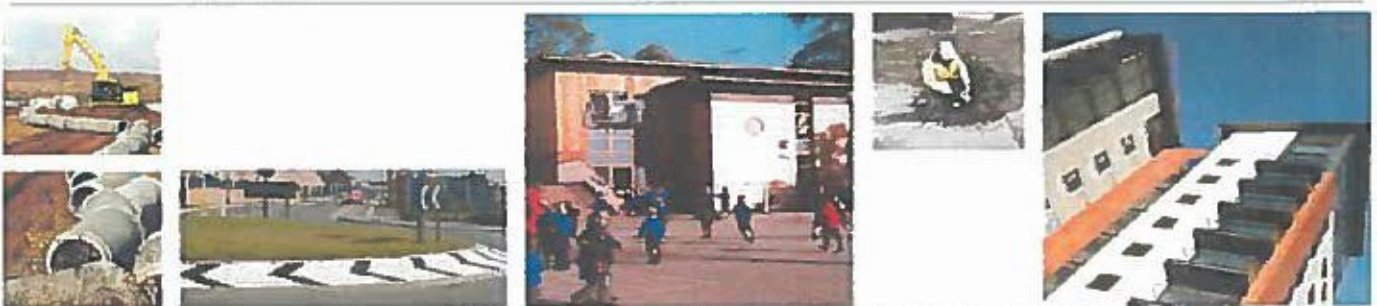


SITE SPECIFIC FLOOD RISK ASSESSMENT

Proposed Dwelling, Abbey Bottom Farm, Wix, Essex

Client: Mrs Milwain

Project no: 45051



CONSULTING CIVIL, STRUCTURAL AND GEOTECHNICAL ENGINEERS

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Document Review Sheet: -

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Senior Engineer
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Signature: - *C. Halford*

Date: - 30 / 01 / 2014

Document approved by: - Mark Geddes
Director
on behalf of Richard Jackson Ltd

Signature: - *M. J. Geddes*

Date: - 30 / 01 / 2014

Document Status

DRAFT

FINAL

Revision Status

Issue	Date	Description	Author	Checker	Approved
	Jan 2014	First Issue	CH	MG	<i>MJG</i>

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APPENDIX

- Appendix A – Site location
- Appendix B – Architectural Layout
- Appendix C – Environment Agency Flood Mapping
- Appendix D – Flood Zone Extent Mapping
- Appendix E – Preliminary Drainage Calculations
- Appendix F – Topographical Survey

1. INTRODUCTION

- 1.1 Richard Jackson Ltd has been commissioned by Mr & Mrs Milwain to undertake a Flood Risk Assessment (FRA) in accordance with the Technical Guidance to the National Planning Policy Framework (NPPF) to support a planning application for a new dwelling.
- 1.2 The copyright of this report is vested in Richard Jackson Ltd. The client or his appointed representatives may copy this report for the purposes in connection with the development described herein. It shall not be copied or distributed in any other form by any other party or used for any other purpose without the written consent of Richard Jackson Ltd.

2. DEVELOPMENT DESCRIPTION AND SITE LOCATION

- 2.1 The location of the site is to the north side of Harwich Road in of Wix with grid reference 616660E, 228551N as shown on the site location plan in Appendix A. The proposal is for a 2 storey dwelling with a permeable vehicle drive as shown in Appendix B.
- 2.2 The area of the site is approximately 0.2ha with topography falling generally from north to south with a level range just above 21 to just below 18m AOD, reference the topographical survey in Appendix F. The site consists mainly of grass with a farm dwelling and outbuildings / sheds.
- 2.3 Most of the site is shown to be in zone 2 and 3 in the south of the site with flood zone 1 in the north for flood risk on the Environment Agency flood mapping in Appendix C.
- 2.4 According to table 2 of the Technical Guidance to NPPF, 'flood risk vulnerability and flood zone compatibility' residential developments, are classed as more vulnerable to flood risk, are deemed appropriate within zone 1. With this in mind the client has been advised to locate the proposed dwelling to the north of the site so that it is within flood zone 1 following the principles of the Sequential Test.
- 2.5 Published geological records of the British Geological Survey show that the site is underlain with sand and gravel.

3. DEFINITION OF THE FLOOD HAZARD

- 3.1 There are three main sources of flooding that have the potential to effect development and therefore must be assessed for their potential to flood the development and to increase the risk of flooding to others. The main sources of flooding that need to be considered are as follows:
- Fluvial
 - Overloading of the existing drainage network (surface water flooding)

- Groundwater flooding

Fluvial /tidal flooding

- 3.2 The nearest major watercourse to the site is the River Stour which is 3.5km to the north of the site. The EA flooding mapping shows that the site is not at risk of flooding from the tidal River Stour or from tidal flooding from the east coast 7.5 km east of the site.
- 3.3 The nearest watercourse is adjacent to the south of the site on the north side of Harwich Road. The watercourse starts its catchment 1.9km west of the site passing to the north of a small reservoir 1km west of the site but remaining to the south of the A120 as it flows west to east. Some 600m east of the site the watercourse flows in a south easterly direction before flowing north east to the Ramsey Creek just west of Harwich. A tributary joins the watercourse at the site access via a culvert under the Harwich Road. The fluvial flood levels taken from the River Ramsey Risk Study 2010 by Scott Wilson undertaken for the Environment Agency are summarised below in table 3.3. The flood zone 2 and flood zone 3 extents are shown on drawing 45051/P/02 in Appendix D. This drawing shows that the proposed dwelling and the site access are within flood zone 1 and therefore confirms the Sequential Test passed.

Nearest modelled flood level node to the site RAM_11327Spu		
1 in 20+cc	1 in 100+cc	1 in 1000+cc
18.920 m AOD	18.990 m AOD	19.080m AOD

Table 3

Surface Water Flooding

- 3.4 Surface water flooding occurs when the drainage capacity of the network is exceeded or fails. This can be due to the design capacity of the network being less than the return period of the rainfall event. Otherwise, it can be when the network does not perform to the design capacity due to blockage or damage within the network.

Groundwater Flooding

- 3.5 The site is underlain by sands and gravels according to published geology records for this site. Since the site is close to the watercourse, ground water levels within the site are expected to respond to water levels within the watercourse but not result in any flooding to the proposed dwelling since it is not located in localised low areas adjacent to the site.

4. PROBABILITY OF FLOODING

- 4.1 The site is located in flood zone 1, 2 and 3, but the proposed dwelling itself is located to the north of the site within flood zone 1. Flood zone 1 is land assessed as having less than a 1 in 1000 year annual probability of river or sea flooding (<1%). Land in flood zone 2 is assessed as having between a 1 in 100 and 1 in 10000 annual probability of river flooding or between a 1 in 200 and 1 in 1000 year annual probability from the sea.

5. CLIMATE CHANGE

- 5.1 Climate change over the next 100 years or so is predicted to cause increases in the peak flows in rivers. The Environment Agency supplied flood data includes an allowance for climate change on peak river flows. Rainfall is also expected in frequency and intensity along with increased sea levels. The drainage calculations in Appendix E have been factored +30% to accommodate climate change.

6. DETAILED DEVELOPMENT PROPOSALS

- 6.1 The overall site area is approximately 0.2ha. The proposal is for single 2 storey residential unit. The private vehicular drive providing access from the Harwich Road will be constructed of unbound material so that it remains permeable. The proposed dwelling will have an impermeable area of 0.009ha and located within flood zone 1 as shown on the flood extents drawing 45051/P/02.
- 6.2 The disposal of surface water from the roof area will be via downpipes to a 5m length of 225mm storage pipe with a restricted outfall to a 150mm diameter pipe using a 75mm orifice within a chamber before outfalling to the watercourse to the south of the site adjacent to the site access as shown on drawing 45051/P/03 in Appendix E. Calculations for the 1 in 1, 1 in 30 and 1 in 100+climate change storm events are provided in Appendix E and provide discharge rates of 1.2, 3.1 and 4.8 $l s^{-1}$ respectively. The surface water discharge from the proposed dwelling is therefore below the maximum of 5 $l s^{-1}$ stated in the Code for Sustainable Homes Technical Guide (2009). The 75mm orifice used to restrict the surface water discharge is the minimum recommended within the SuDS Manual (2010).

