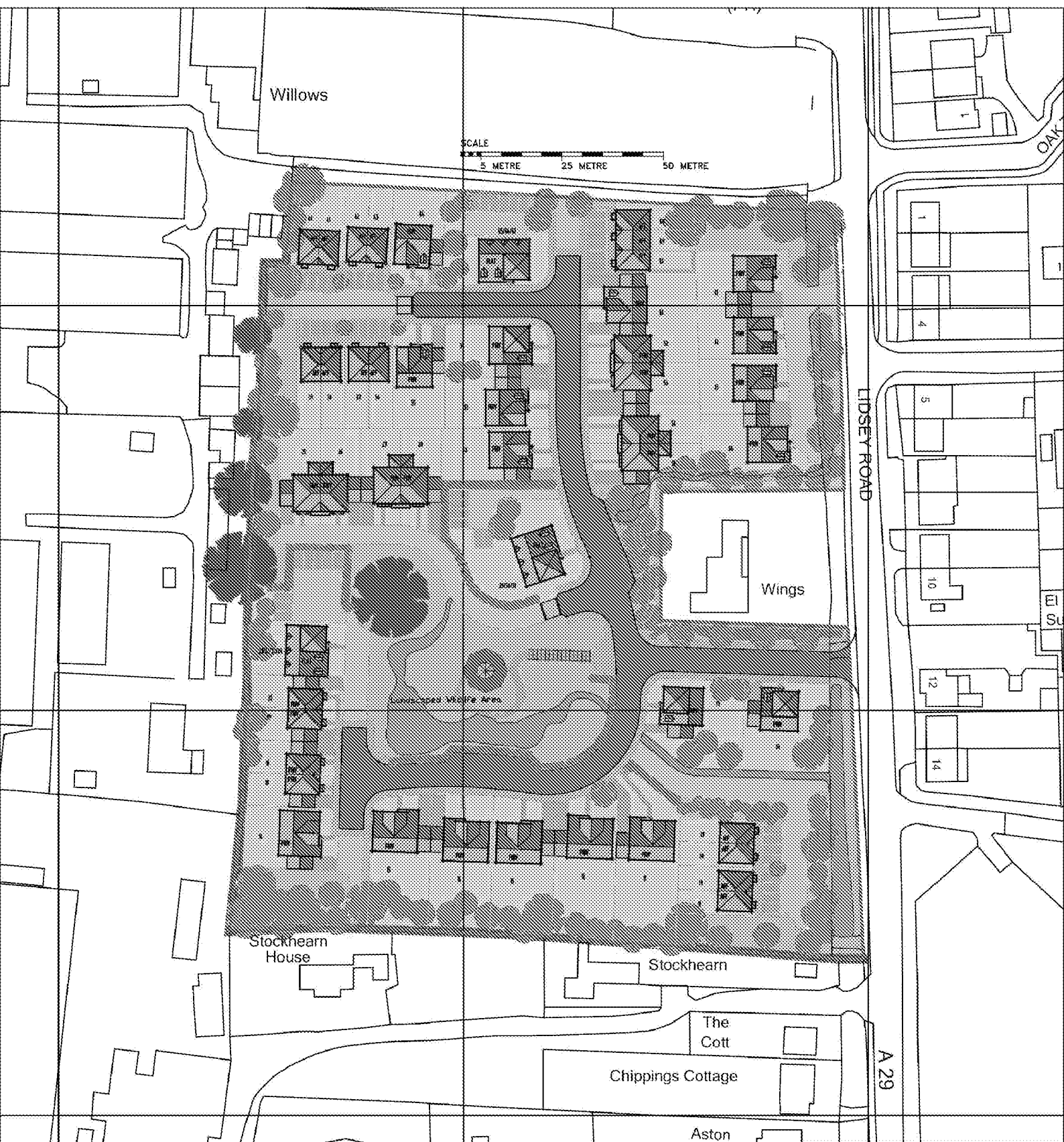


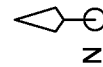
Appendix A Architects Layout GA



Appendix B Public Sewer Maps

[illegible]

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.

in the event of inaccuracy.

The actual positions should be determined on site.

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SU9304SE

493252

Title: 263390_Land at Wings Nursery,

Drawn by: kumaria

Scale: 1:2500

Date: 05/10/2017

Appendix C EA/LLFA Flood Risk

creating a better place

Dear Stuart,



Environment
Agency

Thank you for your request of 2nd October 2017 to use Environment Agency Product 4 data, for Land at Wings Nursery, Lidsey Road, Woodgate PO20 3SU.

