

**LAND TO REAR OF NO.17 LOVEDEAN
LANE, HORNDEAN, WATERLOOVILLE,
PO8 8HH**

Proposed Residential Development

Drainage Strategy Report

Prepared on behalf of Richard Gander

D1154/DS/1.2

May 2016

DOCUMENT CONTROL

Project: Land to Rear of No.17 Lovedean Lane, Horndean, Waterloooville, PO8 8HH
Proposed Residential Development

Document: Drainage Strategy Report

Client: Richard Gander

Reference: D1154/DS/1.2

Document Checking:

Author:



Date: 23/05/2016

Checked by:



Date: 24/05/2016

Approved by:



Date: 24/05/2016

Status:

Issue	Date	Status	Issued by
1.	24/05/2016	Final	MJA
2.	25/05/2016	Final	MJA
3.			
4.			
5.			
6.			
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PLANS

Proposed Development - 347/02 Architects Layout GA

DRAWINGS

2016/D1154/SK100 – Site Location Plan
 2016/D1154/SK200 – Impermeable Area Comparison
 2016/D1154/SK300 – Proposed Drainage Strategy

APPENDICES

Appendix A Public Sewer Map
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MICRODRAINAGE CALCULATIONS

Greenfield Run-off rate (Qbar)
 Greenfield Run-off volume

1 INTRODUCTION

1.1 Background

1.1.1 RGP Design Ltd is instructed by Richard Gander to prepare a Drainage Strategy to support a planning application for the development of a site at No.17 Lovedean Lane, Horndean, Waterlooville, PO8 8HH.

1.1.2 This strategy considers Hampshire County Councils Planning Guidance document relating to 'Flooding and Flood Water' and 'Surface Water and Sustainable Guidance for Developers, Designers and Planners', published on Hampshire County Councils website.

1.1.3 The proposed development comprises the construction of 1 No. dwelling and the formation of parking areas.

1.1.4 In preparing this strategy, RGP Design Ltd has made reference to the following documents and information:

- Environment Agency's Flood Risk Maps for Planning
- Local Authorities Strategic Flood Risk Assessment (SFRA)
- Public Sewer Records
- Hampshire County Council's PUSH website.

1.1.5 Reference has also been made to a Topographic Survey undertaken by Solent Surveys, commissioned by the Client.

1.1.6 This strategy has been prepared to demonstrate that the proposed development will not increase flood risk and maximises the use of sustainable drainage techniques.

1.1.7 This report has been prepared for the benefit of the parties listed in the Terms of Appointment.

1.2 Development Location and Description

1.2.1 The proposed development is on land located to the rear of No.17 Lovedean Lane, Horndean, Waterlooville, PO8 8HH.

- 1.2.2 The site is located 7.5km inland and lies centrally within the urbanisation of Waterloooville.
- 1.2.3 The closest Main River lies approximately 1.7km to the west.
- 1.2.4 The site lies within an urban area historically with residential use. There is currently no formal access to the site. As the development boundary sits directly adjacent Gladys Avenue back of footway, a new dropped kerb access will be required to facilitate vehicular access.
- 1.2.5 The site is approximately 0.025Ha (250m²) in size and it lies between 66.90m and 66.50m AOD, sloping down in an easterly direction. The site elevation ties-in with the adjacent existing roadways and falls away towards No.15 Lovedean Lane.
- 1.2.6 The pre-development impermeable area is 16m² (predominately grassed garden). This is shown on drawing **2016/D1154/SK200**, included in this report.
- 1.2.7 The proposed development comprises construction of 1 No. dwelling summarised as follows:

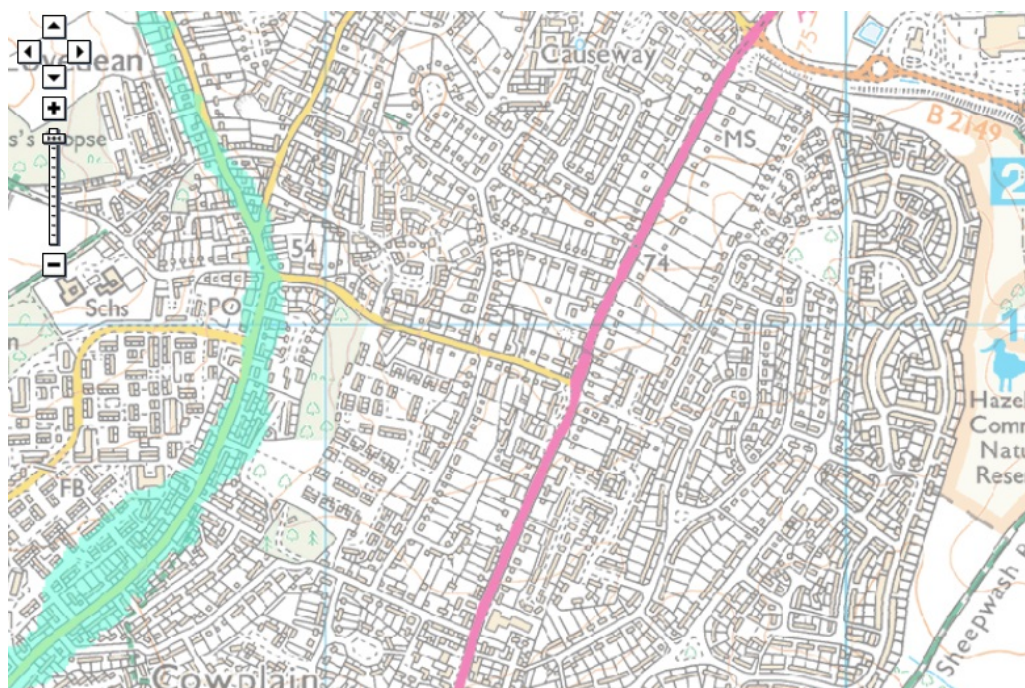
Phase 1		
Plot	Beds	Type
1	2	New Bungalow

1.3 Strategic Flood Risk Assessment

- 1.3.1 The NPPF requires that all sources of flooding are considered being Tidal, Fluvial, Pluvial, Groundwater, Sewers and Man-made reservoirs/canals.
- 1.3.2 A review of the SRFA sources shows that the site is at the lowest risk from flooding for all sources.
- 1.3.3 The maps also show that the site falls within the High permeability classification for flooding from Groundwater.