7. FLOOD RISK MANAGEMENT MEASURES

- 7.1. The impact of any groundwater flooding, overloading of the existing drainage network or burst water main can be managed by careful consideration of the finished floor level of the proposed buildings. The floor level will be set higher than the external areas, ensuring that any localised floodwater does not enter the building.
- 7.2. The site access does not flood in the 1 in 100 year flood plus climate change event as shown on drawing 45051/P/02 in Appendix E.

8. OFFSITE IMPACTS

- 8.1 There are no offsite impacts to consider since the surface water discharge from the proposed development will be sustainably managed by infiltration to the ground below. The proposed dwelling is out of the floodplain and therefore will not displace any flood storage volume within the floodplain.

9. RESIDUAL RISKS

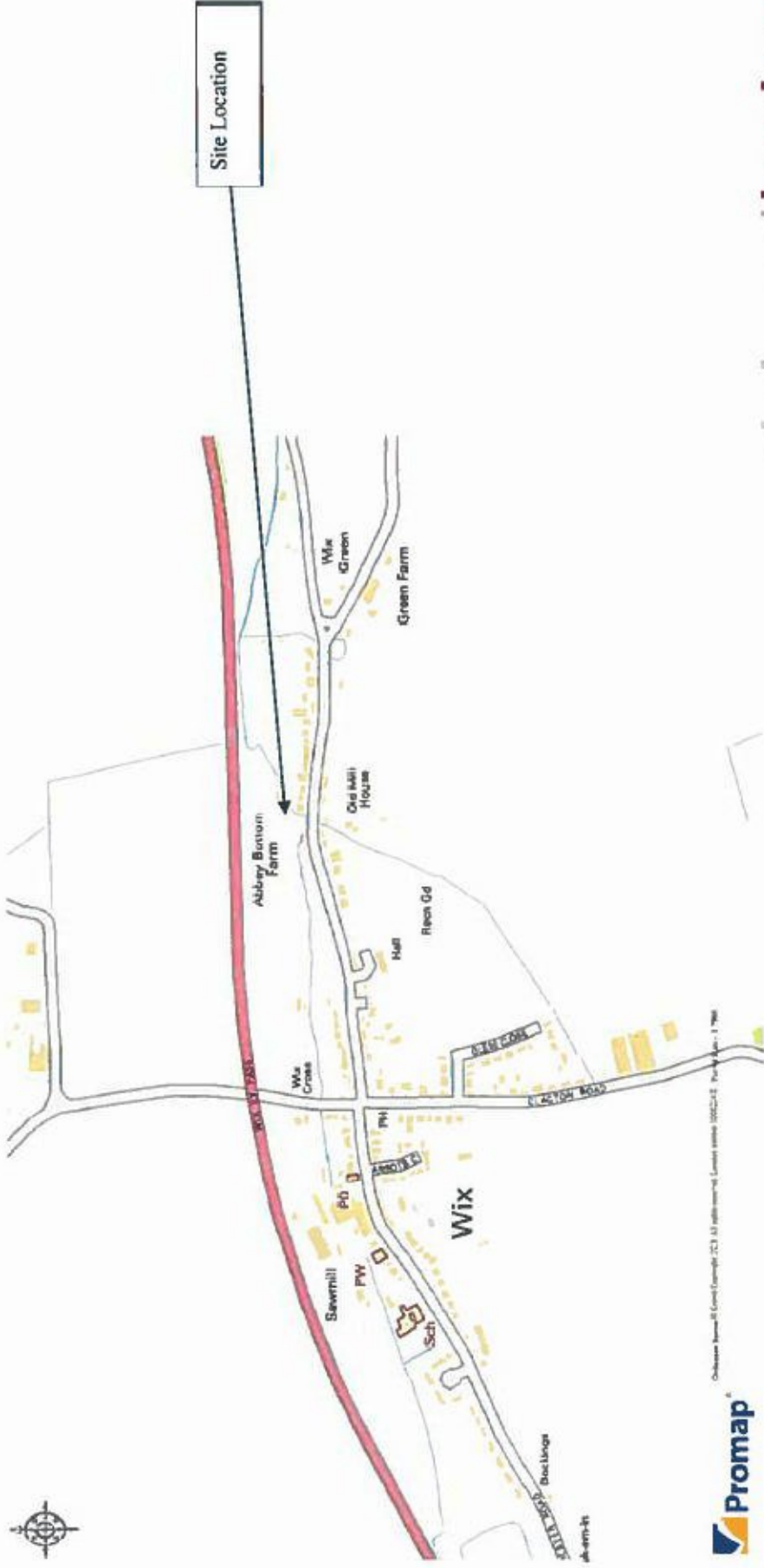
- 9.1 The residual risk is usually taken to refer to the portion of overall risk that remains once risk-aversion measures have been put in place.
- 9.2 It is always possible that flood events greater than the 1 in 100 rainfall event will occur.
- 9.3 Surface water flooding events due to climate change may become more frequent, the drainage calculations have therefore been factored +30% to account for this.
- 9.4 The residual risks will not be the subject of any formalised management.

10. CONCLUSIONS

- 10.1. The proposed dwelling has been located outside of the flood zone extents so that it is in flood zone 1.
- 10.2. The access to the proposed dwelling consists of permeable construction and roof area surface water discharge to the watercourse is restricted to below 5 ls⁻¹.
- 10.3. Bearing in mind the scale of this proposal, there will be no significant impact on or off site with regard to flood risk and we would therefore recommend this application for approval.
- 10.4. The site access does not flood in the 1 in 100 year plus climate change event.