The Environment Agency's records indicate that the above site is located in Flood Zone 1 (land assessed as having less than 0.1% (1 in 1,000) chance of flooding in any given year from rivers or the sea). Therefore the likelihood of flooding in this area is estimated as 'very low'.

The above site is approximately 350m away from Flood Zone 2.

We are therefore unable to provide data from our detailed fluvial or tidal models which is relevant to your site.

Please be aware that in February 2016 the Environment Agency updated its guidance on climate change allowances. The standard allowance of adding 20% to peak flows – as per previous guidance in the National Planning Policy Framework, may not be applicable for the purposes of informing development proposals. It is possible that our current modelling has under estimated flood risk when taking climate change into consideration. This does not however have an effect on Flood Zone 2 or 3. For further information please visit:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments

<https://www.gov.uk/planning-applications-assessing-flood-risk>

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

In regards to the flood history, we hold no records but recommend you contact the lead local flooding authority - West Sussex County Council, and the Local Council - Arun District Council for a more comprehensive flood history check.

This information is supplied subject to the notice which can be viewed via the following link:
<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Please get in touch if you have any further queries or contact us within two months if you would like us to review the information we have sent.

Kind regards,

Nick Allen

Customer & Engagement Officer



ENVIRONMENT IN PROGRESS

From: Kevin Mackna [REDACTED]
To: Stuart Burnet [REDACTED]
Cc: Paul Can [REDACTED]
Subject: RE: D1382 Land at Wings Nursery, Lidsey Road, Woodgate PO20 3SU

Stuart,

Further to your recent enquiry. Please find our reply below:

Flood Zones

- Please confirm the Flood Zones for this area.
Please contact to EA for conformation of the flood zone for this area and any associated flood risk from rivers or the sea.
- Please confirm surface water, reservoir flooding, sewer flooding. Please provide plans and depth data from your GIS UFMSW for 30yr, 100yr & 1000yr as applicable (OS Datum).
See attached plan showing surface water flood risk for the site. Current mapping shows the site is not at risk from surface water flooding.
- Please confirm mapping and records for any surface water assets owned or maintained.
See attached plan showing current WSCC Highway gullies. The existing highway drain discharges to the south of the proposed development site.
- Please confirm if there are any future drainage improvements proposed for this area.
None currently planned.
- Please confirm details of existing or planned flood alleviation and defences in this area.
None known of or planned for the area.
- Please confirm if you are aware of any historic flooding within the confines of the site.
We do not have any records of historic flooding within the confines of the proposed site. This should not be taken that this site has never suffered from flooding, only that it has never been reported to the LLFA.
- Please confirm if you are aware of any historic flooding in close vicinity and/or on the public highway.
We are aware that during periods of heavy rain and high ground water the carriageway adjacent to the site has flooded in the past.

Groundwater

- Please confirm details of any groundwater flooding issues in the area, including flood levels, flood extents and any available anecdotal information.
See attached plan showing current JBA ground water mapping for the area. This shows that ground water could rise to within 0.025m below ground. Thus making infiltration during periods of high ground water unlikely.

Assets

- Please confirm mapping and records for any surface water assets owned or maintained.
See attached plan.
- Please confirm if there are any historic culverted watercourses within or in close vicinity to the site.
Please provide map records where available.
Current OS mapping does show the existing site has existing ditches along both western and eastern boundaries. Historic OS mapping does show that the site used to be two fields therefore it is likely that this historic field division may once have been a ditch.
- Please can you provide any map records denoting the highway drainage network. Is this a piped system or soakaways?