1.4 Environment Agency Flood Data

- 1.4.1 The Environment Agency Flood Risk Maps for Planning show that the site is located in Zone 1 and is consistent with the SFRA (lowest risk of flooding).



- 1.4.2 The Environment Agency flood maps for surface water flooding show that the site is at very low risk from this source.



- 1.4.3 The Environment Agency flood data and PUSH data shows that the site is at the lowest risk of tidal flooding.

2 EXISTING DRAINAGE

2.1 Surface Water

- 2.1.1 The public sewer records show there is a 150mm diameter public surface water sewer in close proximity to the site. This is located within Gladys Avenue flowing due south.
- 2.1.2 It is understood that the site drains naturally, partially by infiltration and also overland on to lower-lying areas.
- 2.1.3 The existing run-off rate (QBar) has been calculated using Microdrainage (ICOP SUDS) to be 0.1 l/s. The Greenfield run-off volume is calculated to be 8.198m³.

2.2 Foul Water

- 2.2.1 The public sewer records show there is a 150mm diameter public foul water sewer in close proximity to the site. This is located within Gladys Avenue flowing due south.
- 2.2.2 There is no formal foul water drainage on the site.
- 2.2.3 It is understood that the wastewater from the existing buildings (No.17 adjacent) is collected and discharged to the sewer located within Lovedean Lane.

2.3 Highway Drainage

- 2.3.1 Lovedean Lane (Public Highway), near the site is drained by traditional road gullies, which discharge into the existing 300mm diameter public surface water sewer.
- 2.3.2 Gladys Avenue (Public Highway), adjacent the site west boundary is drained by traditional road gullies which discharge into the existing 150mm diameter public surface water sewer.
- 2.3.3 There are no existing drives and vehicular areas within the site.

2.4 Ground Conditions

- 2.4.1 Analysis of the BGS website data within the local area confirms underlying strata to be as follows:

Bedrock Geology:

Lambeth Group - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 56 to 66 million years ago in the Palaeogene Period. Local environment previously dominated by swamps, estuaries and deltas.

Superficial Deposits:

None.

- 2.4.2 A site investigation has not been undertaken.
- 2.4.3 The PUSH website data advises the underlying strata to be of a high permeability. It is therefore probable that infiltration methods of drainage will operate successfully, subject to review of the seasonal groundwater table. It is recommended that further infiltration testing and/or groundwater level monitoring is undertaken at detailed design stage.

3 PROPOSED DEVELOPMENT

3.1 Surface Water Run Off

- 3.1.1 The SUDS manual and Building Regulations sets out a hierarchy of drainage methods to ensure that developments maximise the use of sustainable drainage techniques. In short, this hierarchy favours infiltration methods of disposal over other methods such as watercourses or sewers.
- 3.1.2 As discussed in section 2.4, the soil underlying the site is likely to have some infiltration potential, therefore any surface water drainage should be disposed of using infiltration techniques.
- 3.1.1 It is proposed to discharge the run-off from the proposed roof into the porous paving system/soakaway where it will infiltrate in to the ground.
- 3.1.2 The strategy above will ensure that there is no increase in the amount of run-off leaving the site, therefore no increase in the risk of flooding from this source.
- 3.1.3 The proposed development results in an increase in the impermeable area on the site of approximately 111m² (48%).
- 3.1.4 It is proposed to construct the new hardstandings using permeable/porous paving. The roof areas will be drained into the sub base of the permeable/porous paving construction which will convey it through the site to the outfall into an ultimate soakaway feature.
- 3.1.5 The strategy above will ensure that there is no increase in the risk of flooding from this source.
- 3.1.6 Surface water storage will be provided by using the voids available in the sub base of the permeable/porous paving construction. Preliminary calculations show that for a 1 in 100 year +30% critical storm, restricted to 5l/s, a storage volume of the order of 1.7m³ is required. The available volume of storage is likely to be in the region of 3m³ and is therefore achievable within the confines of the site.
- 3.1.7 The proposed surface water drainage system is shown on drawing **2016/D1154/SK300**, included in this report.

3.2 Foul Water

- 3.2.1 It is proposed to connect the proposed dwellings to the public foul water sewer.
- 3.2.2 Whilst there will be an increase in the wastewater flow leaving the site, the rate and volume will be negligible.
- 3.2.3 The proposed foul drainage layout is shown on drawing **2016/D1154/SK300**.

3.3 Maintenance

- 3.3.1 Maintenance plays an important part in the long term performance of a surface water drainage system and will be required to ensure that it remains fully operational.
- 3.3.2 The traditional parts (inspection chambers, pipes, gullies, etc) of the proposed surface water drainage system will need a minimal amount of maintenance similar to other traditional systems.
- 3.3.3 The SUDS devices will require slightly more maintenance focusing on reducing the amount of silt that is allowed to enter the system. For the cellular storage tanks, this will involve ensuring that upstream catchpits and gully sumps are regularly emptied of silt.
- 3.3.4 It is important to ensure that the porous paved areas are properly maintained in accordance with the manufacturers recommendations which may include:
- Periodic surface sweeping to reduce silt and debris accumulation.
 - Periodic silt removal from porous paved construction.
 - Redressing the joints on the block paved surface as required.

4 SUMMARY

- 4.1.1 This strategy considers Hampshire County Councils Planning Guidance document relating to 'Flooding and Flood Water' and 'Surface Water and Sustainable Guidance for Developers, Designers and Planners', published on Hampshire County Councils website.
- 4.1.2 Reference has been made to the Local Authorities Strategic Flood Risk Assessment (SFRA), Public Sewer Records and Hampshire County Council's PUSH website and a topographical survey.
- 4.1.3 The site is currently not in use; historically the land comprised a rear-grassed garden to residential property No.17.
- 4.1.4 The application site is approximately 0.025Ha in size and it lies between 66.90m and 66.50m AOD. The pre-development impermeable area is 0.02Ha.
- 4.1.5 The site is located in Environment Agency Zone 1.
- 4.1.6 Although a formal flood risk assessment is not required to support a planning application due to the overall size of the site, a brief assessment has been undertaken which concludes that flood risk is low.
- 4.1.7 There is no formal drainage within the confines of the site and run-off believed to discharge to the ground via infiltration.
- 4.1.8 The proposed development will result in an increase in impermeable area, which is mitigated by utilising SUDS techniques where possible.
- 4.1.9 The proposed drainage system will be designed to cater for a 1 in 100 year critical storm event including a 30% increase in peak rainfall intensity, to cater for the effects of climate change.
- 4.1.10 The nature of the development will ensure that overflow land flows during an exceedance event will remain unchanged.
- 4.1.11 The foul drainage from the site will be discharged to the public foul sewer currently serving Gladys Avenue.
- 4.1.12 A maintenance regime should be established to ensure the long-term effectiveness of the surface water drainage system.

