Technical Note

Batley Mortar – Flood Risk Assessment Addendum

Introduction

1.1 This technical note has been prepared to support the planning application for a residential development submitted to Kirklees Council in 2012.

1.2 In 2012 Mayer Brown undertook a Flood Risk Assessment (FRA) for the Batley Mortar site located in Bridge Street, Birstall, Kirklees (Ref 1). Kirklees Council have reviewed the FRA and have noted that since the FRA was produced a third generation surface water flood map has been issued. The revised surface water flood map indicates that some plots north of the watercourse on the proposed development site are vulnerable to flooding in a 1 in 100 year event. The development proposals include altering some of the land levels on site. The council would like an investigation into the impact these land levels have on flood risk.

1.3 As a result of the consultation, this technical note has been produced to address the comments put forward by Kirklees Council.

Site location and proposed layout

1.4 The site is located in Batley, Kirklees as illustrated in Figure 1.1. The site is bounded by Mill Street to the southwest, Bridge Street to the southeast and Smithies Moor Lane to the northeast.

Figure 1.1: Site location

1.5 The site was formally a mortar production facility. Structures associated with its former use have been removed except for a concrete ramp. The proposed development includes the construction of approximately 21 new residential units with associated parking.

1.6 The Smithies Beck crosses the site, where it flows in a west-easterly direction. This watercourse has two distinctive sections within site boundary, it enters the site via a culverted section at the western boundary and leaves the site as an open channel watercourse at the eastern boundary.

1.7 An indicative site layout is illustrated in Figure 1.2 and a full set of proposed development drawings is provided in Appendix A.

Figure 1.2: Indicative site layout.

1.8 As detailed in the previous FRA (Ref 1) the site generally falls towards the watercourse from all directions. Levels were surveyed approximately at 88.00mAOD (above ordnance datum) in the southern corner of the site and approximately 81.00mAOD in the northern corner of the site. Ground level close to the watercourse are approximately 80.52mAOD. Top of the parapet wall at northern bank of the watercourse is surveyed between 80.29mAOD and 80.67mAOD. Levels at the top of the southern embankment vary between 81.00mAOD and 81.26mAOD.

EA flood maps

1.9 As part of this report 'Flood Product 4' data requests were submitted to the EA. The response to these requests is provided in Appendix B. An extract from the supplied Flood Map, applicable to the site, is shown in Figure 1.3. The Flood Map (Ref 2) shows that the site is located wholly within Flood Zone 1. As part of this EA flood product data regarding

historical flooding events has been provided by the EA. The EA state that there is no known flood history having affected this site.

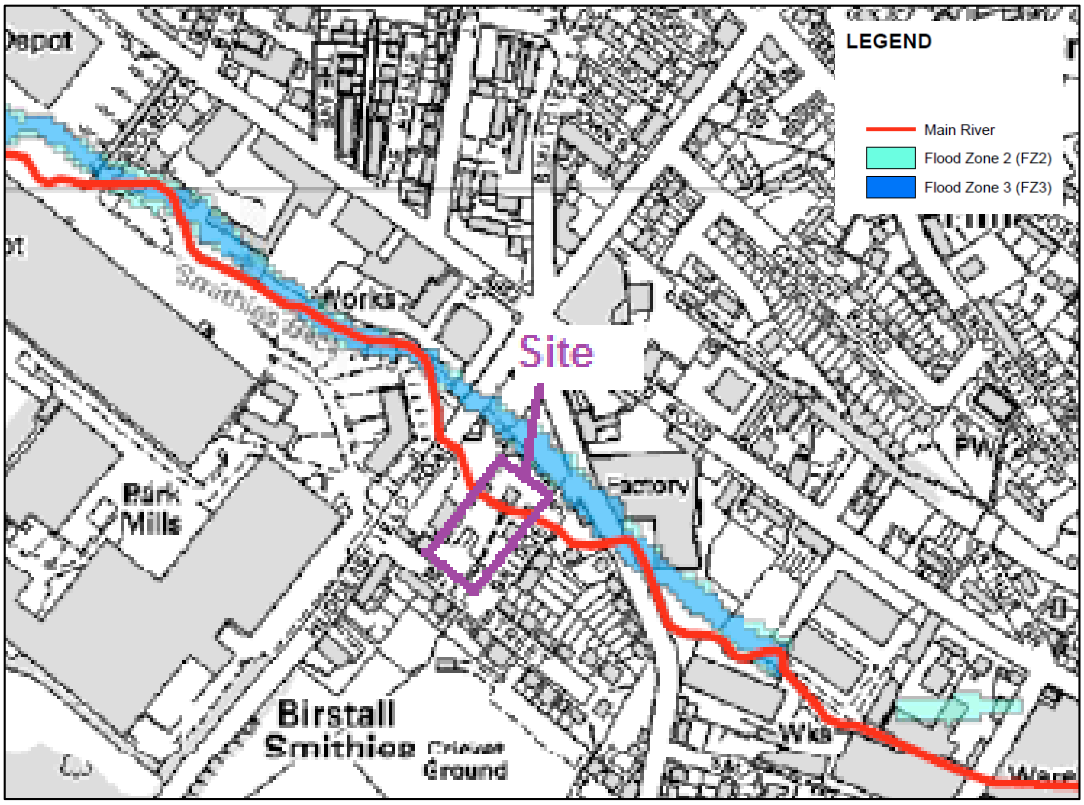


Figure 1.3: Environment Agency Flood map

1.10 The EA Flood product data also provides information regarding defence assets within the vicinity of the site, this is shown in Figure 1.4. The site is protected by a walled open channel along the watercourse. It is understood that the EA inspect the defences twice a year to ensure that they remain fit for purpose with regard to both condition and crest height. These defences are maintained, by their owners. The last EA inspection classified the condition of the wall local to the site as 3 (average), on a scale of 1 (very good) to 5 (very poor).

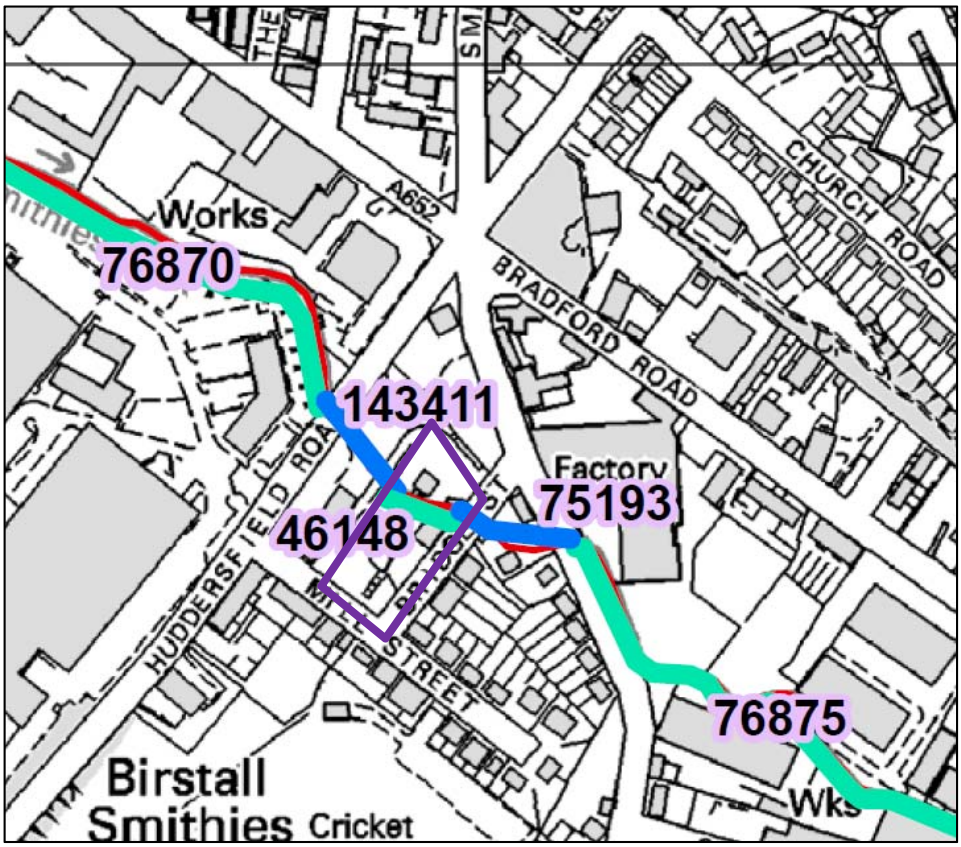


Figure 1.4: Defence Assets in the vicinity of the site.

1.11 In channel flood levels for the Smithies Beck have been supplied by the EA, with the location of EA model nodes as illustrated in Figure 1.5. The closest model node to the site is Node EA1231295BAT6038 and the predicted maximum flood water levels at this node are shown in Table 1.1 for the undefended scenario and Table 1.2 for the defended scenario.

