

Prepared on behalf of

Farnley Estates Ltd

FLOOD RISK ASSESSMENT

**Proposed Development
Farnley Tyas, Huddersfield
Allocation 03**

Flood Risk Overview

Acknowledgements:

Environment Agency

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

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Report Ref:	9069/DH/002/01	January 2016	
Author:	Darren Hawkyard		
Checked & Approved:	Thomas Walker	Date:	19 January 2016

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Flood Extent Plan: 9069/201

Appendix B - Consultations

Environment Agency

APPENDIX C – Calculations

Existing Greenfield Run Off Estimate

1 Introduction

- 1.1 Sanderson Associates (Consulting Engineers) Ltd have been appointed to undertake a Flood Risk Overview for possible development sites Farnley Tyas, Huddersfield. The aim of this assessment is to discuss the present and future flood risk to the site and to assess possible uses and mitigation measures required. The location of the site is shown on drawing 9069/001 contained in Appendix A.
- 1.2 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF) March 2012 and the associated Planning Practice Guidance, 2014.
- 1.3 Consultation with Environment Agency (EA) has taken place. The consultation response is discussed in Section 3 and contained within Appendix B.
- 1.4 Each site allocation will be separated into individual reports and assessed on their own merits. A site Location plan showing each of the site allocations is located in Appendix A.

2 Existing Situation

2.1 Existing Site Description

2.1.1 The site is currently open fields and located to the east of Penistone Road, Huddersfield. Drawing 9069/001 included in Appendix A shows the site limits and location.

2.1.2 Access is currently gained to the site from Rowley Lane via an unformal access.

2.1.3 The site is bound by Rowley Lane to the north and private developments to the east and south. Penistone Road bounds the site to the west.

2.1.4 The closest main river is the Fenay Beck which is located 180m to the west of the site at its nearest point. The Fenay Beck generally flows from south to north.

2.2 Existing Site Analysis

2.2.1 The site area is 32,678m² (3.3Ha) taken from information provided by the client is considered to be permeable (not positively drained). Therefore the site is considered to be 0% impermeable and 100% permeable.

2.2.2 The estimated Greenfield runoff rate from the site has been assessed using WinDES Source Control software. The run off rate has been calculated at 7.00l/s or 2.19l/s/Ha for a 1 in 1 year return period (IH124 Method requires calculations based on 50Ha reduced to the site area). The WinDES output files are contained within Appendix C.

2.2.3 The topography of the site generally grades from south to north. Levels range from approximately 99.0m AOD at the south eastern corner of the site to 85.00m AOD upon the north western corner of the site.

3 Consultations

- 3.1 As part of this assessment, the Environment Agency (EA) information has been reviewed in relation to flood zones and groundwater. All responses are contained in Appendix B.
- 3.2 The response from the Environment Agency confirms that the site falls within Flood Zone 1 and assessed as having a less than 1 in 1,000 annual probability of river flooding.
- 3.3 The Environment Agency have provided historic flooding maps and shows that the site has not been affected by historic flooding events.
- 3.4 The Environment Agency website show that the site is not within a Groundwater Source Protection Zone.

4 Flood Risk

- 4.1 The main risk of flooding to the site comes from the Fenay Beck which is located upon 180m to the west of the site. No flood defences are located within close proximity to the site.
- 4.2 The Environment Agency confirms that the site falls within Flood Zone 1 and assessed as having a less than 1 in 1,000 annual probability of river flooding.
- 4.3 Drawing 9069-201 contained within Appendix A shows the flood extents and area of developable land. As this site is located wholly within Flood Zone 1 there are no restrictions on development types or location.
- 4.4 The Environment Agency online surface water mapping shows areas of modelled surface water flooding within the boundary of the site, the probability of this occurring is less than 1 in 1000 (0.1%) annual probability of occurring in any given year and is deemed to have a low risk of occurring.
- 4.5 Yorkshire Water could have sewers running through the site which may restrict development. Yorkshire Water should be consulted at the time of a full flood risk assessment being written to determine the exact location of any existing sewers.
- 4.6 Mitigation measures can be implemented within the Full Flood Risk Assessment to ensure surface water localised to, and conveyed within the sites road network would not affect any of the proposed development.

5 Drainage Constraints

5.1 The current building regulations, Part H3, detail the favoured hierarchy of surface water disposal being in order of preference, to ground by infiltration, to watercourse and then to sewer.

1. Infiltration

2. Watercourse

3. Sewer

1. Infiltration Drainage

5.2 Infiltration methods of drainage such as soakaways and filter drains percolate surface water runoff allowing it to permeate into the subsoil at its natural rate mimicking the natural process of drainage and as such are subject to the local ground conditions.

5.3 The Local Authority will request that a site investigation is carried out to deem whether infiltration methods are viable within the site.

2. Discharge to Watercourse

5.4 If the above is not deemed viable the Local Authority will accept discharge to watercourse. The closest main watercourse to the site is the Fenay Beck which is located 180m to the west of the site.

5.5 As the site does not have direct access to the watercourse it is deemed unviable to make discharge of surface water to the Fenay Beck.

3. Discharge to Sewer

- 5.6 If neither infiltration methods are deemed unviable at the site, Yorkshire Water should be consulted in order to agree possible surface water outfall. In addition Yorkshire Water will have to be consulted to agree a point of foul connection.