- 4.1.13 This surface water drainage strategy shows that the development can be implemented without increasing flows on to adjacent land or to existing surface water drainage systems, ensuring that flood risk is not increased.

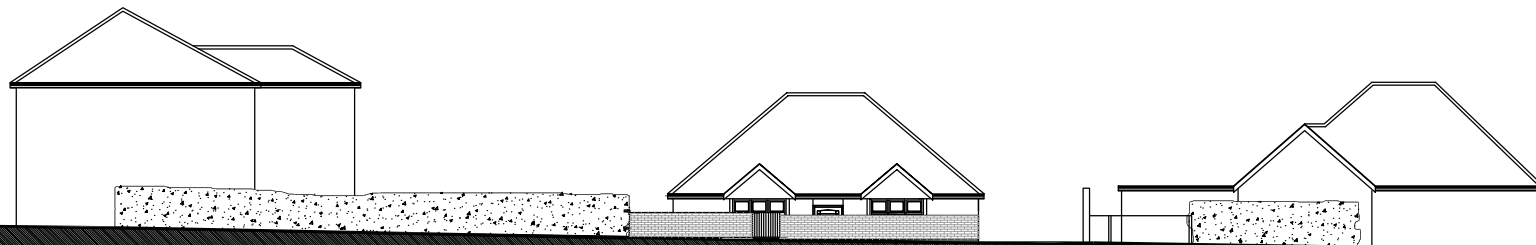
PLANS and DRAWINGS

Proposed Development - 347/02 Architects Layout GA

2016/D1154/SK100 – Site Location Plan

2016/D1154/SK200 – Impermeable Area Comparison

2016/D1154/SK300 – Proposed Drainage Strategy



17 Lovedean lane
STREET SCENE

60 Gladys Avenue

LOVEDEAN LANE

19 to 23

u/s eaves
74 70

17

ridge
75.64

c: 71.94
h: 73.00

ridge
74.38'

15

ridge
73.83+

13

ridge
73.84
c:69.47
h:71.51

h:68.92
u/s eaves
71.86

69

u/s eaves
71.16

c: 72.40
h: 73.76

c: 72.40
h: 73.76

b/h lines

Gladys Avenue

Existing 2m high close boarded fence



lose 66.3

new

60

ridge
73.18

~~u/s eaves~~
60.6-

60.63

A3

Plans 1:250

No.	Revision/Issue	Date
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Project 347/02	Sheet 02
Date 9.03.16	
Scale 1:200	



Site Boundary (239sqm / 0.02ha)

A3

1. This drawing is to be read in conjunction with all other RGP drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
2. RGP accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
3. Do not scale, work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain.

-	19/05/2016	Original Issue	RAA
Rev.	Date	Amendments	Drawn



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Metro House, Northgate, Chichester, West Sussex, PO19 1BE
Tel: 01243 410418 Fax: 01483 861682 www.rgp.co.uk

Client
Ms Gander

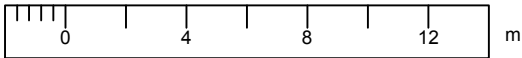
Project
Land Adjoining 17 Lovedean Lane,
Cowplain, Havant, PO8 8HH

