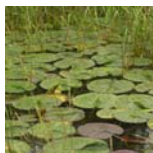


**RESIDENTIAL DEVELOPMENT
DAPPERS LANE
ANGMERING
WEST SUSSEX
BN16 4DA**

**SITE SPECIFIC FLOOD RISK ASSESSMENT
LEVEL 1**

ISSUE 1

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- C: Environment Agency Flood Mapping
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Issue	Copies	Distribution	Format	Date	Status
1	1	Ms C Bartlett, Strutt & Parker	By email: Clare.Bartlett@StruttAndParker.com	30 August 2013	For comment

1.0 INTRODUCTION

1.1 Archibald Shaw was commissioned by Strutt and Parker LLP to undertake a Level 1 Flood Risk Assessment [FRA] in accordance with the National Planning Policy Framework on the parcel of land shown overleaf – herein known as ‘the site’.

1.1.2 The development of the site totals some 1.27ha which includes the removal of two buildings and associated hardstandings, and the construction of 28 two bedroom cottages, and a 60 bedroom care home.

1.1.3 This report has been written in support of an outline planning application

1.1.4 Nothing in this report confers or purports to confer on any third party, any benefit or any right to enforce any term of this report pursuant to the Contract (Rights of Third Parties) Act 1999.

1.2 Terms of Reference

1.2.1 This report comprises a Level 1 Flood Risk Assessment in accordance with the requirements and guidance of:

- The National Planning Policy Framework
- Technical Guidance to the National Planning Policy Framework
- Flooding – Engineering Resilience, ICE:
- Flood Risks to People – FD2321/TR2 defra

1.3 Proposed Development

1.3.1 Vehicular and pedestrian access to the new estate would remain as existing, from Dappers Lane.

1.3.2 According to the Environment Agency’s flood mapping, accessible from the internet, it appears that the site lies within a low risk of flooding and so would be categorised having a less than 1 in 1000 annual probability of flooding in any year.

1.4 Summary of Brief

1.4.1 In accordance with the Client’s specific objectives, the purpose of this report is primarily:

- (i) To provide a contemporary record of current flood risks affecting the site and future proposals.

- (ii) To advise on exceptional flooding events that may have an influence on developing the site.
- (iii) To advise on potential methods of mitigating flood risks on site.
- (iv) To form the basis of site based drainage strategy.



Aerial view of site

2.0 SOURCES OF INFORMATION**2.1 Desk Top and Site Based Research**

2.1.1 The flood risk assessment research comprised:

Site Information	YES	NO
Review of information supplied by the Client	✓	
Site walkover	✓	
Preliminary discussion with owner/occupier		✓

Public Domain Information	YES	NO
Geological mapping	✓	
Statutory services information	✓	
Local Authority enquiry		✓
Strategic Flood Risk Assessment	✓	
Topographic site survey	✓	
Internet data	✓	
Anecdotal flooding information	✓	
Aerial photographs	✓	
LIDAR Survey		✓
Historic mapping		✓

Key: NA = Not applicable
 NR = No records available
 AR = Awaiting response

2.2 Response to Enquiries**2.2.1 Water Authority**

2.2.1.1 There is an adopted foul water sewer local to the site, within Water Lane. No adopted surface water levels are present local to the site.

2.2.2 Environment Agency

2.2.2.1 The Environment Agency's flood mapping available on their web site indicates the site lies within an area of low flood risk from rivers and the sea.

3.0 SITE DETAILS

3.1 Site Location

- 3.1.1 The site lies within a rural area on the eastern side of Angmering village. It is bounded to the west by Dappers Lane, and to the south by Water Lane. The National Grid reference for the site is 507318; 104724.

3.2 Site Description

- 3.2.1 The site is currently occupied by two buildings, several ancillary structures, and a copse.

3.3 Local Topography and Geology

- 3.3.1 The site has an average downward gradient of 1 in 20 from north to south, with site levels ranging from 21.6m to 14.6m local datum. The site is generally horizontal in the east/west plane.