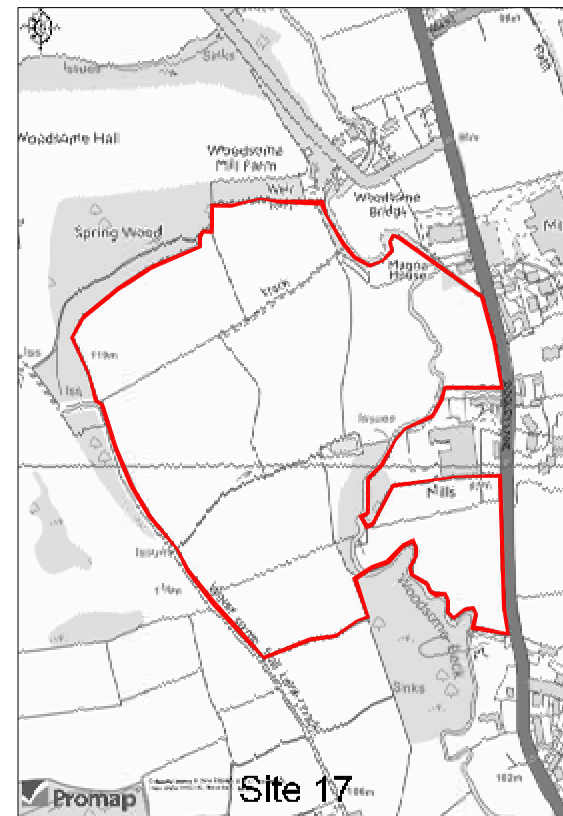
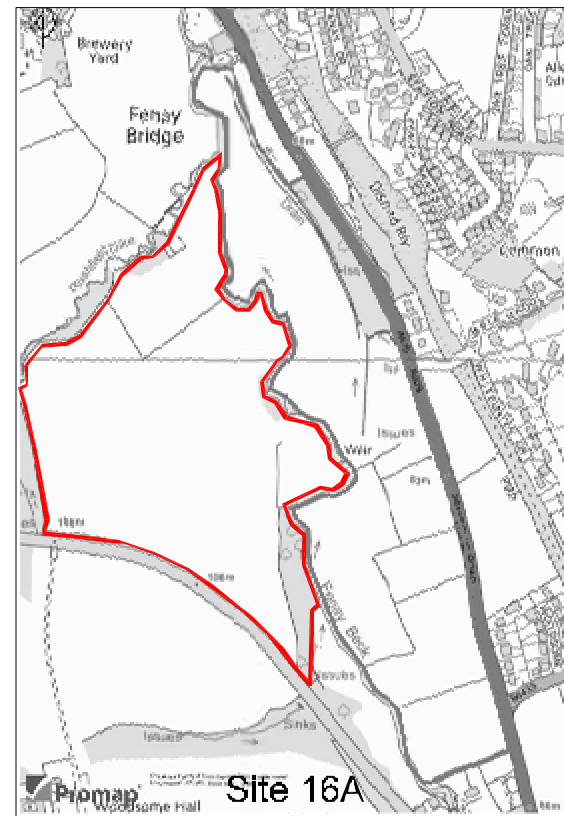
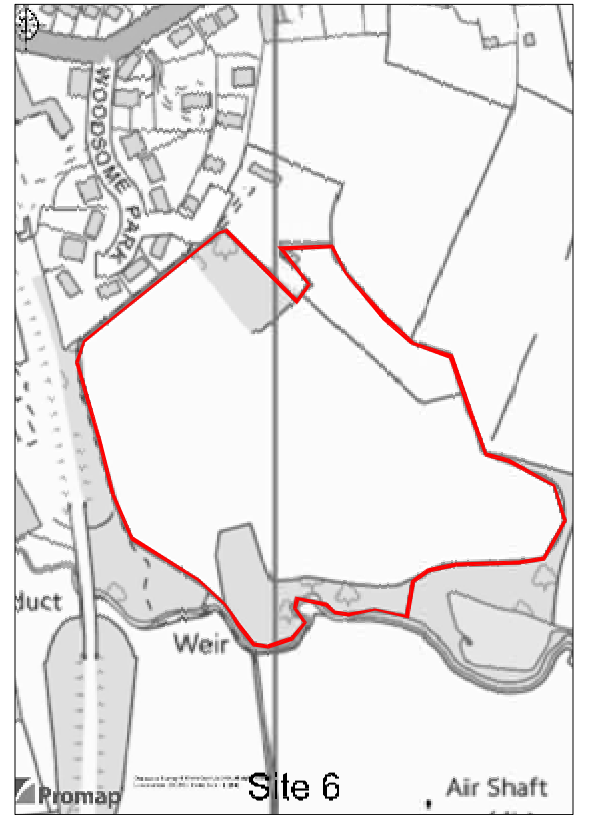
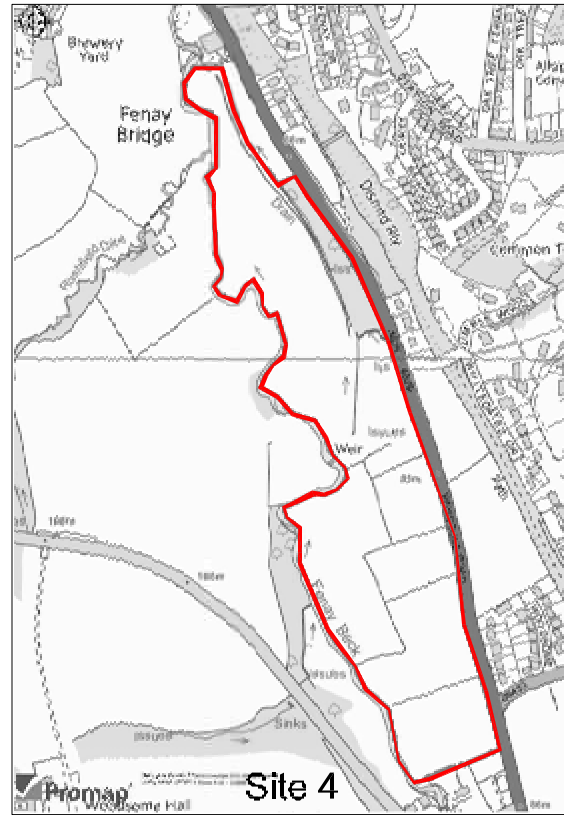
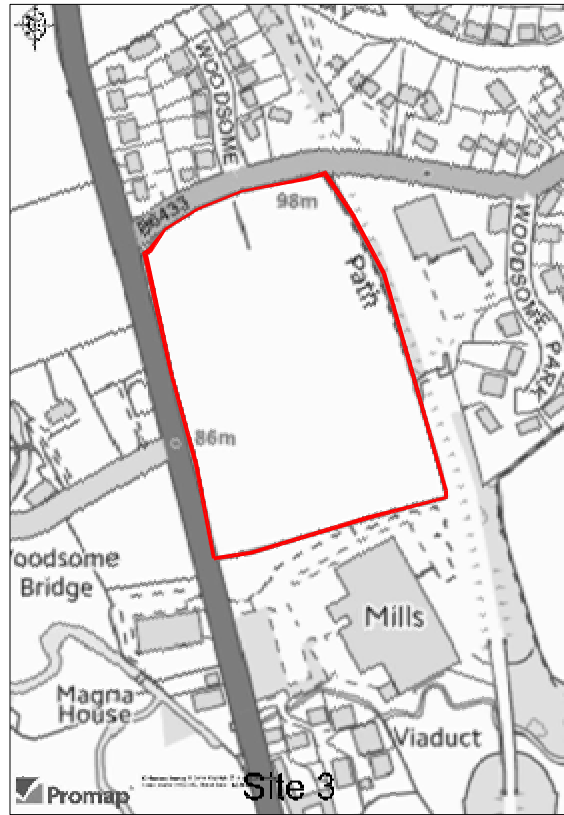
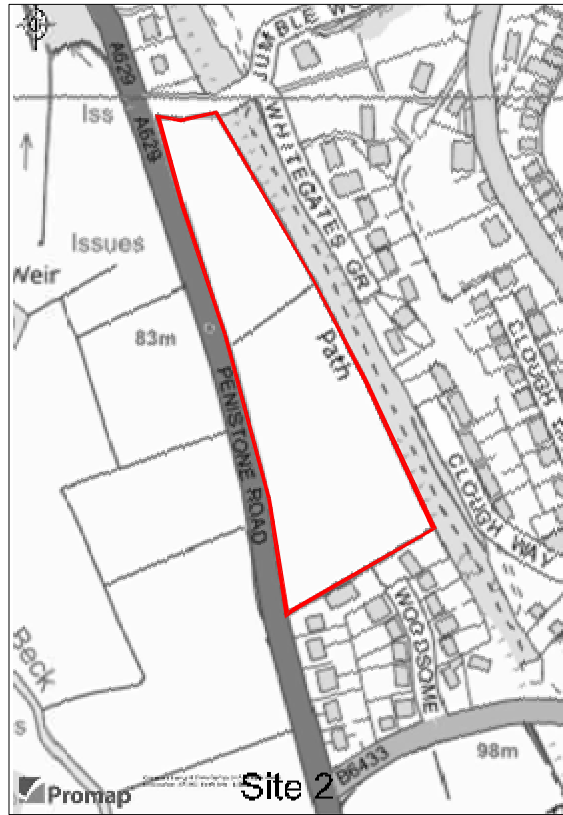
6 Conclusion

