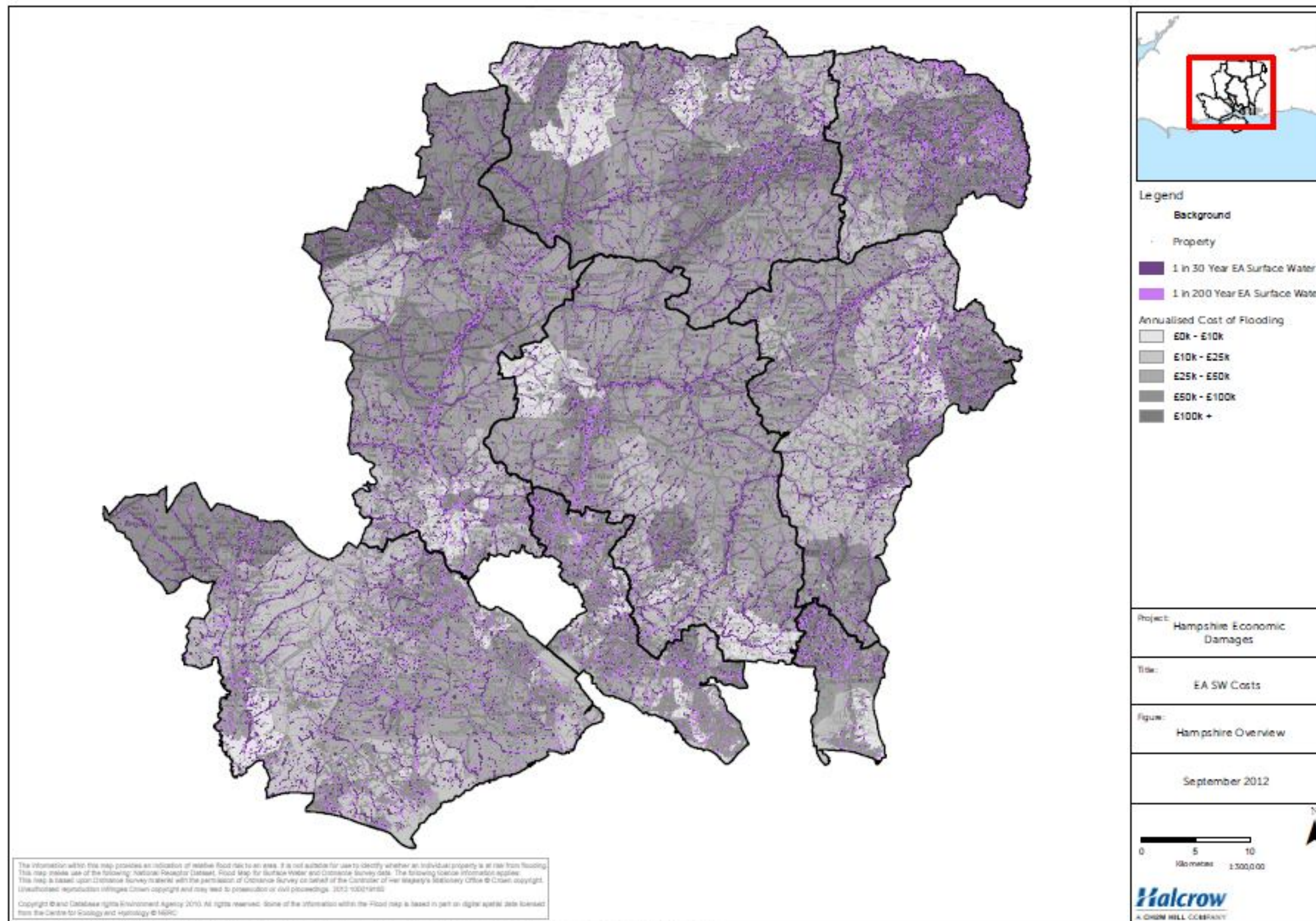