- 3.3.2 With reference to British Geological Survey mapping, the site is underlain by superficial Head deposits, and Bedrock geology of the Lambeth Group:

Head Deposits: Clays, silts, sands and gravels which were formed some 2 million years ago in the Quaternary Period.

Lambeth Group: Clay, silts and sands. This sedimentary bedrock was formed some 55 to 65 million years ago in the Palaeogene Period when the local environment was dominated by swamps, estuaries and deltas.

4.0 ANECDOTAL EVIDENCE

4.1 Flooding from Rivers

- 4.1 A statement made by Mr R Hobden, the landowner confirms that the site has not suffered flooding under his ownership. See appendix D.

5.0 POTENTIAL FLOOD HAZARDS

5.1 Flooding from Rivers

5.1.1 Rivers flood out of bank when the amount of water in them exceeds the flow capacity of the river channel. Flooding can also result when culverts, trash screens and bridges are partially or fully blocked by debris and washload.

5.1.2 The site appears to lie in an area of low flooding probability.

5.2 Flooding from the Sea

5.2.1 The site is located some 2 miles from the sea.

5.2.2 It is considered that the risk of flooding from the sea is low.

5.3 Flooding from Land

5.3.1 Intense rainfall of short duration, which is unable to soak into the ground or enter drainage systems can run off land in sheet flows resulting in local flooding.

5.3.2 Significant overland flows are not anticipated given the local topography, the relative low position of Dapper Lane and Water Lane, superficial and bedrock geology.

5.3.3 It is considered that the risk of flooding from the land is low.

5.4 Flooding from Groundwater

5.4.1 On site geotechnical investigation has not been undertaken at this stage.

5.4.2 Such risks will require consideration at detailed design stage when planning geotechnical investigations and proposed surface water infiltration systems.

5.4.3 Subject to a geotechnical investigation and implementation of the drainage strategy given in 6.4, it is considered the risk from groundwater flooding would be low.

5.5 Flooding from Sewers

5.5.1 Flooding can result when a sewer is overwhelmed by heavy rainfall, groundwater, becomes blocked or is of inadequate capacity.

5.5.2 The foul water system serving the estate currently discharges to a private cesspit. It is proposed that the new foul water system is piped to a local adopted foul water sewer. Peak water flows from this development will be relatively low and are not anticipated to cause a nuisance to the downstream adopted sewer.

5.5.3 There are no known problems with local foul sewers.

5.6 Flooding from Reservoirs, Canals other Manmade Sources

5.6.1 Reservoir or canal flooding may occur as a result of the structure being overwhelmed, or as a result of dam and bank failure.

5.6.2 Patching pond which lies to the north of the A27 outfalls to a watercourse which runs close to and south of Water Lane. Water Lane is known to flood when the watercourse becomes overwhelmed from Patching Pond flows during times of prolonged wet weather.

5.6.3 Water Lane, in the vicinity of the site, has a significant risk of flooding, which is greater than 1.3% or 1 in 75 of flooding in any one year.

5.6.4 The depth of flooding within Water Lane close to the site is likely to be low, say 50mm, given the 1 in 50 longitudinal gradient of the carriageway at this location. The consequential risk of flooding the site, which lies some 1.0m above the carriageway is low.

6.0 SURFACE WATER RUN-OFF ASSESSMENT

6.1 General

6.1.1 The total site area is 1.27ha approximately.

6.1.2 It is proposed to cater for all new building and pavement surface water run-off through the use of local soakaways, which would be subject to a satisfactory geotechnical investigation.

6.2 Design Criteria and Allowances for Climate Change

6.2.1 Sewers for adoption 6th edition requires that surface water drainage systems for new developments should be designed to prevent pipe surcharging during a 1 in 2 year storm event. The system should also accommodate a 1 in 30 year event without surface flooding. During extreme wet weather events, it should be demonstrated that flood waters would be routed away from buildings, and not cause a nuisance elsewhere.