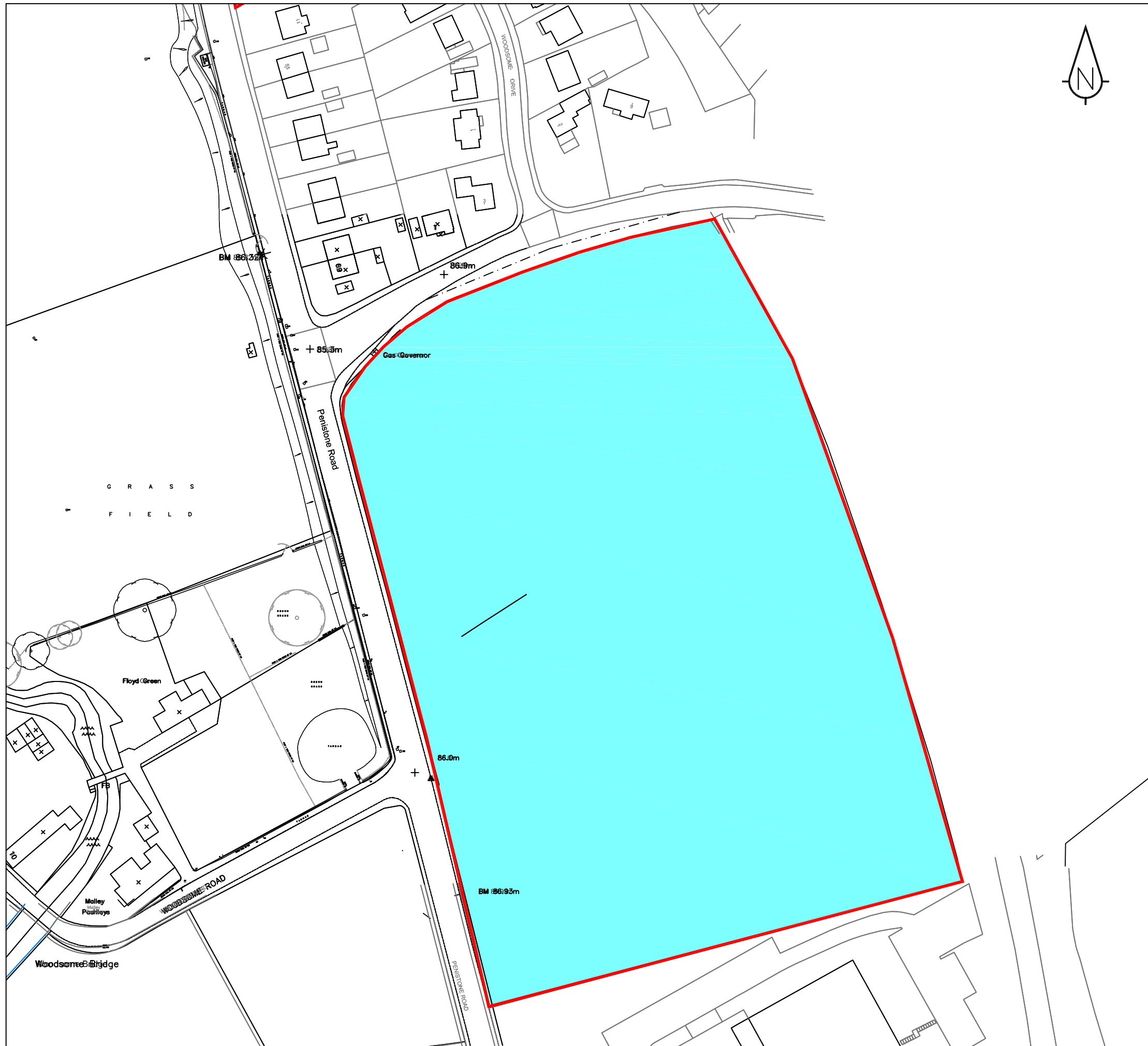
- 6.1 This flood risk overview serves to review and assess the sources of potential flooding to the site.
- 6.2 As concluded in section 3 the site is considered to lie within Flood Zone 1 and assessed as having a less than 1 in 1,000 annual probability of river flooding.
- 6.3 As this site is located wholly within Flood Zone 1 there are no restrictions on development types or location. Yorkshire Water should be consulted at the time of a full flood risk assessment being written to determine the exact location of any existing sewers that will require diverting or accommodating.
- 6.4 A full flood risk assessment and surface water management strategy would have to be written and submitted to the Local Authority in order to gain planning permission. This document serves as an overview to inform the client of possible risk and constraints that could arise at the site.