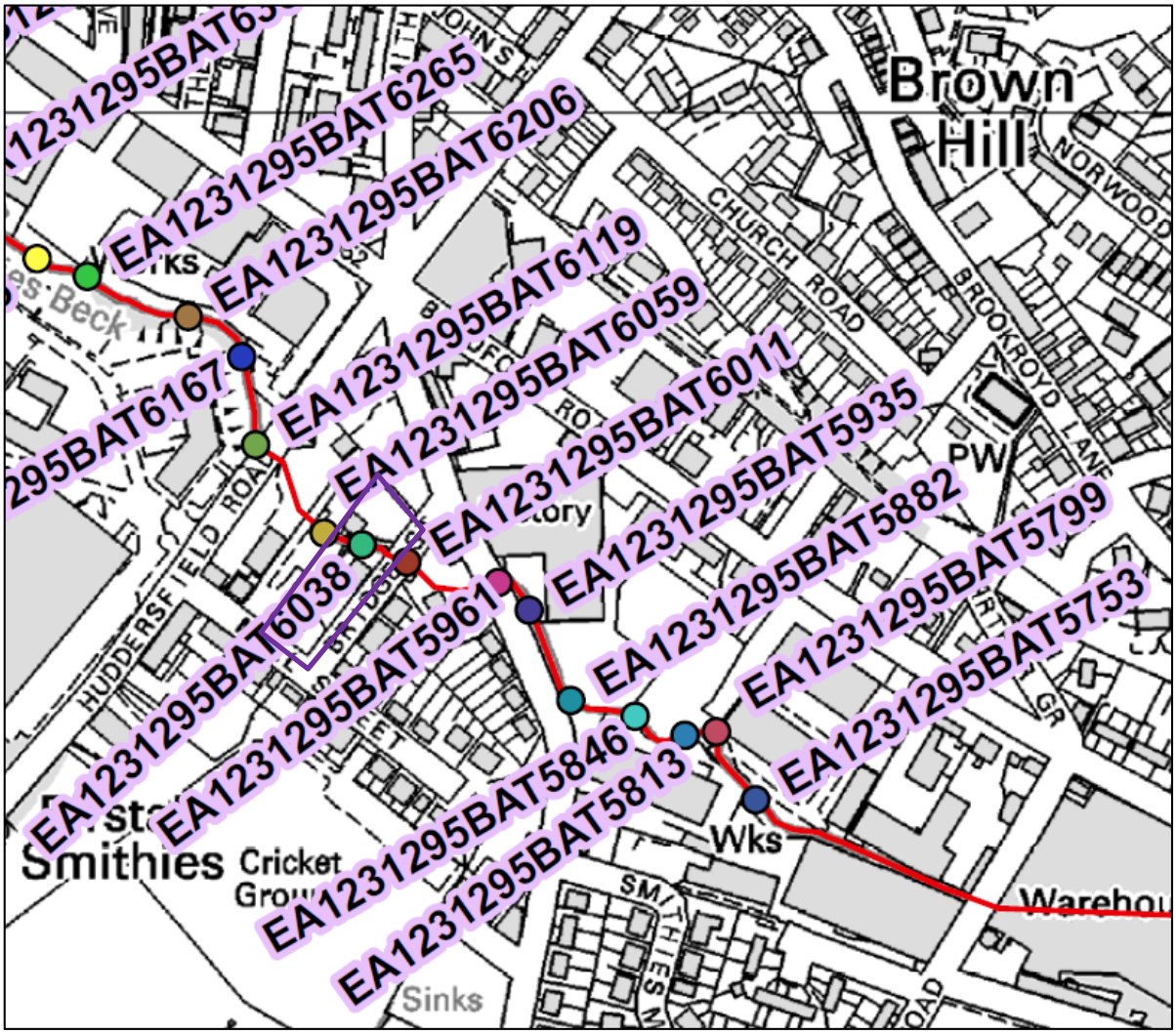


Figure 1.5: Location of the EA model nodes in the Smithies Beck adjacent to the Scheme

Max Level m AOD Undefended Scenario							
Model node	**1 in 2**	**1 in 5**	**1 in 10**	**1 in 20**	**1 in 30**	**1 in 75**	**1 in 100**
EA1231295BAT6038	79.44	79.63	79.78	79.97	80.07	80.51	80.66

Table 1.1: Predicted floodwater levels for the undefended scenario for the model nodes closest to the Scheme

Max Level m AOD Defended Scenario									
Model node	1 in 2	1 in 5	1 in 10	1 in 20	1 in 30	1 in 75	1 in 100	1 in 200	1 in 1000
EA1231295BAT6038	79.44	79.63	79.78	79.97	80.07	80.60	80.74	80.90	81.18

Table 1.2: Predicted floodwater levels for the defended scenario for the model nodes closest to the Scheme

1.12 As discussed in section 1.8 the site ground levels vary from approximately at 88.00mAOD in the southern corner of the site and 81.00mAOD in the northern corner of the site. Ground level close to the watercourse are approximately 80.52mAOD. Meaning that the maximum predicted water level at that location for the 1 in 1000 event is 0.66m.

Revised Surface water flood maps

1.13 Third generation surface water flood maps have been produced for the Kirklees borough. The 1 in 100 year extent is outlined in Figure 1.6 and the 1 in 1000 year extent is outlined in Figure 1.7. The maps can be found in full in Appendix C. It can be seen that in both events surface water flooding is predicted to affect the site. It is also believed the surface water flood maps are also more representative for the fluvial flood risk to the site.

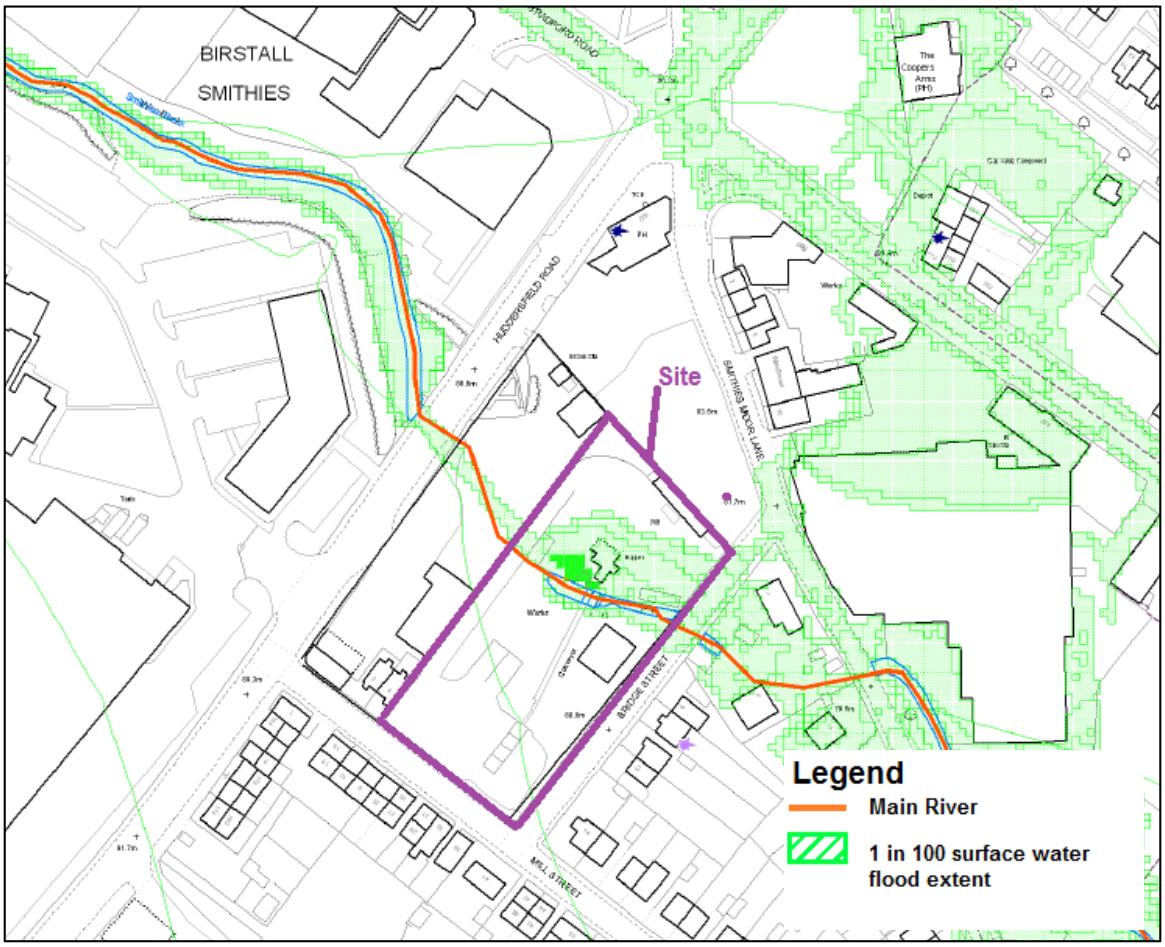


Figure 1.6: 1 in 100 year surface water flood map

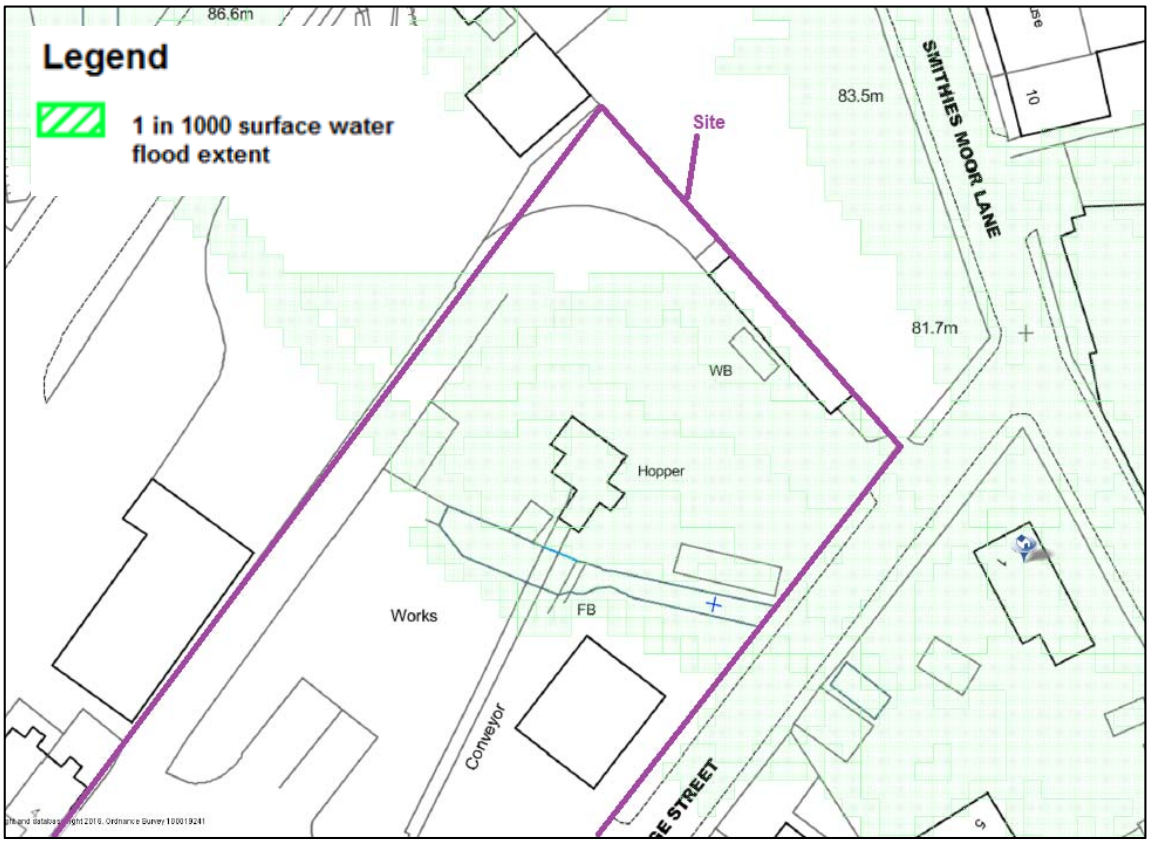


Figure 1.7: 1 in 1000 year surface water flood map

Impact on development

1.14 The revised surface water flood maps were transposed on top of the proposed development layout plans. This is illustrated in Figure 1.8 and 1.9 and can be found in full in Appendix C.

