



CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

ENVIRONMENT - WATER
LOCK STREET, DEWSBURY
FLOOD RISK ASSESSMENT



ENVIRONMENT – WATER

LOCK STREET
 DEWSBURY

FLOOD RISK ASSESSMENT

Birmingham
 Livery Place, 35 Livery Street, Colmore
 Business District, Birmingham, B3 2PB
 T: 0121 233 3322

Leeds
 Whitehall Waterfront, 2 Riverside Way, Leeds
 LS1 4EH
 T: 0113 233 8000




London
 15 Weller Street, London, SE1 1QU
 T: 020 7234 9122

Manchester
 4th Floor Carvers Warehouse, 77 Dale Street
 Manchester, M1 2HG
 T: 0161 233 4260

Nottingham
 Waterfront House, Station Street,
 Nottingham NG2 3DQ
 T: 0115 924 1100

E – FloodRisk@bwiconsulting.com

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AUTHOR:	Darren Stewart BSc (Hons)	
CHECKED:	Darren Harvey BEng (Hons)	
APPROVED:	Tony Goodchild BEng (Hons)	
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REVISION STATUS

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- (ii) The date on which the final report is delivered*

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The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Technical Guidance (March, 2012). It has been produced on behalf of Blackmores in respect of a residential development at Lock Street, Dewsbury, North Yorkshire (approximate grid reference: SE248200).

This report demonstrates that the proposed development is not at significant flood risk, subject to the recommended flood mitigation strategies being implemented.

The report has considered other sources of flood risk and none are considered to be significant, some simple mitigation is proposed to address any minor residual risk which may remain.

A sustainable drainage strategy is proposed which will limit discharge from the site to less than the existing rate and up to approximately 808m³ of attenuation storage may be required for this purpose.

In compliance with the requirements of National Planning Policy Framework, and subject to the mitigation measures proposed, the development may proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

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1.0 INTRODUCTION

Summary Information

- 1.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Technical Guidance (March, 2012). The FRA has been produced on behalf of Blackmores in respect of development at Lock Street, Dewsbury.

Site Name	Lock Street
Location	Dewsbury, North Yorkshire
NGR (approx.)	SE252200
Application Site Area (Ha)	Approximately 2.7 Hectares
Development Type	Residential
NPPF Vulnerability	More Vulnerable
EA Flood Zone	Flood Zone 1
EA Office	North East - Yorkshire
Local Planning Authority	Kirklees Metropolitan Council

Table 1.1 – Site Summary

Sources of Data

- 1.2 The report is based on the following information:
- (i) Site Layout Plan – calderpeel 11031(Fe)001
 - (ii) Topographical Survey- Paragon Surveys PS-0671-TS
 - (iii) OS Explorer Series mapping
 - (iv) Environment Agency consultation and model information
 - (v) Yorkshire Water Sewer Records
 - (vi) Local Press Flood Reports / Anecdotal Evidence
 - (vii) British Geological Survey Drift & Geology Maps

Existing Site

- 1.3 The site is located south of Lock Street in Dewsbury as shown in **Figure 1.1** overleaf and was previously developed as a scrap yard.
- 1.4 The site is bound to the north by Lock Street, beyond Lock Street to the north there is a railway line and to the south of the development the Calder and Hebble Navigation Long Cut. A disused railway embankment is present to the west and beyond that there is existing residential development.

- 1.5 Elevations on site typically fall from the west to the east with a low point of around 41.15m AOD in the vicinity of Lock Street and a high of around 48.0m AOD near to the canal. There is a substantial embankment near the canal and the elevation drops from circa 46m AOD on site to 38m AOD near the canal typically levels across the bulk of the site vary from 43.30m AOD to 49.00m AOD.
- 1.6 There are a number of buildings on site and the majority of the surfacing is believed to be rough ground and hardcore.
- 1.7 A review of available public literature suggests that the site may overlay coal measures incorporating mudstone, siltstone and sandstone. An outcrop of Emley Rock Sandstone may also be present. Borehole records for the general area suggest that permeable soils may be present.

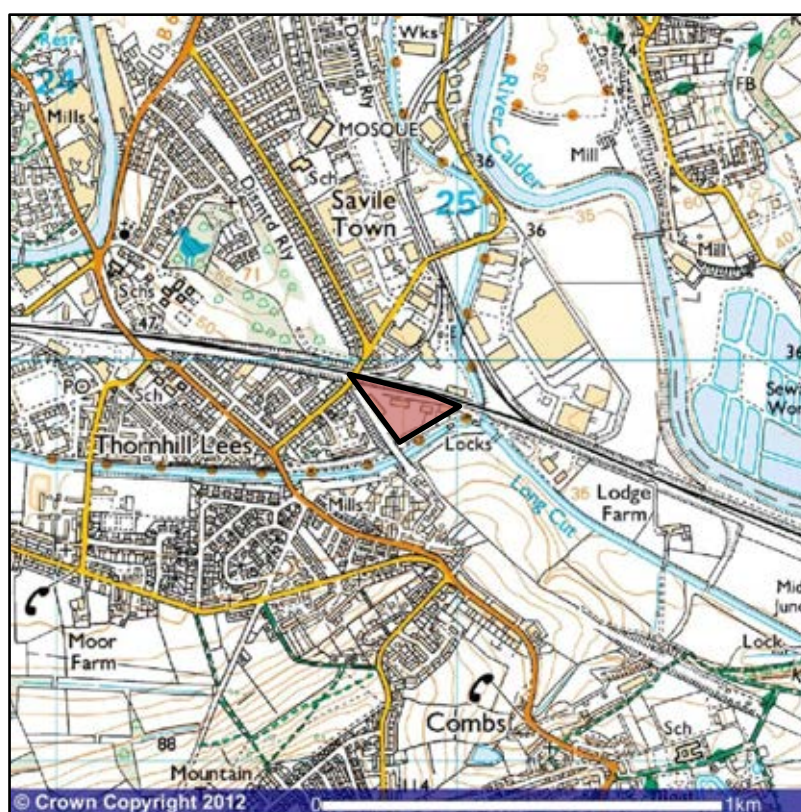


Figure 1.1 – Site Location

Proposed Development

- 1.8 The development proposals are for a residential development of approximately 109 properties together with associated landscaping, access ways and car parks. Proposals are outline however a development proposal plan has been produced and is included as **Appendix B**.

Flood Risk Planning Policy

National Planning Policy Framework

- 1.9 The NPPF¹ sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. A supporting Technical Guidance document is also available².
- 1.10 The NPPF Technical Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible, and stresses the importance of preventing increases in flood risk off site to the wider catchment area.
- 1.11 The Technical Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.
- 1.12 This Flood Risk Assessment is written in accordance with the NPPF.

NPPF Flood Zones

- 1.13 Flood Zone mapping prepared by the Environment Agency identifies areas potentially at risk of flooding from fluvial or tidal sources without taking into account the presence of flood defences or structures such as culverts or minor watercourses. An extract from the mapping is included as **Figure 1.2**.