Appendix A - Drawings

Site Location: 9069/001

Flood Extent Plan: 9069/201





 - Flood Zone 1 (Developable Land)

Rev	Amendment	Drawn	Date	Checked




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Allocation 02**

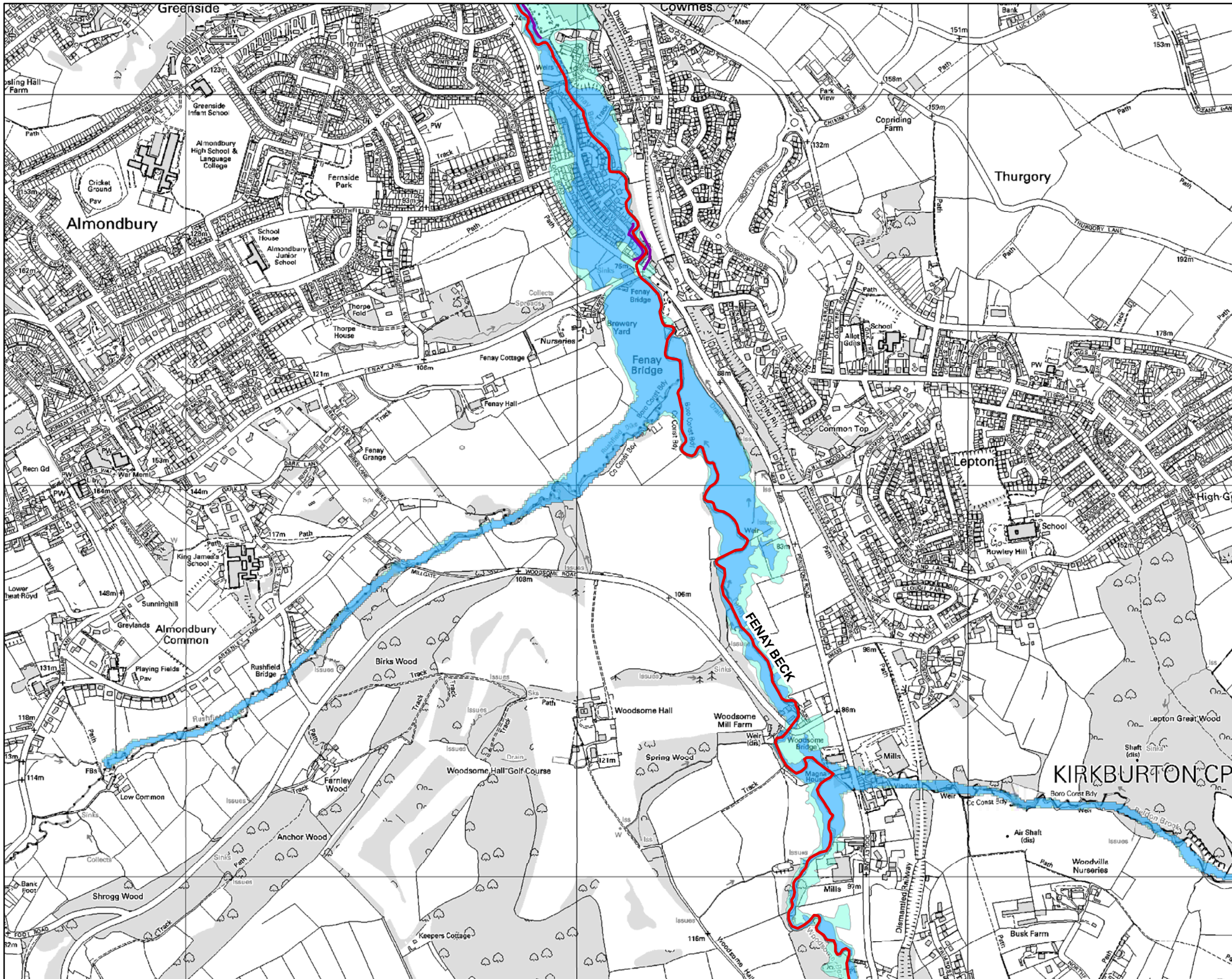
Drawing Title
Flood Extent Plan

Scale 1:1250	Drawn By DH
Drawing Size A3	Checked By IE
Date Jan 16	Approved By IE