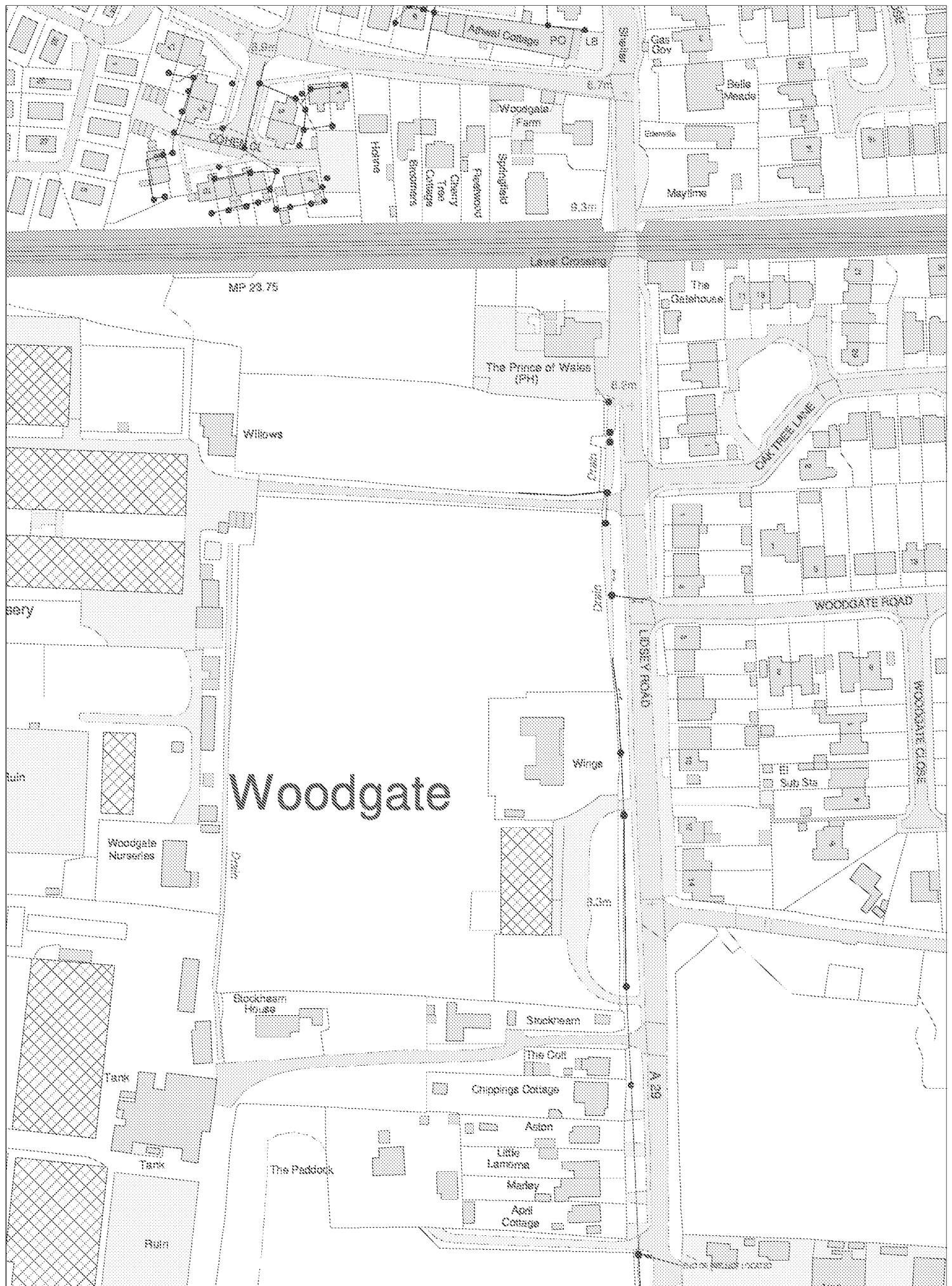
See attached plan. The existing highway drainage system is piped and outfalls to the south of the proposed site.

Policy/Future

- Please confirm the most recent Strategic Flood Risk Assessment (SFRA).
WSCC Strategic Flood Risk Assessment – January 2010
WSCC Local Flood Risk Management Strategy – May 2014
- Please confirm if there are any future drainage improvements proposed for this area.
None currently planned.
- Please confirm if any drainage studies and/or SWMP have/are being assess for this area.
The Lidsey Surface Water Management Plan – October 2014 does cover the area of Woodgate.

Kevin Macknay
Flood Risk Management – Team Leader
Economy, Infrastructure and Environment
Highways and Transport
West Sussex County Council

