

Huntingdonshire Local Plan to 2036 Examination

EXAM/47: Representations to the Proposed Main Modifications 2018 Consultation (in Representor Order)

Part 4 of 4 – M to W

Huntingdonshire District Council
February 2018

Comment

Consultee	Mr Alan Marnes (1038785)
Email Address	[REDACTED]
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Mr Alan Marnes (1038785)
Comment ID	PMM2018:1
Response Date	16/12/18 21:54
Consultation Point	1.2 Paragraph (View)
Status	Processed
Submission Type	Web
Version	0.2

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

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Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

As the representative of Southoe and Midloe parish council, I attended many of the sessions to try and get over to H.D.C. and the inspector that the priority for the district is to get the infrastructure right before anymore development is allowed. The roads are a nightmare in the south of the district, especially the A1 which is unfit for the modern traffic that we see every day. This was pointed out to the inspector that the documentation (Cambridgeshire county councils long term transport strategy plan 2015) used to evaluate traffic flows/problems, was flawed. This in as much as the figures used are out by as much as 25% on the day to day vehicle flows on the A1 between the Blackcat roundabout and the Buckden roundabout. Hence most mornings and evenings there is often traffic backed up for many miles. The second flaw with the C.C.C. document it assumes central governments R.I.S2 identified 2 schemes that would have positive impact on Huntingdonshire that would be acted on. The 1st of these is to upgrade the A1 from Baldock to Alconbury. Highways England have told interested parties that this plan is will not be even considered for many years. The 2nd of the schemes to upgrade the A428 is in the pipeline once the A14 is finished. But when this is done it will only exacerbate the problems on the A1.

Summary

Southoe and Midloe parish council continue to express concern over traffic levels on the A1 and A428 and the methodology used for the long term transport strategy 2015.

Comment

Consultee	Mr Graham Moore (34415)
Email Address	[REDACTED]
Company / Organisation	Middle Level Commissioners
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Middle Level Commissioners (Mr Graham Moore - 34415)
Comment ID	PMM2018:72
Response Date	29/01/19 16:22
Consultation Point	Proposed Main Modification 30 (View)
Status	Processed
Submission Type	Letter
Version	0.11
Files	Middle Level Commissioners_Redacted.pdf

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

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Do you consider this proposed main modification to be legally compliant? **Not legally compliant**

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Please enter your representation here.

Huntingdonshire Local Plan to 2036 Proposed Main Modifications 2018 for Consultation Thank you for your e-mail dated 11th December concerning the above. The content of the above Modification document has been considered and our comments are as follows: MM30 – RA3 West Station Yard & Northern Mill, Ramsey The contents of item F are noted but fail to consider the judgement of the Supreme Court in the Commissioners' favour in 2014 (Manchester Ship Canal v United Utilities 2014) which questioned the right of a sewerage undertaker to discharge sewage, both surface water and treated effluent, to a watercourse. This case established a number of principles and for our purposes established the following: • The implied right of an undertaker without either the consent of the owner of the watercourse or the exercise of compulsory powers to create new outfalls or increase the discharge through previously constructed outfalls ended in 1991 with the passing of the Water Industry Act 1991. • Pre-existing outfalls and discharges constructed or made under the pre-existing legislative regime remain legal. • As far as bodies such as Internal Drainage Boards are concerned, both the right to discharge and the right of a developer to connect to an existing public sewer under Section 106 of the Water Industry Act are "relevant sewerage provisions" and therefore require consent from the Middle Level Commissioners or Internal Drainage Boards where their systems would be adversely affected, in addition to any consents from the sewerage undertaker. In addition, any consents issued by either the Commissioners or associated Boards fully consider the implications of the WFD on its watercourses.

Supporting documents

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[Middle Level Commissioners_Redacted.pdf](#)

Summary

Object to Main Modification 30. The contents of item F are noted but fail to consider the judgement of the Supreme Court in the Commissioners' favour in 2014 (Manchester Ship Canal v United Utilities 2014) which questioned the right of a sewerage undertaker to discharge sewage, both surface water and treated effluent, to a watercourse.

From: [DMAdmin](#)
To: [Local Plan](#)
Subject: FW: Huntingdonshire Local Plan to 2036 - Proposed Main Modifications 2018 for Consultation
Date: 29 January 2019 16:22:30

From: Planning [REDACTED]
Sent: 29 January 2019 14:16
To: CRM_Planning
Subject: Huntingdonshire Local Plan to 2036 - Proposed Main Modifications 2018 for Consultation

Our ref: GM/139/1/Admin HDF LDF, 324/1, 325/1, 333/1, 342/1, 350/, & 357/1

Dear Sirs

Huntingdonshire Local Plan to 2036

-

Proposed Main Modifications 2018 for Consultation

-

Thank you for your e-mail dated 11th December concerning the above.

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The content of the above Modification document has been considered and our comments are as follows:

MM30 – RA3 West Station Yard & Northern Mill, Ramsey

The contents of item F are noted but fail to consider the judgement of the Supreme Court in the Commissioners' favour in 2014 (Manchester Ship Canal v United Utilities 2014) which questioned the right of a sewerage undertaker to discharge sewage, both surface water and treated effluent, to a watercourse.

This case established a number of principles and for our purposes established the following:

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In addition, any consents issued by either the Commissioners or associated Boards fully consider the implications of the WFD on its watercourses.

MM33 – WB2 Manor Farm Buildings, Warboys

The Planning Inspector's comment is incorrect as it fails to consider the judgement of the Supreme Court in the Commissioners' favour in 2014 (Manchester Ship Canal v United Utilities 2014) which questioned the right of a sewerage undertaker to discharge sewage, both surface water and treated effluent, to a watercourse.

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In addition, any consents issued by either the Commissioners or associated Boards fully consider the implications of the WFD on its watercourses.

Regards

Graham Moore
Planning Engineer

Middle Level Commissioners

85 Whittlesey Road, March, Cambs. PE15 0AH

[REDACTED]

[REDACTED]

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Comment

Consultee	Mr Graham Moore (34415)
Email Address	[REDACTED]
Company / Organisation	Middle Level Commissioners
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Middle Level Commissioners (Mr Graham Moore - 34415)
Comment ID	PMM2018:73
Response Date	29/01/19 16:22
Consultation Point	Proposed Main Modification 33 (View)
Status	Processed
Submission Type	Email
Version	0.5
Files	Middle Level Commissioners_Redacted.pdf

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

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MM33 – WB2 Manor Farm Buildings, Warboys The Planning Inspector's comment is incorrect as it fails to consider the judgement of the Supreme Court in the Commissioners' favour in 2014 (Manchester Ship Canal v United Utilities 2014) which questioned the right of a sewerage undertaker to discharge sewage, both surface water and treated effluent, to a watercourse. This case established a number of principles and for our purposes established the following: • The implied right of an undertaker without either the consent of the owner of the watercourse or the exercise of compulsory powers to create new outfalls or increase the discharge through previously constructed outfalls ended in 1991 with the passing of the Water Industry Act 1991. • Pre-existing outfalls and discharges constructed or made under the pre-existing legislative regime remain legal. • As far as bodies such as Internal Drainage Boards are concerned, both the right to discharge and the right of a developer to connect to an existing public sewer under Section 106 of the Water Industry Act are "relevant sewerage provisions" and therefore require consent from the Middle Level Commissioners or Internal Drainage Boards where their systems would be adversely affected, in addition to any consents from the sewerage undertaker. In addition, any consents issued by either the Commissioners or associated Boards fully consider the implications of the WFD on its watercourses.

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Summary

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To: CRM_Planning
Subject: Huntingdonshire Local Plan to 2036 - Proposed Main Modifications 2018 for Consultation

Our ref: GM/139/1/Admin HDF LDF, 324/1, 325/1, 333/1, 342/1, 350/, & 357/1

Dear Sirs

Huntingdonshire Local Plan to 2036

-

Proposed Main Modifications 2018 for Consultation

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Thank you for your e-mail dated 11th December concerning the above.

-

The content of the above Modification document has been considered and our comments are as follows:

MM30 – RA3 West Station Yard & Northern Mill, Ramsey

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Regards

Graham Moore
Planning Engineer

Middle Level Commissioners

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[REDACTED]

[REDACTED]

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Comment

Consultee	Hannah Bevins (1136581)
Email Address	[REDACTED]
Company / Organisation	National Grid
Address	* * *
Event Name	Proposed Main Modifications 2018
Comment by	National Grid (Hannah Bevins - 1136581)
Comment ID	PMM2018:5
Response Date	13/12/18 11:55
Consultation Point	Huntingdonshire Local Plan to 2036: Proposed Main Modifications 2018 for Consultation (View)
Status	Processed
Submission Type	Email
Version	0.5

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

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Please enter your representation here.

We have reviewed the above consultation document and can confirm that National Grid has no comments to make in response to this consultation.

Summary

National Grid have no comments.

Comment

Consultee	Janet Nuttall (34468)
Email Address	[REDACTED]
Company / Organisation	Natural England
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Natural England (Janet Nuttall - 34468)
Comment ID	PMM2018:68
Response Date	29/01/19 15:51
Consultation Point	Proposed Main Modification 3 (View)
Status	Processed
Submission Type	Email
Version	0.5
Files	Nuttall for Natural England_Redacted.pdf

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MM3 – Natural England supports the inclusion of an additional paragraph within Policy LP 5 Flood Risk to require development to demonstrate how opportunities for flood risk management, multi-functional flood storage, SUDS and rainwater harvesting have been considered. This will help to ensure the delivery additional benefits to the natural environment including biodiversity enhancements and climate change mitigation.

Summary

Natural England supports the inclusion of the additional paragraph. This will help to ensure the delivery of additional benefits to the natural environment including biodiversity enhancements and climate change mitigation.

Date: 29 January 2019
Our ref: 267292, 267516, 267520
Your ref: [Click here to enter text.](#)



Local Plans Team
Huntingdonshire District Council

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Dear Sir/Madam

Thank you for consulting Natural England on the above in your email of 10 December 2018.

You will be aware that Natural England has provided comments during earlier consultation stages of the Huntingdonshire Local Plan preparation process including comments at the submission stage, in our letter dated 5 February 2018 (ref. 234429), and written representations submitted for the examination. Our comments on proposed modifications relevant to our natural environment, and the accompanying HRA and SA, are provided below.

MM3 – Natural England supports the inclusion of an additional paragraph within Policy LP 5 Flood Risk to require development to demonstrate how opportunities for flood risk management, multi-functional flood storage, SUDS and rainwater harvesting have been considered. This will help to ensure the delivery additional benefits to the natural environment including biodiversity enhancements and climate change mitigation.

MM14 - we welcome inclusion of additional text within policy LP 32 Biodiversity and Geodiversity to clarify the package of on and off-site mitigation and monitoring measures that developers may be expected to deliver, or provide a contribution towards their delivery, to address impacts to designated sites.

MM21 – Natural England is disappointed with the amendment to Policy HU10 to significantly reduce the Hinchingsbrooke Country Park Extension area from 44ha to 27.5ha. We have provided further comments on this in response to the Habitats Regulations Assessment. However, we welcome the proposed provision of additional pedestrian paths, including a north to south route via the eastern edge of the island.

The Proposed Main Modifications 2018 Habitats Regulations Assessment identifies marginally positive effects for European sites, particularly Portholme Special Area of Conservation (SAC). This is considered to be largely due to MM1 which reduces the anticipated number of housing completions within the plan period, particularly around the Huntingdon Spatial Planning Area. The HRA indicates that this will have potentially positive effects for Portholme in terms of reduced airborne pollution, reduced pressure for recreational use, reduced overall risk of flooding and reduced risk of impacts from reduced water quality. Natural England's advice is that the HRA should assess the effects of significantly reducing the area of the Hinchingsbrooke Country Park Extension, through MM21, given that this is a key measure for mitigating the recreational impacts

of Plan development on Portholme SAC. Clarification should be provided to demonstrate that this 'reduced mitigation' is proportionately offset by a reduction in the number of housing completions through the plan period.

We agree that the clearer guidance on flood risk assessments and requirement for climate change predictions to be taken into account, introduced through MM3, will have potentially positive effects on Portholme SAC and the Ouse Washes SAC, SPA and Ramsar site through reduced impact on water quality.

Subject to clarification relating to MM21, discussed above, Natural England is generally supportive of the HRA conclusion that proposed main modifications will not result in any adverse effect on the ecological integrity of any designated site addressed in the HRA. Since the proposed main modifications do not introduce any new development site allocations the no adverse effect conclusion of the Local Plan HRA therefore remains unchanged.

The Proposed Main Modifications 2018 Sustainability Appraisal identifies the need for further appraisal of the sustainability implications of a number of the proposed main modifications. Whilst we are satisfied that most of the modifications will not give rise to additional significant environmental impact we are not convinced that MM21, which significantly reduces the area of the proposed Hinchingsbrooke Country Park Extension, does not reduce the social and environmental benefits that could be achieved. Natural England welcomes the recommendation for further appraisal of the effects of MM21 given the 'mitigation' that the Country Park Extension is expected to provide through creation of alternative open space: this seeks to divert additional recreational pressure, through Plan development, away from more sensitive areas of the green infrastructure network, including European and nationally designated sites. The need for developments to deliver additional green infrastructure, in lieu of that 'lost' through MM21, should be considered in light of the need for adequate mitigation to address the effects of recreational pressure on European and nationally designated sites, including Portholme SAC. The Sustainability Appraisal should be revised to provide clarification on this issue.

I hope you will find our detailed comments helpful. For any queries relating to the specific advice in this letter only please contact [REDACTED]. For any new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

Yours sincerely

Janet Nuttall
Sustainable Land Use Adviser

Comment

Consultee	Janet Nuttall (34468)
Email Address	[REDACTED]
Company / Organisation	Natural England
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Natural England (Janet Nuttall - 34468)
Comment ID	PMM2018:69
Response Date	29/01/19 15:51
Consultation Point	Proposed Main Modification 14 (View)
Status	Processed
Submission Type	Email
Version	0.3
Files	Nuttall for Natural England_Redacted.pdf

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MM14 - we welcome inclusion of additional text within policy LP 32 Biodiversity and Geodiversity to clarify the package of on and off-site mitigation and monitoring measures that developers may be expected to deliver, or provide a contribution towards their delivery, to address impacts to designated sites.

Summary

Welcome inclusion of additional text.

Comment

Consultee	Janet Nuttall (34468)
Email Address	[REDACTED]
Company / Organisation	Natural England
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Natural England (Janet Nuttall - 34468)
Comment ID	PMM2018:70
Response Date	29/01/19 15:51
Consultation Point	Proposed Main Modification 21 (View)
Status	Processed
Submission Type	Email
Version	0.3
Files	Nuttall for Natural England_Redacted.pdf

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MM21 – Natural England is disappointed with the amendment to Policy HU10 to significantly reduce the Hinchingsbrooke Country Park Extension area from 44ha to 27.5ha. We have provided further comments on this in response to the Habitats Regulations Assessment. However, we welcome the proposed provision of additional pedestrian paths, including a north to south route via the eastern edge of the island.

Summary

Natural England is disappointed with the amendment to Policy HU10 to significantly reduce the Hinchingsbrooke Country Park Extension area.

Family or Company Name: Price, Nick
Agent: Brown & Co. Barfords (Page, Martin)
PMM: MM20

Comment

Agent	Mr Martin Page (1114230)
Email Address	[REDACTED]
Company / Organisation	Brown & Co Barfords
Address	[REDACTED] [REDACTED] [REDACTED]
Consultee	Mr Nick Price (1117165)
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Mr Nick Price (1117165)
Comment ID	PMM2018:35
Response Date	28/01/19 15:27
Consultation Point	Proposed Main Modification 20 (View)
Status	Processed
Submission Type	Web
Version	0.5
Files	Modification Statement (1) Modification Statement Appendix B Modification Statement Appendix A Modification Statement (2) Modification Statement

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Object

Do you consider this proposed main modification Not Sound
to be sound?

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not... . Positively prepared
Justified

Please say whether you think this proposed main modification is legally compliant. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the issues covered by legal compliance.

Do you consider this proposed main modification to be legally compliant? Not legally compliant

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

Please note: There are no limits on the length of representations but please be as concise as possible, including only that which is necessary to explain your representation. You can support your representation with supporting documents if you wish (see below) but please include clear references and reasoning as to why any attachments support your representation.

Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

1. The first justification in the Proposed Main Modifications Sustainability Appraisal for the deletion of the site is factually incorrect. The site is not flood zone 3a. 2. Allocation HU9 has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages with known flood issues, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20. 3. The site benefits from flood defences maintained by the Environment Agency. The Environment Agency has previously confirmed the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected. Thus flood defences appear to have functioned as designed and without issue during this event. 4. A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority. The FRA includes modelled flood data for the area provided by the Environment Agency and a topographical survey has established the roads surrounding the site provide a raised barrier and it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land. 5. Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1. 6. This assessment is reflected in advice from the Environment Agency when commenting on the adjacent development proposals approved as recently as April 2018, when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1. 7. For the reasons explained above it is evident there is confusion regarding the risk of flooding at the site and at the time of submitting this representation the Environment Agency has advised it is currently reviewing the flood zone classification for the allocation site HU9 with its flood modelling team. 8. In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims as the allocation site is located within the Huntingdon Spatial Planning Area, which is a focus for growth. Therefore the relative merits of developing land benefiting from permanent flood defences where the actual risk of the site flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, should be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by

the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1. 9. The proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions. 10. In relation to the second reason for the modification it is highlighted the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the level of growth in a sustainable Spatial Planning Area, which must be a negative impact, as opposed to the stated neutral impact. The above points are expanded in the attached statement and accompanying Appendices.

Supporting documents

If you would like you can support your representation with supporting documents. Please provide a description for any documents you upload and clearly reference them in your representation.

If you want to refer to a publication that is available elsewhere or that is subject to copyright that you do not control please provide a link to a website where it is available or give a full reference (including author(s), full title and date of publication) in your comment.

By submitting a supporting document you give permission for the council to use it for the purposes of drawing up planning policy for Huntingdonshire and to reproduce the document for such purposes.

Please note: There is no limit to the size of documents that can be uploaded but please only upload relevant documents and consider the use of extracts for long documents.

To upload more than one document first select your first document and upload it, then save your comment using the button at the bottom of the page. You can then select another document to upload.

Modification Statement (2)

Please tell us whether changes can be made to address the issue(s) you have identified.

Can the issue(s) you have identified be addressed by making changes to the proposed main modification? Yes

Please tell us what changes would address the issue(s) that you have identified.

You should say why these changes will make this proposed main modification sound and/ or legally compliant.

It would be helpful if you could include revised wording of any policy or text. Please identify additional text by underlining it (**U**) and identifying any text to be deleted by striking it through (**ABC**).

What changes would address the issue(s) that you have identified?

Retain allocation HU9.

Summary

Object to Main Modification 20 and the deletion of the allocation. The site specific Flood Risk Assessment and Sustainable Drainage Strategy submitted with a planning application for the site has not been challenged by the Environment Agency or the Lead Local Flood Authority. Modelled flood data for the area provided by the Environment Agency and a topographical survey has established the roads surrounding the site provide a raised barrier and it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event meaning that the site would be classified as lying within Flood Zone 1. This assessment is reflected in advice from the Environment Agency when commenting on the adjacent development proposals approved as recently as April 2018, when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1. Removing

the site could result in less sustainable locations for development, such as the Key Service centres and smaller villages, or greater reliance on rural exceptions sites and Prior Approvals to make up the housing numbers.

**Objection representation in respect of proposed Main Modification
20 to the Huntingdonshire Local Plan to 2036 and the intended
deletion of site HU9 for residential development of approximately
30 homes on land at Main Street, Hartford, Huntingdon, PE29 1YA**

on behalf of Mr N Price

Prepared by: Martin Page, Planning Consultant

For and on behalf of Brown & Co.

Brown & Co is a leading provider of agency, professional and consultancy services across the whole range of rural, commercial, residential, and agricultural markets.

Date: January 2019.

Reference: P-548P.

1.0 Introduction

1.1 Brown & Co Barfords have been instructed to submit the following Objection on behalf of Mr N Price representing the owners of land at Main Street, Hartford, Huntingdon, PE29 1YA that is allocated for residential development of approximately 30 homes (Site HU9) in the Submission Local Plan and is proposed to be deleted by Modification 20.

2.0 Background

2.1 The allocation site is located on the eastern edge of Huntingdon. To the north of the site is the Owl Way residential estate and to the south west is the property no. 2 Old Houghton Road where planning permission has recently been granted for 3 new dwellings. To the south the site is enclosed by the former West Anglia Training Centre (now in administration). The site is therefore enclosed by built form on three sides. The site is also on the Huntingdon to Cambridge Busway route with 3 services per hour during the day (in either direction) which run along Main Street and there are bus stops with real time information displays 2 minutes' walk from the site. The site is therefore in an accessible location and there are a range of services and facilities available within walking and cycling distance.



Proposed allocation site context.

2.2 The suitability of the site for development was justified in the Sustainability Appraisal on the grounds: *The site is greenfield land on the edge of Huntingdon's built-up area and is well screened from the open countryside by a mature tree belt. Access to services and*

employment are reasonable with good transport links available to Huntingdon town centre. The site does have flooding constraints and mitigation will be necessary. Access arrangements would need to be resolved to ensure highway safety.

2.3 Site allocation HU9 has been a content of the Local Plan for more than 5 years and this has passed through 4 consultation stages:

- Between May and July 2013 a draft Huntingdonshire Local Plan to 2036 (Stage 3) document was published for public consultation. This allocated the site for approximately 25 dwellings to include a mix of property types and sizes. The site was included in the Stage 3 consultation on the grounds *'the site performs well in the sustainability appraisal' and 'it is the last remaining parcel of land along Hartford Road contained within the A1123 and relates well to the existing built-up area'*.
- Between January and March 2015 the Council undertook a further targeted public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation, though the site area was enlarged to include part of the garden of No. 2 Old Houghton Road and identified a development of approximately 30 dwellings to include a mix of property types and sizes.
- Between July and August 2017 the Council undertook a further public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation for a scheme of approximately 30 dwellings to include a mix of property types and sizes.
- Between December 2017 and February 2018 the Council undertook a public consultation on the Proposed Submission Plan.

2.4 The allocation has at times included neighbouring land forming part of the garden of the No. 2 Old Houghton Road. However planning permission has been granted for 3 dwellings on this land, most recently as 20th April 2018 (LPA Ref. No. 18/00089/FUL).

2.5 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is currently under consideration (LPA Ref. No. 18/02239/OUT). This is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority.

3.0 The Council's explanation for Modification 20

3.1 The Proposed Main Modifications Sustainability Appraisal explains *'The removal of this allocation produces a positive impact in terms of removing the possibility of housing development on a site that is situated within flood zone 3a and the climate change allowance zone'*.

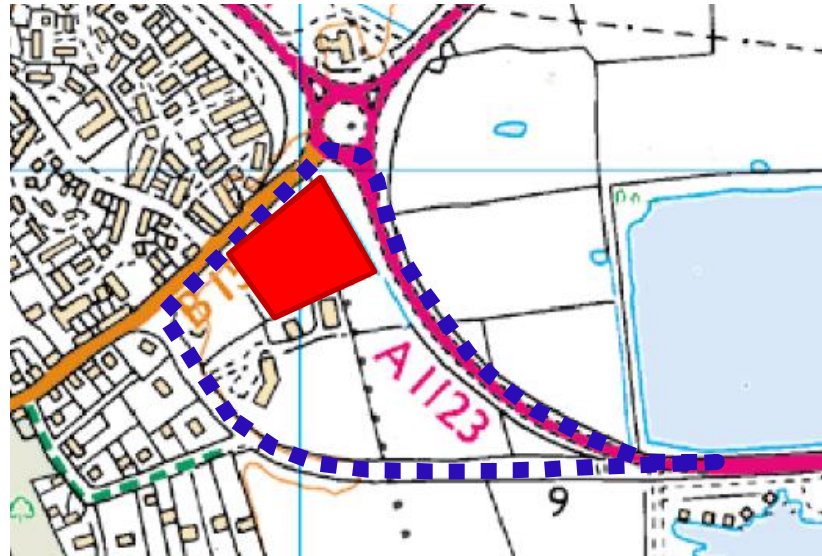
3.2 The Main Modifications Sustainability Appraisal also explains *'The removal of the allocation reduces the certainty of housing provision within the Huntingdon Spatial Planning Area; however, it has a neutral impact overall as the Development Strategy seeks to permit approximately three quarters of all housing development within Spatial Planning Areas'*.

4.0 Review of the justification for the deletion of Site HU9

- 4.1 It is highlighted the first justification is factually incorrect. This refers to 'removing the possibility of housing development on a site that is situated within flood zone 3a' However, the site is identified to be in flood zone 2, which is sequentially preferable to flood zone 3a.
- 4.2 The first justification is also at odds with the fact site was identified to be flood zone 2 in the Submission Local Plan, which the Council considered to be sound. Paragraph 9.86 of the Submission document states *'The site lies in flood zone 2 and is known to be at risk of surface water flooding so a site specific flood risk assessment will be essential. The site is defended against flooding by the raised roads near the northwestern and northeastern boundaries and by Environment Agency defences to the south. There is also a risk from surface water flooding, which is greatest in northern and eastern areas. The floor levels of dwellings should be raised above the maximum 1 in 100 year flood level taking account of climate change. A detailed explanation of flood risk management and mitigation measures will be required which should include provision of flood resilient structures. A flood response emergency plan should also be produced.'*
- 4.3 Further, to aid the preparation of the Local Plan the Council prepared a 'Huntingdonshire Local Plan to 2036: Sequential test for flood risk'. This documents the sequential and exception tests for flood risk that were undertaken to inform site allocations in the Submission Local Plan. The assessment concludes that despite meeting the housing requirement, it was considered worthwhile to assess additional sites to increase flexibility of supply, and to take advantage of specific regeneration opportunities. The document includes allocation HU9, where it notes the use of the sequential approach is limited due to the site being located entirely within Flood Zone 2; therefore any Highly Vulnerable development placed within Flood Zone 2 will be required to pass the Exception Test. Safe access and egress is not considered an issue, although climate change may increase the extent of surface water and fluvial flooding in the future and have the potential to affect routes.
- 4.4 It is acknowledged the National Planning Policy Framework states the aim is to steer new development to areas with the lowest probability of flooding. However, in preparing the Plan the Council has had regard to the Framework and the allocation has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.
- 4.5 The Planning Policy Guidance clarifies the Environment Agency Planning Flood Maps are the starting point for the sequential approach and the Flood Maps identify allocation site HU9 to be primarily within defended Flood Zone 3a, with small areas in the northern part of the site being in Flood Zone 2. The Huntingdonshire Strategic Flood Risk Assessment published in June 2017 is a level 1 and level 2 assessment that refines information on river and sea flooding risk shown on the Environment Agency's Flood Map for Planning. The Strategic Flood Risk Assessment concludes that allocation HU9 lies entirely in Flood Zone 2, with none of the site or surrounding land being classified as defended Flood Zone 3. The Assessment takes no account of the defences to the site provided by the Houghton flood defence bank that is maintained by the Environment Agency and encloses the village of

Houghton around its southern edge, extending westerly along the southern side of the Huntingdon Road (A1123) to the Old Houghton Road. The defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site. The defences are intended to provide a 1% AEP standard of protection.

- 4.6 It is highlighted that the Level 2 Detailed Site Assessment for the Main Street allocation produced (FLO/03) states *'There are no flood defences at this site'* and this is clearly an error.
- 4.7 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.
- 4.8 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore is considered to supersede the Environment Agency Flood Map, thus the site is identified to be Flood Zone 2, not defended Flood Zone 3. The Flood Zone 2 classification in the Strategic Flood Risk Assessment is believed to be solely due to flooding having historically occurred at the site in 1947.
- 4.9 The Strategic Flood Risk Assessment states the Level 2 assessment is not intended to replace site-specific FRAs and the Framework clarifies local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific flood risk assessment. To accompany the current planning application the landowners have commissioned a Flood Risk Assessment and Sustainable Drainage Strategy and this is attached – see *Appendix A*. In preparing the Assessment the Environment Agency has supplied modelled flood data for the area and the node applicable to the site identifies the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD. The topographical survey has established the roads surrounding the site provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level. As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.



Raised roads above the 1 in 1000 year flood level identified by blue dots.

- 4.10 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. Indeed the Strategic Flood Risk Assessment mapping, which included 23%, 35% and 65% allowances for climate change on a 1 in 100 year event shows that the site remained dry during all of these event.
- 4.11 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1. This is reflected in advice from the Environment Agency when commenting on the adjacent development proposals (para 2.4 above refers) when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1 - see Appendix B. It is understood the Environment Agency has subsequently found some issues with its most recent modelling, and has therefore suspended the use of this model whilst these issues are investigated further and resolved. As such it has temporarily reverted to the use of an older version of the Flood Map for Planning.
- 4.12 It is clear there is a degree of conflict between flood related sources of information for the site, which is causing confusion as to how the site should be classified. The Environment Agency Flood Map for Planning until very recently (earlier in 2018) showed the allocation site as Flood Zone 2. However the currently available Environment Agency Flood Map for Planning shows the allocation site as defended flood zone 3a. The 2017 Huntingdonshire District Council Strategic Flood Risk Assessment Flood Zone mapping also indicates the site lies in Flood Zone 2. However, the Environment Agency flood level data and the topographical survey support that allocation site HU9 should be zone 1 and this is reflected in revised modelling being prepared by the Environment Agency. In light of the additional information that has been provided in connection with the planning application and subsequent exchanges, the Environment Agency has advised it is currently reviewing the flood zone for the allocation site HU9 with its flood modelling team.
- 4.13 It is clearly a material consideration in relation to the Sequential Test that the Environment Agency have previously indicated that when their latest modelling is finalised and released the site will likely be reclassified as Flood Zone 1, thus at a low risk of flooding from fluvial

and tidal sources, and in a zone in which the Sequential Test would be automatically passed.

- 4.14 Even if the Strategic Flood Risk Assessment flood zone 2 is given weight, due regard should be given to the defences identified above that effectively put the site in flood zone 1 according to the National Planning Policy Framework classification and the reliance on the Strategic Flood Risk Assessment, which takes no account of defences, is inappropriate. It is further highlighted that under the National Planning Policy Framework the proposed residential use is classified as a “more vulnerable” use that is appropriate in Flood Zone 2.
- 4.15 In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims. The allocation site is located within the Huntingdon Spatial Planning Area which is a focus for growth in both the adopted and emerging new Local Plan. The town is one of the district’s largest offering a wide range of services including the local hospital; number of schools and higher education; significant employment areas; a good range of shops; and leisure facilities and is therefore a very suitable location for housing growth. Growth in the town therefore offers the opportunity for development consistent with the sustainable development aims.
- 4.16 The relative merits of developing land in flood zone 2, but benefiting from permanent defences where the actual risk of the site flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, therefore needs to be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.
- 4.17 Due to its size and relationship to surrounding development the allocation site has not been in active agricultural use for a number of years and this has been limited to horse grazing. However, due to security and animal welfare issues the grazing use has tended to be intermittent and this has not generated sufficient finance for the active management of the site. Residential development with high quality well designed properties will therefore enable the land to be put to a beneficial use with landscaping enhancement for the local area.
- 4.18 Finally, the proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 4.19 In relation to the second reason for the modification that the removal of the allocation reducing the housing provision within the Huntingdon Spatial Planning Area has a neutral impact, this is challenged. Paragraph 4.15 of the Submission Plan states *‘The spatial planning areas offer some of the best opportunities for promoting sustainable development in Huntingdonshire and meeting the everyday needs of residents in one place thereby reducing the need to travel’*. Consequently the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the

level of growth in a sustainable Spatial Planning Area, which must be a negative impact as opposed to neutral impact.

5.0 Conclusions

5.1 The first justification in the Proposed Main Modifications Sustainability Appraisal for the deletion of the site is factually incorrect. The site is not flood zone 3a.

5.2 Allocation HU9 has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages with known flood issues, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.

5.3 The site benefits from flood defences maintained by the Environment Agency. The Environment Agency has previously confirmed the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected. Thus flood defences appear to have functioned as designed and without issue during this event.

5.4 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority. The FRA includes modelled flood data for the area provided by the Environment Agency and a topographical survey has established the roads surrounding the site provide a raised barrier and it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.

5.5 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1.

5.6 This assessment is reflected in advice from the Environment Agency when commenting on the adjacent development proposals approved as recently as April 2018, when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1.

5.7 For the reasons explained above it is evident there is confusion regarding the risk of flooding at the site and at the time of submitting this representation the Environment Agency has advised it is currently reviewing the flood zone classification for the allocation site HU9 with its flood modelling team.

5.8 In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims as the allocation site is located within the Huntingdon Spatial Planning Area, which is a focus for growth. Therefore the relative merits of developing land benefiting from permanent flood defences where the actual risk of the site

flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, should be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.

- 5.9 The proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 5.10 In relation to the second reason for the modification it is highlighted the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the level of growth in a sustainable Spatial Planning Area, which must be a negative impact, as opposed to the stated neutral impact.

APPENDIX A



ENGINEERING

Flood Risk Assessment & Sustainable Drainage Strategy for the Proposed Development of 27 Residential Dwellings on Land Off Main Street, Hartford

Contents

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- 4 The Proposal
- 6 Sustainable Drainage Strategy
- 6 Assessment
- 7 Conclusion

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- 2 Environment Agency Flood Map for Planning
- 3 Strategic Flood Risk Assessment Mapping – Flood Zones
- 4 Strategic Flood Risk Assessment Mapping – Climate Change
- 5 Environment Agency Modelled and Historical Flood Data
- 6 Topographic Survey of the Site and Surrounding Road Network
- 7 Indicative Site Layout
- 8 Indicative Drainage Layout
- 9 Micro Drainage Calculations: Infiltration Discharge
- 10 Micro Drainage Calculations: Greenfield Run Off Rate
- 11 Micro Drainage Calculations: Positive Discharge

1506 - FRA & DS Aug 2018

**Flood Risk Assessment & Sustainable Drainage Strategy
for the Proposed Development of 27 Residential Dwellings
on Land Off Main Street, Hartford**

1 Introduction

- 1.1 MTC Engineering (Cambridge) Limited has been asked to provide a Flood Risk Assessment and Sustainable Drainage Strategy in respect of the proposed residential redevelopment of approximately 1.2Ha of land off Main Street, Hartford, on behalf of Messrs. N Price and E Howson.
- 1.2 This Flood Risk Assessment and Sustainable Drainage Strategy is based on the following information:-
 - 1.2.1 Site survey by ASC Surveys Limited.
 - 1.2.2 Environment Agency Modelled and Historical Flooding Data;
 - 1.2.3 Huntingdonshire District Council Strategic Flood Risk Assessment;
 - 1.2.4 Proposed Site Layout by Brown & Co;
 - 1.2.5 Cambridgeshire County Council Surface Water Drainage Guidance for Developers;
 - 1.2.6 British Geological Survey information.

- 1.3 All the comments and opinions contained in this report including any conclusions are based on the information available to MTC Engineering (Cambridge) Ltd. during our investigations. The conclusions drawn could therefore differ if the information is found to be inaccurate, incomplete or misleading. MTC Engineering (Cambridge) Ltd. accept no liability should this prove to be the case, nor if additional information exists or becomes available with respect to this site.
- 1.4 MTC Engineering (Cambridge) Ltd. makes no representation whatsoever concerning the legal significance of its findings or any other matters referred to in the following report. Except as otherwise requested by the client, MTC Engineering (Cambridge) Ltd. are not obliged and disclaim any obligation to update the report for events taking place after the Assessment was undertaken.
- 1.5 This report is a Flood Risk Assessment and Sustainable Drainage Strategy relating to flooding and drainage issues associated with the proposed development. The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. This report provides no guarantee against flooding of the study site or elsewhere, nor as to the absolute accuracy of water levels, flow rates and associated probabilities quoted.

2 Site Description

- 2.1 The Site is located on the southeastern side of Main Street (the B1514) and western side of the A1123, in eastern Hartford.
- 2.2 The site is approximately square in shape, occupies an area of approximately 1.2Ha and is currently occupied by an agricultural field. It is allocated for the development of approximately 30 homes (HU 9) in Huntingdonshire's Local Plan to 2036: Proposed Submission 2017.
- 2.3 To the northwest the site is bound by Main Street, past which lies residential development off Owl Way. Main Street is generally about a metre or so higher than the northern part of the site, with the lowest section of Main Road present on the stretch between the roundabout junction with the A1123 at the northern corner of the site and junction with Old Huntingdon Road to the west of the site being 9.8 metres above Ordnance Datum (AOD) at the location of the existing site access. The majority of Main Road this stretch of Main Road is at levels of between 10 and 10.5 metres AOD.
- 2.4 To the northeast the site is bound by the A1123, past which lies open agricultural land and also Hartford Lake which is about 300 metres east of the site. The A1123 is again embanked above adjacent land, falling from a level of almost 11 metres AOD at the junction with Main Street at the northern corner of the site to a level of about 9.6 metres AOD at the junction with Old Houghton Road (now a cycleway/bus route only) to the southeast of the site.
- 2.5 To the south and east of the site lies number 2 Houghton Road and a training centre which are on the northern/eastern side of Old Houghton Road, along with some further agricultural land. West past Old Houghton Road lies existing residential development off The Grove, with the main body of Hartford lying to the west of the site. South past Houghton Road lies some agricultural land and then the River Great Ouse which flows in an easterly direction approximately 300 metres south of the site.

- 2.6 Old Houghton Road runs in a southerly direction from Main Street then easterly direction to the A1123, although the eastern part of Old Houghton Road is now only used as a bus route and cycleway. The southern section of Old Houghton Road is at a level of about 9.5 metres AOD, although there is a bank along the northern side of the majority of this section to levels of about 10.3 metres. Old Houghton Road then rises in a northerly direction to levels of about 10.7 metres at the junction with Main Street.
- 2.7 As such Main Street, the A1123, and Old Houghton Road form a continuous embankment to a minimum level of about 9.5 metre AOD around the triangle of land made up of the site, number 2 Old Houghton Road, the training centre, and other agricultural land, with the majority of this land being at a slightly lower level than these roads.
- 2.8 The site itself falls in a southeasterly direction from levels of above 9 metres AOD in the northern area adjacent to Main Road to levels of about 8.6/8.7 metres AOD along the southeastern boundary.
- 2.9 A small drain runs along the northeastern boundary of the site in a southerly direction, having flowed beneath Hartford Road through a 450mm culvert. This drain then flows through a short length of dual pipe (about 600mm diameter) at the eastern corner of the site, then continues southeast along the southern side of the A1123 before flowing east beneath the A1123/Old Houghton Road through a dual 600mm pipe. Environment Agency defences located at the downstream side of this outfall prevent backflow of flood water in a northerly direction along this drain towards the site.
- 2.10 There is a small pond in the eastern corner of the site, which is thought to be in continuity with ground water levels and created for agricultural use. Whilst there are a few other small drains present in the vicinity of the site these are located outside of the triangle of roads surrounding the site.
- 2.11 There are no further surface water features of note in the vicinity of the site.

2.12 British Geological Survey Mapping indicates that the bedrock geology underlying the site is the Oxford Clay formation, with a superficial geology of river terrace deposits of sand and gravel also present.

3 Sources of Potential Flood Risk

- 3.1 In accordance with The National Planning Policy Framework all forms of flood risk need to be considered in relation to any development.
- 3.2 The first form of flood risk to be considered in respect of The National Planning Policy Framework is fluvial flooding.
- 3.3 The River Great Ouse which flows in an easterly direction approximately 300m south of the site is the only significant source of fluvial flood risk to the site, with the Environment Agency Flood Map for Planning (Appendix 2) indicating that the site lies primarily within defended Flood Zone 3a but with small areas in the northern part of the site being in Flood Zone 2.
- 3.4 The Huntingdonshire District Council Strategic Flood Risk Assessment map (Appendix 3) however indicates that the site lies entirely in Flood Zone 2 with none of the site or surrounding land being classified as defended Flood Zone 3.
- 3.5 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore being the most recent available source of flood data is considered to supersede the Environment Agency Flood Map, thus it is considered that the site is classified as Flood Zone 2 not defended Flood Zone 3.
- 3.6 The Strategic Flood Risk Assessment also provides mapping of a 1 in 100 year event with 'central' 25%, 'higher central' 35% and 'upper end' allowances for climate change, as provided in Appendix 4. This mapping shows that the site would remain dry in all of the above events, thus is considered to be at a low risk of flooding during a 1 in 100 year event even with allowance for climate change.
- 3.7 The Environment Agency have supplied modelled flood data for the area, a copy of which is provided in Appendix 5.

- 3.8 The node applicable to the site is node EA052349LO0117 at which the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the flows at these levels being 99.56 cumecs and 103.84 cumecs respectively.
- 3.9 As can be seen from the survey of the roads surrounding the site (Appendix 5) these provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level.
- 3.10 As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event.
- 3.11 Current modelled climate change allowances have not been modelled by the Environment Agency, with the only modelled climate change water level being 9.17m AOD based upon 20% climate change, where the modelled flow was 100.02 cumecs. As the 1 in 100 year flow was 99.56 cumecs, which indicates a flow increase of 0.023 cumecs per % climate change.
- 3.12 As such even in the maximum 65% climate change flood event that requires consideration under current guidelines flows in a 1 in 100 year event would increase by approximately 1.5 cumecs to 101.06 cumecs. As such they would remain more than 2.5 cumecs below the 1 in 1000 year flow that has been modelled, and thus the 1 in 100 year plus 65% climate change water level would be less than the 1 in 1000 year water level of 9.37m AOD.
- 3.13 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. As such the Strategic Flood Risk Assessment mapping which shows that the site would remain dry during a 1 in 100 year plus climate change event is considered to be correct.

- 3.14 It should be noted that whilst Environment Agency defences in the area terminate at the eastern end of Old Houghton Road, defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site.
- 3.15 As such unless this defence failed flood water would not come back up this watercourse towards the site, thus given the level of adjacent roads protecting the site from flood water coming across land it is considered that the site is fully protected against fluvial flooding from the River Great Ouse in 1 in 100 year, 1 in 100 year plus climate change and 1 in 1000 year flood events.
- 3.16 In the unlikely event that the Environment Agency defence failed and allowed water to flow northwards along the drain running along the western side of the A1123 during a fluvial flood event this would be a slow process due to the twin 600mm pipes restricting the flow capacity, with water gradually beginning to pond in the land to the north of the A1123. Lower lying areas adjacent to the drain would be effected first, with ponding gradually spreading northwards through this triangle of land towards the site.
- 3.17 It is unlikely that water levels in this area of flood plain would actually reach same level as water levels in the Great Ouse Channel under any circumstances, although even if this were to occur during a 1 in 100 year event the northern section of the site would remain dry, whilst the southeastern section would be subject to shallow ponding to a depth of up to about 300mm in the majority of the southern area. During a 1 in 1000 year event the northwestern area of the site would remain dry, with the water level in the southern part being a maximum depth of about 600mm
- 3.18 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the west on the other side of the A1123 the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.

- 3.19 The only other fluvial flood risk to the site comes from the small drain along the eastern boundary of the site with the worst case flood risk involving a blockage of either the channel itself or the culvert at the eastern edge of the site.
- 3.20 During any such event water would simply flow south past the blockage before rejoining the drain channel downstream, with the only anticipated impact being a little bit of surface water flooding occurring in the vicinity of the blockage.
- 3.21 Overall it is considered that the risk of fluvial flooding to the site is low with the only significant risk of flooding to the site coming from the potential failure of Environment Agency defences allowing flow in a northerly direction up the drain adjacent to the site. This would result in a gradual filling of the basin formed by the triangle of roads surrounding the site, with the higher parts of the site remaining dry and lower parts possibly subjected to shallow ponding.
- 3.22 The second source of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from the sea.
- 3.23 This site is well inland and with existing ground levels in the order of 9 metres AOD is considered to be at a low risk of flooding from the sea.
- 3.24 The third form of flood risk to be considered in respect of The National Planning Policy Framework is flooding from land.
- 3.25 Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can quickly run off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage with foul sewer surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro level can influence or exacerbate this. Overland flow paths need to be taken into account in development to minimise the risk of flooding from overland flow.

- 3.26 The A1123 and Old Houghton Road provide embanked barriers against any overland flow coming towards the site from the east, south, or west.
- 3.27 Overland flow could potentially come southeast onto Main Street from the residential development to the north, however much of this area is garden space rather than impermeable hence overland flows are less likely to develop, whilst any flows that did develop would likely either enter highway drainage systems or be channeled along the local road network by raised kerbs.
- 3.28 In the event that any overland flow did come onto the site from Main Road this would likely be at the low point in Main Road at the existing site access, and any such flow would simply be across the site in a southeasterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site, other than the potential forming of shallow ponding at low spots on the site such as at the existing pond in the southeastern corner of the site.
- 3.29 The surface water flood map shows that the only area of ponding that may occur on the site in a 'high risk' 1 in 30 year event being an extremely small area of shallow flooding in the southeastern corner of the site at the low spot/pond.
- 3.30 In a 'medium risk' 1 in 100 year event the extent of flooding would be a little greater in the southeastern area of the site, however other than at the existing pond the depth of water would remain below 300mm.
- 3.31 In a 'low risk' 1 in 1000 year event the extent of flooding would again increase, with comparison of flood extents and levels on the site survey indicating a ponded water level of approximately 8.9m AOD.
- 3.32 As such the overall the majority of the site is considered to be at only a low or very low risk of flooding from surface water, however adequate steps will be taken to ensure that the proposed development is adequately protected against any potential risk of surface water flooding as detailed in Section 4.

- 3.33 The fourth form of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from rising groundwater.
- 3.34 Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands and river gravels in valley bottoms underlain by less permeable rocks. Water levels below the ground rise during wet winter months, and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land.
- 3.35 Geological Mapping indicates that the site is underlain by a bedrock geology of clay which would not have a water table, however a perched water table may be present in the overlying superficial geology of sand and gravels.
- 3.36 Based upon the pond in the eastern corner of the site which is likely to be in continuity with ground water levels this indicates a water level of about 7.7 metres at the site at the time of survey, which is about a metre below most site levels.
- 3.37 Under normal circumstances it is anticipated that any outflow of groundwater would be directly to the River Great Ouse or result in the development of spring lines in the lower lying land to the south of Old Houghton Road.
- 3.38 During a fluvial flood event on the River Great Ouse however it is possible that ground water levels would rise at the site and it is possible that some outflow could occur, however the impact upon the site would be less than that which would occur in the event that Environment Agency defences failed during a 1 in 100 year plus climate change fluvial flood event or 1 in 1000 year flood event, whilst there was no recorded groundwater flooding occurring at the site during the 1998 event when water was present in surrounding fields.

- 3.39 The fifth form of flood risk to be considered in accordance with the National Planning Policy Framework is the risk of flooding from blocked, overloaded, or burst sewers and water mains.
- 3.40 Should any sewer or water main block, become overloaded, or burst on Main Road any water which came on to the site would likely do so in the vicinity of the existing access, and would simply flow across the site in a south easterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site.
- 3.41 The last form of flood risk to be considered in accordance with the National Planning Policy Framework is flooding from reservoirs, canals or other artificial sources.
- 3.42 Grafham Water lies about 11km southwest of the site, and should its dam burst water would flood down Diddington Brook to the River Great Ouse where it would occupy much of the flood plain of the River Great Ouse both upstream and downstream of this point.
- 3.43 Environment Agency mapping indicates that the flood extent in such an event would be similar to a 1 in 100 year fluvial flood event on the River Great Ouse in the vicinity of the site, however makes no allowance for defences and it is anticipated that the fluvial defences and raised roads in the vicinity of the site would ensure that the site remained dry during any such event.
- 3.44 Further to the above Grafham Water is owned and maintained by Anglian Water Services Ltd, thus it is anticipated that the dam will remain well maintained and its risk of failure is low.
- 3.45 There are no further artificial sources of flood risk to the site and the overall risk of flooding to the site from artificial sources is considered to be low.

4 The Proposal

- 4.1 The proposal involves the outline Planning Application for the residential development of the site with 27 dwellings, as shown by the indicative site layout provided in Appendix 7.
- 4.2 Overall it is considered that the flood risk to the site by any means is low, with the site being defended against flooding by the surrounding embankments. Even in the event that Environment Agency measures to prevent backflow were to fail, flow beneath these embankments would be restricted by the twin 600mm culvert, and it is anticipated that water levels that would occur on site would remain significantly below water levels in the main River Great Ouse channel.
- 4.3 Therefore the minimum finished floor level of all dwellings will be set at above 9.37 metres AOD which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 4.4 It is not considered that any further flood resistant or resilient construction is required at the site.
- 4.5 The raised floor levels will ensure that the proposed dwellings are adequately protected against flooding from any other potential source including flooding from surface water where the maximum water level anticipated during a 1 in 1000 year event is approximately 8.9m AOD.
- 4.6 The superficial geology will likely provide acceptable infiltration rates for infiltration systems to be used as a means of drainage at the proposed development. Infiltration testing in accordance with BRE 365 will therefore take place to fully determine infiltration rates once outline planning permission has been granted and if acceptable infiltration rates are achieved then all surface water discharge from the development will be to infiltration systems designed in accordance with CIRIA Report 156.

- 4.7 In the event that either acceptable infiltration rates are not achieved or groundwater levels are too high to allow infiltration drainage to be used then surface water drainage will be via a positive system discharging to the adjacent ditch system running along the eastern boundary of the site, with discharge rates restricted to a maximum discharge rate of 2.0 liters per second during all events up to and including a 1 in 100 year plus 40% climate change event.
- 4.8 The outline Surface Water Drainage Strategy detailed in Section 5 has therefore been developed in compliance with all current relevant local and national guidance, with full detailed drainage design to be completed in line with this strategy and submitted for approval at the detailed design phase once outline planning permission is granted.
- 4.9 Foul drainage from the proposed development will either be to the existing foul sewerage network, via a pumped system if necessary, or to a package treatment plant discharging to the adjacent drain with all necessary discharge consents/permits obtained from relevant bodies such as the Environment Agency.