APPENDICES

APPENDIX A
Site Location Plan



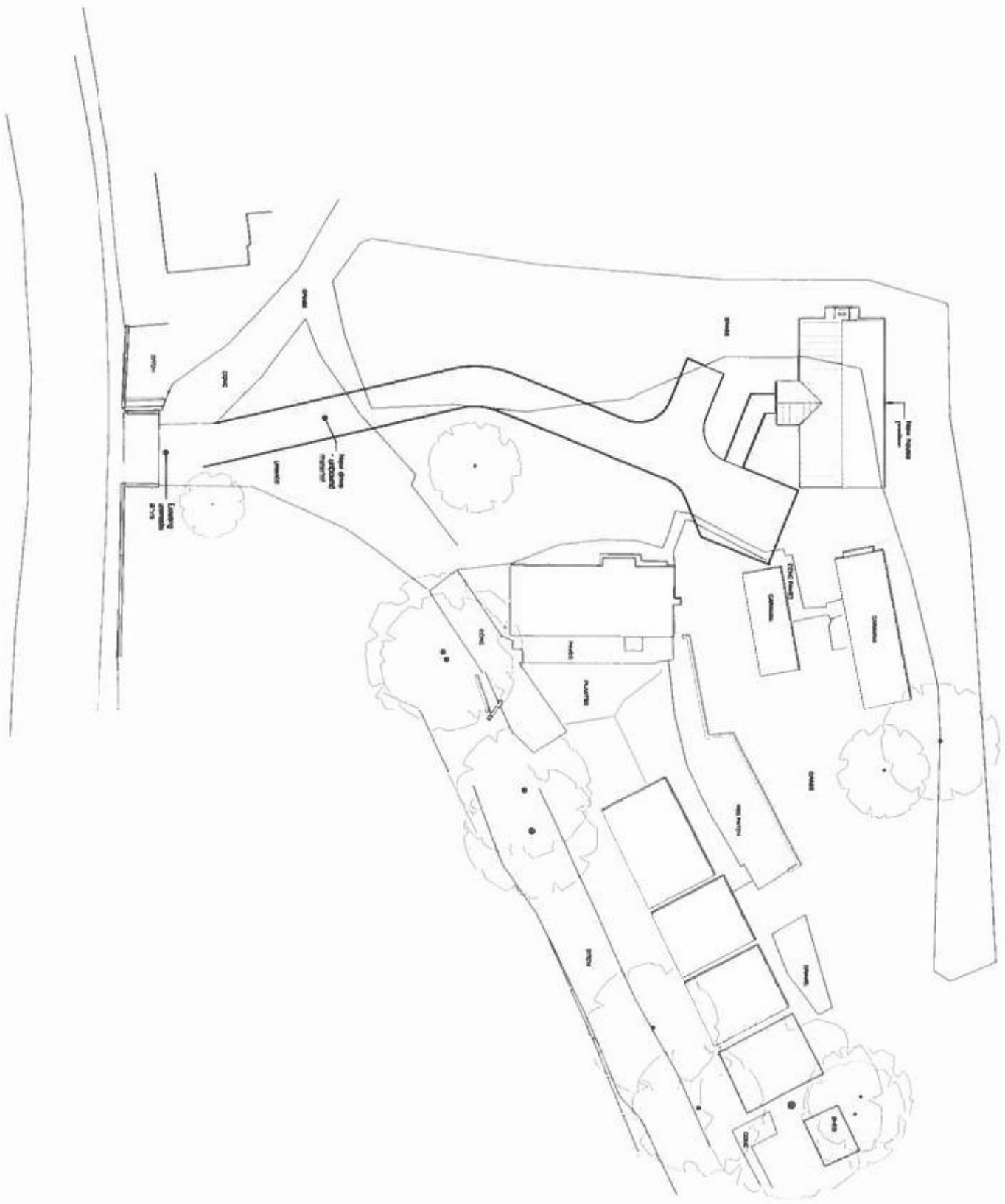
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Client: Mr & Mrs Milwain	Drawing Title: Location Plan		26 High Street Hadleigh Ipswich Suffolk IP7 5AP T: 01473 825300 F: 08453 722553 www.richardjackson.uk.com
Proposed Dwelling, Abbey Bottom Farm, Wix, Essex	Date: 22 January 14	Job No: 45051	Drawing No: 45051/P/01

APPENDIX B
Architectural Layout



APPENDIX C

Environment Agency Flood Mapping



Environment
Agency

Mr C Halford,
Richard Jackson
colinhalford@rj-ie.co.uk

Our ref CCE/2013/51976
Date 09 January 2014

Dear Mr Halford

Provision of Product 4 for Abbey Bottom Farm, Wix

Thank you for your request of 10 December to use Environment Agency data in the development of the FRA for the above site. The information is attached.

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

This area falls within Flood Zone 2 & 3, Fluvial. Please see the attached map showing the Flood Zones (outlines) for the area of the site.

Flood Zone 1 means a less than 0.1% annual probability of flooding.

The Flood Zone 2 outline shows a 1 in 1000 chance of flooding at a location in any one given year (i.e., a 0.1% annual probability of flooding).

The Flood Zone 3 fluvial outline shows a 1 in 100 chance of flooding at a location in any one given year (i.e., a 1% annual probability of flooding).

The Flood Zone 3 tidal outline shows a 1 in 200 chance of flooding at a location in any one given year (i.e., a 0.5% annual probability of flooding).

The flood outlines show areas of potential flooding as a direct result of floodwater coming from rivers or sea. They do not show the risk of flooding to individual properties, because we do not hold this data.

Eastern Area - Icenl House
Cobham Road, Ipswich, Suffolk, IP3 9JD
General Enquiries: 03708 506506 Fax: 01473 724205
Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and that count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone.
Email: enquiries@environment-agency.gov.uk
Website: www.environment-agency.gov.uk

Please be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed. We have worked with Lead local Flood Authorities (LLFAs) to develop a map which incorporates the best local and national scale information on surface water flood risk. These maps can be viewed on our website at the following:-

<http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfs#w=x=357683&y=355134&scale=2>

We have checked our historic flooding database and have found no record of flooding in this area. This does not mean that the site has never flooded, only that no flooding has been reported to us in this location.

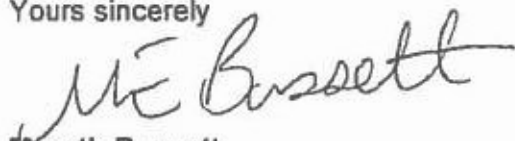
There are no Environment Agency maintained flood defences in this area.

This site is not in a flood warning area.

This information is provided subject to the enclosed notice, which you should read.

If you have any queries or would like to discuss the content of this letter further please contact Julian Adams at the Environment Agency.

Yours sincerely



Mareth Bassett
Customers & Engagement Officer

PSO Team
Essex 01473 706805

Eastern Area - Icen House

Cobham Road, Ipswich, Suffolk, IP3 9JD
General Enquiries: 03708 506506 Fax: 01473 724205
Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone
Email: enquiries@environment-agency.gov.uk
Website: www.environment-agency.gov.uk

Datasheet Reference CCE/2013/5/1976

Fluvial flood levels (mAODN)



Undefended

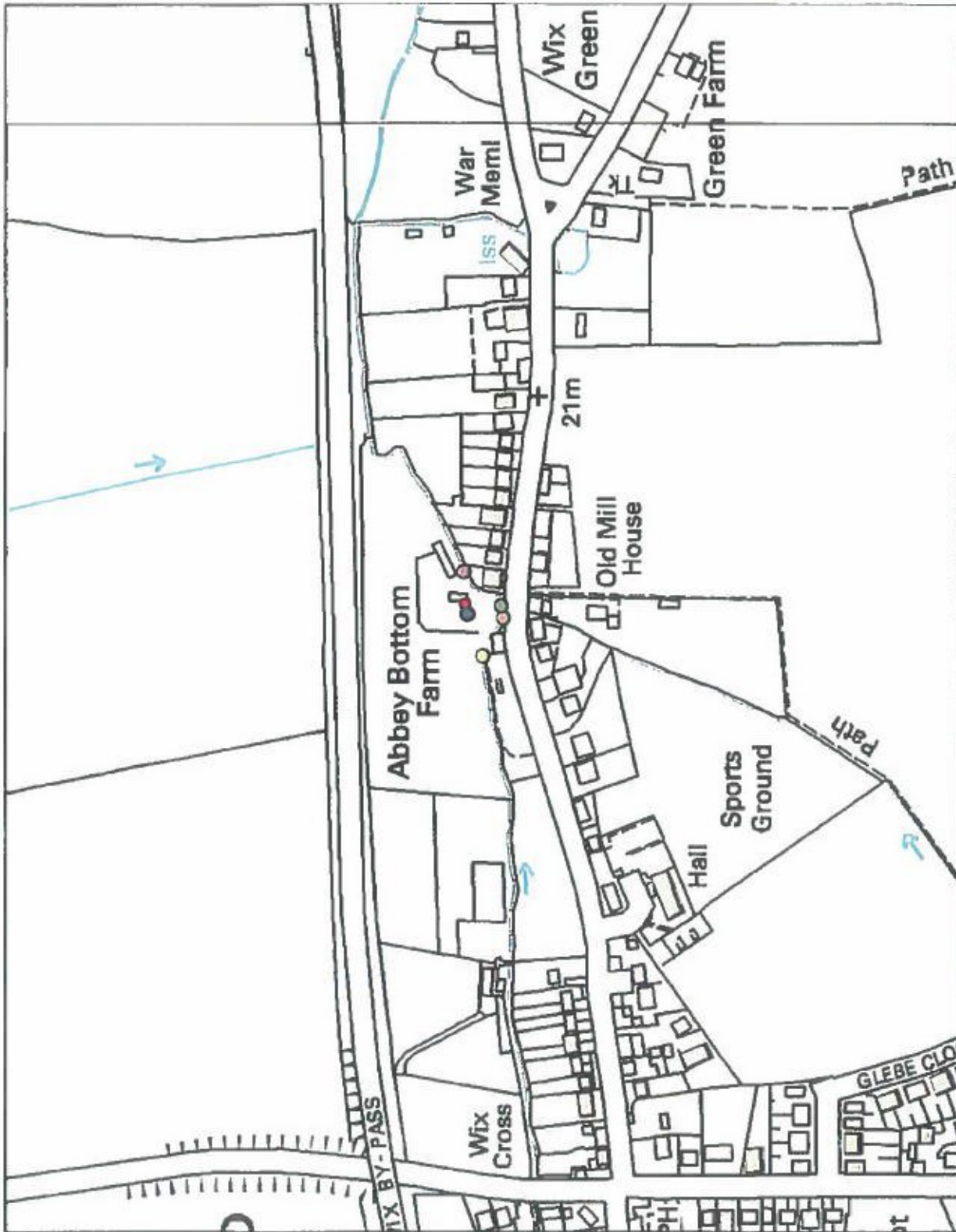
Node	Easting	Northing	5% (1:20)	5% (1:20) +CC	1.3% (1:75)	1% (1:100)	1% (1:100) +CC	0.1% (1:1000)	0.1% (1:1000) +CC
RAM_11362	616634	228515	19.06	19.15	19.16	19.17	19.21	19.25	19.30
RAM_11327	616660	228501	18.87	18.92	18.93	18.95	18.99	19.03	19.08
RAM_11327SpU	616663	228525	18.87	18.92	18.93	18.95	18.99	19.03	19.08
RAM_11327D	616669	228503	18.84	18.89	18.91	18.92	18.96	19.00	19.05
RAM_11279_IT	616693	228528	18.47	18.53	18.54	18.56	18.62	18.67	18.73