Arun District Council Maps



Mapping produced by Arun District Council

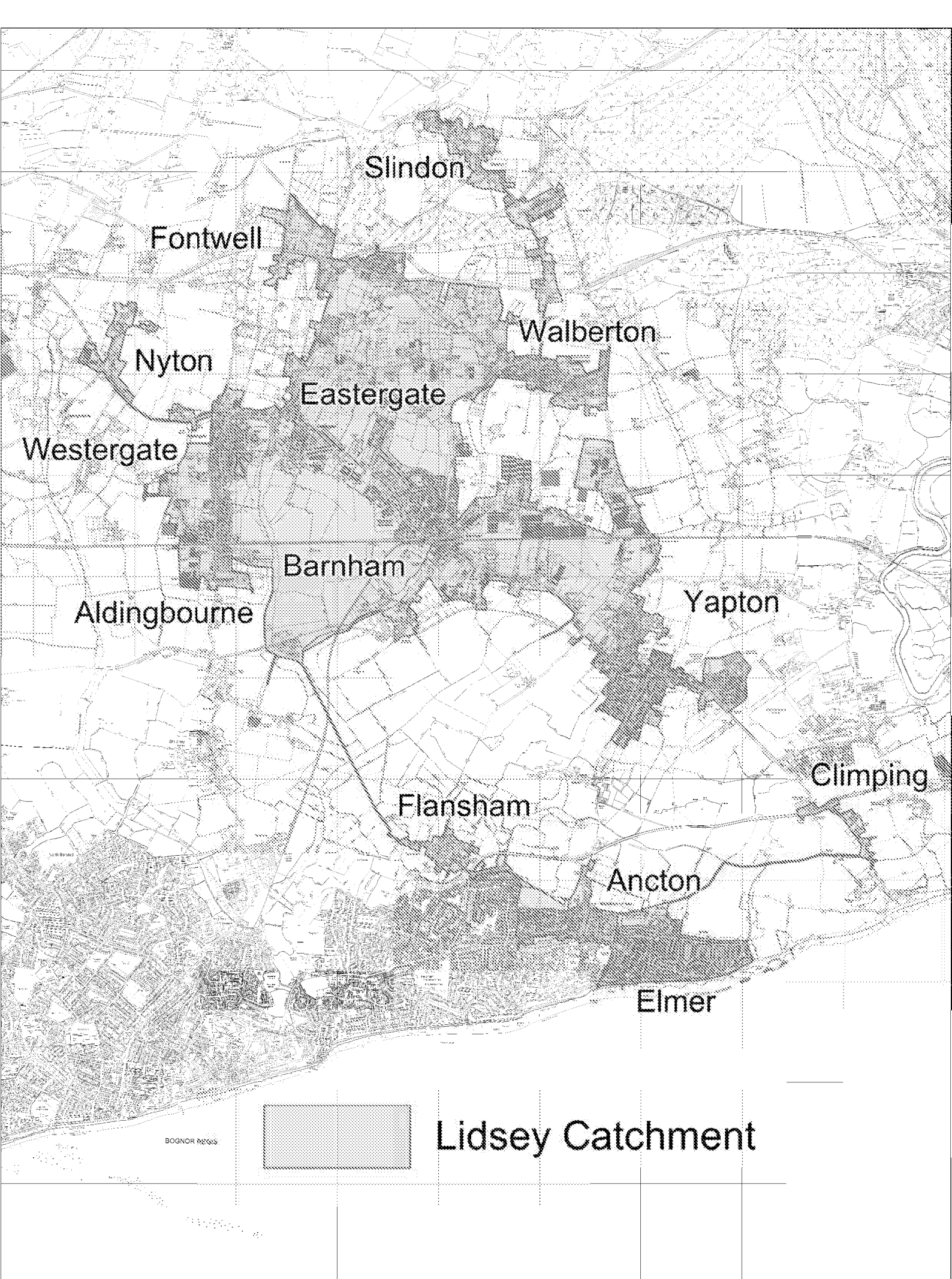
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ARUN District Council 2017

www.arun.gov.uk



Appendix D Lidsey SWMP Extracts



Lidsey Surface Water Management Plan

West Sussex County Council

ATKINS

A Partnership between:

- West Sussex County Council
- Southern Water
- Arun District Council
- Environment Agency

Plan Design Enable

ARUN DISTRICT COUNCIL AL/32/19/OUT

Figure 7.37 - Flood Risk LFRZ_018 (1 in 100 year storm event)