5 Sustainable Drainage Strategy

5.1 Point of Discharge and Discharge Rate

- 5.1.1 In line with the Drainage Hierarchy, surface water should be discharged to the ground via infiltration systems where feasible. Whilst the site is underlain by a bedrock sandstone geology which is largely permeable, the superficial geology is a much lower permeability geology in which infiltration systems are unlikely to prove feasible.
- 5.1.2 Infiltration testing in line with BRE365 will however be carried out once conditional planning permission has been granted, and if acceptable rates obtained then all surface water from the proposed development will be drained via infiltration systems.
- 5.1.3 5×10^{-6} m/s is generally considered the lowest rate at which infiltration systems provide an acceptable means of surface water discharge, thus if rates below this are obtained during testing then the second preferable method of discharge in line with the Drainage Hierarchy is discharge to a surface watercourse.
- 5.1.4 If acceptable infiltration rates are not achieved and a positive discharge solution is required then discharge will be to the watercourse along the northeastern boundary of the site, with post development discharge rates will be restricted to a maximum discharge rate of 2.0 l/s during all rainfall events up to and including a 1 in 100 year plus 40% climate change event.
- 5.1.5 As such regardless of the infiltration rates obtained during testing the proposed development can be drained in line with rather the first or second method required by the Drainage Hierarchy.
- 5.1.6 It is therefore considered appropriate to require full detailed infiltration testing at the detailed design phase rather than current planning application stage, with this information to be secured by planning condition.

5.2 Drainage Areas and Attenuation Volumes

- 5.2.1 An indicative drainage area plan is provided in Appendix 8, which shows that the total post development roof area of the new buildings is anticipated to be approximately 2,020m², with approximately 2,130m² of shared access and parking areas, and 980m² of road areas. As such the total post development drained area will be approximately 0.513Ha in total.
- 5.2.2 Based upon the minimum feasible infiltration rate of 5×10^{-6} m/s (0.018m/hr), the Micro Drainage calculations (Appendix 9) indicate that a base depth of 320mm beneath the parking areas and access areas to be permeably surfaced (with 30% void space) would be sufficient to accommodate run off from the 0.415Ha area roof and permeable accesses/parking areas during a 1 in 100 year plus 40% climate change event. Alternatively dependent upon the final detailed design the base thickness of the paving may be reduced, with cellular units such as aquacell instead used beneath some areas.
- 5.2.3 Infiltration calculations also indicate that the adoptable highway area (for which the Local Highway Authority are unlikely to accept permeable paving) could be successfully drained by an infiltration basin with a base are of 61.5m² and area of 190.5m² as shown on the indicative drainage layout in Appendix 8.
- 5.2.4 As such should an infiltration rate of 5×10^{-6} m/s be achieved during testing be achieved then the full post development drained area can be drained by infiltration. Should a rate higher than 5×10^{-6} m/s be achieved during testing then a reduced area/depth pond could be provided when detailed design takes place, thus the indicative pond shown is considered the worst case in terms of land take, and the base depth to permeable paving is considered to be worst case.
- 5.2.5 In the event that following testing rates are less than 5×10^{-6} m/s and a positive discharge is required, the Micro Drainage Calculations provided in Appendix 10 show that the QBAR greenfield discharge rate from this area is 1.3 litres per second (l/s), with the 1 in 1, 1 in 30, and 1 in 100 year discharge rates being 1.1l/s, 3.2l/s and 4.7l/s respectively.

- 5.2.6 Sewers for Adoption 7th Edition indicates that the minimum diameter flow control generally accepted by undertakes is 75mm. The lowest discharge rate that can be feasibly achieved using such a flow control is 2 l/s, thus discharge from the post development site would be restricted to a maximum of 2 l/s during all rainfall events upto and including a 1 in 100 year plus 40% climate change event.
- 5.2.7 Whist 2 l/s is slightly above greenfield discharge rates, it is less than two thirds the existing 1 in 30 year greenfield rate and less than half the 1 in 100 year greenfield rate. As such the flow restriction proposed will reduce flows during more extreme rainfall events when surrounding drainage infrastructure is closest to capacity thereby providing a benefit in extreme events and reducing the downstream risk of flooding in these events.
- 5.2.8 The Micro Drainage calculations provided in Appendix 11 indicate that to attenuate discharge from the full post redevelopment area of 0.513Ha to 2.0l/s during a 1 in 100 year plus 40% climate change event will require an attenuation volume of about 347m³.
- 5.2.9 The pond shown on the indicative drainage layout provided in Appendix 11 will provide approximately 63m³ of attenuation, whilst assuming a base thickness of 300mm to the permeable paving area with 30% void space would provide a further 192m³ of attenuation. The remaining 93m³ of attenuation required will be provided by using 250m² of cellular storage beneath shared/private driveway areas that are permeably surfaced, which based upon aquacell units with 0.4m depth and 95% void space would provide 95m³ of attenuation. As such the attenuation required can be comfortable accommodated at the proposed development.
- 5.2.10 The outline calculations provided clearly demonstrate that post development surface water discharge will either be to infiltration if suitable rates are obtained during testing or can be restricted to a maximum rate of 2.0l/s during all events up to and including a 1 in 100 year plus 40% climate change rainfall event.

5.2.11 Full detailed design of the surface water drainage and attenuation systems will therefore only take place once planning approval has been granted and the layout finalized, and will be submitted for approval at the conditional discharge stage.

5.3 SuDS Systems Proposed at Development

5.3.1 Living/green roof systems are a preferred SuDS technique, given that they are a flood reduction measure, reduce pollution through filtration, and provide a landscape and wildlife benefit. In this instance however living roofs will not prove feasible, firstly as the dwellings are likely to have pitched roofs and secondly as maintenance requirements are onerous for single dwelling owners.

5.3.2 Water re-use systems such as rainwater harvesting and water butts that would allow rainwater to be re-used for purposes such as irrigation may be provided at the development. This will however only be confirmed at the detailed design stage, whilst any storage provided within such systems (which would overflow to the main surface water drainage network) will not be counted towards that required to accommodate the design rainfall event as such system may be full at the time the rainfall event occurs.

5.3.3 Basins and ponds are considered preferred SuDS features as they provide both a flood and pollution reduction measure along with landscape and wildlife benefits.

5.3.4 Given the size of the site there is sufficient area in which to incorporate an infiltration/attenuation pond, which will be provided in the low eastern area of the site to enable drainage by gravity as indicated on the indicative drainage plan provided in Appendix 8.

5.3.5 Permeable paving is a SuDS technique that is appropriate to use at most developments, and provides both a flood reduction benefit due to the attenuation provided in the base and a pollution reduction benefit due to the filtration of water as it passes through the permeable surfacing.

5.3.6 Permeable paving will therefore be used on all private access and parking areas at the development. At present the Local Highway Authority will not adopt permeable access roads, thus it is anticipated that the main access road will be impermeably surfaced, however if the Local Highway Authority position changes prior to the detailed application/design being undertaken then the main access road will also be permeably surfaced.

5.4 **SuDS Treatment Stages**

5.4.1 All surface water will receive an appropriate level of treatment in line with requirements prior to discharge to the surface water sewer network.

5.4.2 Drainage from all external hard standing/access areas which will be lightly trafficked requires two treatment stages prior to discharge. For the private access areas which will be permeably surfaced the first treatment stage will be via filtration through the permeable surfacing and second stage being filtration through the membrane (such as terram) in which the base layer would be wrapped.

5.4.3 For impermeable areas of adoptable highway the first treatment stage will therefore be through a traditional drainage system incorporating measures such as trapped gulleys, whilst the second stage will be via settlement and adsorption in the infiltration/attenuation basin to be provided.

5.4.4 Surface water from the roofs is considered clean discharge thus requires one treatment stage only prior to discharge, which will be provided by filtration through the membrane such as terram in which the base layer of the permeable paving will be used, whilst if a positive discharge is required an additional stage would also be provided by means of settlement and adsorption in the infiltration/attenuation pond.

5.4.5 All surface water will therefore receive the required number of treatment stages prior to discharge.

5.5 Maintenance of SuDS Systems

- 5.5.1 All drainage systems serving single dwellings only will be the responsibility of the dwelling owner to maintain.
- 5.5.2 Drainage systems serving multiple dwellings will likely be the responsibility of the management company set up to maintain communal areas of the development to maintain, with funding provided by the ground rent/service charge to be levied on dwellings.
- 5.5.3 The possible alternative is that sewage undertakers will be accepting SuDS systems by the time detailed design takes place (Sewers for Adoption 8 which covers adoption of SuDS is likely to be released and implemented in the near future). If this happens prior to detailed design and construction then the SuDS systems may be offered for adoption rather than maintained by a management company.
- 5.5.4 A full maintenance plan will be produced at the detailed design phase to all relevant parties once conditional planning approval has been granted covering all drainage systems at the site to ensure that relevant parties are aware of their responsibilities and the maintenance requirements of the systems provided.
- 5.6 Full detailed design of the surface water drainage system serving the development will only take place once conditional planning approval has been granted, with provision of the full detailed drainage design and associated information such as infiltration test results and maintenance plans to be secured by appending an appropriate planning condition to any planning approval granted.
- 5.7 This will be based on this outline Sustainable Drainage Strategy, which clearly demonstrates that the proposed redevelopment can be drained in accordance with all national and local requirements and that the design 1 in 100 year plus 40% climate change rainfall event can be dealt with on site without having an adverse impact upon the off-site risk of flooding.

6 Assessment

- 6.1 The proposal involves erection of 27 dwellings on land off Main Street, Hartford.
- 6.2 The site is shown as lying in Flood Zone 2 on the Strategic Flood Risk Assessment, and in defended Flood Zone 3a on the Environment Agency Flood Map for Planning.
- 6.3 As the Strategic Flood Risk Assessment is based upon more recent hydraulic modelling than the Flood Map for Planning, this is considered to represent the most up to date classification of the site, which is therefore considered to lie in Flood Zone 2.
- 6.4 Under the National Planning Policy Framework the proposed use is classified as a “more vulnerable” use. This use is appropriate in Flood Zone 2 without the need for an Exception Test, however a Sequential Test may be required.
- 6.5 The site has an allocation (HU 9) in Huntingdonshire’s Local Plan to 2036: Proposed Submission 2017 for residential development, thus the Sequential Test has already been considered and has been passed by the proposed development. No further Sequential Test information is therefore required in this instance.
- 6.6 All the sources of flood risk to the proposed development have been considered in Section 3, and the only significant risk of flooding comes from the River Great Ouse.
- 6.7 The modelled in channel 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the 1 in 1000 year flood level considered to exceed the 1 in 100 year plus 65% climate change level as it involves higher flows.
- 6.8 Surrounding road levels are significantly above these levels, whilst the Environment Agency have backflow prevention systems in place to prevent flooding back onto the beneath embankments from drains in the area. As such even if water could get onto the site water levels would be significantly lower than the modelled in channel levels referred to above.

- 6.9 The minimum floor level of the proposed dwellings will in any case be set at 9.37 metres AOD, which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 6.10 It is not considered that any further flood resilient or resistant construction is required in this instance.
- 6.11 Surface water drainage from the proposed development will be to infiltration systems subject to satisfactory infiltration rates being achieved during testing and groundwater levels not being too high. If infiltration systems cannot be used as a means of surface water drainage then a positive system with attenuation and a flow control limiting discharge to the adjacent drain a maximum rate of 2.0 litres per second during all events upto and including a 1 in 100 year plus 40% climate change event.
- 6.12 Further details in relation to surface water drainage will be provided at the detailed design stage, with the outline drainage strategy provided in Section 5 clearly demonstrating that the proposed development can be drained in line with all local and national requirements and without having an adverse impact upon the off-site risk of flooding.
- 6.13 Foul drainage from the proposed development will be either to the existing foul network or to a package treatment plant discharging to the adjacent drain with all necessary permits and consents to be obtained.

7 Conclusion

- 7.1 The proposal involves the development of 27 residential dwellings on land off Main Street, Hartford, as shown on the indicative layout provided in Appendix 8.
- 7.2 The site lies in Flood Zone 2 based upon the Strategic Flood Risk Assessment which is based upon more recent modelling than the Environment Agency Flood Map for Planning.
- 7.3 The Exception Test is not required for ‘more vulnerable’ development in Flood Zone 2, whilst the site has an allocation in the Local Plan (HU 9) thus has already been considered to pass the Sequential Test.
- 7.4 Surveyed levels demonstrate that the roads surrounding the site on all sides are significantly above the modelled flood level during a 1 in 100 year event of 9.06m AOD and 1 in 1000 year water level of 9.37m AOD (considered to be higher than any 1 in 100 year plus climate change level. Environment Agency defences prevent the flow of flood water back up adjacent drains and the site is therefore fully defended against a 1 in 100 year and 1 in 1000 year event on the River Great Ouse.
- 7.5 In the unlikely event that the defences fail the finished floor level of the proposed dwellings will be set at a minimum height of 9.37 metres AOD which is the same as the modelled 1 in 1000 year flood level on the River Great Ouse which is a higher level than would occur on site in the unlikely event that defences failed and allowed water to come onto the site.
- 7.6 Surface water drainage will be to infiltration systems if acceptable rates are achieved in testing or to a positive system with discharge restricted to a maximum rate of 2 litres per second during all events upto and including a 1 in 100 year plus 40% climate change rainfall event, as fully detailed within the outline sustainable drainage strategy provided in Section 5.

- 7.7 The surface water drainage strategy clearly demonstrates that the site can be drained in line with all relevant local and national guidance and without adversely impacting the off-site risk of flooding. It is therefore appropriate to secure the full detailed drainage design by means of appending an appropriate planning condition to any approval granted.
- 7.8 There are no flood or drainage related grounds under the National Planning Policy Framework on which to oppose the erection of 27 dwellings on land off Main Road, Hartford.

APPENDIX 1
SITE LOCATION PLAN



APPENDIX 2

ENVIRONMENT AGENCY FLOOD MAP FOR PLANNING

Flood map for planning

Your reference
1506

Location (easting/northing)
525993/272913

Created
17 Aug 2018 3:17

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

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
1506

Location (easting/northing)
525993/272913

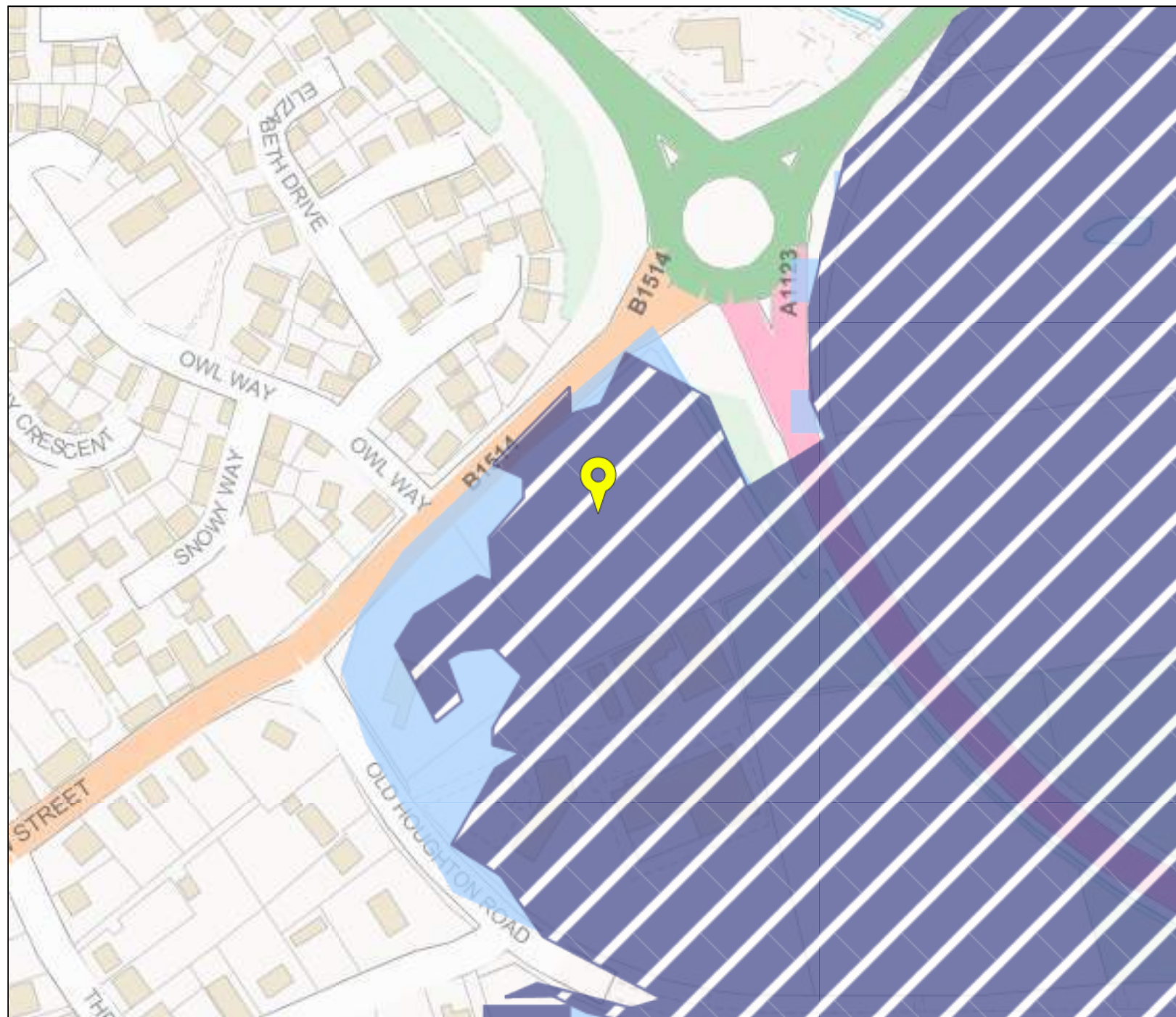
Scale
1:2500

Created
17 Aug 2018 3:17

-  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

0 20 40 60m

Page 2 of 2



APPENDIX 3

STRATEGIC FLOOD RISK ASSESSMENT MAPPING – FLOOD ZONES

SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	 Flood Zone 2	 Flood Zone 3a	 Flood Zone 3b	
Climate Change Flood Risk	 Central	 Higher Central	 Upper End	
Updated Flood Map for Surface Water	 30 year extent	 100 year extent	 1,000 year extent	
Areas Susceptible to Ground Water Flooding	 $\geq 75\%$	 $\geq 50\% < 75\%$	 $\geq 25\% < 50\%$	 $< 25\%$
Flood Warning Coverage	 Flood warning area			

- Flood Zones
 Climate Change Flood Risk
 Updated Flood Map for Surface Water
 Areas Susceptible to Groundwater Flooding
 Flood Warning Coverage



APPENDIX 4

STRATEGIC FLOOD RISK ASSESSMENT MAPPING - CLIMATE CHANGE

SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	
Climate Change Flood Risk	Central	Higher Central	Upper End	
Updated Flood Map for Surface Water	30 year extent	100 year extent	1,000 year extent	
Areas Susceptible to Ground Water Flooding	$\geq 75\%$	$\geq 50\% < 75\%$	$\geq 25\% < 50\%$	$< 25\%$
Flood Warning Coverage	Flood warning area			

Flood Zones Climate Change Flood Risk Updated Flood Map for Surface Water

Areas Susceptible to Groundwater Flooding Flood Warning Coverage



Map data © OpenStreetMap contributors, CC-BY-SA | ©Crown Copyright...

POWERED BY
esri

APPENDIX 5

ENVIRONMENT AGENCY MODELLED AND HISTORICAL FLOOD DATA

Emily Fell
MTC Engineering (Cambridge) Ltd

Our ref EAn2018/73180
Date 14 February 2018

emilyfell@mtcengineering.co.uk

Dear Emily

Enquiry regarding Product 4 for Main Street, Hartford

Thank you for your enquiry which was received on 17 January 2018.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The information we hold and a copy of the Flood Risk Assessment (FRA) advisory note is attached to my email. There are no defences in the area which would protect this property.

Informatives & Caveats

Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

If you have any queries regarding our data please contact the Flood and Coastal Risk Management team on 0208 474 5245.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Page 587

Website: <https://www.gov.uk/government/organisations/environment-agency>



Name	Product 4
Description	Detailed Flood Risk Assessment Map centred on Main Street, Hartford
Licence	Open Government Licence
Information Warnings	None
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our <https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion> and email it to our Sustainable Places team at: planning.brampton@environment-agency.gov.uk. They will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD

Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE

General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our [website](#).

Please note we have published revised climate change allowances, which are available online. These new allowances will need to be reflected in your Flood Risk Assessment. If you want to discuss this please call our Sustainable Places team on 020 8474 5242.

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

Yours sincerely

Karen Brown

Karen Brown

Customers and Engagement Officer

Direct dial: [REDACTED]

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD

Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE














General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

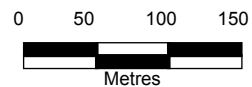
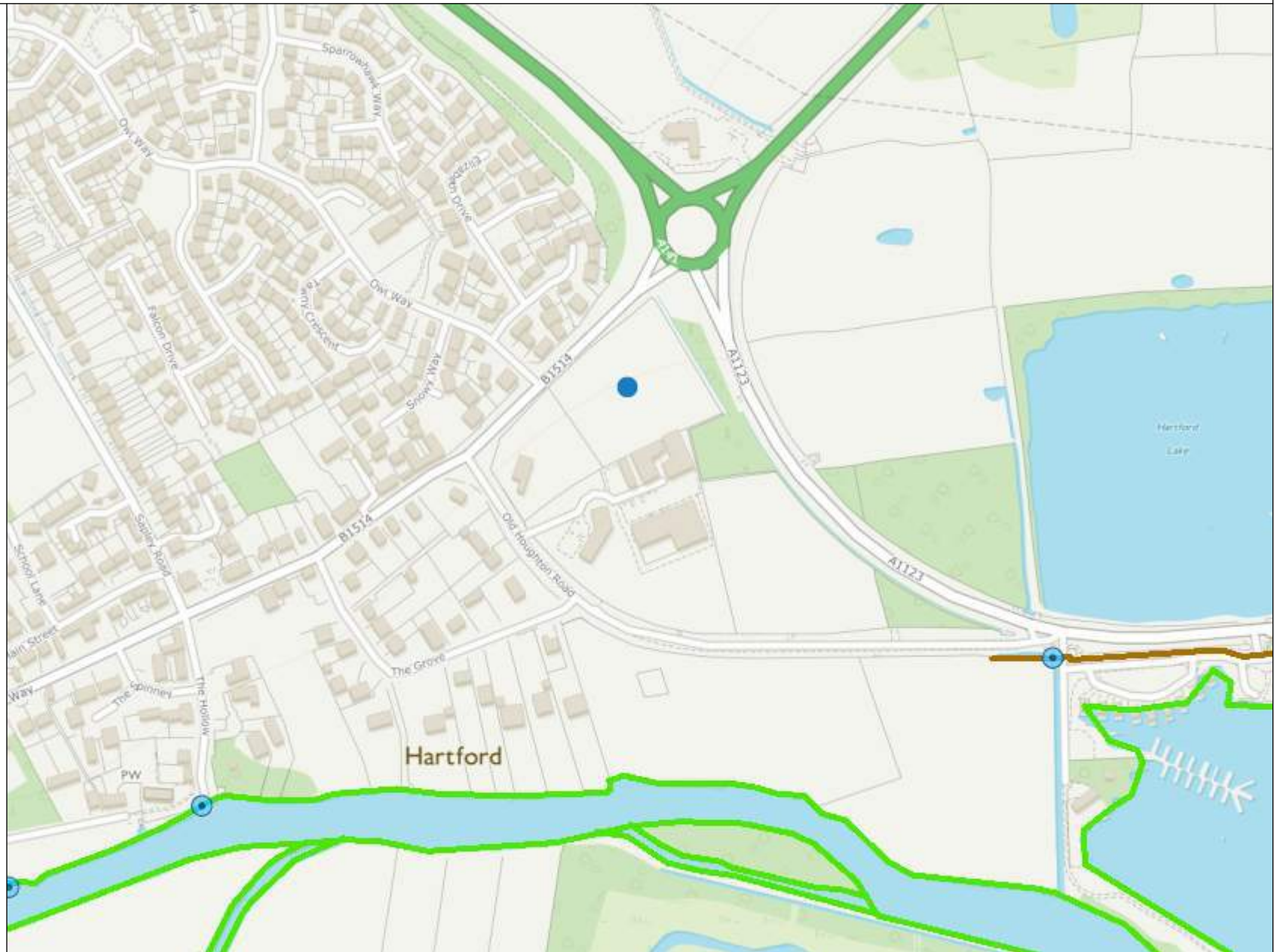
Legend

Structures

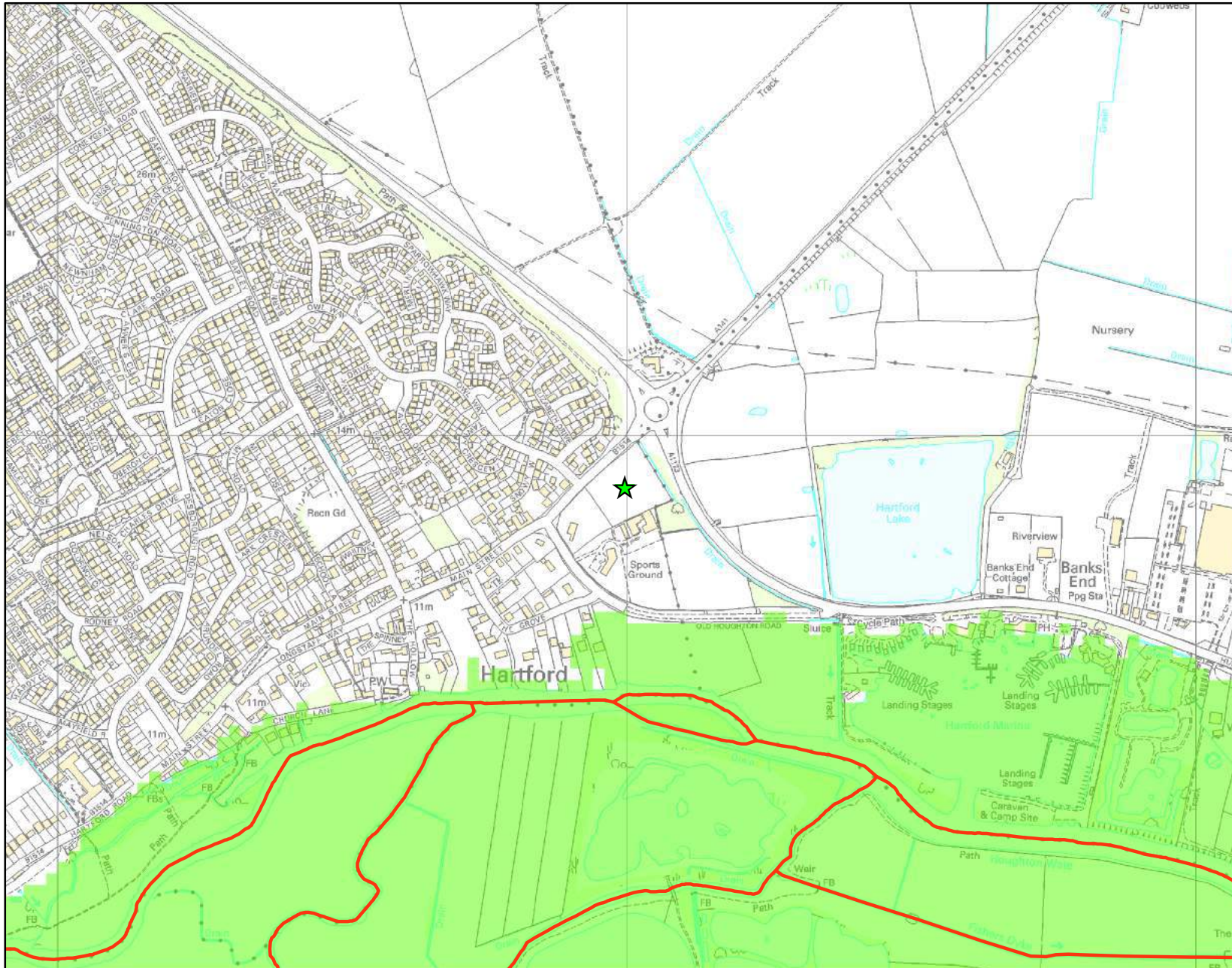
-  Draw Off Tower
-  Fish Pass
-  Hydrobrake
-  In Channel Stoplogs
-  Control Gate
-  Screen
-  Outfall
-  Inspection Chamber
-  Jetty
-  Spillway
-  Stilling Basin
-  Weir
-  Other structure

Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable Defence
-  Bridge Abutment
-  High Ground
-  Beach
-  Barrier Beach
-  Promenade
-  Quay
-  Cliff
-  Dunes
-  Culvert






Defended Climate Change Model Flood Outlines centred on Land at Main Street, Hartford, PE29 1XU NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



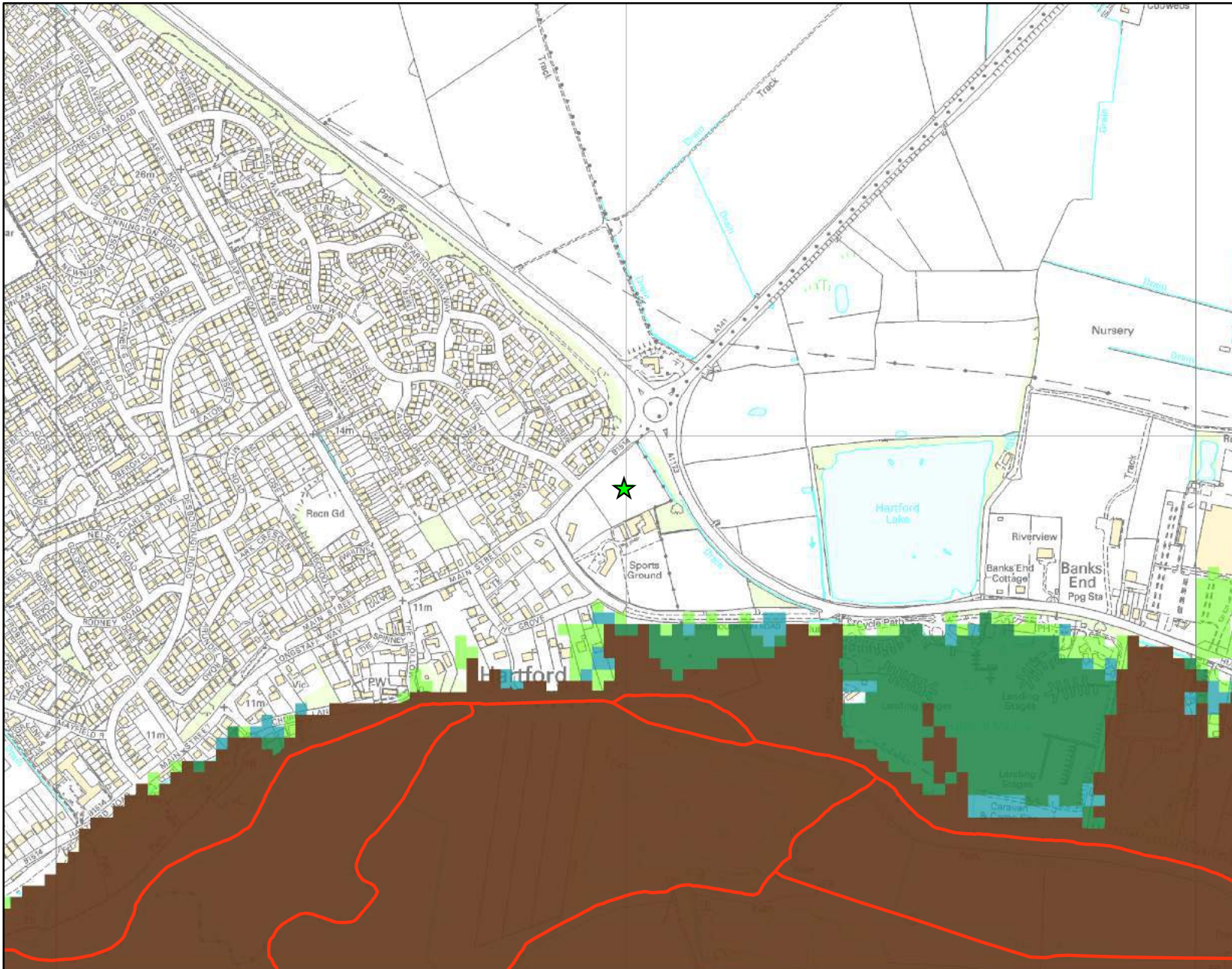
Scale 1:10,000



Legend

-  Defended 1%+20 Climate Change AEP
-  Main River
-  Site







**Defended Model Flood Outlines centred on Land at Main Street, Hartford, PE29 1XU.
NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

-  Defended 20% AEP
-  Defended 5% AEP
-  Defended 1% AEP
-  Defended 0.1% AEP
-  Main River
-  Site

Flood risk assessments: Climate change allowances

Application of the allowances and local considerations

East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire

1) The climate change allowances

The [National Planning Practice Guidance](#) refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in February 2016 and is available on [Gov.uk](#). The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

2) Assessment of climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as a **guide only**. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. **For these reasons we recommend that applicants and / or their consultants should contact the Environment Agency at the pre-planning application stage to confirm the assessment approach, on a case by case basis.** **Table A** defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

VULNERABILITY CLASSIFICATION	FLOOD ZONE	DEVELOPMENT TYPE		
		MINOR	SMALL-MAJOR	LARGE-MAJOR
ESSENTIAL INFRASTRUCTURE	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
HIGHLY VULNERABLE	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
MORE VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Intermediate/ Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
LESS VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
WATER COMPATIBLE	Zone 2	None		
	Zone 3a	Intermediate/ Basic		
	Zone 3b	Detailed		

Note: Where the table states 'not appropriate development', this is in line with national planning policy. If in exceptional circumstances such development types are proposed in these locations, we would expect a detailed modelling approach to be used.

NOTES:

- Minor: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveller site over 30+ pitches | any other development that creates a non residential building or development over 1000 sq m.

The assessment approach should be agreed with the Environment Agency as part of pre-planning application discussions to avoid abortive work.

3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Essex, Norfolk and Suffolk

Hydraulic Model (Watercourse)	Central	Higher Central	Upper
Blackwater & Brain - Blackwater between TL7520925623 and TL7820324314 Brain between TL7373323312 and TL7683821321	500mm	600mm	900mm
Chelmer - between TL6872107082 and TL7161609422 and TL7436306592	350mm	450mm	750mm
Colne (Model Extent)	450mm	600mm	950mm
Gipping – Downstream of Needham Market	400mm	500mm	850mm
Gipping – Needham Market and upstream including Somersham W/C	200mm	250mm	400mm
Norwich Downstream of TG2332009072	450mm	600mm	950mm
Norwich Upstream of TG2332009072	600mm	800mm	1200mm
Wensum (Model Extent)	400mm	500mm	800mm
Yare (Model Extent)	200mm	250mm	450mm
Broads (2008 Model Extent) Bure and Ant (2012 Model Extent)	Please use the current 1 in 1000 (0.1%) annual probability including climate change allowance		
Other main rivers, tributaries and ordinary watercourses	<p>For other main rivers, tributaries and ordinary watercourses that are not stated above, basic allowances have not been calculated. In this instance you can either:</p> <ul style="list-style-type: none"> • If flow data is available you can request this data from us and can conduct an intermediate assessment yourself • Or alternatively, you can choose to undertake a Detailed Assessment and “perform detailed hydraulic modelling, through either re-running our hydraulic models (if available) or constructing a new model 		

Cambridgeshire and Bedfordshire

Watercourse / Model	Central	Higher Central	Upper End
Alconbury Brook	600mm	700mm	900mm
River Kym			
Lower Ouse (Model Extent)	700mm	800mm	1100mm
Mid Ouse (Cold Brayfield to Bromham – between SP9156852223 and TL0132950919)	700mm	800mm	1100mm
Mid Ouse (East of Bedford to Roxton – between TL0791848903 and TL1618854543)	700mm	850mm	1200mm
River Hiz and River Purwell	400mm	450mm	550mm
River Ivel	500mm	600mm	750mm
Pix Brook	450mm	500mm	600mm
Potton Brook	500mm	600mm	700mm
River Cam and tributaries (excluding the Cam Lodes and the Slade System)	600mm	700mm	950mm
Great Barford (ordinary watercourses)	500mm	550mm	650mm
Bromham (ordinary watercourse)	550mm	650mm	850mm

NOTES:

Urban areas excluded from the 'basic' approach: St Ives, Holywell, Godmanchester, Swavesey, Over, Bedford, Newport Pagnell, Buckingham and Leighton Buzzard. More detailed assessment of climate change allowances will need to be undertaken in these locations.

Use of these allowances will only be accepted after discussion with the Environment Agency.

4) Fluvial food risk mitigation

For planning consultations where we are a statutory consultee and our [Flood risk standing](#) advice **does not** apply we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications. **These are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis.** For planning consultations where we are not a statutory consultee or our [Flood risk Standing advice](#) applies we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as '**Essential Infrastructure**' our benchmark for flood risk mitigation is for it to be designed to the '**upper end**' climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.
- For **highly vulnerable** or **more vulnerable developments** in flood zone 2, the '**central**' climate change allowance is our minimum benchmark for flood risk mitigation, and in flood zone 3 the '**higher central**' climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).
- For **water compatible** or **less vulnerable** development (e.g. commercial), the '**central**' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (particularly in flood zone 3) to inform built in resilience.

For a visual representation of the above, please see Tables 1 and 2 overleaf.

5) Development in Tidal Areas

There is no change to the way we respond to sites affected solely by tidal flood risk as the sea level allowances are unchanged.

6) Our Service

Non-chargeable service

We will give a free opinion on:

- What climate change allowance to apply to a particular development type
- Which technical approach is suitable in the FRA

Chargeable service:

- Review of climate change impacts using intermediate and detailed technical approaches (i.e. modelling review)
- Assessment and review of proposals for managed adaptation.

Table 1 peak river flow allowances by river basin district (use 1961 to 1990 baseline)				
River basin district	Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Anglian	Upper end	25%	35%	65%
	Higher central	15%	20%	35%
	Central	10%	15%	25%
Thames	Upper end	25%	35%	70%
	Higher central	15%	25%	35%
	Central	10%	15%	25%

Table 2: Using peak river flow allowances for flood risk assessments

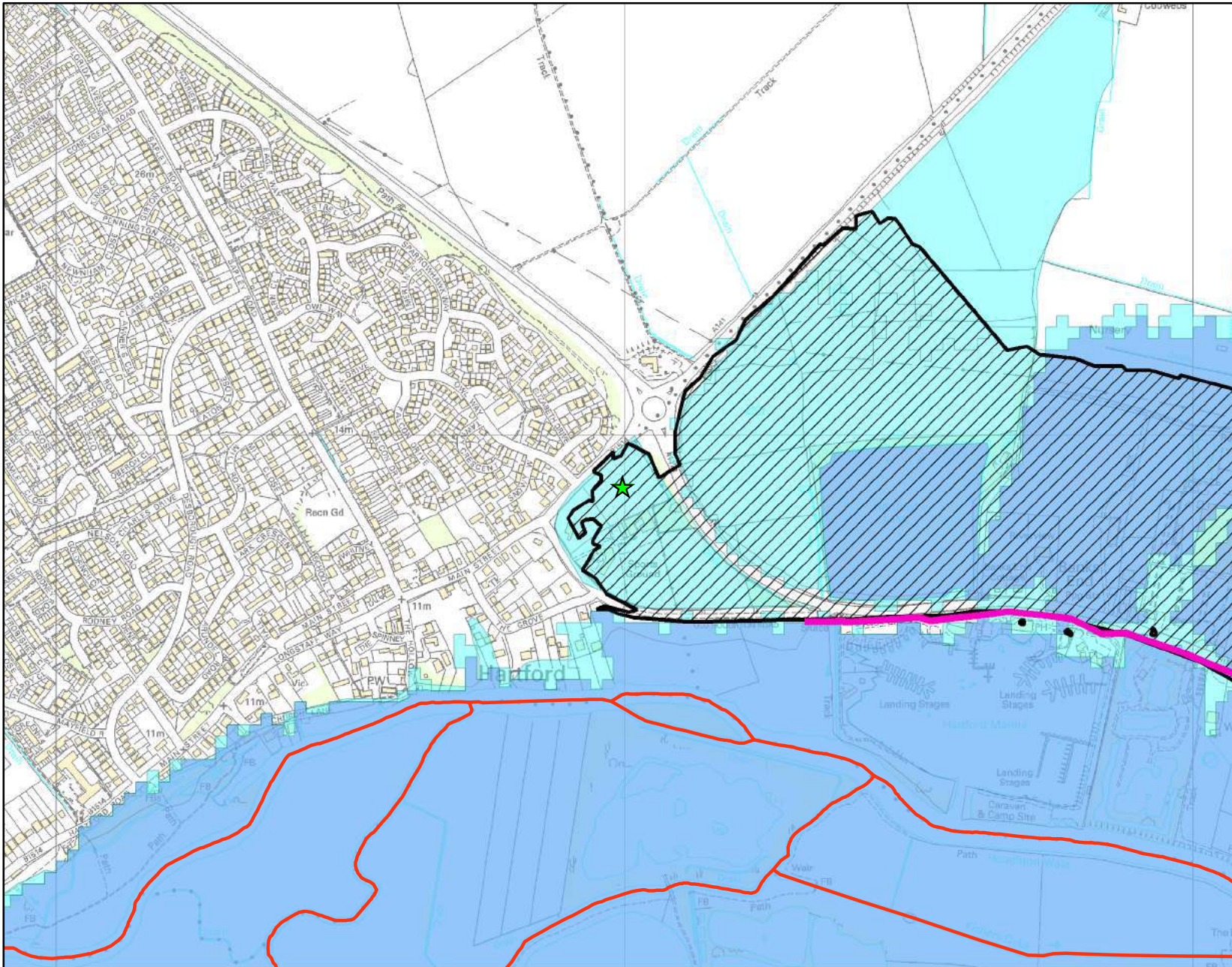
Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
2	higher central and upper end allowances	higher central and upper end allowances	central and higher central allowances	central allowance	none of the allowances
3a	upper end allowance	X	higher central and upper end	central and higher central	central allowance
3b	upper end allowance	X	X	X	central allowance

X – Development should not be permitted

If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the upper end allowance.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

**Flood Map for Planning (Rivers and Sea) centred on Land at Main Street, Hartford, PE29 1XU.
 NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

- Flood Zone 3
- Flood Zone 2
- Areas Benefiting From Defences
- Flood Map - Flood Storage Areas
- Flood Map Defences
- Main River
- Site

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

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

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

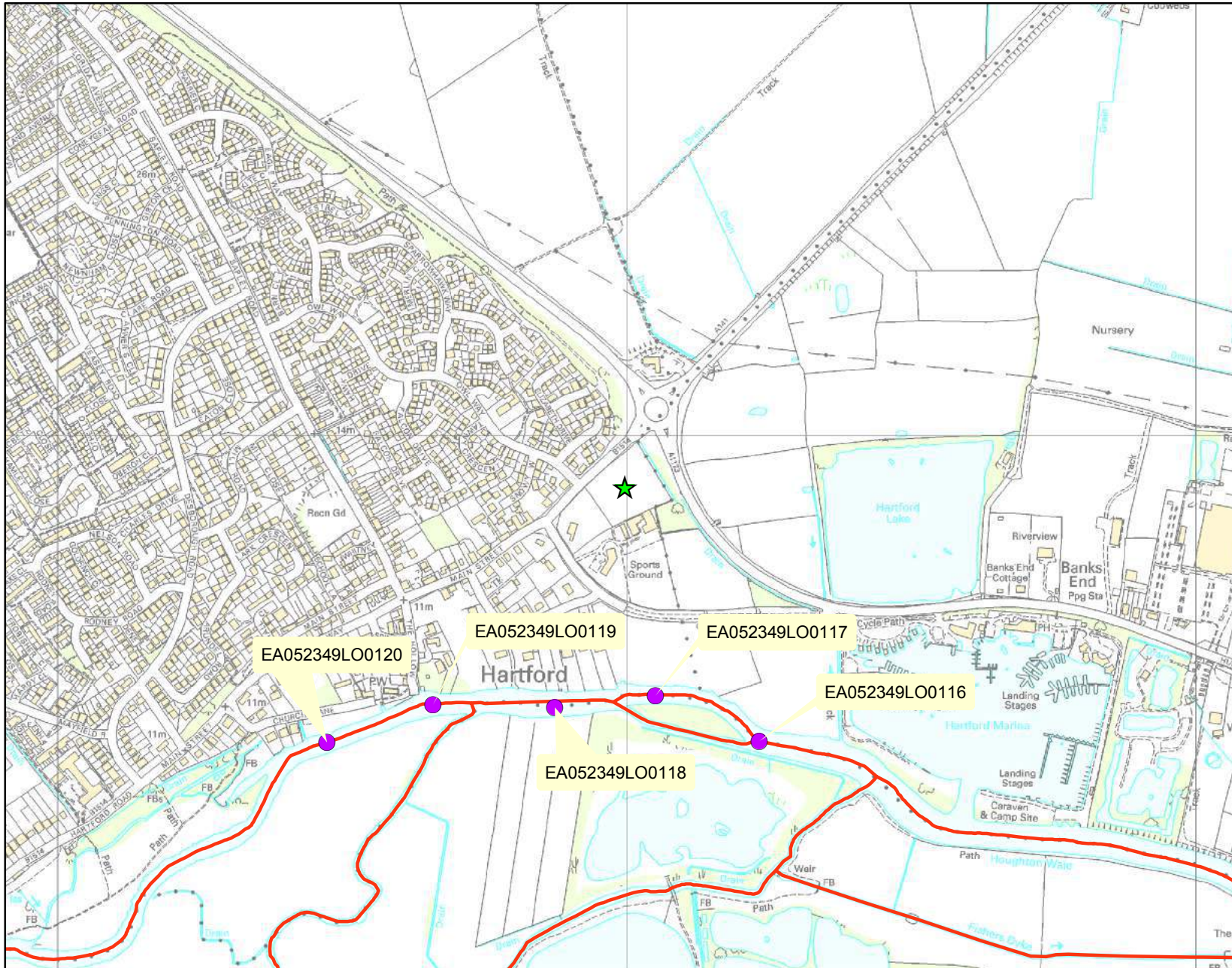
<https://www.gov.uk/flood-risk-assessment-standing-advice>
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

Modelled Node Point Locations centred on Land at Main Street, Hartford, PE29 1XU NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



Scale 1:10,000



Legend

- Modelled Node Point
- Main River
- ★ Site

Our Reference	Enquirer	Site	Grid Reference
73180	Emily Fell	Land at Main Street, Hartford, PE29 1XU	TL2599772909

Model Information

The following table shows a summary of all the model information relevant to the area of interest.