CC = Climate Change

Source of information: Ramsey River Flood Risk Study (2010) by Scott Wilson Consultant for the Environment Agency

Modelled Level Location Map centred on Wix Created 20th December 2013.

Ref: CCE/2013/51976



Scale 1:3,897

Legend

Modelled Level node point

NODE_LABEL

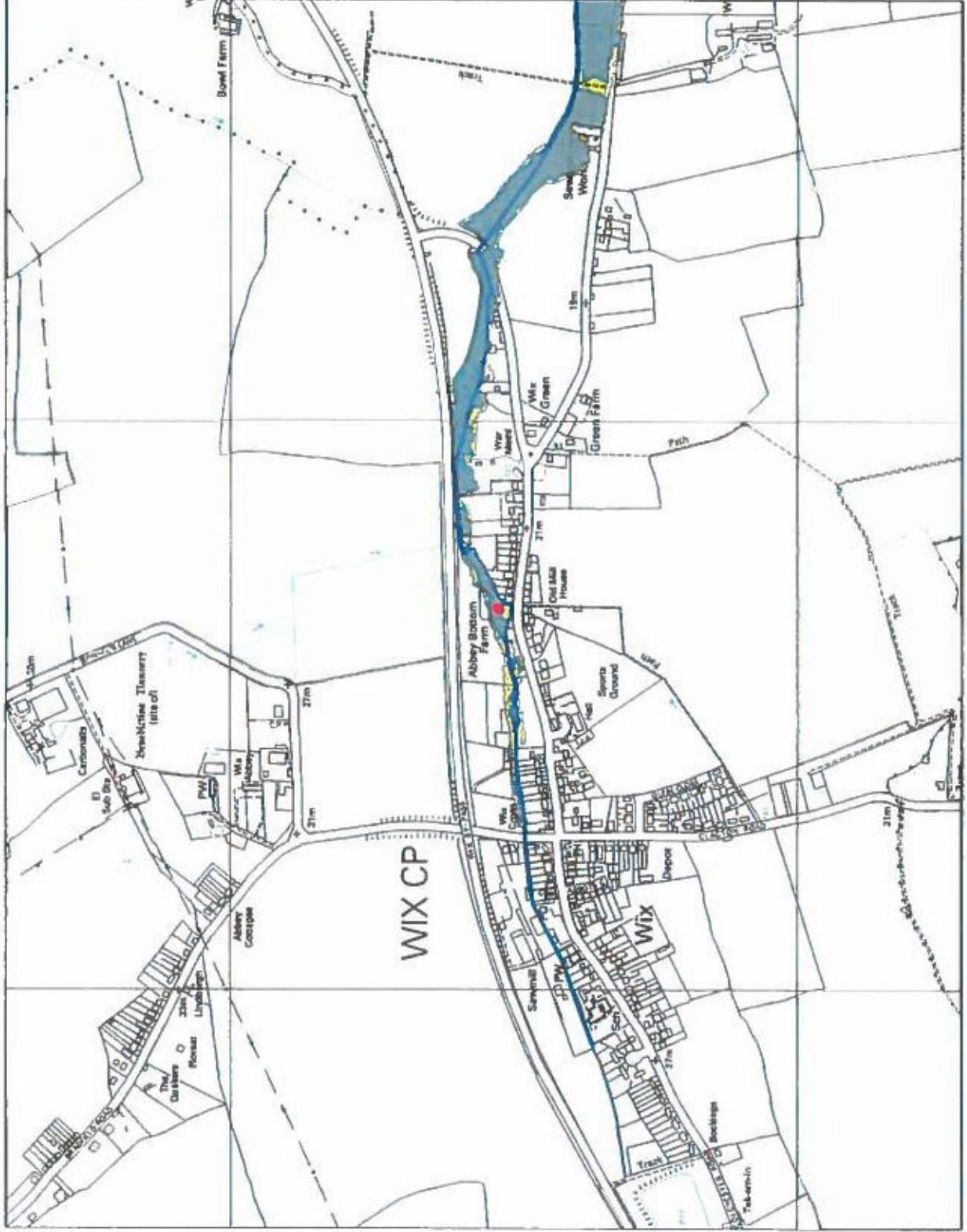
- RAM_11279_IT
- RAM_11327
- RAM_11327D
- RAM_11327SpU
- RAM_11362
- Site



Detailed Flood Map centred on Wix Created 20th December 2013.
Ref: CCE/2013/51976