¹ National Planning Policy Framework, CLG, March 2012

² Technical Guidance to the National Planning Policy Framework, CLG, March 2012

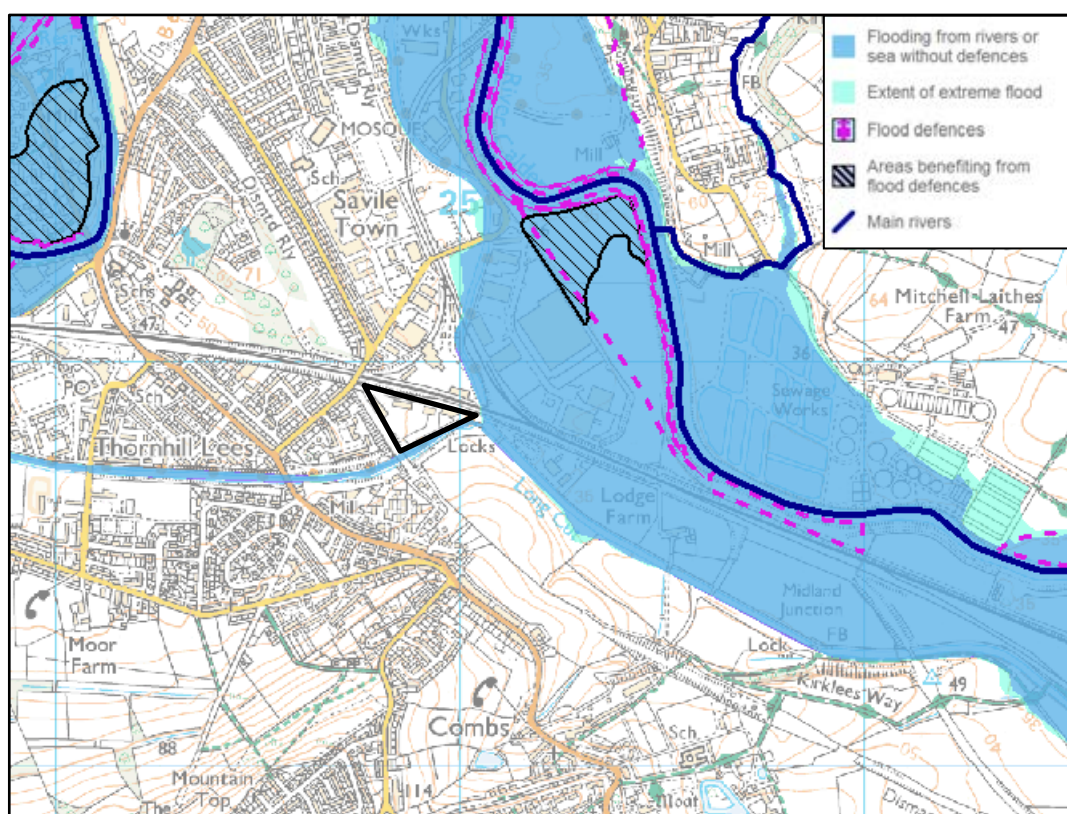


Figure 1.2 – Environment Agency Flood Zone Mapping

- 1.14 The Environment Agency Flood Zone mapping shows the site to be entirely located within Flood Zone 1 and is not affected by any modelled watercourse.
- 1.15 The NPPF also defines and 2 (Medium Probability) and 3a (High Probability). These zones are identified as land assessed as having between a 1 in 100 year and a 1 in 1000-year annual probability of river/tidal flooding and land assessed as having more than 1 in 100-year annual probability of river flooding respectively.
- 1.16 Whilst the entirety of the site is considered to lie within Flood Zone 1 it is clear that the site is adjacent to a substantial element of Flood Zone 3a.

Other Relevant Policy and Guidance

Strategic Flood Risk Assessment

- 1.17 Calderdale and Kirklees Metropolitan Borough Council, and the City of Wakefield Metropolitan District Council Strategic Flood Risk Assessment (SFRA) was produced by JBA consulting in November 2008 and covers the general area of the site.

2.0 SOURCES OF FLOOD RISK

2.1 The table below identifies the potential sources of flood risk to the site and the proposed development, as well as the impacts which the development could have in the wider catchment. These are discussed in greater detail in the forthcoming section, and Section 3.0 explains the mitigation measures proposed to address flood risk and ensure the development is appropriate for its location.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial			X		River Calder nearby
Tidal				X	Not impacted by tides
Canals			X		Calder and Hebble Navigation – Long Cut and Dewsbury Cut
Groundwater			X		No known history
Reservoirs and waterbodies				X	No significant waterbodies nearby
Sewers			X		Sewers serving nearby developed areas
Pluvial runoff			X		Land to the north of the site
Effect of Development on Wider Catchment		X			Development could lead to increase in impermeable area and runoff rates.

Table 2.1 – Potential Sources of Flood Risk

Fluvial Flood Risk

Main Rivers

- 2.2 The River Calder is located to the east of the development at a distance of around 500m.
- 2.3 The Environment Agency were consulted and initially indicated that the site was in Flood Zone 1 and no levels were available. As a further check they were re-consulted and flood levels along the River Calder were obtained. Communication is included in **Appendix C**.

- 2.4 Levels were provided for a variety of return period events along the Calder, the nearest node to the development is considered to be CALD07_4750 and the level associated with this node in the 1:1000 year event is reported to be 36.84m AOD with the 1:100+CC event 35.94m AOD.
- 2.5 Inspection of the topographical survey of the site shows that this flood level is substantially lower than the lowest elevation of the site. Accordingly the risk associated with the River Calder is not considered to be significant.

Minor Watercourses

- 2.6 No significant minor watercourses are recorded on the OS mapping for the area that lie within the vicinity of the site. Some minor land drainage ditches are present to the south but are separated from the site by the Calder and Hebble Canal and are not considered to present a risk.

Flood Risk from Reservoirs/Waterbodies

- 2.7 Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide. An extract from the mapping is included as **Figure 2.1**.