6.2.2 It is proposed that this development is designed to prevent flooding above ground level during a 1 in 100 year storm event with an additional allowance for climate change to the year 2115.

6.3 Applicability of SuDs

6.3.1 Current guidance and advice recommends that surface water run-off shall discharge to one of the following, listed in order of priority:

- a) an adequate soakaway or some other adequate infiltration system, or where that is not reasonably practicable;
- b) a watercourse, or, where that is not reasonably practicable;
- c) a sewer.

6.3.2 A SuDs scheme therefore will be required to control discharge to an acceptable level. SuDs can incorporate some or all of the following:

- source control measures including rainwater recycling, green roofs and permeable pavements;
- wetlands providing both stormwater attenuation and treatment;
- infiltration devices to allow water to soak into the ground, that can include individual soakaways and communal facilities;

- swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
- filtration, through vegetation, shallow landscaped depressions and a sand bed providing high pollutant removal; and
- detention basins to hold excess water after rainfall which allow controlled discharge to avoid flooding.

6.3.3 In accordance with CIRIA C697 *The SuDs Manual – Chapter 5 SuDs Selection*, the application of these options is outlined below.

- (i) Given local superficial and bedrock geology the use of infiltration SuDs such as subterranean drainage blankets and soakaways are likely to be acceptable throughout the site. See 3.3.2.
- (ii) Source control methods such as rainwater harvesting could be incorporated as part of the development, and permeable pavements could be utilized on driveways, car parks and ancillary hardstanding areas.

6.4 Outline Surface Water Drainage Strategy

6.4.1 It is proposed that the new works are served by infiltration systems such as discrete soakaways and drainage blankets *et al* which will retain rainfall on site. With reference to drawing 101B; appendix A it may be seen that the roadway and car park arrangement lends itself to a porous pavement system with plate soakaways beneath.

6.5 Foul Water Strategy

6.5.1 The new foul water system is proposed to connect by simple gravity pipeline to the adopted sewer at node 2501.

7.0 DISCUSSIONS AND CONCLUSIONS

- 7.1 This redevelopment will not adversely affect the site or surrounding properties in terms of flood risk.
- 7.2 A detailed geotechnical investigation will be required in order to determine local infiltration rates. Should some areas prove to have unacceptably low infiltration rates, soakaways may be moved within the site where infiltration rates are proven to be acceptable.
- 7.3 The new foul water system will be connected to a local adopted sewer.

Prepared by: Eur Ing Vincent Carpenter BSc (Hons) CEng MICE CWEM FCIWEM MIHT MIOd

Date: 30 August 2013

APPENDICES

- A. Development General Arrangement
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APPENDIX A