Scale 1:10,000



Legend

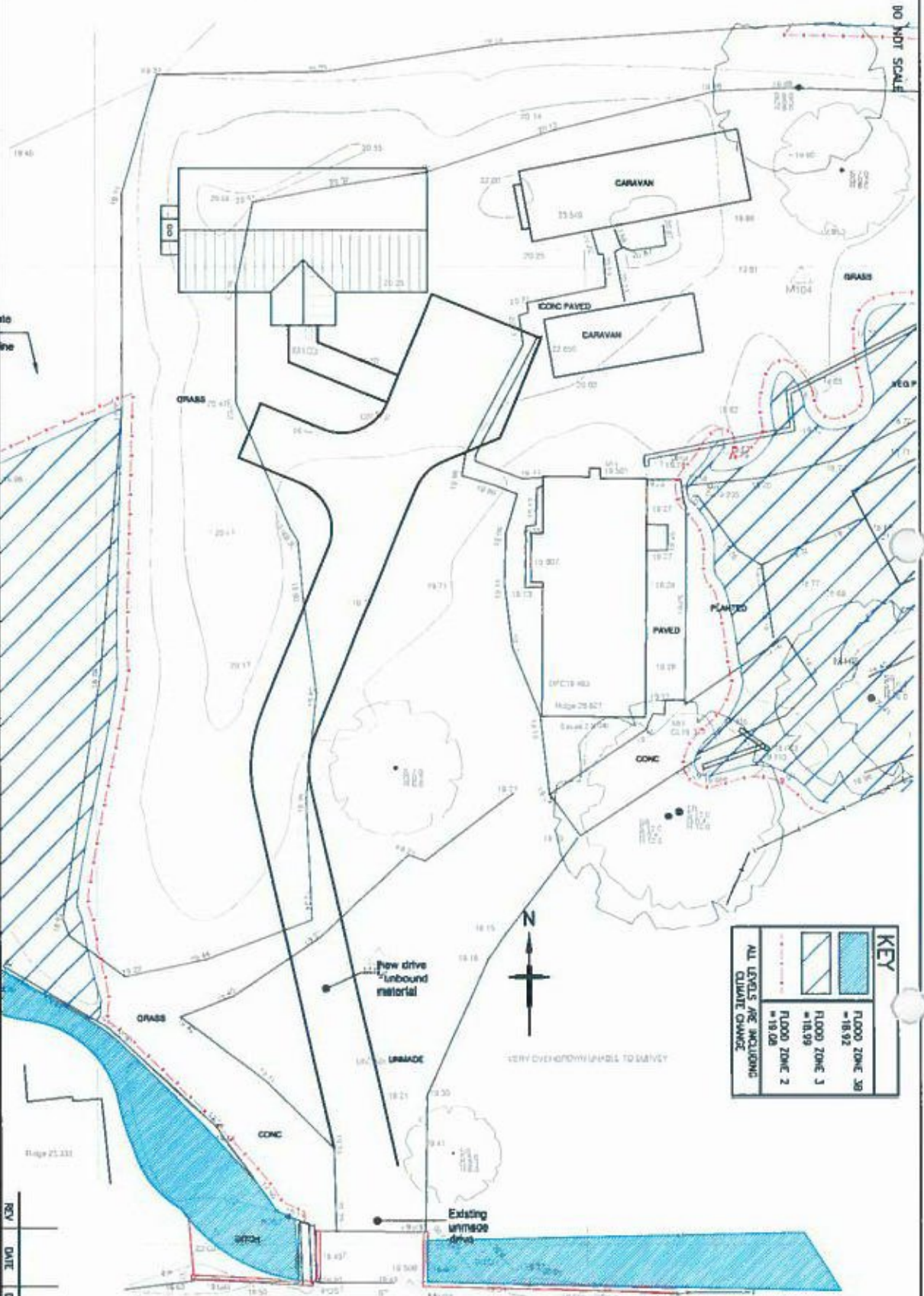
- Site
- Main River
- ▨ Areas Benefit Flood Defe
- Flood Storage Area
- Flood Zone 3 (Eastern)
- Flood Zone 2 (Eastern)



APPENDIX D

Flood Zone Extent Mapping

DO NOT SCALE



KEY	
	FLOOD ZONE 3B =18.92
	FLOOD ZONE 3 =18.99
	FLOOD ZONE 2 =18.08
ALL LEVELS ARE INCLUDING CLIMATE CHANGE	

- NOTES:**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELATED ARCHITECT'S AND SURVEYOR'S DRAWINGS AND REPORTS. DO NOT SCALE FROM THIS DRAWING.
 2. THIS DRAWING SHOULD NOT BE USED FOR CONSTRUCTION.

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 Tel: 020 7448 9910
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 Fax: 01484 223300
 Fax: 01484 223300
 Fax: 01484 223300
 Email: info@richardjackson.com
 Web Site: http://www.richardjackson.com

Project Title
 PROPOSED DWELLING,
 ABBEY BOTTOM FARM, WIX

Client Title
 MRS MILWAIN

Drawing No.
 45051/P/02

Drawing Title
 FLOOD ZONE
 MAPPING

Scale
 1:200 @ A3
Job Manager
 M. GEORGE

Drawing Status
 INFORMATION
 TENDER
 APPROVAL
 CONSTRUCTION
 AS CONSTRUCTED

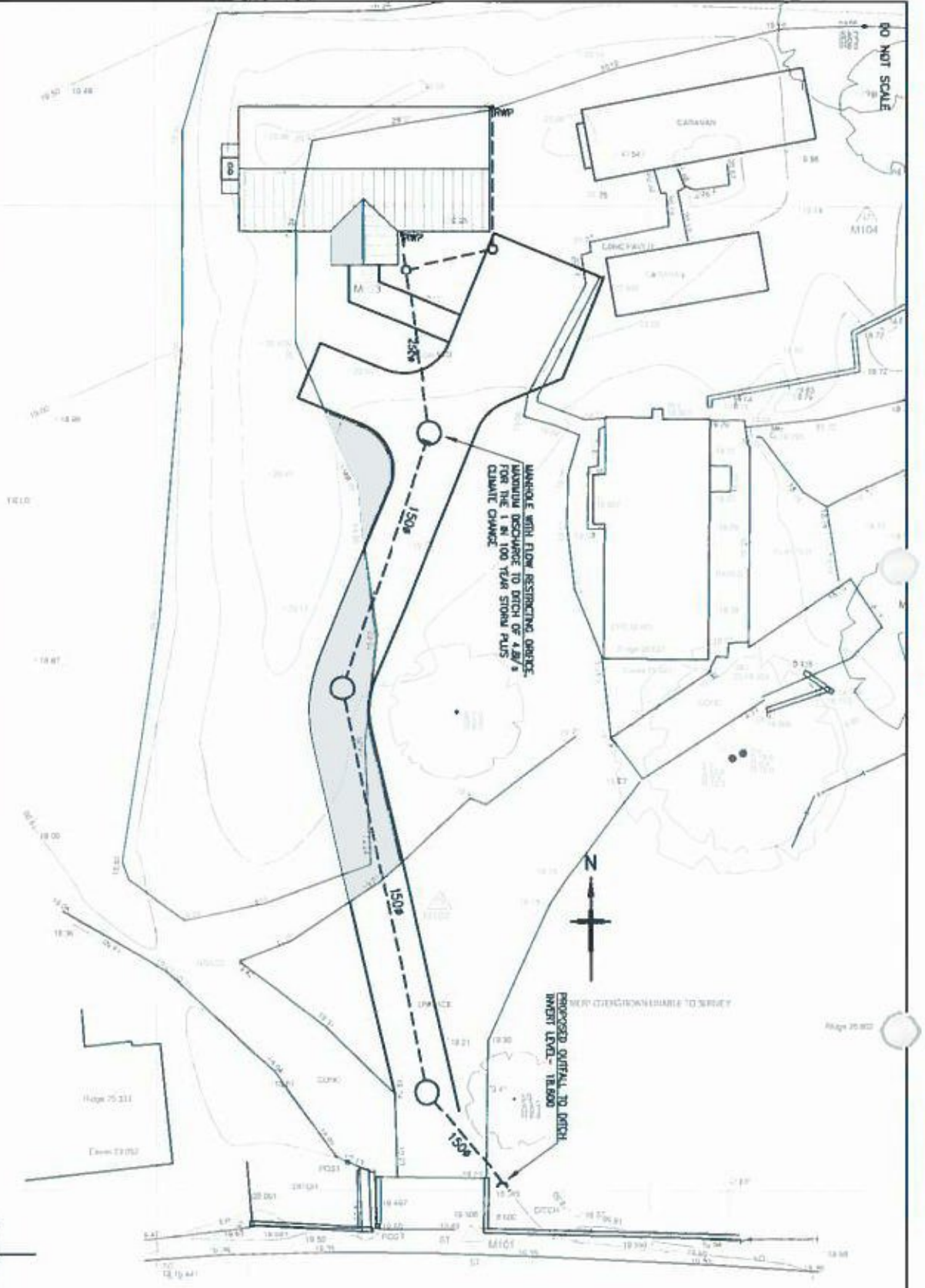
Date
 JANUARY 2014

Revision
 CHD

APPENDIX E

Preliminary Drainage Calculations

DO NOT SCALE



- NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELATED ARCHITECT'S AND SURVEYOR'S DRAWINGS AND REPORTS.
 2. DO NOT SCALE FROM THIS DRAWING.
 3. THIS DRAWING SHOULD NOT BE USED FOR CONSTRUCTION.