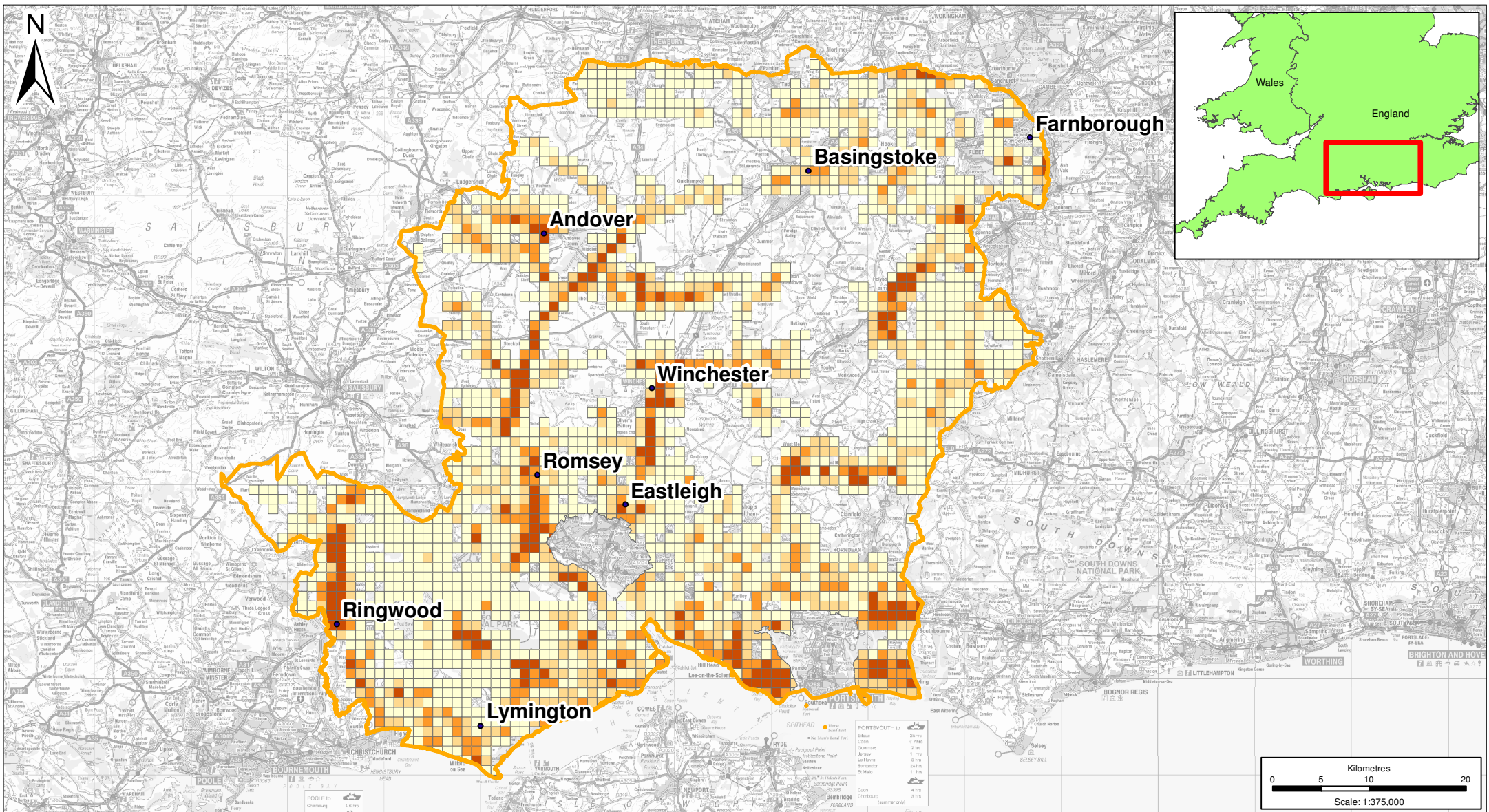