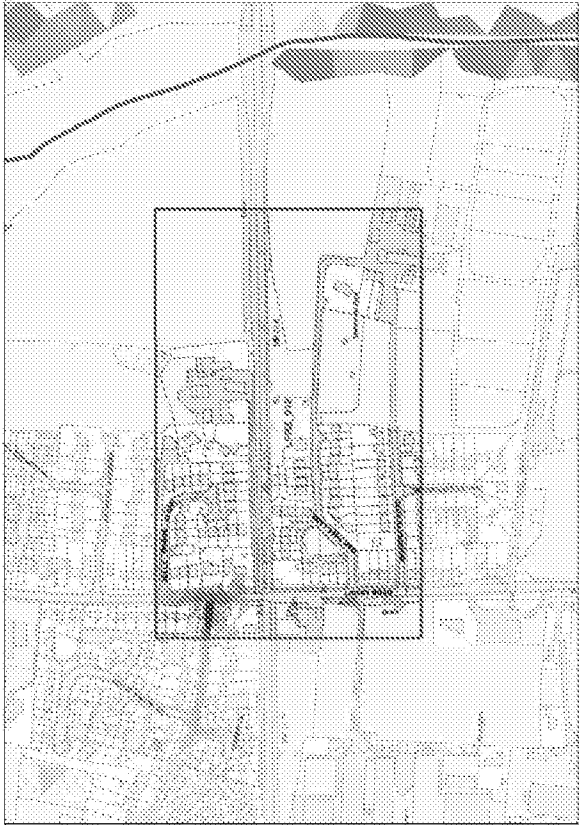


Figure 7.38 - Flood Hazard LFRZ_018 (1 in 100 year storm event)

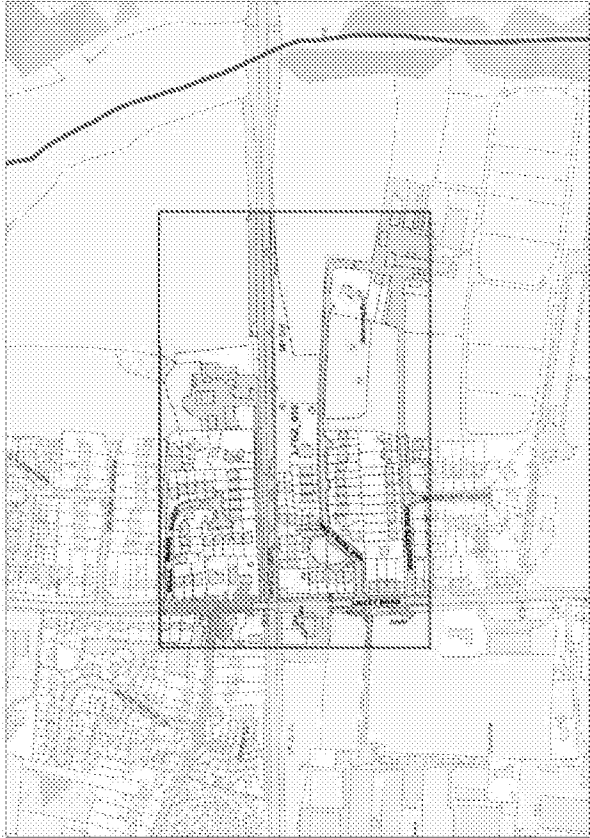


Table 7-36 - Predicted Residential and Commercial Property Flood Impact LFRZ_018

Rainfall Return Period	Predicted number of properties at risk of flooding	
	Residential	Commercial
1 in 30 Year	8	0
1 in 100 Year	10	0
1 in 100 Year + (Climate Change (2080 s))	16	1

Table 7-37 - Summary of local flood risk within the LFRZ_018

Flood Risk Source			
Pluvial Flood Risk	Fluvial Flood Risk	Ground Water Flood Risk	Public Sewer Flood Risk
Medium	Low	Low	High
Flood Mechanism			
Property flooding caused by pluvial runoff from highway. Flooding from foul manholes in highway due to hydraulic overload			
Flood Risk Receptors			
Residential, commercial properties and highway.			
Flood Hazard			
A 'low' flood hazard is predicted for 1% annual chance storm event (1 in 100 year return period) of Burndell Road			
Validation			
Pluvial flooding experienced during the summer 2012 storm along Lidsey Road - otherwise flooding has not occurred here in recent history. Hydraulic overload of sewers reported in Oak Tree Lane on 02/01/2013 and on Westergate Street on 29/01/2013 and 09/11/2010.			

LFRZ_018 – Oak Tree Lane, Woodgate

Preferred Interventions: Asset Management. Reduce surface water and infiltration entering public foul sewers. Improve surface water conveyance.