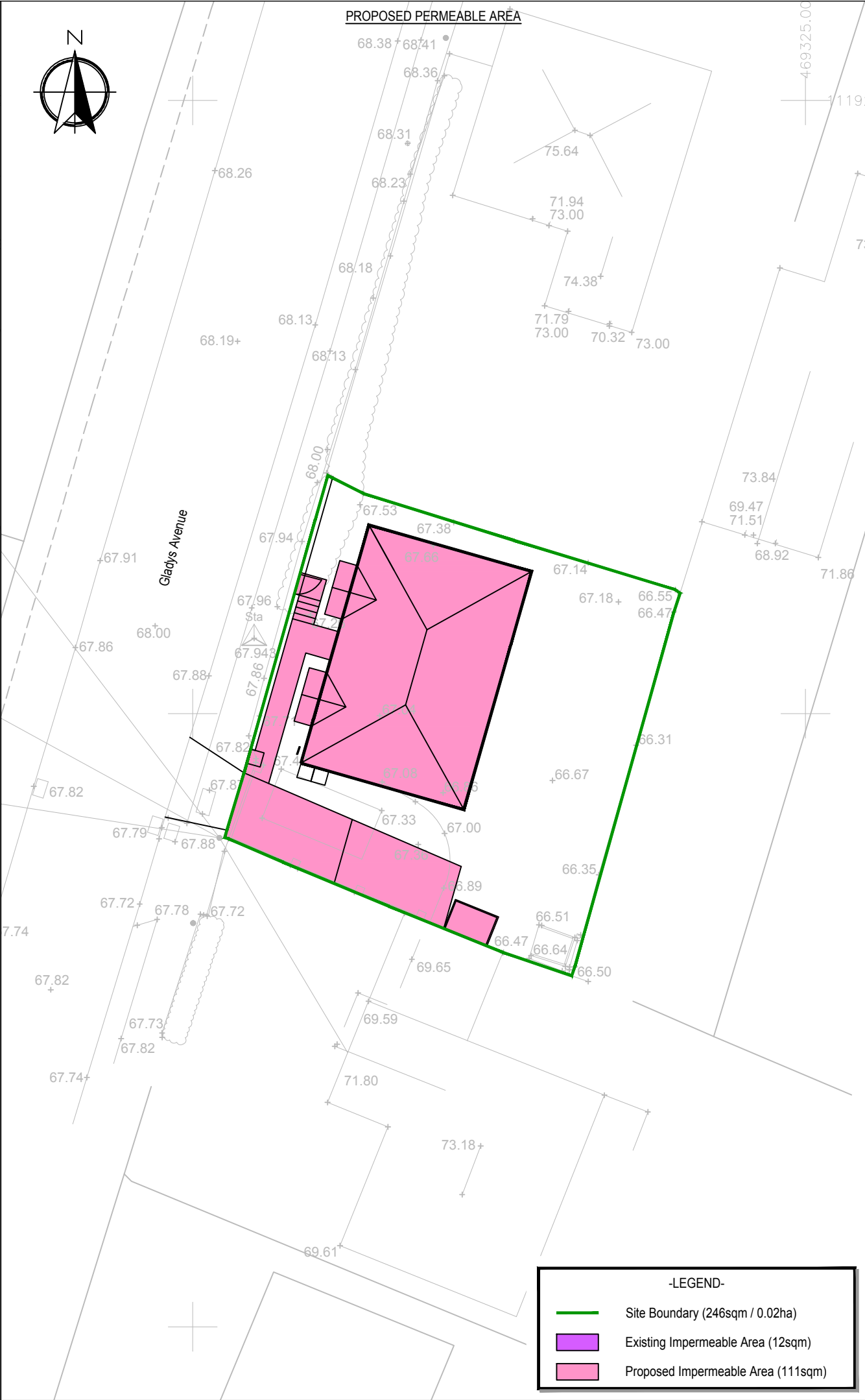
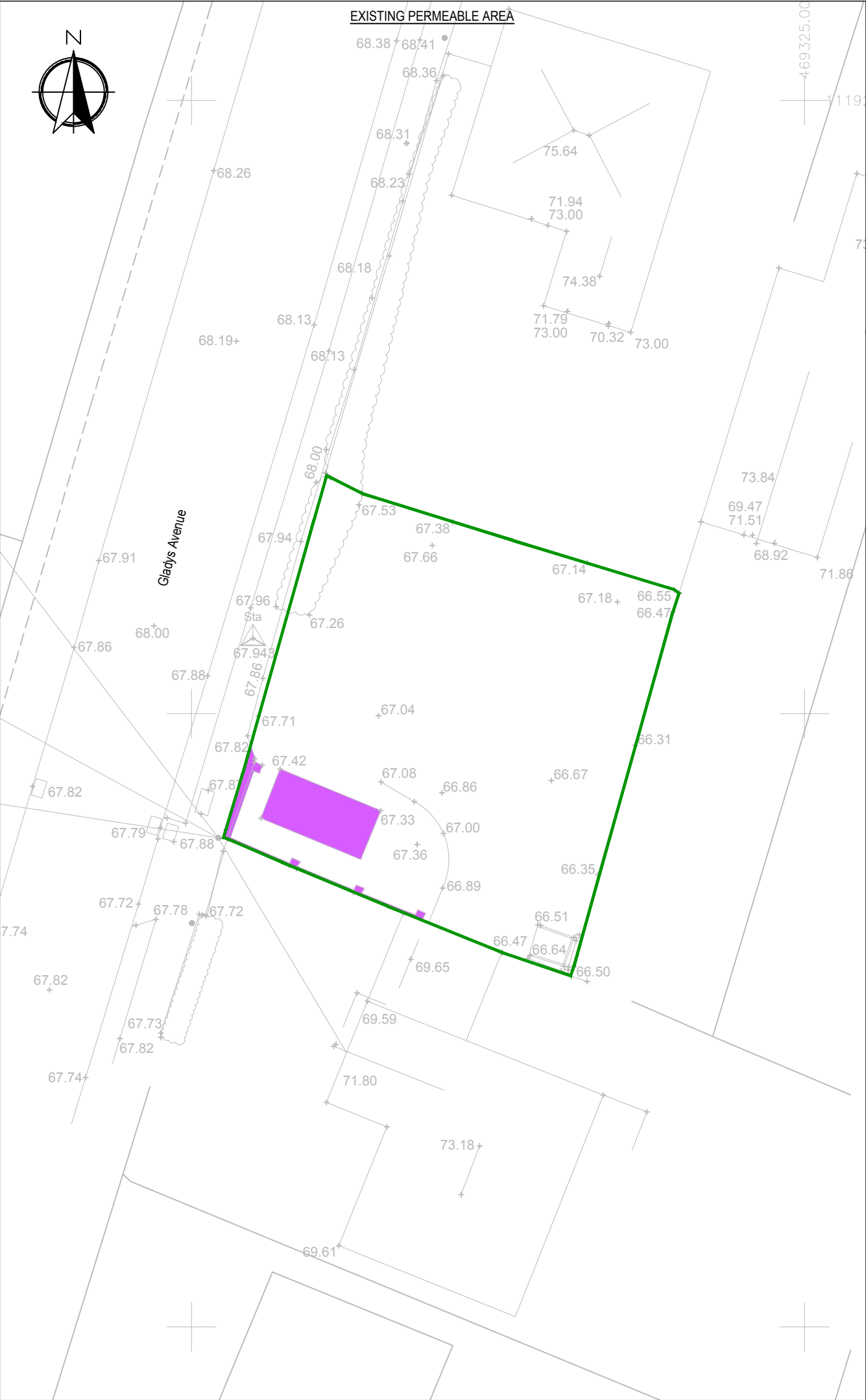
Drawing Title

Site Location Plan

Scale 1:500	Drawn By RAA	Checked By MJA	Approved By MJA
Date May 2016	Drawing No. 2016-D1154-SK100		Rev. -

1:250 @ A1
1:500 @ A3





-LEGEND-

Site Boundary (246sqm / 0.02ha)

Existing Impermeable Area (12sqm)

Proposed Impermeable Area (111sqm)

NOTES

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19/05/2016

Original Issue

RAA

Rev.