Figure 4.3: Risk of flooding calculated as an economic cost from the Environment Agency Flood Map for Surface Water

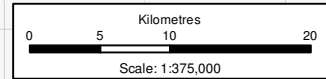




**Proportion of 1 km square susceptible to groundwater flood emergence**

- $\geq 75\%$
- $\geq 50\% < 75\%$
- $\geq 25\% < 50\%$
- $< 25\%$
- Hampshire County Boundary

Figure Number: 7  
 Job Number: 461312  
 Drawn By: CLK  
 Date: 01-05-2013



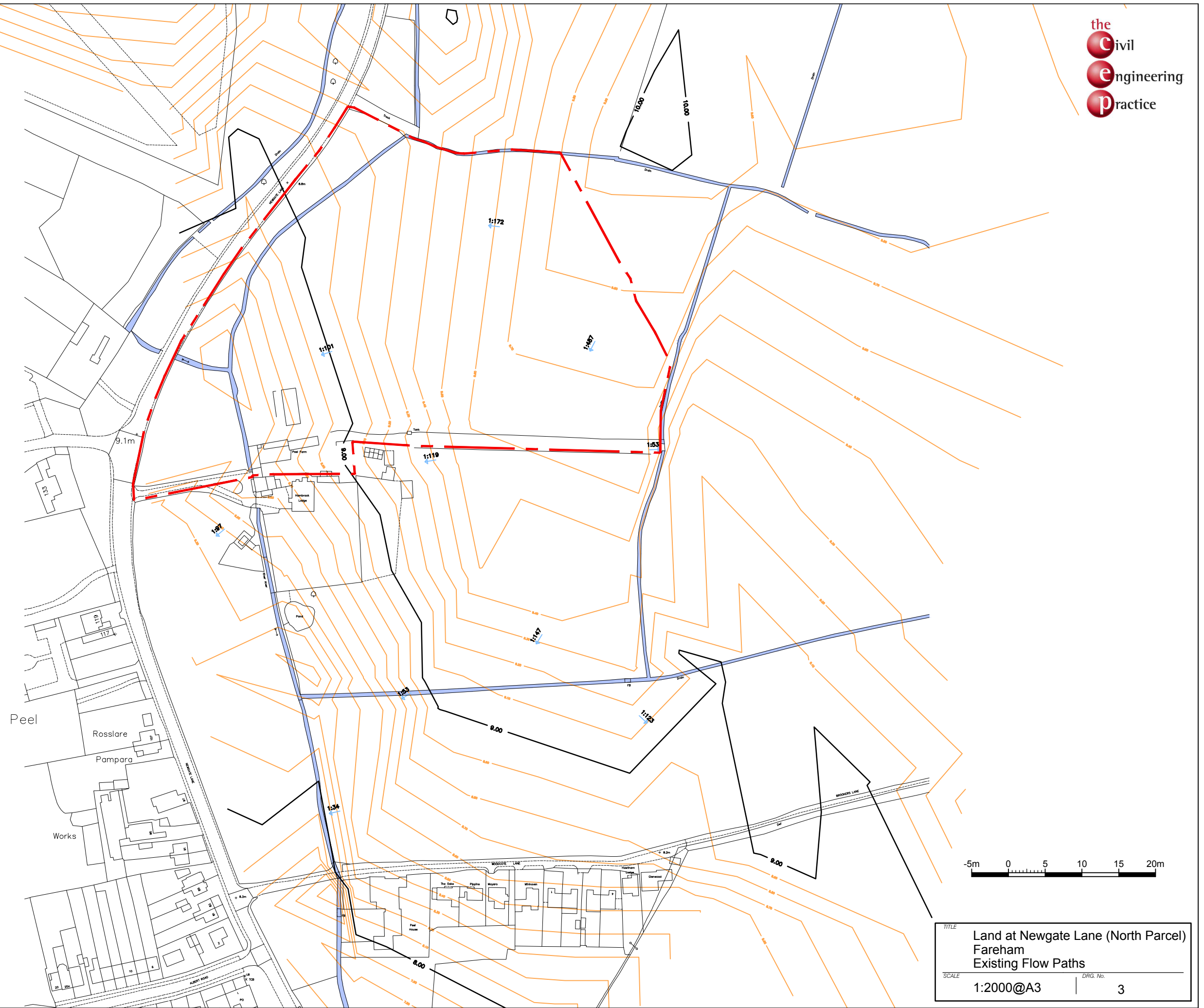
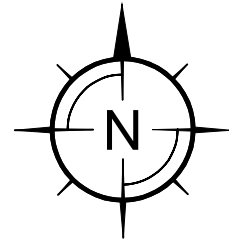
Hampshire GWMP  
 Figure 7 Areas susceptible to groundwater flooding