Development General Arrangement

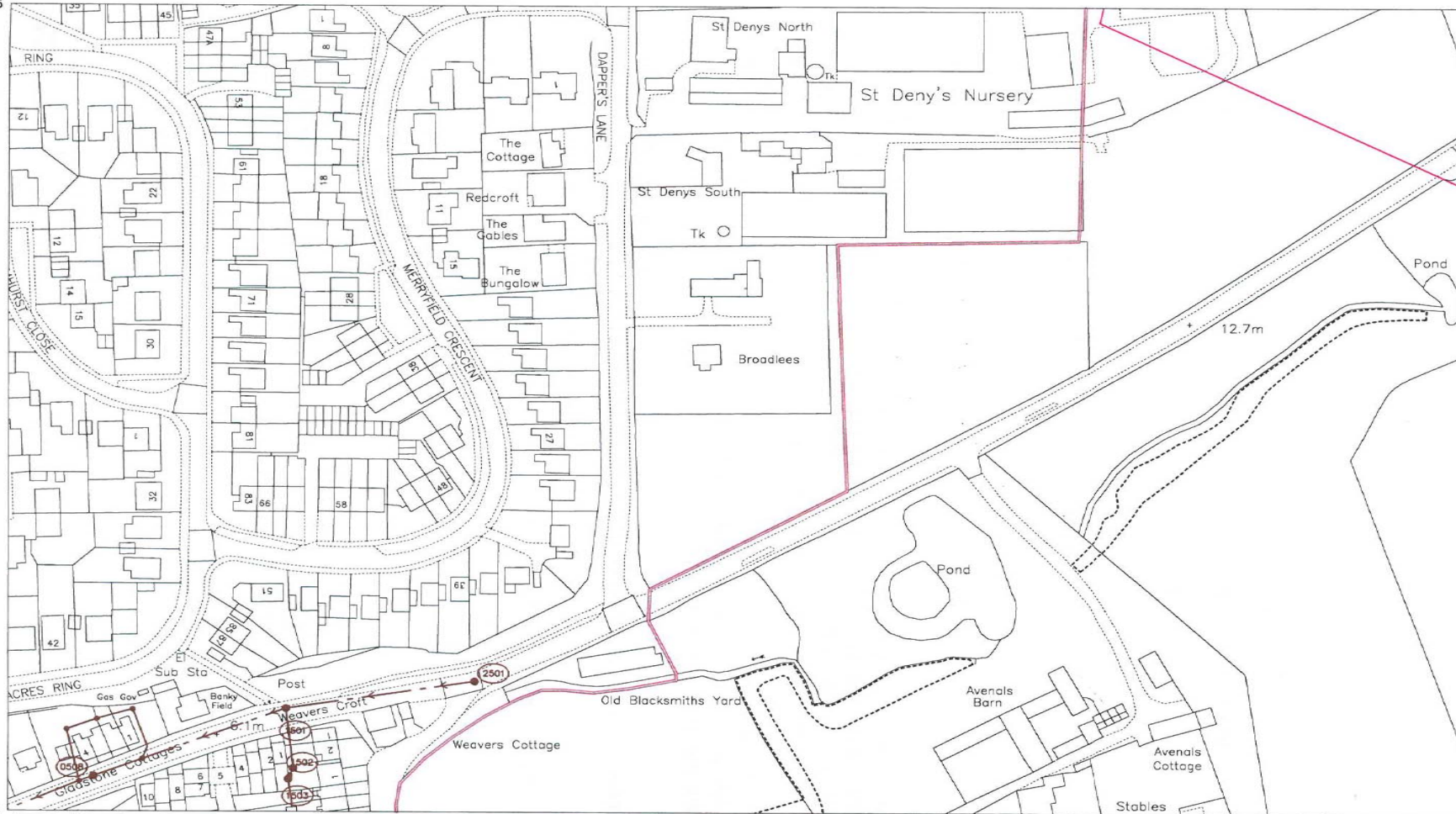
APPENDIX B

Foul Water Drainage Records

SEWER RECORDS PAGE 1 OF 2

104835

104547



O.S. REF.

TQ0704NW

Title: 158926_Water Lane

Drawn by: spaceyk

Scale: 1:1250

Date: 23/08/2013

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.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.