Date

Amendments

Drawn

rgp

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Client

Ms Gander

Project

Land Adjoining 17 Lovedean Lane, Cowplain, Havant, PO8 8HH

Drawing Title

Impermeable Areas Comparison

Scale

1:200

Drawn By

RAA

Checked By

MJA

Approved By

MJA

Date

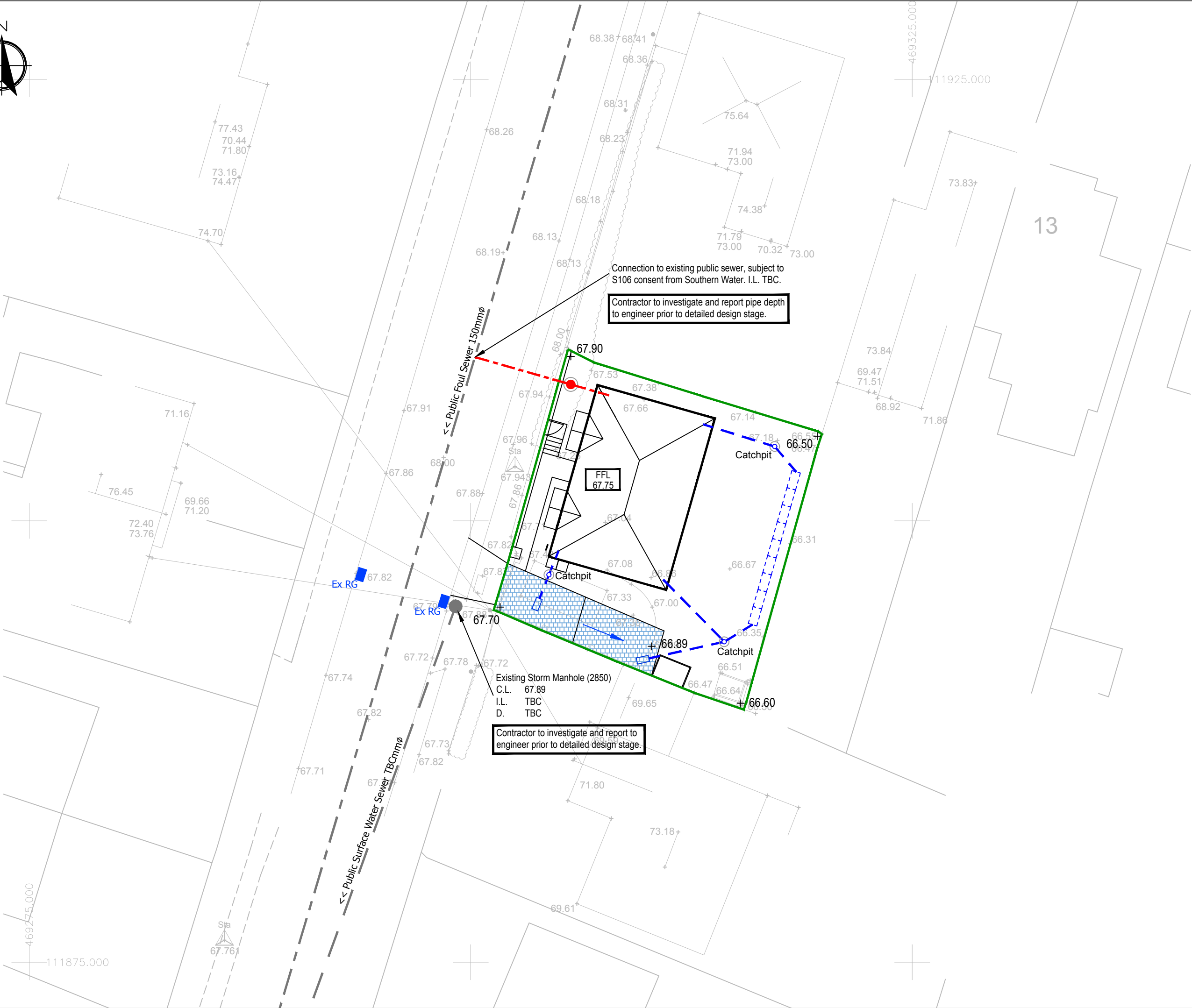
May 2016

Drawing No.

2016-D1154-SK200

Rev.

-



NOTES

A3

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-	19/05/2016	Original Issue	RAA
Rev.	Date	Amendments	Drawn



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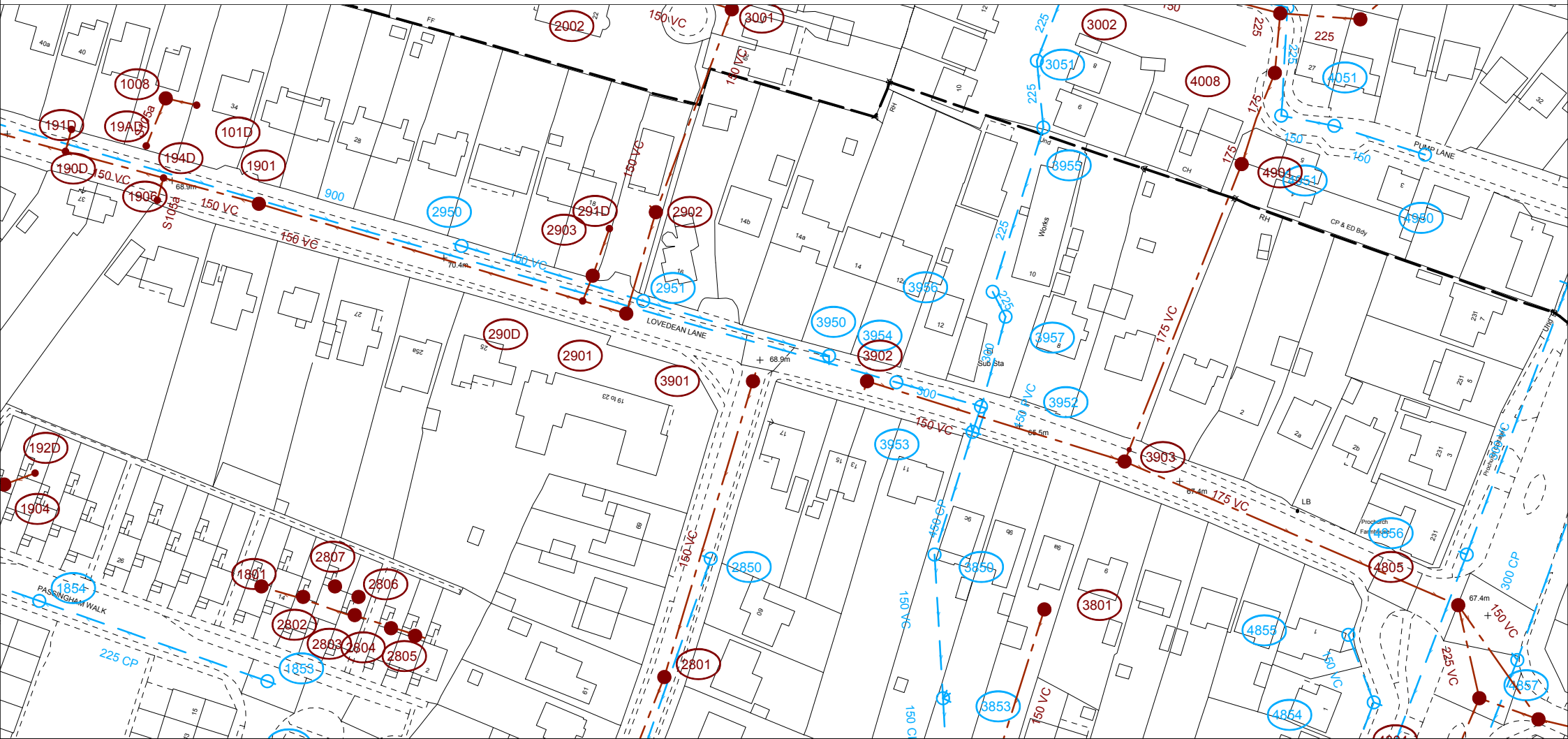
Drawing Title
Foul and Surface Water Proposals