Figure 1.8: 1 in 100 year surface water flood map transposed on site development proposals

Figure 1.9: 1 in 1000 year surface water flood map transposed on site development proposals

1.15 The flood extents illustrate that the area surrounding the watercourse and the car parking spaces to the north of the site are at risk of flooding in the 1 in 100 and 1 in 1000 year surface water flood map. Additionally the three properties located in the most north easterly

corner of the site are at risk of flooding in the 1 in 100 event, with the seven properties located towards the north of the site being at risk of flooding in the 1 in 1000 event. It is understood that the 1 in 1000 year flood event is an exaggeration of the flood extent as the levels in the main road to the North West (Smithies Moor Road) are believed to be higher than in the surface water modelling and are therefore exaggerating the flooding onsite. (See email correspondence Appendix D). For the 1 in 100 year the surface water flood depth will vary from approximately 150mm to 300mm around the vicinity of those three properties (See email correspondence Appendix D). It is understood that the ground levels in that area range from 80.9 mAOD to 81 mAOD. To make these three properties safe in the 1 in 100 surface water flood event the ground levels onsite have been raised to 81.55 mAOD.

1.16 It is understood that the area surrounding the watercourse and the car parking spaces to the north of the site are at risk of surface water flooding and that in the event of the flood safe access and egress may not always be possible. It is recommended that a Flood evacuation and emergency plan for the residents of the housing development is produced, with the plan being regularly updated for the lifetime of the development. Key to the plan is a link into the EA's advanced flood warning service.

Changes in Ground Level

1.17 In Appendix A the proposed and existing ground levels across the site are shown. It can be seen that in Section C-C and Section F-F the proposed ground levels are slightly higher than existing around the houses south of the Smithies Beck. It is not thought the increase in ground level here will impact on flood risk as this area of site is not deemed to be at fluvial or surface water flood risk.

Conclusions and Recommendations

1.18 This technical note has been prepared to support the planning application for a residential development submitted to Kirklees Council in 2012. The technical note is an addendum to the 2012 FRA for the Batley Mortar site located in Bridge Street, Birstall, Kirklees.

1.19 Kirklees Council have reviewed the FRA and have noted that since the FRA was produced a third generation surface water flood map has been issued. The revised surface water flood map indicates that some plots north of the watercourse on the proposed development site are vulnerable to flooding in a 1 in 100 year event. The development proposals include altering some of the land levels on site. The council would like an investigation into the impact these land levels have on flood risk.

1.20 The EA Flood Map shows that the site is wholly located in Flood Zone 1 (less than 1 in 1000 annual probability of flooding from rivers or the sea).

1.21 The revised surface water flood extents illustrate that the area surrounding the watercourse and the car parking spaces to the north of the site are at risk of flooding in the 1 in 100 and 1 in 1000 year flood event.

1.22 For the 1 in 100 year the surface water flood depth will vary from approximately 150mm to 300mm around the vicinity of three properties located towards the north of the site. It is understood that the ground levels in that area range from 80.9 mAOD to 81 mAOD. To make these three properties safe in the 1 in 100 surface water flood event the ground levels onsite have been raised to 81.55 mAOD

1.23 It is recommended that a Flood evacuation and emergency plan for the residents of the housing development is produced, with the plan being regularly updated for the lifetime of the development.

1.24 The changes in ground level on site are not believed to have an impact on flood risk as where ground levels are changing they are not in an area at site deemed at fluvial or surface water flood risk.

Author: Victoria Berg-Holdo - Engineer

Checked: Paul Stewart – Technical Director

Date: 24th May 2016

References

1. Cemex Batley Mortar, Bridge Street, Birstall Flood Risk Assessment, August 2012, Mayer Brown.
2. What's In Your Backyard' Mapping, Environment Agency, http://maps.environmentagency.gov.uk/wiyby (linked accessed April 2016).

APPENDIX A: Proposed layout drawings

Construction staff and operatives must ensure the principal contractor has provided thorough and accurate information on all health and safety aspects relating to the designs identified on this drawing including the review of:

- Designers/contractors risk assessments
- Method statements
- Permit to work
- Pre construction Information

The designers note that the following health and safety risks relating to this drawing have not been eliminated during the design process:

ref	residual risk

Schedule of Accommodation

2b4p House (Type 1) 76SQ.M (GIFA)	-	10no.
3b5p House (Type 2) 105SQ.M (GIFA)	-	11no.
Total	-	21no.
200% Parking provision		
Site Area	-	0.5 Ha
Density	-	42 units/Ha
Public open space	-	641 sqm

Proposed surfacing Materials

- Tarmacadam (access roads)
- Tarmacadam (pavements)
- Buff resin bonded gravel (parking bays)
- Buff paving (garden/yards)
- Landscaping (public open space)
- Landscaping (private)

RM APPLICATION

	revision	date	by	chk
B	Finished floor level of dwellings to N/E of site amended Further updated FRA. Access roads amended.	18.15.16	RW	AW
A	Further to consultation responses, turning heads added to northern and central access roads, bin stores amended	18.12.15	RW	AW

All dimensions to be verified on site and the Architect informed of any discrepancy. All drawings and specifications should be read in conjunction with the Health and Safety Plan; all conflicts should be reported to the CDM Co-ordinator.

- [ ] preliminary
- [ ] comment
- [ ] construction
- [x] planning
- [ ] tender
- [ ] record

bowmanrileyarchitects
Wellington House · Otley St · Skipton · N Yorkshire · BD23 1EL
Leeds | London | Skipton
01756 795611 · www.bowmanriley.com

Toureen Mangan

drawn by	checked by	date	scale @ A1
RW	AW	12.08.14	1/200

Bridge Street, Birstall

Proposed Site Layout

project number	drawing number	revision
7428	P(0)01	B

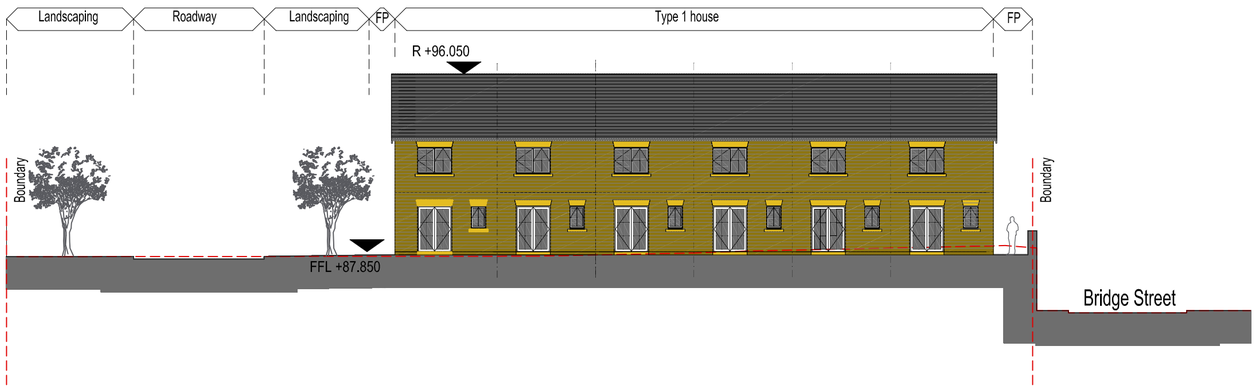
card reference: CL_P-C\7428 - Bridge Street, Birstall\7428 - 03 Card\(000) Existing, Presentation, Planning\RM application 160516.dwg

Construction staff and operatives must ensure the principal contractor has provided thorough and accurate Information on all health and safety aspects relating to the designs identified on this drawing including the review of:

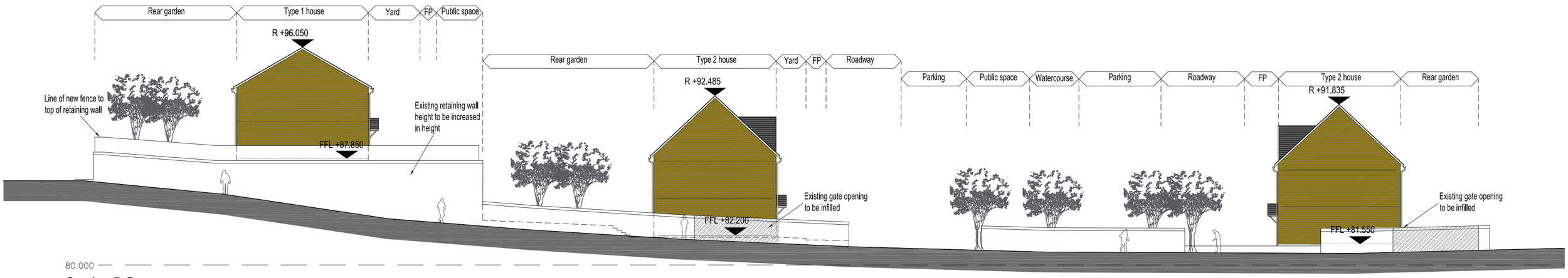
- Designers/contractors risk assessments
- Method statements
- Permit to work
- Pre construction information

The designers note that the following health and safety risks relating to this drawing have not been eliminated during the design process:

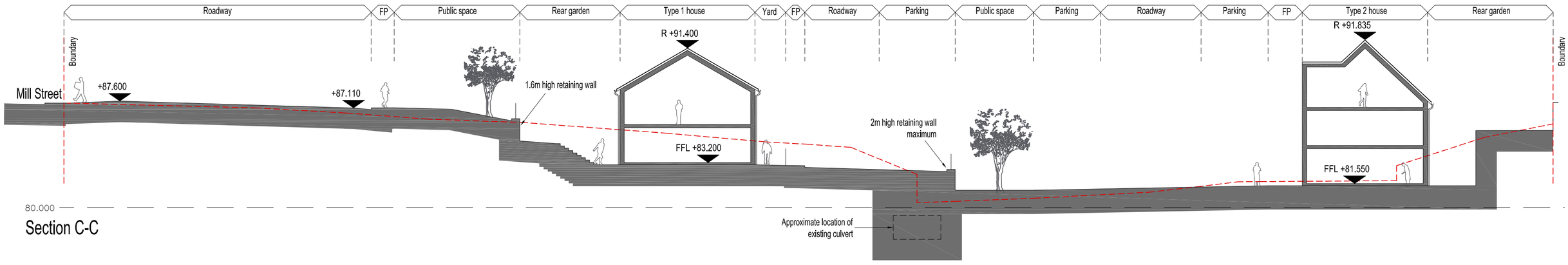
ref	residual risk



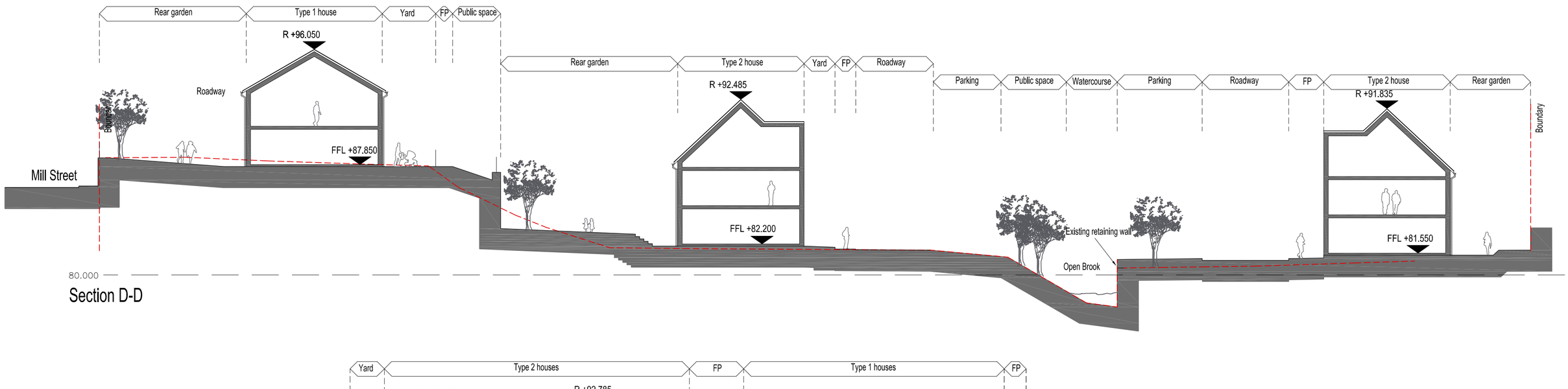
Section A-A



Section B-B

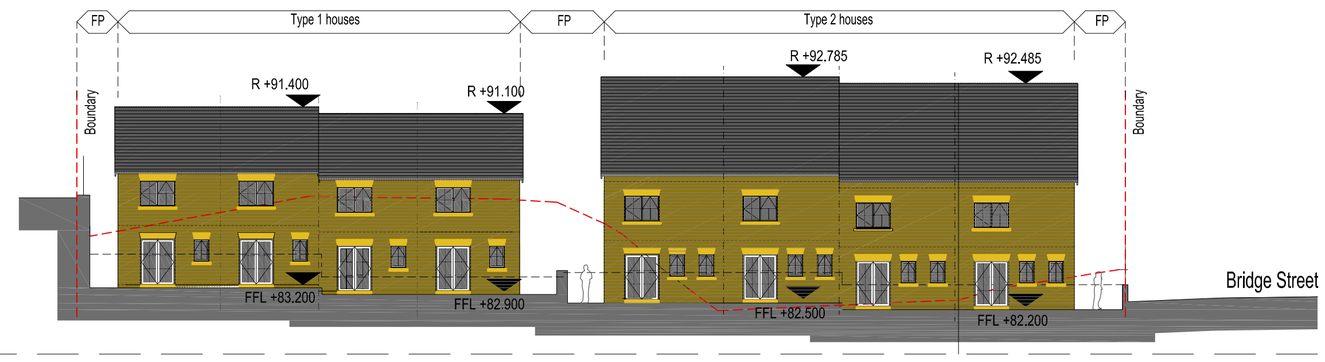


Section C-C



Section D-D

Section E-E



Section F-F

Section G-G

RM APPLICATION

B	Finished floor level of dwellings to N/E of site amended further updated FRA. Access roads amended.	18.15.16	RW	AW
	revision	date	by	chk

All dimensions to be verified on site and the Architect informed of any discrepancy. All drawings and specifications should be read in conjunction with the Health and Safety Plan; all conflicts should be reported to the CDM Co-ordinator.

☐ preliminary ☐ comment ☐ construction
☒ planning ☐ tender ☐ record

bowmanrileyarchitects
Wellington House · Otley St · Skipton · N Yorkshire · BD23 1EL
Leeds | London | Skipton
01756 795611 · www.bowmanriley.com

Toureen Mangan

drawn by	checked by	date	scale @ A1
RW	AW	12.05.14	1/200

Bridge Street, Birstall

Site Sections

project number	drawing number	revision
7428	P(0)04	A

cad reference: G:_P-C\7428 - Bridge Street, Birstall\7428 - 03 Cad\(000) Existing, Presentation, Planning\RM application 160518.dwg

APPENDIX B: EA Flood product data

Standard notice *[not for use with Special Data, Personal Data or unlicensed 3rd party rights]*

Information warning

We (The Environment Agency) do not promise that the Information supplied to You will always be accurate, free from viruses and other malicious or damaging code (if electronic), complete or up to date or that the Information will provide any particular facilities or functions or be suitable for any particular purpose. You must ensure that the Information meets your needs and are entirely responsible for the consequences of using the Information. Please also note any specific information warning or guidance supplied to you.

Permitted use

- The Information is protected by intellectual property rights and whilst you have certain statutory rights which include the right to read the Information, you are granted no additional use rights whatsoever unless you agree to the licence set out below.
- Commercial use of anything except EA OpenData is subject to payment of a £50 licence fee (+VAT) for each person seeking the benefit of the licence, except for use as an Environment Agency contractor or for approved media use.
- To activate this licence you do not need to contact us (unless you need to pay us a Commercial licence fee) but if you make any use in excess of your statutory rights you are deemed to accept the terms below.

Licence

We grant you a worldwide, royalty-free (apart from the £50 licence fee for commercial use), perpetual, non-exclusive licence to use the Information subject to the conditions below.

You are free to:

- copy, publish, distribute and transmit the Information
- adapt the Information
- exploit the Information commercially, for example, by combining it with other Information, or by including it in your own product or application

You must (where you do any of the above):

- acknowledge the source of the Information by including the following attribution statement:
  "Contains Environment Agency information © Environment Agency and database right"
- ensure that you do not use the Information in a way that suggests any official status or that We endorse you or your use of the Information
- ensure that you do not mislead others or misrepresent the Information or its source or use the Information in a way that is detrimental to the environment, including the risk of reduced future enhancement
- ensure that your use of the Information does not breach the Data Protection Act 1998 or the Privacy and Electronic Communications (EC Directive) Regulations 2003

These are important conditions and if you fail to comply with them the rights granted to you under this licence, or any similar licence granted by us will end automatically.

No warranty

The Information is licensed 'as is' and We exclude all representations, warranties, obligations and liabilities in relation to the Information to the maximum extent permitted by law. We are not liable for any errors or omissions in the Information and shall not be liable for any loss, injury or damage of any kind caused by its use. We do not guarantee the continued supply of the Information.

Governing Law

This licence is governed by the laws of England and Wales.

Definitions

"Information" means the information that is protected by copyright or by database right (for example, literary and artistic works, content, data and source code) offered for use under the terms of this licence.

"Commercial" means:

- offering a product or service containing the Information, or any adaptation of it, for a charge, or
- internal use for any purpose, or offering a product or service based on the Information for indirect commercial advantage, by an organisation that is primarily engaged in trade, commerce or a profession.

Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments

Important
If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:-

http://www.environment-agency.gov.uk/research/planning/33580.aspx

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice, the technical guidance to the National Planning Policy Framework and the existing PPS25 Practice Guide for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

http://www.environment-agency.gov.uk/research/planning/82587.aspx

http://www.communities.gov.uk/publications/planningandbuilding/nppftechnicalguidance

http://www.communities.gov.uk/publications/planningandbuilding/pps25guideupdate

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

In **Wales,** you should refer to TAN15 for information about what flood consequence assessment is needed for new development in the different flood zones
http://new.wales.gov.uk/splash;jsessionid=8ylGTfGZthmB0t2vhp6hS1GcB1LXvZzB3Ylczf20Xn7LK3zK0nMk!981825250?orig=/topics/planning/policy/tans/tan15/

You should also consult the Strategic Flood Consequence Assessment if one has been produced by your local planning authority.

In both **England and Wales** you should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk / Consequence Assessment (FRA / FCA) 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 overland runoff. The information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.

4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

Taking climate change into account

11. Global sea level will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west. In preparing a Strategic Flood Risk Assessment or a site-specific flood risk assessment, the allowances for the rates of relative sea level rise shown in table 4 should be used as a starting point for considering flooding from the sea, along with the sensitivity ranges for wave height and wind speed in table 5.

Table 4: Recommended contingency allowances for net sea level rises

	Net sea level rise (mm per year) relative to 1990			
	1990 to 2025	**2025 to 2055**	**2055 to 2085**	**2085 to 2115**
East of England, east midlands, London, south-east England (south of Flamborough Head)	4.0	8.5	12.0	15.0
South-west England	3.5	8.0	11.5	14.5
North-west England, north-east England (north of Flamborough Head)	2.5	7.0	10.0	13.0

Notes to table 4:

a. For deriving sea levels up to 2025, the 4mm per year, 3mm per year and 2.5mm per year rates (covering the three geographical groups respectively), should be applied back to the 1990 base sea level year. From 2026 to 2055, the increase in sea level in this period is derived by adding the number of years on from 2025 (to 2055), multiplied by the respective rate shown in the table. Subsequent time periods 2056 to 2085 and 2086 to 2115 are treated similarly.

b. Refer to Department for Environment, Food and Rural Affairs *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts,* October 2006, for details of the derivation of this table. In particular, Annex A1 of this Note shows examples of how to calculate sea level rise.

c. Vertical movement of the land is incorporated in the table and does not need to be calculated separately.

12. The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels, assuming no change in storminess. There may also be secondary impacts such as changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events. A 10 per cent sensitivity allowance should be added to offshore wind speeds and wave heights by the 2080s.

13. In making an assessment of the impacts of climate change on flooding from the land, rivers and sea as part of a flood risk assessment, the sensitivity ranges in table 5 may provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, river flow, wave height and wind speed.

Table 5: Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	*+5%*	*+10%*	*+20%*	*+30%*
Peak river flow	*+10%*	*+20%*		
Offshore wind speed	*+5%*		*+10%*	
Extreme wave height	*+5%*		*+10%*	

Notes to table 5:

a. Refer to Department for Environment, Food and Rural Affairs *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts,* October 2006, for details of the derivation of this table.

b. For deriving peak rainfall, for example, between 2025 and 2055 multiply the rainfall measurement (in mm per hour) by 10 per cent and between 2055 and 2085 multiply the rainfall measurement by 20 per cent. So, if there is a 10mm per hour event, for the 2025 to 2055 period this would equate to 11mm per hour; and for the 2055 to 2085 period, this would equate to 12mm per hour. Other parameters in table 5 are treated similarly.