Model Code	Model Name	Release Date
EA052349	Lower Ouse	01/04/2016

Level Information

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	8.71	8.8	8.857	8.88	8.97	8.99	9.02	9.1	9.34
EA052349LO0117	EA052349_003	526051	272542	8.78	8.86	8.913	8.93	9.01	9.04	9.06	9.14	9.37
EA052349LO0118	EA052349_003	525873	272522	8.87	8.94	8.996	9.01	9.09	9.11	9.13	9.2	9.42
EA052349LO0119	EA052349_003	525659	272526	8.91	8.98	9.029	9.05	9.12	9.14	9.16	9.23	9.45
EA052349LO0120	EA052349_003	525474	272460	8.94	9.01	9.061	9.08	9.15	9.17	9.19	9.26	9.48

Levels Climate Change subform

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	9.13
EA052349LO0117	EA052349_003	526051	272542	9.17
EA052349LO0118	EA052349_003	525873	272522	9.23
EA052349LO0119	EA052349_003	525659	272526	9.26
EA052349LO0120	EA052349_003	525474	272460	9.28

Flow Information

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	107.1	108.55	109.855	108.79	108.99	109.01	109.03	110.05	113.12
EA052349LO0117	EA052349_003	526051	272542	95.61	97.4	98.855	99.12	99.26	99.31	99.56	100.25	103.84
EA052349LO0118	EA052349_003	525873	272522	90.94	91.75	92.663	93.05	94.7	95.4	95.65	99.43	109.22
EA052349LO0119	EA052349_003	525659	272526	97.2	97.35	97.63	97.64	97.48	97.52	97.64	98.38	106.05
EA052349LO0120	EA052349_003	525474	272460	101.89	101.9	101.91	101.91	101.23	101.19	100.95	101.13	109.2

Flows Climate Change subform

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	109.31
EA052349LO0117	EA052349_003	526051	272542	100.02
EA052349LO0118	EA052349_003	525873	272522	100.12
EA052349LO0119	EA052349_003	525659	272526	98.24
EA052349LO0120	EA052349_003	525474	272460	101.33

Historic Flooding Information

Code	Event	Start	Source	Cause
EA052199804	Easter 1998	08/04/1998	Main River	Channel Capacity Exceeded (no raised defences)
EA052194703	March 1947	13/03/1947	Main River	Channel Capacity Exceeded (no raised defences)

Informatives

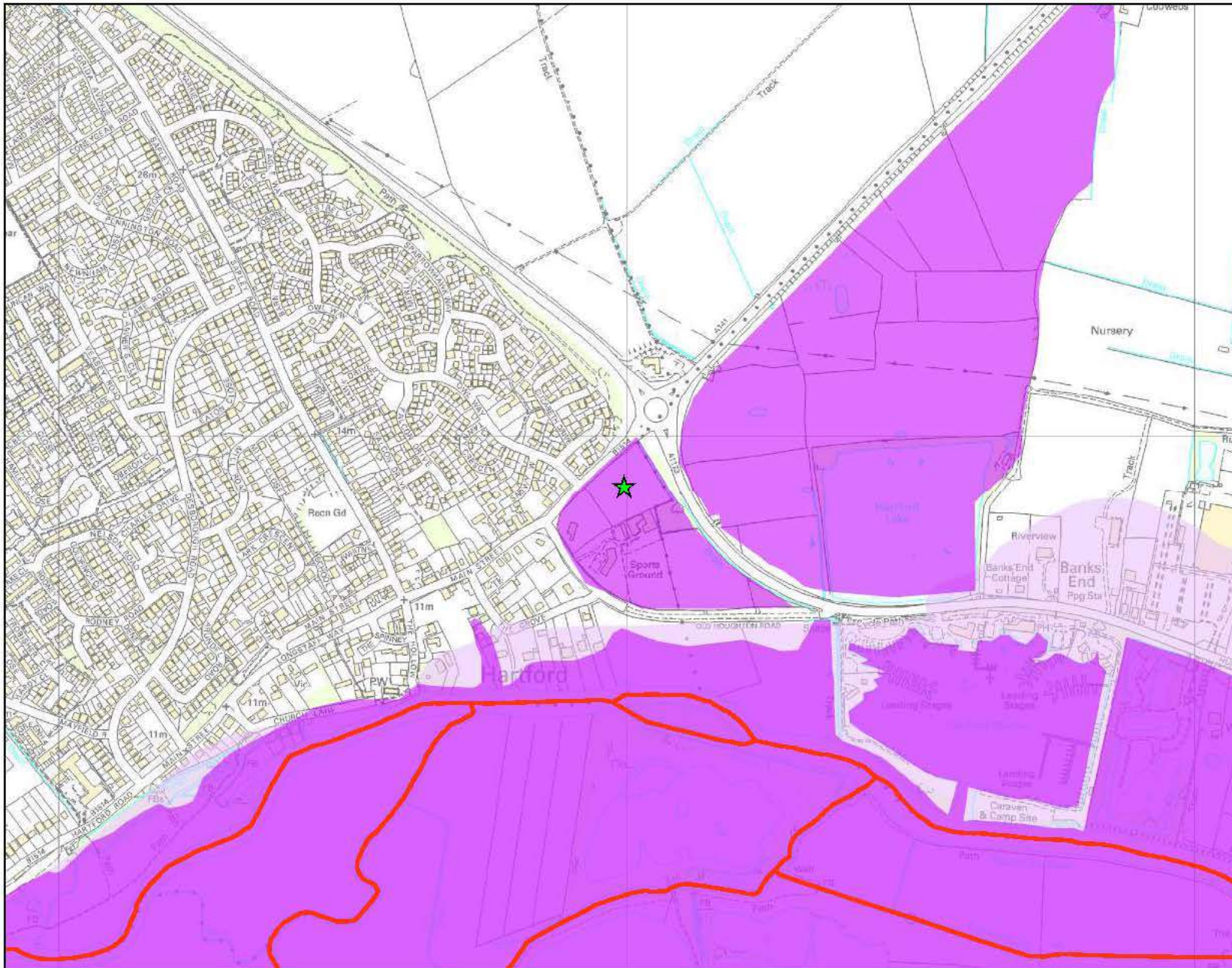
Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

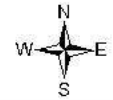
AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

**Recorded Flood Event Outlines centred on Land at Main Street, Hartford, PE29 1XU.
 NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

- Historic Flood Outline Easter 1998
- Historic Flood Outline March 1947
- Main River
- Site

From: [Enquiries_EastAnglia](#)
To: [Emily Fell](#)
Subject: 73180 - Land at Main Street, Hartford, PE29 1XU
Date: 19 January 2018 11:58:24

Dear Emily,

Thank you for your enquiry of 17th January 2018 regarding Land at Main Street, Hartford, PE29 1XU (Product 4 request).

We are liaising with our technical teams to gather the information/data you have requested. Your enquiry has been allocated the reference number 73180.

We will aim to send you our response as soon as possible, but by no later than 14th February 2018, which is in accordance with the Freedom of Information Act (2000) and the Environment Information Regulations (2004).

In the meantime if we can be of further assistance, please contact us quoting the above reference number.

Kind regards,

Ethan Cross.

Customers & Engagement Officer, Customers & Engagement Team, East Anglia Area
Environment Agency | Bromholme Lane, Brampton, Huntingdon, Cambridgeshire, PE28 4NE
Environment Agency | Icen House, Cobham Road, Ipswich IP3 9JD

Email team: Enquiries_EastAnglia@environment-agency.gov.uk
Team Number: 020 3025 5472

Working days: Monday-Friday (part time)
National Duty Communications Officer (24/7) | 0800 023 2522
National Duty Communications Manager | 0800 028 2411



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APPENDIX 6

TOPOGRAPHIC SURVEY OF THE SITE AND SURROUNDING ROAD NETWORK



Chartered Surveyors
Land, minerals and geomatics

**associated
surveying
consultants**

ABC (Surveyors) Limited Registered in England and Wales No. 4500707
Tel: 01480 212700 65A Huntingdon Street St. Neots Cambridgeshire PE18 1DU

Topographical Survey of Land at Malt Sluice, Harford, Huntingdon and Surrounding Road Network
Survey oriented to True North, all levels in metres A.O.D.

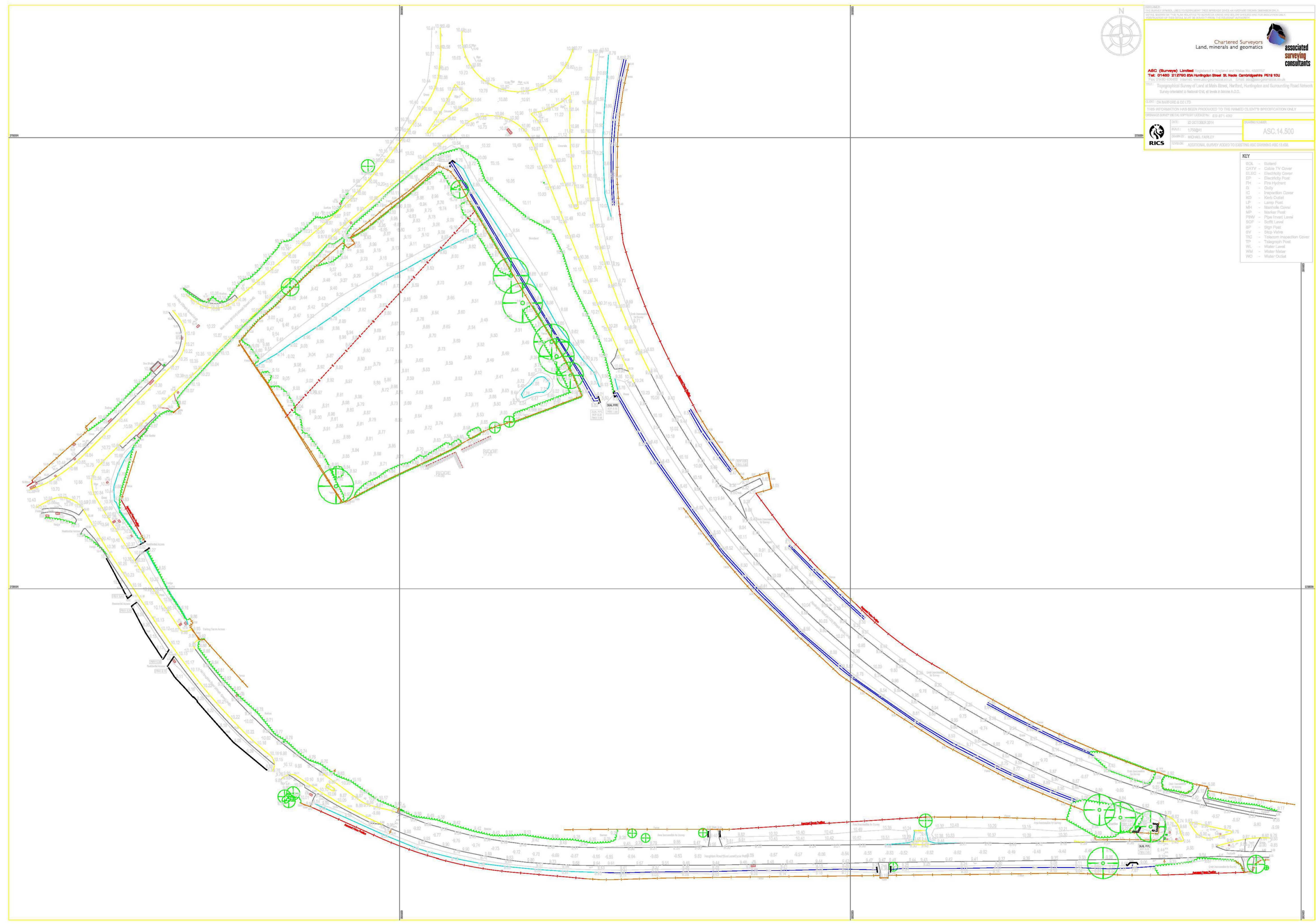
DATE: 30 OCTOBER 2014
SCALE: 1:5000
DRAWN BY: MICHAEL PARLEY
CHECKED BY: [Signature]

CONTRACT NO: ASC.14.500
PROJECT NO: [Signature]

ADDITIONAL SURVEY ADDED TO EXISTING ASC DRAWING ASC.13.430

KEY

- BOLK - Bollock
- CACTV - Cable TV Cover
- ELEC - Electricity Cover
- EP - Electricity Post
- FH - Fire Hydrant
- GI - Gully
- IC - Inspection Cover
- IO - Irons Outlet
- LP - Lamp Post
- MC - Manhole Cover
- MP - Marker Post
- PI - Pipe Inset Level
- SOP - Silt Level
- SP - Sign Post
- SW - Stop Valve
- TIC - Telecom Inspection Cover
- TP - Telegraph Post
- WL - Water Level
- WM - Water Meter
- WO - Water Outlet



APPENDIX 7
INDICATIVE SITE LAYOUT

Revision		
A	First issue	WF 15.06.18
B	Updated to received comments	WF 10.07.18
C	Updated to received comments	WF 08.08.18
D	Updated to received comments	WF 13.08.18

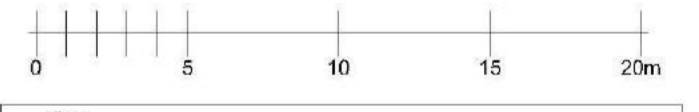
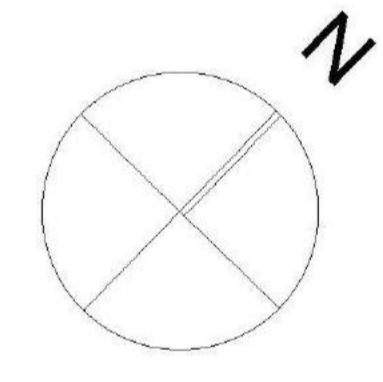


- Key**
- 7 x 2 Bed House
 - 4 x 3 Bed House
 - 11 x 4 Bed House
 - 5 x 5 Bed House

= 27 Houses Total

Site Area
= 12,069 sq m / 1.2 hectares

Public Open Space = 1,500 sq m
/ 0.15 hectares




client: Messrs. N Price & E Howson	
project: Land East of Main Street, Hartford, Huntingdon	
drawing: Feasibility Study - Proposed Site Layout Plan	
date: 15.06.18	scale: 1:250@A1
drawn: WF	checked by: AJD

BROWN & CO
ARCHITECTURE + PLANNING
Brown & Co., The Arklet, St. George's Street, Norwich, NR3 1AD.
Brown & Co Registered Office: Grantham Hall, Finkin Street, Grantham, Lincolnshire, NG31 5QZ.
Registration no: 00202922. Registered in England & Wales. T: 01463 492220

APPENDIX 8
INDICATIVE DRIANAGE LAYOUT

APPENDIX 9

MICRO DRAINAGE CALCULATIONS: INFILTRATION DISCHARGE

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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

Half Drain Time : 321 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	8.153	0.153	5.3	97.6	O K
30 min Summer	8.198	0.198	5.3	126.6	O K
60 min Summer	8.238	0.238	5.3	152.0	O K
120 min Summer	8.267	0.267	5.3	170.5	O K
180 min Summer	8.274	0.274	5.3	175.3	O K
240 min Summer	8.273	0.273	5.3	174.4	O K
360 min Summer	8.264	0.264	5.3	168.4	O K
480 min Summer	8.254	0.254	5.3	162.4	O K
600 min Summer	8.244	0.244	5.3	156.1	O K
720 min Summer	8.234	0.234	5.3	149.5	O K
960 min Summer	8.214	0.214	5.3	136.5	O K
1440 min Summer	8.175	0.175	5.3	112.1	O K
2160 min Summer	8.128	0.128	5.3	81.7	O K
2880 min Summer	8.092	0.092	5.3	58.7	O K
4320 min Summer	8.052	0.052	5.3	33.3	O K
5760 min Summer	8.042	0.042	4.4	26.6	O K
7200 min Summer	8.035	0.035	3.8	22.5	O K
8640 min Summer	8.031	0.031	3.3	19.5	O K
10080 min Summer	8.027	0.027	2.8	17.2	O K
15 min Winter	8.174	0.174	5.3	111.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	18
30 min Summer	92.629	0.0	33
60 min Summer	56.713	0.0	62
120 min Summer	33.583	0.0	122
180 min Summer	24.424	0.0	180
240 min Summer	19.389	0.0	240
360 min Summer	13.924	0.0	292
480 min Summer	11.018	0.0	354
600 min Summer	9.182	0.0	418
720 min Summer	7.908	0.0	486
960 min Summer	6.245	0.0	618
1440 min Summer	4.471	0.0	882
2160 min Summer	3.197	0.0	1256
2880 min Summer	2.518	0.0	1612
4320 min Summer	1.796	0.0	2248
5760 min Summer	1.413	0.0	2944
7200 min Summer	1.172	0.0	3672
8640 min Summer	1.006	0.0	4408
10080 min Summer	0.884	0.0	5144
15 min Winter	143.954	0.0	18

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MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	8.225	0.225	5.3	143.6	O K
60 min Winter	8.270	0.270	5.3	172.8	O K
120 min Winter	8.305	0.305	5.3	194.9	O K
180 min Winter	8.316	0.316	5.3	201.8	O K
240 min Winter	8.317	0.317	5.3	202.4	O K
360 min Winter	8.306	0.306	5.3	195.4	O K
480 min Winter	8.292	0.292	5.3	186.8	O K
600 min Winter	8.279	0.279	5.3	178.3	O K
720 min Winter	8.265	0.265	5.3	169.1	O K
960 min Winter	8.235	0.235	5.3	150.1	O K
1440 min Winter	8.178	0.178	5.3	113.7	O K
2160 min Winter	8.108	0.108	5.3	68.9	O K
2880 min Winter	8.061	0.061	5.3	39.2	O K
4320 min Winter	8.040	0.040	4.2	25.3	O K
5760 min Winter	8.031	0.031	3.3	20.1	O K
7200 min Winter	8.026	0.026	2.8	16.6	O K
8640 min Winter	8.022	0.022	2.4	14.2	O K
10080 min Winter	8.020	0.020	2.1	12.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	176
240 min Winter	19.389	0.0	232
360 min Winter	13.924	0.0	338
480 min Winter	11.018	0.0	380
600 min Winter	9.182	0.0	454
720 min Winter	7.908	0.0	530
960 min Winter	6.245	0.0	676
1440 min Winter	4.471	0.0	952
2160 min Winter	3.197	0.0	1320
2880 min Winter	2.518	0.0	1612
4320 min Winter	1.796	0.0	2248
5760 min Winter	1.413	0.0	2992
7200 min Winter	1.172	0.0	3712
8640 min Winter	1.006	0.0	4408
10080 min Winter	0.884	0.0	5128

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.415

Time (mins)	Area
From:	To: (ha)
0	4 0.415

MTC Engineering Ltd		Page 4																								
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C																									
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by																									
Micro Drainage	Source Control 2017.1.2																									
<p><u>Model Details</u></p> <p>Storage is Online Cover Level (m) 9.000</p> <p><u>Porous Car Park Structure</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Infiltration Coefficient Base (m/hr)</td> <td style="width: 20%;">0.01800</td> <td style="width: 20%;">Width (m)</td> <td style="width: 20%;">5.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>426.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>591.7</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>8.000</td> <td>Cap Volume Depth (m)</td> <td>0.320</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0	Membrane Percolation (mm/hr)	1000	Length (m)	426.0	Max Percolation (l/s)	591.7	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.000	Cap Volume Depth (m)	0.320
Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0																							
Membrane Percolation (mm/hr)	1000	Length (m)	426.0																							
Max Percolation (l/s)	591.7	Slope (1:X)	0.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	8.000	Cap Volume Depth (m)	0.320																							
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MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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

Half Drain Time : 745 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	8.284	0.284	0.5	26.1	Flood Risk
30 min Summer	8.338	0.338	0.6	33.3	Flood Risk
60 min Summer	8.385	0.385	0.6	40.2	Flood Risk
120 min Summer	8.422	0.422	0.7	46.2	Flood Risk
180 min Summer	8.439	0.439	0.7	49.0	Flood Risk
240 min Summer	8.447	0.447	0.7	50.4	Flood Risk
360 min Summer	8.452	0.452	0.7	51.3	Flood Risk
480 min Summer	8.452	0.452	0.7	51.2	Flood Risk
600 min Summer	8.449	0.449	0.7	50.8	Flood Risk
720 min Summer	8.447	0.447	0.7	50.3	Flood Risk
960 min Summer	8.441	0.441	0.7	49.4	Flood Risk
1440 min Summer	8.428	0.428	0.7	47.1	Flood Risk
2160 min Summer	8.406	0.406	0.7	43.6	Flood Risk
2880 min Summer	8.385	0.385	0.6	40.3	Flood Risk
4320 min Summer	8.348	0.348	0.6	34.7	Flood Risk
5760 min Summer	8.315	0.315	0.5	30.2	Flood Risk
7200 min Summer	8.288	0.288	0.5	26.6	Flood Risk
8640 min Summer	8.264	0.264	0.5	23.6	Flood Risk
10080 min Summer	8.242	0.242	0.4	21.0	Flood Risk
15 min Winter	8.309	0.309	0.5	29.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	19
30 min Summer	92.629	0.0	34
60 min Summer	56.713	0.0	64
120 min Summer	33.583	0.0	122
180 min Summer	24.424	0.0	182
240 min Summer	19.389	0.0	242
360 min Summer	13.924	0.0	360
480 min Summer	11.018	0.0	478
600 min Summer	9.182	0.0	522
720 min Summer	7.908	0.0	584
960 min Summer	6.245	0.0	706
1440 min Summer	4.471	0.0	980
2160 min Summer	3.197	0.0	1388
2880 min Summer	2.518	0.0	1792
4320 min Summer	1.796	0.0	2596
5760 min Summer	1.413	0.0	3392
7200 min Summer	1.172	0.0	4112
8640 min Summer	1.006	0.0	4848
10080 min Summer	0.884	0.0	5640
15 min Winter	143.954	0.0	19

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24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	8.366	0.366	0.6	37.4	Flood Risk
60 min Winter	8.416	0.416	0.7	45.1	Flood Risk
120 min Winter	8.456	0.456	0.7	52.0	Flood Risk
180 min Winter	8.474	0.474	0.8	55.2	Flood Risk
240 min Winter	8.483	0.483	0.8	56.9	Flood Risk
360 min Winter	8.491	0.491	0.8	58.2	Flood Risk
480 min Winter	8.492	0.492	0.8	58.5	Flood Risk
600 min Winter	8.489	0.489	0.8	58.1	Flood Risk
720 min Winter	8.485	0.485	0.8	57.3	Flood Risk
960 min Winter	8.478	0.478	0.8	56.0	Flood Risk
1440 min Winter	8.462	0.462	0.7	53.0	Flood Risk
2160 min Winter	8.433	0.433	0.7	48.0	Flood Risk
2880 min Winter	8.405	0.405	0.7	43.4	Flood Risk
4320 min Winter	8.354	0.354	0.6	35.6	Flood Risk
5760 min Winter	8.312	0.312	0.5	29.7	Flood Risk
7200 min Winter	8.275	0.275	0.5	25.0	Flood Risk
8640 min Winter	8.244	0.244	0.4	21.3	Flood Risk
10080 min Winter	8.217	0.217	0.4	18.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	180
240 min Winter	19.389	0.0	236
360 min Winter	13.924	0.0	350
480 min Winter	11.018	0.0	462
600 min Winter	9.182	0.0	566
720 min Winter	7.908	0.0	658
960 min Winter	6.245	0.0	744
1440 min Winter	4.471	0.0	1052
2160 min Winter	3.197	0.0	1496
2880 min Winter	2.518	0.0	1932
4320 min Winter	1.796	0.0	2764
5760 min Winter	1.413	0.0	3568
7200 min Winter	1.172	0.0	4328
8640 min Winter	1.006	0.0	5096
10080 min Winter	0.884	0.0	5848

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.098

Time (mins)	Area
From:	To: (ha)
0	4 0.098

24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
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Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	
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Micro Drainage	Source Control 2017.1.2
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Model Details

Storage is Online Cover Level (m) 8.500

Infiltration Basin Structure

Invert Level (m) 8.000 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.01800 Porosity 1.00
 Infiltration Coefficient Side (m/hr) 0.01800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	61.5	0.500	190.5

APPENDIX 10

MICRO DRAINAGE CALCULATIONS: GREENFIELD RUN OFF RATE

24 High Street
Whittlesford
CB22 4LT

MIN STREET, HARTFORD
GREENFIELD RUN OFF RATE



Date 20/08/2018 10:18
File

Designed by M.J.B
Checked by

Micro Drainage Source Control 2017.1.2

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	0.513	Urban	0.000
SAAR (mm)	550	Region Number	Region 5

Results 1/s


QBAR Rural 1.3
QBAR Urban 1.3

Q1 year 1.1

Q1 year 1.1
Q30 years 3.2
Q100 years 4.7

APPENDIX 11

MICRO DRAINAGE CALCULATIONS: POSITIVE DISCHARGE


MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage 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 ³)	Status
15 min Summer	8.183	0.183	2.0	137.1	O K
30 min Summer	8.234	0.234	2.0	175.7	O K
60 min Summer	8.284	0.284	2.0	213.3	O K
120 min Summer	8.332	0.332	2.0	248.9	O K
180 min Summer	8.357	0.357	2.0	267.7	O K
240 min Summer	8.372	0.372	2.0	279.3	O K
360 min Summer	8.390	0.390	2.0	292.4	O K
480 min Summer	8.400	0.400	2.0	299.9	O K
600 min Summer	8.405	0.405	2.0	303.9	O K
720 min Summer	8.407	0.407	2.0	305.5	O K
960 min Summer	8.406	0.406	2.0	304.6	O K
1440 min Summer	8.393	0.393	2.0	295.0	O K
2160 min Summer	8.373	0.373	2.0	280.1	O K
2880 min Summer	8.353	0.353	2.0	265.0	O K
4320 min Summer	8.310	0.310	2.0	232.7	O K
5760 min Summer	8.270	0.270	2.0	202.8	O K
7200 min Summer	8.235	0.235	2.0	176.6	O K
8640 min Summer	8.204	0.204	2.0	153.3	O K
10080 min Summer	8.177	0.177	2.0	133.1	O K
15 min Winter	8.205	0.205	2.0	153.7	O K
30 min Winter	8.263	0.263	2.0	197.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	117.6	19
30 min Summer	92.629	0.0	147.3	34
60 min Summer	56.713	0.0	206.3	64
120 min Summer	33.583	0.0	242.9	124
180 min Summer	24.424	0.0	263.0	184
240 min Summer	19.389	0.0	276.1	242
360 min Summer	13.924	0.0	292.1	362
480 min Summer	11.018	0.0	300.9	482
600 min Summer	9.182	0.0	304.2	602
720 min Summer	7.908	0.0	303.5	722
960 min Summer	6.245	0.0	296.1	960
1440 min Summer	4.471	0.0	279.3	1256
2160 min Summer	3.197	0.0	432.6	1624
2880 min Summer	2.518	0.0	452.0	2020
4320 min Summer	1.796	0.0	475.6	2812
5760 min Summer	1.413	0.0	518.5	3584
7200 min Summer	1.172	0.0	537.2	4328
8640 min Summer	1.006	0.0	552.0	5096
10080 min Summer	0.884	0.0	562.9	5760
15 min Winter	143.954	0.0	130.9	19
30 min Winter	92.629	0.0	159.2	34


MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	


Micro Drainage 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 ³)	Status
60 min Winter	8.319	0.319	2.0	239.4	O K
120 min Winter	8.373	0.373	2.0	279.7	O K
180 min Winter	8.401	0.401	2.0	300.9	O K
240 min Winter	8.419	0.419	2.0	314.2	O K
360 min Winter	8.439	0.439	2.0	329.5	O K
480 min Winter	8.452	0.452	2.0	338.7	O K
600 min Winter	8.459	0.459	2.0	344.0	O K
720 min Winter	8.462	0.462	2.0	346.7	O K
960 min Winter	8.463	0.463	2.0	347.3	O K
1440 min Winter	8.452	0.452	2.0	338.7	O K
2160 min Winter	8.425	0.425	2.0	318.7	O K
2880 min Winter	8.399	0.399	2.0	299.5	O K
4320 min Winter	8.344	0.344	2.0	257.8	O K
5760 min Winter	8.281	0.281	2.0	211.1	O K
7200 min Winter	8.228	0.228	2.0	171.1	O K
8640 min Winter	8.183	0.183	2.0	137.0	O K
10080 min Winter	8.146	0.146	2.0	109.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	56.713	0.0	230.5	64
120 min Winter	33.583	0.0	269.6	122
180 min Winter	24.424	0.0	289.9	180
240 min Winter	19.389	0.0	301.9	240
360 min Winter	13.924	0.0	312.4	358
480 min Winter	11.018	0.0	313.4	474
600 min Winter	9.182	0.0	310.2	590
720 min Winter	7.908	0.0	306.7	704
960 min Winter	6.245	0.0	299.7	932
1440 min Winter	4.471	0.0	285.9	1358
2160 min Winter	3.197	0.0	483.3	1708
2880 min Winter	2.518	0.0	503.8	2164
4320 min Winter	1.796	0.0	518.8	3108
5760 min Winter	1.413	0.0	581.0	3912
7200 min Winter	1.172	0.0	602.1	4680
8640 min Winter	1.006	0.0	619.0	5360
10080 min Winter	0.884	0.0	631.8	5960

MTC Engineering Ltd		Page 3						
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C							
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by							
Micro Drainage	Source Control 2017.1.2							
<u>Rainfall Details</u>								
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)	20.000	Shortest Storm (mins) 15						
Ratio R	0.450	Longest Storm (mins) 10080						
Summer Storms	Yes	Climate Change % +40						
<u>Time Area Diagram</u>								
Total Area (ha) 0.513								
<table border="0"> <thead> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4 0.513</td> </tr> </tbody> </table>			Time (mins)	Area	From: To:	(ha)	0	4 0.513
Time (mins)	Area							
From: To:	(ha)							
0	4 0.513							
©1982-2017 XP Solutions								

MTC Engineering Ltd		Page 4
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

Model Details

Storage is Online Cover Level (m) 9.000

Tank or Pond Structure

Invert Level (m) 8.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	750.0	0.500	750.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-2000-0475-2000
Design Head (m) 0.475
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 75
Invert Level (m) 8.000
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.475	2.0
Flush-Flo™	0.142	2.0
Kick-Flo®	0.329	1.7
Mean Flow over Head Range	-	1.7

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)
0.100	2.0	1.200	3.1	3.000	4.7	7.000	7.0
0.200	2.0	1.400	3.3	3.500	5.0	7.500	7.3
0.300	1.8	1.600	3.5	4.000	5.3	8.000	7.5
0.400	1.9	1.800	3.7	4.500	5.6	8.500	7.7
0.500	2.0	2.000	3.9	5.000	5.9	9.000	8.0
0.600	2.2	2.200	4.0	5.500	6.2	9.500	8.2
0.800	2.5	2.400	4.2	6.000	6.5		
1.000	2.8	2.600	4.4	6.500	6.8		

APPENDIX B

James Lloyd
Huntingdonshire District Council
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

Our ref: AC/2016/124826/01-L01
Your ref: 16/00597/FUL
Date: 06 September 2016

Dear Mr Lloyd

**RESUBMISSION OF WITHDRAWN APPLICATION HDC REF 15/01172/FUL
PROPOSED ERECTION OF TWO DETACHED DWELLINGS WITH GARAGES.
2 OLD HOUGHTON ROAD, HARTFORD**

Thank you for referring the above application which was received on 18 August 2016.

A copy of the subsequent decision notice would be appreciated.

We have reviewed the FRA submitted and have the following comments to make:

The site is currently within defended flood zone 3 of the Environment Agency's Flood Map. However since we previously commented on this planning application in August 2015 we have completed and released the outputs to our Lower Ouse Modelling Project. The outputs of this modelling project now place the site into flood zone 1. The updated Flood Map will be published later this year to reflect these changes.

In light of these changes we have no objection on flood risk grounds to the proposed development in relation to main river flooding though would suggest raising the finished floor levels to 9.55m AOD as stated in the FRA.

All surface water from roofs shall be piped direct to an approved surface water system using sealed downpipes. Open gullies should not be used.

Only clean, uncontaminated surface water should be discharged to any soakaway, watercourse or surface water sewer.

Where soakaways are proposed for the disposal of uncontaminated surface water, percolation tests should be undertaken, and soakaways designed and constructed in accordance with BRE Digest 365 (or CIRIA Report 156), and to the satisfaction of the Local Authority. The maximum acceptable depth for soakaways is 2 metres below existing ground level. Soakaways must not be located in contaminated areas. If, after tests, it is found that soakaways do not work satisfactorily, alternative proposals must be submitted.

Surface water from roads and impermeable vehicle parking areas shall be discharged via trapped gullies.

Anglian Water Services Ltd. should be consulted by the Local Planning Authority and be requested to demonstrate that the sewerage and sewage disposal systems serving the development have sufficient capacity to accommodate the additional flows, generated as a result of the development, without causing pollution or flooding. If there is not capacity in either of the sewers, the Agency must be reconsulted with alternative methods of disposal.

Site operators should ensure that there is no possibility of contaminated water entering and polluting surface or underground waters.

Yours sincerely

Mrs Dawn Porter
Sustainable Places Planning Advisor

Direct dial [REDACTED]

Direct e-mail Planning_Liaison.Anglian_Central@environment-agency.gov.uk

Environment Agency (East Anglia area), Sustainable Places Team, Bromholme Lane, Brampton, Huntingdon,
Cambridgeshire, PE28 4NE
Email: planning_liaison.anglian_central@environment-agency.gov.uk
Customer services line: 03708 506 506



End

**Objection representation in respect of proposed Main Modification
20 to the Huntingdonshire Local Plan to 2036 and the intended
deletion of site HU9 for residential development of approximately
30 homes on land at Main Street, Hartford, Huntingdon, PE29 1YA**

on behalf of Mr N Price

Prepared by: Martin Page, Planning Consultant

For and on behalf of Brown & Co.

Brown & Co is a leading provider of agency, professional and consultancy services across the whole range of rural, commercial, residential, and agricultural markets.

Date: January 2019.

Reference: P-548P.

1.0 Introduction

1.1 Brown & Co Barfords have been instructed to submit the following Objection on behalf of Mr N Price representing the owners of land at Main Street, Hartford, Huntingdon, PE29 1YA that is allocated for residential development of approximately 30 homes (Site HU9) in the Submission Local Plan and is proposed to be deleted by Modification 20.

2.0 Background

2.1 The allocation site is located on the eastern edge of Huntingdon. To the north of the site is the Owl Way residential estate and to the south west is the property no. 2 Old Houghton Road where planning permission has recently been granted for 3 new dwellings. To the south the site is enclosed by the former West Anglia Training Centre (now in administration). The site is therefore enclosed by built form on three sides. The site is also on the Huntingdon to Cambridge Busway route with 3 services per hour during the day (in either direction) which run along Main Street and there are bus stops with real time information displays 2 minutes' walk from the site. The site is therefore in an accessible location and there are a range of services and facilities available within walking and cycling distance.



Proposed allocation site context.

2.2 The suitability of the site for development was justified in the Sustainability Appraisal on the grounds: *The site is greenfield land on the edge of Huntingdon's built-up area and is well screened from the open countryside by a mature tree belt. Access to services and*

employment are reasonable with good transport links available to Huntingdon town centre. The site does have flooding constraints and mitigation will be necessary. Access arrangements would need to be resolved to ensure highway safety.

2.3 Site allocation HU9 has been a content of the Local Plan for more than 5 years and this has passed through 4 consultation stages:

- Between May and July 2013 a draft Huntingdonshire Local Plan to 2036 (Stage 3) document was published for public consultation. This allocated the site for approximately 25 dwellings to include a mix of property types and sizes. The site was included in the Stage 3 consultation on the grounds *'the site performs well in the sustainability appraisal' and 'it is the last remaining parcel of land along Hartford Road contained within the A1123 and relates well to the existing built-up area'*.
- Between January and March 2015 the Council undertook a further targeted public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation, though the site area was enlarged to include part of the garden of No. 2 Old Houghton Road and identified a development of approximately 30 dwellings to include a mix of property types and sizes.
- Between July and August 2017 the Council undertook a further public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation for a scheme of approximately 30 dwellings to include a mix of property types and sizes.
- Between December 2017 and February 2018 the Council undertook a public consultation on the Proposed Submission Plan.

2.4 The allocation has at times included neighbouring land forming part of the garden of the No. 2 Old Houghton Road. However planning permission has been granted for 3 dwellings on this land, most recently as 20th April 2018 (LPA Ref. No. 18/00089/FUL).

2.5 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is currently under consideration (LPA Ref. No. 18/02239/OUT). This is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority.

3.0 The Council's explanation for Modification 20

3.1 The Proposed Main Modifications Sustainability Appraisal explains *'The removal of this allocation produces a positive impact in terms of removing the possibility of housing development on a site that is situated within flood zone 3a and the climate change allowance zone'*.

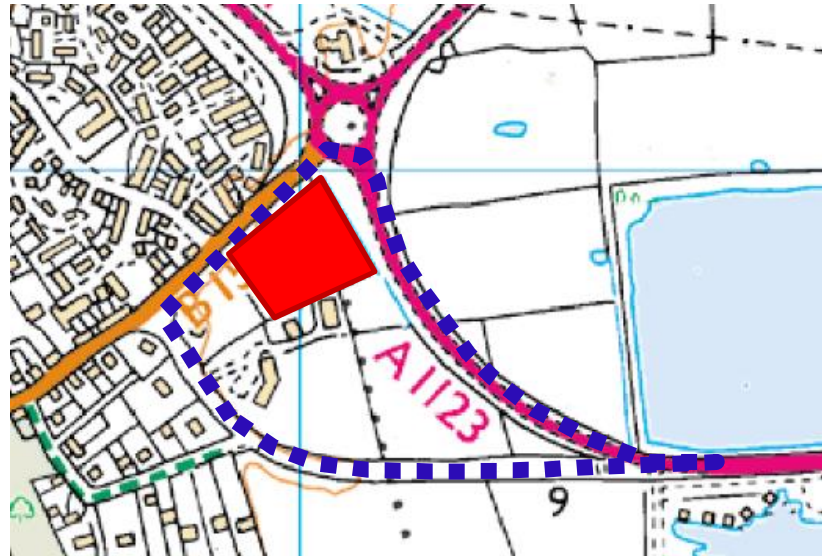
3.2 The Main Modifications Sustainability Appraisal also explains *'The removal of the allocation reduces the certainty of housing provision within the Huntingdon Spatial Planning Area; however, it has a neutral impact overall as the Development Strategy seeks to permit approximately three quarters of all housing development within Spatial Planning Areas'*.

4.0 Review of the justification for the deletion of Site HU9

- 4.1 It is highlighted the first justification is factually incorrect. This refers to 'removing the possibility of housing development on a site that is situated within flood zone 3a' However, the site is identified to be in flood zone 2, which is sequentially preferable to flood zone 3a.
- 4.2 The first justification is also at odds with the fact site was identified to be flood zone 2 in the Submission Local Plan, which the Council considered to be sound. Paragraph 9.86 of the Submission document states *'The site lies in flood zone 2 and is known to be at risk of surface water flooding so a site specific flood risk assessment will be essential. The site is defended against flooding by the raised roads near the northwestern and northeastern boundaries and by Environment Agency defences to the south. There is also a risk from surface water flooding, which is greatest in northern and eastern areas. The floor levels of dwellings should be raised above the maximum 1 in 100 year flood level taking account of climate change. A detailed explanation of flood risk management and mitigation measures will be required which should include provision of flood resilient structures. A flood response emergency plan should also be produced.'*
- 4.3 Further, to aid the preparation of the Local Plan the Council prepared a 'Huntingdonshire Local Plan to 2036: Sequential test for flood risk'. This documents the sequential and exception tests for flood risk that were undertaken to inform site allocations in the Submission Local Plan. The assessment concludes that despite meeting the housing requirement, it was considered worthwhile to assess additional sites to increase flexibility of supply, and to take advantage of specific regeneration opportunities. The document includes allocation HU9, where it notes the use of the sequential approach is limited due to the site being located entirely within Flood Zone 2; therefore any Highly Vulnerable development placed within Flood Zone 2 will be required to pass the Exception Test. Safe access and egress is not considered an issue, although climate change may increase the extent of surface water and fluvial flooding in the future and have the potential to affect routes.
- 4.4 It is acknowledged the National Planning Policy Framework states the aim is to steer new development to areas with the lowest probability of flooding. However, in preparing the Plan the Council has had regard to the Framework and the allocation has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.
- 4.5 The Planning Policy Guidance clarifies the Environment Agency Planning Flood Maps are the starting point for the sequential approach and the Flood Maps identify allocation site HU9 to be primarily within defended Flood Zone 3a, with small areas in the northern part of the site being in Flood Zone 2. The Huntingdonshire Strategic Flood Risk Assessment published in June 2017 is a level 1 and level 2 assessment that refines information on river and sea flooding risk shown on the Environment Agency's Flood Map for Planning. The Strategic Flood Risk Assessment concludes that allocation HU9 lies entirely in Flood Zone 2, with none of the site or surrounding land being classified as defended Flood Zone 3. The Assessment takes no account of the defences to the site provided by the Houghton flood defence bank that is maintained by the Environment Agency and encloses the village of

Houghton around its southern edge, extending westerly along the southern side of the Huntingdon Road (A1123) to the Old Houghton Road. The defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site. The defences are intended to provide a 1% AEP standard of protection.

- 4.6 It is highlighted that the Level 2 Detailed Site Assessment for the Main Street allocation produced (FLO/03) states 'There are no flood defences at this site' and this is clearly an error.
- 4.7 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.
- 4.8 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore is considered to supersede the Environment Agency Flood Map, thus the site is identified to be Flood Zone 2, not defended Flood Zone 3. The Flood Zone 2 classification in the Strategic Flood Risk Assessment is believed to be solely due to flooding having historically occurred at the site in 1947.
- 4.9 The Strategic Flood Risk Assessment states the Level 2 assessment is not intended to replace site-specific FRAs and the Framework clarifies local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific flood risk assessment. To accompany the current planning application the landowners have commissioned a Flood Risk Assessment and Sustainable Drainage Strategy and this is attached – see *Appendix A*. In preparing the Assessment the Environment Agency has supplied modelled flood data for the area and the node applicable to the site identifies the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD. The topographical survey has established the roads surrounding the site provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level. As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.



Raised roads above the 1 in 1000 year flood level identified by blue dots.

- 4.10 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. Indeed the Strategic Flood Risk Assessment mapping, which included 23%, 35% and 65% allowances for climate change on a 1 in 100 year event shows that the site remained dry during all of these event.
- 4.11 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1. This is reflected in advice from the Environment Agency when commenting on the adjacent development proposals (para 2.4 above refers) when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1 - see Appendix B. It is understood the Environment Agency has subsequently found some issues with its most recent modelling, and has therefore suspended the use of this model whilst these issues are investigated further and resolved. As such it has temporarily reverted to the use of an older version of the Flood Map for Planning.
- 4.12 It is clear there is a degree of conflict between flood related sources of information for the site, which is causing confusion as to how the site should be classified. The Environment Agency Flood Map for Planning until very recently (earlier in 2018) showed the allocation site as Flood Zone 2. However the currently available Environment Agency Flood Map for Planning shows the allocation site as defended flood zone 3a. The 2017 Huntingdonshire District Council Strategic Flood Risk Assessment Flood Zone mapping also indicates the site lies in Flood Zone 2. However, the Environment Agency flood level data and the topographical survey support that allocation site HU9 should be zone 1 and this is reflected in revised modelling being prepared by the Environment Agency. In light of the additional information that has been provided in connection with the planning application and subsequent exchanges, the Environment Agency has advised it is currently reviewing the flood zone for the allocation site HU9 with its flood modelling team.
- 4.13 It is clearly a material consideration in relation to the Sequential Test that the Environment Agency have previously indicated that when their latest modelling is finalised and released the site will likely be reclassified as Flood Zone 1, thus at a low risk of flooding from fluvial

and tidal sources, and in a zone in which the Sequential Test would be automatically passed.

- 4.14 Even if the Strategic Flood Risk Assessment flood zone 2 is given weight, due regard should be given to the defences identified above that effectively put the site in flood zone 1 according to the National Planning Policy Framework classification and the reliance on the Strategic Flood Risk Assessment, which takes no account of defences, is inappropriate. It is further highlighted that under the National Planning Policy Framework the proposed residential use is classified as a “more vulnerable” use that is appropriate in Flood Zone 2.
- 4.15 In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims. The allocation site is located within the Huntingdon Spatial Planning Area which is a focus for growth in both the adopted and emerging new Local Plan. The town is one of the district’s largest offering a wide range of services including the local hospital; number of schools and higher education; significant employment areas; a good range of shops; and leisure facilities and is therefore a very suitable location for housing growth. Growth in the town therefore offers the opportunity for development consistent with the sustainable development aims.
- 4.16 The relative merits of developing land in flood zone 2, but benefiting from permanent defences where the actual risk of the site flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, therefore needs to be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.
- 4.17 Due to its size and relationship to surrounding development the allocation site has not been in active agricultural use for a number of years and this has been limited to horse grazing. However, due to security and animal welfare issues the grazing use has tended to be intermittent and this has not generated sufficient finance for the active management of the site. Residential development with high quality well designed properties will therefore enable the land to be put to a beneficial use with landscaping enhancement for the local area.
- 4.18 Finally, the proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 4.19 In relation to the second reason for the modification that the removal of the allocation reducing the housing provision within the Huntingdon Spatial Planning Area has a neutral impact, this is challenged. Paragraph 4.15 of the Submission Plan states *‘The spatial planning areas offer some of the best opportunities for promoting sustainable development in Huntingdonshire and meeting the everyday needs of residents in one place thereby reducing the need to travel’*. Consequently the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the

level of growth in a sustainable Spatial Planning Area, which must be a negative impact as opposed to neutral impact.

5.0 Conclusions

5.1 The first justification in the Proposed Main Modifications Sustainability Appraisal for the deletion of the site is factually incorrect. The site is not flood zone 3a.

5.2 Allocation HU9 has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages with known flood issues, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.

5.3 The site benefits from flood defences maintained by the Environment Agency. The Environment Agency has previously confirmed the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected. Thus flood defences appear to have functioned as designed and without issue during this event.

5.4 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority. The FRA includes modelled flood data for the area provided by the Environment Agency and a topographical survey has established the roads surrounding the site provide a raised barrier and it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.

5.5 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1.

5.6 This assessment is reflected in advice from the Environment Agency when commenting on the adjacent development proposals approved as recently as April 2018, when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1.

5.7 For the reasons explained above it is evident there is confusion regarding the risk of flooding at the site and at the time of submitting this representation the Environment Agency has advised it is currently reviewing the flood zone classification for the allocation site HU9 with its flood modelling team.

5.8 In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims as the allocation site is located within the Huntingdon Spatial Planning Area, which is a focus for growth. Therefore the relative merits of developing land benefiting from permanent flood defences where the actual risk of the site

flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, should be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.

- 5.9 The proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 5.10 In relation to the second reason for the modification it is highlighted the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the level of growth in a sustainable Spatial Planning Area, which must be a negative impact, as opposed to the stated neutral impact.

**Objection representation in respect of proposed Main Modification
20 to the Huntingdonshire Local Plan to 2036 and the intended
deletion of site HU9 for residential development of approximately
30 homes on land at Main Street, Hartford, Huntingdon, PE29 1YA**

on behalf of Mr N Price

Prepared by: Martin Page, Planning Consultant

For and on behalf of Brown & Co.

Brown & Co is a leading provider of agency, professional and consultancy services across the whole range of rural, commercial, residential, and agricultural markets.

Date: January 2019.

Reference: P-548P.

1.0 Introduction

1.1 Brown & Co Barfords have been instructed to submit the following Objection on behalf of Mr N Price representing the owners of land at Main Street, Hartford, Huntingdon, PE29 1YA that is allocated for residential development of approximately 30 homes (Site HU9) in the Submission Local Plan and is proposed to be deleted by Modification 20.

2.0 Background

2.1 The allocation site is located on the eastern edge of Huntingdon. To the north of the site is the Owl Way residential estate and to the south west is the property no. 2 Old Houghton Road where planning permission has recently been granted for 3 new dwellings. To the south the site is enclosed by the former West Anglia Training Centre (now in administration). The site is therefore enclosed by built form on three sides. The site is also on the Huntingdon to Cambridge Busway route with 3 services per hour during the day (in either direction) which run along Main Street and there are bus stops with real time information displays 2 minutes' walk from the site. The site is therefore in an accessible location and there are a range of services and facilities available within walking and cycling distance.



Proposed allocation site context.

2.2 The suitability of the site for development was justified in the Sustainability Appraisal on the grounds: *The site is greenfield land on the edge of Huntingdon's built-up area and is well screened from the open countryside by a mature tree belt. Access to services and*

employment are reasonable with good transport links available to Huntingdon town centre. The site does have flooding constraints and mitigation will be necessary. Access arrangements would need to be resolved to ensure highway safety.

2.3 Site allocation HU9 has been a content of the Local Plan for more than 5 years and this has passed through 4 consultation stages:

- **Between May and July 2013** a draft Huntingdonshire Local Plan to 2036 (Stage 3) document was published for public consultation. This allocated the site for approximately 25 dwellings to include a mix of property types and sizes. The site was included in the Stage 3 consultation on the grounds *'the site performs well in the sustainability appraisal' and 'it is the last remaining parcel of land along Hartford Road contained within the A1123 and relates well to the existing built-up area'*.
- **Between January and March 2015** the Council undertook a further targeted public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation, though the site area was enlarged to include part of the garden of No. 2 Old Houghton Road and identified a development of approximately 30 dwellings to include a mix of property types and sizes.
- **Between July and August 2017** the Council undertook a further public consultation on an updated draft Huntingdonshire Local Plan document. This retained the allocation for a scheme of approximately 30 dwellings to include a mix of property types and sizes.
- **Between December 2017 and February 2018** the Council undertook a public consultation on the Proposed Submission Plan.

2.4 The allocation has at times included neighbouring land forming part of the garden of the No. 2 Old Houghton Road. However planning permission has been granted for 3 dwellings on this land, most recently as 20th April 2018 (LPA Ref. No. 18/00089/FUL).

2.5 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is currently under consideration (LPA Ref. No. 18/02239/OUT). This is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority.

3.0 The Council's explanation for Modification 20

3.1 The Proposed Main Modifications Sustainability Appraisal explains *'The removal of this allocation produces a positive impact in terms of removing the possibility of housing development on a site that is situated within flood zone 3a and the climate change allowance zone'*.

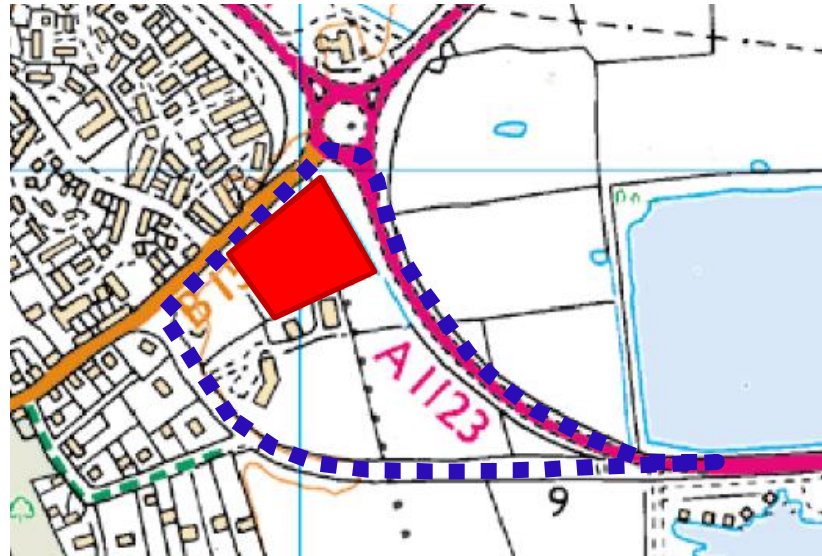
3.2 The Main Modifications Sustainability Appraisal also explains *'The removal of the allocation reduces the certainty of housing provision within the Huntingdon Spatial Planning Area; however, it has a neutral impact overall as the Development Strategy seeks to permit approximately three quarters of all housing development within Spatial Planning Areas'*.