	Drawing Number	Rev
	9069-201	

Appendix B - Consultations
Environment Agency

Flood Map Woodsome Road/ Penistone Road, Kirklees - Date Created: 21/06/2013 Ref: 26205



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Scale: 1:10,000

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LEGEND

- Main River
- Flood Map Flood Defences
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

APPENDIX C – Calculations
Existing Greenfield Run Off Estimate

Sanderson House
Jubilee Way
Huddersfield, WF4 4TD



Date 12/01/2016 10:09
File

Designed by darren.hawkyard
Checked by

Micro Drainage Source Control 2015.1

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (ha)	50.000	Urban	0.000
SAAR (mm)	931	Region Number	Region 3

Results l/s

QBAR Rural 127.2
QBAR Urban 127.2

Q1 year 109.4

Q1 year 109.4
Q2 years 120.0
Q5 years 159.0
Q10 years 184.5
Q20 years 208.9
Q25 years 217.0
Q30 years 223.6
Q50 years 240.9
Q100 years 264.6
Q200 years 300.2
Q250 years 311.7
Q1000 years 386.7

109.4 / 50ha = 2.19l/s
2.19 x 3.3ha = 7.0l/s
7.0l/s

Prepared on behalf of

Farnley Estates Ltd

FLOOD RISK ASSESSMENT

**Proposed Development
Farnley Tyas, Huddersfield
Allocation 06**

Flood Risk Overview

Acknowledgements:

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Appendices

Appendix A - Drawings

Site Location: 9069/001

Flood Extent Plan: 9069/501

Appendix B - Consultations

Environment Agency

APPENDIX C – Calculations

Existing Greenfield Run Off Estimate

1 Introduction

- 1.1 Sanderson Associates (Consulting Engineers) Ltd have been appointed to undertake a Flood Risk Overview for possible development sites Farnley Tyas, Huddersfield. The aim of this assessment is to discuss the present and future flood risk to the site and to assess possible uses and mitigation measures required. The location of the site is shown on drawing 9069/001 contained in Appendix A.
- 1.2 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF) March 2012 and the associated Planning Practice Guidance, 2014.
- 1.3 Consultation with Environment Agency (EA) has taken place. The consultation response is discussed in Section 3 and contained within Appendix B.
- 1.4 Each site allocation will be separated into individual reports and assessed on their own merits. A site Location plan showing each of the site allocations is located in Appendix A.

2 Existing Situation

2.1 *Existing Site Description*

- 2.1.1 The site is currently open fields and located to the south of Beldon Brook Green, Huddersfield. Drawing 9069/001 included in Appendix A shows the site limits and location.
- 2.1.2 Access is currently gained from Beldon Brook Green via a wooden gated field access.
- 2.1.3 The site is bound by Beldon Brook Green to the north with an adjoining field bounding the site to the east. A private development bounds the site to the west with Beldon Brook to the south.
- 2.1.4 The closest main river is the Beldon Brook which is located upon the southern boundary of the site.

2.2 *Existing Site Analysis*

- 2.2.1 The site area is 50,679m² (5.06Ha) taken from information provided by the client is considered to be permeable (not positively drained). Therefore the site is considered to be 0% impermeable and 100% permeable.
- 2.2.2 The estimated Greenfield surface water runoff rate from the site has been assessed using WinDES Source Control software. The run off rate has been calculated at 11.10l/s or 2.19l/s/Ha for a 1 in 1 year return period (IH124 Method requires calculations based on 50Ha reduced to the site area). The WinDES output files are contained within Appendix C.
- 2.2.3 The topography of the site generally grades from south to north. Levels range from approximately 106.0m AOD at the north eastern corner of the site to 91.00m AOD upon the southern boundary of the site.

3 Consultations

- 3.1 As part of this assessment, the Environment Agency (EA) information has been reviewed in relation to flood zones and groundwater. All responses are contained in Appendix B.
- 3.2 The response from the Environment Agency confirms that the site falls within Flood Zones 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).
- 3.3 The Environment Agency provided modelled flood levels for the Fenay Beck in the vicinity of the site. These include levels for the 1 in 100 + climate change and 1 in 1000 year events. There are no flood defences in close proximity to the site.
- 3.4 The Environment Agency have provided historic flooding maps and shows that the site was not subject to historic flooding.
- 3.5 The Environment Agency website show that the site is not within a Groundwater Source Protection Zone.

4 Flood Risk

- 4.1 The main risk of flooding to the site comes from the Beldon Brook which is located upon the southern boundary of the site. No flood defences are located within close proximity to the site.
- 4.2 The Environment Agency confirms that the site falls within Flood Zone 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).
- 4.3 Drawing 9069-501 contained within Appendix A shows the flood extents of a 1 in 100 year + climate change and 1 in 1000 year flood event. A small area of the site is located within Flood Zone 3 upon the southern boundary of the site and is deemed as undevelopable land. The drawing highlights areas of the site where building structures can be built.
- 4.4 There are no constraints to the type of proposal on this allocation assuming that building structures are located wholly within Flood Zone 1.
- 4.5 The Environment Agency online surface water mapping shows areas of modelled surface water flooding within the boundary of the site, the probability of this occurring is given at between a 1 in 100 and 1 in 1000 annual probability of occurring in any given year and is deemed to have a low risk of occurring. It is assumed that this is a low point within the site.
- 4.6 Mitigation measures can be implemented within the Full Flood Risk Assessment to ensure surface water localised to, and conveyed within the sites road network would not affect any of the proposed development.