KEY	
	SURFACE WATER NETWORK
	450mm PLASTIC INSPECTION CHAMBER
	RURAL WATER PIPE

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engineering consultants

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 Via Email: J.Stokes@rjackson.com, 01474 312124
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Project Title
**PROPOSED DWELLING,
 ABBEY BOTTOM FARM, WIX**

Drawing Title
**PROPOSED SURFACE WATER
 DRAINAGE STRATEGY**

Client Title
MRS MILWAIN

Scale
 1:200 @ A3
 Job Manager
 M. GEODES

Drawn
 J. TINKER

Checked
 OH

Date
 JANUARY 2014


Approved

REV	DATE	DESCRIPTION	DRAWN	CHECKED

Drawing No.
45051/P/03


Drawing Status

<input checked="" type="checkbox"/> INFORMATION	<input type="checkbox"/> APPROVAL	<input type="checkbox"/> COSTING
<input type="checkbox"/> TENDER	<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> AS CONSTRUCTED

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14	Designed by CH	
File Abbey Bottom Far...	Checked by	
Micro Drainage	Source Control 2013.1	


Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	19.200	0.200	4.7	0.4	O K
30 min Summer	19.170	0.170	4.3	0.3	O K
60 min Summer	19.114	0.114	3.2	0.2	O K
120 min Summer	19.084	0.084	2.2	0.1	O K
180 min Summer	19.071	0.071	1.7	0.1	O K
240 min Summer	19.063	0.063	1.4	0.1	O K
360 min Summer	19.051	0.051	1.0	0.1	O K
480 min Summer	19.044	0.044	0.8	0.1	O K
600 min Summer	19.041	0.041	0.7	0.1	O K
720 min Summer	19.038	0.038	0.6	0.0	O K
960 min Summer	19.035	0.035	0.5	0.0	O K
1440 min Summer	19.029	0.029	0.3	0.0	O K
2160 min Summer	19.025	0.025	0.3	0.0	O K
2880 min Summer	19.022	0.022	0.2	0.0	O K
4320 min Summer	19.018	0.018	0.1	0.0	O K
5760 min Summer	19.017	0.017	0.1	0.0	O K
7200 min Summer	19.015	0.015	0.1	0.0	O K
8640 min Summer	19.014	0.014	0.1	0.0	O K
10080 min Summer	19.013	0.013	0.1	0.0	O K
15 min Winter	19.206	0.206	4.8	0.4	O K
30 min Winter	19.148	0.148	3.9	0.3	O K
60 min Winter	19.097	0.097	2.7	0.2	O K
120 min Winter	19.071	0.071	1.7	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)	
15 min Summer	114.281	0.0	2.1	11	
30 min Summer	75.158	0.0	2.8	18	
60 min Summer	47.182	0.0	3.5	34	
120 min Summer	28.693	0.0	4.3	62	
180 min Summer	21.198	0.0	4.8	92	
240 min Summer	17.014	0.0	5.1	122	
360 min Summer	12.387	0.0	5.6	184	
480 min Summer	9.861	0.0	5.9	242	
600 min Summer	8.268	0.0	6.2	304	
720 min Summer	7.157	0.0	6.4	358	
960 min Summer	5.695	0.0	6.8	478	
1440 min Summer	4.121	0.0	7.4	734	
2160 min Summer	2.977	0.0	8.0	1072	
2880 min Summer	2.361	0.0	8.5	1444	
4320 min Summer	1.701	0.0	9.2	2144	
5760 min Summer	1.347	0.0	9.7	2880	
7200 min Summer	1.123	0.0	10.1	3640	
8640 min Summer	0.968	0.0	10.5	4272	
10080 min Summer	0.853	0.0	10.7	5048	
15 min Winter	114.281	0.0	2.4	11	
30 min Winter	75.158	0.0	3.2	18	
60 min Winter	47.182	0.0	4.0	32	
120 min Winter	28.693	0.0	4.8	64	

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
180 min Winter	19.060	0.060	1.2	0.1	O K
240 min Winter	19.051	0.051	1.0	0.1	O K
360 min Winter	19.042	0.042	0.7	0.1	O K
480 min Winter	19.038	0.038	0.6	0.0	O K
600 min Winter	19.036	0.036	0.5	0.0	O K
720 min Winter	19.033	0.033	0.4	0.0	O K
960 min Winter	19.029	0.029	0.3	0.0	O K
1440 min Winter	19.025	0.025	0.3	0.0	O K
2160 min Winter	19.021	0.021	0.2	0.0	O K
2880 min Winter	19.019	0.019	0.1	0.0	O K
4320 min Winter	19.016	0.016	0.1	0.0	O K
5760 min Winter	19.014	0.014	0.1	0.0	O K
7200 min Winter	19.013	0.013	0.1	0.0	O K
8640 min Winter	19.012	0.012	0.1	0.0	O K
10080 min Winter	19.011	0.011	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
180 min Winter	21.198	0.0	5.3	94	
240 min Winter	17.014	0.0	5.7	124	
360 min Winter	12.387	0.0	6.2	178	
480 min Winter	9.861	0.0	6.6	242	
600 min Winter	8.268	0.0	6.9	300	
720 min Winter	7.157	0.0	7.2	366	
960 min Winter	5.695	0.0	7.7	482	
1440 min Winter	4.121	0.0	8.3	734	
2160 min Winter	2.977	0.0	9.0	1096	
2880 min Winter	2.361	0.0	9.5	1444	
4320 min Winter	1.701	0.0	10.3	2176	
5760 min Winter	1.347	0.0	10.9	2944	
7200 min Winter	1.123	0.0	11.3	3536	
8640 min Winter	0.968	0.0	11.7	4352	
10080 min Winter	0.853	0.0	12.0	5096	

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Date 15 Jan 14	Designed by CH		
File Abbey Bottom Far...	Checked by		
Micro Drainage	Source Control 2013.1		


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change t	+30

Time Area Diagram

Total Area (ha) 0.010

Time (mins)	Area
From:	To: (ha)
0	4 0.010

Richard Jackson Plc		Page 4
26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Model Details