4.0 Review of the justification for the deletion of Site HU9

- 4.1 It is highlighted the first justification is factually incorrect. This refers to 'removing the possibility of housing development on a site that is situated within flood zone 3a' However, the site is identified to be in flood zone 2, which is sequentially preferable to flood zone 3a.
- 4.2 The first justification is also at odds with the fact site was identified to be flood zone 2 in the Submission Local Plan, which the Council considered to be sound. Paragraph 9.86 of the Submission document states *'The site lies in flood zone 2 and is known to be at risk of surface water flooding so a site specific flood risk assessment will be essential. The site is defended against flooding by the raised roads near the northwestern and northeastern boundaries and by Environment Agency defences to the south. There is also a risk from surface water flooding, which is greatest in northern and eastern areas. The floor levels of dwellings should be raised above the maximum 1 in 100 year flood level taking account of climate change. A detailed explanation of flood risk management and mitigation measures will be required which should include provision of flood resilient structures. A flood response emergency plan should also be produced.'*
- 4.3 Further, to aid the preparation of the Local Plan the Council prepared a 'Huntingdonshire Local Plan to 2036: Sequential test for flood risk'. This documents the sequential and exception tests for flood risk that were undertaken to inform site allocations in the Submission Local Plan. The assessment concludes that despite meeting the housing requirement, it was considered worthwhile to assess additional sites to increase flexibility of supply, and to take advantage of specific regeneration opportunities. The document includes allocation HU9, where it notes the use of the sequential approach is limited due to the site being located entirely within Flood Zone 2; therefore any Highly Vulnerable development placed within Flood Zone 2 will be required to pass the Exception Test. Safe access and egress is not considered an issue, although climate change may increase the extent of surface water and fluvial flooding in the future and have the potential to affect routes.
- 4.4 It is acknowledged the National Planning Policy Framework states the aim is to steer new development to areas with the lowest probability of flooding. However, in preparing the Plan the Council has had regard to the Framework and the allocation has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.
- 4.5 The Planning Policy Guidance clarifies the Environment Agency Planning Flood Maps are the starting point for the sequential approach and the Flood Maps identify allocation site HU9 to be primarily within defended Flood Zone 3a, with small areas in the northern part of the site being in Flood Zone 2. The Huntingdonshire Strategic Flood Risk Assessment published in June 2017 is a level 1 and level 2 assessment that refines information on river and sea flooding risk shown on the Environment Agency's Flood Map for Planning. The Strategic Flood Risk Assessment concludes that allocation HU9 lies entirely in Flood Zone 2, with none of the site or surrounding land being classified as defended Flood Zone 3. The Assessment takes no account of the defences to the site provided by the Houghton flood defence bank that is maintained by the Environment Agency and encloses the village of

Houghton around its southern edge, extending westerly along the southern side of the Huntingdon Road (A1123) to the Old Houghton Road. The defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site. The defences are intended to provide a 1% AEP standard of protection.

- 4.6 It is highlighted that the Level 2 Detailed Site Assessment for the Main Street allocation produced (FLO/03) states *'There are no flood defences at this site'* and this is clearly an error.
- 4.7 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.
- 4.8 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore is considered to supersede the Environment Agency Flood Map, thus the site is identified to be Flood Zone 2, not defended Flood Zone 3. The Flood Zone 2 classification in the Strategic Flood Risk Assessment is believed to be solely due to flooding having historically occurred at the site in 1947.
- 4.9 The Strategic Flood Risk Assessment states the Level 2 assessment is not intended to replace site-specific FRAs and the Framework clarifies local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific flood risk assessment. To accompany the current planning application the landowners have commissioned a Flood Risk Assessment and Sustainable Drainage Strategy and this is attached – see *Appendix A*. In preparing the Assessment the Environment Agency has supplied modelled flood data for the area and the node applicable to the site identifies the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD. The topographical survey has established the roads surrounding the site provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level. As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.



Raised roads above the 1 in 1000 year flood level identified by blue dots.

- 4.10 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. Indeed the Strategic Flood Risk Assessment mapping, which included 23%, 35% and 65% allowances for climate change on a 1 in 100 year event shows that the site remained dry during all of these event.
- 4.11 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1. This is reflected in advice from the Environment Agency when commenting on the adjacent development proposals (para 2.4 above refers) when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1 - see Appendix B. It is understood the Environment Agency has subsequently found some issues with its most recent modelling, and has therefore suspended the use of this model whilst these issues are investigated further and resolved. As such it has temporarily reverted to the use of an older version of the Flood Map for Planning.
- 4.12 It is clear there is a degree of conflict between flood related sources of information for the site, which is causing confusion as to how the site should be classified. The Environment Agency Flood Map for Planning until very recently (earlier in 2018) showed the allocation site as Flood Zone 2. However the currently available Environment Agency Flood Map for Planning shows the allocation site as defended flood zone 3a. The 2017 Huntingdonshire District Council Strategic Flood Risk Assessment Flood Zone mapping also indicates the site lies in Flood Zone 2. However, the Environment Agency flood level data and the topographical survey support that allocation site HU9 should be zone 1 and this is reflected in revised modelling being prepared by the Environment Agency. In light of the additional information that has been provided in connection with the planning application and subsequent exchanges, the Environment Agency has advised it is currently reviewing the flood zone for the allocation site HU9 with its flood modelling team.
- 4.13 It is clearly a material consideration in relation to the Sequential Test that the Environment Agency have previously indicated that when their latest modelling is finalised and released the site will likely be reclassified as Flood Zone 1, thus at a low risk of flooding from fluvial

and tidal sources, and in a zone in which the Sequential Test would be automatically passed.

- 4.14** Even if the Strategic Flood Risk Assessment flood zone 2 is given weight, due regard should be given to the defences identified above that effectively put the site in flood zone 1 according to the National Planning Policy Framework classification and the reliance on the Strategic Flood Risk Assessment, which takes no account of defences, is inappropriate. It is further highlighted that under the National Planning Policy Framework the proposed residential use is classified as a “more vulnerable” use that is appropriate in Flood Zone 2.
- 4.15** In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims. The allocation site is located within the Huntingdon Spatial Planning Area which is a focus for growth in both the adopted and emerging new Local Plan. The town is one of the district’s largest offering a wide range of services including the local hospital; number of schools and higher education; significant employment areas; a good range of shops; and leisure facilities and is therefore a very suitable location for housing growth. Growth in the town therefore offers the opportunity for development consistent with the sustainable development aims.
- 4.16** The relative merits of developing land in flood zone 2, but benefiting from permanent defences where the actual risk of the site flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, therefore needs to be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.
- 4.17** Due to its size and relationship to surrounding development the allocation site has not been in active agricultural use for a number of years and this has been limited to horse grazing. However, due to security and animal welfare issues the grazing use has tended to be intermittent and this has not generated sufficient finance for the active management of the site. Residential development with high quality well designed properties will therefore enable the land to be put to a beneficial use with landscaping enhancement for the local area.
- 4.18** Finally, the proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 4.19** In relation to the second reason for the modification that the removal of the allocation reducing the housing provision within the Huntingdon Spatial Planning Area has a neutral impact, this is challenged. Paragraph 4.15 of the Submission Plan states *‘The spatial planning areas offer some of the best opportunities for promoting sustainable development in Huntingdonshire and meeting the everyday needs of residents in one place thereby reducing the need to travel’*. Consequently the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the

level of growth in a sustainable Spatial Planning Area, which must be a negative impact as opposed to neutral impact.

5.0 Conclusions

5.1 The first justification in the Proposed Main Modifications Sustainability Appraisal for the deletion of the site is factually incorrect. The site is not flood zone 3a.

5.2 Allocation HU9 has been an element of the emerging plan for more than 5 years and has been through 4 consultation stages with known flood issues, and the Plan was considered to be sound. Consequently, there has been no change of circumstances in flood terms that now justify Modification 20.

5.3 The site benefits from flood defences maintained by the Environment Agency. The Environment Agency has previously confirmed the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the east on the other side of the A1123, the Environment Agency do not believe the site was effected. Thus flood defences appear to have functioned as designed and without issue during this event.

5.4 A planning application for development that accords with allocation HU9 including 40% affordable units has been submitted to the Council and this is supported by a site specific Flood Risk Assessment and Sustainable Drainage Strategy, which has not been challenged by the Environment Agency or the Lead Local Flood Authority. The FRA includes modelled flood data for the area provided by the Environment Agency and a topographical survey has established the roads surrounding the site provide a raised barrier and it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event. The roads include new highways constructed since the historic 1947 flood event and unlike the Environment Agency defences, which are reliant on maintenance, the roads provide a permanent defence of the land.

5.5 Consequently, the actual risk of the allocation site flooding is low, at below a 1 in 1000 year event and under normal circumstances this would mean that the site would be classified as lying within Flood Zone 1.

5.6 This assessment is reflected in advice from the Environment Agency when commenting on the adjacent development proposals approved as recently as April 2018, when it was confirmed it was in process of updating mapping to show the site as lying in Flood Zone 1.

5.7 For the reasons explained above it is evident there is confusion regarding the risk of flooding at the site and at the time of submitting this representation the Environment Agency has advised it is currently reviewing the flood zone classification for the allocation site HU9 with its flood modelling team.

5.8 In weighing up the application of the sequential test a further material consideration is the wider sustainable development aims as the allocation site is located within the Huntingdon Spatial Planning Area, which is a focus for growth. Therefore the relative merits of developing land benefiting from permanent flood defences where the actual risk of the site

flooding is low (at below a 1 in 1000 year event) and in a highly sustainable settlement, should be weighed with the alternative of developing in less sustainable locations, such as the Key Service centres and smaller villages, or the intended greater reliance by the Council on rural exceptions sites and Prior Approvals to make up the housing numbers. The inclusion of allocation HU9 in the submission plan by implication means the Council has found the site to be sequentially preferable to other land in flood zone 1.

- 5.9 The proposed Modification is prejudicial to the land owners who, as supporters of the Submission Plan, have not had the opportunity to address the flood matters outlined above or to promote the site through participation in the Examination hearing sessions.
- 5.10 In relation to the second reason for the modification it is highlighted the deletion of allocation HU9 and other allocations to be compensated by a greater number of rural exception sites will reduce the level of growth in a sustainable Spatial Planning Area, which must be a negative impact, as opposed to the stated neutral impact.

APPENDIX A



ENGINEERING

Flood Risk Assessment & Sustainable Drainage Strategy for the Proposed Development of 27 Residential Dwellings on Land Off Main Street, Hartford

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1506 - FRA & DS Aug 2018

**Flood Risk Assessment & Sustainable Drainage Strategy
for the Proposed Development of 27 Residential Dwellings
on Land Off Main Street, Hartford**

1 Introduction

- 1.1 MTC Engineering (Cambridge) Limited has been asked to provide a Flood Risk Assessment and Sustainable Drainage Strategy in respect of the proposed residential redevelopment of approximately 1.2Ha of land off Main Street, Hartford, on behalf of Messrs. N Price and E Howson.
- 1.2 This Flood Risk Assessment and Sustainable Drainage Strategy is based on the following information:-
 - 1.2.1 Site survey by ASC Surveys Limited.
 - 1.2.2 Environment Agency Modelled and Historical Flooding Data;
 - 1.2.3 Huntingdonshire District Council Strategic Flood Risk Assessment;
 - 1.2.4 Proposed Site Layout by Brown & Co;
 - 1.2.5 Cambridgeshire County Council Surface Water Drainage Guidance for Developers;
 - 1.2.6 British Geological Survey information.

- 1.3 All the comments and opinions contained in this report including any conclusions are based on the information available to MTC Engineering (Cambridge) Ltd. during our investigations. The conclusions drawn could therefore differ if the information is found to be inaccurate, incomplete or misleading. MTC Engineering (Cambridge) Ltd. accept no liability should this prove to be the case, nor if additional information exists or becomes available with respect to this site.
- 1.4 MTC Engineering (Cambridge) Ltd. makes no representation whatsoever concerning the legal significance of its findings or any other matters referred to in the following report. Except as otherwise requested by the client, MTC Engineering (Cambridge) Ltd. are not obliged and disclaim any obligation to update the report for events taking place after the Assessment was undertaken.
- 1.5 This report is a Flood Risk Assessment and Sustainable Drainage Strategy relating to flooding and drainage issues associated with the proposed development. The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. This report provides no guarantee against flooding of the study site or elsewhere, nor as to the absolute accuracy of water levels, flow rates and associated probabilities quoted.

2 Site Description

- 2.1 The Site is located on the southeastern side of Main Street (the B1514) and western side of the A1123, in eastern Hartford.
- 2.2 The site is approximately square in shape, occupies an area of approximately 1.2Ha and is currently occupied by an agricultural field. It is allocated for the development of approximately 30 homes (HU 9) in Huntingdonshire's Local Plan to 2036: Proposed Submission 2017.
- 2.3 To the northwest the site is bound by Main Street, past which lies residential development off Owl Way. Main Street is generally about a metre or so higher than the northern part of the site, with the lowest section of Main Road present on the stretch between the roundabout junction with the A1123 at the northern corner of the site and junction with Old Huntingdon Road to the west of the site being 9.8 metres above Ordnance Datum (AOD) at the location of the existing site access. The majority of Main Road this stretch of Main Road is at levels of between 10 and 10.5 metres AOD.
- 2.4 To the northeast the site is bound by the A1123, past which lies open agricultural land and also Hartford Lake which is about 300 metres east of the site. The A1123 is again embanked above adjacent land, falling from a level of almost 11 metres AOD at the junction with Main Street at the northern corner of the site to a level of about 9.6 metres AOD at the junction with Old Houghton Road (now a cycleway/bus route only) to the southeast of the site.
- 2.5 To the south and east of the site lies number 2 Houghton Road and a training centre which are on the northern/eastern side of Old Houghton Road, along with some further agricultural land. West past Old Houghton Road lies existing residential development off The Grove, with the main body of Hartford lying to the west of the site. South past Houghton Road lies some agricultural land and then the River Great Ouse which flows in an easterly direction approximately 300 metres south of the site.

- 2.6 Old Houghton Road runs in a southerly direction from Main Street then easterly direction to the A1123, although the eastern part of Old Houghton Road is now only used as a bus route and cycleway. The southern section of Old Houghton Road is at a level of about 9.5 metres AOD, although there is a bank along the northern side of the majority of this section to levels of about 10.3 metres. Old Houghton Road then rises in a northerly direction to levels of about 10.7 metres at the junction with Main Street.
- 2.7 As such Main Street, the A1123, and Old Houghton Road form a continuous embankment to a minimum level of about 9.5 metre AOD around the triangle of land made up of the site, number 2 Old Houghton Road, the training centre, and other agricultural land, with the majority of this land being at a slightly lower level than these roads.
- 2.8 The site itself falls in a southeasterly direction from levels of above 9 metres AOD in the northern area adjacent to Main Road to levels of about 8.6/8.7 metres AOD along the southeastern boundary.
- 2.9 A small drain runs along the northeastern boundary of the site in a southerly direction, having flowed beneath Hartford Road through a 450mm culvert. This drain then flows through a short length of dual pipe (about 600mm diameter) at the eastern corner of the site, then continues southeast along the southern side of the A1123 before flowing east beneath the A1123/Old Houghton Road through a dual 600mm pipe. Environment Agency defences located at the downstream side of this outfall prevent backflow of flood water in a northerly direction along this drain towards the site.
- 2.10 There is a small pond in the eastern corner of the site, which is thought to be in continuity with ground water levels and created for agricultural use. Whilst there are a few other small drains present in the vicinity of the site these are located outside of the triangle of roads surrounding the site.
- 2.11 There are no further surface water features of note in the vicinity of the site.

2.12 British Geological Survey Mapping indicates that the bedrock geology underlying the site is the Oxford Clay formation, with a superficial geology of river terrace deposits of sand and gravel also present.

3 Sources of Potential Flood Risk

- 3.1 In accordance with The National Planning Policy Framework all forms of flood risk need to be considered in relation to any development.
- 3.2 The first form of flood risk to be considered in respect of The National Planning Policy Framework is fluvial flooding.
- 3.3 The River Great Ouse which flows in an easterly direction approximately 300m south of the site is the only significant source of fluvial flood risk to the site, with the Environment Agency Flood Map for Planning (Appendix 2) indicating that the site lies primarily within defended Flood Zone 3a but with small areas in the northern part of the site being in Flood Zone 2.
- 3.4 The Huntingdonshire District Council Strategic Flood Risk Assessment map (Appendix 3) however indicates that the site lies entirely in Flood Zone 2 with none of the site or surrounding land being classified as defended Flood Zone 3.
- 3.5 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore being the most recent available source of flood data is considered to supersede the Environment Agency Flood Map, thus it is considered that the site is classified as Flood Zone 2 not defended Flood Zone 3.
- 3.6 The Strategic Flood Risk Assessment also provides mapping of a 1 in 100 year event with 'central' 25%, 'higher central' 35% and 'upper end' allowances for climate change, as provided in Appendix 4. This mapping shows that the site would remain dry in all of the above events, thus is considered to be at a low risk of flooding during a 1 in 100 year event even with allowance for climate change.
- 3.7 The Environment Agency have supplied modelled flood data for the area, a copy of which is provided in Appendix 5.

- 3.8 The node applicable to the site is node EA052349LO0117 at which the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the flows at these levels being 99.56 cumecs and 103.84 cumecs respectively.
- 3.9 As can be seen from the survey of the roads surrounding the site (Appendix 5) these provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level.
- 3.10 As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event.
- 3.11 Current modelled climate change allowances have not been modelled by the Environment Agency, with the only modelled climate change water level being 9.17m AOD based upon 20% climate change, where the modelled flow was 100.02 cumecs. As the 1 in 100 year flow was 99.56 cumecs, which indicates a flow increase of 0.023 cumecs per % climate change.
- 3.12 As such even in the maximum 65% climate change flood event that requires consideration under current guidelines flows in a 1 in 100 year event would increase by approximately 1.5 cumecs to 101.06 cumecs. As such they would remain more than 2.5 cumecs below the 1 in 1000 year flow that has been modelled, and thus the 1 in 100 year plus 65% climate change water level would be less than the 1 in 1000 year water level of 9.37m AOD.
- 3.13 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. As such the Strategic Flood Risk Assessment mapping which shows that the site would remain dry during a 1 in 100 year plus climate change event is considered to be correct.

- 3.14 It should be noted that whilst Environment Agency defences in the area terminate at the eastern end of Old Houghton Road, defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site.
- 3.15 As such unless this defence failed flood water would not come back up this watercourse towards the site, thus given the level of adjacent roads protecting the site from flood water coming across land it is considered that the site is fully protected against fluvial flooding from the River Great Ouse in 1 in 100 year, 1 in 100 year plus climate change and 1 in 1000 year flood events.
- 3.16 In the unlikely event that the Environment Agency defence failed and allowed water to flow northwards along the drain running along the western side of the A1123 during a fluvial flood event this would be a slow process due to the twin 600mm pipes restricting the flow capacity, with water gradually beginning to pond in the land to the north of the A1123. Lower lying areas adjacent to the drain would be effected first, with ponding gradually spreading northwards through this triangle of land towards the site.
- 3.17 It is unlikely that water levels in this area of flood plain would actually reach same level as water levels in the Great Ouse Channel under any circumstances, although even if this were to occur during a 1 in 100 year event the northern section of the site would remain dry, whilst the southeastern section would be subject to shallow ponding to a depth of up to about 300mm in the majority of the southern area. During a 1 in 1000 year event the northwestern area of the site would remain dry, with the water level in the southern part being a maximum depth of about 600mm
- 3.18 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the west on the other side of the A1123 the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.

- 3.19 The only other fluvial flood risk to the site comes from the small drain along the eastern boundary of the site with the worst case flood risk involving a blockage of either the channel itself or the culvert at the eastern edge of the site.
- 3.20 During any such event water would simply flow south past the blockage before rejoining the drain channel downstream, with the only anticipated impact being a little bit of surface water flooding occurring in the vicinity of the blockage.
- 3.21 Overall it is considered that the risk of fluvial flooding to the site is low with the only significant risk of flooding to the site coming from the potential failure of Environment Agency defences allowing flow in a northerly direction up the drain adjacent to the site. This would result in a gradual filling of the basin formed by the triangle of roads surrounding the site, with the higher parts of the site remaining dry and lower parts possibly subjected to shallow ponding.
- 3.22 The second source of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from the sea.
- 3.23 This site is well inland and with existing ground levels in the order of 9 metres AOD is considered to be at a low risk of flooding from the sea.
- 3.24 The third form of flood risk to be considered in respect of The National Planning Policy Framework is flooding from land.
- 3.25 Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can quickly run off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage with foul sewer surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro level can influence or exacerbate this. Overland flow paths need to be taken into account in development to minimise the risk of flooding from overland flow.

- 3.26 The A1123 and Old Houghton Road provide embanked barriers against any overland flow coming towards the site from the east, south, or west.
- 3.27 Overland flow could potentially come southeast onto Main Street from the residential development to the north, however much of this area is garden space rather than impermeable hence overland flows are less likely to develop, whilst any flows that did develop would likely either enter highway drainage systems or be channeled along the local road network by raised kerbs.
- 3.28 In the event that any overland flow did come onto the site from Main Road this would likely be at the low point in Main Road at the existing site access, and any such flow would simply be across the site in a southeasterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site, other than the potential forming of shallow ponding at low spots on the site such as at the existing pond in the southeastern corner of the site.
- 3.29 The surface water flood map shows that the only area of ponding that may occur on the site in a 'high risk' 1 in 30 year event being an extremely small area of shallow flooding in the southeastern corner of the site at the low spot/pond.
- 3.30 In a 'medium risk' 1 in 100 year event the extent of flooding would be a little greater in the southeastern area of the site, however other than at the existing pond the depth of water would remain below 300mm.
- 3.31 In a 'low risk' 1 in 1000 year event the extent of flooding would again increase, with comparison of flood extents and levels on the site survey indicating a ponded water level of approximately 8.9m AOD.
- 3.32 As such the overall the majority of the site is considered to be at only a low or very low risk of flooding from surface water, however adequate steps will be taken to ensure that the proposed development is adequately protected against any potential risk of surface water flooding as detailed in Section 4.

- 3.33 The fourth form of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from rising groundwater.
- 3.34 Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands and river gravels in valley bottoms underlain by less permeable rocks. Water levels below the ground rise during wet winter months, and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land.
- 3.35 Geological Mapping indicates that the site is underlain by a bedrock geology of clay which would not have a water table, however a perched water table may be present in the overlying superficial geology of sand and gravels.
- 3.36 Based upon the pond in the eastern corner of the site which is likely to be in continuity with ground water levels this indicates a water level of about 7.7 metres at the site at the time of survey, which is about a metre below most site levels.
- 3.37 Under normal circumstances it is anticipated that any outflow of groundwater would be directly to the River Great Ouse or result in the development of spring lines in the lower lying land to the south of Old Houghton Road.
- 3.38 During a fluvial flood event on the River Great Ouse however it is possible that ground water levels would rise at the site and it is possible that some outflow could occur, however the impact upon the site would be less than that which would occur in the event that Environment Agency defences failed during a 1 in 100 year plus climate change fluvial flood event or 1 in 1000 year flood event, whilst there was no recorded groundwater flooding occurring at the site during the 1998 event when water was present in surrounding fields.

- 3.39 The fifth form of flood risk to be considered in accordance with the National Planning Policy Framework is the risk of flooding from blocked, overloaded, or burst sewers and water mains.
- 3.40 Should any sewer or water main block, become overloaded, or burst on Main Road any water which came on to the site would likely do so in the vicinity of the existing access, and would simply flow across the site in a south easterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site.
- 3.41 The last form of flood risk to be considered in accordance with the National Planning Policy Framework is flooding from reservoirs, canals or other artificial sources.
- 3.42 Grafham Water lies about 11km southwest of the site, and should its dam burst water would flood down Diddington Brook to the River Great Ouse where it would occupy much of the flood plain of the River Great Ouse both upstream and downstream of this point.
- 3.43 Environment Agency mapping indicates that the flood extent in such an event would be similar to a 1 in 100 year fluvial flood event on the River Great Ouse in the vicinity of the site, however makes no allowance for defences and it is anticipated that the fluvial defences and raised roads in the vicinity of the site would ensure that the site remained dry during any such event.
- 3.44 Further to the above Grafham Water is owned and maintained by Anglian Water Services Ltd, thus it is anticipated that the dam will remain well maintained and its risk of failure is low.
- 3.45 There are no further artificial sources of flood risk to the site and the overall risk of flooding to the site from artificial sources is considered to be low.

4 The Proposal

- 4.1 The proposal involves the outline Planning Application for the residential development of the site with 27 dwellings, as shown by the indicative site layout provided in Appendix 7.
- 4.2 Overall it is considered that the flood risk to the site by any means is low, with the site being defended against flooding by the surrounding embankments. Even in the event that Environment Agency measures to prevent backflow were to fail, flow beneath these embankments would be restricted by the twin 600mm culvert, and it is anticipated that water levels that would occur on site would remain significantly below water levels in the main River Great Ouse channel.
- 4.3 Therefore the minimum finished floor level of all dwellings will be set at above 9.37 metres AOD which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 4.4 It is not considered that any further flood resistant or resilient construction is required at the site.
- 4.5 The raised floor levels will ensure that the proposed dwellings are adequately protected against flooding from any other potential source including flooding from surface water where the maximum water level anticipated during a 1 in 1000 year event is approximately 8.9m AOD.
- 4.6 The superficial geology will likely provide acceptable infiltration rates for infiltration systems to be used as a means of drainage at the proposed development. Infiltration testing in accordance with BRE 365 will therefore take place to fully determine infiltration rates once outline planning permission has been granted and if acceptable infiltration rates are achieved then all surface water discharge from the development will be to infiltration systems designed in accordance with CIRIA Report 156.

- 4.7 In the event that either acceptable infiltration rates are not achieved or groundwater levels are too high to allow infiltration drainage to be used then surface water drainage will be via a positive system discharging to the adjacent ditch system running along the eastern boundary of the site, with discharge rates restricted to a maximum discharge rate of 2.0 liters per second during all events up to and including a 1 in 100 year plus 40% climate change event.
- 4.8 The outline Surface Water Drainage Strategy detailed in Section 5 has therefore been developed in compliance with all current relevant local and national guidance, with full detailed drainage design to be completed in line with this strategy and submitted for approval at the detailed design phase once outline planning permission is granted.
- 4.9 Foul drainage from the proposed development will either be to the existing foul sewerage network, via a pumped system if necessary, or to a package treatment plant discharging to the adjacent drain with all necessary discharge consents/permits obtained from relevant bodies such as the Environment Agency.

5 Sustainable Drainage Strategy

5.1 Point of Discharge and Discharge Rate

- 5.1.1 In line with the Drainage Hierarchy, surface water should be discharged to the ground via infiltration systems where feasible. Whilst the site is underlain by a bedrock sandstone geology which is largely permeable, the superficial geology is a much lower permeability geology in which infiltration systems are unlikely to prove feasible.
- 5.1.2 Infiltration testing in line with BRE365 will however be carried out once conditional planning permission has been granted, and if acceptable rates obtained then all surface water from the proposed development will be drained via infiltration systems.
- 5.1.3 5×10^{-6} m/s is generally considered the lowest rate at which infiltration systems provide an acceptable means of surface water discharge, thus if rates below this are obtained during testing then the second preferable method of discharge in line with the Drainage Hierarchy is discharge to a surface watercourse.
- 5.1.4 If acceptable infiltration rates are not achieved and a positive discharge solution is required then discharge will be to the watercourse along the northeastern boundary of the site, with post development discharge rates will be restricted to a maximum discharge rate of 2.0 l/s during all rainfall events up to and including a 1 in 100 year plus 40% climate change event.
- 5.1.5 As such regardless of the infiltration rates obtained during testing the proposed development can be drained in line with rather the first or second method required by the Drainage Hierarchy.
- 5.1.6 It is therefore considered appropriate to require full detailed infiltration testing at the detailed design phase rather than current planning application stage, with this information to be secured by planning condition.

5.2 Drainage Areas and Attenuation Volumes

- 5.2.1 An indicative drainage area plan is provided in Appendix 8, which shows that the total post development roof area of the new buildings is anticipated to be approximately 2,020m², with approximately 2,130m² of shared access and parking areas, and 980m² of road areas. As such the total post development drained area will be approximately 0.513Ha in total.
- 5.2.2 Based upon the minimum feasible infiltration rate of 5×10^{-6} m/s (0.018m/hr), the Micro Drainage calculations (Appendix 9) indicate that a base depth of 320mm beneath the parking areas and access areas to be permeably surfaced (with 30% void space) would be sufficient to accommodate run off from the 0.415Ha area roof and permeable accesses/parking areas during a 1 in 100 year plus 40% climate change event. Alternatively dependent upon the final detailed design the base thickness of the paving may be reduced, with cellular units such as aquacell instead used beneath some areas.
- 5.2.3 Infiltration calculations also indicate that the adoptable highway area (for which the Local Highway Authority are unlikely to accept permeable paving) could be successfully drained by an infiltration basin with a base area of 61.5m² and area of 190.5m² as shown on the indicative drainage layout in Appendix 8.
- 5.2.4 As such should an infiltration rate of 5×10^{-6} m/s be achieved during testing then the full post development drained area can be drained by infiltration. Should a rate higher than 5×10^{-6} m/s be achieved during testing then a reduced area/depth pond could be provided when detailed design takes place, thus the indicative pond shown is considered the worst case in terms of land take, and the base depth to permeable paving is considered to be worst case.
- 5.2.5 In the event that following testing rates are less than 5×10^{-6} m/s and a positive discharge is required, the Micro Drainage Calculations provided in Appendix 10 show that the QBAR greenfield discharge rate from this area is 1.3 litres per second (l/s), with the 1 in 1, 1 in 30, and 1 in 100 year discharge rates being 1.1l/s, 3.2l/s and 4.7l/s respectively.

- 5.2.6 Sewers for Adoption 7th Edition indicates that the minimum diameter flow control generally accepted by undertakes is 75mm. The lowest discharge rate that can be feasibly achieved using such a flow control is 2 l/s, thus discharge from the post development site would be restricted to a maximum of 2 l/s during all rainfall events upto and including a 1 in 100 year plus 40% climate change event.
- 5.2.7 Whist 2 l/s is slightly above greenfield discharge rates, it is less than two thirds the existing 1 in 30 year greenfield rate and less than half the 1 in 100 year greenfield rate. As such the flow restriction proposed will reduce flows during more extreme rainfall events when surrounding drainage infrastructure is closest to capacity thereby providing a benefit in extreme events and reducing the downstream risk of flooding in these events.
- 5.2.8 The Micro Drainage calculations provided in Appendix 11 indicate that to attenuate discharge from the full post redevelopment area of 0.513Ha to 2.0l/s during a 1 in 100 year plus 40% climate change event will require an attenuation volume of about 347m³.
- 5.2.9 The pond shown on the indicative drainage layout provided in Appendix 11 will provide approximately 63m³ of attenuation, whilst assuming a base thickness of 300mm to the permeable paving area with 30% void space would provide a further 192m³ of attenuation. The remaining 93m³ of attenuation required will be provided by using 250m² of cellular storage beneath shared/private driveway areas that are permeably surfaced, which based upon aquacell units with 0.4m depth and 95% void space would provide 95m³ of attenuation. As such the attenuation required can be comfortable accommodated at the proposed development.
- 5.2.10 The outline calculations provided clearly demonstrate that post development surface water discharge will either be to infiltration if suitable rates are obtained during testing or can be restricted to a maximum rate of 2.0l/s during all events up to and including a 1 in 100 year plus 40% climate change rainfall event.

5.2.11 Full detailed design of the surface water drainage and attenuation systems will therefore only take place once planning approval has been granted and the layout finalized, and will be submitted for approval at the conditional discharge stage.

5.3 SuDS Systems Proposed at Development

5.3.1 Living/green roof systems are a preferred SuDS technique, given that they are a flood reduction measure, reduce pollution through filtration, and provide a landscape and wildlife benefit. In this instance however living roofs will not prove feasible, firstly as the dwellings are likely to have pitched roofs and secondly as maintenance requirements are onerous for single dwelling owners.

5.3.2 Water re-use systems such as rainwater harvesting and water butts that would allow rainwater to be re-used for purposes such as irrigation may be provided at the development. This will however only be confirmed at the detailed design stage, whilst any storage provided within such systems (which would overflow to the main surface water drainage network) will not be counted towards that required to accommodate the design rainfall event as such system may be full at the time the rainfall event occurs.

5.3.3 Basins and ponds are considered preferred SuDS features as they provide both a flood and pollution reduction measure along with landscape and wildlife benefits.

5.3.4 Given the size of the site there is sufficient area in which to incorporate an infiltration/attenuation pond, which will be provided in the low eastern area of the site to enable drainage by gravity as indicated on the indicative drainage plan provided in Appendix 8.

5.3.5 Permeable paving is a SuDS technique that is appropriate to use at most developments, and provides both a flood reduction benefit due to the attenuation provided in the base and a pollution reduction benefit due to the filtration of water as it passes through the permeable surfacing.

5.3.6 Permeable paving will therefore be used on all private access and parking areas at the development. At present the Local Highway Authority will not adopt permeable access roads, thus it is anticipated that the main access road will be impermeably surfaced, however if the Local Highway Authority position changes prior to the detailed application/design being undertaken then the main access road will also be permeably surfaced.

5.4 **SuDS Treatment Stages**

5.4.1 All surface water will receive an appropriate level of treatment in line with requirements prior to discharge to the surface water sewer network.

5.4.2 Drainage from all external hard standing/access areas which will be lightly trafficked requires two treatment stages prior to discharge. For the private access areas which will be permeably surfaced the first treatment stage will be via filtration through the permeable surfacing and second stage being filtration through the membrane (such as terram) in which the base layer would be wrapped.

5.4.3 For impermeable areas of adoptable highway the first treatment stage will therefore be through a traditional drainage system incorporating measures such as trapped gulleys, whilst the second stage will be via settlement and adsorption in the infiltration/attenuation basin to be provided.

5.4.4 Surface water from the roofs is considered clean discharge thus requires one treatment stage only prior to discharge, which will be provided by filtration through the membrane such as terram in which the base layer of the permeable paving will be used, whilst if a positive discharge is required an additional stage would also be provided by means of settlement and adsorption in the infiltration/attenuation pond.

5.4.5 All surface water will therefore receive the required number of treatment stages prior to discharge.

5.5 Maintenance of SuDS Systems

- 5.5.1 All drainage systems serving single dwellings only will be the responsibility of the dwelling owner to maintain.
- 5.5.2 Drainage systems serving multiple dwellings will likely be the responsibility of the management company set up to maintain communal areas of the development to maintain, with funding provided by the ground rent/service charge to be levied on dwellings.
- 5.5.3 The possible alternative is that sewage undertakers will be accepting SuDS systems by the time detailed design takes place (Sewers for Adoption 8 which covers adoption of SuDS is likely to be released and implemented in the near future). If this happens prior to detailed design and construction then the SuDS systems may be offered for adoption rather than maintained by a management company.
- 5.5.4 A full maintenance plan will be produced at the detailed design phase to all relevant parties once conditional planning approval has been granted covering all drainage systems at the site to ensure that relevant parties are aware of their responsibilities and the maintenance requirements of the systems provided.
- 5.6 Full detailed design of the surface water drainage system serving the development will only take place once conditional planning approval has been granted, with provision of the full detailed drainage design and associated information such as infiltration test results and maintenance plans to be secured by appending an appropriate planning condition to any planning approval granted.
- 5.7 This will be based on this outline Sustainable Drainage Strategy, which clearly demonstrates that the proposed redevelopment can be drained in accordance with all national and local requirements and that the design 1 in 100 year plus 40% climate change rainfall event can be dealt with on site without having an adverse impact upon the off-site risk of flooding.

6 Assessment

- 6.1 The proposal involves erection of 27 dwellings on land off Main Street, Hartford.
- 6.2 The site is shown as lying in Flood Zone 2 on the Strategic Flood Risk Assessment, and in defended Flood Zone 3a on the Environment Agency Flood Map for Planning.
- 6.3 As the Strategic Flood Risk Assessment is based upon more recent hydraulic modelling than the Flood Map for Planning, this is considered to represent the most up to date classification of the site, which is therefore considered to lie in Flood Zone 2.
- 6.4 Under the National Planning Policy Framework the proposed use is classified as a “more vulnerable” use. This use is appropriate in Flood Zone 2 without the need for an Exception Test, however a Sequential Test may be required.
- 6.5 The site has an allocation (HU 9) in Huntingdonshire’s Local Plan to 2036: Proposed Submission 2017 for residential development, thus the Sequential Test has already been considered and has been passed by the proposed development. No further Sequential Test information is therefore required in this instance.
- 6.6 All the sources of flood risk to the proposed development have been considered in Section 3, and the only significant risk of flooding comes from the River Great Ouse.
- 6.7 The modelled in channel 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the 1 in 1000 year flood level considered to exceed the 1 in 100 year plus 65% climate change level as it involves higher flows.
- 6.8 Surrounding road levels are significantly above these levels, whilst the Environment Agency have backflow prevention systems in place to prevent flooding back onto the beneath embankments from drains in the area. As such even if water could get onto the site water levels would be significantly lower than the modelled in channel levels referred to above.

- 6.9 The minimum floor level of the proposed dwellings will in any case be set at 9.37 metres AOD, which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 6.10 It is not considered that any further flood resilient or resistant construction is required in this instance.
- 6.11 Surface water drainage from the proposed development will be to infiltration systems subject to satisfactory infiltration rates being achieved during testing and groundwater levels not being too high. If infiltration systems cannot be used as a means of surface water drainage then a positive system with attenuation and a flow control limiting discharge to the adjacent drain a maximum rate of 2.0 litres per second during all events upto and including a 1 in 100 year plus 40% climate change event.
- 6.12 Further details in relation to surface water drainage will be provided at the detailed design stage, with the outline drainage strategy provided in Section 5 clearly demonstrating that the proposed development can be drained in line with all local and national requirements and without having an adverse impact upon the off-site risk of flooding.
- 6.13 Foul drainage from the proposed development will be either to the existing foul network or to a package treatment plant discharging to the adjacent drain with all necessary permits and consents to be obtained.

7 Conclusion

- 7.1 The proposal involves the development of 27 residential dwellings on land off Main Street, Hartford, as shown on the indicative layout provided in Appendix 8.
- 7.2 The site lies in Flood Zone 2 based upon the Strategic Flood Risk Assessment which is based upon more recent modelling than the Environment Agency Flood Map for Planning.
- 7.3 The Exception Test is not required for ‘more vulnerable’ development in Flood Zone 2, whilst the site has an allocation in the Local Plan (HU 9) thus has already been considered to pass the Sequential Test.
- 7.4 Surveyed levels demonstrate that the roads surrounding the site on all sides are significantly above the modelled flood level during a 1 in 100 year event of 9.06m AOD and 1 in 1000 year water level of 9.37m AOD (considered to be higher than any 1 in 100 year plus climate change level. Environment Agency defences prevent the flow of flood water back up adjacent drains and the site is therefore fully defended against a 1 in 100 year and 1 in 1000 year event on the River Great Ouse.
- 7.5 In the unlikely event that the defences fail the finished floor level of the proposed dwellings will be set at a minimum height of 9.37 metres AOD which is the same as the modelled 1 in 1000 year flood level on the River Great Ouse which is a higher level than would occur on site in the unlikely event that defences failed and allowed water to come onto the site.
- 7.6 Surface water drainage will be to infiltration systems if acceptable rates are achieved in testing or to a positive system with discharge restricted to a maximum rate of 2 litres per second during all events upto and including a 1 in 100 year plus 40% climate change rainfall event, as fully detailed within the outline sustainable drainage strategy provided in Section 5.

- 7.7 The surface water drainage strategy clearly demonstrates that the site can be drained in line with all relevant local and national guidance and without adversely impacting the off-site risk of flooding. It is therefore appropriate to secure the full detailed drainage design by means of appending an appropriate planning condition to any approval granted.
- 7.8 There are no flood or drainage related grounds under the National Planning Policy Framework on which to oppose the erection of 27 dwellings on land off Main Road, Hartford.

APPENDIX 1
SITE LOCATION PLAN



APPENDIX 2

ENVIRONMENT AGENCY FLOOD MAP FOR PLANNING

Flood map for planning

Your reference
1506

Location (easting/northing)
525993/272913

Created
17 Aug 2018 3:17

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

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
1506

Location (easting/northing)
525993/272913

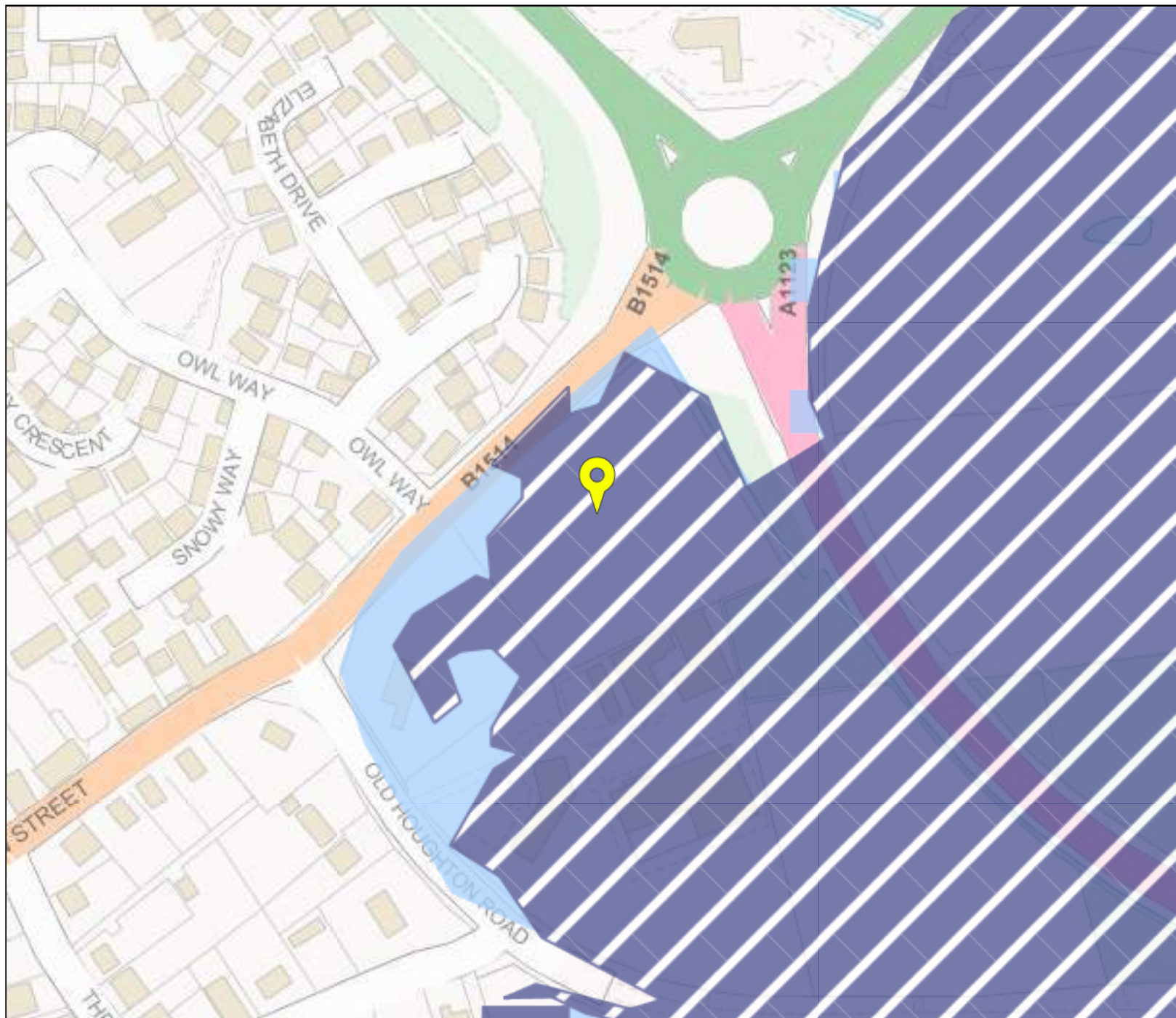
Scale
1:2500

Created
17 Aug 2018 3:17

-  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

0 20 40 60m

Page 2 of 2



APPENDIX 3

STRATEGIC FLOOD RISK ASSESSMENT MAPPING – FLOOD ZONES

SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	 Flood Zone 2	 Flood Zone 3a	 Flood Zone 3b	
Climate Change Flood Risk	 Central	 Higher Central	 Upper End	
Updated Flood Map for Surface Water	 30 year extent	 100 year extent	 1,000 year extent	
Areas Susceptible to Ground Water Flooding	 $\geq 75\%$	 $\geq 50\% < 75\%$	 $\geq 25\% < 50\%$	 $< 25\%$
Flood Warning Coverage	 Flood warning area			

- Flood Zones
 Climate Change Flood Risk
 Updated Flood Map for Surface Water
 Areas Susceptible to Groundwater Flooding
 Flood Warning Coverage



APPENDIX 4

STRATEGIC FLOOD RISK ASSESSMENT MAPPING - CLIMATE CHANGE

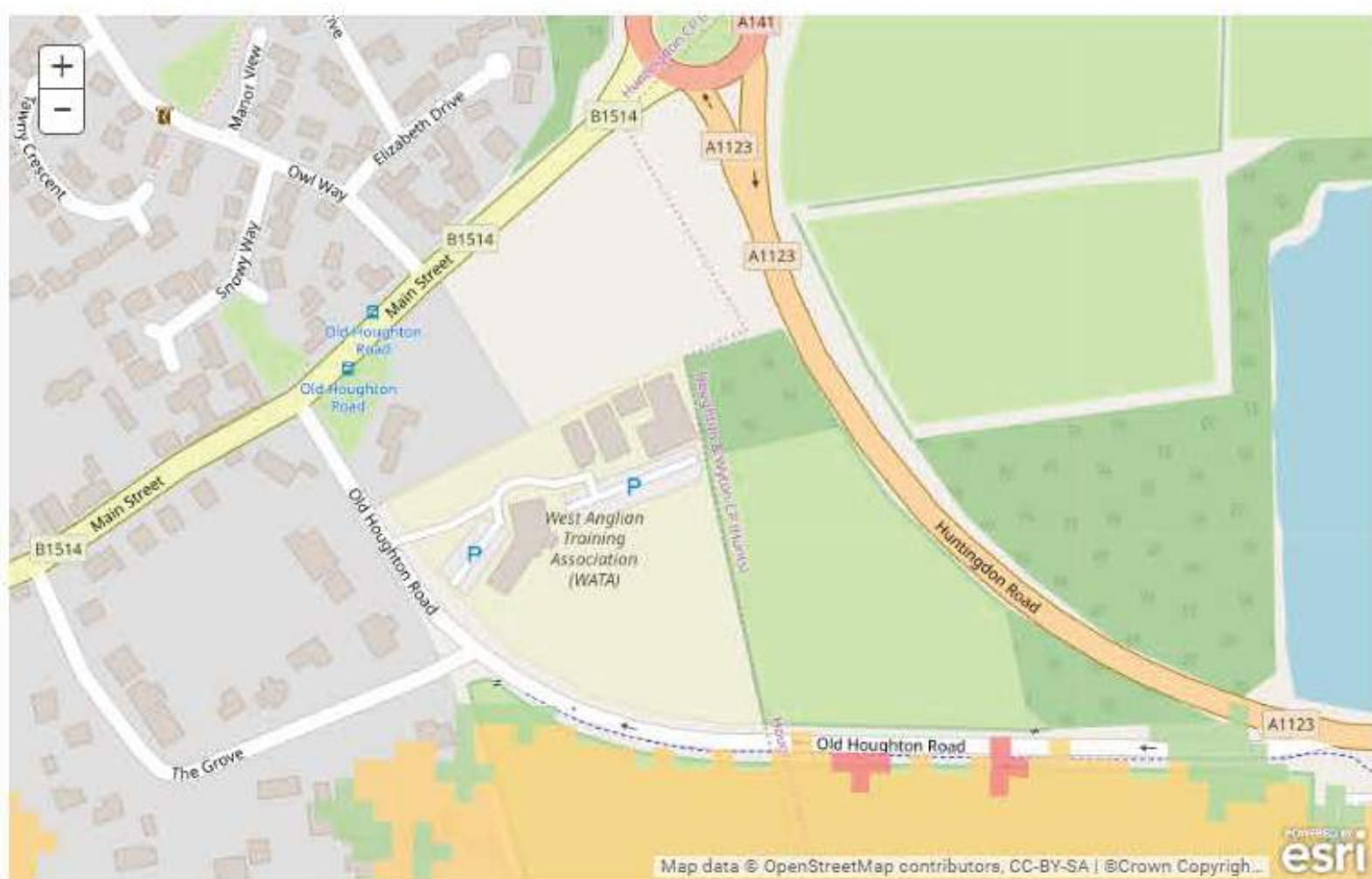
SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	
Climate Change Flood Risk	Central	Higher Central	Upper End	
Updated Flood Map for Surface Water	30 year extent	100 year extent	1,000 year extent	
Areas Susceptible to Ground Water Flooding	$\geq 75\%$	$\geq 50\% < 75\%$	$\geq 25\% < 50\%$	$< 25\%$
Flood Warning Coverage	Flood warning area			

- Flood Zones
 Climate Change Flood Risk
 Updated Flood Map for Surface Water
 Areas Susceptible to Groundwater Flooding
 Flood Warning Coverage



APPENDIX 5

ENVIRONMENT AGENCY MODELLED AND HISTORICAL FLOOD DATA

Emily Fell
MTC Engineering (Cambridge) Ltd

Our ref
Date

EAn2018/73180
14 February 2018

emilyfell@mtcengineering.co.uk

Dear Emily

Enquiry regarding Product 4 for Main Street, Hartford

Thank you for your enquiry which was received on 17 January 2018.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The information we hold and a copy of the Flood Risk Assessment (FRA) advisory note is attached to my email. There are no defences in the area which would protect this property.