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**Appendix 6**  
**Existing Flow Path Plan**



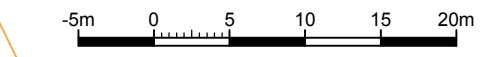


Peel

Rosslare

Pampara

Works




TITLE	
Land at Newgate Lane (North Parcel) Fareham Existing Flow Paths	
SCALE	DRG. No.
1:2000@A3	3

**Appendix 7**  
**Illustrative Master Plan**





-  APPLICATION BOUNDARY
- LAND USE:**
-  RESIDENTIAL PARCELS
-  PRIMARY FRONTAGE
-  SECONDARY FRONTAGE
-  PUBLIC OPEN SPACE
- ACCESS AND CONNECTIONS:**
-  PROPOSED ACCESS
-  RETAINED EXISTING ACCESS TO HAMBROOK LODGE
-  PRIMARY SPINE ROAD
-  SECONDARY ROAD
-  TERTIARY ROAD
-  FOOTPATH CONNECTIONS
-  FOOTPATHS KEY NODE
- GREEN AND BLUE INFRASTRUCTURE:**
-  EXISTING VEGETATION
-  PROPOSED VEGETATION
-  PROPOSED LEAP (400SQM WITH 20M OFFSET)
-  DRAINAGE CHANNELS
-  INDICATIVE ATTENUATION
- OTHER:**
-  PROPOSED PUMPING STATION (MIN 12M X 8M WITH 15M OFFSET)

LAND ADJACENT TO NEWGATE LANE, FAREHAM - ILLUSTRATIVE FRAMEWORK MASTERPLAN - NORTHERN PARCEL



## **Appendix 8**

### **Preliminary Surface Water Storage Calculations**

11 Tungsten Building  
George Street  
Fishersgate BN41 1RA

23013  
Land at Newgate Lane, Fareham  
North Site Preliminary Storage



Date 06/09/2018  
File Preliminary Storage (No...

Designed by SRD  
Checked by

XP Solutions

Source Control 2017.1.2

Summary of Results for 100 year Return Period (+40%)