Storage is Online Cover Level (m) 20.000

Pipe Structure

Diameter (m) 0.225 Length (m) 5.000
Slope (1:X) 167.000 Invert Level (m) 19.000


Orifice Outflow Control

Diameter (m) 0.075 Discharge Coefficient 0.600 Invert Level (m) 19.000

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage		Source Control 2013.1

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	19.108	0.108	3.1	0.2	O K
30 min Summer	19.098	0.098	2.7	0.2	O K
60 min Summer	19.078	0.078	1.9	0.1	O K
120 min Summer	19.061	0.061	1.3	0.1	O K
180 min Summer	19.050	0.050	1.0	0.1	O K
240 min Summer	19.044	0.044	0.8	0.1	O K
360 min Summer	19.038	0.038	0.6	0.0	O K
480 min Summer	19.035	0.035	0.5	0.0	O K
600 min Summer	19.032	0.032	0.4	0.0	O K
720 min Summer	19.029	0.029	0.3	0.0	O K
960 min Summer	19.026	0.026	0.3	0.0	O K
1440 min Summer	19.023	0.023	0.2	0.0	O K
2160 min Summer	19.019	0.019	0.2	0.0	O K
2880 min Summer	19.017	0.017	0.1	0.0	O K
4320 min Summer	19.014	0.014	0.1	0.0	O K
5760 min Summer	19.013	0.013	0.1	0.0	O K
7200 min Summer	19.012	0.012	0.1	0.0	O K
8640 min Summer	19.011	0.011	0.0	0.0	O K
10080 min Summer	19.010	0.010	0.0	0.0	O K
15 min Winter	19.108	0.108	3.1	0.2	O K
30 min Winter	19.090	0.090	2.4	0.1	O K
60 min Winter	19.069	0.069	1.6	0.1	O K
120 min Winter	19.050	0.050	1.0	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)	
15 min Summer	68.004	0.0	1.3	10	
30 min Summer	44.316	0.0	1.7	18	
60 min Summer	27.653	0.0	2.1	32	
120 min Summer	16.779	0.0	2.5	64	
180 min Summer	12.409	0.0	2.8	94	
240 min Summer	9.980	0.0	3.0	124	
360 min Summer	7.303	0.0	3.3	180	
480 min Summer	5.839	0.0	3.5	244	
600 min Summer	4.911	0.0	3.7	306	
720 min Summer	4.261	0.0	3.8	366	
960 min Summer	3.405	0.0	4.1	488	
1440 min Summer	2.479	0.0	4.5	728	
2160 min Summer	1.803	0.0	4.9	1100	
2880 min Summer	1.438	0.0	5.2	1424	
4320 min Summer	1.044	0.0	5.6	2188	
5760 min Summer	0.831	0.0	6.0	2936	
7200 min Summer	0.696	0.0	6.3	3568	
8640 min Summer	0.602	0.0	6.5	4264	
10080 min Summer	0.533	0.0	6.7	5072	
15 min Winter	68.004	0.0	1.4	10	
30 min Winter	44.316	0.0	1.9	18	
60 min Winter	27.653	0.0	2.3	32	
120 min Winter	16.779	0.0	2.8	64	

Richard Jackson Plc		Page 2
26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
180 min Winter	19.042	0.042	0.7	0.1	O K
240 min Winter	19.038	0.038	0.6	0.0	O K
360 min Winter	19.033	0.033	0.4	0.0	O K
480 min Winter	19.029	0.029	0.3	0.0	O K
600 min Winter	19.027	0.027	0.3	0.0	O K
720 min Winter	19.025	0.025	0.3	0.0	O K
960 min Winter	19.022	0.022	0.2	0.0	O K
1440 min Winter	19.019	0.019	0.1	0.0	O K
2160 min Winter	19.016	0.016	0.1	0.0	O K
2880 min Winter	19.014	0.014	0.1	0.0	O K
4320 min Winter	19.012	0.012	0.1	0.0	O K
5760 min Winter	19.011	0.011	0.0	0.0	O K
7200 min Winter	19.010	0.010	0.0	0.0	O K
8640 min Winter	19.009	0.009	0.0	0.0	O K
10080 min Winter	19.008	0.008	0.0	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)	
180 min Winter	12.409	0.0	3.1	92	
240 min Winter	9.980	0.0	3.4	118	
360 min Winter	7.303	0.0	3.7	186	
480 min Winter	5.839	0.0	3.9	240	
600 min Winter	4.911	0.0	4.1	298	
720 min Winter	4.261	0.0	4.3	368	
960 min Winter	3.405	0.0	4.6	482	
1440 min Winter	2.479	0.0	5.0	724	
2160 min Winter	1.803	0.0	5.5	1084	
2880 min Winter	1.438	0.0	5.8	1452	
4320 min Winter	1.044	0.0	6.3	2136	
5760 min Winter	0.831	0.0	6.7	2920	
7200 min Winter	0.696	0.0	7.0	3392	
8640 min Winter	0.602	0.0	7.3	4352	
10080 min Winter	0.533	0.0	7.5	5184	

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26 HIGH ST. HADLEIGH
IPSWICH SUFFOLK
IP7 5AP

Abbey Bottom Farm
Wix
Orifice Control



Date 15 Jan 14

Designed by CH

File Abbey Bottom Far...

Checked by

Micro Drainage

Source Control 2013.1


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change ‡	+0

Time Area Diagram

Total Area (ha) 0.010

Time (mins)	Area
From: To:	(ha)
0	4 0.010

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Model Details


Storage is Online Cover Level (m) 20.000

Pipe Structure

Diameter (m) 0.225 Length (m) 5.000
Slope (1:X) 167.000 Invert Level (m) 19.000


Orifice Outflow Control

Diameter (m) 0.075 Discharge Coefficient 0.600 Invert Level (m) 19.000

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Summary of Results for 1 year Return Period


Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	19.059	0.059	1.2	0.1	O K
30 min Summer	19.054	0.054	1.1	0.1	O K
60 min Summer	19.044	0.044	0.8	0.1	O K
120 min Summer	19.037	0.037	0.5	0.0	O K
180 min Summer	19.033	0.033	0.4	0.0	O K
240 min Summer	19.029	0.029	0.3	0.0	O K
360 min Summer	19.026	0.026	0.3	0.0	O K
480 min Summer	19.023	0.023	0.2	0.0	O K
600 min Summer	19.021	0.021	0.2	0.0	O K
720 min Summer	19.020	0.020	0.2	0.0	O K
960 min Summer	19.018	0.018	0.1	0.0	O K
1440 min Summer	19.015	0.015	0.1	0.0	O K
2160 min Summer	19.013	0.013	0.1	0.0	O K
2880 min Summer	19.012	0.012	0.1	0.0	O K
4320 min Summer	19.010	0.010	0.0	0.0	O K
5760 min Summer	19.009	0.009	0.0	0.0	O K
7200 min Summer	19.008	0.008	0.0	0.0	O K
8640 min Summer	19.007	0.007	0.0	0.0	O K
10080 min Summer	19.007	0.007	0.0	0.0	O K
15 min Winter	19.060	0.060	1.2	0.1	O K
30 min Winter	19.050	0.050	1.0	0.1	O K
60 min Winter	19.040	0.040	0.7	0.1	O K
120 min Winter	19.032	0.032	0.4	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)	
15 min Summer	27.777	0.0	0.5	10	
30 min Summer	18.030	0.0	0.7	18	
60 min Summer	11.376	0.0	0.9	32	
120 min Summer	7.043	0.0	1.1	62	
180 min Summer	5.294	0.0	1.2	94	
240 min Summer	4.319	0.0	1.3	122	
360 min Summer	3.239	0.0	1.5	182	
480 min Summer	2.634	0.0	1.6	242	
600 min Summer	2.237	0.0	1.7	304	
720 min Summer	1.957	0.0	1.8	364	
960 min Summer	1.585	0.0	1.9	490	
1440 min Summer	1.179	0.0	2.1	724	
2160 min Summer	0.877	0.0	2.4	1104	
2880 min Summer	0.711	0.0	2.6	1428	
4320 min Summer	0.529	0.0	2.9	2124	
5760 min Summer	0.428	0.0	3.1	2912	
7200 min Summer	0.364	0.0	3.3	3648	
8640 min Summer	0.319	0.0	3.4	4304	
10080 min Summer	0.285	0.0	3.6	5040	
15 min Winter	27.777	0.0	0.6	10	
30 min Winter	18.030	0.0	0.8	18	
60 min Winter	11.376	0.0	1.0	32	
120 min Winter	7.043	0.0	1.2	62	