Table 10-19 - LFRZ_018 Options

Option Ref.	Option Category (Source / Pathway / Receptor / Other)	Option	Potential	Considered	Economic	Environmental	Objectiveness	Social	Technical	Total Score	Summary of scheme / General discussion
2	Do minimum	Do minimum - continue current maintenance	Yes	Yes	2	2	0	2	1	7	
7	Source	Rainwater Harvesting	Yes	Yes	2	2	1	2	2	9	Installation of water butts in upstream catchment.
12	Source	Sealing of manhole covers and protecting gullies	Yes	Yes	1	2	2	2	1	8	Reduce surface water inflow.
13	Source	Sealing Sewers (Reduce ground water / rainfall induced infiltration)	Yes	Yes	1	2	2	2	0	7	Reduce ground water inflows.
15	Pathway	Increasing Capacity in Drainage System (Storage, Upsize)	Yes	Yes	0	0	2	0	2	4	Investigate conveying surface water away from properties. This should be completed after survey of existing drainage assets. See figure 9.9.
17	Pathway	Improved maintenance regimes	Yes	Yes	-2	0	2	0	2	2	Optimisation of existing assets. WSCC and ADC are planning to clear the ditch on the west side of Lidsey Road
18	Pathway	Increase Gully Assets	Yes	Yes	0	0	2	1	2	5	This should be investigated to remove highway flooding.
22	Pathway	Separation of foul and surface water	Yes	Yes	0	2	2	0	0	4	Control at source see activities 12 & 13
24	Receptor	Improve resilience to flooding	Yes	Yes	2	2	2	2	1	9	To be considered in a hydraulic investigation.
26	Receptor	Raising doorway / access threshold	Yes	Yes	2	2	2	2	1	9	To be considered in a hydraulic investigation.
28	Receptor	Temporary demountable flood defences	Yes	Yes	1	0	2	0	2	5	Potentially applicable.
29	Strategy	Further Study / Investigations	Yes	Yes	1	1	1	1	1	5	Detailed hydraulic investigation is required. As detailed in Option 15.

LFRZ_018 – Oak Tree Lane, Woodgate (Cont.)

Increased Surface Water Conveyance

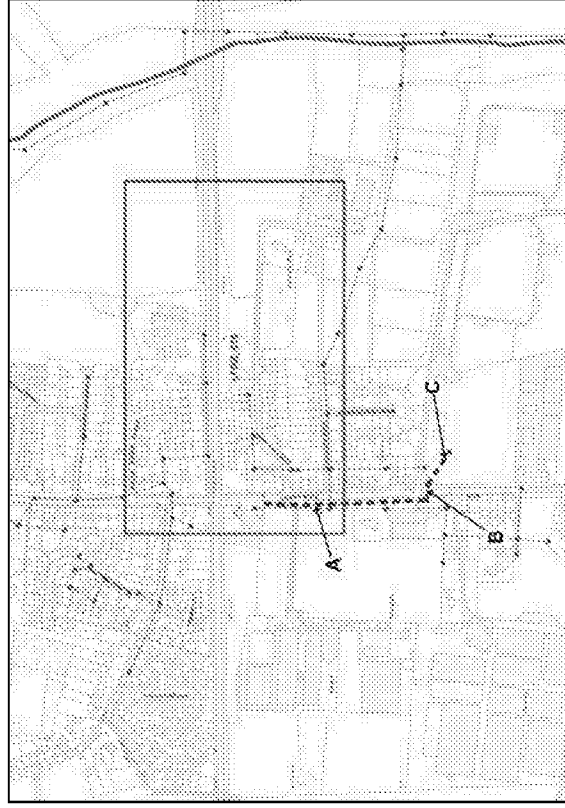
A: Improve / maintain existing ditch. The conveyance system upgrade may also need to extend further north to the level crossing as the hydraulic model indicates that surface water runoff is predicted to occur north of the railway line. Conveying surface water from Lidsey Road (north of railway crossing) to the south would require construction of a culvert. If practical this would be costly element of works.

B: New Culvert

C: Install new ditch to convey water to open green space

Note: This option has not been hydraulically modelled.

Figure 10.9 - Oak Tree Lane, Woodgate



WSCC and ADC are planning to clear the ditch on the west side of Lidsey Road and are investigating liaising with land owners to ensure capacity is available downstream of the highway ditch.

Appendix E Historical Borehole Records

GEORGE STOW CO. LTD.

317

453

Waterworks Engineers

READING ROAD - HENLEY-on-THAMES. OXON.

RECORD OF WELL (SHAFT OR BOREHOLE)

SU 90/93

Borehole No. 9

DATE COMPLETED 1.8.78

All depths to be measured below Ground Level

Work carried out for Southern Water Authority, Sussex River & Water Division (Brighton)
Locality (Exact Site) Woodgate, Nr. Chichester, Sussex - N.G.R. SU 90 SW (9383 0400)

Level of Ground Surface above Sea Level (O.D.) 30 m.