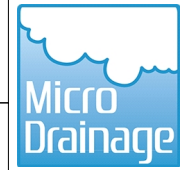
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	6.798	0.298	5.0	304.2	O K
30 min Summer	6.900	0.400	5.0	407.8	O K
60 min Summer	7.009	0.509	5.0	519.4	O K
120 min Summer	7.122	0.622	5.0	634.8	O K
180 min Summer	7.186	0.686	5.0	699.8	O K
240 min Summer	7.227	0.727	5.0	741.3	O K
360 min Summer	7.281	0.781	5.0	796.5	O K
480 min Summer	7.316	0.816	5.0	831.8	O K
600 min Summer	7.338	0.838	5.0	855.1	O K
720 min Summer	7.353	0.853	5.0	870.4	O K
960 min Summer	7.368	0.868	5.0	885.8	O K
1440 min Summer	7.365	0.865	5.0	882.7	O K
2160 min Summer	7.341	0.841	5.0	858.1	O K
2880 min Summer	7.313	0.813	5.0	829.6	O K
4320 min Summer	7.254	0.754	5.0	769.3	O K
5760 min Summer	7.193	0.693	5.0	707.1	O K
7200 min Summer	7.127	0.627	5.0	639.6	O K
8640 min Summer	7.060	0.560	5.0	571.3	O K
10080 min Summer	7.002	0.502	5.0	511.9	O K
15 min Winter	6.835	0.335	5.0	341.3	O K
30 min Winter	6.949	0.449	5.0	457.6	O K
60 min Winter	7.072	0.572	5.0	583.4	O K
120 min Winter	7.200	0.700	5.0	714.1	O K
180 min Winter	7.272	0.772	5.0	787.4	O K
240 min Winter	7.318	0.818	5.0	834.7	O K
360 min Winter	7.381	0.881	5.0	898.7	O K
480 min Winter	7.422	0.922	5.0	940.6	O K
600 min Winter	7.450	0.950	5.0	969.0	O K
720 min Winter	7.469	0.969	5.0	988.7	O K
960 min Winter	7.491	0.991	5.0	1011.0	O K
1440 min Winter	7.498	0.998	5.0	1017.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	126.074	0.0	274.8	26
30 min Summer	84.745	0.0	360.8	41
60 min Summer	54.368	0.0	513.5	70
120 min Summer	33.674	0.0	631.7	130
180 min Summer	25.065	0.0	696.9	190
240 min Summer	20.180	0.0	736.3	250
360 min Summer	14.839	0.0	770.4	368
480 min Summer	11.923	0.0	767.5	486
600 min Summer	10.054	0.0	759.0	606
720 min Summer	8.741	0.0	749.9	724
960 min Summer	7.003	0.0	732.5	962
1440 min Summer	5.114	0.0	701.3	1402
2160 min Summer	3.727	0.0	1288.7	1736
2880 min Summer	2.973	0.0	1353.2	2116
4320 min Summer	2.159	0.0	1300.8	2944
5760 min Summer	1.718	0.0	1611.5	3800
7200 min Summer	1.438	0.0	1685.3	4616
8640 min Summer	1.245	0.0	1749.6	5360
10080 min Summer	1.102	0.0	1801.6	6056
15 min Winter	126.074	0.0	306.8	26
30 min Winter	84.745	0.0	392.0	41
60 min Winter	54.368	0.0	574.0	70
120 min Winter	33.674	0.0	699.5	128
180 min Winter	25.065	0.0	759.0	186
240 min Winter	20.180	0.0	779.7	244
360 min Winter	14.839	0.0	776.6	362
480 min Winter	11.923	0.0	768.3	478
600 min Winter	10.054	0.0	760.6	594
720 min Winter	8.741	0.0	753.8	710
960 min Winter	7.003	0.0	742.3	938
1440 min Winter	5.114	0.0	726.0	1382



11 Tungsten Building  
George Street  
Fishersgate BN41 1RA

23013  
Land at Newgate Lane, Fareham  
North Site Preliminary Storage



Date 06/09/2018  
File Preliminary Storage (No...)

Designed by SRD  
Checked by


XP Solutions

Source Control 2017.1.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
2160 min Winter	7.467	0.967	5.0	986.5	O K
2880 min Winter	7.432	0.932	5.0	950.7	O K
4320 min Winter	7.351	0.851	5.0	868.0	O K
5760 min Winter	7.264	0.764	5.0	778.9	O K
7200 min Winter	7.171	0.671	5.0	684.7	O K
8640 min Winter	7.063	0.563	5.0	574.4	O K
10080 min Winter	6.972	0.472	5.0	481.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
2160 min Winter	3.727	0.0	1429.2	1972
2880 min Winter	2.973	0.0	1461.5	2248
4320 min Winter	2.159	0.0	1349.8	3164
5760 min Winter	1.718	0.0	1804.9	4096
7200 min Winter	1.438	0.0	1887.4	5040
8640 min Winter	1.245	0.0	1959.8	5784
10080 min Winter	1.102	0.0	2020.1	6456

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11 Tungsten Building George Street Fishergate BN41 1RA	23013 Land at Newgate Lane, Fareham North Site Preliminary Storage	
Date 06/09/2018	Designed by SRD	
File Preliminary Storage (No...)	Checked by	
XP Solutions	Source Control 2017.1.2	


Rainfall Details

Rainfall Model	FSR	Ratio R	0.350	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	19.200	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.308