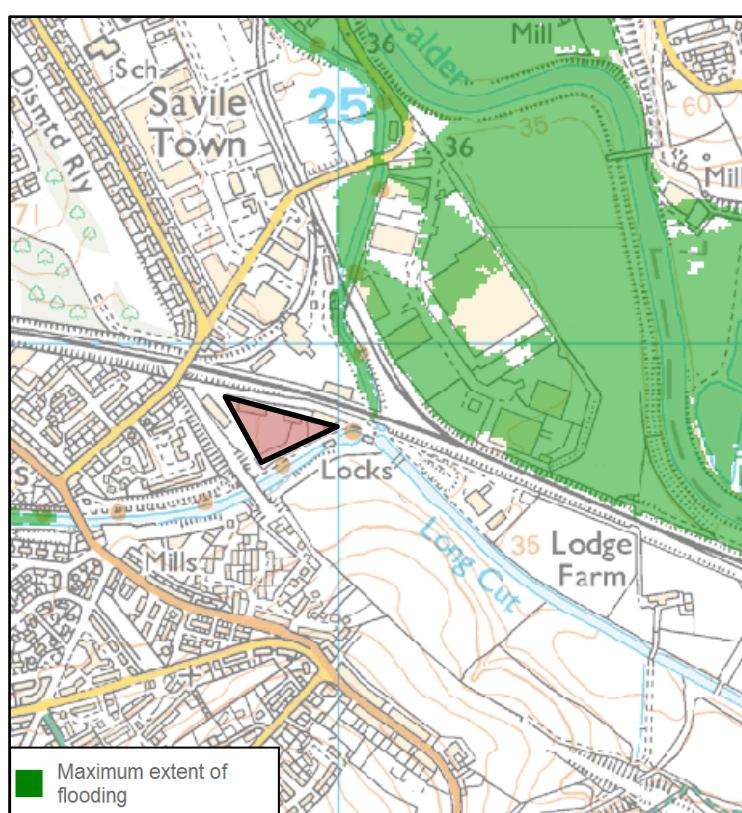


Figure 2.1 – EA Reservoir Failure Flood Risk Map

- 2.8 As can be seen from the reservoir failure map, the site is not considered to be at risk from reservoirs.

Flood Risk from Sewers

- 2.9 The site is situated in the southern part of Dewsbury and the east of Thornhill Leys. Sewer records have been obtained from Yorkshire Water and are included as **Appendix D**. Kirklees Metropolitan Borough council have been approached and advised that they are not aware of any culverted watercourse or substantial private drainage in the area that could give rise to a significant flood risk, their comments are included as **Appendix E**.
- 2.10 The records provided show a network of combined sewers to the west of the development but they are separated from the site by the abandoned railway embankment. The railway embankment provides protection from any flood risk associated with these sewers and accordingly the flood risk is considered negligible.
- 2.11 It can be reasoned that some privately maintained surface water or public highway drainage may be present in Lock Street. However any drainage is likely to be of small diameter and unlikely to present a flood risk to the development.

Pluvial Flood Risk

- 2.12 The site is generally protected on all sides by the canal, existing railway embankment and disused embankment, accordingly any risk is considered minimal.

Flood Risk from Canals

- 2.13 The Canal and River Trust has been consulted and report no incidences of flooding from the canal adjacent to the site although some overtopping of the towpath near the railway bridge is reported. The canal is located at the lower extent of the site and a water level of 37.69m is recorded in on the survey this is substantially lower than the general levels on site and as such there is not considered to be a significant flood risk from this source.

Groundwater Flood Risk

- 2.14 There is no history of groundwater flood risk associated with the development and we have not been made aware of any particular concerns during our investigations.
- 2.15 Geological mapping show the site to lie on soils which may be permeable in nature. However intrusive investigation has indicated that the permeability of the underlying geology is less than was anticipated and no groundwater was found during the investigation. Accordingly the development is not thought to be at a significant risk of groundwater flooding.
- 2.16 Nevertheless the area is known for its mining history and the risk of groundwater flooding cannot be ruled out entirely and it is recommended that simple mitigation should be incorporated into the design of the development to manage the residual risk.

Effect of Development on Wider Catchment

Development Drainage

- 2.17 The proposed development will introduce an increase in impermeable area across the development area and this increase may result in an increased rate of runoff to the wider environment. This risk must be managed if the development is to proceed without causing an undue increase in flood risk to the wider environment.

3.0 FLOOD RISK MITIGATION

- 3.1 Section 2.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Site Arrangements

Finished Levels

- 3.2 No specific flood risks are known to exist and most have been largely ruled out. Only risk from groundwater cannot be discounted entirely and it is suggested that building finished floor levels are maintained above external ground levels where possible to limit this residual risk.
- 3.3 No specific risks have been identified within the assessment associated with sewer, groundwater or pluvial based risks. However risk cannot always be ruled out entirely and it would be prudent to arrange external levels so as to divert any exceedance flows away from building entrances.

4.0 OUTLINE SURFACE WATER DRAINAGE ASSESSMENT

Existing Site Runoff

- 4.1 The existing site is partially developed and impermeable across a reasonable percentage of the site. However the external areas are not thought to be formally drained and conservatively it is suggested that the existing runoff calculations are progressed on the basis that only the existing roofs are formally drained.
- 4.2 An impermeable area analysis has been carried out and is included as **Appendix F**. Approximately 3,190m² of the existing site is currently impermeably developed and a calculation can be made to assess the runoff by the Rational Method as follows: -

$$Q = 2.78Ai$$

- 4.3 The rainfall intensity used in the rational method calculation has been extracted from Microdrainage Windes software using the FEH rainfall model calculated based upon catchment descriptors extracted from the FEH CD-ROM. The results are summarised below in **Table 4.1**.

Return Period (Yrs.)	Rainfall Rate (mm/hr.)	Existing Discharge Rate (l/s)
2	32	28.4
30	81	71.8
100	122	108.2

Table 4.1 – Existing Discharge Rates

Proposed Site Runoff

- 4.4 The potential use of soakaways has been investigated and has been deemed to have limited potential due to the nature on the underlying geology. In the absence of suitable soakaway facilities, discharge priorities should be in accordance with the Building Regulations Approved Document H and the next most preferable point of discharge would be to a suitable watercourse. In this instance no watercourse is available in the vicinity of the site and it is recommended that discharge is either to the canal by agreement with the canal operators or to existing points of connection presumed to be to the public sewerage system.
- 4.5 Proposals for the site layout have not yet been fixed, however it can be assumed that impermeable development will not exceed 60% when taking into account gardens and public open space. Accordingly it is likely that the development will be impermeably surfaced across approximately 1.75 hectares.
- 4.6 It is recommended that discharge from the proposed development is restricted to the existing surface water runoff rate less an allowance of 20% to provide an element of betterment when measured against the existing situation and

accordingly discharge should be restricted to 22.72, 57.44 and 86.56 l/s in the 1:2, 1:30 and 1:100 year events respectively.

- 4.7 In order to attenuate flows to the proposed rates, storage will be required on site. Microdrainage Windes Quick Storage Module has been used to calculate the volumes that will be required. Results are summarised below in **Table 4.2** and screenshots of the calculations are included as **Appendix G**. Calculations have been carried out for all return periods up to the 1:100 year event plus an additional allowance of 30% for climate change which is considered appropriate given the anticipated lifetime of the development.

Return Period (Yrs.)	Runoff Rate (l/s)		Storage Volume Required (m ³)
	Existing	Proposed	
2	28.4	22.72	116-220
30	71.8	57.44	250-415
100	108.2	86.56	367-568
100+CC	108.2	86.56	524-808

Table 4.2 – Attenuation Volumes

- 4.8 Based upon the above calculations up to 808m³ of storage could be required to attenuate the flows to predevelopment levels less 20%.
- 4.9 It is recommended that the storage is provided in an appropriate SuDS treatment train which includes above ground storage elements such as ponds and swales where practical. Some element of the storage may be retained below ground if required, typically the 30 year event volume, could be contained in the below ground adopted drainage network.