507538

APPENDIX C

Environment Agency Flood Mapping

Map legend

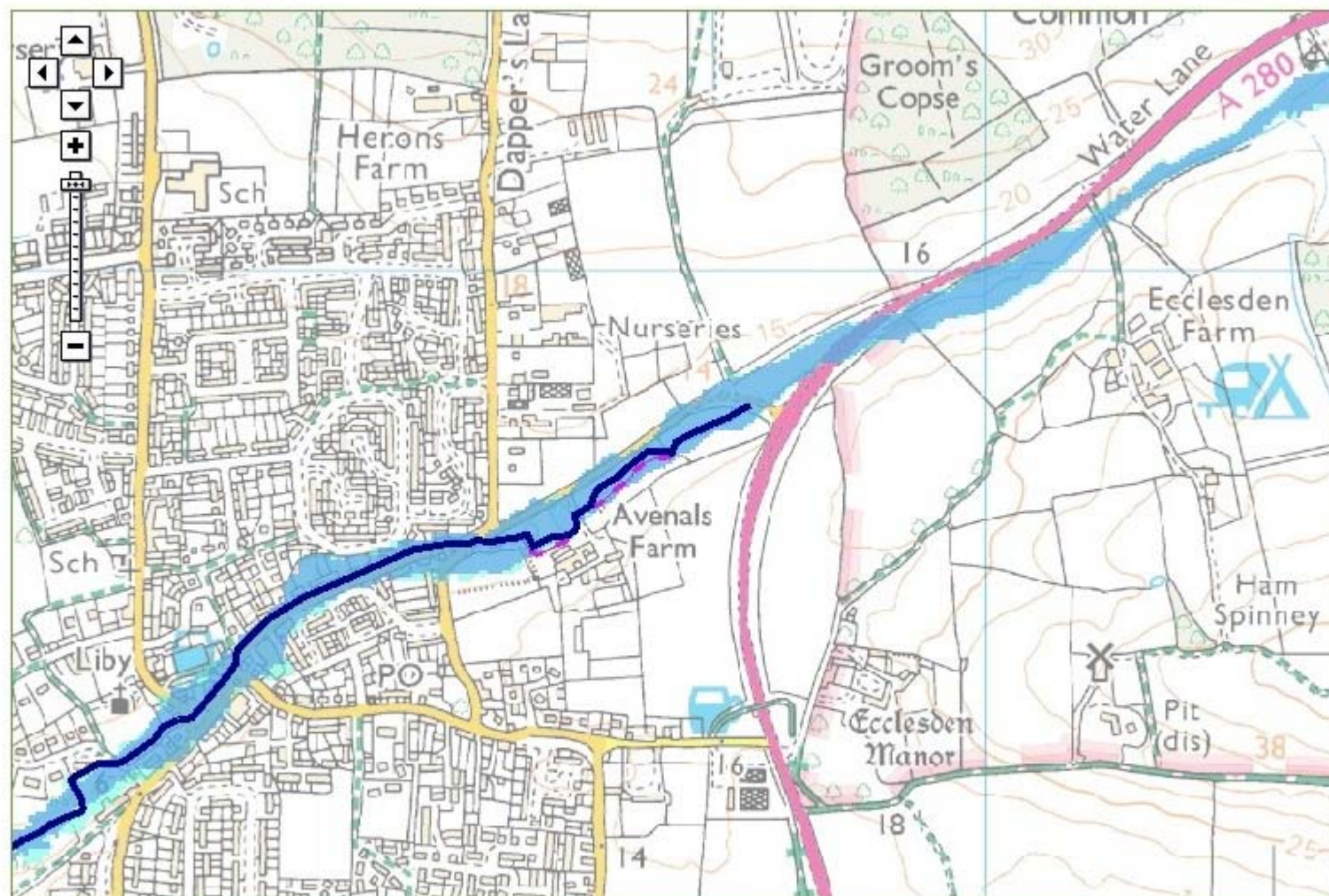
Click on the map to see what is the Risk of Flooding at a particular location.

☒ Flood Maps 

-  Flooding from rivers or sea without defences
-  Extent of extreme flood
-  Flood defences (Not all may be shown*)
-  Areas benefiting from flood defences (Not all may be shown*)
-  Main rivers

X: 507,542;Y: 104,722 at scale 1:10,000

Data search  Text only version 



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) will take over the responsibilities of the Environment Agency in Wales.
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APPENDIX D

Anecdotal Evidence

30 AUG 2013

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01903 786130 / 770661
broadlees@hotmail.com

Clare Bartlett MRTPI AIEMA
Strutt & Parker LLP
31 North Street
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West Sussex
PO19 1LY

28 August 2013

Dear Clare

My wife and I have been resident at Broadlees since 2000, and we can confirm that since then, there have been no instances of flooding or of drainage problems affecting the site.

Yours sincerely



Richard Hobden