Time (mins)			Time (mins)			Time (mins)		
From:	To:	Area (ha)	From:	To:	Area (ha)	From:	To:	Area (ha)
0	4	0.436	4	8	0.436	8	12	0.436

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Model Details

Storage is Online Cover Level (m) 8.000

Tank or Pond Structure

Invert Level (m) 6.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	1020.0	0.600	1020.0	1.200	0.0	1.800	0.0	2.400	0.0
0.100	1020.0	0.700	1020.0	1.300	0.0	1.900	0.0	2.500	0.0
0.200	1020.0	0.800	1020.0	1.400	0.0	2.000	0.0		
0.300	1020.0	0.900	1020.0	1.500	0.0	2.100	0.0		
0.400	1020.0	1.000	1020.0	1.600	0.0	2.200	0.0		
0.500	1020.0	1.001	0.0	1.700	0.0	2.300	0.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0105-5000-1000-5000	Sump Available	Yes
Design Head (m)	1.000	Diameter (mm)	105
Design Flow (l/s)	5.0	Invert Level (m)	6.500
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	5.0	Kick-Flo®	0.637	4.1
Flush-Flo™	0.296	5.0	Mean Flow over Head Range	-	4.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	0.800	4.5	2.000	6.9	4.000	9.6	7.000	12.5
0.200	4.8	1.000	5.0	2.200	7.2	4.500	10.1	7.500	12.9
0.300	5.0	1.200	5.4	2.400	7.5	5.000	10.6	8.000	13.3
0.400	4.9	1.400	5.8	2.600	7.8	5.500	11.1	8.500	13.7
0.500	4.7	1.600	6.2	3.000	8.4	6.000	11.6	9.000	14.1
0.600	4.3	1.800	6.6	3.500	9.0	6.500	12.1	9.500	14.5



## **Appendix 9**

### **Outline Drainage Maintenance Schedule**

# Maintenance Schedule

<b>Project</b>	<b>Newgate Lane, Fareham</b>
<b>Project Number</b>	<b>23013</b>

**By** Steve Doughty

**Date** 25 May 2018



**The Civil Engineering Practice**  
 11 Tungsten Building  
 George Street  
 Fishersgate  
 Sussex  
 BN41 1RA

T. 01273 424 424  
 E. [design@civil.co.uk](mailto:design@civil.co.uk)  
[www.civil.co.uk](http://www.civil.co.uk)

## 1 Indicative Schedule of Maintenance

- 1.1 Once appointed the Contractor will prepare a site specific method statement for the control of silt and other pollutants during construction. CIRIA Report C532, Control of water pollution from construction sites, provides further guidance on this.
- 1.2 The Contractor will maintain the proposed drainage system during construction and until the handing over of the site. Upon completion the maintenance will be passed on to the property owner.
- 1.3 The following maintenance schedule details the typical tasks to be undertaken at different intervals.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from silt trap chambers, channel drains and inlet chambers	6 monthly
	Remove silt and debris from oil interceptor	When alarm indicates
	Litter and debris removal – catch pits	Monthly or as required
	Surface and Foul water pipe work – jetting / rodding	Every 2 years or as required
	Manage other vegetation and remove nuisance plants – aesthetics	As required
	Visual Inspection of permeable parking for defects and settlement	Annually
	Sweeping/brushing of permeable parking	Twice Annually
Corrective Maintenance	Remove debris/blockages to silt traps / channel drains	As required
	Repairs to access chambers / manhole covers	As required
	Replace any broken permeable blocks/surface, remedial works to any depressions or rutting	As required
	Inspect inlet, outlet from downpipe and gullies for blockages, standing water and clear	As required

### Indicative Schedule of Maintenance for the Proposed Drainage System



<b>Inspection / Action Required</b>	<b>Gullies, Channels and Gutters</b>	<b>Catchpits</b>	<b>Oil Interceptors</b>	<b>Permeable Surface</b>	<b>Surface Water Pipework</b>
After leaf fall in Autumn	✓	✓			
6 Months	✓	✓		✓	
1 Year				✓	
2 Years					✓
When alarm indicates			✓		

**Drainage System Maintenance Summary**