5.0 SEQUENTIAL TEST AND EXCEPTION TEST

- 5.1 The Sequential Test is a risk-based application intended to direct new development to areas of lowest possible flood risk, and ensuring development is located within an appropriate Flood Zone. This is done by classifying land use according to its vulnerability to the potential impacts of flooding.

Sequential Test

- 5.2 The Flood Zone maps in **Figure 1.2** identify the site as falling entirely within Flood Zone 1 (Low Probability), and the development proposals will remain in this Flood Zone 1.
- 5.3 As all forms of development are deemed appropriate from a flood risk perspective within this Flood Zone, the Sequential Test can be deemed passed and the Exception Test is not required.

6.0 CONCLUSIONS AND RECOMMENDATIONS

- 6.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Technical Guidance (March, 2012). The FRA has been produced on behalf of Blackmores in respect of a planning application for a residential development of Lock Street, Dewsbury.
- 6.2 This report demonstrates that the proposed development is not at significant flood risk, subject to the recommended flood mitigation strategies being implemented. The identified risks and mitigation measures are summarised within **Table 6.1**:

Flood Source	Risk	Proposed Mitigation Measure
Groundwater	Low	No known risk but cannot be ruled out entirely. Simple mitigation in the form of elevated finished floor levels and carefully arranged external levels are recommended to manage the residual risk.
Impact of the Development	Medium	<p>A 20% reduction in outflow from the site, and a proposed 100-year plus climate change drainage design standard provides betterment and reduces any strain on the receiving pipe network in the wider catchment.</p> <p>It is recommended that discharge from the site be made to the Existing drainage outfalls or to the nearby canal and up to 808m³ of attenuation may be required in order to facilitate the outfall.</p> <p>It is recommended that maximum use is made of the opportunity to incorporate above ground SuDS within the drainage and attenuation system wherever practical.</p>

Table 6.1 - Summary of FRA

- 6.3 In compliance with the requirements of National Planning Policy Framework, and subject to the mitigation measures proposed, the development may proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

APPENDIX A

Topographical Survey

APPENDIX B

Proposed Development



schedule of accommodation

Mews Houses @ 860 sqft -	23
Mews Houses @ 920 sqft -	18
Semi detached @ 980 sqft -	21
Semi detached @ 1,100 sq.ft -	28
Semi detached @ 1,220 sq.ft -	15
Detached houses @ 1,450 sq.ft -	4

Total Units 109

APPENDIX C

Environment Agency Correspondence

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

Important

If you have requested this information to help inform a development proposal, then you should note the following:

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice and PPS25 and its associated 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/pps25floodrisk>

<http://www.communities.gov.uk/publications/planningandbuilding/pps25practiceguide>

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/topics/planning/policy/tans/tan15?lang=en>

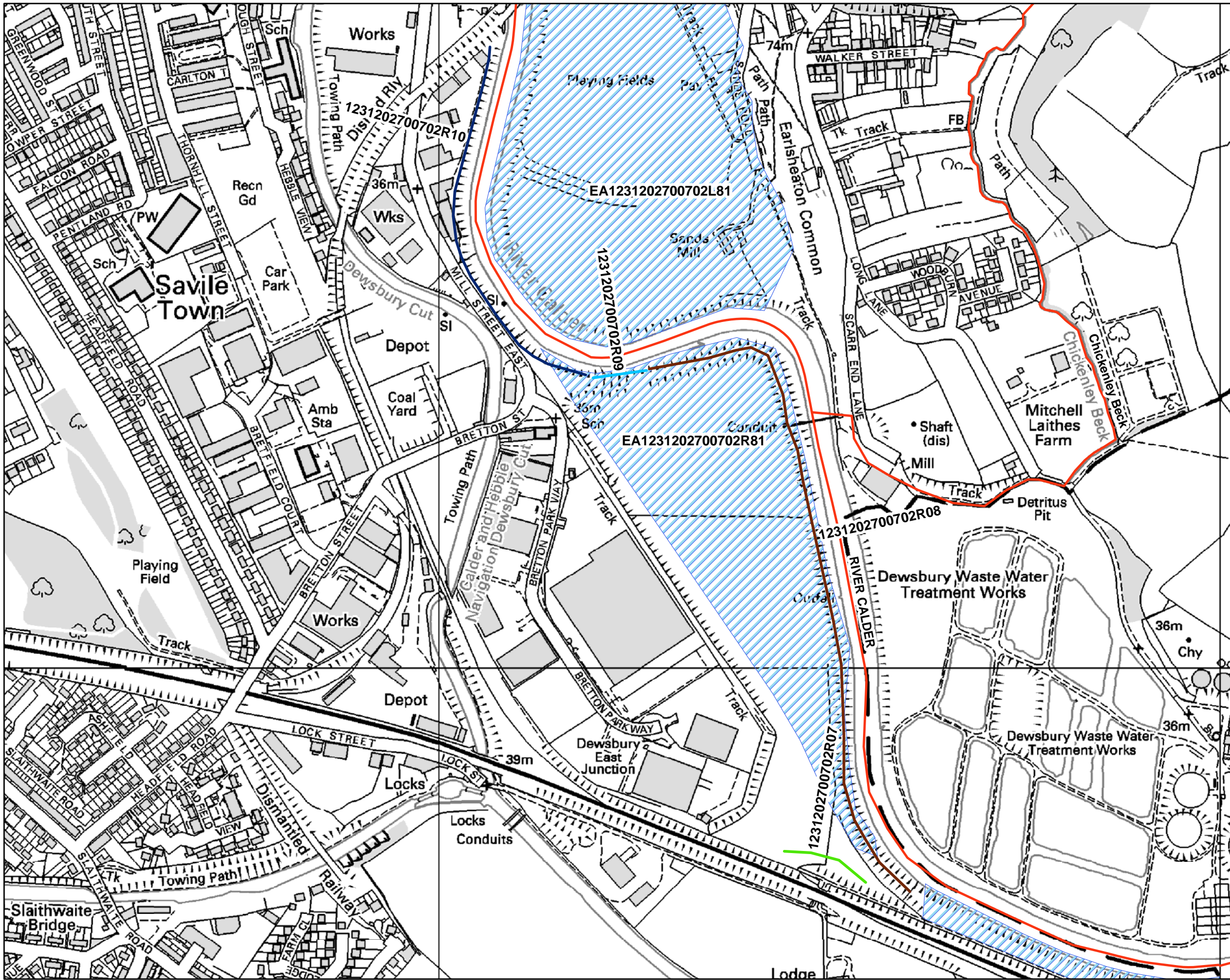
You should also refer to any Strategic Flood Consequence Assessment produced by your local planning authority.

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 or flood 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 the local planning authority.