Scale 1:200	Drawn By RAA	Checked By MJA	Approved By MJA
Date May 2016	Drawing No. 2016-D1154-SK300	Rev. -	

APPENDICES

Appendix A Public Sewer Map

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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O.S. REF: SU6911NW

Scale: 1:1250

Sewer Plot

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement



Printed By: PC

Date: 19-11-2015

Land Adjoining 17 Lovedean Lane

Requested By:

Land Searches Map Legend

Sewer

Pipe Line Styles/Colours

	Foul Sewer
	Foul Rising Main
	Foul Syphon Sewer
	Foul Vacuum Sewer
	Foul Trunk Sewer
	Foul Tank Sewer
	Surface Water Sewer
	Surface Water Rising Main
	Surface Water Syphon Sewer
	Surface Water Trunk Sewer
	Surface Water Tank Sewer
	Culverted Watercourse
	Combined Sewer
	Combined Rising Main
	Combined Syphon Sewer
	Combined Trunk Sewer
	Combined Tank Sewer
	Treated Effluent
	Treated Effluent Rising Main
	Sludge Rising Main
	Flow Direction Arrows (All Styles)
	As above line styles but decommissioned
	(Yellow) As above line styles but private
	Access Shaft – Personnel Only

Boundary Line Styles/Colours

	Catchment Boundary
	Sub-Catchment Boundary
	Section 104 Agreement Area
	Building Over Agreement Area

Materials

AK Alkathene	GRP Glass Reinforced Plastic
BAC Bonded Asbestos Cement *	MAC Masonry in regular courses
BRE Brick (Engineering)	MAR Masonry in random courses
BRC Brick (Common)	PE Polyethylene
CC Concrete Box Culvert	PF Pitch Fibre
CI Cast Iron	PP Polypropylene
CO Concrete (In-Situ)	PVC Polyvinyl Chloride
CP Concrete (Pre-Cast)	RPM Reinforced Plastic Matrix
CSB Concrete Segments (Bolted)	SI Spun Iron
CSU Concrete Segments (Un-Bolted)	ST Steel
DI Ductile Iron	VC Vitrified Clay
GRC Glass Reinforced Concrete	UNK Unknown*

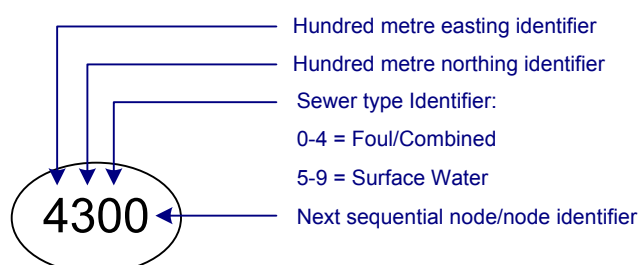
*Warning
BAC Pipes are constructed of Bonded Asbestos Cement
UNK Pipes are may be constructed of Bonded Asbestos Cement