5 Drainage Constraints

5.1 The current building regulations, Part H3, detail the favoured hierarchy of surface water disposal being in order of preference, to ground by infiltration, to watercourse and then to sewer.

1. Infiltration

2. Watercourse

3. Sewer

1. Infiltration Drainage

5.2 Infiltration methods of drainage such as soakaways and filter drains percolate surface water runoff allowing it to permeate into the subsoil at its natural rate mimicking the natural process of drainage and as such are subject to the local ground conditions.

5.3 The Local Authority will request that a site investigation is carried out to deem whether infiltration methods are viable within the site.

2. Discharge to Watercourse

5.4 If the above is not deemed viable the Local Authority will accept discharge to watercourse. The closest main watercourse to the site is the Beldon Brook which is located on the southern boundary of the site.

5.5 The Environment Agency and internal drainage board would have to be consulted in regards to agreeing an acceptable discharge rate into the Beldon Brook. A rate no greater than 1.4l/s/ha for discharge into local watercourse is normally requested.

3. Discharge to Sewer

- 5.6 If neither of the above are deemed viable Yorkshire Water should be consulted in order to agree possible surface water outfall. In addition Yorkshire Water will have to be consulted to agree a point of foul connection.

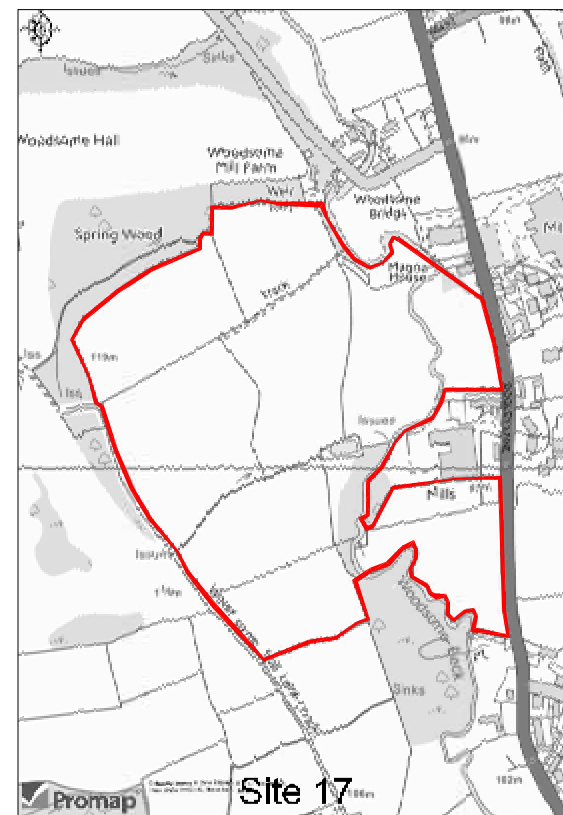
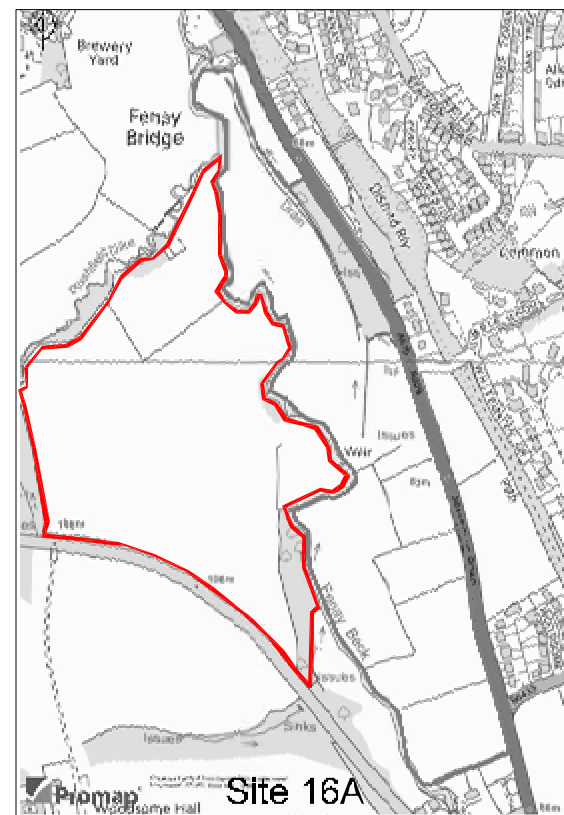
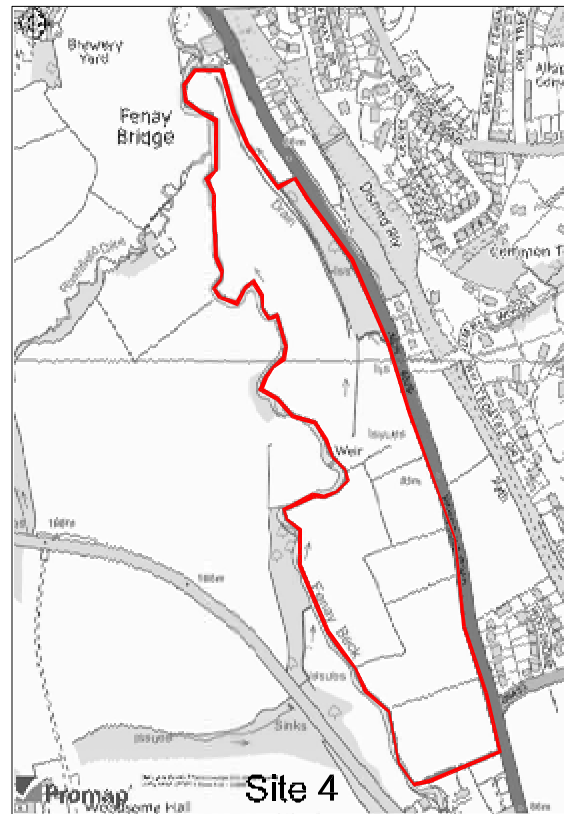
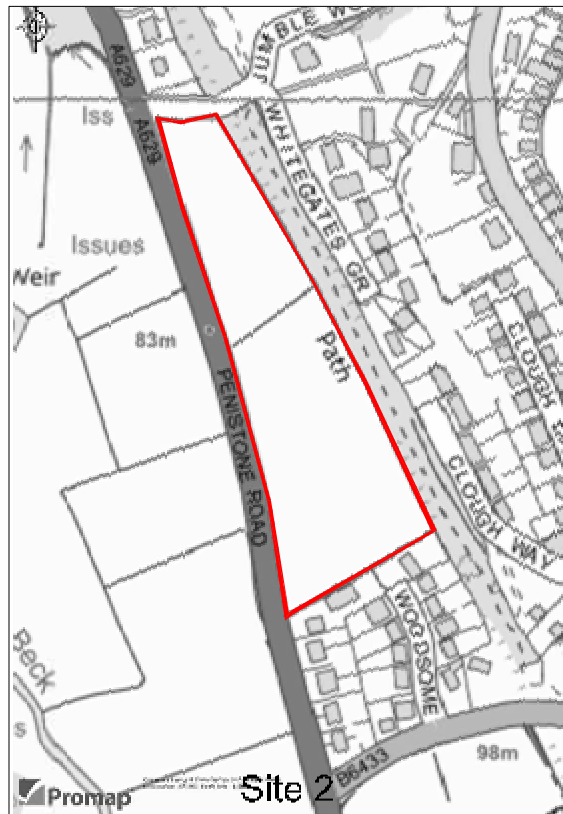
6 Conclusion