14. Sensitivity testing of the flood map produced by the Environment Agency, using the 20 per cent from 2025 to 2115 allowance for peak flows, suggests that changes in the extent of inundation are negligible in well-defined floodplains, but can be dramatic in very flat areas. However, changes in the depth of flooding under the same allowance will reduce the return period of a given flood. This

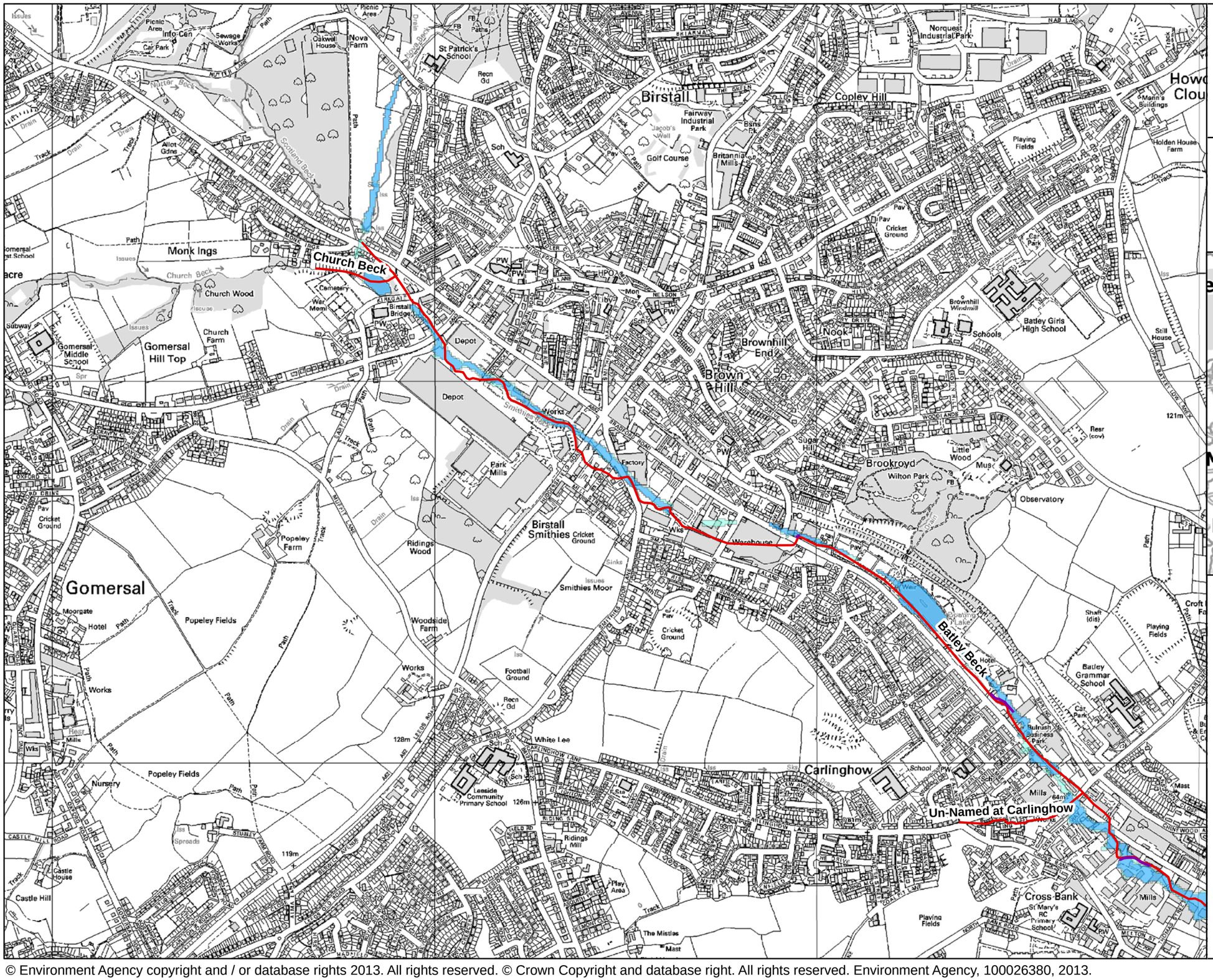
means that a site currently located within a lower risk zone (e.g. Zone 2 in table 1) could in future be re-classified as lying within a higher risk zone (e.g. Zone 3a in table 1). This in turn could have implications for the type of development that is appropriate according to its vulnerability to flooding (see table 2). It will therefore be important that developers, their advisors and local authorities refer to the current flood map and the Strategic Flood Risk Assessment when preparing and considering proposals.

15. Flooding in estuaries may result from the combined effects of high river flows and high sea surges. When taking account of impacts of climate change in flood risk assessments covering tidal estuaries, it will be necessary for the allowances for sea level rise in table 4 and the allowances for peak flow, wave height and wind speed in table 5 to be combined.[11]

---

[11] Refer to Defra *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts*, October 2006. Annex A2 gives details of joint probability analysis. www.defra.gov.uk/environ/fcd/pubs/pagn/climatechangeupdate.pdf

Flood Map for Planning for Batley Mortar Bridge Street, Birstall, Kirklees WF17 9AU. Created: 15/04/16 RFI: 6192



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

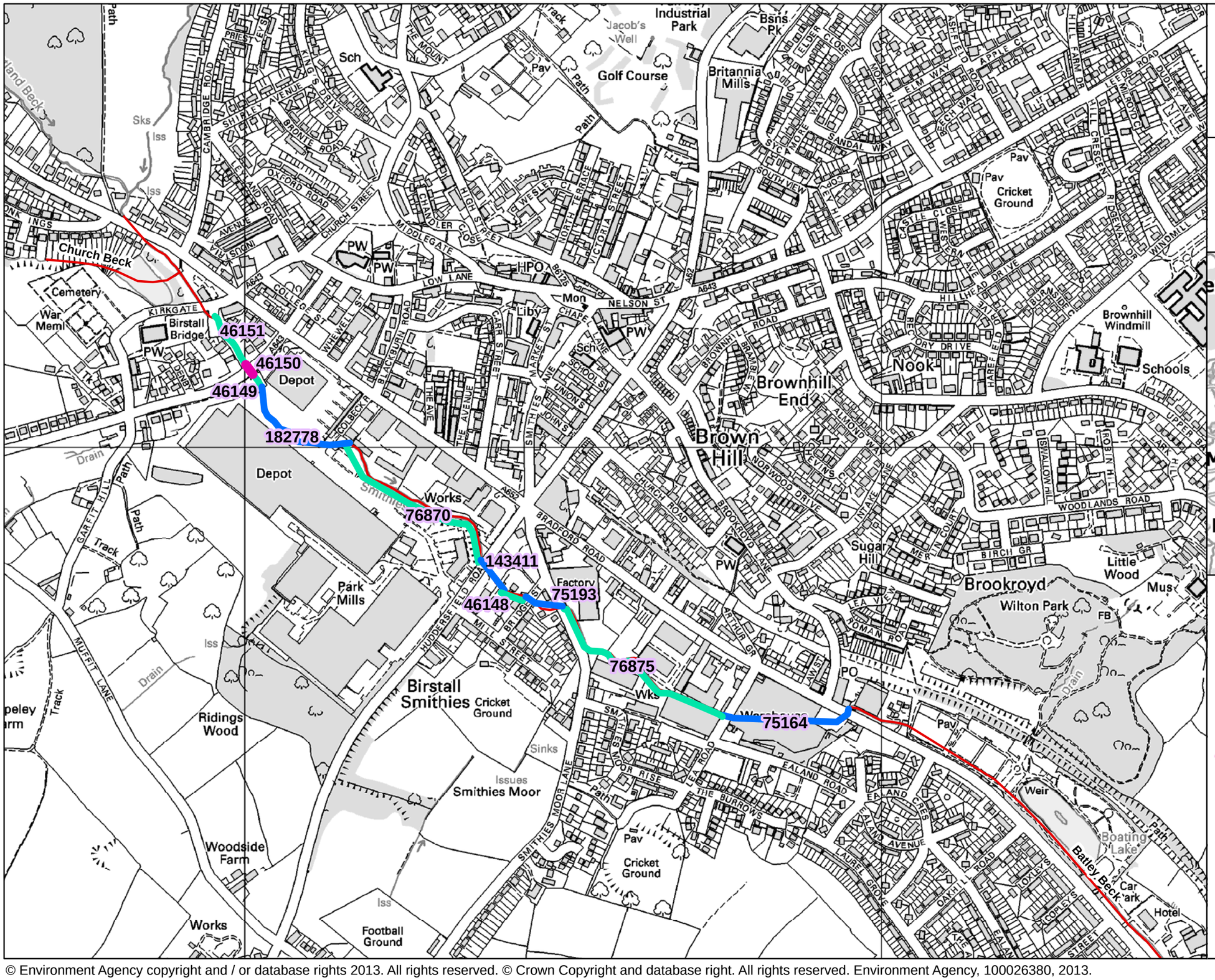
when reproduced @ A3

LEGEND

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

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Asset Defence Map for Batley Mortar Bridge Street, Birstall, Kirklees WF17 9AU. Created: 15/04/16 RFI: 6192