Informatives & Caveats

Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

If you have any queries regarding our data please contact the Flood and Coastal Risk Management team on 0208 474 5245.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Page 691

Website: <https://www.gov.uk/government/organisations/environment-agency>



Name	Product 4
Description	Detailed Flood Risk Assessment Map centred on Main Street, Hartford
Licence	Open Government Licence
Information Warnings	None
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our <https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion> and email it to our Sustainable Places team at: planning.brampton@environment-agency.gov.uk. They will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our [website](#).

Please note we have published revised climate change allowances, which are available online. These new allowances will need to be reflected in your Flood Risk Assessment. If you want to discuss this please call our Sustainable Places team on 020 8474 5242.

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

Yours sincerely

Karen Brown

Karen Brown

Customers and Engagement Officer

Direct dial: [REDACTED]

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD

Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE














General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

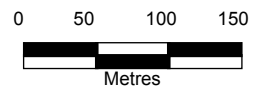
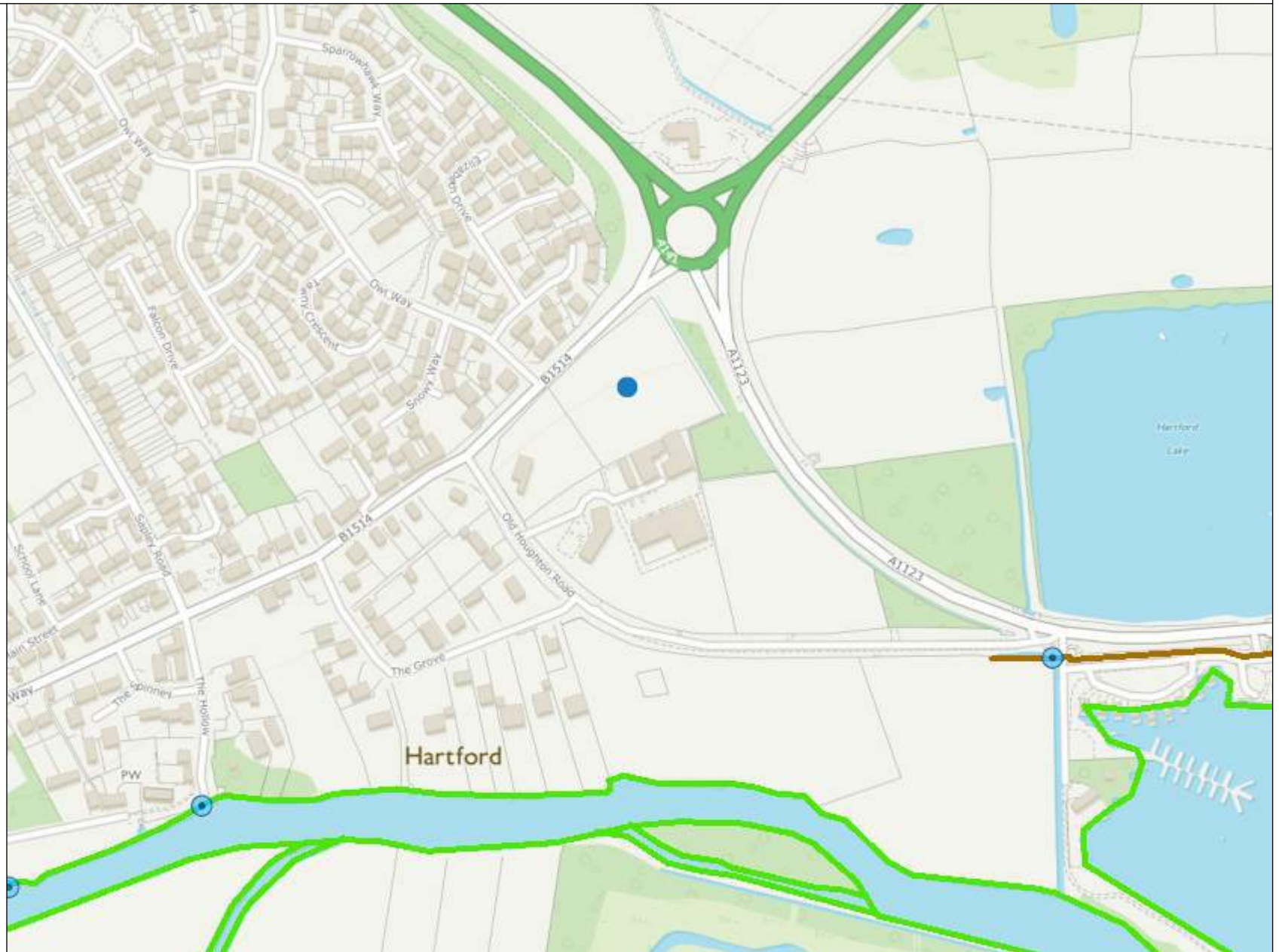
Legend

Structures

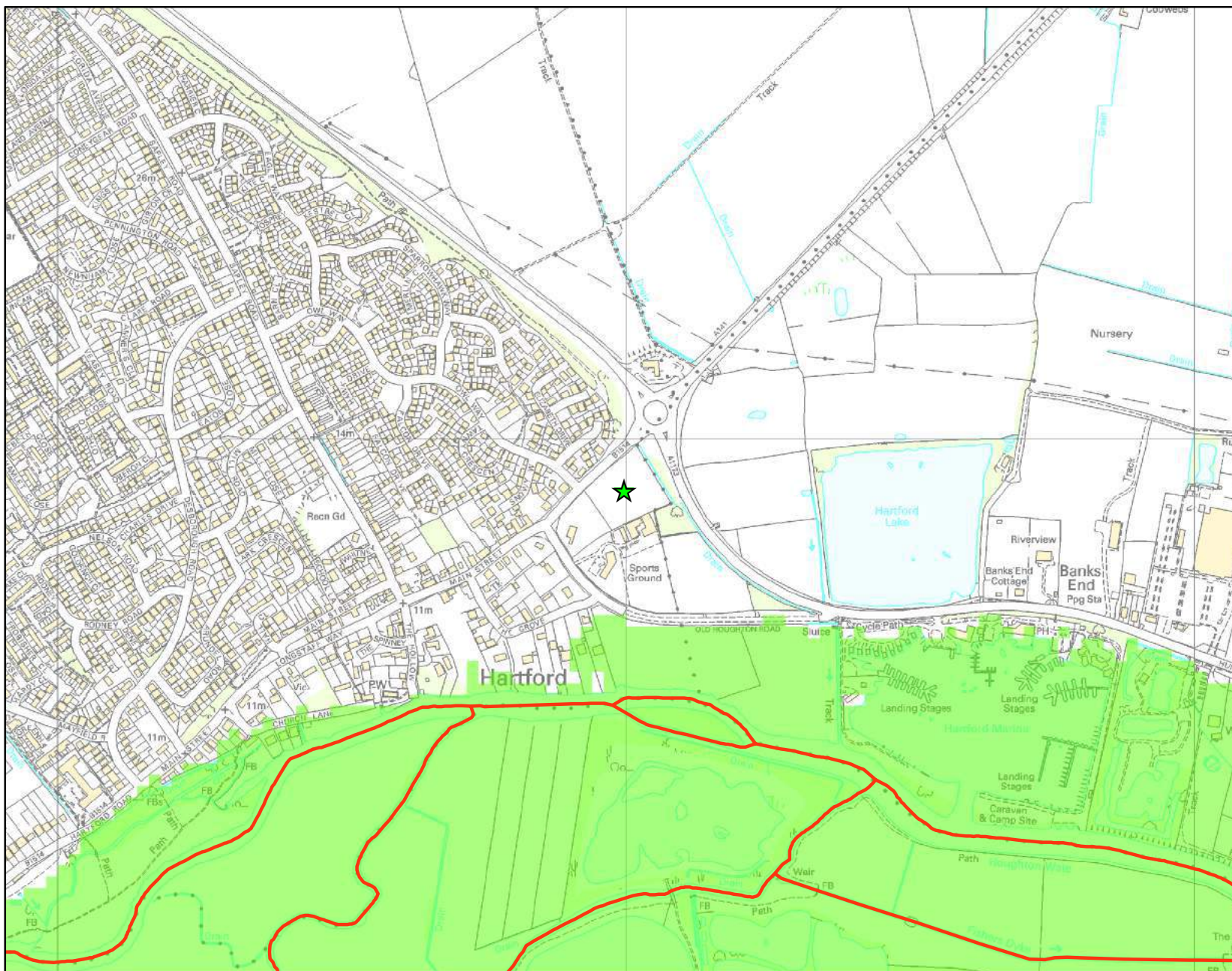
-  Draw Off Tower
-  Fish Pass
-  Hydrobrake
-  In Channel Stoplogs
-  Control Gate
-  Screen
-  Outfall
-  Inspection Chamber
-  Jetty
-  Spillway
-  Stilling Basin
-  Weir
-  Other structure

Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable Defence
-  Bridge Abutment
-  High Ground
-  Beach
-  Barrier Beach
-  Promenade
-  Quay
-  Cliff
-  Dunes
-  Culvert






Defended Climate Change Model Flood Outlines centred on Land at Main Street, Hartford, PE29 1XU NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



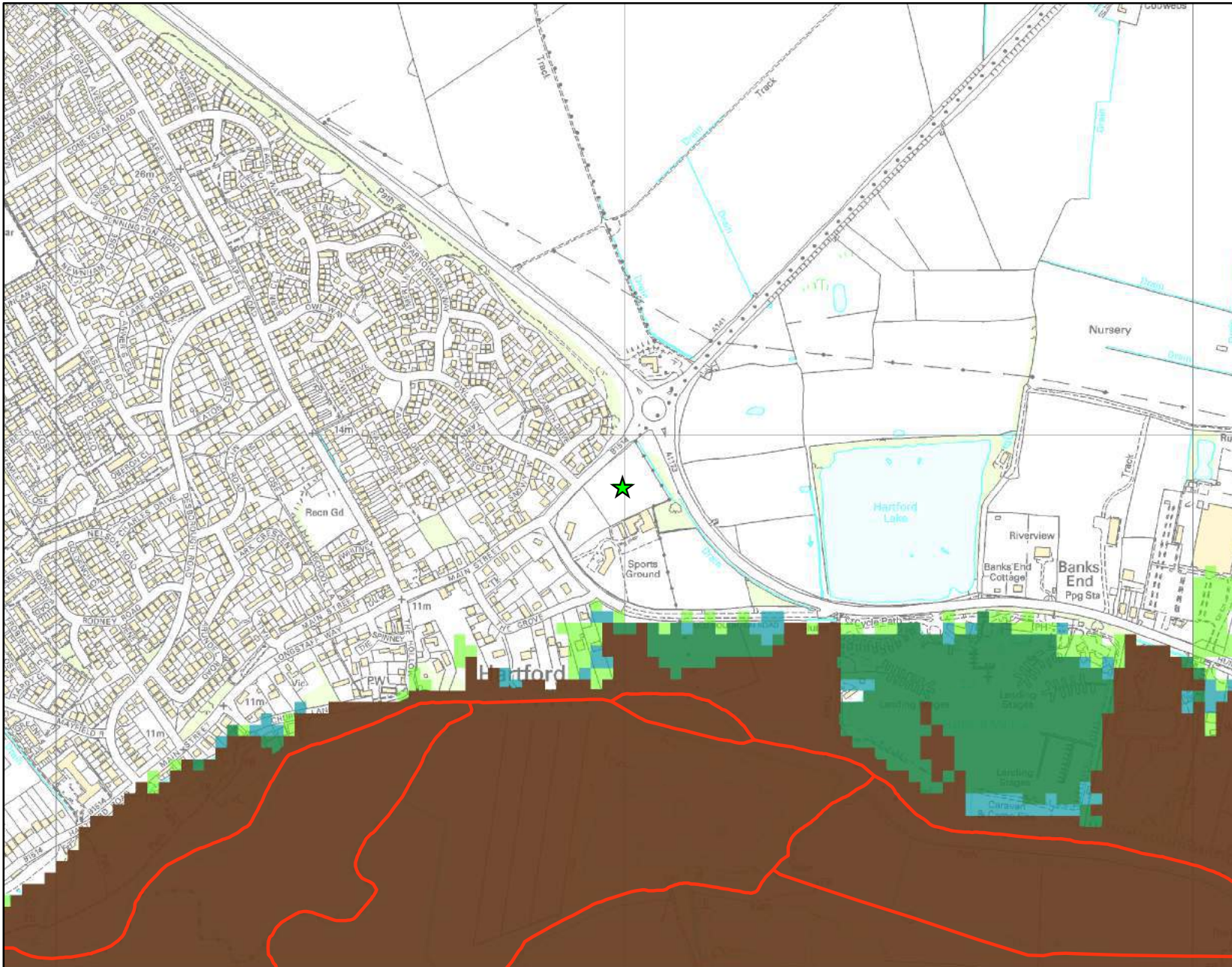
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Legend

-  Defended 1%+20Climate Change AEP
-  Main River
-  Site







**Defended Model Flood Outlines centred on Land at Main Street, Hartford, PE29 1XU.
NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

-  Defended 20% AEP
-  Defended 5% AEP
-  Defended 1% AEP
-  Defended 0.1% AEP
-  Main River
-  Site

Flood risk assessments: Climate change allowances

Application of the allowances and local considerations

East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire

1) The climate change allowances

The [National Planning Practice Guidance](#) refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in February 2016 and is available on [Gov.uk](#). The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

2) Assessment of climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as a **guide only**. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. **For these reasons we recommend that applicants and / or their consultants should contact the Environment Agency at the pre-planning application stage to confirm the assessment approach, on a case by case basis.** **Table A** defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

VULNERABILITY CLASSIFICATION	FLOOD ZONE	DEVELOPMENT TYPE		
		MINOR	SMALL-MAJOR	LARGE-MAJOR
ESSENTIAL INFRASTRUCTURE	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
HIGHLY VULNERABLE	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
MORE VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Intermediate/ Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
LESS VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
WATER COMPATIBLE	Zone 2	None		
	Zone 3a	Intermediate/ Basic		
	Zone 3b	Detailed		

Note: Where the table states 'not appropriate development', this is in line with national planning policy. If in exceptional circumstances such development types are proposed in these locations, we would expect a detailed modelling approach to be used.

NOTES:

- Minor: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveller site over 30+ pitches | any other development that creates a non residential building or development over 1000 sq m.

The assessment approach should be agreed with the Environment Agency as part of pre-planning application discussions to avoid abortive work.

3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Essex, Norfolk and Suffolk

Hydraulic Model (Watercourse)	Central	Higher Central	Upper
Blackwater & Brain - Blackwater between TL7520925623 and TL7820324314 Brain between TL7373323312 and TL7683821321	500mm	600mm	900mm
Chelmer - between TL6872107082 and TL7161609422 and TL7436306592	350mm	450mm	750mm
Colne (Model Extent)	450mm	600mm	950mm
Gipping – Downstream of Needham Market	400mm	500mm	850mm
Gipping – Needham Market and upstream including Somersham W/C	200mm	250mm	400mm
Norwich Downstream of TG2332009072	450mm	600mm	950mm
Norwich Upstream of TG2332009072	600mm	800mm	1200mm
Wensum (Model Extent)	400mm	500mm	800mm
Yare (Model Extent)	200mm	250mm	450mm
Broads (2008 Model Extent) Bure and Ant (2012 Model Extent)	Please use the current 1 in 1000 (0.1%) annual probability including climate change allowance		
Other main rivers, tributaries and ordinary watercourses	<p>For other main rivers, tributaries and ordinary watercourses that are not stated above, basic allowances have not been calculated. In this instance you can either:</p> <ul style="list-style-type: none"> • If flow data is available you can request this data from us and can conduct an intermediate assessment yourself • Or alternatively, you can choose to undertake a Detailed Assessment and “perform detailed hydraulic modelling, through either re-running our hydraulic models (if available) or constructing a new model 		

Cambridgeshire and Bedfordshire

Watercourse / Model	Central	Higher Central	Upper End
Alconbury Brook	600mm	700mm	900mm
River Kym			
Lower Ouse (Model Extent)	700mm	800mm	1100mm
Mid Ouse (Cold Brayfield to Bromham – between SP9156852223 and TL0132950919)	700mm	800mm	1100mm
Mid Ouse (East of Bedford to Roxton – between TL0791848903 and TL1618854543)	700mm	850mm	1200mm
River Hiz and River Purwell	400mm	450mm	550mm
River Ivel	500mm	600mm	750mm
Pix Brook	450mm	500mm	600mm
Potton Brook	500mm	600mm	700mm
River Cam and tributaries (excluding the Cam Lodes and the Slade System)	600mm	700mm	950mm
Great Barford (ordinary watercourses)	500mm	550mm	650mm
Bromham (ordinary watercourse)	550mm	650mm	850mm

NOTES:

Urban areas excluded from the 'basic' approach: St Ives, Holywell, Godmanchester, Swavesey, Over, Bedford, Newport Pagnell, Buckingham and Leighton Buzzard. More detailed assessment of climate change allowances will need to be undertaken in these locations.

Use of these allowances will only be accepted after discussion with the Environment Agency.

4) Fluvial food risk mitigation

For planning consultations where we are a statutory consultee and our [Flood risk standing](#) advice **does not** apply we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications. **These are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis.** For planning consultations where we are not a statutory consultee or our [Flood risk Standing advice](#) applies we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as '**Essential Infrastructure**' our benchmark for flood risk mitigation is for it to be designed to the '**upper end**' climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.
- For **highly vulnerable** or **more vulnerable developments** in flood zone 2, the '**central**' climate change allowance is our minimum benchmark for flood risk mitigation, and in flood zone 3 the '**higher central**' climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).
- For **water compatible** or **less vulnerable** development (e.g. commercial), the '**central**' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (particularly in flood zone 3) to inform built in resilience.

For a visual representation of the above, please see Tables 1 and 2 overleaf.

5) Development in Tidal Areas

There is no change to the way we respond to sites affected solely by tidal flood risk as the sea level allowances are unchanged.

6) Our Service

Non-chargeable service

We will give a free opinion on:

- What climate change allowance to apply to a particular development type
- Which technical approach is suitable in the FRA

Chargeable service:

- Review of climate change impacts using intermediate and detailed technical approaches (i.e. modelling review)
- Assessment and review of proposals for managed adaptation.

Table 1 peak river flow allowances by river basin district (use 1961 to 1990 baseline)				
River basin district	Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Anglian	Upper end	25%	35%	65%
	Higher central	15%	20%	35%
	Central	10%	15%	25%
Thames	Upper end	25%	35%	70%
	Higher central	15%	25%	35%
	Central	10%	15%	25%

Table 2: Using peak river flow allowances for flood risk assessments

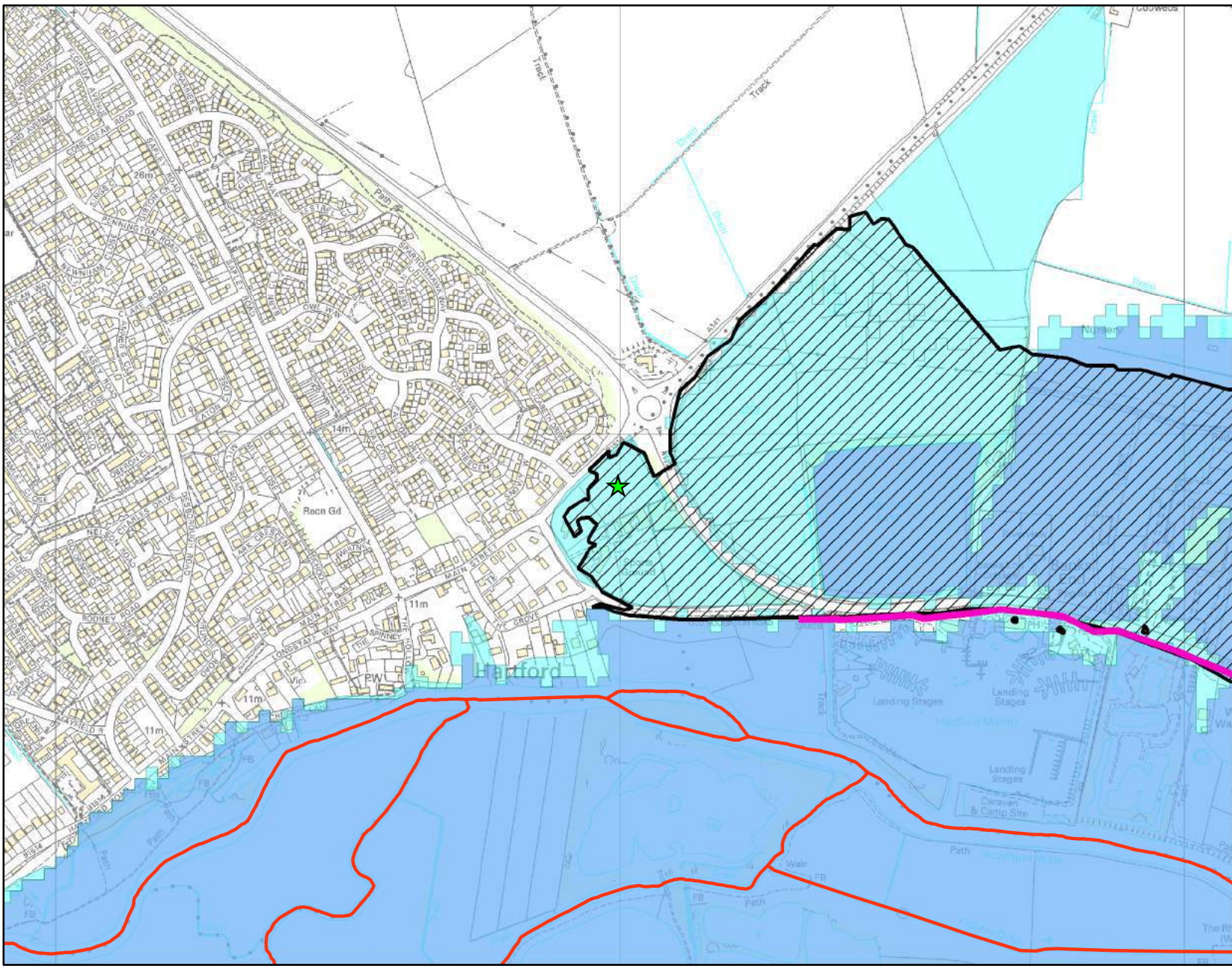
Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
2	higher central and upper end allowances	higher central and upper end allowances	central and higher central allowances	central allowance	none of the allowances
3a	upper end allowance	X	higher central and upper end	central and higher central	central allowance
3b	upper end allowance	X	X	X	central allowance

X – Development should not be permitted

If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the upper end allowance.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

**Flood Map for Planning (Rivers and Sea) centred on Land at Main Street, Hartford, PE29 1XU.
 NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

- Flood Zone 3
- Flood Zone 2
- Areas Benefiting From Defences
- Flood Map - Flood Storage Areas
- Flood Map Defences
- Main River
- Site

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

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

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

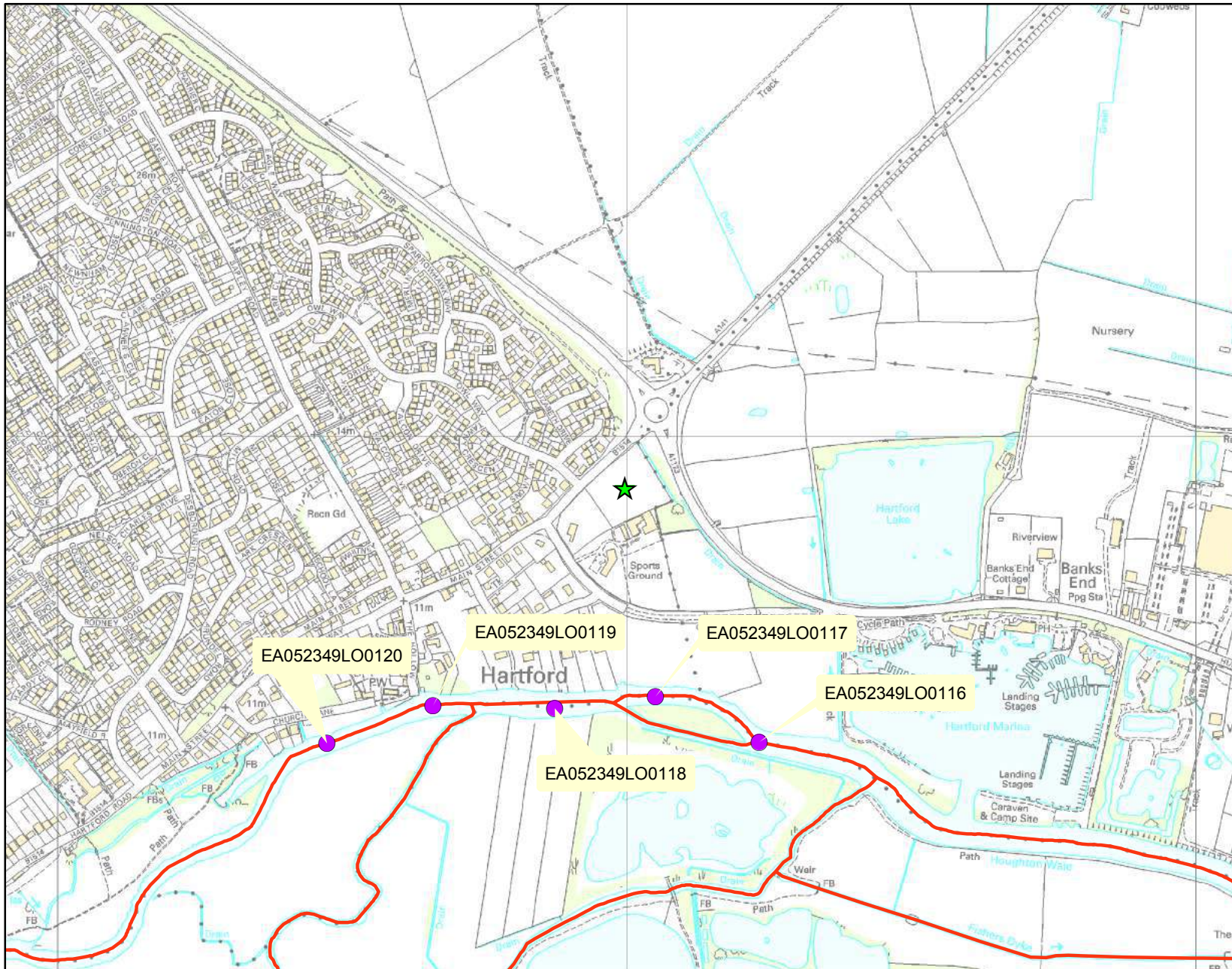
<https://www.gov.uk/flood-risk-assessment-standing-advice>
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

Modelled Node Point Locations centred on Land at Main Street, Hartford, PE29 1XU NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



Scale 1:10,000



Legend

- Modelled Node Point
- Main River
- ★ Site

Our Reference	Enquirer	Site	Grid Reference
73180	Emily Fell	Land at Main Street, Hartford, PE29 1XU	TL2599772909

Model Information

The following table shows a summary of all the model information relevant to the area of interest.

Model Code	Model Name	Release Date
EA052349	Lower Ouse	01/04/2016

Level Information

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	8.71	8.8	8.857	8.88	8.97	8.99	9.02	9.1	9.34
EA052349LO0117	EA052349_003	526051	272542	8.78	8.86	8.913	8.93	9.01	9.04	9.06	9.14	9.37
EA052349LO0118	EA052349_003	525873	272522	8.87	8.94	8.996	9.01	9.09	9.11	9.13	9.2	9.42
EA052349LO0119	EA052349_003	525659	272526	8.91	8.98	9.029	9.05	9.12	9.14	9.16	9.23	9.45
EA052349LO0120	EA052349_003	525474	272460	8.94	9.01	9.061	9.08	9.15	9.17	9.19	9.26	9.48

Levels Climate Change subform

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	9.13
EA052349LO0117	EA052349_003	526051	272542	9.17
EA052349LO0118	EA052349_003	525873	272522	9.23
EA052349LO0119	EA052349_003	525659	272526	9.26
EA052349LO0120	EA052349_003	525474	272460	9.28

Flow Information

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	107.1	108.55	109.855	108.79	108.99	109.01	109.03	110.05	113.12
EA052349LO0117	EA052349_003	526051	272542	95.61	97.4	98.855	99.12	99.26	99.31	99.56	100.25	103.84
EA052349LO0118	EA052349_003	525873	272522	90.94	91.75	92.663	93.05	94.7	95.4	95.65	99.43	109.22
EA052349LO0119	EA052349_003	525659	272526	97.2	97.35	97.63	97.64	97.48	97.52	97.64	98.38	106.05
EA052349LO0120	EA052349_003	525474	272460	101.89	101.9	101.91	101.91	101.23	101.19	100.95	101.13	109.2

Flows Climate Change subform

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	109.31
EA052349LO0117	EA052349_003	526051	272542	100.02
EA052349LO0118	EA052349_003	525873	272522	100.12
EA052349LO0119	EA052349_003	525659	272526	98.24
EA052349LO0120	EA052349_003	525474	272460	101.33

Historic Flooding Information

Code	Event	Start	Source	Cause
EA052199804	Easter 1998	08/04/1998	Main River	Channel Capacity Exceeded (no raised defences)
EA052194703	March 1947	13/03/1947	Main River	Channel Capacity Exceeded (no raised defences)

Informatives

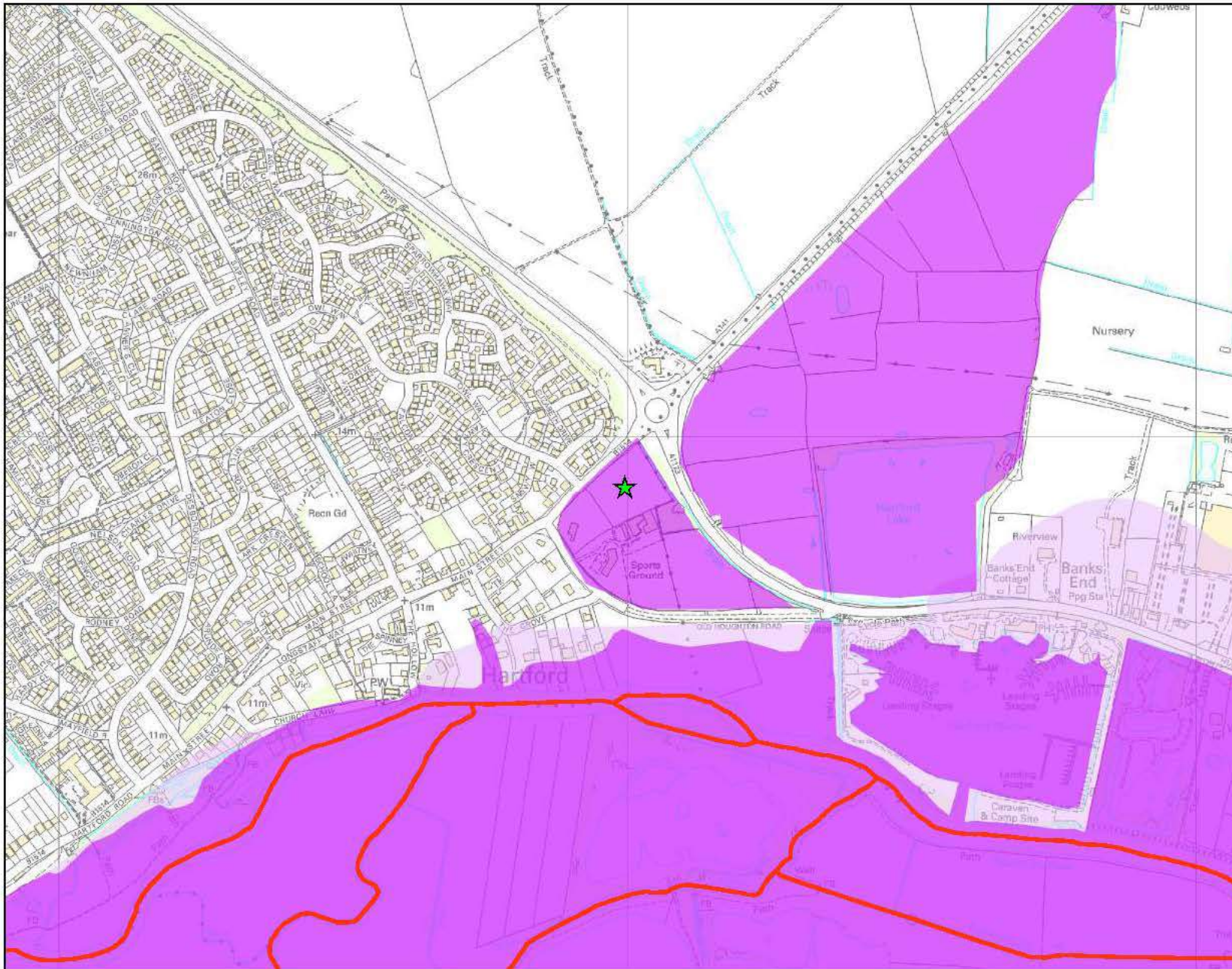
Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

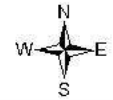
AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

**Recorded Flood Event Outlines centred on Land at Main Street, Hartford, PE29 1XU.
 NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

- Historic Flood Outline Easter 1998
- Historic Flood Outline March 1947
- Main River
- Site

From: [Enquiries_EastAnglia](#)
To: [Emily Fell](#)
Subject: 73180 - Land at Main Street, Hartford, PE29 1XU
Date: 19 January 2018 11:58:24

Dear Emily,

Thank you for your enquiry of 17th January 2018 regarding Land at Main Street, Hartford, PE29 1XU (Product 4 request).

We are liaising with our technical teams to gather the information/data you have requested. Your enquiry has been allocated the reference number 73180.

We will aim to send you our response as soon as possible, but by no later than 14th February 2018, which is in accordance with the Freedom of Information Act (2000) and the Environment Information Regulations (2004).

In the meantime if we can be of further assistance, please contact us quoting the above reference number.

Kind regards,

Ethan Cross.

Customers & Engagement Officer, Customers & Engagement Team, East Anglia Area
Environment Agency | Bromholme Lane, Brampton, Huntingdon, Cambridgeshire, PE28 4NE
Environment Agency | Icen House, Cobham Road, Ipswich IP3 9JD

Email team: Enquiries_EastAnglia@environment-agency.gov.uk
Team Number: 020 3025 5472

Working days: Monday-Friday (part time)
National Duty Communications Officer (24/7) | 0800 023 2522
National Duty Communications Manager | 0800 028 2411



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APPENDIX 6

TOPOGRAPHIC SURVEY OF THE SITE AND SURROUNDING ROAD NETWORK



Chartered Surveyors
Land, minerals and geomatics

**associated
surveying
consultants**

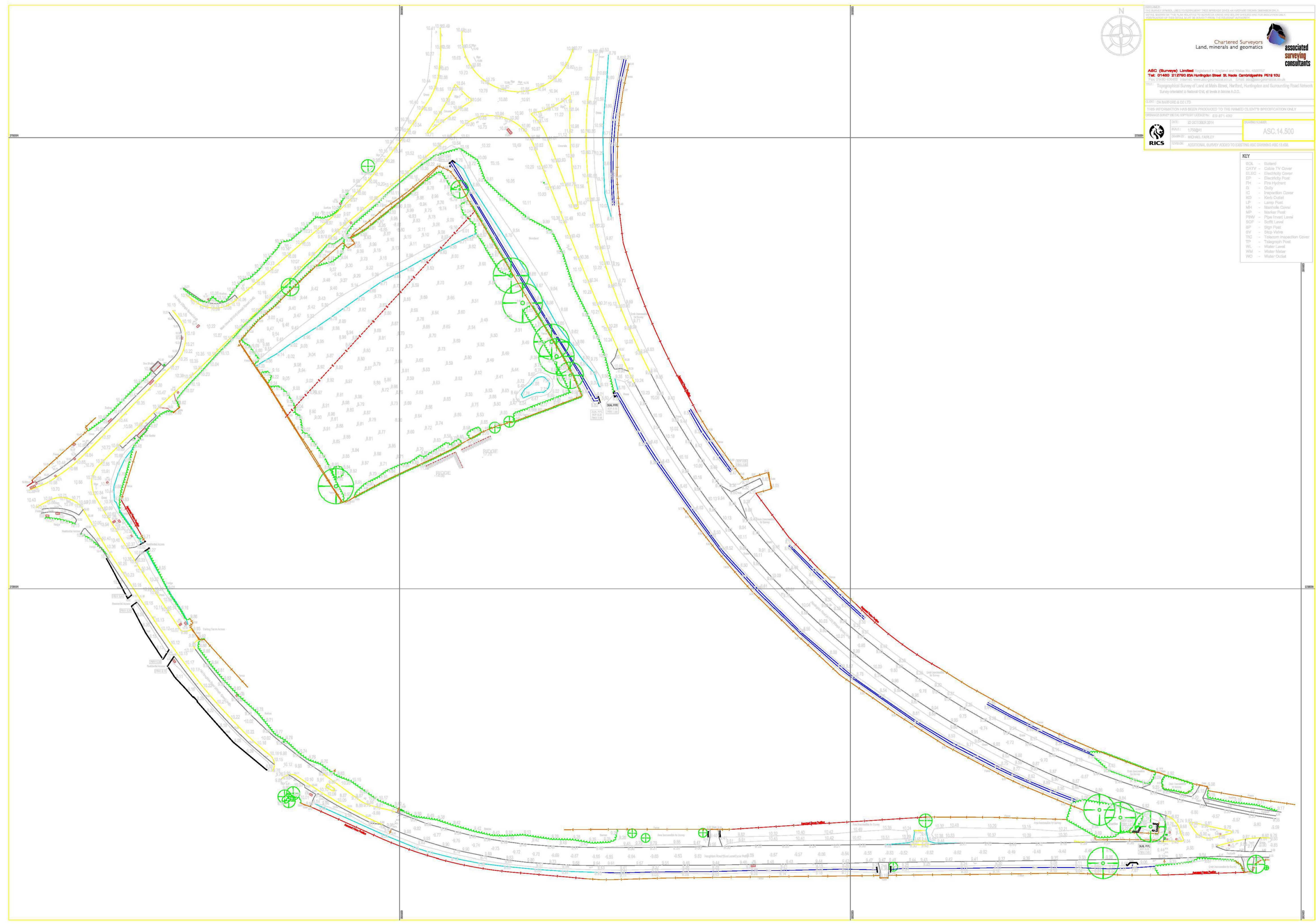
ABC (Surveys) Limited Registered in England and Wales No. 4507077
Tel: 01480 212700 65A Huntingdon Street St. Neots Cambridgeshire PE18 1DU

Topographical Survey of Land at Malt Sluice, Harford, Huntingdon and Surrounding Road Network
Survey oriented to True North, all levels in metres A.O.D.

DATE: 12 OCTOBER 2014
DRAWN BY: MICHAEL PARLEY
CHECKED BY: MICHAEL PARLEY
PROJECT NO.: ASC.14.500
REVISION: ADDITIONAL SURVEY ADDED TO EXISTING ASC DRAWING ASC.13.430

KEY

- BCK - Boiler
- CATV - Cable TV Cover
- ELEC - Electricity Cover
- EP - Electricity Post
- FM - Fire Hydrant
- G - Gully
- IC - Inspection Cover
- IO - Kiosk Outlet
- LP - Lamp Post
- MH - Manhole Cover
- MP - Marker Post
- PI - Pipe Inset Level
- SOP - Silt Level
- SP - Sign Post
- SW - Stop Valve
- TIC - Telecom Inspection Cover
- TP - Telegraph Post
- WL - Water Level
- WM - Water Meter
- WO - Water Outlet



APPENDIX 7
INDICATIVE SITE LAYOUT

Revision		
A	First issue	WF 15.06.18
B	Updated to received comments	WF 10.07.18
C	Updated to received comments	WF 08.08.18
D	Updated to received comments	WF 13.08.18

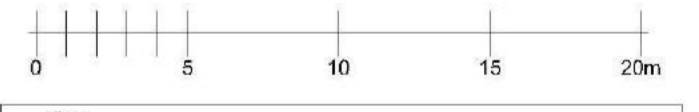
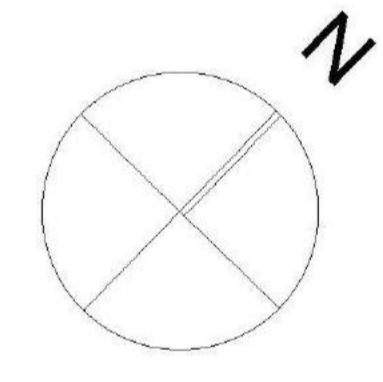


- Key**
- 7 x 2 Bed House
 - 4 x 3 Bed House
 - 11 x 4 Bed House
 - 5 x 5 Bed House

= 27 Houses Total

Site Area
= 12,069 sq m / 1.2 hectares

Public Open Space = 1,500 sq m
/ 0.15 hectares



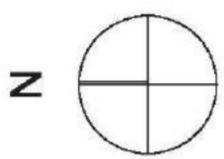
client: Messrs. N Price & E Howson	
project: Land East of Main Street, Hartford, Huntingdon	
drawing: Feasibility Study - Proposed Site Layout Plan	
date: 15.06.18	scale: 1:250@A1
drawn: WF	checked by: AJD

BROWN & CO
ARCHITECTURE + PLANNING
Brown & Co., The Arklet, St. George's Street, Norwich, NR3 1AD.
Brown & Co Registered Office: Grantham Hall, Finkin Street, Grantham, Lincolnshire, NG31 5QZ.
Registration no: 00202922. Registered in England & Wales. T: 01463 492220

APPENDIX 8
INDICATIVE DRIANAGE LAYOUT

Key

- 7 x 2 Bed House
- 4 x 3 Bed House
- 5 x 4 Bed House
- 12,069 sq m / 1.2 hectares
- Site Area
- 1,500 sq m / 0.15 hectares
- Public Open Space
- 27 Houses Total



Roof area 2020m²

Private drive area 2130m²

Adoptable road area 980m²

REV	DATE	DESCRIPTION/REASON FOR ISSUE	APPR


MTC ENGINEERING
 MTC Engineering (Cambridge) Ltd.
 Ground Floor, 24 High Street
 Whitteford, Cambridgeshire, CB22 4LT
 Tel (01223) 837270, fax (01223) 835648
 E-mail office@mtcengineering.co.uk

TITLE		MAIN STREET, HARTFORD INDICATIVE DRAINAGE LAYOUT	
ORIG	M.B	DATE	20-08-18
CHKD		SCALE	1:500
APPR		DRAWING NO	1506-01
		REV -	

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APPENDIX 9

MICRO DRAINAGE CALCULATIONS: INFILTRATION DISCHARGE

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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

Half Drain Time : 321 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	8.153	0.153	5.3	97.6	O K
30 min Summer	8.198	0.198	5.3	126.6	O K
60 min Summer	8.238	0.238	5.3	152.0	O K
120 min Summer	8.267	0.267	5.3	170.5	O K
180 min Summer	8.274	0.274	5.3	175.3	O K
240 min Summer	8.273	0.273	5.3	174.4	O K
360 min Summer	8.264	0.264	5.3	168.4	O K
480 min Summer	8.254	0.254	5.3	162.4	O K
600 min Summer	8.244	0.244	5.3	156.1	O K
720 min Summer	8.234	0.234	5.3	149.5	O K
960 min Summer	8.214	0.214	5.3	136.5	O K
1440 min Summer	8.175	0.175	5.3	112.1	O K
2160 min Summer	8.128	0.128	5.3	81.7	O K
2880 min Summer	8.092	0.092	5.3	58.7	O K
4320 min Summer	8.052	0.052	5.3	33.3	O K
5760 min Summer	8.042	0.042	4.4	26.6	O K
7200 min Summer	8.035	0.035	3.8	22.5	O K
8640 min Summer	8.031	0.031	3.3	19.5	O K
10080 min Summer	8.027	0.027	2.8	17.2	O K
15 min Winter	8.174	0.174	5.3	111.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	18
30 min Summer	92.629	0.0	33
60 min Summer	56.713	0.0	62
120 min Summer	33.583	0.0	122
180 min Summer	24.424	0.0	180
240 min Summer	19.389	0.0	240
360 min Summer	13.924	0.0	292
480 min Summer	11.018	0.0	354
600 min Summer	9.182	0.0	418
720 min Summer	7.908	0.0	486
960 min Summer	6.245	0.0	618
1440 min Summer	4.471	0.0	882
2160 min Summer	3.197	0.0	1256
2880 min Summer	2.518	0.0	1612
4320 min Summer	1.796	0.0	2248
5760 min Summer	1.413	0.0	2944
7200 min Summer	1.172	0.0	3672
8640 min Summer	1.006	0.0	4408
10080 min Summer	0.884	0.0	5144
15 min Winter	143.954	0.0	18

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MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	8.225	0.225	5.3	143.6	O K
60 min Winter	8.270	0.270	5.3	172.8	O K
120 min Winter	8.305	0.305	5.3	194.9	O K
180 min Winter	8.316	0.316	5.3	201.8	O K
240 min Winter	8.317	0.317	5.3	202.4	O K
360 min Winter	8.306	0.306	5.3	195.4	O K
480 min Winter	8.292	0.292	5.3	186.8	O K
600 min Winter	8.279	0.279	5.3	178.3	O K
720 min Winter	8.265	0.265	5.3	169.1	O K
960 min Winter	8.235	0.235	5.3	150.1	O K
1440 min Winter	8.178	0.178	5.3	113.7	O K
2160 min Winter	8.108	0.108	5.3	68.9	O K
2880 min Winter	8.061	0.061	5.3	39.2	O K
4320 min Winter	8.040	0.040	4.2	25.3	O K
5760 min Winter	8.031	0.031	3.3	20.1	O K
7200 min Winter	8.026	0.026	2.8	16.6	O K
8640 min Winter	8.022	0.022	2.4	14.2	O K
10080 min Winter	8.020	0.020	2.1	12.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	176
240 min Winter	19.389	0.0	232
360 min Winter	13.924	0.0	338
480 min Winter	11.018	0.0	380
600 min Winter	9.182	0.0	454
720 min Winter	7.908	0.0	530
960 min Winter	6.245	0.0	676
1440 min Winter	4.471	0.0	952
2160 min Winter	3.197	0.0	1320
2880 min Winter	2.518	0.0	1612
4320 min Winter	1.796	0.0	2248
5760 min Winter	1.413	0.0	2992
7200 min Winter	1.172	0.0	3712
8640 min Winter	1.006	0.0	4408
10080 min Winter	0.884	0.0	5128

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.415

Time (mins)	Area
From:	To: (ha)
0	4 0.415

MTC Engineering Ltd		Page 4																								
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C																									
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by																									
Micro Drainage	Source Control 2017.1.2																									
<p><u>Model Details</u></p> <p>Storage is Online Cover Level (m) 9.000</p> <p><u>Porous Car Park Structure</u></p> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01800</td> <td>Width (m)</td> <td>5.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>426.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>591.7</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>8.000</td> <td>Cap Volume Depth (m)</td> <td>0.320</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0	Membrane Percolation (mm/hr)	1000	Length (m)	426.0	Max Percolation (l/s)	591.7	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.000	Cap Volume Depth (m)	0.320
Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0																							
Membrane Percolation (mm/hr)	1000	Length (m)	426.0																							
Max Percolation (l/s)	591.7	Slope (1:X)	0.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	8.000	Cap Volume Depth (m)	0.320																							
©1982-2017 XP Solutions																										

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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

Half Drain Time : 745 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	8.284	0.284	0.5	26.1	Flood Risk
30 min Summer	8.338	0.338	0.6	33.3	Flood Risk
60 min Summer	8.385	0.385	0.6	40.2	Flood Risk
120 min Summer	8.422	0.422	0.7	46.2	Flood Risk
180 min Summer	8.439	0.439	0.7	49.0	Flood Risk
240 min Summer	8.447	0.447	0.7	50.4	Flood Risk
360 min Summer	8.452	0.452	0.7	51.3	Flood Risk
480 min Summer	8.452	0.452	0.7	51.2	Flood Risk
600 min Summer	8.449	0.449	0.7	50.8	Flood Risk
720 min Summer	8.447	0.447	0.7	50.3	Flood Risk
960 min Summer	8.441	0.441	0.7	49.4	Flood Risk
1440 min Summer	8.428	0.428	0.7	47.1	Flood Risk
2160 min Summer	8.406	0.406	0.7	43.6	Flood Risk
2880 min Summer	8.385	0.385	0.6	40.3	Flood Risk
4320 min Summer	8.348	0.348	0.6	34.7	Flood Risk
5760 min Summer	8.315	0.315	0.5	30.2	Flood Risk
7200 min Summer	8.288	0.288	0.5	26.6	Flood Risk
8640 min Summer	8.264	0.264	0.5	23.6	Flood Risk
10080 min Summer	8.242	0.242	0.4	21.0	Flood Risk
15 min Winter	8.309	0.309	0.5	29.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	19
30 min Summer	92.629	0.0	34
60 min Summer	56.713	0.0	64
120 min Summer	33.583	0.0	122
180 min Summer	24.424	0.0	182
240 min Summer	19.389	0.0	242
360 min Summer	13.924	0.0	360
480 min Summer	11.018	0.0	478
600 min Summer	9.182	0.0	522
720 min Summer	7.908	0.0	584
960 min Summer	6.245	0.0	706
1440 min Summer	4.471	0.0	980
2160 min Summer	3.197	0.0	1388
2880 min Summer	2.518	0.0	1792
4320 min Summer	1.796	0.0	2596
5760 min Summer	1.413	0.0	3392
7200 min Summer	1.172	0.0	4112
8640 min Summer	1.006	0.0	4848
10080 min Summer	0.884	0.0	5640
15 min Winter	143.954	0.0	19