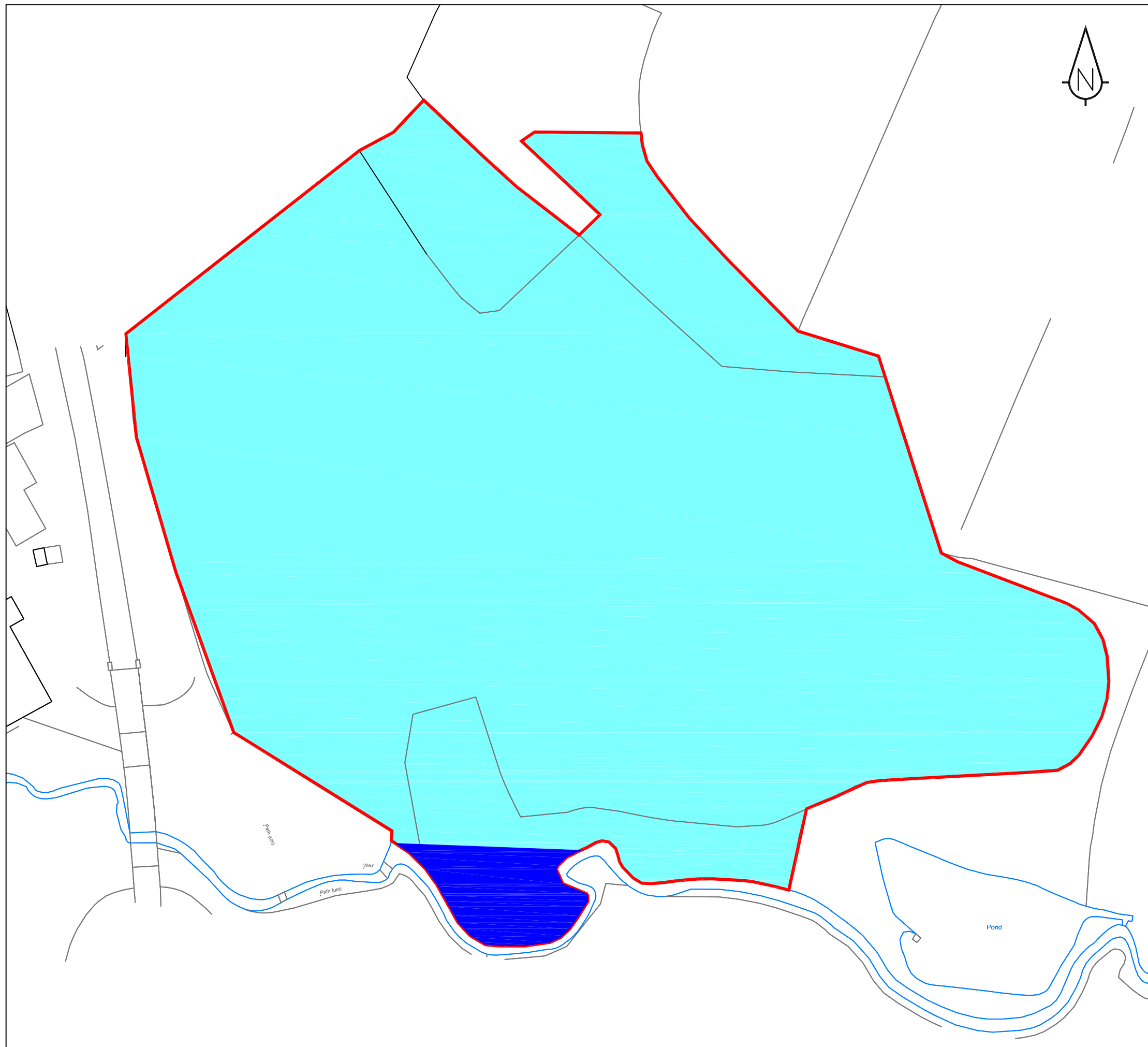
- 6.1 This flood risk overview serves to review and assess the sources of potential flooding to the site
- 6.2 As concluded in section 3 the site is considered to lie within Flood Zone 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).
- 6.3 All buildings should be located wholly within Flood Zone 1.
- 6.4 A full flood risk assessment and surface water management strategy would have to be written and submitted to the Local Authority in order to gain planning permission. This document serves as an overview to inform the client of possible risk and constraints that could arise at the site.