RFI/2012/23257
Assets Descriptions

Asset Reference	Asset Type	Asset Description	Asset Location	Maintainer	Overall Condition	Actual Upstream Crest Level	Actual Downstream Crest Level
1231202700702R10	raised defence (man-made)	FLOODBANK - query data and maintainer	Mill Street East	Environment Agency	3	39.93	36.48
1231202700702R09	raised defence (man-made)	SPILLWAY IN EMBANKMENT	Off Bretton Street - EARLSHEATON	Environment Agency	2	36.86	35.76
1231202700702R08	raised defence (man-made)	FLOODBANK	Off Bretton Street - to opposite Dewsbury STW	Environment Agency	2	35.19	35.38
1231202700702R07	maintained channel	SHORT EMBANKMENT	Between Lodge Farm and Dewsbury Waste Water Treatment works	private	3	36.54	36.61



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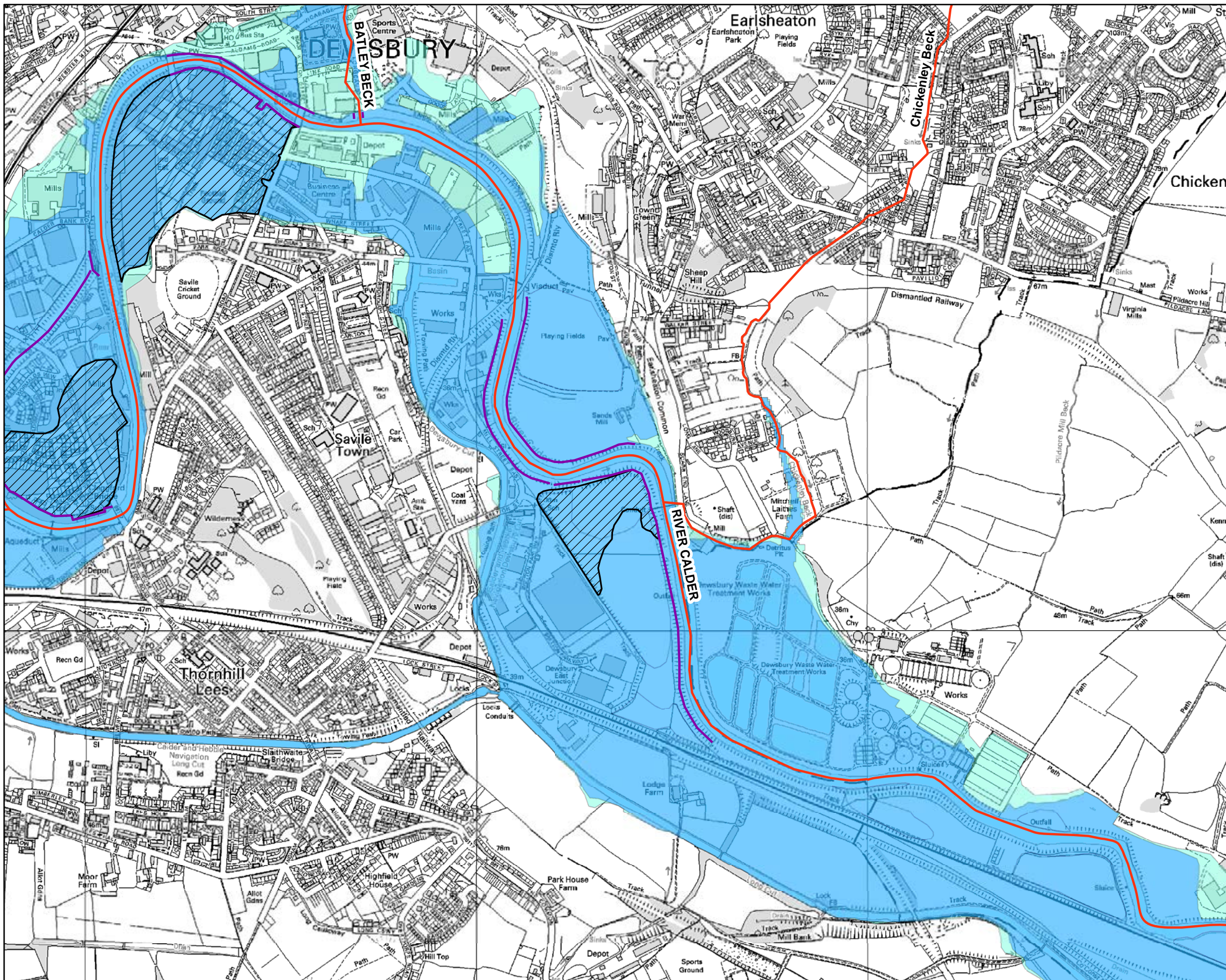
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LEGEND

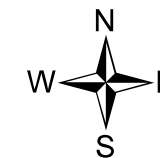
- Main River
- Defences**
- 1231202700702R07
- 1231202700702R08
- 1231202700702R09
- 1231202700702R10
- Flood Storage Areas

Flood Map centered on Lock Street, Dewsbury - Date Created: 27/09/2012 [Ref: 23257]



www.environment-agency.gov.uk

Scale: 1:10,000



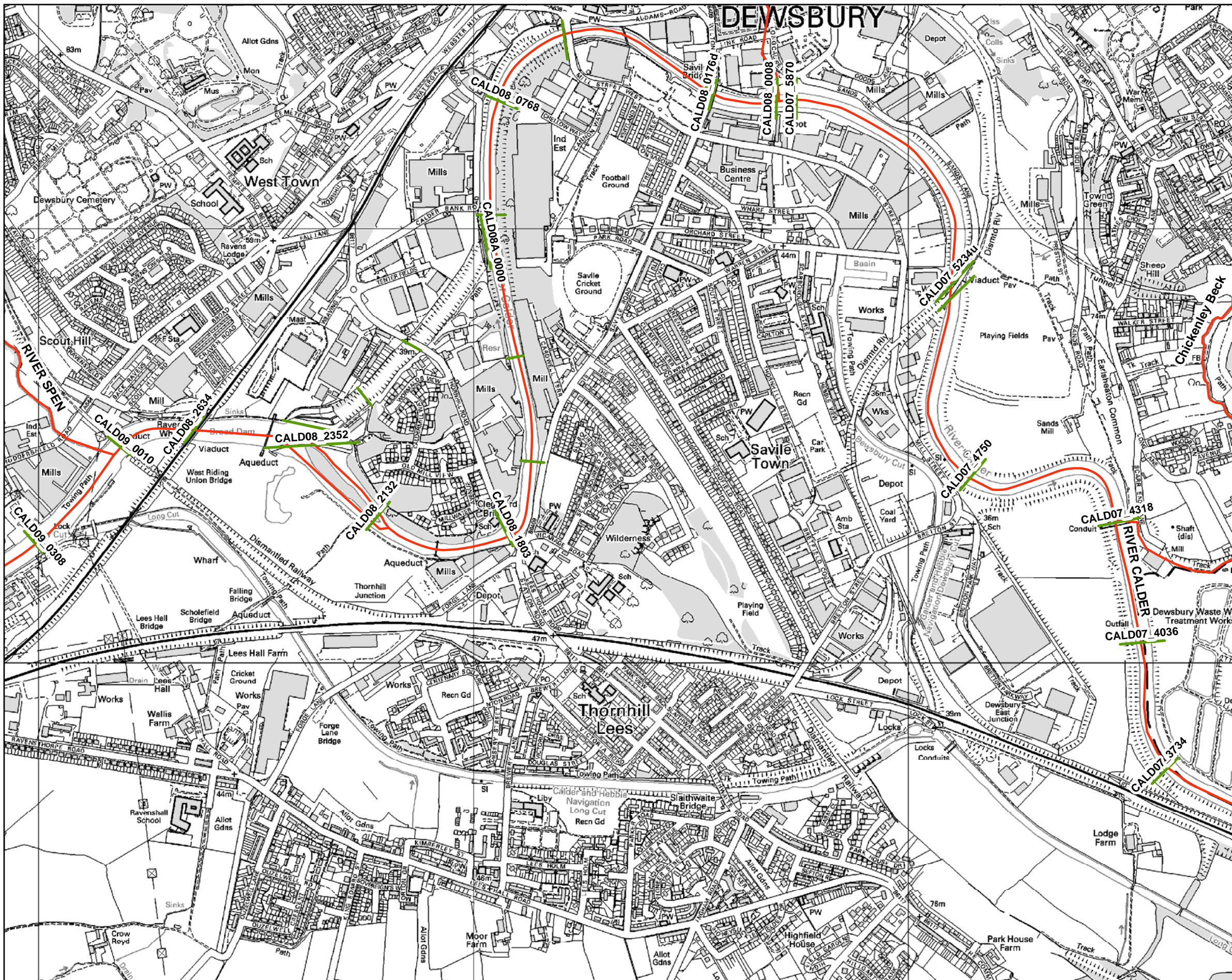
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LEGEND