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MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	8.366	0.366	0.6	37.4	Flood Risk
60 min Winter	8.416	0.416	0.7	45.1	Flood Risk
120 min Winter	8.456	0.456	0.7	52.0	Flood Risk
180 min Winter	8.474	0.474	0.8	55.2	Flood Risk
240 min Winter	8.483	0.483	0.8	56.9	Flood Risk
360 min Winter	8.491	0.491	0.8	58.2	Flood Risk
480 min Winter	8.492	0.492	0.8	58.5	Flood Risk
600 min Winter	8.489	0.489	0.8	58.1	Flood Risk
720 min Winter	8.485	0.485	0.8	57.3	Flood Risk
960 min Winter	8.478	0.478	0.8	56.0	Flood Risk
1440 min Winter	8.462	0.462	0.7	53.0	Flood Risk
2160 min Winter	8.433	0.433	0.7	48.0	Flood Risk
2880 min Winter	8.405	0.405	0.7	43.4	Flood Risk
4320 min Winter	8.354	0.354	0.6	35.6	Flood Risk
5760 min Winter	8.312	0.312	0.5	29.7	Flood Risk
7200 min Winter	8.275	0.275	0.5	25.0	Flood Risk
8640 min Winter	8.244	0.244	0.4	21.3	Flood Risk
10080 min Winter	8.217	0.217	0.4	18.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	180
240 min Winter	19.389	0.0	236
360 min Winter	13.924	0.0	350
480 min Winter	11.018	0.0	462
600 min Winter	9.182	0.0	566
720 min Winter	7.908	0.0	658
960 min Winter	6.245	0.0	744
1440 min Winter	4.471	0.0	1052
2160 min Winter	3.197	0.0	1496
2880 min Winter	2.518	0.0	1932
4320 min Winter	1.796	0.0	2764
5760 min Winter	1.413	0.0	3568
7200 min Winter	1.172	0.0	4328
8640 min Winter	1.006	0.0	5096
10080 min Winter	0.884	0.0	5848

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.098

Time (mins)	Area
From:	To: (ha)
0	4 0.098

24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C
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Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by
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Micro Drainage	Source Control 2017.1.2
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Model Details

Storage is Online Cover Level (m) 8.500

Infiltration Basin Structure

Invert Level (m) 8.000 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.01800 Porosity 1.00
 Infiltration Coefficient Side (m/hr) 0.01800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	61.5	0.500	190.5

APPENDIX 10

MICRO DRAINAGE CALCULATIONS: GREENFIELD RUN OFF RATE

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MIN STREET, HARTFORD GREENFIELD RUN OFF RATE	
Date 20/08/2018 10:18 File	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	0.513	Urban	0.000
SAAR (mm)	550	Region Number	Region 5

Results 1/s


QBAR Rural 1.3
QBAR Urban 1.3

Q1 year 1.1

Q1 year 1.1
Q30 years 3.2
Q100 years 4.7

APPENDIX 11

MICRO DRAINAGE CALCULATIONS: POSITIVE DISCHARGE


MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage 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 ³)	Status
15 min Summer	8.183	0.183	2.0	137.1	O K
30 min Summer	8.234	0.234	2.0	175.7	O K
60 min Summer	8.284	0.284	2.0	213.3	O K
120 min Summer	8.332	0.332	2.0	248.9	O K
180 min Summer	8.357	0.357	2.0	267.7	O K
240 min Summer	8.372	0.372	2.0	279.3	O K
360 min Summer	8.390	0.390	2.0	292.4	O K
480 min Summer	8.400	0.400	2.0	299.9	O K
600 min Summer	8.405	0.405	2.0	303.9	O K
720 min Summer	8.407	0.407	2.0	305.5	O K
960 min Summer	8.406	0.406	2.0	304.6	O K
1440 min Summer	8.393	0.393	2.0	295.0	O K
2160 min Summer	8.373	0.373	2.0	280.1	O K
2880 min Summer	8.353	0.353	2.0	265.0	O K
4320 min Summer	8.310	0.310	2.0	232.7	O K
5760 min Summer	8.270	0.270	2.0	202.8	O K
7200 min Summer	8.235	0.235	2.0	176.6	O K
8640 min Summer	8.204	0.204	2.0	153.3	O K
10080 min Summer	8.177	0.177	2.0	133.1	O K
15 min Winter	8.205	0.205	2.0	153.7	O K
30 min Winter	8.263	0.263	2.0	197.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	117.6	19
30 min Summer	92.629	0.0	147.3	34
60 min Summer	56.713	0.0	206.3	64
120 min Summer	33.583	0.0	242.9	124
180 min Summer	24.424	0.0	263.0	184
240 min Summer	19.389	0.0	276.1	242
360 min Summer	13.924	0.0	292.1	362
480 min Summer	11.018	0.0	300.9	482
600 min Summer	9.182	0.0	304.2	602
720 min Summer	7.908	0.0	303.5	722
960 min Summer	6.245	0.0	296.1	960
1440 min Summer	4.471	0.0	279.3	1256
2160 min Summer	3.197	0.0	432.6	1624
2880 min Summer	2.518	0.0	452.0	2020
4320 min Summer	1.796	0.0	475.6	2812
5760 min Summer	1.413	0.0	518.5	3584
7200 min Summer	1.172	0.0	537.2	4328
8640 min Summer	1.006	0.0	552.0	5096
10080 min Summer	0.884	0.0	562.9	5760
15 min Winter	143.954	0.0	130.9	19
30 min Winter	92.629	0.0	159.2	34


MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage 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 ³)	Status
60 min Winter	8.319	0.319	2.0	239.4	O K
120 min Winter	8.373	0.373	2.0	279.7	O K
180 min Winter	8.401	0.401	2.0	300.9	O K
240 min Winter	8.419	0.419	2.0	314.2	O K
360 min Winter	8.439	0.439	2.0	329.5	O K
480 min Winter	8.452	0.452	2.0	338.7	O K
600 min Winter	8.459	0.459	2.0	344.0	O K
720 min Winter	8.462	0.462	2.0	346.7	O K
960 min Winter	8.463	0.463	2.0	347.3	O K
1440 min Winter	8.452	0.452	2.0	338.7	O K
2160 min Winter	8.425	0.425	2.0	318.7	O K
2880 min Winter	8.399	0.399	2.0	299.5	O K
4320 min Winter	8.344	0.344	2.0	257.8	O K
5760 min Winter	8.281	0.281	2.0	211.1	O K
7200 min Winter	8.228	0.228	2.0	171.1	O K
8640 min Winter	8.183	0.183	2.0	137.0	O K
10080 min Winter	8.146	0.146	2.0	109.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	56.713	0.0	230.5	64
120 min Winter	33.583	0.0	269.6	122
180 min Winter	24.424	0.0	289.9	180
240 min Winter	19.389	0.0	301.9	240
360 min Winter	13.924	0.0	312.4	358
480 min Winter	11.018	0.0	313.4	474
600 min Winter	9.182	0.0	310.2	590
720 min Winter	7.908	0.0	306.7	704
960 min Winter	6.245	0.0	299.7	932
1440 min Winter	4.471	0.0	285.9	1358
2160 min Winter	3.197	0.0	483.3	1708
2880 min Winter	2.518	0.0	503.8	2164
4320 min Winter	1.796	0.0	518.8	3108
5760 min Winter	1.413	0.0	581.0	3912
7200 min Winter	1.172	0.0	602.1	4680
8640 min Winter	1.006	0.0	619.0	5360
10080 min Winter	0.884	0.0	631.8	5960

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.513

Time (mins)	Area
From:	To: (ha)
0	4 0.513

MTC Engineering Ltd		Page 4
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

Model Details

Storage is Online Cover Level (m) 9.000

Tank or Pond Structure

Invert Level (m) 8.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	750.0	0.500	750.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-2000-0475-2000
 Design Head (m) 0.475
 Design Flow (l/s) 2.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 75
 Invert Level (m) 8.000
 Minimum Outlet Pipe Diameter (mm) 100
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.475	2.0
Flush-Flo™	0.142	2.0
Kick-Flo®	0.329	1.7
Mean Flow over Head Range	-	1.7

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)
0.100	2.0	1.200	3.1	3.000	4.7	7.000	7.0
0.200	2.0	1.400	3.3	3.500	5.0	7.500	7.3
0.300	1.8	1.600	3.5	4.000	5.3	8.000	7.5
0.400	1.9	1.800	3.7	4.500	5.6	8.500	7.7
0.500	2.0	2.000	3.9	5.000	5.9	9.000	8.0
0.600	2.2	2.200	4.0	5.500	6.2	9.500	8.2
0.800	2.5	2.400	4.2	6.000	6.5		
1.000	2.8	2.600	4.4	6.500	6.8		

APPENDIX B

James Lloyd
Huntingdonshire District Council
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

Our ref: AC/2016/124826/01-L01
Your ref: 16/00597/FUL
Date: 06 September 2016

Dear Mr Lloyd

**RESUBMISSION OF WITHDRAWN APPLICATION HDC REF 15/01172/FUL
PROPOSED ERECTION OF TWO DETACHED DWELLINGS WITH GARAGES.
2 OLD HOUGHTON ROAD, HARTFORD**

Thank you for referring the above application which was received on 18 August 2016.

A copy of the subsequent decision notice would be appreciated.

We have reviewed the FRA submitted and have the following comments to make:

The site is currently within defended flood zone 3 of the Environment Agency's Flood Map. However since we previously commented on this planning application in August 2015 we have completed and released the outputs to our Lower Ouse Modelling Project. The outputs of this modelling project now place the site into flood zone 1. The updated Flood Map will be published later this year to reflect these changes.

In light of these changes we have no objection on flood risk grounds to the proposed development in relation to main river flooding though would suggest raising the finished floor levels to 9.55m AOD as stated in the FRA.

All surface water from roofs shall be piped direct to an approved surface water system using sealed downpipes. Open gullies should not be used.

Only clean, uncontaminated surface water should be discharged to any soakaway, watercourse or surface water sewer.

Where soakaways are proposed for the disposal of uncontaminated surface water, percolation tests should be undertaken, and soakaways designed and constructed in accordance with BRE Digest 365 (or CIRIA Report 156), and to the satisfaction of the Local Authority. The maximum acceptable depth for soakaways is 2 metres below existing ground level. Soakaways must not be located in contaminated areas. If, after tests, it is found that soakaways do not work satisfactorily, alternative proposals must be submitted.

Surface water from roads and impermeable vehicle parking areas shall be discharged via trapped gullies.

Anglian Water Services Ltd. should be consulted by the Local Planning Authority and be requested to demonstrate that the sewerage and sewage disposal systems serving the development have sufficient capacity to accommodate the additional flows, generated as a result of the development, without causing pollution or flooding. If there is not capacity in either of the sewers, the Agency must be reconsulted with alternative methods of disposal.

Site operators should ensure that there is no possibility of contaminated water entering and polluting surface or underground waters.

Yours sincerely

Mrs Dawn Porter
Sustainable Places Planning Advisor

Direct dial [REDACTED]

Direct e-mail Planning_Liaison.Anglian_Central@environment-agency.gov.uk

Environment Agency (East Anglia area), Sustainable Places Team, Bromholme Lane, Brampton, Huntingdon,
Cambridgeshire, PE28 4NE
Email: planning_liaison.anglian_central@environment-agency.gov.uk
Customer services line: 03708 506 506



End



ENGINEERING

Flood Risk Assessment & Sustainable Drainage Strategy for the Proposed Development of 27 Residential Dwellings on Land Off Main Street, Hartford

Contents

- 1 Introduction
- 2 Site Description
- 3 Sources of Potential Flood Risk
- 4 The Proposal
- 6 Sustainable Drainage Strategy
- 6 Assessment
- 7 Conclusion

Appendices

- 1 Site Location Plan
- 2 Environment Agency Flood Map for Planning
- 3 Strategic Flood Risk Assessment Mapping – Flood Zones
- 4 Strategic Flood Risk Assessment Mapping – Climate Change
- 5 Environment Agency Modelled and Historical Flood Data
- 6 Topographic Survey of the Site and Surrounding Road Network
- 7 Indicative Site Layout
- 8 Indicative Drainage Layout
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1506 - FRA & DS Aug 2018

**Flood Risk Assessment & Sustainable Drainage Strategy
for the Proposed Development of 27 Residential Dwellings
on Land Off Main Street, Hartford**

1 Introduction

- 1.1 MTC Engineering (Cambridge) Limited has been asked to provide a Flood Risk Assessment and Sustainable Drainage Strategy in respect of the proposed residential redevelopment of approximately 1.2Ha of land off Main Street, Hartford, on behalf of Messrs. N Price and E Howson.
- 1.2 This Flood Risk Assessment and Sustainable Drainage Strategy is based on the following information:-
 - 1.2.1 Site survey by ASC Surveys Limited.
 - 1.2.2 Environment Agency Modelled and Historical Flooding Data;
 - 1.2.3 Huntingdonshire District Council Strategic Flood Risk Assessment;
 - 1.2.4 Proposed Site Layout by Brown & Co;
 - 1.2.5 Cambridgeshire County Council Surface Water Drainage Guidance for Developers;
 - 1.2.6 British Geological Survey information.

- 1.3 All the comments and opinions contained in this report including any conclusions are based on the information available to MTC Engineering (Cambridge) Ltd. during our investigations. The conclusions drawn could therefore differ if the information is found to be inaccurate, incomplete or misleading. MTC Engineering (Cambridge) Ltd. accept no liability should this prove to be the case, nor if additional information exists or becomes available with respect to this site.
- 1.4 MTC Engineering (Cambridge) Ltd. makes no representation whatsoever concerning the legal significance of its findings or any other matters referred to in the following report. Except as otherwise requested by the client, MTC Engineering (Cambridge) Ltd. are not obliged and disclaim any obligation to update the report for events taking place after the Assessment was undertaken.
- 1.5 This report is a Flood Risk Assessment and Sustainable Drainage Strategy relating to flooding and drainage issues associated with the proposed development. The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. This report provides no guarantee against flooding of the study site or elsewhere, nor as to the absolute accuracy of water levels, flow rates and associated probabilities quoted.

2 Site Description

- 2.1 The Site is located on the southeastern side of Main Street (the B1514) and western side of the A1123, in eastern Hartford.
- 2.2 The site is approximately square in shape, occupies an area of approximately 1.2Ha and is currently occupied by an agricultural field. It is allocated for the development of approximately 30 homes (HU 9) in Huntingdonshire's Local Plan to 2036: Proposed Submission 2017.
- 2.3 To the northwest the site is bound by Main Street, past which lies residential development off Owl Way. Main Street is generally about a metre or so higher than the northern part of the site, with the lowest section of Main Road present on the stretch between the roundabout junction with the A1123 at the northern corner of the site and junction with Old Huntingdon Road to the west of the site being 9.8 metres above Ordnance Datum (AOD) at the location of the existing site access. The majority of Main Road this stretch of Main Road is at levels of between 10 and 10.5 metres AOD.
- 2.4 To the northeast the site is bound by the A1123, past which lies open agricultural land and also Hartford Lake which is about 300 metres east of the site. The A1123 is again embanked above adjacent land, falling from a level of almost 11 metres AOD at the junction with Main Street at the northern corner of the site to a level of about 9.6 metres AOD at the junction with Old Houghton Road (now a cycleway/bus route only) to the southeast of the site.
- 2.5 To the south and east of the site lies number 2 Houghton Road and a training centre which are on the northern/eastern side of Old Houghton Road, along with some further agricultural land. West past Old Houghton Road lies existing residential development off The Grove, with the main body of Hartford lying to the west of the site. South past Houghton Road lies some agricultural land and then the River Great Ouse which flows in an easterly direction approximately 300 metres south of the site.

- 2.6 Old Houghton Road runs in a southerly direction from Main Street then easterly direction to the A1123, although the eastern part of Old Houghton Road is now only used as a bus route and cycleway. The southern section of Old Houghton Road is at a level of about 9.5 metres AOD, although there is a bank along the northern side of the majority of this section to levels of about 10.3 metres. Old Houghton Road then rises in a northerly direction to levels of about 10.7 metres at the junction with Main Street.
- 2.7 As such Main Street, the A1123, and Old Houghton Road form a continuous embankment to a minimum level of about 9.5 metre AOD around the triangle of land made up of the site, number 2 Old Houghton Road, the training centre, and other agricultural land, with the majority of this land being at a slightly lower level than these roads.
- 2.8 The site itself falls in a southeasterly direction from levels of above 9 metres AOD in the northern area adjacent to Main Road to levels of about 8.6/8.7 metres AOD along the southeastern boundary.
- 2.9 A small drain runs along the northeastern boundary of the site in a southerly direction, having flowed beneath Hartford Road through a 450mm culvert. This drain then flows through a short length of dual pipe (about 600mm diameter) at the eastern corner of the site, then continues southeast along the southern side of the A1123 before flowing east beneath the A1123/Old Houghton Road through a dual 600mm pipe. Environment Agency defences located at the downstream side of this outfall prevent backflow of flood water in a northerly direction along this drain towards the site.
- 2.10 There is a small pond in the eastern corner of the site, which is thought to be in continuity with ground water levels and created for agricultural use. Whilst there are a few other small drains present in the vicinity of the site these are located outside of the triangle of roads surrounding the site.
- 2.11 There are no further surface water features of note in the vicinity of the site.

2.12 British Geological Survey Mapping indicates that the bedrock geology underlying the site is the Oxford Clay formation, with a superficial geology of river terrace deposits of sand and gravel also present.

3 Sources of Potential Flood Risk

- 3.1 In accordance with The National Planning Policy Framework all forms of flood risk need to be considered in relation to any development.
- 3.2 The first form of flood risk to be considered in respect of The National Planning Policy Framework is fluvial flooding.
- 3.3 The River Great Ouse which flows in an easterly direction approximately 300m south of the site is the only significant source of fluvial flood risk to the site, with the Environment Agency Flood Map for Planning (Appendix 2) indicating that the site lies primarily within defended Flood Zone 3a but with small areas in the northern part of the site being in Flood Zone 2.
- 3.4 The Huntingdonshire District Council Strategic Flood Risk Assessment map (Appendix 3) however indicates that the site lies entirely in Flood Zone 2 with none of the site or surrounding land being classified as defended Flood Zone 3.
- 3.5 The Environment Agency Flood Map is currently based upon model data from 2016, whereas the Strategic Flood Risk Assessment was produced in 2017 using updated modelling and therefore being the most recent available source of flood data is considered to supersede the Environment Agency Flood Map, thus it is considered that the site is classified as Flood Zone 2 not defended Flood Zone 3.
- 3.6 The Strategic Flood Risk Assessment also provides mapping of a 1 in 100 year event with 'central' 25%, 'higher central' 35% and 'upper end' allowances for climate change, as provided in Appendix 4. This mapping shows that the site would remain dry in all of the above events, thus is considered to be at a low risk of flooding during a 1 in 100 year event even with allowance for climate change.
- 3.7 The Environment Agency have supplied modelled flood data for the area, a copy of which is provided in Appendix 5.

- 3.8 The node applicable to the site is node EA052349LO0117 at which the 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the flows at these levels being 99.56 cumecs and 103.84 cumecs respectively.
- 3.9 As can be seen from the survey of the roads surrounding the site (Appendix 5) these provide a raised barrier of a minimum level of about 9.5 metres AOD which is more than 400mm above the modelled 1 in 100 year flood level and about 150mm above the modelled 1 in 1000 year water level.
- 3.10 As such it is not considered that flood water from the River Great Ouse would come over these roads and towards the site under any circumstances in either a 1 in 100 year or 1 in 1000 year fluvial flood event.
- 3.11 Current modelled climate change allowances have not been modelled by the Environment Agency, with the only modelled climate change water level being 9.17m AOD based upon 20% climate change, where the modelled flow was 100.02 cumecs. As the 1 in 100 year flow was 99.56 cumecs, which indicates a flow increase of 0.023 cumecs per % climate change.
- 3.12 As such even in the maximum 65% climate change flood event that requires consideration under current guidelines flows in a 1 in 100 year event would increase by approximately 1.5 cumecs to 101.06 cumecs. As such they would remain more than 2.5 cumecs below the 1 in 1000 year flow that has been modelled, and thus the 1 in 100 year plus 65% climate change water level would be less than the 1 in 1000 year water level of 9.37m AOD.
- 3.13 Given that the site would not flood during the 1 in 1000 year event due to the raised road embankments surrounding the site it would clearly not flood in a 1 in 100 year plus 65% climate change event where the water level is lower. As such the Strategic Flood Risk Assessment mapping which shows that the site would remain dry during a 1 in 100 year plus climate change event is considered to be correct.

- 3.14 It should be noted that whilst Environment Agency defences in the area terminate at the eastern end of Old Houghton Road, defences include measures to prevent the backflow of flood water north along the drains in the area including that running beneath Old Houghton Road and along the western side of the A1123 in the vicinity of the site.
- 3.15 As such unless this defence failed flood water would not come back up this watercourse towards the site, thus given the level of adjacent roads protecting the site from flood water coming across land it is considered that the site is fully protected against fluvial flooding from the River Great Ouse in 1 in 100 year, 1 in 100 year plus climate change and 1 in 1000 year flood events.
- 3.16 In the unlikely event that the Environment Agency defence failed and allowed water to flow northwards along the drain running along the western side of the A1123 during a fluvial flood event this would be a slow process due to the twin 600mm pipes restricting the flow capacity, with water gradually beginning to pond in the land to the north of the A1123. Lower lying areas adjacent to the drain would be effected first, with ponding gradually spreading northwards through this triangle of land towards the site.
- 3.17 It is unlikely that water levels in this area of flood plain would actually reach same level as water levels in the Great Ouse Channel under any circumstances, although even if this were to occur during a 1 in 100 year event the northern section of the site would remain dry, whilst the southeastern section would be subject to shallow ponding to a depth of up to about 300mm in the majority of the southern area. During a 1 in 1000 year event the northwestern area of the site would remain dry, with the water level in the southern part being a maximum depth of about 600mm
- 3.18 The Environment Agency have previously confirmed that the site flooded in 1947 however in 1998 whilst flood water was present on the fields to the west on the other side of the A1123 the Environment Agency do not believe the site was effected thus defences appear to have functioned as designed and without issue during this event.

- 3.19 The only other fluvial flood risk to the site comes from the small drain along the eastern boundary of the site with the worst case flood risk involving a blockage of either the channel itself or the culvert at the eastern edge of the site.
- 3.20 During any such event water would simply flow south past the blockage before rejoining the drain channel downstream, with the only anticipated impact being a little bit of surface water flooding occurring in the vicinity of the blockage.
- 3.21 Overall it is considered that the risk of fluvial flooding to the site is low with the only significant risk of flooding to the site coming from the potential failure of Environment Agency defences allowing flow in a northerly direction up the drain adjacent to the site. This would result in a gradual filling of the basin formed by the triangle of roads surrounding the site, with the higher parts of the site remaining dry and lower parts possibly subjected to shallow ponding.
- 3.22 The second source of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from the sea.
- 3.23 This site is well inland and with existing ground levels in the order of 9 metres AOD is considered to be at a low risk of flooding from the sea.
- 3.24 The third form of flood risk to be considered in respect of The National Planning Policy Framework is flooding from land.
- 3.25 Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can quickly run off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage with foul sewer surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro level can influence or exacerbate this. Overland flow paths need to be taken into account in development to minimise the risk of flooding from overland flow.

- 3.26 The A1123 and Old Houghton Road provide embanked barriers against any overland flow coming towards the site from the east, south, or west.
- 3.27 Overland flow could potentially come southeast onto Main Street from the residential development to the north, however much of this area is garden space rather than impermeable hence overland flows are less likely to develop, whilst any flows that did develop would likely either enter highway drainage systems or be channeled along the local road network by raised kerbs.
- 3.28 In the event that any overland flow did come onto the site from Main Road this would likely be at the low point in Main Road at the existing site access, and any such flow would simply be across the site in a southeasterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site, other than the potential forming of shallow ponding at low spots on the site such as at the existing pond in the southeastern corner of the site.
- 3.29 The surface water flood map shows that the only area of ponding that may occur on the site in a 'high risk' 1 in 30 year event being an extremely small area of shallow flooding in the southeastern corner of the site at the low spot/pond.
- 3.30 In a 'medium risk' 1 in 100 year event the extent of flooding would be a little greater in the southeastern area of the site, however other than at the existing pond the depth of water would remain below 300mm.
- 3.31 In a 'low risk' 1 in 1000 year event the extent of flooding would again increase, with comparison of flood extents and levels on the site survey indicating a ponded water level of approximately 8.9m AOD.
- 3.32 As such the overall the majority of the site is considered to be at only a low or very low risk of flooding from surface water, however adequate steps will be taken to ensure that the proposed development is adequately protected against any potential risk of surface water flooding as detailed in Section 4.

- 3.33 The fourth form of flood risk to be considered in accordance with The National Planning Policy Framework is flooding from rising groundwater.
- 3.34 Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands and river gravels in valley bottoms underlain by less permeable rocks. Water levels below the ground rise during wet winter months, and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land.
- 3.35 Geological Mapping indicates that the site is underlain by a bedrock geology of clay which would not have a water table, however a perched water table may be present in the overlying superficial geology of sand and gravels.
- 3.36 Based upon the pond in the eastern corner of the site which is likely to be in continuity with ground water levels this indicates a water level of about 7.7 metres at the site at the time of survey, which is about a metre below most site levels.
- 3.37 Under normal circumstances it is anticipated that any outflow of groundwater would be directly to the River Great Ouse or result in the development of spring lines in the lower lying land to the south of Old Houghton Road.
- 3.38 During a fluvial flood event on the River Great Ouse however it is possible that ground water levels would rise at the site and it is possible that some outflow could occur, however the impact upon the site would be less than that which would occur in the event that Environment Agency defences failed during a 1 in 100 year plus climate change fluvial flood event or 1 in 1000 year flood event, whilst there was no recorded groundwater flooding occurring at the site during the 1998 event when water was present in surrounding fields.

- 3.39 The fifth form of flood risk to be considered in accordance with the National Planning Policy Framework is the risk of flooding from blocked, overloaded, or burst sewers and water mains.
- 3.40 Should any sewer or water main block, become overloaded, or burst on Main Road any water which came on to the site would likely do so in the vicinity of the existing access, and would simply flow across the site in a south easterly direction and into the drain along the eastern boundary of the site without having a significant impact upon the site.
- 3.41 The last form of flood risk to be considered in accordance with the National Planning Policy Framework is flooding from reservoirs, canals or other artificial sources.
- 3.42 Grafham Water lies about 11km southwest of the site, and should its dam burst water would flood down Diddington Brook to the River Great Ouse where it would occupy much of the flood plain of the River Great Ouse both upstream and downstream of this point.
- 3.43 Environment Agency mapping indicates that the flood extent in such an event would be similar to a 1 in 100 year fluvial flood event on the River Great Ouse in the vicinity of the site, however makes no allowance for defences and it is anticipated that the fluvial defences and raised roads in the vicinity of the site would ensure that the site remained dry during any such event.
- 3.44 Further to the above Grafham Water is owned and maintained by Anglian Water Services Ltd, thus it is anticipated that the dam will remain well maintained and its risk of failure is low.
- 3.45 There are no further artificial sources of flood risk to the site and the overall risk of flooding to the site from artificial sources is considered to be low.

4 The Proposal

- 4.1 The proposal involves the outline Planning Application for the residential development of the site with 27 dwellings, as shown by the indicative site layout provided in Appendix 7.
- 4.2 Overall it is considered that the flood risk to the site by any means is low, with the site being defended against flooding by the surrounding embankments. Even in the event that Environment Agency measures to prevent backflow were to fail, flow beneath these embankments would be restricted by the twin 600mm culvert, and it is anticipated that water levels that would occur on site would remain significantly below water levels in the main River Great Ouse channel.
- 4.3 Therefore the minimum finished floor level of all dwellings will be set at above 9.37 metres AOD which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 4.4 It is not considered that any further flood resistant or resilient construction is required at the site.
- 4.5 The raised floor levels will ensure that the proposed dwellings are adequately protected against flooding from any other potential source including flooding from surface water where the maximum water level anticipated during a 1 in 1000 year event is approximately 8.9m AOD.
- 4.6 The superficial geology will likely provide acceptable infiltration rates for infiltration systems to be used as a means of drainage at the proposed development. Infiltration testing in accordance with BRE 365 will therefore take place to fully determine infiltration rates once outline planning permission has been granted and if acceptable infiltration rates are achieved then all surface water discharge from the development will be to infiltration systems designed in accordance with CIRIA Report 156.

- 4.7 In the event that either acceptable infiltration rates are not achieved or groundwater levels are too high to allow infiltration drainage to be used then surface water drainage will be via a positive system discharging to the adjacent ditch system running along the eastern boundary of the site, with discharge rates restricted to a maximum discharge rate of 2.0 liters per second during all events up to and including a 1 in 100 year plus 40% climate change event.
- 4.8 The outline Surface Water Drainage Strategy detailed in Section 5 has therefore been developed in compliance with all current relevant local and national guidance, with full detailed drainage design to be completed in line with this strategy and submitted for approval at the detailed design phase once outline planning permission is granted.
- 4.9 Foul drainage from the proposed development will either be to the existing foul sewerage network, via a pumped system if necessary, or to a package treatment plant discharging to the adjacent drain with all necessary discharge consents/permits obtained from relevant bodies such as the Environment Agency.

5 Sustainable Drainage Strategy

5.1 Point of Discharge and Discharge Rate

- 5.1.1 In line with the Drainage Hierarchy, surface water should be discharged to the ground via infiltration systems where feasible. Whilst the site is underlain by a bedrock sandstone geology which is largely permeable, the superficial geology is a much lower permeability geology in which infiltration systems are unlikely to prove feasible.
- 5.1.2 Infiltration testing in line with BRE365 will however be carried out once conditional planning permission has been granted, and if acceptable rates obtained then all surface water from the proposed development will be drained via infiltration systems.
- 5.1.3 5×10^{-6} m/s is generally considered the lowest rate at which infiltration systems provide an acceptable means of surface water discharge, thus if rates below this are obtained during testing then the second preferable method of discharge in line with the Drainage Hierarchy is discharge to a surface watercourse.
- 5.1.4 If acceptable infiltration rates are not achieved and a positive discharge solution is required then discharge will be to the watercourse along the northeastern boundary of the site, with post development discharge rates will be restricted to a maximum discharge rate of 2.0 l/s during all rainfall events up to and including a 1 in 100 year plus 40% climate change event.
- 5.1.5 As such regardless of the infiltration rates obtained during testing the proposed development can be drained in line with rather the first or second method required by the Drainage Hierarchy.
- 5.1.6 It is therefore considered appropriate to require full detailed infiltration testing at the detailed design phase rather than current planning application stage, with this information to be secured by planning condition.

5.2 Drainage Areas and Attenuation Volumes

- 5.2.1 An indicative drainage area plan is provided in Appendix 8, which shows that the total post development roof area of the new buildings is anticipated to be approximately 2,020m², with approximately 2,130m² of shared access and parking areas, and 980m² of road areas. As such the total post development drained area will be approximately 0.513Ha in total.
- 5.2.2 Based upon the minimum feasible infiltration rate of 5×10^{-6} m/s (0.018m/hr), the Micro Drainage calculations (Appendix 9) indicate that a base depth of 320mm beneath the parking areas and access areas to be permeably surfaced (with 30% void space) would be sufficient to accommodate run off from the 0.415Ha area roof and permeable accesses/parking areas during a 1 in 100 year plus 40% climate change event. Alternatively dependent upon the final detailed design the base thickness of the paving may be reduced, with cellular units such as aquacell instead used beneath some areas.
- 5.2.3 Infiltration calculations also indicate that the adoptable highway area (for which the Local Highway Authority are unlikely to accept permeable paving) could be successfully drained by an infiltration basin with a base area of 61.5m² and area of 190.5m² as shown on the indicative drainage layout in Appendix 8.
- 5.2.4 As such should an infiltration rate of 5×10^{-6} m/s be achieved during testing then the full post development drained area can be drained by infiltration. Should a rate higher than 5×10^{-6} m/s be achieved during testing then a reduced area/depth pond could be provided when detailed design takes place, thus the indicative pond shown is considered the worst case in terms of land take, and the base depth to permeable paving is considered to be worst case.
- 5.2.5 In the event that following testing rates are less than 5×10^{-6} m/s and a positive discharge is required, the Micro Drainage Calculations provided in Appendix 10 show that the QBAR greenfield discharge rate from this area is 1.3 litres per second (l/s), with the 1 in 1, 1 in 30, and 1 in 100 year discharge rates being 1.1l/s, 3.2l/s and 4.7l/s respectively.

- 5.2.6 Sewers for Adoption 7th Edition indicates that the minimum diameter flow control generally accepted by undertakes is 75mm. The lowest discharge rate that can be feasibly achieved using such a flow control is 2 l/s, thus discharge from the post development site would be restricted to a maximum of 2 l/s during all rainfall events upto and including a 1 in 100 year plus 40% climate change event.
- 5.2.7 Whist 2 l/s is slightly above greenfield discharge rates, it is less than two thirds the existing 1 in 30 year greenfield rate and less than half the 1 in 100 year greenfield rate. As such the flow restriction proposed will reduce flows during more extreme rainfall events when surrounding drainage infrastructure is closest to capacity thereby providing a benefit in extreme events and reducing the downstream risk of flooding in these events.
- 5.2.8 The Micro Drainage calculations provided in Appendix 11 indicate that to attenuate discharge from the full post redevelopment area of 0.513Ha to 2.0l/s during a 1 in 100 year plus 40% climate change event will require an attenuation volume of about 347m³.
- 5.2.9 The pond shown on the indicative drainage layout provided in Appendix 11 will provide approximately 63m³ of attenuation, whilst assuming a base thickness of 300mm to the permeable paving area with 30% void space would provide a further 192m³ of attenuation. The remaining 93m³ of attenuation required will be provided by using 250m² of cellular storage beneath shared/private driveway areas that are permeably surfaced, which based upon aquacell units with 0.4m depth and 95% void space would provide 95m³ of attenuation. As such the attenuation required can be comfortable accommodated at the proposed development.
- 5.2.10 The outline calculations provided clearly demonstrate that post development surface water discharge will either be to infiltration if suitable rates are obtained during testing or can be restricted to a maximum rate of 2.0l/s during all events up to and including a 1 in 100 year plus 40% climate change rainfall event.

5.2.11 Full detailed design of the surface water drainage and attenuation systems will therefore only take place once planning approval has been granted and the layout finalized, and will be submitted for approval at the conditional discharge stage.

5.3 SuDS Systems Proposed at Development

5.3.1 Living/green roof systems are a preferred SuDS technique, given that they are a flood reduction measure, reduce pollution through filtration, and provide a landscape and wildlife benefit. In this instance however living roofs will not prove feasible, firstly as the dwellings are likely to have pitched roofs and secondly as maintenance requirements are onerous for single dwelling owners.

5.3.2 Water re-use systems such as rainwater harvesting and water butts that would allow rainwater to be re-used for purposes such as irrigation may be provided at the development. This will however only be confirmed at the detailed design stage, whilst any storage provided within such systems (which would overflow to the main surface water drainage network) will not be counted towards that required to accommodate the design rainfall event as such system may be full at the time the rainfall event occurs.

5.3.3 Basins and ponds are considered preferred SuDS features as they provide both a flood and pollution reduction measure along with landscape and wildlife benefits.

5.3.4 Given the size of the site there is sufficient area in which to incorporate an infiltration/attenuation pond, which will be provided in the low eastern area of the site to enable drainage by gravity as indicated on the indicative drainage plan provided in Appendix 8.

5.3.5 Permeable paving is a SuDS technique that is appropriate to use at most developments, and provides both a flood reduction benefit due to the attenuation provided in the base and a pollution reduction benefit due to the filtration of water as it passes through the permeable surfacing.

5.3.6 Permeable paving will therefore be used on all private access and parking areas at the development. At present the Local Highway Authority will not adopt permeable access roads, thus it is anticipated that the main access road will be impermeably surfaced, however if the Local Highway Authority position changes prior to the detailed application/design being undertaken then the main access road will also be permeably surfaced.

5.4 **SuDS Treatment Stages**

5.4.1 All surface water will receive an appropriate level of treatment in line with requirements prior to discharge to the surface water sewer network.

5.4.2 Drainage from all external hard standing/access areas which will be lightly trafficked requires two treatment stages prior to discharge. For the private access areas which will be permeably surfaced the first treatment stage will be via filtration through the permeable surfacing and second stage being filtration through the membrane (such as terram) in which the base layer would be wrapped.

5.4.3 For impermeable areas of adoptable highway the first treatment stage will therefore be through a traditional drainage system incorporating measures such as trapped gulleys, whilst the second stage will be via settlement and adsorption in the infiltration/attenuation basin to be provided.

5.4.4 Surface water from the roofs is considered clean discharge thus requires one treatment stage only prior to discharge, which will be provided by filtration through the membrane such as terram in which the base layer of the permeable paving will be used, whilst if a positive discharge is required an additional stage would also be provided by means of settlement and adsorption in the infiltration/attenuation pond.

5.4.5 All surface water will therefore receive the required number of treatment stages prior to discharge.

5.5 Maintenance of SuDS Systems

- 5.5.1 All drainage systems serving single dwellings only will be the responsibility of the dwelling owner to maintain.
- 5.5.2 Drainage systems serving multiple dwellings will likely be the responsibility of the management company set up to maintain communal areas of the development to maintain, with funding provided by the ground rent/service charge to be levied on dwellings.
- 5.5.3 The possible alternative is that sewage undertakers will be accepting SuDS systems by the time detailed design takes place (Sewers for Adoption 8 which covers adoption of SuDS is likely to be released and implemented in the near future). If this happens prior to detailed design and construction then the SuDS systems may be offered for adoption rather than maintained by a management company.
- 5.5.4 A full maintenance plan will be produced at the detailed design phase to all relevant parties once conditional planning approval has been granted covering all drainage systems at the site to ensure that relevant parties are aware of their responsibilities and the maintenance requirements of the systems provided.
- 5.6 Full detailed design of the surface water drainage system serving the development will only take place once conditional planning approval has been granted, with provision of the full detailed drainage design and associated information such as infiltration test results and maintenance plans to be secured by appending an appropriate planning condition to any planning approval granted.
- 5.7 This will be based on this outline Sustainable Drainage Strategy, which clearly demonstrates that the proposed redevelopment can be drained in accordance with all national and local requirements and that the design 1 in 100 year plus 40% climate change rainfall event can be dealt with on site without having an adverse impact upon the off-site risk of flooding.

6 Assessment

- 6.1 The proposal involves erection of 27 dwellings on land off Main Street, Hartford.
- 6.2 The site is shown as lying in Flood Zone 2 on the Strategic Flood Risk Assessment, and in defended Flood Zone 3a on the Environment Agency Flood Map for Planning.
- 6.3 As the Strategic Flood Risk Assessment is based upon more recent hydraulic modelling than the Flood Map for Planning, this is considered to represent the most up to date classification of the site, which is therefore considered to lie in Flood Zone 2.
- 6.4 Under the National Planning Policy Framework the proposed use is classified as a “more vulnerable” use. This use is appropriate in Flood Zone 2 without the need for an Exception Test, however a Sequential Test may be required.
- 6.5 The site has an allocation (HU 9) in Huntingdonshire’s Local Plan to 2036: Proposed Submission 2017 for residential development, thus the Sequential Test has already been considered and has been passed by the proposed development. No further Sequential Test information is therefore required in this instance.
- 6.6 All the sources of flood risk to the proposed development have been considered in Section 3, and the only significant risk of flooding comes from the River Great Ouse.
- 6.7 The modelled in channel 1 in 100 year flood level is 9.06 metres AOD and 1 in 1000 year flood level 9.37m AOD, with the 1 in 1000 year flood level considered to exceed the 1 in 100 year plus 65% climate change level as it involves higher flows.
- 6.8 Surrounding road levels are significantly above these levels, whilst the Environment Agency have backflow prevention systems in place to prevent flooding back onto the beneath embankments from drains in the area. As such even if water could get onto the site water levels would be significantly lower than the modelled in channel levels referred to above.

- 6.9 The minimum floor level of the proposed dwellings will in any case be set at 9.37 metres AOD, which is equivalent to the 1 in 1000 year water level on the River Great Ouse channel which is higher than the 1 in 100 year plus 65% climate change water level and higher than any water level likely to develop on site under any circumstances.
- 6.10 It is not considered that any further flood resilient or resistant construction is required in this instance.
- 6.11 Surface water drainage from the proposed development will be to infiltration systems subject to satisfactory infiltration rates being achieved during testing and groundwater levels not being too high. If infiltration systems cannot be used as a means of surface water drainage then a positive system with attenuation and a flow control limiting discharge to the adjacent drain a maximum rate of 2.0 litres per second during all events upto and including a 1 in 100 year plus 40% climate change event.
- 6.12 Further details in relation to surface water drainage will be provided at the detailed design stage, with the outline drainage strategy provided in Section 5 clearly demonstrating that the proposed development can be drained in line with all local and national requirements and without having an adverse impact upon the off-site risk of flooding.
- 6.13 Foul drainage from the proposed development will be either to the existing foul network or to a package treatment plant discharging to the adjacent drain with all necessary permits and consents to be obtained.

7 Conclusion

- 7.1 The proposal involves the development of 27 residential dwellings on land off Main Street, Hartford, as shown on the indicative layout provided in Appendix 8.
- 7.2 The site lies in Flood Zone 2 based upon the Strategic Flood Risk Assessment which is based upon more recent modelling than the Environment Agency Flood Map for Planning.
- 7.3 The Exception Test is not required for 'more vulnerable' development in Flood Zone 2, whilst the site has an allocation in the Local Plan (HU 9) thus has already been considered to pass the Sequential Test.
- 7.4 Surveyed levels demonstrate that the roads surrounding the site on all sides are significantly above the modelled flood level during a 1 in 100 year event of 9.06m AOD and 1 in 1000 year water level of 9.37m AOD (considered to be higher than any 1 in 100 year plus climate change level. Environment Agency defences prevent the flow of flood water back up adjacent drains and the site is therefore fully defended against a 1 in 100 year and 1 in 1000 year event on the River Great Ouse.
- 7.5 In the unlikely event that the defences fail the finished floor level of the proposed dwellings will be set at a minimum height of 9.37 metres AOD which is the same as the modelled 1 in 1000 year flood level on the River Great Ouse which is a higher level than would occur on site in the unlikely event that defences failed and allowed water to come onto the site.
- 7.6 Surface water drainage will be to infiltration systems if acceptable rates are achieved in testing or to a positive system with discharge restricted to a maximum rate of 2 litres per second during all events upto and including a 1 in 100 year plus 40% climate change rainfall event, as fully detailed within the outline sustainable drainage strategy provided in Section 5.

- 7.7 The surface water drainage strategy clearly demonstrates that the site can be drained in line with all relevant local and national guidance and without adversely impacting the off-site risk of flooding. It is therefore appropriate to secure the full detailed drainage design by means of appending an appropriate planning condition to any approval granted.
- 7.8 There are no flood or drainage related grounds under the National Planning Policy Framework on which to oppose the erection of 27 dwellings on land off Main Road, Hartford.

APPENDIX 1
SITE LOCATION PLAN



APPENDIX 2

ENVIRONMENT AGENCY FLOOD MAP FOR PLANNING

Flood map for planning

Your reference
1506

Location (easting/northing)
525993/272913

Created
17 Aug 2018 3:17

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

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

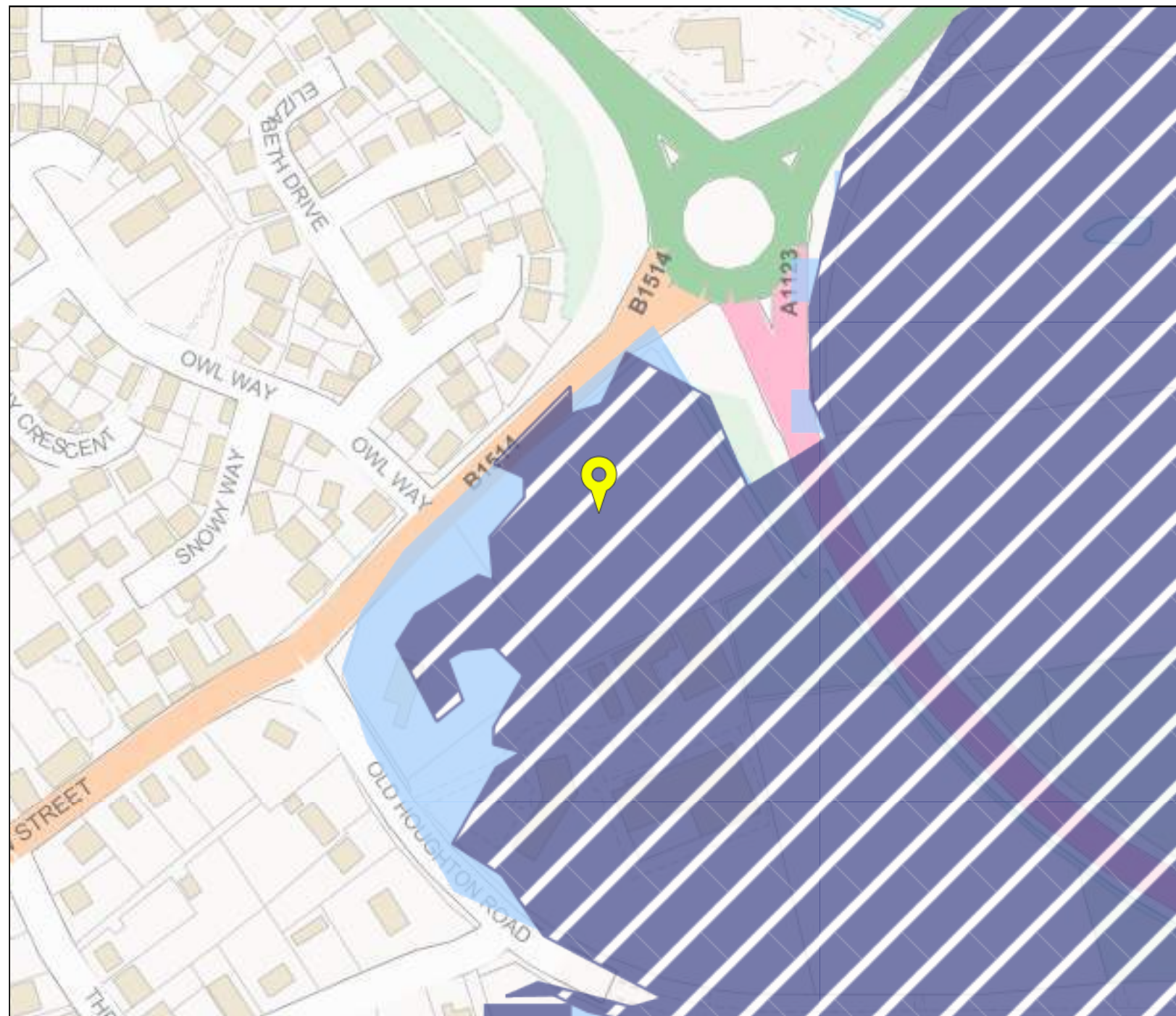
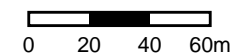
Your reference
1506

Location (easting/northing)
525993/272913

Scale
1:2500

Created
17 Aug 2018 3:17

-  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



APPENDIX 3

STRATEGIC FLOOD RISK ASSESSMENT MAPPING – FLOOD ZONES

SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	
Climate Change Flood Risk	Central	Higher Central	Upper End	
Updated Flood Map for Surface Water	30 year extent	100 year extent	1,000 year extent	
Areas Susceptible to Ground Water Flooding	≥ 75%	≥ 50% < 75%	≥ 25% < 50%	< 25%
Flood Warning Coverage	Flood warning area			

- Flood Zones
- Climate Change Flood Risk
- Updated Flood Map for Surface Water
- Areas Susceptible to Groundwater Flooding
- Flood Warning Coverage



APPENDIX 4

STRATEGIC FLOOD RISK ASSESSMENT MAPPING - CLIMATE CHANGE

SFRA 2017 map

Please refer to the [SFRA report 2017](#) for explanations of the information shown on this map.

Map Legend

Flood Zones	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	
Climate Change Flood Risk	Central	Higher Central	Upper End	
Updated Flood Map for Surface Water	30 year extent	100 year extent	1,000 year extent	
Areas Susceptible to Ground Water Flooding	$\geq 75\%$	$\geq 50\% < 75\%$	$\geq 25\% < 50\%$	$< 25\%$
Flood Warning Coverage	Flood warning area			

- Flood Zones
 Climate Change Flood Risk
 Updated Flood Map for Surface Water
 Areas Susceptible to Groundwater Flooding
 Flood Warning Coverage



APPENDIX 5

ENVIRONMENT AGENCY MODELLED AND HISTORICAL FLOOD DATA

Emily Fell
MTC Engineering (Cambridge) Ltd

Our ref
Date

EAn2018/73180
14 February 2018

emilyfell@mtcengineering.co.uk

Dear Emily

Enquiry regarding Product 4 for Main Street, Hartford

Thank you for your enquiry which was received on 17 January 2018.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The information we hold and a copy of the Flood Risk Assessment (FRA) advisory note is attached to my email. There are no defences in the area which would protect this property.