Environment Agency

www.environment-agency.gov.uk

Scale: 1:6,000

when reproduced @ A3

N W E S

LEGEND

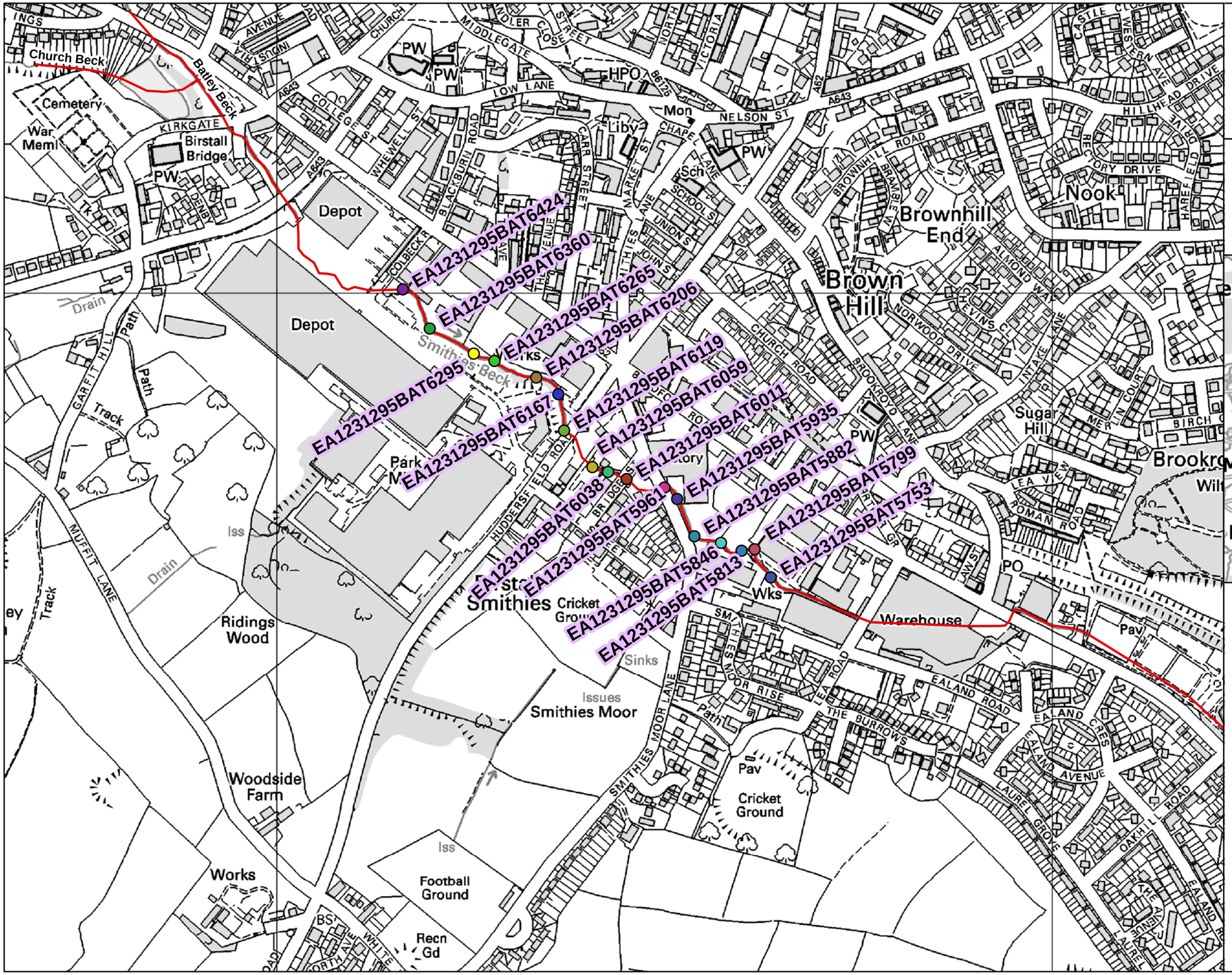
Defences

Subtype

- Bridge Abutment
- High Ground
- Simple Culvert
- Main River

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Node Point Map for Batley Mortar Bridge Street, Birstall, Kirklees WF17 9AU. Created: 15/04/16 RFI: 6192



Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Asset Defence Information
RFI: 6192

Asset ID	Asset Type	AIMS Subtype	Asset Maintainer	Description	Design Standard of Protection (yrs)	Actual condition rating
75164	Channel	Simple culvert	Environment agency	CULVERT	50	4
46151	Defence	High ground	Private	NATURAL OPEN CHANNEL	Unknown	3
76870	Defence	High ground	Private	OPEN CHANNEL	50	3
46149	Defence	High ground	Private	NATURAL CHANNEL	Unknown	2
143411	Channel	Simple culvert	Private	CULVERT	Unknown	5
76875	Defence	High ground	Private	WALLED OPEN CHANNEL	50	2
46148	Defence	High ground	Private	LINED WALLED CHANNEL	Unknown	3
75193	Channel	Simple culvert	Environment agency	CULVERT	50	3
46150	Defence	Bridge abutment	Private	BRIDGE ABUTMENTS	Unknown	3
182778	Channel	Simple culvert	Environment agency	CULVERT	50	4

Node Point Information
RFI: 6192

2015 Batley Beck Model **- Undefended Scenario Results** (Level - mAOD, Flow - m3/s)												
	Return Period											
	2		5		10		20		30		50	
Node Point	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow
EA1231295BAT6424	83.59	2.88	83.72	3.73	83.84	4.51	83.97	5.50	84.04	6.07	84.12	6.73
EA1231295BAT6360	82.47	2.90	82.57	3.77	82.66	4.55	82.75	5.55	82.80	6.13	82.86	6.80
EA1231295BAT6295	81.61	2.90	81.73	3.77	81.82	4.55	81.93	5.55	81.99	6.13	82.05	6.80
EA1231295BAT6265	81.46	2.90	81.58	3.77	81.68	4.55	81.79	5.55	81.85	6.13	81.91	6.80
EA1231295BAT6206	81.31	2.90	81.40	3.77	81.47	4.55	81.54	5.54	81.59	6.13	81.63	6.80
EA1231295BAT6167	80.64	2.90	80.71	3.77	80.78	4.55	80.87	5.55	80.94	6.13	81.08	6.89
EA1231295BAT6119	80.55	2.98	80.60	3.88	80.66	4.69	80.75	5.71	80.82	6.32	81.00	7.02
EA1231295BAT6059	79.53	3.51	79.73	4.60	79.89	5.57	80.08	6.81	80.18	7.55	80.63	9.13
EA1231295BAT6038	79.44	3.51	79.63	4.60	79.78	5.57	79.97	6.81	80.07	7.55	80.24	8.79
EA1231295BAT6011	78.46	3.51	78.72	4.60	79.07	5.84	79.37	6.80	79.52	7.54	79.68	8.42
EA1231295BAT5961	78.19	3.50	78.39	4.60	78.82	6.00	79.12	6.80	79.27	7.53	79.45	8.33
EA1231295BAT5935	77.94	3.83	78.11	5.03	78.69	7.58	79.02	7.55	79.19	8.17	79.38	9.19
EA1231295BAT5882	77.83	3.82	78.04	5.03	78.67	6.86	78.97	7.39	79.14	8.16	79.32	9.08
EA1231295BAT5846	77.66	3.83	77.88	5.03	78.25	6.61	78.49	7.39	78.61	8.17	78.73	9.09
EA1231295BAT5813	77.45	4.05	77.63	5.35	78.12	6.43	78.35	7.86	78.47	8.69	78.59	9.66
EA1231295BAT5799	77.31	4.05	77.47	5.35	77.59	6.76	77.72	7.86	77.78	8.69	77.85	9.66
EA1231295BAT5753	76.85	4.05	76.99	5.34	77.08	6.55	77.19	7.86	77.26	8.69	77.32	9.66

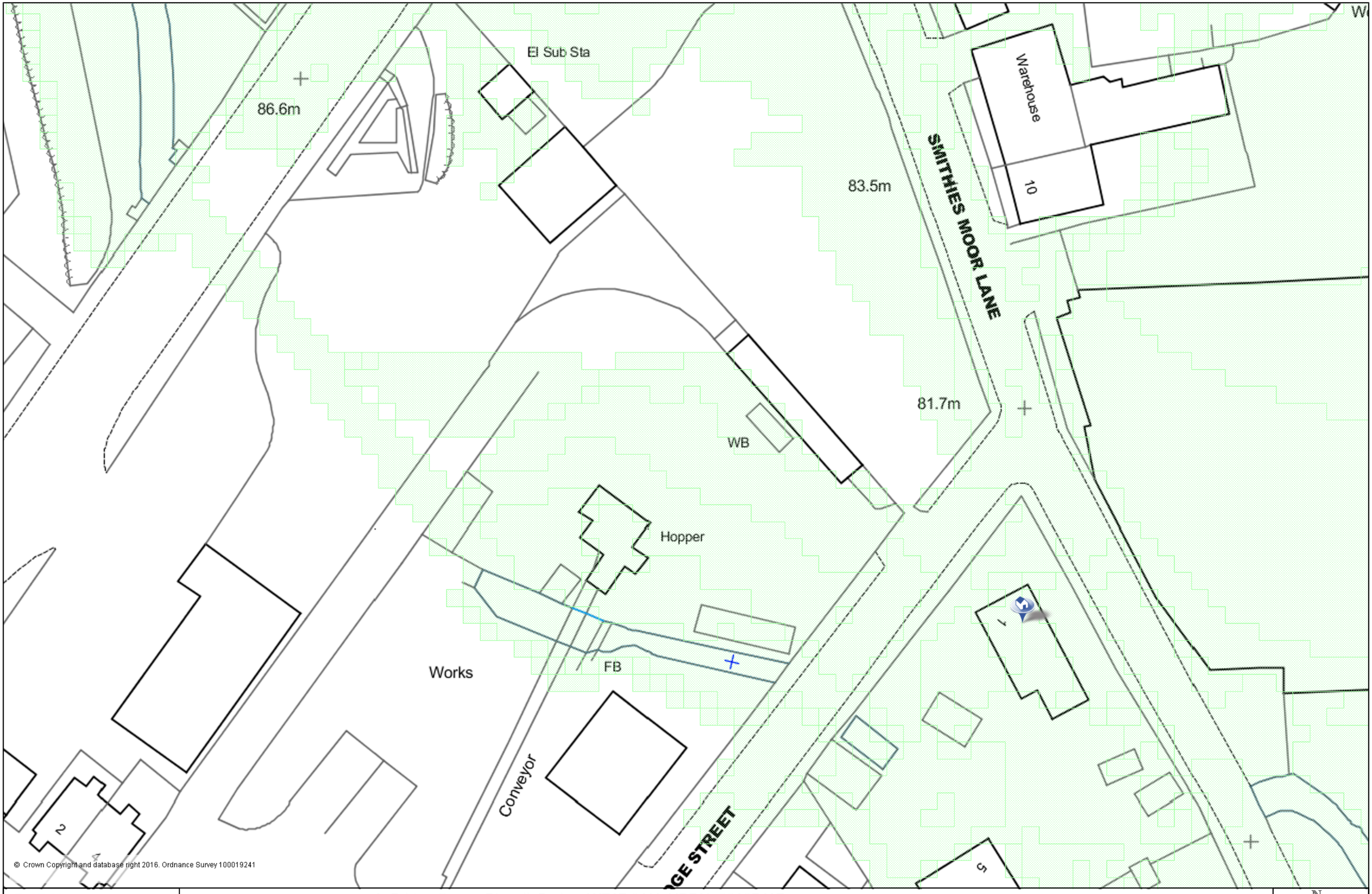
	Return Period					
	75		100		101	
Node Point	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow
EA1231295BAT6424	84.23	7.66	84.29	8.20	84.44	9.68
EA1231295BAT6360	82.94	7.74	82.98	8.29	83.11	9.78
EA1231295BAT6295	82.14	7.74	82.19	8.29	82.38	9.78
EA1231295BAT6265	82.00	7.73	82.07	8.28	82.30	9.77
EA1231295BAT6206	81.72	7.73	81.83	8.26	82.14	9.78
EA1231295BAT6167	81.35	7.71	81.57	8.25	81.98	9.80
EA1231295BAT6119	81.32	7.88	81.55	8.48	81.97	10.10
EA1231295BAT6059	80.90	9.31	81.04	9.99	81.23	11.93
EA1231295BAT6038	80.51	9.30	80.66	9.95	80.92	10.62
EA1231295BAT6011	79.89	9.27	80.01	9.93	80.24	11.07
EA1231295BAT5961	79.69	9.27	79.82	9.93	80.03	11.76
EA1231295BAT5935	79.72	9.52	79.86	9.56	80.08	9.67
EA1231295BAT5882	79.47	9.77	79.65	10.41	79.93	10.62
EA1231295BAT5846	78.84	9.76	78.92	10.46	79.20	12.49
EA1231295BAT5813	78.69	10.36	78.78	11.01	79.05	13.15
EA1231295BAT5799	77.90	10.36	77.94	11.01	78.06	13.15
EA1231295BAT5753	77.37	10.35	77.41	11.01	77.55	13.15