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

Cross Sections Location Map centered on Lock Street, Deswbury - Date: 01/10/2012 [Ref: 23257]



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LEGEND

- Main River
- Cross Sections

2011 Calder Tabulated Model Results

Label	10% annual probability		4% annual probability		2% annual probability		1.33% annual		1% annual probability		0.5% annual probability		1% + climate change		0.1% annual probability	
	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage	Flow	Max Stage
CALD09_0308	330.19	39.75	373.96	40.03	409.98	40.23	432.03	40.35	448.92	40.45	494.93	40.72	527.18	40.89	797.08	42.16
CALD09_0010u	330.19	39.36	373.97	39.59	409.95	39.78	432.02	39.89	448.82	39.98	494.57	40.21	526.63	40.37	795.22	41.57
CALD09_0010c	339.29	39.36	383.77	39.59	419.71	39.78	442.10	39.89	458.89	39.98	503.58	40.21	536.21	40.37	808.02	41.57
CALD08_2634u	339.28	39.13	383.72	39.33	419.67	39.48	442.06	39.58	458.84	39.66	503.54	39.86	536.11	40.00	807.90	41.07
CALD08_2634c	339.28	39.10	383.72	39.28	419.67	39.43	442.06	39.52	458.84	39.60	503.54	39.79	536.11	39.93	807.90	40.96
CALD08_2360u	339.24	38.55	383.69	38.65	419.64	38.73	442.00	38.78	458.77	38.83	503.46	38.99	536.01	39.10	807.79	39.98
CALD08_2360c	291.22	38.55	313.82	38.65	330.84	38.73	341.00	38.78	354.56	38.83	390.15	38.99	416.68	39.10	638.28	39.98
CALD08_2352	291.21	38.55	313.82	38.65	330.83	38.72	341.00	38.78	354.56	38.83	390.15	38.99	416.67	39.10	638.09	39.98
CALD08_2352c	291.21	38.50	313.82	38.61	330.83	38.69	341.00	38.75	354.56	38.81	390.15	38.97	416.67	39.09	638.09	39.97
CALD08_2132u	290.23	37.93	313.01	38.14	330.19	38.26	340.40	38.34	353.79	38.41	389.40	38.59	415.64	38.71	635.21	39.50
CALD08_2132c	290.31	37.93	313.10	38.14	330.29	38.26	340.51	38.34	353.90	38.41	389.52	38.59	415.77	38.71	635.39	39.50
CALD08_1803u	287.93	37.74	311.22	37.98	328.60	38.13	339.00	38.21	352.23	38.30	387.50	38.51	412.91	38.65	635.00	39.55
CALD08_1803c	288.02	37.65	311.33	37.90	328.72	38.06	339.13	38.15	352.36	38.24	387.64	38.46	413.06	38.60	635.23	39.53
CALD08_1611	287.64	37.45	311.01	37.71	328.34	37.87	338.82	37.97	352.08	38.05	387.11	38.29	412.43	38.44	633.26	39.44
CALD08_1366	287.14	37.29	310.68	37.57	327.98	37.74	338.56	37.85	351.90	37.93	386.77	38.17	412.12	38.32	642.69	39.32
CALD08_1366c	286.57	37.02	310.29	37.33	327.60	37.53	338.30	37.65	351.78	37.73	386.56	37.98	411.95	38.14	639.57	39.18
CALD08_1033	334.82	37.02	380.41	37.33	416.47	37.53	438.48	37.65	455.68	37.73	499.53	37.98	530.87	38.14	800.49	39.18
CALD08_0768	334.64	36.80	380.34	37.11	416.39	37.31	438.41	37.42	455.66	37.50	499.49	37.75	530.83	37.90	806.58	38.97
CALD08_0544u	334.52	36.55	380.28	36.85	416.37	37.03	438.36	37.13	455.65	37.19	499.46	37.43	530.80	37.56	803.90	38.48
CALD08_0544c	334.52	36.55	380.28	36.85	416.37	37.02	438.36	37.12	455.65	37.19	499.46	37.42	530.80	37.55	803.90	38.42
CALD08_0176u	334.46	36.44	380.25	36.73	416.35	36.90	438.34	36.99	455.64	37.05	499.44	37.28	530.79	37.40	802.91	38.22
CALD08_0176c	334.46	36.41	380.25	36.69	416.35	36.84	438.34	36.92	455.64	36.97	499.44	37.13	530.79	37.23	802.91	38.18
CALD08_0008	334.37	36.31	380.20	36.59	416.33	36.73	438.31	36.80	455.63	36.85	499.43	36.95	530.70	37.01	898.28	37.89
CALD08_0008c	336.41	36.31	382.42	36.59	418.68	36.73	440.79	36.80	458.19	36.85	502.17	36.95	533.63	37.01	902.77	37.89
CALD07_5870	336.37	36.33	382.40	36.61	418.67	36.76	440.77	36.84	458.19	36.89	502.17	37.00	533.62	37.06	860.25	37.82
CALD07_5234u	335.89	35.68	381.91	35.93	417.90	36.09	439.89	36.18	457.43	36.25	501.31	36.41	532.35	36.52	800.11	37.32
CALD07_5234c	335.89	35.66	381.91	35.92	417.90	36.08	439.89	36.17	457.43	36.24	501.31	36.39	532.35	36.49	800.11	37.25
CALD07_4750	334.46	35.32	379.92	35.62	415.90	35.82	437.75	35.93	455.59	36.01	499.68	36.18	530.29	36.28	795.86	37.08
CALD07_4318	333.72	35.05	378.70	35.33	414.45	35.51	435.85	35.63	453.56	35.72	497.67	35.92	527.89	36.04	792.18	36.91
CALD07_4036u	333.19	34.94	378.32	35.21	413.85	35.41	435.00	35.52	452.54	35.61	496.31	35.82	526.37	35.94	789.98	36.84
CALD07_4036c	333.43	34.94	378.59	35.21	414.15	35.41	435.32	35.52	452.87	35.61	496.66	35.82	526.74	35.94	790.53	36.84