Informatives & Caveats

Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

If you have any queries regarding our data please contact the Flood and Coastal Risk Management team on 0208 474 5245.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Page 774

Website: <https://www.gov.uk/government/organisations/environment-agency>



Name	Product 4
Description	Detailed Flood Risk Assessment Map centred on Main Street, Hartford
Licence	Open Government Licence
Information Warnings	None
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our <https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion> and email it to our Sustainable Places team at: planning.brampton@environment-agency.gov.uk. They will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our [website](#).

Please note we have published revised climate change allowances, which are available online. These new allowances will need to be reflected in your Flood Risk Assessment. If you want to discuss this please call our Sustainable Places team on 020 8474 5242.

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

Yours sincerely

Karen Brown

Karen Brown

Customers and Engagement Officer

Direct dial: [REDACTED]

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD

Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE














General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

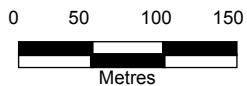
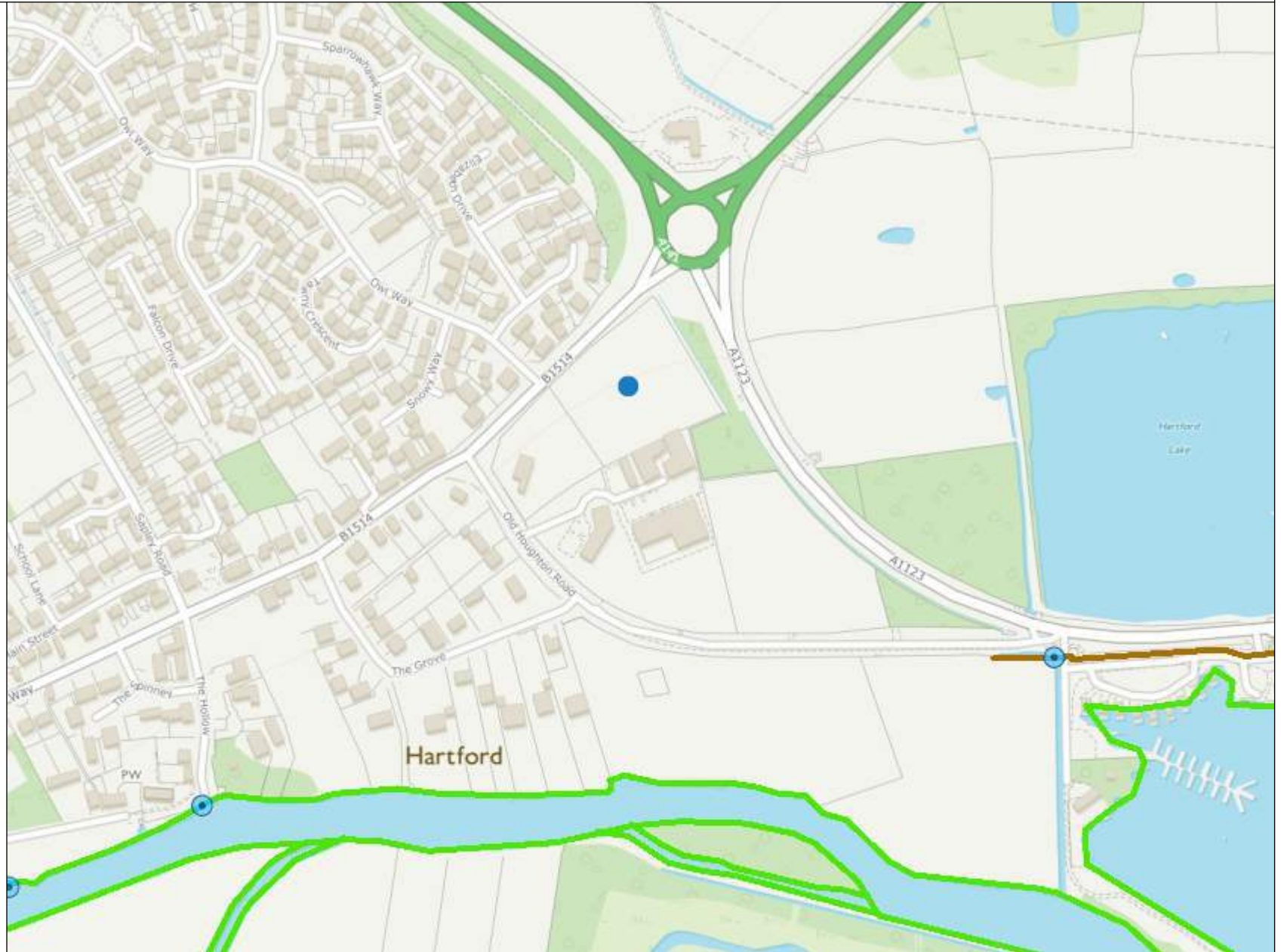
Legend

Structures

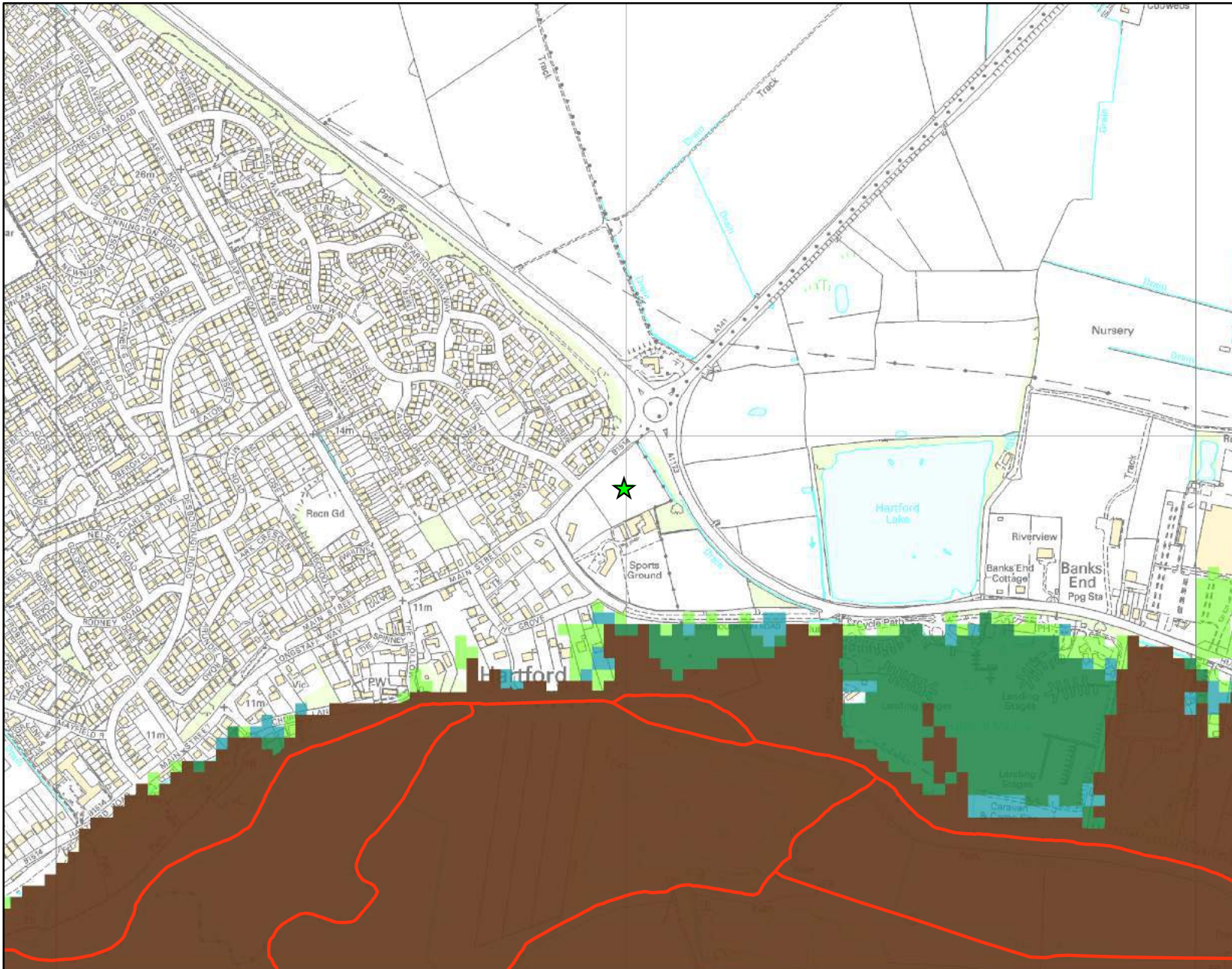
-  Draw Off Tower
-  Fish Pass
-  Hydrobrake
-  In Channel Stoplogs
-  Control Gate
-  Screen
-  Outfall
-  Inspection Chamber
-  Jetty
-  Spillway
-  Stilling Basin
-  Weir
-  Other structure

Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable Defence
-  Bridge Abutment
-  High Ground
-  Beach
-  Barrier Beach
-  Promenade
-  Quay
-  Cliff
-  Dunes
-  Culvert









**Defended Model Flood Outlines centred on Land at Main Street, Hartford, PE29 1XU.
NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

-  Defended 20% AEP
-  Defended 5% AEP
-  Defended 1% AEP
-  Defended 0.1% AEP
-  Main River
-  Site

Flood risk assessments: Climate change allowances

Application of the allowances and local considerations

East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire

1) The climate change allowances

The [National Planning Practice Guidance](#) refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in February 2016 and is available on [Gov.uk](#). The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

2) Assessment of climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as a **guide only**. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. **For these reasons we recommend that applicants and / or their consultants should contact the Environment Agency at the pre-planning application stage to confirm the assessment approach, on a case by case basis.** **Table A** defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

VULNERABILITY CLASSIFICATION	FLOOD ZONE	DEVELOPMENT TYPE		
		MINOR	SMALL-MAJOR	LARGE-MAJOR
ESSENTIAL INFRASTRUCTURE	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
HIGHLY VULNERABLE	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
MORE VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Intermediate/ Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
LESS VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
WATER COMPATIBLE	Zone 2	None		
	Zone 3a	Intermediate/ Basic		
	Zone 3b	Detailed		

Note: Where the table states 'not appropriate development', this is in line with national planning policy. If in exceptional circumstances such development types are proposed in these locations, we would expect a detailed modelling approach to be used.

NOTES:

- Minor: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveller site over 30+ pitches | any other development that creates a non residential building or development over 1000 sq m.

The assessment approach should be agreed with the Environment Agency as part of pre-planning application discussions to avoid abortive work.

3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Essex, Norfolk and Suffolk

Hydraulic Model (Watercourse)	Central	Higher Central	Upper
Blackwater & Brain - Blackwater between TL7520925623 and TL7820324314 Brain between TL7373323312 and TL7683821321	500mm	600mm	900mm
Chelmer - between TL6872107082 and TL7161609422 and TL7436306592	350mm	450mm	750mm
Colne (Model Extent)	450mm	600mm	950mm
Gipping – Downstream of Needham Market	400mm	500mm	850mm
Gipping – Needham Market and upstream including Somersham W/C	200mm	250mm	400mm
Norwich Downstream of TG2332009072	450mm	600mm	950mm
Norwich Upstream of TG2332009072	600mm	800mm	1200mm
Wensum (Model Extent)	400mm	500mm	800mm
Yare (Model Extent)	200mm	250mm	450mm
Broads (2008 Model Extent) Bure and Ant (2012 Model Extent)	Please use the current 1 in 1000 (0.1%) annual probability including climate change allowance		
Other main rivers, tributaries and ordinary watercourses	<p>For other main rivers, tributaries and ordinary watercourses that are not stated above, basic allowances have not been calculated. In this instance you can either:</p> <ul style="list-style-type: none"> • If flow data is available you can request this data from us and can conduct an intermediate assessment yourself • Or alternatively, you can choose to undertake a Detailed Assessment and “perform detailed hydraulic modelling, through either re-running our hydraulic models (if available) or constructing a new model 		

Cambridgeshire and Bedfordshire

Watercourse / Model	Central	Higher Central	Upper End
Alconbury Brook	600mm	700mm	900mm
River Kym			
Lower Ouse (Model Extent)	700mm	800mm	1100mm
Mid Ouse (Cold Brayfield to Bromham – between SP9156852223 and TL0132950919)	700mm	800mm	1100mm
Mid Ouse (East of Bedford to Roxton – between TL0791848903 and TL1618854543)	700mm	850mm	1200mm
River Hiz and River Purwell	400mm	450mm	550mm
River Ivel	500mm	600mm	750mm
Pix Brook	450mm	500mm	600mm
Potton Brook	500mm	600mm	700mm
River Cam and tributaries (excluding the Cam Lodes and the Slade System)	600mm	700mm	950mm
Great Barford (ordinary watercourses)	500mm	550mm	650mm
Bromham (ordinary watercourse)	550mm	650mm	850mm

NOTES:

Urban areas excluded from the 'basic' approach: St Ives, Holywell, Godmanchester, Swavesey, Over, Bedford, Newport Pagnell, Buckingham and Leighton Buzzard. More detailed assessment of climate change allowances will need to be undertaken in these locations.

Use of these allowances will only be accepted after discussion with the Environment Agency.

4) Fluvial food risk mitigation

For planning consultations where we are a statutory consultee and our [Flood risk standing](#) advice **does not** apply we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications. **These are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis.** For planning consultations where we are not a statutory consultee or our [Flood risk Standing advice](#) applies we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as '**Essential Infrastructure**' our benchmark for flood risk mitigation is for it to be designed to the '**upper end**' climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.
- For **highly vulnerable** or **more vulnerable developments** in flood zone 2, the '**central**' climate change allowance is our minimum benchmark for flood risk mitigation, and in flood zone 3 the '**higher central**' climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).
- For **water compatible** or **less vulnerable** development (e.g. commercial), the '**central**' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (particularly in flood zone 3) to inform built in resilience.

For a visual representation of the above, please see Tables 1 and 2 overleaf.

5) Development in Tidal Areas

There is no change to the way we respond to sites affected solely by tidal flood risk as the sea level allowances are unchanged.

6) Our Service

Non-chargeable service

We will give a free opinion on:

- What climate change allowance to apply to a particular development type
- Which technical approach is suitable in the FRA

Chargeable service:

- Review of climate change impacts using intermediate and detailed technical approaches (i.e. modelling review)
- Assessment and review of proposals for managed adaptation.

Table 1 peak river flow allowances by river basin district (use 1961 to 1990 baseline)				
River basin district	Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Anglian	Upper end	25%	35%	65%
	Higher central	15%	20%	35%
	Central	10%	15%	25%
Thames	Upper end	25%	35%	70%
	Higher central	15%	25%	35%
	Central	10%	15%	25%

Table 2: Using peak river flow allowances for flood risk assessments

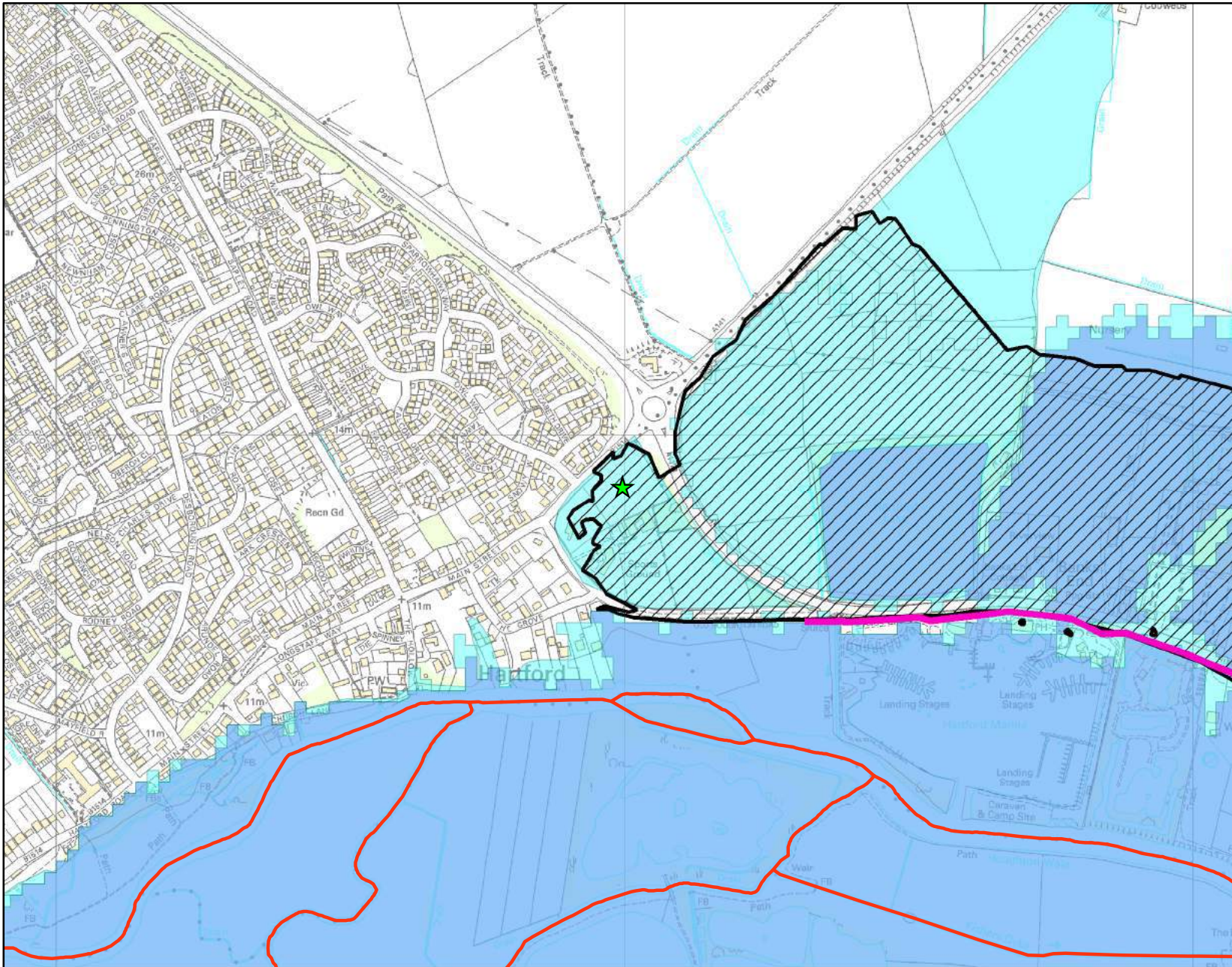
Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
2	higher central and upper end allowances	higher central and upper end allowances	central and higher central allowances	central allowance	none of the allowances
3a	upper end allowance	X	higher central and upper end	central and higher central	central allowance
3b	upper end allowance	X	X	X	central allowance

X – Development should not be permitted

If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the upper end allowance.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

**Flood Map for Planning (Rivers and Sea) centred on Land at Main Street, Hartford, PE29 1XU.
 NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.**



Scale 1:10,000



Legend

- Flood Zone 3
- Flood Zone 2
- Areas Benefiting From Defences
- Flood Map - Flood Storage Areas
- Flood Map Defences
- Main River
- Site

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

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

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

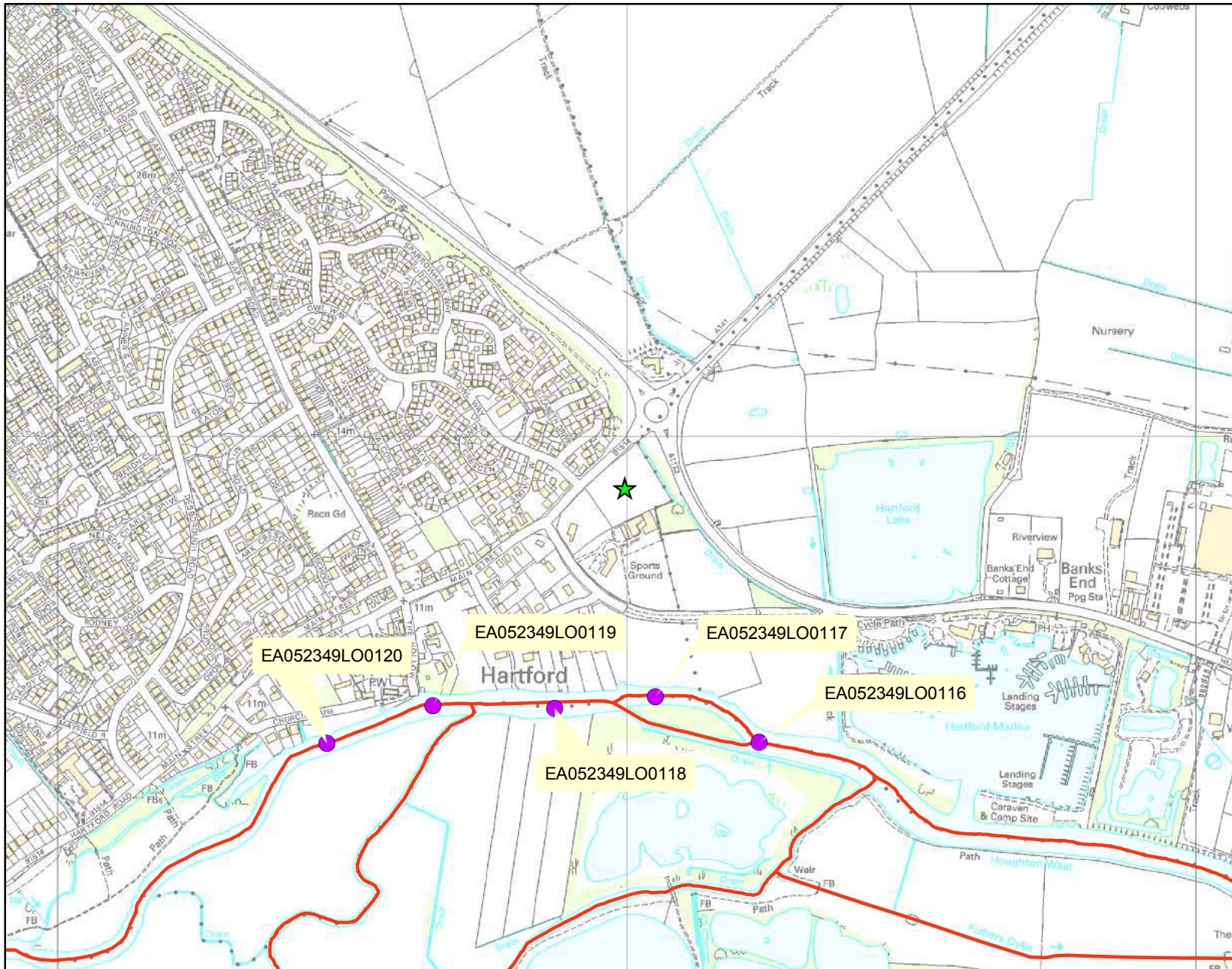
<https://www.gov.uk/flood-risk-assessment-standing-advice>
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

Modelled Node Point Locations centred on Land at Main Street, Hartford, PE29 1XU NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



Scale 1:10,000



Legend

- Modelled Node Point
- Main River
- ★ Site

Our Reference	Enquirer	Site	Grid Reference
73180	Emily Fell	Land at Main Street, Hartford, PE29 1XU	TL2599772909

Model Information

The following table shows a summary of all the model information relevant to the area of interest.

Model Code	Model Name	Release Date
EA052349	Lower Ouse	01/04/2016

Level Information

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	8.71	8.8	8.857	8.88	8.97	8.99	9.02	9.1	9.34
EA052349LO0117	EA052349_003	526051	272542	8.78	8.86	8.913	8.93	9.01	9.04	9.06	9.14	9.37
EA052349LO0118	EA052349_003	525873	272522	8.87	8.94	8.996	9.01	9.09	9.11	9.13	9.2	9.42
EA052349LO0119	EA052349_003	525659	272526	8.91	8.98	9.029	9.05	9.12	9.14	9.16	9.23	9.45
EA052349LO0120	EA052349_003	525474	272460	8.94	9.01	9.061	9.08	9.15	9.17	9.19	9.26	9.48

Levels Climate Change subform

The following table shows modelled level information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	9.13
EA052349LO0117	EA052349_003	526051	272542	9.17
EA052349LO0118	EA052349_003	525873	272522	9.23
EA052349LO0119	EA052349_003	525659	272526	9.26
EA052349LO0120	EA052349_003	525474	272460	9.28

Flow Information

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	20% AEP	10% AEP	5% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
EA052349LO0116	EA052349_003	526233	272462	107.1	108.55	109.855	108.79	108.99	109.01	109.03	110.05	113.12
EA052349LO0117	EA052349_003	526051	272542	95.61	97.4	98.855	99.12	99.26	99.31	99.56	100.25	103.84
EA052349LO0118	EA052349_003	525873	272522	90.94	91.75	92.663	93.05	94.7	95.4	95.65	99.43	109.22
EA052349LO0119	EA052349_003	525659	272526	97.2	97.35	97.63	97.64	97.48	97.52	97.64	98.38	106.05
EA052349LO0120	EA052349_003	525474	272460	101.89	101.9	101.91	101.91	101.23	101.19	100.95	101.13	109.2

Flows Climate Change subform

The following table shows modelled flow information from the above models.

Node	Model	Easting	Northing	1%(20%cc) AEP
EA052349LO0116	EA052349_003	526233	272462	109.31
EA052349LO0117	EA052349_003	526051	272542	100.02
EA052349LO0118	EA052349_003	525873	272522	100.12
EA052349LO0119	EA052349_003	525659	272526	98.24
EA052349LO0120	EA052349_003	525474	272460	101.33

Historic Flooding Information

Code	Event	Start	Source	Cause
EA052199804	Easter 1998	08/04/1998	Main River	Channel Capacity Exceeded (no raised defences)
EA052194703	March 1947	13/03/1947	Main River	Channel Capacity Exceeded (no raised defences)

Informatives

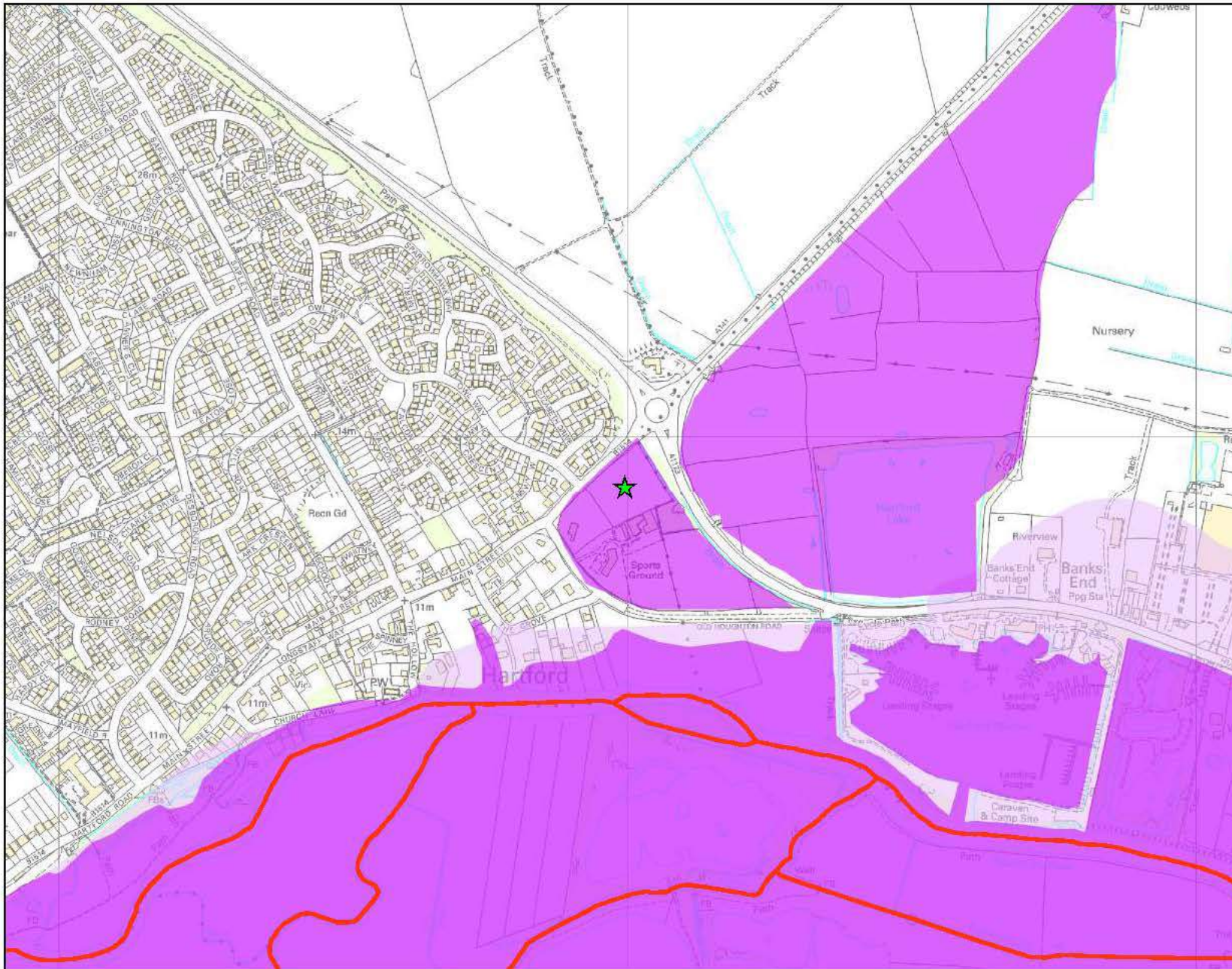
Limited Modelled Extents Provided - We have only provided a limited number of modelled flood extents for clarity. If you require further AEP extents we will be happy to provide them.

Historic Flooding - The historic flood map is an indicative outline of areas which have flooded. Not all properties within this area will have flooded.

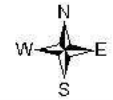
AEP - Annual Exceedance Probability - The probability of a given event to occur in any one year. Please note that this is not a return period.

Climate Change Allowances - Please note that the 1%+CC AEP flood level in the above table will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. We have released new guidance on climate change allowances for the purpose of flood risk assessments, which is available on our website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.

Recorded Flood Event Outlines centred on Land at Main Street, Hartford, PE29 1XU. NGR TL 25997 72909. Ref 73180 Created on 08 February 2018.



Scale 1:10,000



Legend

- Historic Flood Outline Easter 1998
- Historic Flood Outline March 1947
- Main River
- Site

From: [Enquiries_EastAnglia](#)
To: [Emily Fell](#)
Subject: 73180 - Land at Main Street, Hartford, PE29 1XU
Date: 19 January 2018 11:58:24

Dear Emily,

Thank you for your enquiry of 17th January 2018 regarding Land at Main Street, Hartford, PE29 1XU (Product 4 request).

We are liaising with our technical teams to gather the information/data you have requested. Your enquiry has been allocated the reference number 73180.

We will aim to send you our response as soon as possible, but by no later than 14th February 2018, which is in accordance with the Freedom of Information Act (2000) and the Environment Information Regulations (2004).

In the meantime if we can be of further assistance, please contact us quoting the above reference number.

Kind regards,

Ethan Cross.

Customers & Engagement Officer, Customers & Engagement Team, East Anglia Area
Environment Agency | Bromholme Lane, Brampton, Huntingdon, Cambridgeshire, PE28 4NE
Environment Agency | Icen House, Cobham Road, Ipswich IP3 9JD

Email team: Enquiries_EastAnglia@environment-agency.gov.uk
Team Number: 020 3025 5472

Working days: Monday-Friday (part time)
National Duty Communications Officer (24/7) | 0800 023 2522
National Duty Communications Manager | 0800 028 2411



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APPENDIX 6

TOPOGRAPHIC SURVEY OF THE SITE AND SURROUNDING ROAD NETWORK



Chartered Surveyors
Land, minerals and geomatics

**associated
surveying
consultants**

ABC (Surveys) Limited Registered in England and Wales No. 4507077
Tel: 01480 212700 65A Huntingdon Street St. Neots Cambridgeshire PE18 1DU

Topographical Survey of Land at Malt Sluice, Harford, Huntingdon and Surrounding Road Network
Survey oriented to True North, all levels in metres A.O.D.

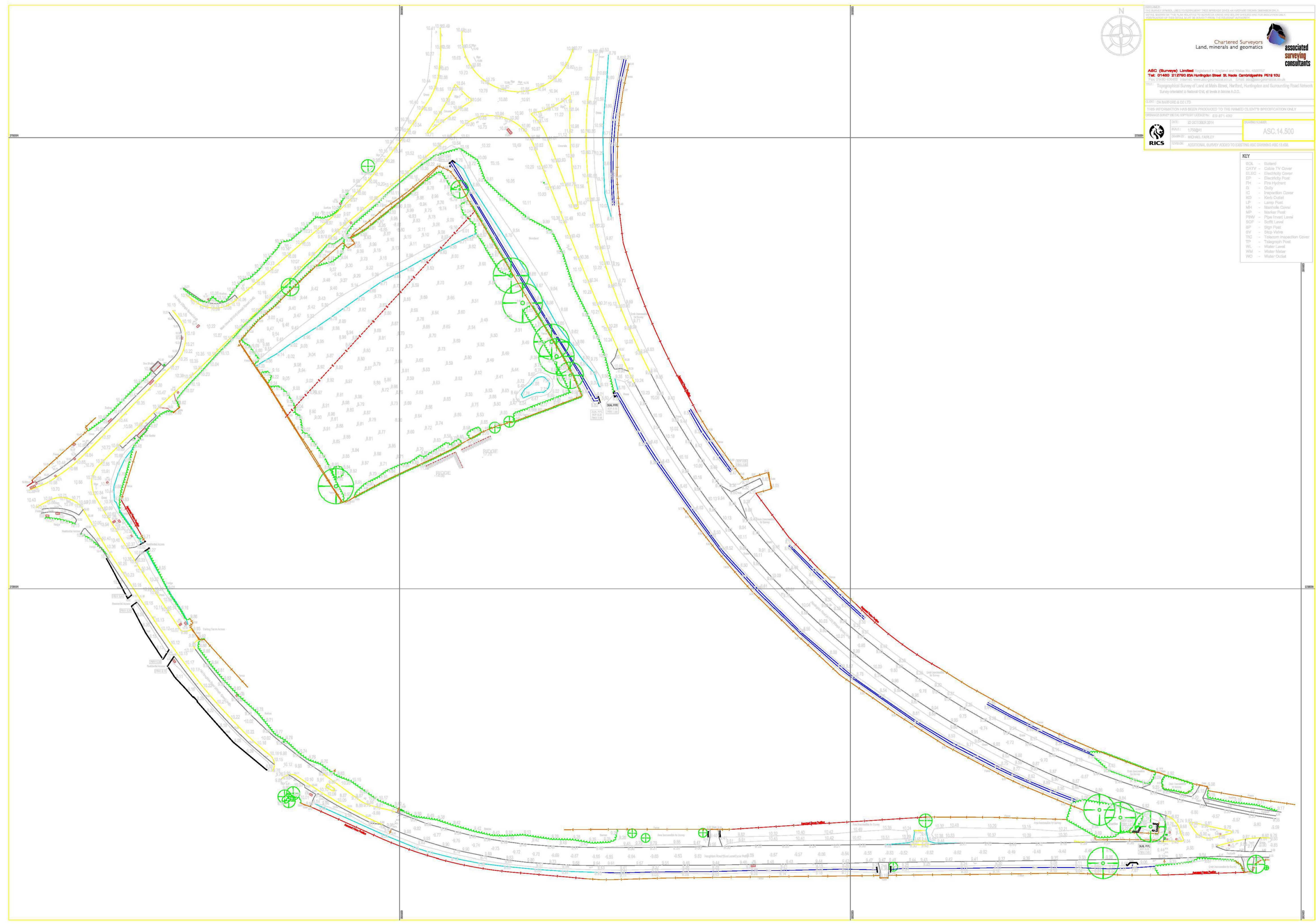
DATE: 12 OCTOBER 2014
DRAWN: MICHAEL PARLEY
CHECKED: MICHAEL PARLEY
ADDITIONAL SURVEY ADDED TO EXISTING ABC DRAWING ASC 13.430

CONTRACT NO: ASC.14.500

RICS

KEY

- BCK - Boiler
- CATV - Cable TV Cover
- ELEC - Electricity Cover
- EP - Electricity Post
- FM - Fire Hydrant
- G - Gully
- IC - Inspection Cover
- IO - Kiosk Outlet
- LP - Lamp Post
- MH - Manhole Cover
- MP - Marker Post
- PI - Pipe Inset Level
- SOP - Silt Level
- SP - Sign Post
- SW - Stop Valve
- TIC - Telecom Inspection Cover
- TP - Telegraph Post
- WL - Water Level
- WM - Water Meter
- WO - Water Outlet



APPENDIX 7
INDICATIVE SITE LAYOUT

Revision		
A	First issue	WF 15.06.18
B	Updated to received comments	WF 10.07.18
C	Updated to received comments	WF 08.08.18
D	Updated to received comments	WF 13.08.18

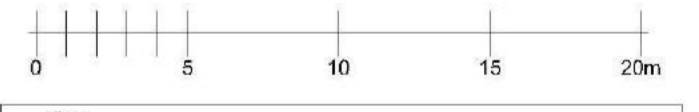
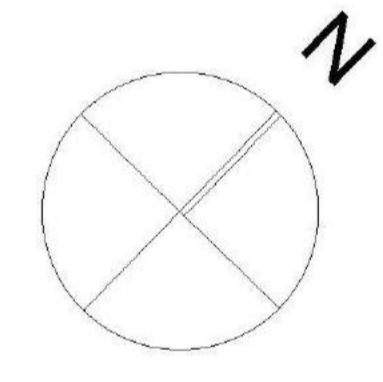


- Key**
- 7 x 2 Bed House
 - 4 x 3 Bed House
 - 11 x 4 Bed House
 - 5 x 5 Bed House

= 27 Houses Total

Site Area
= 12,069 sq m / 1.2 hectares

Public Open Space = 1,500 sq m
/ 0.15 hectares



client: Messrs. N Price & E Howson	
project: Land East of Main Street, Hartford, Huntingdon	
drawing: Feasibility Study - Proposed Site Layout Plan	
date: 15.06.18	scale: 1:250@A1
drawn: WF	checked by: AJD

BROWN & CO
ARCHITECTURE + PLANNING
Brown & Co, The Arklet, St George's Street, Norwich, NR3 1AD.
Brown & Co Registered Office: Grantham Hall, Finkin Street, Grantham, Lincolnshire, NG31 5QZ.
Registration no: 00202922. Registered in England & Wales. T: 01463 492220

APPENDIX 8
INDICATIVE DRIANAGE LAYOUT

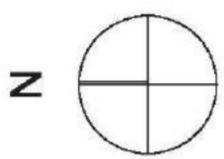
Key

- 7 x 2 Bed House
- 4 x 3 Bed House
- 5 x 4 Bed House
- 12 x 5 Bed House

= 27 Houses Total

Site Area = 12,069 sq m / 1.2 hectares

Public Open Space = 1,500 sq m / 0.15 hectares



Indicative infiltration/attenuation basin: Base area 61.5m², area at 0.5m depth 190.5m²

Roof area 2020m²

Private drive area 2130m²

Adoptable road area 980m²

REV	DATE	DESCRIPTION/REASON FOR ISSUE	APPR

MTC ENGINEERING


MTC Engineering (Cambridge) Ltd.
 Ground Floor, 24 High Street
 Whittesford, Cambridgeshire, CB22 4LT
 Tel (01223) 837270, fax (01223) 835648
 E-mail office@mtcengineering.co.uk


TITLE		MAIN STREET, HARTFORD INDICATIVE DRAINAGE LAYOUT	
ORIG	M.B	DATE	20-08-18
CHKD		SCALE	1:500
APPR		DRAWING NO	1506-01
		REV -	

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APPENDIX 9

MICRO DRAINAGE CALCULATIONS: INFILTRATION DISCHARGE

MTC Engineering Ltd		Page 1																																																																																																																														
24 High Street Whittlesford CB22 4LT																																																																																																																																
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx		MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C. Designed by M.J.B Checked by																																																																																																																														
Micro Drainage		Source Control 2017.1.2																																																																																																																														
<p><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p>Half Drain Time : 321 minutes.</p>																																																																																																																																
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MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	8.225	0.225	5.3	143.6	O K
60 min Winter	8.270	0.270	5.3	172.8	O K
120 min Winter	8.305	0.305	5.3	194.9	O K
180 min Winter	8.316	0.316	5.3	201.8	O K
240 min Winter	8.317	0.317	5.3	202.4	O K
360 min Winter	8.306	0.306	5.3	195.4	O K
480 min Winter	8.292	0.292	5.3	186.8	O K
600 min Winter	8.279	0.279	5.3	178.3	O K
720 min Winter	8.265	0.265	5.3	169.1	O K
960 min Winter	8.235	0.235	5.3	150.1	O K
1440 min Winter	8.178	0.178	5.3	113.7	O K
2160 min Winter	8.108	0.108	5.3	68.9	O K
2880 min Winter	8.061	0.061	5.3	39.2	O K
4320 min Winter	8.040	0.040	4.2	25.3	O K
5760 min Winter	8.031	0.031	3.3	20.1	O K
7200 min Winter	8.026	0.026	2.8	16.6	O K
8640 min Winter	8.022	0.022	2.4	14.2	O K
10080 min Winter	8.020	0.020	2.1	12.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	176
240 min Winter	19.389	0.0	232
360 min Winter	13.924	0.0	338
480 min Winter	11.018	0.0	380
600 min Winter	9.182	0.0	454
720 min Winter	7.908	0.0	530
960 min Winter	6.245	0.0	676
1440 min Winter	4.471	0.0	952
2160 min Winter	3.197	0.0	1320
2880 min Winter	2.518	0.0	1612
4320 min Winter	1.796	0.0	2248
5760 min Winter	1.413	0.0	2992
7200 min Winter	1.172	0.0	3712
8640 min Winter	1.006	0.0	4408
10080 min Winter	0.884	0.0	5128

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:00 File 1506 - INFILTRATION.srcx	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.415

Time (mins)	Area
From:	To: (ha)
0	4 0.415

MTC Engineering Ltd		Page 4																								
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD INFILTRATION - PRIVATE AREAS 1 IN 100 YEAR PLUS 40% C.C																									
Date 20/08/2018 11:00	Designed by M.J.B																									
File 1506 - INFILTRATION.srcx	Checked by																									
Micro Drainage	Source Control 2017.1.2																									
<p><u>Model Details</u></p> <p>Storage is Online Cover Level (m) 9.000</p> <p><u>Porous Car Park Structure</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Infiltration Coefficient Base (m/hr)</td> <td style="width: 20%;">0.01800</td> <td style="width: 20%;">Width (m)</td> <td style="width: 20%;">5.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>426.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>591.7</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>8.000</td> <td>Cap Volume Depth (m)</td> <td>0.320</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0	Membrane Percolation (mm/hr)	1000	Length (m)	426.0	Max Percolation (l/s)	591.7	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	8.000	Cap Volume Depth (m)	0.320
Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	5.0																							
Membrane Percolation (mm/hr)	1000	Length (m)	426.0																							
Max Percolation (l/s)	591.7	Slope (1:X)	0.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	8.000	Cap Volume Depth (m)	0.320																							
©1982-2017 XP Solutions																										

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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

Half Drain Time : 745 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	8.284	0.284	0.5	26.1	Flood Risk
30 min Summer	8.338	0.338	0.6	33.3	Flood Risk
60 min Summer	8.385	0.385	0.6	40.2	Flood Risk
120 min Summer	8.422	0.422	0.7	46.2	Flood Risk
180 min Summer	8.439	0.439	0.7	49.0	Flood Risk
240 min Summer	8.447	0.447	0.7	50.4	Flood Risk
360 min Summer	8.452	0.452	0.7	51.3	Flood Risk
480 min Summer	8.452	0.452	0.7	51.2	Flood Risk
600 min Summer	8.449	0.449	0.7	50.8	Flood Risk
720 min Summer	8.447	0.447	0.7	50.3	Flood Risk
960 min Summer	8.441	0.441	0.7	49.4	Flood Risk
1440 min Summer	8.428	0.428	0.7	47.1	Flood Risk
2160 min Summer	8.406	0.406	0.7	43.6	Flood Risk
2880 min Summer	8.385	0.385	0.6	40.3	Flood Risk
4320 min Summer	8.348	0.348	0.6	34.7	Flood Risk
5760 min Summer	8.315	0.315	0.5	30.2	Flood Risk
7200 min Summer	8.288	0.288	0.5	26.6	Flood Risk
8640 min Summer	8.264	0.264	0.5	23.6	Flood Risk
10080 min Summer	8.242	0.242	0.4	21.0	Flood Risk
15 min Winter	8.309	0.309	0.5	29.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	19
30 min Summer	92.629	0.0	34
60 min Summer	56.713	0.0	64
120 min Summer	33.583	0.0	122
180 min Summer	24.424	0.0	182
240 min Summer	19.389	0.0	242
360 min Summer	13.924	0.0	360
480 min Summer	11.018	0.0	478
600 min Summer	9.182	0.0	522
720 min Summer	7.908	0.0	584
960 min Summer	6.245	0.0	706
1440 min Summer	4.471	0.0	980
2160 min Summer	3.197	0.0	1388
2880 min Summer	2.518	0.0	1792
4320 min Summer	1.796	0.0	2596
5760 min Summer	1.413	0.0	3392
7200 min Summer	1.172	0.0	4112
8640 min Summer	1.006	0.0	4848
10080 min Summer	0.884	0.0	5640
15 min Winter	143.954	0.0	19

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MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	8.366	0.366	0.6	37.4	Flood Risk
60 min Winter	8.416	0.416	0.7	45.1	Flood Risk
120 min Winter	8.456	0.456	0.7	52.0	Flood Risk
180 min Winter	8.474	0.474	0.8	55.2	Flood Risk
240 min Winter	8.483	0.483	0.8	56.9	Flood Risk
360 min Winter	8.491	0.491	0.8	58.2	Flood Risk
480 min Winter	8.492	0.492	0.8	58.5	Flood Risk
600 min Winter	8.489	0.489	0.8	58.1	Flood Risk
720 min Winter	8.485	0.485	0.8	57.3	Flood Risk
960 min Winter	8.478	0.478	0.8	56.0	Flood Risk
1440 min Winter	8.462	0.462	0.7	53.0	Flood Risk
2160 min Winter	8.433	0.433	0.7	48.0	Flood Risk
2880 min Winter	8.405	0.405	0.7	43.4	Flood Risk
4320 min Winter	8.354	0.354	0.6	35.6	Flood Risk
5760 min Winter	8.312	0.312	0.5	29.7	Flood Risk
7200 min Winter	8.275	0.275	0.5	25.0	Flood Risk
8640 min Winter	8.244	0.244	0.4	21.3	Flood Risk
10080 min Winter	8.217	0.217	0.4	18.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.629	0.0	33
60 min Winter	56.713	0.0	62
120 min Winter	33.583	0.0	120
180 min Winter	24.424	0.0	180
240 min Winter	19.389	0.0	236
360 min Winter	13.924	0.0	350
480 min Winter	11.018	0.0	462
600 min Winter	9.182	0.0	566
720 min Winter	7.908	0.0	658
960 min Winter	6.245	0.0	744
1440 min Winter	4.471	0.0	1052
2160 min Winter	3.197	0.0	1496
2880 min Winter	2.518	0.0	1932
4320 min Winter	1.796	0.0	2764
5760 min Winter	1.413	0.0	3568
7200 min Winter	1.172	0.0	4328
8640 min Winter	1.006	0.0	5096
10080 min Winter	0.884	0.0	5848

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.098

Time (mins)	Area
From:	To: (ha)
0	4 0.098

MTC Engineering Ltd		Page 4
24 High Street Whittlesford CB22 4LT	MAIN ROAD, HARTFORD INFILTRATION CALCS-ADOPT ROAD 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 10:58 File 1506 - Infiltration - A...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

Model Details

Storage is Online Cover Level (m) 8.500


Infiltration Basin Structure

Invert Level (m) 8.000 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.01800 Porosity 1.00
 Infiltration Coefficient Side (m/hr) 0.01800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	61.5	0.500	190.5


APPENDIX 10

MICRO DRAINAGE CALCULATIONS: GREENFIELD RUN OFF RATE

MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MIN STREET, HARTFORD GREENFIELD RUN OFF RATE	
Date 20/08/2018 10:18 File	Designed by M.J.B Checked by	
Micro Drainage	Source Control 2017.1.2	
<u>ICP SUDS Mean Annual Flood</u>		
Input		
Return Period (years)	1	Soil 0.400
Area (ha)	0.513	Urban 0.000
SAAR (mm)	550	Region Number Region 5
Results 1/s		
	QBAR Rural	1.3
	QBAR Urban	1.3
	Q1 year	1.1
	Q1 year	1.1
	Q30 years	3.2
	Q100 years	4.7
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APPENDIX 11

MICRO DRAINAGE CALCULATIONS: POSITIVE DISCHARGE


MTC Engineering Ltd		Page 1
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage 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 ³)	Status
15 min Summer	8.183	0.183	2.0	137.1	O K
30 min Summer	8.234	0.234	2.0	175.7	O K
60 min Summer	8.284	0.284	2.0	213.3	O K
120 min Summer	8.332	0.332	2.0	248.9	O K
180 min Summer	8.357	0.357	2.0	267.7	O K
240 min Summer	8.372	0.372	2.0	279.3	O K
360 min Summer	8.390	0.390	2.0	292.4	O K
480 min Summer	8.400	0.400	2.0	299.9	O K
600 min Summer	8.405	0.405	2.0	303.9	O K
720 min Summer	8.407	0.407	2.0	305.5	O K
960 min Summer	8.406	0.406	2.0	304.6	O K
1440 min Summer	8.393	0.393	2.0	295.0	O K
2160 min Summer	8.373	0.373	2.0	280.1	O K
2880 min Summer	8.353	0.353	2.0	265.0	O K
4320 min Summer	8.310	0.310	2.0	232.7	O K
5760 min Summer	8.270	0.270	2.0	202.8	O K
7200 min Summer	8.235	0.235	2.0	176.6	O K
8640 min Summer	8.204	0.204	2.0	153.3	O K
10080 min Summer	8.177	0.177	2.0	133.1	O K
15 min Winter	8.205	0.205	2.0	153.7	O K
30 min Winter	8.263	0.263	2.0	197.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	143.954	0.0	117.6	19
30 min Summer	92.629	0.0	147.3	34
60 min Summer	56.713	0.0	206.3	64
120 min Summer	33.583	0.0	242.9	124
180 min Summer	24.424	0.0	263.0	184
240 min Summer	19.389	0.0	276.1	242
360 min Summer	13.924	0.0	292.1	362
480 min Summer	11.018	0.0	300.9	482
600 min Summer	9.182	0.0	304.2	602
720 min Summer	7.908	0.0	303.5	722
960 min Summer	6.245	0.0	296.1	960
1440 min Summer	4.471	0.0	279.3	1256
2160 min Summer	3.197	0.0	432.6	1624
2880 min Summer	2.518	0.0	452.0	2020
4320 min Summer	1.796	0.0	475.6	2812
5760 min Summer	1.413	0.0	518.5	3584
7200 min Summer	1.172	0.0	537.2	4328
8640 min Summer	1.006	0.0	552.0	5096
10080 min Summer	0.884	0.0	562.9	5760
15 min Winter	143.954	0.0	130.9	19
30 min Winter	92.629	0.0	159.2	34


MTC Engineering Ltd		Page 2
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage 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 ³)	Status
60 min Winter	8.319	0.319	2.0	239.4	O K
120 min Winter	8.373	0.373	2.0	279.7	O K
180 min Winter	8.401	0.401	2.0	300.9	O K
240 min Winter	8.419	0.419	2.0	314.2	O K
360 min Winter	8.439	0.439	2.0	329.5	O K
480 min Winter	8.452	0.452	2.0	338.7	O K
600 min Winter	8.459	0.459	2.0	344.0	O K
720 min Winter	8.462	0.462	2.0	346.7	O K
960 min Winter	8.463	0.463	2.0	347.3	O K
1440 min Winter	8.452	0.452	2.0	338.7	O K
2160 min Winter	8.425	0.425	2.0	318.7	O K
2880 min Winter	8.399	0.399	2.0	299.5	O K
4320 min Winter	8.344	0.344	2.0	257.8	O K
5760 min Winter	8.281	0.281	2.0	211.1	O K
7200 min Winter	8.228	0.228	2.0	171.1	O K
8640 min Winter	8.183	0.183	2.0	137.0	O K
10080 min Winter	8.146	0.146	2.0	109.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	56.713	0.0	230.5	64
120 min Winter	33.583	0.0	269.6	122
180 min Winter	24.424	0.0	289.9	180
240 min Winter	19.389	0.0	301.9	240
360 min Winter	13.924	0.0	312.4	358
480 min Winter	11.018	0.0	313.4	474
600 min Winter	9.182	0.0	310.2	590
720 min Winter	7.908	0.0	306.7	704
960 min Winter	6.245	0.0	299.7	932
1440 min Winter	4.471	0.0	285.9	1358
2160 min Winter	3.197	0.0	483.3	1708
2880 min Winter	2.518	0.0	503.8	2164
4320 min Winter	1.796	0.0	518.8	3108
5760 min Winter	1.413	0.0	581.0	3912
7200 min Winter	1.172	0.0	602.1	4680
8640 min Winter	1.006	0.0	619.0	5360
10080 min Winter	0.884	0.0	631.8	5960

MTC Engineering Ltd		Page 3
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2


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)	20.000	Shortest Storm (mins)	15
Ratio R	0.450	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.513

Time (mins)	Area
From:	To: (ha)
0	4 0.513

MTC Engineering Ltd		Page 4
24 High Street Whittlesford CB22 4LT	MAIN STREET, HARTFORD POSITIVE DISCHARGE - FULL DEV 1 IN 100 YEAR PLUS 40% C.C	
Date 20/08/2018 11:14 File 1506 - Positive Dischar...	Designed by M.J.B Checked by	

Micro Drainage Source Control 2017.1.2

Model Details

Storage is Online Cover Level (m) 9.000

Tank or Pond Structure

Invert Level (m) 8.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	750.0	0.500	750.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-2000-0475-2000
 Design Head (m) 0.475
 Design Flow (l/s) 2.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 75
 Invert Level (m) 8.000
 Minimum Outlet Pipe Diameter (mm) 100
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.475	2.0
Flush-Flo™	0.142	2.0
Kick-Flo®	0.329	1.7
Mean Flow over Head Range	-	1.7

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)
0.100	2.0	1.200	3.1	3.000	4.7	7.000	7.0
0.200	2.0	1.400	3.3	3.500	5.0	7.500	7.3
0.300	1.8	1.600	3.5	4.000	5.3	8.000	7.5
0.400	1.9	1.800	3.7	4.500	5.6	8.500	7.7
0.500	2.0	2.000	3.9	5.000	5.9	9.000	8.0
0.600	2.2	2.200	4.0	5.500	6.2	9.500	8.2
0.800	2.5	2.400	4.2	6.000	6.5		
1.000	2.8	2.600	4.4	6.500	6.8		

James Lloyd
Huntingdonshire District Council
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

Our ref: AC/2016/124826/01-L01
Your ref: 16/00597/FUL
Date: 06 September 2016

Dear Mr Lloyd

**RESUBMISSION OF WITHDRAWN APPLICATION HDC REF 15/01172/FUL
PROPOSED ERECTION OF TWO DETACHED DWELLINGS WITH GARAGES.
2 OLD HOUGHTON ROAD, HARTFORD**

Thank you for referring the above application which was received on 18 August 2016.