Depth of Shaft 156 (512 ft) m. Diameter 300 (12 ins) mm.
Depth of Bore 156 (512 ft) m. Diameter: At Top 300 mm. At Bottom 200 (8 ins) mm.

Details of Permanent Lining Tubes

Diameter	Length Inserted				Top At	above Ground Level
	200 mm.	136.65 m.	Plain	NIL	0.15 m	above Ground Level

Water Struck at depth of (in m.) X

Rest Level of Water below Ground Level 5.5 m.

Yield on X Hours test. Pumping litres per sec. Date

Pump Water level X m. below Ground Level.

Time of Recovery

Remarks X Borehole drilled by mud flush Rotary therefore depth at which water struck not apparent. The borehole was developed by swabbing and jetting.
No test pumping was carried out.

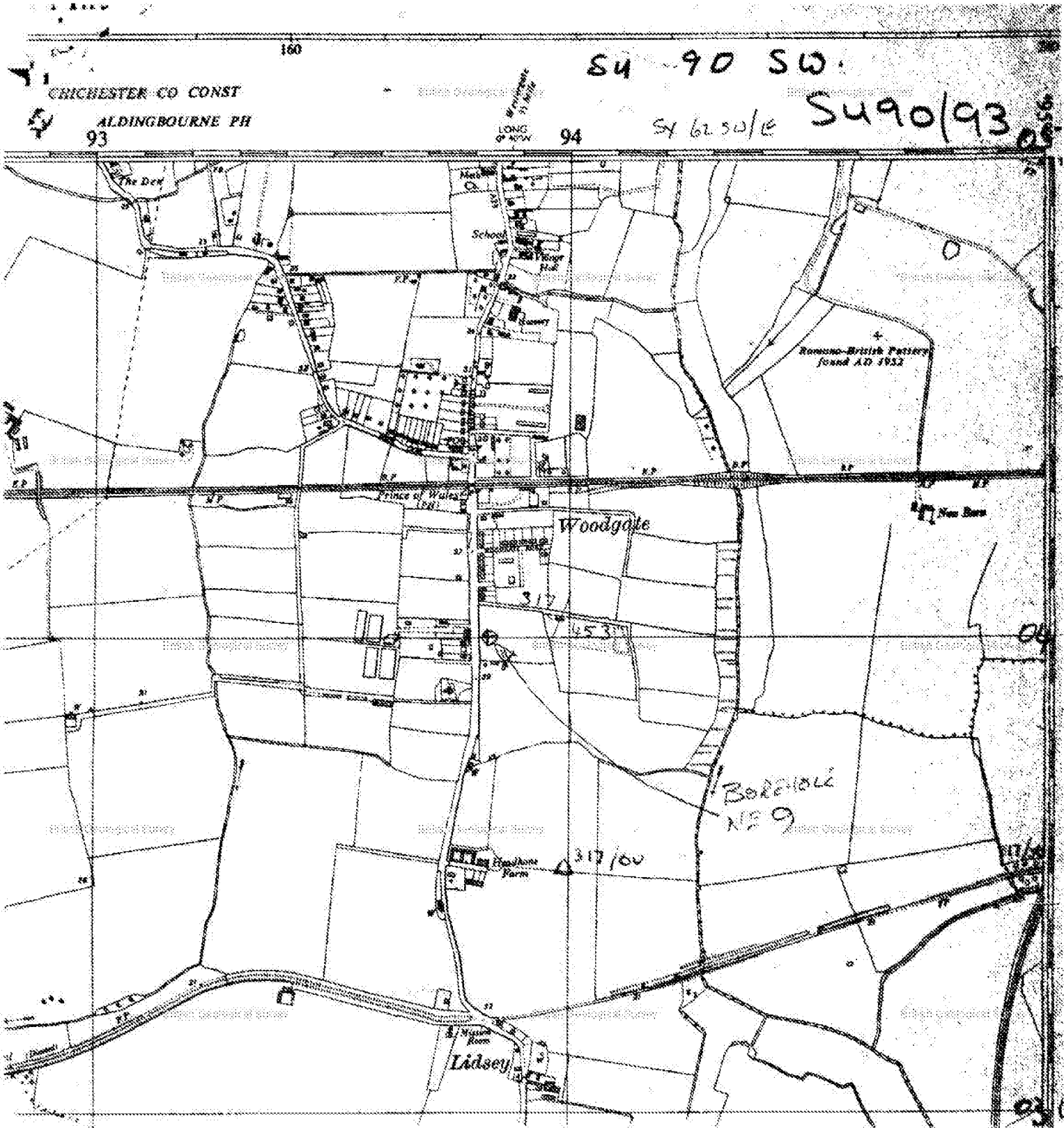
Area by D on 1" Map Sussex 62 SW/E
on N.G. Sheet

See back for Strata Record.