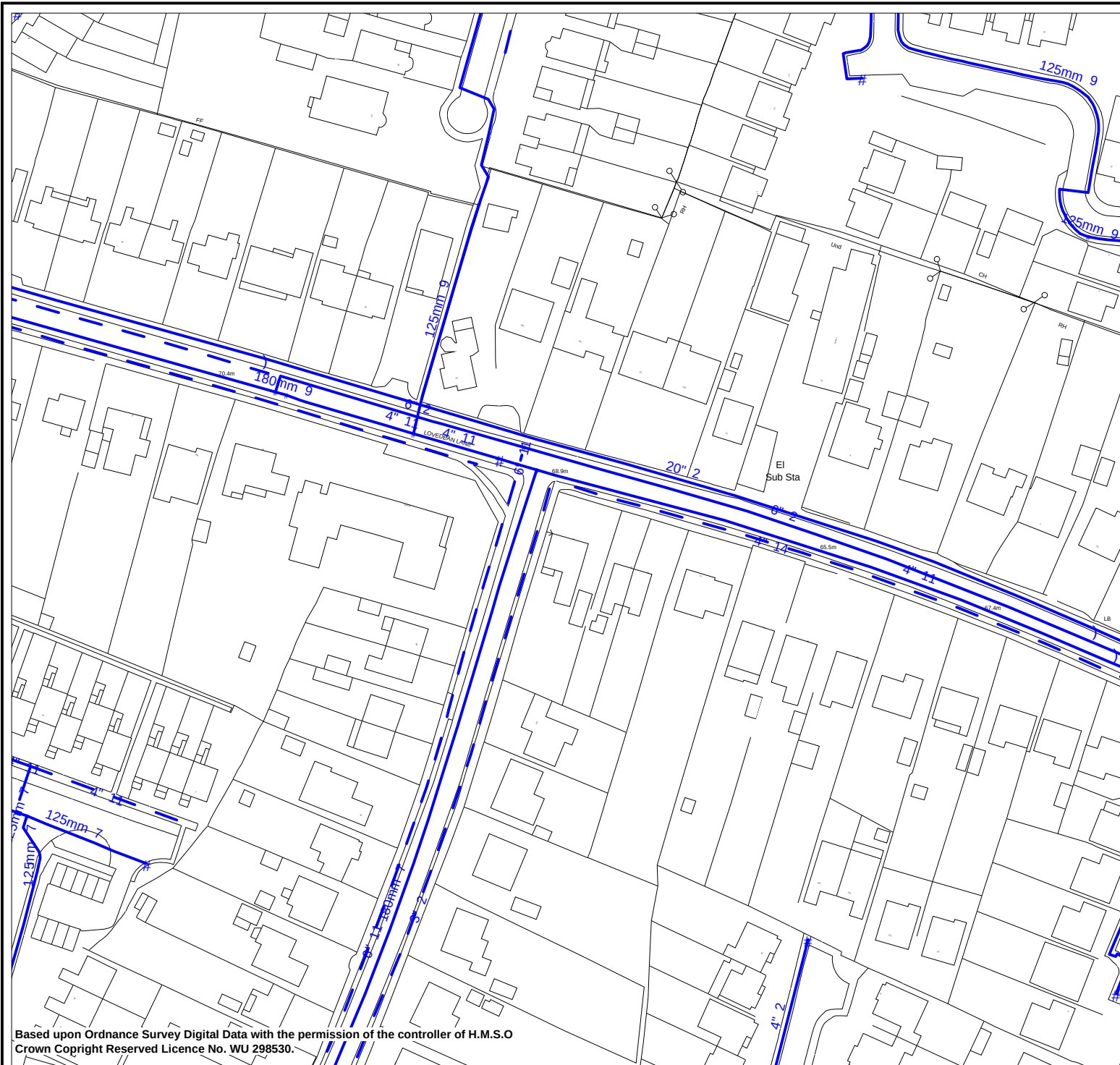
Symbols

Surface	Foul	Combined	
			Label Ellipse
			Manhole
			Dummy/S.24 Manhole
			Manhole Backdrop
			Catchpit
			Soakaway
			Balancing Pond
			Rodding Eye
			Washout
			Flushing Chamber Mn-E
			Flushing Chamber No-E
			Hatch Box
			Lamphole
			Interceptor Chamber
			Blind Shaft
			Storm Tank
			Vortex Chamber
			Vent
			Vent Column
			Other/Unknown
			Penstock
			Cascade
			Change Node
			Pumping Station
			Micro Pumping Station
			Air Valve
			Valve
			Reflux Valve
			Anti-Flood Device
			Blank End
			Head of Public Sewer
			Inlet
			Outfall
			Storm Overflow
			Treatment Works

Other symbols or text may be visible which are not shown here.
These are used for Southern Water operational guidance only.

Node Referencing System





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**LandSearches
from
Southern Water**

Southern House
Capstone Road
Chatham
Kent ME5 7QA
Telephone: 0845 270 0212
Fax: 01634 844514

The information supplied is given in good faith as a guide to locating underground apparatus. It's accuracy cannot be guaranteed, nor does it include comprehensive information about the existence or location of services pipes or cables to individual premises. The responsibility for locating and avoiding damage to apparatus on site shall be that of the persons proposing to excavate in the street who shall be liable to the apparatus owner and any third party who may be affected in any way for any loss or damage caused by their failure to do so.

Legend

	Water Main
	Abandoned Main
	Private Main
	Hydrants / Washout Hydrants
	Valves / Fittings