A copy of the subsequent decision notice would be appreciated.

We have reviewed the FRA submitted and have the following comments to make:

The site is currently within defended flood zone 3 of the Environment Agency's Flood Map. However since we previously commented on this planning application in August 2015 we have completed and released the outputs to our Lower Ouse Modelling Project. The outputs of this modelling project now place the site into flood zone 1. The updated Flood Map will be published later this year to reflect these changes.

In light of these changes we have no objection on flood risk grounds to the proposed development in relation to main river flooding though would suggest raising the finished floor levels to 9.55m AOD as stated in the FRA.

All surface water from roofs shall be piped direct to an approved surface water system using sealed downpipes. Open gullies should not be used.

Only clean, uncontaminated surface water should be discharged to any soakaway, watercourse or surface water sewer.

Where soakaways are proposed for the disposal of uncontaminated surface water, percolation tests should be undertaken, and soakaways designed and constructed in accordance with BRE Digest 365 (or CIRIA Report 156), and to the satisfaction of the Local Authority. The maximum acceptable depth for soakaways is 2 metres below existing ground level. Soakaways must not be located in contaminated areas. If, after tests, it is found that soakaways do not work satisfactorily, alternative proposals must be submitted.

Surface water from roads and impermeable vehicle parking areas shall be discharged via trapped gullies.

Anglian Water Services Ltd. should be consulted by the Local Planning Authority and be requested to demonstrate that the sewerage and sewage disposal systems serving the development have sufficient capacity to accommodate the additional flows, generated as a result of the development, without causing pollution or flooding. If there is not capacity in either of the sewers, the Agency must be reconsulted with alternative methods of disposal.

Site operators should ensure that there is no possibility of contaminated water entering and polluting surface or underground waters.

Yours sincerely

Mrs Dawn Porter
Sustainable Places Planning Advisor

Direct dial [REDACTED]

Direct e-mail Planning_Liaison.Anglian_Central@environment-agency.gov.uk

Environment Agency (East Anglia area), Sustainable Places Team, Bromholme Lane, Brampton, Huntingdon,
Cambridgeshire, PE28 4NE
Email: planning_liaison.anglian_central@environment-agency.gov.uk
Customer services line: 03708 506 506



End

Comment

Consultee	Mr Jeffrey Dummett (1198427)
Email Address	[REDACTED]
Company / Organisation	R2 Developments Limited
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	R2 Developments Limited (Mr Jeffrey Dummett - 1198427)
Comment ID	PMM2018:61
Response Date	29/01/19 16:13
Consultation Point	Proposed Main Modification 7 (View)
Status	Processed
Submission Type	Web
Version	0.3

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Object

Do you consider this proposed main modification to be sound? Not Sound

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not... Positively prepared
 Justified
 Consistent with national policy

Please say whether you think this proposed main modification is legally compliant. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the issues covered by legal compliance.

Do you consider this proposed main modification Not legally compliant to be legally compliant?

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

Please note: There are no limits on the length of representations but please be as concise as possible, including only that which is necessary to explain your representation. You can support your representation with supporting documents if you wish (see below) but please include clear references and reasoning as to why any attachments support your representation.

Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

The proposed Main Modification 7 (MM7) is not sound or legally compliant. The modification fails to show due regard to National Policy and Guidance and the principles of sustainable development. This representation concerns MM7 - however is directly relevant to other Main Modifications which are amended as a result of MM7 being implemented, and should be read as such. MM7 proposes to delete Draft Local Plan Policy LP9 and the settlement classification of Local Service Centres with the effect of downgrading the existing settlements of Bluntisham, Alconbury and Great Staughton to 'small settlements'. The deletion threatens to undermine the ability of the Local Plan to deliver sustainable development across the plan area, the long terms sustainability of the three settlements and housing delivery throughout the plan period. The result of the deletion of the Local Service Centre ('LSC') classification is to direct the overwhelming majority of housing growth towards a small number of strategic growth sites. This is illogical and irrational given the predominantly rural nature of Huntingdonshire and risks undermining the sustainability of the LSC settlements - positively planned growth improves the sustainability of these communities by meeting housing need, allowing for planned community facilities and amenities and improving the viability of local businesses and services. Paragraph 78 of the NPPF demands that Local Plans identify opportunities for villages to grow and thrive, especially this will support local services. The site west of Longacres, Bluntisham would deliver sustainable transport and recreation improvements. The site has been tested at planning application and can deliver suitable access and transport. MM1 fails in regard for the above and is contrary to NPPF Paragraph 78. The deletion of LP9 leads to the three settlements being lumped in with the single designation of 'Smaller Settlements' - this singular category fails to show any regard for the diversity in size, location, services and ability for growth and housing needs. The LSC classification ensured a mechanism for delivering planned development within the rural areas and to meet rural need. This is contrary to the requirement to ensure a Thriving Rural Economy and is therefore inconsistent with the remaining Local Plan together with the NPPF when read as a whole. MM7 and the deletion of the LP9 threatens the ability of the plan to deliver the OAN housing figures throughout the plan period. The housing trajectory places a heavy reliance on fast delivery at large strategic sites and the deliverability of these is questioned given they are more susceptible to market fluctuations and reliant upon infrastructure provision. MM7 creates a gap whereby reliance is placed upon small rural exceptions sites and prior approval conversions. This reliance is flawed considering that the supply of prior approvals would decrease as opportunities are used. Similarly, exception sites are often put forward at a specific point to meet a specific need with a willing landowner and local community and are therefore too specific to be relied upon for the housing trajectory figures. Para.48 of the NPPF says that windfall sites can be included where there is 'compelling evidence' - the evidence has not been put forward as being so compelling. The site west of Longacres, Bluntisham, is deliverable, has a willing landowner and developer, and an absence of technical constraints to a live planning application. The removal of LP9 takes away predicable housing supply that would serve to ensure predictable growth and improve the sustainability of this location - the current approach of MM7 (and the related policy amendments) takes a position from housing trajectory assumptions leading to a Policy decision which is not effective and not positively prepared, and threatens the long term sustainability of rural Huntingdonshire by directing planned growth to a small number of large sites. The modification MM7 is therefore not legally compliant and is not sound as it is irrational, it fails to have regard to the National

Planning Policy Framework and the objectives of Sustainable Development and the Local Plan when read as a whole.

Please tell us whether changes can be made to address the issue(s) you have identified.

**Can the issue(s) you have identified be addressed Yes
by making changes to the proposed main
modification?**

Please tell us what changes would address the issue(s) that you have identified.

You should say why these changes will make this proposed main modification sound and/ or legally compliant.

It would be helpful if you could include revised wording of any policy or text. Please identify additional text by underlining it (**U**) and identifying any text to be deleted by striking it through (**ABC**).

What changes would address the issue(s) that you have identified?

Reject MM7 and reinstate Policy LP9 and classification of Local Services Centres, thereby reinstating the site allocations at these settlements - in particular BL1 Land West of Longacres, Bluntisham.

Summary

Deletion of the Local Service Centres category threatens to undermine the ability of the Local Plan to deliver sustainable development across the plan area, the long terms sustainability of the three settlements and housing delivery throughout the plan period. Continues to promote site BL1 wst of Longacres, Bluntisham

Comment

Consultee	Mr Robin Riordan (1150020)
Email Address	[REDACTED]
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Mr Robin Riordan (1150020)
Comment ID	PMM2018:26
Response Date	25/01/19 13:07
Consultation Point	Proposed Main Modification 32 (View)
Status	Processed
Submission Type	Letter
Version	0.7
Files	Riordan letter_Redacted.pdf

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

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Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

I fully support Huntingdon District Council's decision to remove the proposed development site MM32 SM5 Land East of Robert Avenue and paragraphs 13.83 to 13.89 from the Huntingdonshire Local Plan to 2036 on the grounds that the landowner does not own access to the site. Further, development of the land East of Robert Avenue would fail to meet several Sustainability Assessment Objectives. It is a Greenfield site currently actively used for agriculture where development would be detrimental due to its proximity to open countryside. Hence the development would fail to meet Objectives 1 and 6. The site is immediately adjacent to a designated Wildlife Site and to Somersham Lake, so it fails to meet Objective 5. There is no direct access onto a suitable access road, which would result in severe transport infrastructure constraints. With only 9.1m between property boundaries, Robert Avenue is a quiet cul-de-sac which is too narrow to provide access for a development of this size because the Huntingdonshire Design Guide specifies a minimum corridor width of 10.3m. Additionally, a development of this size would severely increase traffic levels which would require use of The Trundle, Parkhall Road or Feoffees Road for access through Somersham (B1086). Both of these roads are residential with substantial on street parking and are already severely congested at peak times. Overall, these severe transport infrastructure constraints mean that the site fails to meet Objective 21. In conclusion Somersham Parish Council have re-iterated their opposition to the development of this site and their unwillingness to sell valuable community recreation land for any such purpose. The proposal fails on a number of factors and should not be considered for development again.

Supporting documents

If you would like you can support your representation with supporting documents. Please provide a description for any documents you upload and clearly reference them in your representation.

If you want to refer to a publication that is available elsewhere or that is subject to copyright that you do not control please provide a link to a website where it is available or give a full reference (including author(s), full title and date of publication) in your comment.

By submitting a supporting document you give permission for the council to use it for the purposes of drawing up planning policy for Huntingdonshire and to reproduce the document for such purposes.

Please note: There is no limit to the size of documents that can be uploaded but please only upload relevant documents and consider the use of extracts for long documents.

To upload more than one document first select your first document and upload it, then save your comment using the button at the bottom of the page. You can then select another document to upload.

[Riordan letter_Redacted.pdf](#)

Summary

Support Main modification 32. Retention of the site would fail to meet Sustainability Appraisal Objectives 1, 5, and 21. The field is used for agriculture, it is in open countryside and adjacent to a designated wildlife site. Robert Avenue and connecting roads are too narrow for increased traffic. The Parish Council are unwilling to sell their portion of land.

Mr R D Riordan

Somersham
Cambridgeshire

23rd January 2019

Inspector on the Huntingdon Local Plan Examination
C/o Annette Feeney,
Huntingdonshire Local Plan Programme Officer,
Pathfinder House
St Mary's Street
Huntingdon PE29 3TN

Dear Sir,

Huntingdonshire Local Plan Matter 10 Proposed site allocations Key Service Centres - Somersham

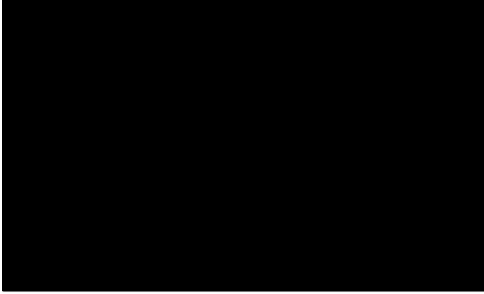
I fully support Huntingdon District Council's decision to remove the proposed development site MM32 SM5 Land East of Robert Avenue and paragraphs 13.83 to 13.89 from the Huntingdonshire Local Plan to 2036 on the grounds that the landowner does not own access to the site.

Further, development of the land East of Robert Avenue would fail to meet several Sustainability Assessment Objectives. It is a Greenfield site currently actively used for agriculture where development would be detrimental due to its proximity to open countryside. Hence the development would fail to meet Objectives 1 and 6. The site is immediately adjacent to a designated Wildlife Site and to Somersham Lake, so it fails to meet Objective 5.

There is no direct access onto a suitable access road, which would result in severe transport infrastructure constraints. With only 9.1m between property boundaries, Robert Avenue is a quiet cul-de-sac which is too narrow to provide access for a development of this size because the Huntingdonshire Design Guide specifies a minimum corridor width of 10.3m. Additionally, a development of this size would severely increase traffic levels which would require use of The Trundle, Parkhall Road or Feoffees Road for access through Somersham (B1086). Both of these roads are residential with substantial on street parking and are already severely congested at peak times. Overall, these severe transport infrastructure constraints mean that the site fails to meet Objective 21.

In conclusion Somersham Parish Council have re-iterated their opposition to the development of this site and their unwillingness to sell valuable community recreation land for any such purpose. The proposal fails on a number of factors and should not be considered for development again.

Yours sincerely,



R D Riordan

Comment

Consultee	Ms Diane Davis (701283)
Email Address	[REDACTED]
Company / Organisation	Sawtry Parish Council
Address	[REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Sawtry Parish Council (Ms Diane Davis - 701283)
Comment ID	PMM2018:81
Response Date	31/01/19 13:04
Consultation Point	Huntingdonshire Local Plan to 2036: Proposed Main Modifications 2018 for Consultation (View)
Status	Processed
Submission Type	Email
Version	0.4

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you **Support**

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

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Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

Late representation: Sawtry Parish Council have asked me to contact you to offer their support for the local plan amendments and that they look forward to a speedy completion of the process. Regards Diane Davis Clerk to Sawtry Parish Council

Comment

Consultee	Mr Peter Scarisbrick (1150466)
Email Address	[REDACTED]
Address	[REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Mr Peter Scarisbrick (1150466)
Comment ID	PMM2018:11
Response Date	21/01/19 19:47
Consultation Point	Proposed Main Modification 32 (View)
Status	Processed
Submission Type	Web
Version	0.4

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

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Please enter your representation here.

I support the removal of SM5 from the Huntingdon Local Plan to 2036. The proposed development would have increased traffic on roads through the village that are already congested at peak times. The loss of habitat next to the local nature reserve would have a negative impact on the wildlife of the reserve.

Summary

Support Main Modification 32. The proposed development would increase traffic on roads through the village that are already congested at peak times. The loss of habitat next to the local nature reserve would have a negative impact on the wildlife of the reserve.

Comment

Consultee	Penny Bryant (34953)
Email Address	[REDACTED]
Company / Organisation	Somersham Parish Council
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Somersham Parish Council (Penny Bryant - 34953)
Comment ID	PMM2018:34
Response Date	28/01/19 15:06
Consultation Point	Proposed Main Modification 32 (View)
Status	Processed
Submission Type	Email
Version	0.3

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

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Do you consider this proposed main modification is not sound because it is not...

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Please enter your representation here.

The Council is supportive of the local residents who have made strong and continuous objections to development on the field identified as SM5. Councillors object to this site as it will impinge on the open countryside, it has poor road access making it unsuitable for additional domestic traffic let alone construction traffic. Therefore, Somersham Parish Council strongly supports the recommendation to REMOVE from the Local Plan to 2036 the land identified as SM5 East of Robert Avenue

Summary

Support Main Modification 32. The allocation would impinge on the open countryside and has poor road access making it unsuitable for additional domestic traffic let alone construction traffic

Family or Company Name: SpittalField Holdings & Bloor Homes
Agent: Bidwells (Rawlings, Stacey)
PMM: MM17

Comment

Agent	Mrs Stacey Rawlings (1118781)
Email Address	[REDACTED]
Company / Organisation	Bidwells
Address	[REDACTED] [REDACTED] [REDACTED]
Consultee	SpittalField Holdings & Bloor Homes (1198465)
Address	C/o Agent - -
Event Name	Proposed Main Modifications 2018
Comment by	SpittalField Holdings & Bloor Homes (1198465)
Comment ID	PMM2018:71
Response Date	29/01/19 16:56
Consultation Point	Proposed Main Modification 17 (View)
Status	Processed
Submission Type	Email
Version	0.6
Files	Rawlings for Bidwells MM17_Redacted.docx

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you **Support**

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Do you consider this proposed main modification is not sound because it is not...

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Please enter your representation here.

Response to Huntingdonshire's Local Plan to 2036: Main Modifications 2018 on behalf of SpittalField Holdings Ltd and Bloor Homes (South Midlands) – ID: 1118804 Main Modification 17: Policy HU1 Ermine Street, Huntingdon, Additional supporting text Comment We note the additional supporting text for Policy HU1 (rather than a change to the Policy itself). This reflects the Inspector's observations regarding the anticipated housing delivery from the allocated sites within the Huntingdon SPA and their ability to all be built out in full during the plan period to 2036. The pace of delivery will be checked through the Council's monitoring process and reported on annually. At the examination hearings all noted that the Outline Planning Application for the southern part of HU1: Ermine Street had been submitted (18/01918/OUT). The application includes a design code for approval to facilitate early submission of Reserved Matters for a first phase of development. It is anticipated that this allocation will commence on site during 2020 with an anticipated 10-year build-out period for the 1,000 unit parcel to the south. We support the proposed modification as explanatory text on the basis that this does not undermine the delivery targets for our clients Site.

Supporting documents

If you would like you can support your representation with supporting documents. Please provide a description for any documents you upload and clearly reference them in your representation.

If you want to refer to a publication that is available elsewhere or that is subject to copyright that you do not control please provide a link to a website where it is available or give a full reference (including author(s), full title and date of publication) in your comment.

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To upload more than one document first select your first document and upload it, then save your comment using the button at the bottom of the page. You can then select another document to upload.

[Rawlings for Bidwells MM17_Redacted.docx](#)

Summary

Support Main Modification 17. This reflects the Inspectors observations regarding anticipated delivery within the Huntingdon SPA. Delivery of the first phase at HU1 is anticipated to commence in 2020. We support the proposed modification as explanatory text on the basis that this does not undermine the delivery targets for our clients site.

We note the additional supporting text for Policy HU1 (rather than a change to the Policy itself). This reflects the Inspector's observations regarding the anticipated housing delivery from the allocated sites within the Huntingdon SPA and their ability to all be built out in full during the plan period to 2036. The pace of delivery will be checked through the Council's monitoring process and reported on annually.

At the examination hearings all noted that the Outline Planning Application for the southern part of HU1: Ermine Street had been submitted . The application includes a design code for approval to facilitate early submission of Reserved Matters for a first phase of development. It is anticipated that this allocation will commence on site during 2020 with an anticipated 10-year build-out period for the 1,000 unit parcel to the south.

We support the proposed modification as explanatory text on the basis that this does not undermine the delivery targets for our clients Site.

Bidwells

[Redacted signature block]

Family or Company Name: St John's College
Agent: Savills (Rowland, Paul)
PMM: MM17

Comment

Agent	Mr Paul Rowland (1198302)
Email Address	[REDACTED]
Company / Organisation	Savills
Address	[REDACTED] [REDACTED] [REDACTED]
Consultee	St John's College, Cambridge (34950)
Address	c/o Agent c/o Agent *
Event Name	Proposed Main Modifications 2018
Comment by	St John's College, Cambridge (34950)
Comment ID	PMM2018:32
Response Date	23/01/19 13:30
Consultation Point	Proposed Main Modification 17 (View)
Status	Processed
Submission Type	Web
Version	0.3

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

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with supporting documents if you wish (see below) but please include clear references and reasoning as to why any attachments support your representation.

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Please enter your representation here.

I am writing on behalf of St. John's College, Cambridge in response to your consultation exercise regarding proposed Main Modifications. On behalf of our clients we have previously made representations to your Local Plan 2036 process under Comment ID HLP2036-PS:263 putting forward the case for annual monitoring of the delivery of houses to be a specific requirement of planning policy. We have noted the Inspector's view that housing delivery from major allocated sites might not all be built out by the end of the plan period. We accept that this will be something the Council monitors and if necessary responds to in the early years of the plan. We note that no specific changes are proposed to the nature and extent or composition of the allocations themselves in light of the proposed modifications sought by the Inspector. We accept that delivery can be affected by market conditions across the period but the Council's key objective remains early delivery of as many of the allocated dwellings as possible. The best and arguably only thing the Council can do to pursue that objective and address the issue positively is to ensure that favourable planning permissions are granted at the earliest opportunity so that our clients are in a position to respond positively to market trends. We therefore SUPPORT the wording of the proposed modification, which highlights the need for the Council to monitor and review the Local Plan, but does so in a way which does not undermine the confidence of landowners and developers to pursue development with certainty where this is in accordance with the Local Plan.

Summary

Supports proposed main modification 17 highlighting the need for the Council to monitor and review the Local Plan.

Family or Company Name: Urban & Civic
Agent: David Lock Associates (Kimber, Tom)
PMM: MM15

Comment

Agent	Tom Kimber (992838)
Email Address	[REDACTED]
Company / Organisation	David Lock Associates
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Consultee	Urban & Civic (992844)
Company / Organisation	Urban&Civic
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Urban&Civic (Urban & Civic - 992844)
Comment ID	PMM2018:66
Response Date	29/01/19 16:40
Consultation Point	Proposed Main Modification 15 (View)
Status	Processed
Submission Type	Email
Version	0.7
Files	Kimber, David Lock for Urban

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Object

Do you consider this proposed main modification to be sound? Not Sound

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

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Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

These representations are submitted on behalf of Urban&Civic by David Lock Associates. Urban&Civic own 100% of Alconbury Weald and are development partners of Wintringham Park, St Neots East as well as being master developer for both sites. Urban&Civic therefore have a long-term interest in the successful delivery of growth within Huntingdonshire. Urban&Civic welcome the opportunity to provide representations on the proposed Main Modifications of the draft Huntingdonshire Local Plan 2018. Urban&Civic have taken an active interest in the evolution of the plan and have commented on previous stages and iterations of the Huntingdonshire Local Plan. This representation relates to Proposed Main Modification 15 and 25 in relation to Strategic Expansion Locations 1.1 and 2. The representation highlights potential soundness and practical difficulties with the imposition of a 'delivery cap' and the proposed modification that not all dwellings will be built by the end of the plan period taking account of the proximity of other nearby allocations. SEL1.1 Former Alconbury Weald Proposed Modification 15 9.8a It is not anticipated that all of the proposed dwellings associated with this allocation will be built by the end of the plan period. When assessed against realistic rates of annual delivery, including taking into account the proximity of other nearby allocations, it is estimated that final completion of the site will be beyond 2036. This will be reviewed through the Council's annual housing trajectory. Whilst adjacent sites to Alconbury Weald are proposed to be allocated in the draft Local Plan neither SEL1.2 (RAF Alconbury) nor the two sites at HU1 (Ermine Street) have yet been granted Outline Planning Permission. As set out in the HDC Annual Monitoring Report 2018, SEL1.2 is currently programmed to start delivering dwellings until 2023/24 and HU1 in 2020/21 at the earliest. As a consequence, it is difficult to assess how these sites have been justified to impact current delivery at Alconbury Weald, given that Alconbury Weald has had Outline Planning Consent since 2014 and has been completing increasing numbers of dwellings year-on-year since 2016. The proposed addition of text to review delivery through the Council's annual housing trajectory is supported. Urban&Civic would like to reiterate the assertion made in the submitted Matter 6 Written Statement that a combination of factors (large site size, early provision of infrastructure, location of Enterprise Zone, potential for multiple delivery fronts) mean that the Alconbury Weald is well established to accelerate delivery and is likely to be relatively unaffected by adjacent allocations that are not yet consented. An average of 250 units per annum over the plan period at Alconbury Weald is not considered to be exceptional given the factors set out above and is a lower average than has been achieved on other comparable sites. There are likely to be additional practical consequences in relation to deliverability if the projected timescale for development is delayed beyond the end of the plan period: • The Alconbury Weald Outline Planning Permission (2014) contains a Condition that stipulates that all reserved matters applications shall be made to HDC within twenty years of Outline Planning Consent. Development must start within two years of the final reserved matters approval. Clearly therefore, any increase in the length of development would impact the ability to meet this Outline Planning Condition. • Furthermore, a slower rate of delivery would impact upon the projected timings and discussions regarding the delivery of those s106 obligations which are due to be discharged prior to a set number of residential occupations.

Summary

Highlights potential soundness and practical difficulties with the imposition of a 'delivery cap' and the proposed modification that not all dwellings will be built by the end of the plan period taking account of the proximity of other nearby allocations. Contends that delivery of an average of 250 dwellings per year at Alconbury Weald alone is not exceptional and is a lower average than has been achieved on

other comparable sites. Any increase in the length of development would impact the ability to meet the Outline Planning Condition.to submit all reserved matters within 20 years of outline consent anddevelopment to commence within 2 years of REM consent.

Mr A Moffat
Planning Services
Huntingdonshire District Council
Pathfinder house
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

29th January 2019

UAC013/TK

Dear Sir/Madam,

RE: Huntingdonshire Local Plan to 2036: Proposed Main Modifications 2018 for Consultation

These representations are submitted on behalf of Urban&Civic by David Lock Associates.

Urban&Civic own 100% of Alconbury Weald and are development partners of Wintringham Park, St Neots East as well as being master developer for both sites. Urban&Civic therefore have a long-term interest in the successful delivery of growth within Huntingdonshire.

Urban&Civic welcome the opportunity to provide representations on the proposed Main Modifications of the draft Huntingdonshire Local Plan 2018. Urban&Civic have taken an active interest in the evolution of the plan and have commented on previous stages and iterations of the Huntingdonshire Local Plan.

This representation relates to Proposed Main Modification 15 and 25 in relation to Strategic Expansion Locations 1.1 and 2. The representation highlights potential soundness and practical difficulties with the imposition of a 'delivery cap' and the proposed modification that not all dwellings will be built by the end of the plan period taking account of *the proximity of other nearby allocations*.

Yours sincerely,



DAVID LOCK ASSOCIATES LIMITED

Tom Kimber
Associate

Email: tkimber@davidlock.com

cc: Tim Leathes, James Scott, Joe Dawson (Urban&Civic)

SEL1.1 Former Alconbury Weald

Proposed Modification 15

9.8a It is not anticipated that all of the proposed dwellings associated with this allocation will be built by the end of the plan period. When assessed against realistic rates of annual delivery, including taking into account the proximity of other nearby allocations, it is estimated that final completion of the site will be beyond 2036. This will be reviewed through the Council's annual housing trajectory.

Whilst adjacent sites to Alconbury Weald are proposed to be allocated in the draft Local Plan neither SEL1.2 (RAF Alconbury) nor the two sites at HU1 (Ermine Street) have yet been granted Outline Planning Permission. As set out in the HDC Annual Monitoring Report 2018, SEL1.2 is currently programmed to start delivering dwellings until 2023/24 and HU1 in 2020/21 at the earliest. As a consequence, it is difficult to assess how these sites have been justified to impact current delivery at Alconbury Weald, given that Alconbury Weald has had Outline Planning Consent since 2014 and has been completing increasing numbers of dwellings year-on-year since 2016. The proposed addition of text to review delivery through the Council's annual housing trajectory is supported.

Urban&Civic would like to reiterate the assertion made in the submitted Matter 6 Written Statement that a combination of factors (large site size, early provision of infrastructure, location of Enterprise Zone, potential for multiple delivery fronts) mean that the Alconbury Weald is well established to accelerate delivery and is likely to be relatively unaffected by adjacent allocations that are not yet consented. An average of 250 units per annum over the plan period at Alconbury Weald is not considered to be exceptional given the factors set out above and is a lower average than has been achieved on other comparable sites.

There are likely to be additional practical consequences in relation to deliverability if the projected timescale for development is delayed beyond the end of the plan period:

- The Alconbury Weald Outline Planning Permission (2014) contains a Condition that stipulates that all reserved matters applications shall be made to HDC within twenty years of Outline Planning Consent. Development must start within two years of the final reserved matters approval. Clearly therefore, any increase in the length of development would impact the ability to meet this Outline Planning Condition.
- Furthermore, a slower rate of delivery would impact upon the projected timings and discussions regarding the delivery of those s106 obligations which are due to be discharged prior to a set number of residential occupations.

SEL2 St Neots East

Proposed modification 22:

10.4a It is not anticipated that all of the proposed dwellings associated with this allocation will be built by the end of the plan period. When assessed against realistic rates of annual delivery, including taking into account the proximity of other nearby allocations, it is estimated that final completion of the site will be beyond 2036. This will be reviewed through the Council's annual housing trajectory.

Given that the Strategic Expansion Location at St Neots East (SEL 2) consists of two sites (Wintringham Park and Land East of Loves Farm) it is unclear which other nearby allocations have been justified to have an impact upon delivery at St Neots East. As proposed by the Main Modifications, the other nearby allocations within the St Neots East Spatial Planning Area consist of the following:

- SN1 St Mary's Urban Village, St Neots: approximately 45 homes
- SN2 Loves Farm Reserved Site, St Neots: approximately 40 dwellings
- SN3: Cromwell Road North, St Neots: approx. 80 dwellings
- SN4: Cromwell Road Car Park, St Neots: approx. 20 dwellings
- ~~SN5: Former Youth Centre, Priory Road, St Neots approx. 14 dwellings - allocation to be deleted~~
- SN6: North of St James Road, Little Paxton: approx. 35 homes

These relatively small-scale sites are not considered to materially impact upon delivery rates at SEL2.

Furthermore, the current trajectories for the sites at both Wintringham Park and Land East of Loves Farm have anticipated completion dates in advance of the end of the plan period in 2035/36 (currently 2033/34 for Wintringham Park and 2027/28 for Loves Farm East). If it is accepted that delivery rates at these two sites will be slower than anticipated - as proposed by the modifications - there is still potential for these sites to be completed within the plan period. The proposed addition of text to review delivery through the Council's annual housing trajectory is supported.

Similar to comments made above in relation to Alconbury Weald, there are likely to be practical consequences - which go to the heart of the effective deliverability of the site allocation - if the projected timescale is delayed in terms of meeting the Outline Planning Permission Condition (all reserved matters to be made within eighteen years at Wintringham Park) and potential for delayed projected timings for delivery of s106 obligations.

Comment

Agent Tom Kimber (992838)
Email Address [REDACTED]
Company / Organisation David Lock Associates
Address [REDACTED]
Consultee Urban & Civic (992844)
Company / Organisation Urban&Civic
Address [REDACTED]
Event Name Proposed Main Modifications 2018
Comment by Urban&Civic (Urban & Civic - 992844)
Comment ID PMM2018:67
Response Date 29/01/19 16:22
Consultation Point Proposed Main Modification 22 ([View](#))
Status Processed
Submission Type Email
Version 0.6
Files [Kimber, David Lock for Urban](#)

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Object

Do you consider this proposed main modification to be sound? Not Sound

It is important to understand how you think this proposed main modification is not sound. Please refer to the 'Proposed Submission Representations Advice Note' for more information about the options here. Please tick all that apply.

Do you consider this proposed main modification is not sound because it is not...

Please enter your representation here. You should say why you either support this proposed main modification or why you think it is not sound and/ or not legally compliant.

Please note: There are no limits on the length of representations but please be as concise as possible, including only that which is necessary to explain your representation. You can support your representation with supporting documents if you wish (see below) but please include clear references and reasoning as to why any attachments support your representation.

Note: Any representations that rely entirely on supporting documents and state 'See attached report' or similar for this question will not be accepted.

Please enter your representation here.

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Summary

Object to Main Modification 22. The representation highlights potential soundness and practical difficulties with the imposition of a 'delivery cap' and the proposed modification that not all dwellings will be built by the end of the plan period taking account of the proximity of other nearby allocations. It is unclear which other nearby allocations have been justified to have an impact upon delivery at St Neots East. Relatively small-scale sites are not considered to materially impact upon delivery rates at

SEL2. The proposed addition of text to review delivery through the Council's annual housing trajectory is supported.

Comment

Consultee	Mrs Michelle Wormald (1196875)
Email Address	[REDACTED]
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
Comment by	Mrs Michelle Wormald (1196875)
Comment ID	PMM2018:9
Response Date	21/01/19 14:04
Consultation Point	Proposed Main Modification 32 (View)
Status	Processed
Submission Type	Web
Version	0.4
Files	Robert Ave flood risk 1.PNG

Please tell us whether you support or object to this proposed main modification. Please note: **Support:** if you select support you will be stating that you think this proposed main modification is both **sound** and **legally compliant** . **Object:** if you select object you will be stating that you think this proposed main modification is either **unsound** and/ or is **not legally compliant** .

Do you Support

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Please enter your representation here.

I note that the development proposal for East for Robert Avenue was removed from the Local Plan 2026 in 2018, we I support. However recently the Parish and community have been informed that the landowner is pushing for its inclusion back into the plan. As a resident and parent I am concerned and this move by the landowner, considering the reasons for the removal in the first instance. Note that Somersham primary school is at significant risk due to continued under performance and it being at capacity. There are no school places for the children of the proposed houses. This data can be sourced directly from the school. The congestion and number of vehicles parked across the village has increased significantly over the last 7 years. It is nearly impossible to move in or out of the village in the morning and afternoons. The school buses and dust carts cannot get through the volume of traffic and parked vehicles. More importantly Robert Avenue is a cul-de-sac not a thorough fair. The Avenue would become noisy and un safe with an additional 50 cars (assumed a minimum of 2 cars per household) moving through it everyday. The increased dust and noise will adversely affect the residents on the Avenue. The Nature Reserve is a quite area for wildlife, habitats and recreation. The proposal would remove trees and undergrowth, damage species pathways and increase noise and pollution in the area. This is not in keeping with Chapter 8 of the Plan Conserving and Enhancing the Environment. Damage to the Nature reserve and its species will have a negative effect on the species diversity levels of the Nature Reserve and to the well being of the residents of Somersham. The PDF map attached from the Government site Magic confirms the proposed site to be part of the Woodland Priority Habitat network and other habitats. It is established that there is a risk of surface water flooding in the Avenue and this will extend into the proposed development site. Evidence previously submitted shows this flood risk (Environment Agency files) and forms part of these objections to including the site in the Plan again. Increasing the hard surfaces in this area will increase rain water and potable water run off, this increasing the pressure on the struggling capacity of the surface water system and brook in this area.

Supporting documents

If you would like you can support your representation with supporting documents. Please provide a description for any documents you upload and clearly reference them in your representation.

If you want to refer to a publication that is available elsewhere or that is subject to copyright that you do not control please provide a link to a website where it is available or give a full reference (including author(s), full title and date of publication) in your comment.

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To upload more than one document first select your first document and upload it, then save your comment using the button at the bottom of the page. You can then select another document to upload.

[Robert Ave flood risk 1.PNG](#)

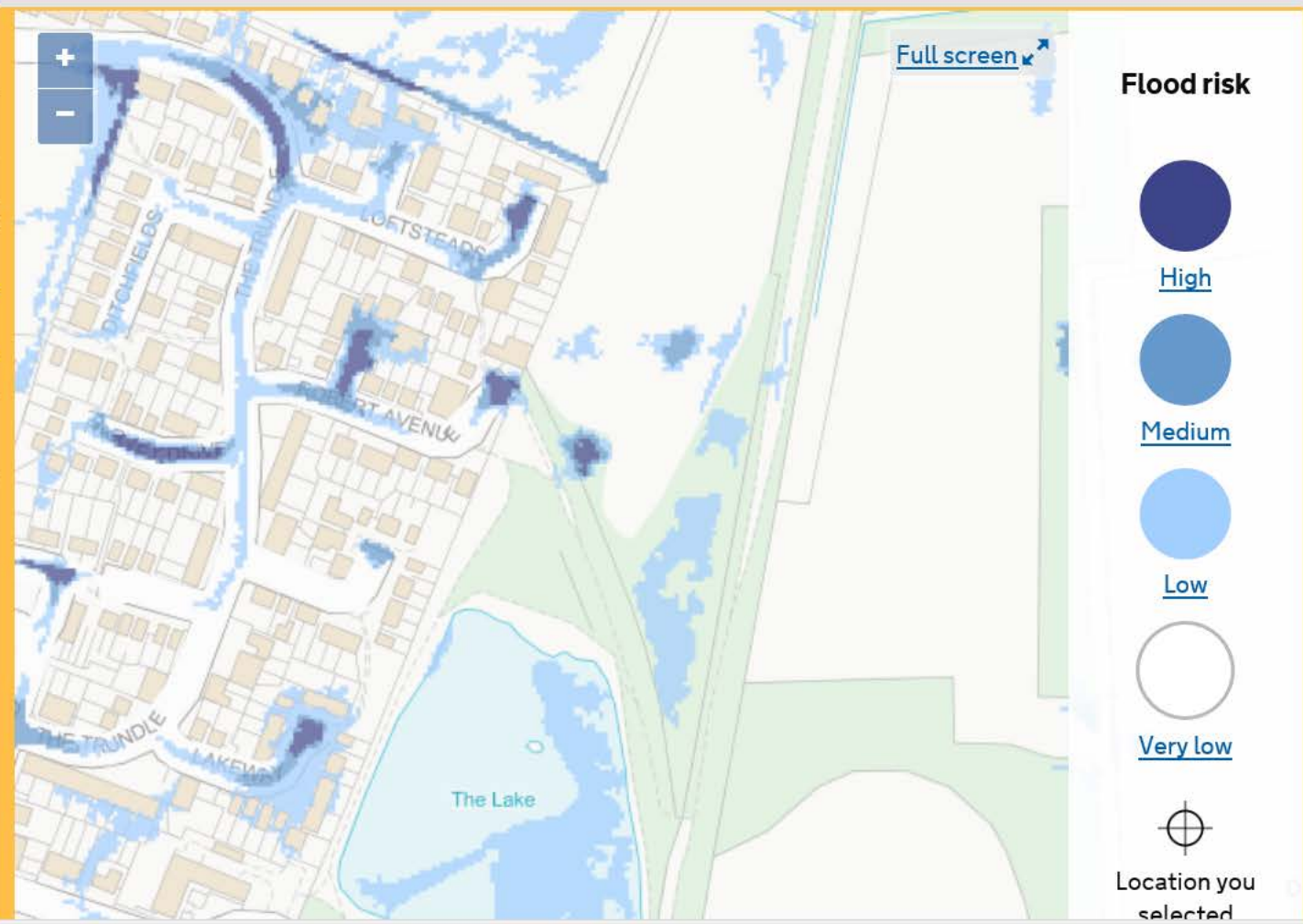
Summary

Support Main Modification 32. The proposed development would increase traffic on roads through the village that are already congested at peak times. Robert Avenue would become noisy and un safe with an additional 50 cars moving through it everyday. The loss of habitat next to the local nature reserve would have a negative impact on the wildlife of the reserve and recreational value of the site. This is not in keeping with the objectives of Chapter 8 of the Plan. The school is at capacity there are no school places for the children of the proposed houses. There is a risk of surface water flooding. Environment Agency map attached to support this.

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

Comment

Consultee	Mrs Michelle Wormald (1196875)
Email Address	[REDACTED]
Address	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Event Name	Proposed Main Modifications 2018
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Comment ID	PMM2018:10
Response Date	21/01/19 14:05
Consultation Point	Proposed Main Modification 32 (View)
Status	Processed
Submission Type	Web
Version	0.4
Files	Robert Avenue - habitats.pdf

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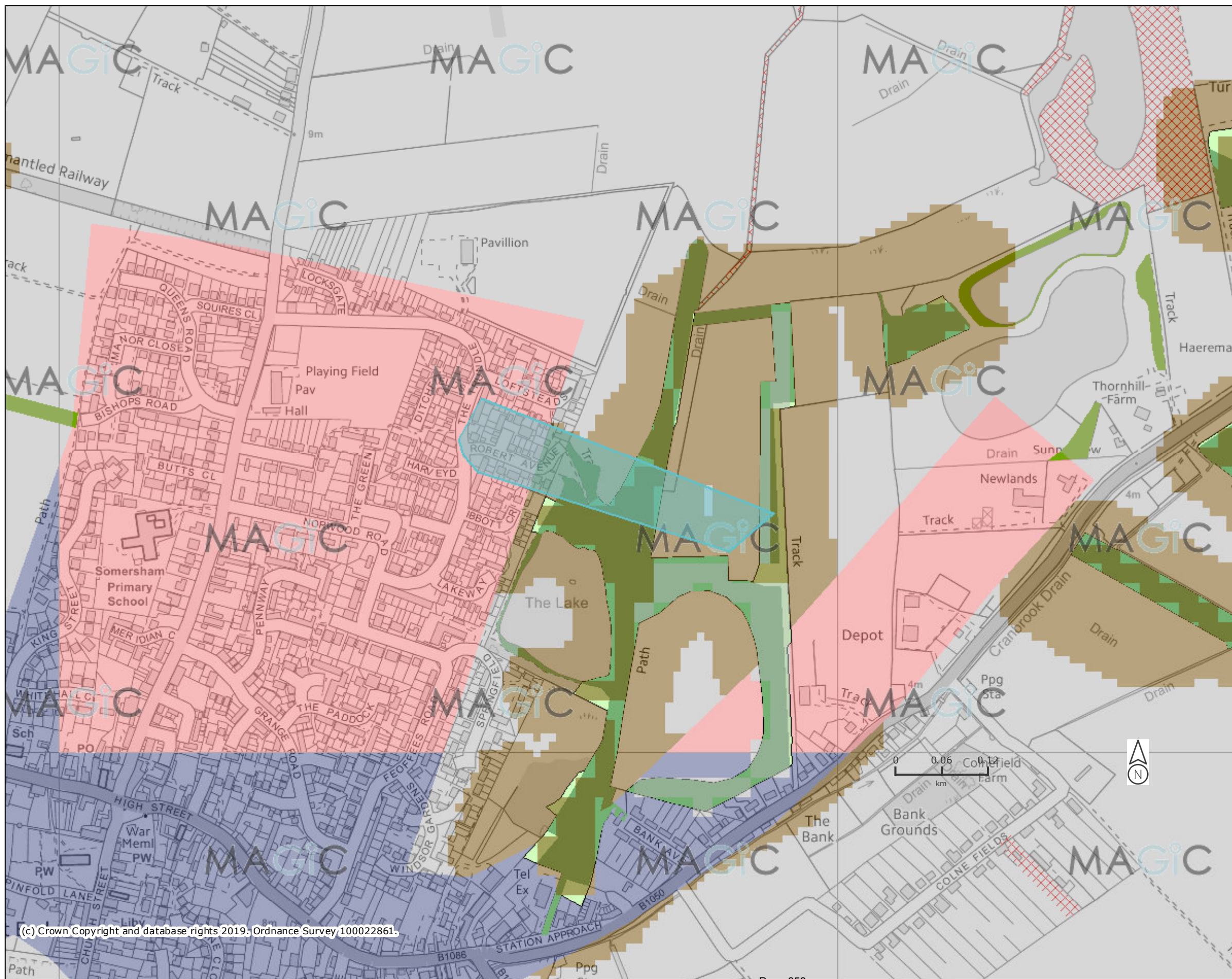
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To upload more than one document first select your first document and upload it, then save your comment using the button at the bottom of the page. You can then select another document to upload.

[Robert Avenue - habitats.pdf](#)

Summary

Support Main Modification 32. The loss of habitat next to the local nature reserve would have a negative impact on the wildlife of the reserve and recreational value of the site. This is not in keeping with the objectives of Chapter 8 of the Plan. The PDF map attached confirms the proposed site to be part of the Woodland Priority Habitat network and other habitats.



Legend

- Ramsar Sites (England)
- Sites of Special Scientific Interest (England)
- Special Areas of Conservation (England)
- Special Protection Areas (England)

Woodland Priority Habitat Network (England)

- High Spatial Priority
- Lower Spatial Priority

Woodland Improvement (England)

- High Spatial Priority
- Lower Spatial Priority
- Priority Habitat Inventory - Coastal Saltmarsh (England)
- Priority Habitat Inventory - Coastal Sand Dunes (England)
- Priority Habitat Inventory - Coastal Vegetated Shingle (England)
- Priority Habitat Inventory - Maritime Cliffs and Slopes (England)
- Priority Habitat Inventory - Mudflats (England)
- Priority Habitat Inventory - Saline Lagoons (England)
- Priority Habitat Inventory - Calaminarian Grassland (England)
- Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)
- Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)
- Priority Habitat Inventory - Lowland Calcareous Grassland (England)
- Priority Habitat Inventory - Lowland Dry Acid Grassland (England)
- Priority Habitat Inventory - Lowland Meadows (England)
- Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)
- Priority Habitat Inventory - Upland Calcareous Grassland (England)
- Priority Habitat Inventory - Upland Hay Meadows (England)
- Refined Coastal and Floodplain Grazing Marsh (England)

Projection = OSGB36
 xmin = 535900
 ymin = 278000
 xmax = 537600
 ymax = 278700

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