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
180 min Winter	19.028	0.028	0.3	0.0	O K
240 min Winter	19.025	0.025	0.3	0.0	O K
360 min Winter	19.022	0.022	0.2	0.0	O K
480 min Winter	19.019	0.019	0.2	0.0	O K
600 min Winter	19.018	0.018	0.1	0.0	O K
720 min Winter	19.017	0.017	0.1	0.0	O K
960 min Winter	19.015	0.015	0.1	0.0	O K
1440 min Winter	19.013	0.013	0.1	0.0	O K
2160 min Winter	19.011	0.011	0.1	0.0	O K
2880 min Winter	19.010	0.010	0.0	0.0	O K
4320 min Winter	19.008	0.008	0.0	0.0	O K
5760 min Winter	19.007	0.007	0.0	0.0	O K
7200 min Winter	19.007	0.007	0.0	0.0	O K
8640 min Winter	19.006	0.006	0.0	0.0	O K
10080 min Winter	19.006	0.006	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume* (m ³)	Time-Peak (mins)
180 min Winter	5.294	0.0	1.3	94
240 min Winter	4.319	0.0	1.5	120
360 min Winter	3.239	0.0	1.6	182
480 min Winter	2.634	0.0	1.8	234
600 min Winter	2.237	0.0	1.9	294
720 min Winter	1.957	0.0	2.0	360
960 min Winter	1.585	0.0	2.1	492
1440 min Winter	1.179	0.0	2.4	736
2160 min Winter	0.877	0.0	2.7	1088
2880 min Winter	0.711	0.0	2.9	1428
4320 min Winter	0.529	0.0	3.2	2064
5760 min Winter	0.428	0.0	3.5	2840
7200 min Winter	0.364	0.0	3.7	3728
8640 min Winter	0.319	0.0	3.9	4312
10080 min Winter	0.285	0.0	4.0	4888

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26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14	Designed by CH	
File Abbey Bottom Far...	Checked by	
Micro Drainage	Source Control 2013.1	


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.010

Time (mins)	Area
From: To:	(ha)
0	4 0.010

Richard Jackson Plc		Page 4
26 HIGH ST. HADLEIGH IPSWICH SUFFOLK IP7 5AP	Abbey Bottom Farm Wix Orifice Control	
Date 15 Jan 14 File Abbey Bottom Far...	Designed by CH Checked by	
Micro Drainage	Source Control 2013.1	

Model Details

Storage is Online Cover Level (m) 20.000

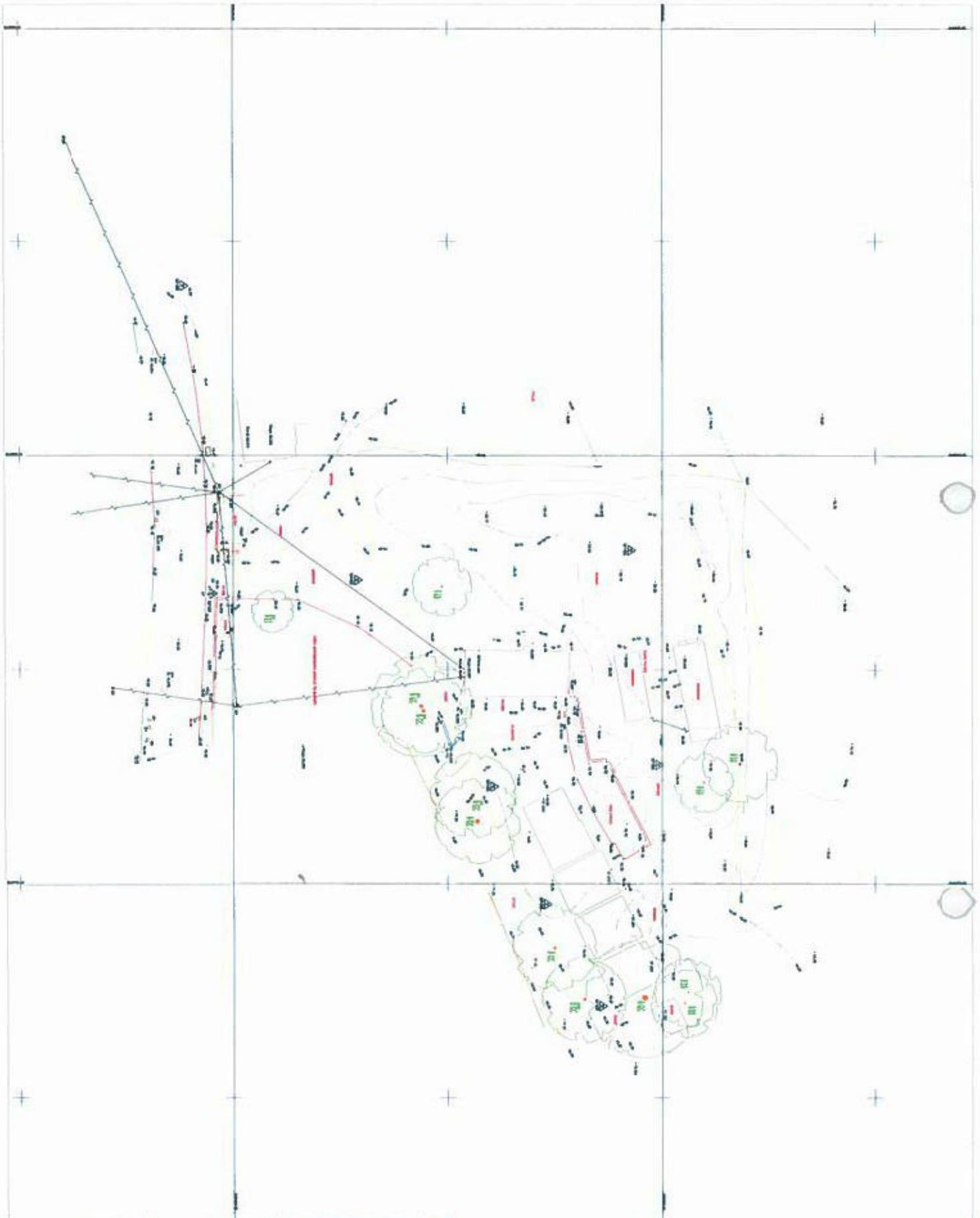
Pipe Structure

Diameter (m) 0.225 Length (m) 5.000
Slope (1:X) 167.000 Invert Level (m) 19.000

Orifice Outflow Control

Diameter (m) 0.075 Discharge Coefficient 0.600 Invert Level (m) 19.000

APPENDIX F
Topographical Survey



STATE OF CONNECTICUT
 DEPARTMENT OF CONSTRUCTION
 SURVEYING BOARD
 56-07010101

NO.	DESCRIPTION	DATE
1	REVISION	11/11/01
2	REVISION	11/11/01
3	REVISION	11/11/01
4	REVISION	11/11/01
5	REVISION	11/11/01
6	REVISION	11/11/01
7	REVISION	11/11/01
8	REVISION	11/11/01
9	REVISION	11/11/01
10	REVISION	11/11/01

DATE: 11/11/01

NO.	DESCRIPTION	DATE
1	REVISION	11/11/01
2	REVISION	11/11/01
3	REVISION	11/11/01
4	REVISION	11/11/01
5	REVISION	11/11/01
6	REVISION	11/11/01
7	REVISION	11/11/01
8	REVISION	11/11/01
9	REVISION	11/11/01
10	REVISION	11/11/01

DATE: June 2011
 SCALE: 1"=50'
 PROJECT: 10/11/11/2011
 CLIENT: Mr. & Mrs. [Name]
 PROJECT: 1/2 Acre [Name]
 ADDRESS: [Address]
 CITY: [City]
 STATE: [State]


Anglo Land Surveys, Inc.
 127700
 1000 [Address]
 [City], [State] 06110
 [Phone Number]
 [Fax Number]
 [Website]

Paul Newbould

From: Planning Portal [support@planningportal.gov.uk]
Sent: 18 February 2014 16:32
To: enquiries@paulnewbould.co.uk
Subject: Planning Portal Online Application Ref 3189313 v1

Ref 3189313 v1

Your Local Planning Authority, Tendring District Council has received your online planning application and will now validate it within their normal work flow and timescales.

If they need more information or have any queries they will contact you direct. Please note that this message does not constitute the formal acceptance of your electronic submission by your Local Planning Authority.

For further information on the progress of your online application please contact:
Tendring District Council
<http://www.tendringdc.gov.uk/TendringDC/>
dcadmin.planning@tendringdc.gov.uk
(01255) 686161

This email is for information only. Please do not reply. For assistance on Planning Portal issues please email support@planningportal.gsi.gov.uk

www.planningportal.gov.uk