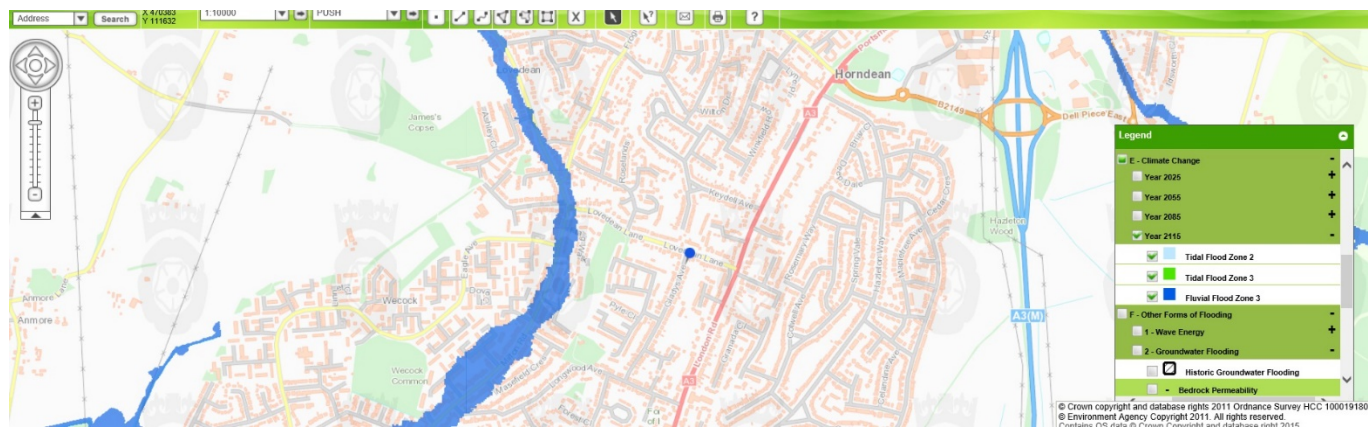
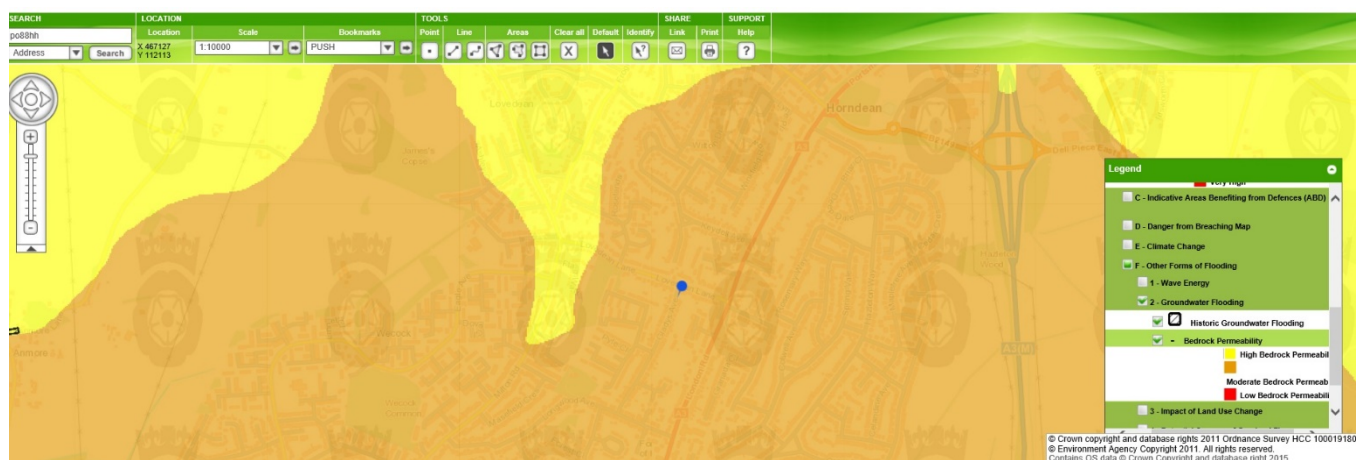
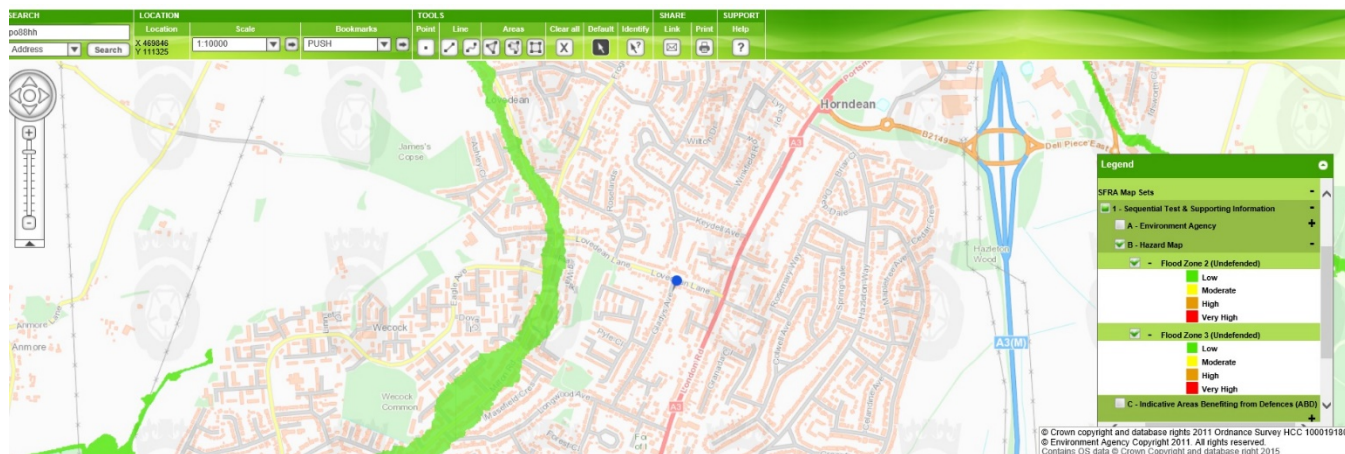
Materials

BP	Black Polyethylene	MDPE	Medium Density Polyethylene
CI	Cast Iron	PSC	Pre-Stressed Concrete
CP	Copper	PVC	Polyvinyl Chloride
DI	Ductile Iron	ST	Steel
FRC	Fibre Reinforced Cement	??	Unknown
HDPE	High Density Polyethylene		

Scale **1:1250**

Date: **19.11.2015**

Appendix B PUSH Website Extracts



RGP Design Limited		Page 1
Metro House Northgate Chichester P019 1BE		
Date 23/05/2016 13:04 File	Designed by m.akmenkalns Checked by	
XP Solutions Source Control 2015.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 805 Urban 0.000
Area (ha) 0.025 Soil 0.450 Region Number Region 7

Results l/s

QBAR Rural 0.1
QBAR Urban 0.1

Q100 years 0.4

Q1 year 0.1
Q30 years 0.3
Q100 years 0.4

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Metro House Northgate Chichester P019 1BE																												
Date 23/05/2016 13:05 File	Designed by m.akmenkalns Checked by																											
XP Solutions		Source Control 2015.1																										
<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</td> <td>England and Wales</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.600</td> </tr> <tr> <td>Ratio R</td> <td>0.330</td> </tr> <tr> <td>Areal Reduction Factor</td> <td>1.00</td> </tr> <tr> <td>Area (ha)</td> <td>0.025</td> </tr> <tr> <td>SAAR (mm)</td> <td>800</td> </tr> <tr> <td>CWI</td> <td>117.339</td> </tr> <tr> <td>Urban</td> <td>0.000</td> </tr> <tr> <td>SPR</td> <td>47.000</td> </tr> </table> Results <table> <tr> <td>Percentage Runoff (%)</td> <td>49.51</td> </tr> <tr> <td>Greenfield Runoff Volume (m³)</td> <td>8.198</td> </tr> </table>			Return Period (years)	100	Storm Duration (mins)	360	Region	England and Wales	M5-60 (mm)	19.600	Ratio R	0.330	Areal Reduction Factor	1.00	Area (ha)	0.025	SAAR (mm)	800	CWI	117.339	Urban	0.000	SPR	47.000	Percentage Runoff (%)	49.51	Greenfield Runoff Volume (m ³)	8.198
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