2015 Batley Beck Model - **Defended Scenario Results** (Level - mAOD, Flow - m3/s)

Node Point	Return Period 2 Max Level	Max Flow	5 Max Level	Max Flow	10 Max Level	Max Flow	20 Max Level	Max Flow	30 Max Level	Max Flow	50 Max Level	Max Flow
EA1231295BAT6424	83.59	2.87	83.73	3.74	83.84	4.51	83.97	5.50	84.04	6.06	84.12	6.73
EA1231295BAT6360	82.47	2.89	82.57	3.78	82.66	4.55	82.75	5.55	82.80	6.12	82.86	6.80
EA1231295BAT6295	81.61	2.89	81.73	3.78	81.82	4.55	81.93	5.55	81.99	6.12	82.05	6.80
EA1231295BAT6265	81.46	2.89	81.58	3.78	81.68	4.55	81.79	5.55	81.85	6.12	81.91	6.80
EA1231295BAT6206	81.31	2.89	81.40	3.78	81.47	4.55	81.54	5.55	81.59	6.12	81.63	6.80
EA1231295BAT6167	80.64	2.89	80.71	3.78	80.78	4.55	80.87	5.56	80.94	6.13	81.08	6.80
EA1231295BAT6119	80.55	2.97	80.60	3.89	80.66	4.69	80.75	5.72	80.82	6.31	81.01	7.00
EA1231295BAT6059	79.53	3.50	79.73	4.61	79.89	5.56	80.08	6.82	80.18	7.54	80.64	8.70
EA1231295BAT6038	79.44	3.50	79.63	4.61	79.78	5.56	79.97	6.82	80.07	7.54	80.27	8.96
EA1231295BAT6011	78.46	3.50	78.72	4.61	79.08	5.79	79.38	6.81	79.53	7.53	79.70	8.33
EA1231295BAT5961	78.19	3.49	78.40	4.60	78.83	5.91	79.13	6.81	79.29	7.53	79.47	8.33
EA1231295BAT5935	77.95	3.82	78.13	5.04	78.73	7.85	79.04	7.85	79.21	8.16	79.40	9.13
EA1231295BAT5882	77.84	3.82	78.05	5.04	78.68	7.60	78.98	7.56	79.14	8.16	79.32	9.09
EA1231295BAT5846	77.65	3.82	77.86	5.04	78.23	6.67	78.46	7.40	78.57	8.16	78.70	9.09
EA1231295BAT5813	77.44	4.05	77.63	5.35	78.12	6.55	78.35	7.87	78.47	8.69	78.59	9.66
EA1231295BAT5799	77.31	4.05	77.47	5.35	77.59	6.83	77.72	7.87	77.78	8.69	77.85	9.66
EA1231295BAT5753	76.85	4.05	76.99	5.35	77.09	6.81	77.19	7.87	77.26	8.69	77.32	9.66

	Return Period									
	75		100		101		200		1000	
Node Point	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow	Max Level	Max Flow
EA1231295BAT6424	84.23	7.66	84.29	8.20	84.44	9.68	84.44	9.68	84.82	14.56
EA1231295BAT6360	82.94	7.73	82.98	8.29	83.10	9.77	83.10	9.77	83.45	14.67
EA1231295BAT6295	82.14	7.73	82.19	8.28	82.32	9.77	82.32	9.77	82.76	14.67
EA1231295BAT6265	82.00	7.73	82.06	8.28	82.22	9.77	82.22	9.78	82.72	14.68
EA1231295BAT6206	81.71	7.72	81.79	8.28	81.98	9.79	81.98	9.79	82.60	14.70
EA1231295BAT6167	81.34	7.71	81.48	8.27	81.74	9.80	81.74	9.80	82.43	14.73
EA1231295BAT6119	81.31	7.89	81.45	8.52	81.72	10.10	81.72	10.11	82.43	15.10
EA1231295BAT6059	80.89	9.31	80.95	10.11	80.97	12.05	80.97	12.07	81.00	17.28
EA1231295BAT6038	80.60	8.92	80.74	9.02	80.90	9.20	80.90	9.21	81.18	9.32
EA1231295BAT6011	80.04	9.12	80.19	9.65	80.36	10.05	80.36	10.07	80.83	10.31
EA1231295BAT5961	79.89	9.11	80.05	9.79	80.20	11.75	80.19	11.77	80.61	15.24
EA1231295BAT5935	79.86	10.09	80.02	10.76	80.20	11.96	80.19	11.95	80.60	16.10
EA1231295BAT5882	79.55	10.03	79.74	10.75	79.98	11.94	79.97	11.92	80.53	13.06
EA1231295BAT5846	78.83	10.03	78.93	10.75	79.07	11.94	79.06	11.92	79.68	17.08
EA1231295BAT5813	78.72	10.62	78.83	11.39	78.97	12.51	78.97	12.49	79.59	17.84
EA1231295BAT5799	77.91	10.62	77.96	11.39	78.03	12.51	78.02	12.49	78.30	17.86
EA1231295BAT5753	77.39	10.62	77.44	11.39	77.51	12.51	77.50	12.49	77.80	17.85

APPENDIX C: Surface water flood map



Kirklees COUNCIL

Kompass

Kirklees Mapping Service

Tel: 01484 221000

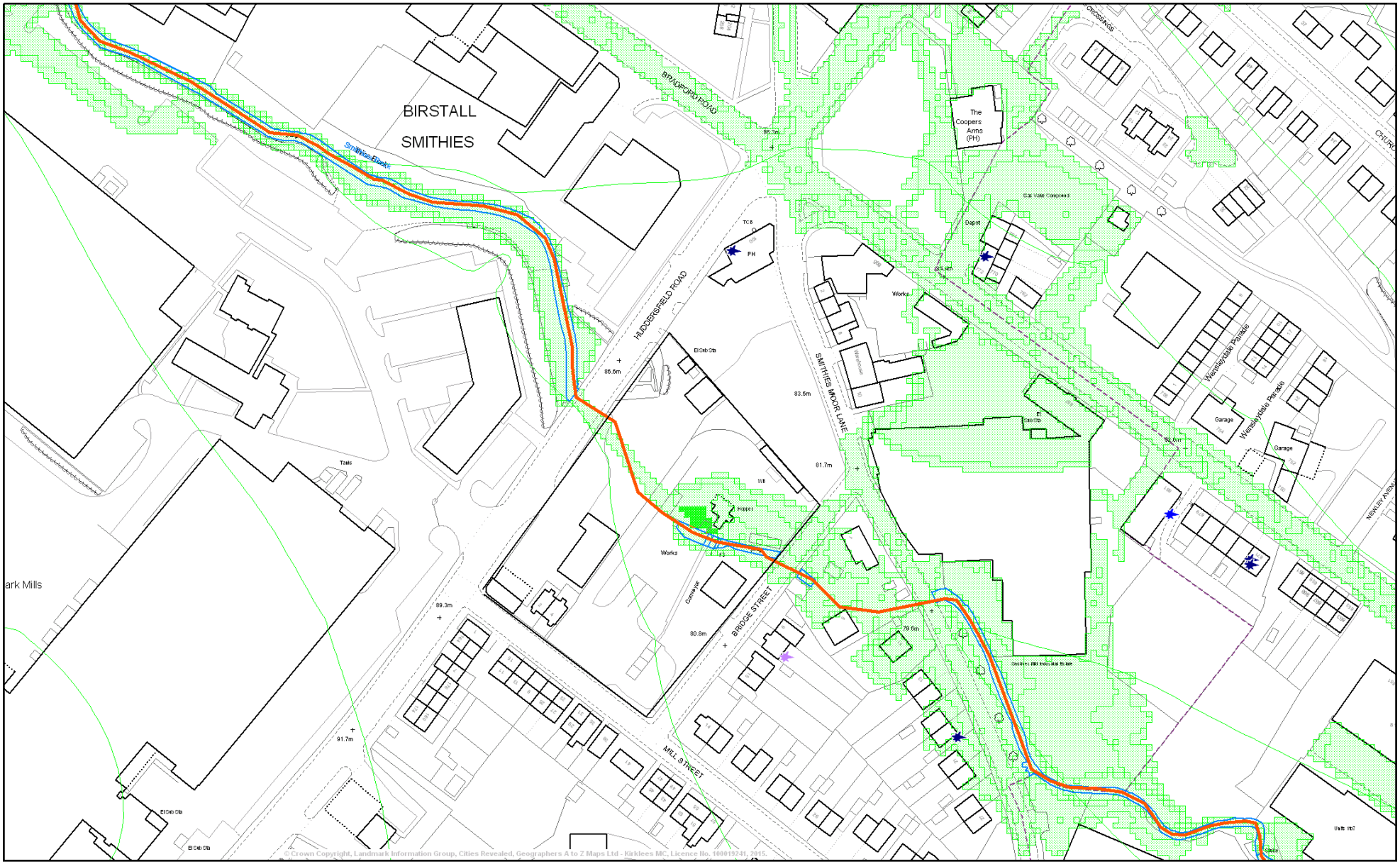
E-Mail: maps@kirklees.gov.uk

1, Bridge Street, Birstall, Batley, WF17 9AU, UPRN=83185417

0 m 20 m 40 m

Scale 1: 412

N W E S



Kirklees COUNCIL

Scale 1/1923

Centre = 422416 E 425808 N

Date 22/4/2015

N W E S

mayer brown
Mayer Brown Limited Lion House
Oriental Road Woking Surrey GU22 8AR
Telephone 01483 750 508 Fax 01483 750 437
wokingoffice@mayerbrown.co.uk www.mayerbrown.co.uk

client
CEMEX UK PROPERTIES

title
BATLEY MORTAR
1 IN 100 YEAR
SURFACE WATER FLOOD EXTENT

scale	1:500@A4	drawn by	NH	checked by	VBH
date	MAY 2016	cad file	FIGURE 1.DWG		

drawing number
BRBATLEY/FIGURE/1

rev.

mayer brown

Mayer Brown Limited Lion House
Oriental Road Woking Surrey GU22 8AR
Telephone 01483 750 508 Fax 01483 750 437
wokingoffice@mayerbrown.co.uk www.mayerbrown.co.uk

client
CEMEX UK PROPERTIES

title
BATLEY MORTAR
1 IN 1000 YEAR
SURFACE WATER FLOOD EXTENT

scale	1:500@A4	drawn by	NH	checked by	VBH
date	MAY 2016	cad file	FIGURE 2.DWG		

drawing number
BRBATLEY/FIGURE/2

rev.