DETAILS OF STRATA

317/453

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA (and any additional remarks)	THICKNESS	DEPTH
		METRES	METRES
	Topsoil	0.50	0.50
DRIET	Sandy brown clay	0.50	1.00
	C lay with stones	1.00	2.00
	Bed of gravel	1.00	3.00
	Sandy blue clay	9.00	12.00
LONDON CLAY	Blue clay with bands of hard stone	67.00	79.00
	Bed of blue coloured clay	5.00	84.00
	Very hard black stone with pyrites	0.50	84.50
	Blue clay with bands of stone	17.50	102.00
REDDING BEDS	Sandy/green/brown clay	3.00	105.00
	Red mottled clay	9.00	114.00
	Dark blue mottled clay	2.00	116.00
	Red mottled clay	2.00	118.00
UPPER CHALK	Red clay with bands of blue/green shale	2.00	120.00
	Red/blue mottled clay	14.00	134.00
	Red clay mottled green and yellow	2.00	136.00
	Chalk and flints	20.00	156.00
REST 9/78			(512 ft)



S4 90 SW

S4 62.50/E S490/93

CHICHESTER CO CONST

ALDINGBOURNE PH

93

94

LONG
OF
N.W.

Appendix F Microdrainage/Run-off Calculations

RGP Design Limited		Page 1
Metro House Northgate Chichester PO19 1BE		
Date 16/10/2017 17:18 File	Designed by sburnett Checked by	
XP Solutions		Source Control 2016.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.400 Area (ha) 2.550 Urban 0.000 SAAR (mm) 770 Region Number Region 7 Results 1/s QBAR Rural 9.7 QBAR Urban 9.7 Q100 years 30.9 Q1 year 8.2 Q30 years 22.0 Q100 years 30.9		
©1982-2016 XP Solutions		

RGP Design Limited		Page 1																										
Metro House Northgate Chichester PO19 1BE																												
Date 16/10/2017 17:19 File	Designed by sburnett Checked by																											
XP Solutions		Source Control 2016.1																										
<u>Greenfield Runoff Volume</u> FSR Data <table> <tr> <td>Return Period (years)</td> <td>100</td> </tr> <tr> <td>Storm Duration (mins)</td> <td>360</td> </tr> <tr> <td>Region England and Wales</td> <td></td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.500</td> </tr> <tr> <td>Ratio R</td> <td>0.333</td> </tr> <tr> <td>Areal Reduction Factor</td> <td>1.00</td> </tr> <tr> <td>Area (ha)</td> <td>2.550</td> </tr> <tr> <td>SAAR (mm)</td> <td>767</td> </tr> <tr> <td>CWI</td> <td>113.645</td> </tr> <tr> <td>Urban</td> <td>0.000</td> </tr> <tr> <td>SPR</td> <td>37.000</td> </tr> </table> Results <table> <tr> <td>Percentage Runoff (%)</td> <td>38.53</td> </tr> <tr> <td>Greenfield Runoff Volume (m³)</td> <td>645.559</td> </tr> </table>			Return Period (years)	100	Storm Duration (mins)	360	Region England and Wales		M5-60 (mm)	19.500	Ratio R	0.333	Areal Reduction Factor	1.00	Area (ha)	2.550	SAAR (mm)	767	CWI	113.645	Urban	0.000	SPR	37.000	Percentage Runoff (%)	38.53	Greenfield Runoff Volume (m³)	645.559
Return Period (years)	100																											
Storm Duration (mins)	360																											
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SPR	37.000																											
Percentage Runoff (%)	38.53																											
Greenfield Runoff Volume (m³)	645.559																											
©1982-2016 XP Solutions																												

D1398 Land at Wings Nursery – Indicative Storage Requirement

Quick Storage Estimate

Variables

FSP Rainfall Cv (Summer)

Return Period (years) Cv (Winter)

Region Impervious Area (ha)

Map M5-60 (mm) Maximum Allowable Discharge (l/s)

Ratio R Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Results

Global Variables require approximate storage of between 822 m³ and 1168 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0