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APPENDIX D

Yorkshire Water Sewer Records



YorkshireWater

BWB Consulting Limited
 5th Floor
 Waterfront House
 Station Street
 Nottingham
 NG2 3DQ

FAO Mr Jack Pickering

Your Ref:
 Our Ref: N011912

BWB CONSULTING LTD	
RECD 03 SEP 2012	
TO SEE	SEEN
JP	

Yorkshire Water Services
 Developer Services
 Sewerage Technical Team
 PO BOX 52
 Bradford
 BD3 7AY

Tel: 0845 120 8482
 Fax: (01274) 372 834

Email:
 Technical.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:

James Sampson on (0845)120 8482

29th August 2012

Dear Sir/Madam,

Lock Street, Dewsbury - Pre-Planning Enquiry - K154336

Thank you for your enquiry received 15th August 2012. Our charge of £90.00 (inc VAT) will be added to your account with us, reference BWB073. You will receive an invoice for your account in due course. Please find enclosed a complimentary extract from the Statutory Sewer Map. This indicates the recorded position of the public sewers. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site:

Development of the site should take place with separate systems for foul and surface water drainage. The separate system should extend to the public sewer.

Foul water domestic waste should discharge to the 300mm diameter public combined sewer recorded in Headfield Road, at a point approximately 82 metres from the site or the 450mm diameter public combined water sewer recorded in Lock Street, at a point approximately 160 metres from the site.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer network. If sewage pumping is required foul water discharge must not exceed 6 (six) litres per second.

The local public sewer network does not have capacity to accept any additional discharge of surface water from the proposal site.

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SUDS), for example the use of soakaways and/or permeable hardstanding etc., may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SUDS in this instance from the appropriate authorities.

Where appropriate, soakaways, swales and infiltration trenches (SUDS) may be adopted as part of the public sewer network. Further information may be seen in the DEFRA publication 'Interim Code of Practice for Sustainable Drainage Systems' (ISBN 0-86017-904-4). If the developer is considering adoption of SUDS they should contact our Developer Services Team on 0845 120 84 82

Alternatively, the developer is advised to contact the Environment Agency/local Land Drainage Authority/Internal Drainage Board with a view to establishing a suitable watercourse for discharge.

As a last resort and subject to providing satisfactory evidence as to why the other methods of surface water disposal have been discounted, curtilage surface water discharges to the public sewer will be restricted to the level of run-off - i.e. same rate of discharge - to that from the existing use of the site minus a 30% reduction in the existing discharge. To maintain the "status quo" in the public sewer network, any discharge of surface water from the site should take place with similar rates of flow and/or measured areas discharging to similar points of connection to that of the existing use of the site. You will need to demonstrate positive drainage, based on a 1 in 1 year storm, to the public sewer to Yorkshire Water by means of investigation and calculation carried out at your expense.

To do this, Yorkshire Water requires to see existing and proposed drainage layouts with pipe sizes, gradients and connection points, measured impermeable areas of the present and proposed use of the site, along with the calculations that show the existing and proposed discharge rate from the site to the public sewer.

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0845 120 84 82) for further information.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no right of connection to the public sewer network. Highway drainage, however, may be accepted under certain circumstances; for instance, if SUDS are not a viable option, there is no highway drain available and if capacity is available within the public sewer network. In this event, the developer may be required to enter into a formal agreement with Yorkshire Water Services under Section 115 Water Industry Act 1991 to discharge non-domestic flows into the public sewer network.

No land drainage to be connected/discharged to public sewer.

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0845 120 84 82.

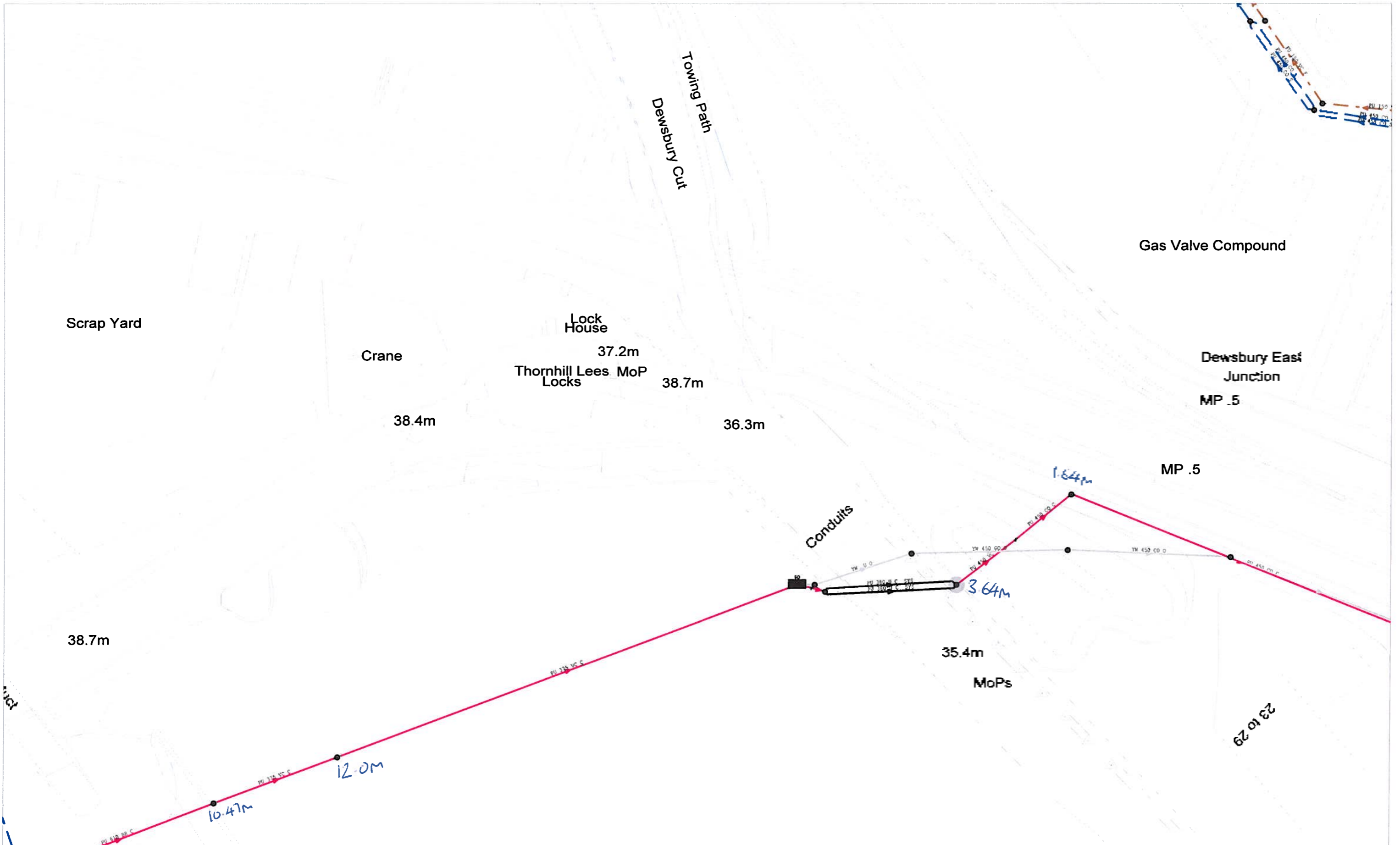
All the above comments are based upon the information and records available at the present time. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith. Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours faithfully