APPENDIX D: Email Correspondence

From:	Paul Farndale
To:	Victoria Berg-Holdo
Cc:	Louise Clarke
Subject:	RE: Bridge Street, Birstall
Date:	23 May 2016 10:43:33
Attachments:	image001.jpg image003.jpg image005.jpg image006.gif image007.png image008.png 7428 P(0)04 rev A Proposed Site Sections.pdf 7428 P(0)01 rev B Proposed Site Layout.pdf

---

Hello Victoria,

Thanks for the latest submissions. I think if all plans are updated to reflect the new levels and Louise is ok with this for other factors apart from flood risk, then I would support the discharge of conditions.

We need to be clear that all other submitted drawings for whatever purpose are revised accordingly so we can clearly supersede previous ones. We can then verify these in our audit check when contractors commence on site.

Kind regards,

Paul Farndale
Principal Engineer
Flood Management & Drainage
Investment & Regeneration Service
Kirklees Council
01484 221000

From: Victoria Berg-Holdo [mailto:vberg-holdo@mayerbrown.co.uk]
Sent: 23 May 2016 08:26
To: Paul Farndale
Subject: FW: Bridge Street, Birstall

Hi Paul,

Please see attached. Hopefully the attachemnets work. Let me know if you have any trouble.

Thanks,

Vicki

Victoria Berg-Holdo,
Engineer

Mayer Brown Limited

T: 01483 750 508

Lion House
Oriental Road

Woking
Surrey

GU22 8AR

F: 01483 750 437

E: vberg-holdo@mayerbrown.co.uk

www.mayerbrown.co.uk

From: Victoria Berg-Holdo
Sent: 19 May 2016 14:42
To: 'Paul Farndale' <Paul.Farndale@kirklees.gov.uk>
Subject: FW: Bridge Street, Birstall

Hi Paul,

Sorry about the confusion again. Please find attached the correct revised long sections for the Batley mortar site. Please let me know your thoughts.

Many Thanks,

Vicki

From: Roy Wilson [mailto:roy.wilson@bowmanriley.com]
Sent: 19 May 2016 14:38
To: Victoria Berg-Holdo <vberg-holdo@mayerbrown.co.uk>
Subject: Bridge Street, Birstall

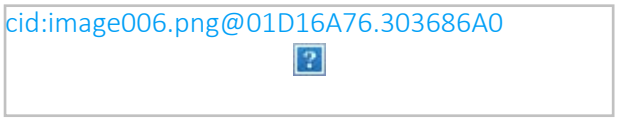
Hi Vicky

Please see attached amended drawings as discussed.

Kind regards

Roy Wilson BA Arch Dip Arch ARB
Architect

07718 523814 | 0203 728 6500 | **VCard download**



Leeds | **London** | Skipton | www.bowmanriley.com | facebook | twitter | linkedIn

From: Paul Farndale
To: Victoria Berg-Holdo
Cc: Louise Clarke
Subject: RE: Batley Mortar – Flood Risk Assessment Addendum
Date: 06 April 2016 10:04:46
Attachments: image001.png
image003.png
image004.jpg
image005.jpg
image006.jpg
image007.jpg
image009.jpg
image010.jpg
14141-103(P3) External Works APRIL MARKUP i.pdf

Hello Victoria,

I think this is where we will end up as there is little alternative.

It is as safe as we can get the properties and only the 1 in 1000 year event appears to be problematic judging by the mapping but I feel this maybe an over exaggeration given the levels in the main road to the north west.

We will of course need to know how this effects levels elsewhere on the site and just perhaps check with the EA as to whether there is an impact here for any main river figures, and any consideration the planning officer has for other issues

Perhaps a plan showing the changes in levels to be sent to Louise and myself. I've copied Louise in to this email.

Regards,

Paul Farndale
Principal Engineer
Flood Management & Drainage
Investment & Regeneration Service
Kirklees Council
01484 221000

From: Victoria Berg-Holdo [mailto:vberg-holdo@mayerbrown.co.uk]
Sent: 05 April 2016 16:48
To: Paul Farndale
Subject: FW: Batley Mortar – Flood Risk Assessment Addendum

Hi Paul,

I hope all is well with you. I have finally got hold of the Architects who said they could realistically raise the finished floor levels of those three properties to 81.55 mAOD (see attached) which is slightly less than 81.6 mAOD. I just wondered what your thoughts were?

Many Thanks

Vicki

From: Roy Wilson [mailto:roy.wilson@bowmanriley.com]
Sent: 05 April 2016 16:37
To: Victoria Berg-Holdo <vberg-holdo@mayerbrown.co.uk>
Subject: FW: Batley Mortar – Flood Risk Assessment Addendum

Hi Vicki

Please see below and attached.

Kind regards

Roy Wilson BA Arch Dip Arch ARB
Architect

07718 523814 | 0203 728 6500 | **VCard download**

cid:image006.png@01D16A76.303686A0

From: Andy Walker [mailto:Andy.Walker@Dudleys.org.uk]
Sent: 05 April 2016 16:31
To: Roy Wilson
Subject: RE: Batley Mortar – Flood Risk Assessment Addendum

Roy,

RE: Batley Mortar

In principle, the details attached are what I think could be achieved in level terms to the northern units with adopted highways and acceptable levels.

Regards

Andy Walker

E: andy.walker@dudleys.org.uk
T: 0113 258 3611 **M:** 07812 370 363
P: Tithe House 35 Town Street Leeds LS18 5LJ
W: www.dudleys.org.uk

From: Roy Wilson [mailto:roy.wilson@bowmanriley.com]
Sent: 04 April 2016 17:57
To: Andy Walker
Subject: FW: Batley Mortar – Flood Risk Assessment Addendum

Hi Andy

Please see below.

I would be grateful if we could discuss once you have had chance to have a look.

Kind regards

Roy Wilson BA Arch Dip Arch ARB
Architect

07718 523814 | 0203 728 6500 | **VCard download**

From: Victoria Berg-Holdo [mailto:vberg-holdo@mayerbrown.co.uk]
Sent: 01 April 2016 17:06
To: Roy Wilson
Subject: Batley Mortar – Flood Risk Assessment Addendum

Hi Roy,

I hope all is well with you and that you had a nice Easter weekend. I have been discussing the development with Paul Farndale from Kirklees council today. Figure 1 below shows in green the revised 1 in 100 year surface water flood extent. As you can see the three properties to the north of the site (circled in purple) are at risk of flooding in the 1 in 100 event. The surface water depths will range between 1500mm-300mm. Kirklees council would like the finished floor levels of these properties to be raised to 81.6 m AOD. I wondered if this would be achievable for you and if not how realistically could you raise the finished floor levels of these properties?

Additionally it is my understanding that the ground levels on the development site will be changing. If this is correct can you send me the proposed site ground levels.

Many thanks,

Vicki

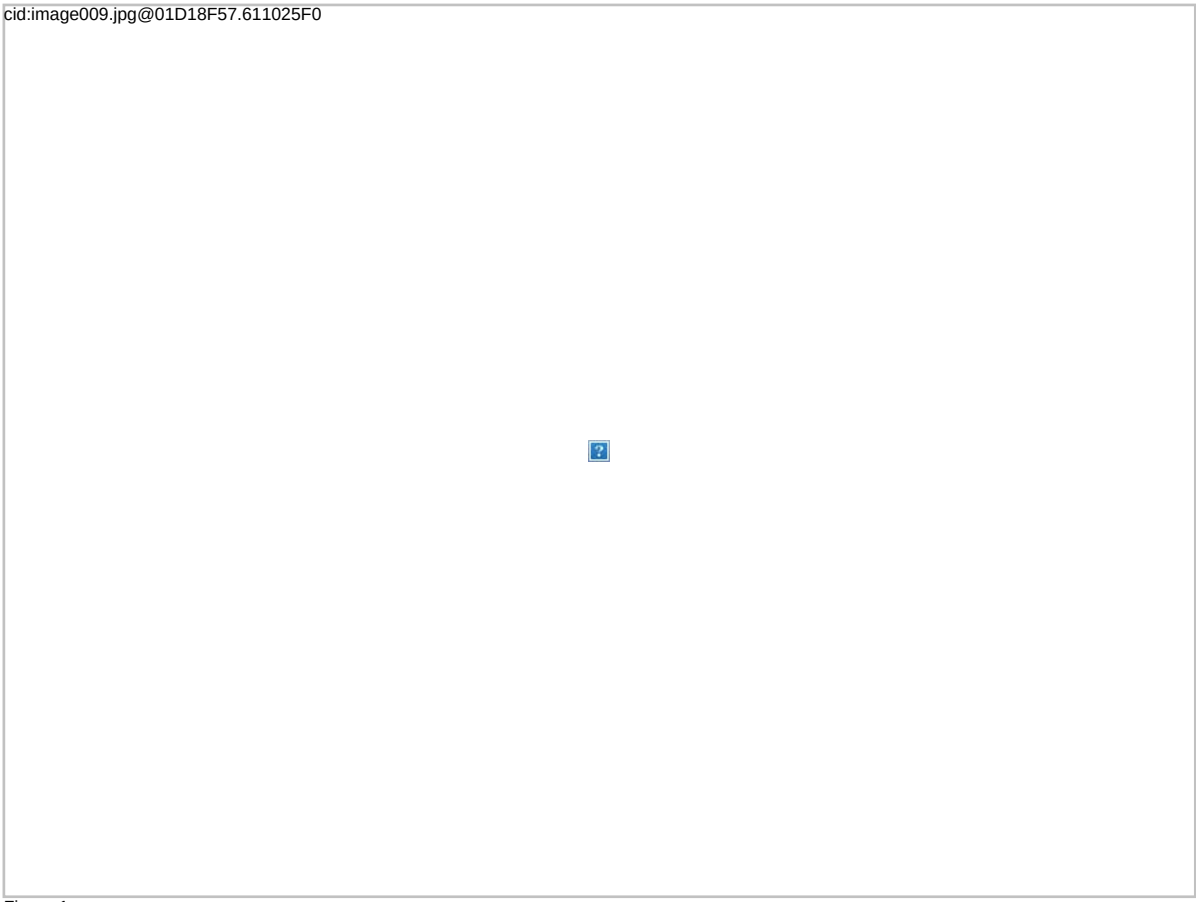


Figure 1

Victoria Berg-Holdo,
Engineer

Mayer Brown Limited
Lion House
Oriental Road

Woking
Surrey

GU22 8AR

T: 01483 750 508
F: 01483 750 437

E: vberg-holdo@mayerbrown.co.uk

www.mayerbrown.co.uk

Mayer Brown ISO9001 RoSPA

This e-mail has been scanned for all viruses by Star. The service is powered by MessageLabs. For more information on a proactive anti-virus service working around the clock, around the globe, visit: http://www.star.net.uk

---

This e-mail has been scanned for all viruses by Star. The
service is powered by MessageLabs. For more information on a proactive
anti-virus service working around the clock, around the globe, visit:
http://www.star.net.uk