Appendix A - Drawings

Site Location: 9069/001

Flood Extent Plan: 9069/501





- Flood Zone 3
- Flood Zone 1 (Developable Land)

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Rev	Amendment	Drawn	Date	Checked
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Project Name
**Proposed Development
 Farnley Tyas, Huddersfield
 Allocation 06**

Drawing Title
Flood Extent Plan

Scale 1:1250	Drawn By DH
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Drawing Size A3	Checked By IE
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Date Jan 16	Approved By IE
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	Drawing Number 9069-501	Rev
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Appendix B - Consultations
Environment Agency

Flood Map Woodsome Road/ Penistone Road, Kirklees - Date Created: 21/06/2013 Ref: 26205



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Scale: 1:10,000

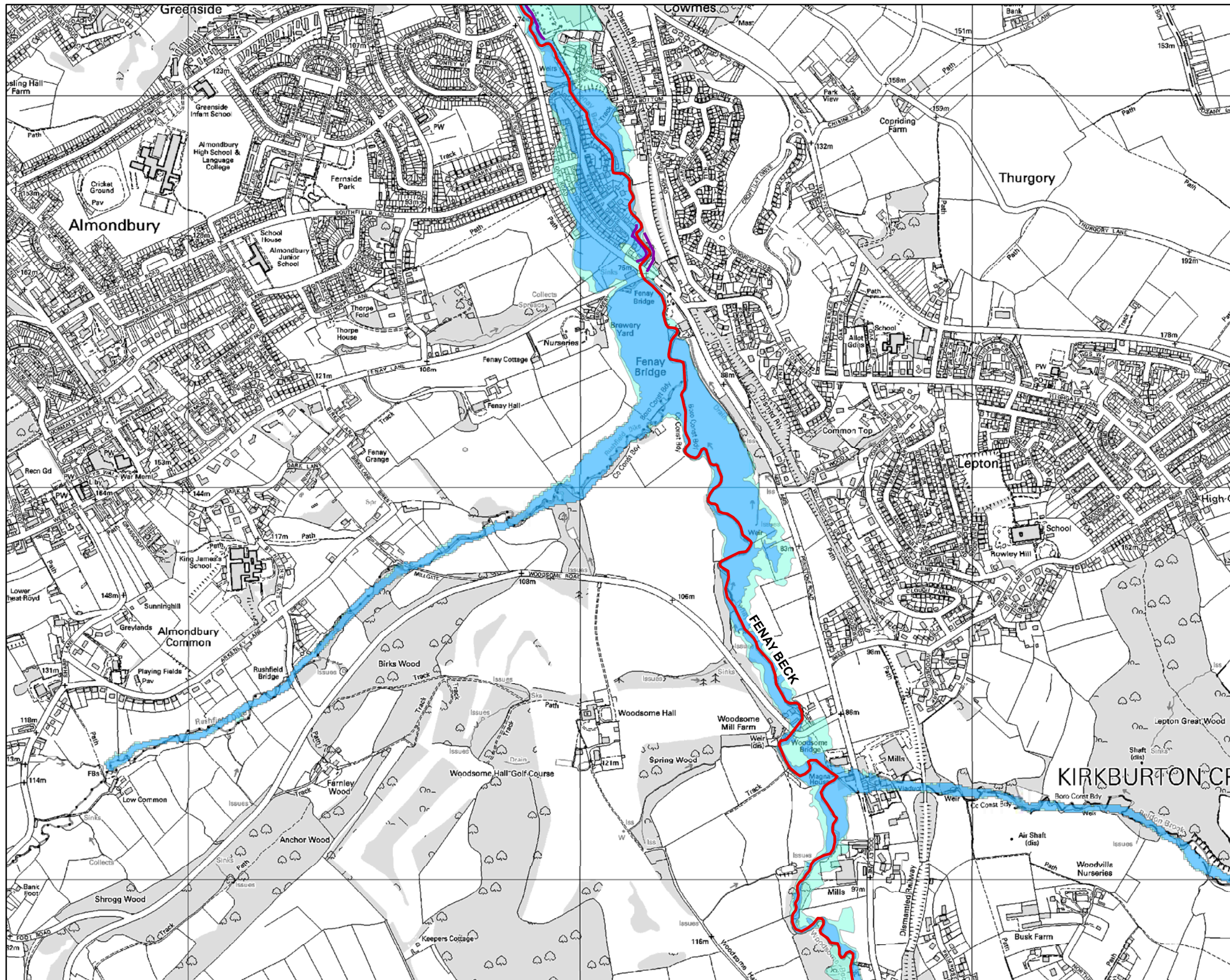


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LEGEND

-  Main River
-  Flood Map Flood Defences
-  Flood Zone 3 (FZ3)
-  Flood Zone 2 (FZ2)



APPENDIX C – Calculations
Existing Greenfield Run Off Estimate

Sanderson House
Jubilee Way
Huddersfield, WF4 4TD

Designed by darren.hawkyard



Date 12/01/2016 10:09
File

Checked by

Micro Drainage Source Control 2015.1

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (ha)	50.000	Urban	0.000
SAAR (mm)	931	Region Number	Region 3

Results l/s

QBAR Rural 127.2
QBAR Urban 127.2

Q1 year 109.4

Q1 year 109.4
Q2 years 120.0
Q5 years 159.0
Q10 years 184.5
Q20 years 208.9
Q25 years 217.0
Q30 years 223.6
Q50 years 240.9
Q100 years 264.6
Q200 years 300.2
Q250 years 311.7
Q1000 years 386.7

109.4 / 50ha = 2.19l/s

2.19 x 5.07ha = 11.10/s

11.10l/s