James Sampson
For: Developer Services

cc:



424904 : 419741



Map Name: SE241WNE

Yorkshire Water,
 PO Box 500,
 Halifax Road,
 Bradford BD8 2LZ
 Contact Name:
 Sampson
 Contact Tel:

Title

Notes

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Partial Key

Foul Sewer = F
 Combined Sewer = C
 Surface Water Sewer = SW
 Trade Sewer = TD
 Partially Separate = PS

This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connection

Date Req: 29/08/2012, 15:55:42

Date Gen: 29/08/2012, 15:55:48

Source: Sewer Network Enquiry

APPENDIX E

Kirklees Communication

Darren Stewart

From: Paul Farndale <Paul.Farndale@kirklees.gov.uk>
Sent: 31 August 2012 14:14
To: Jack Pickering
Subject: RE: RFI - BMS2048 - Lock Street, Dewsbury

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Red Category

Hello Jack,

River Flood Zone 1 – low risk, although I suggest you contact the EA for their views on how the canal interacts with the main river as this is highlighted as flood zone 3 and is on the boundary of the site.

We have no record of surface water flooding for the site or the immediate vicinity and crude surface water flood maps don't appear to highlight any concerns. An assessment of flow routes into the site and those generated from proposed on site drainage (blockage or exceedance flows) will need to be analysed. I'm not sure of the site levels but canals and dismantled/live railways create images of embankments so you will need to demonstrate that water cannot pond and flood buildings etc.

We don't hold any records of watercourse through the site and cannot identify any on historical plans. This of course does not mean that there are no watercourse under the site or that it hasn't flooded in the past.

If the site has no formal drainage at the moment then greenfield discharge restrictions apply. The Canal and River Trust (British Waterways) may impose further restrictions on new surface water connections to the canal. You may also wish to consult the EA on whether soakaways are suitable for use on a former scrap yard (pollution).

Kind regards,

Paul Farndale
Senior Engineer
Flood Management & Drainage
Investment & Regeneration Service
Kirklees Council
01484 225377

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From: Jack Pickering [<mailto:Jack.Pickering@bwbcconsulting.com>]
Sent: 15 August 2012 12:01
To: Paul Farndale
Subject: RFI - BMS2048 - Lock Street, Dewsbury

Dear Paul,

We are preparing a flood risk assessment to support a planning application for a proposed development on behalf of our client. Attached is a location plan for the site, the national grid reference of which is approximately 424877, 419857.

I would be grateful if you could provide any relevant information you may have, including flood levels or records of historic flooding.

Should you require any further details, please don't hesitate to contact me.

Regards,

Jack Pickering
Technician | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
tel 0115 9241100 dir 0115 8517439 web www.bwbconsulting.com



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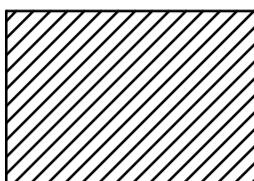
APPENDIX F

Impermeable Area Analysis



- NOTES**
1. DO NOT SCALE THIS DRAWING. ALL DIMENSIONS MUST BE CHECKED/ VERIFIED ON SITE. IF IN DOUBT ASK.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
 3. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE.
 4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

KEY

	EXISTING IMPERMEABLE ROOFSCAPE 3,190M ²
---	---

Rev	Date	Details of issue / revision	Drawn	Reviewed
P1	28.02.13	PRELIMINARY ISSUE	DS	TG

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Client
BLACKMORES

Project Title
**LOCK STREET
DEWSBURY**

Drawing Title
**EXISTING IMPERMEABLE
AREAS**

Scale	1:500	Drawn	D STEWART
Size	A1	Reviewed	T GOODCHILD

Drawing Status
PRELIMINARY

Drawing No.	Revision
BMW/2048/W100	P1

APPENDIX G

Quick Storage Estimates

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall

Return Period (years) 2

Site Location GB 457850 327250 SK 57850 2725

Cv (Summer) 0.750

Cv (Winter) 0.840

Impemeable Area (ha) 1.750

Maximum Allowable Discharge (l/s) 22.72

C (1km) -0.025 D3 (1km) 0.230

D1 (1km) 0.362 E (1km) 0.304

D2 (1km) 0.296 F (1km) 2.368

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

Climate Change (%) 0

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 116 m³ and 220 m³.

These values are estimates only and should not be used for design purposes.

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall Cv (Summer) 0.750

Return Period (years) 30 Cv (Winter) 0.840

Site Location Impervious Area (ha) 1.750

GB 457850 327250 SK 57850 2725 Maximum Allowable Discharge (l/s) 57.4

C (1km) -0.025 D3 (1km) 0.230

D1 (1km) 0.362 E (1km) 0.304 Infiltration Coefficient (m/hr) 0.00000

D2 (1km) 0.296 F (1km) 2.368 Safety Factor 2.0

Climate Change (%) 0

Analyse OK Cancel Help

Enter Safety Factor between 1.0 and 50.0

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 250 m³ and 415 m³.

These values are estimates only and should not be used for design purposes.

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Analyse OK Cancel Help

Enter Safety Factor between 1.0 and 50.0

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall Cv (Summer)

Return Period (years) Cv (Winter)

Site Location Impemeable Area (ha)

Maximum Allowable Discharge (l/s)

C (1km) D3 (1km)

D1 (1km) E (1km) Infiltration Coefficient (m/hr)

D2 (1km) F (1km) Safety Factor

Climate Change (%)

Analyse OK Cancel Help

Enter Return Period between 1 and 1000

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 367 m³ and 568 m³.

These values are estimates only and should not be used for design purposes.

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Analyse OK Cancel Help

Enter Return Period between 1 and 1000

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall Cv (Summer)

Return Period (years) Cv (Winter)

Site Location Impervious Area (ha)

Maximum Allowable Discharge (l/s)

C (1km) D3 (1km) Infiltration Coefficient (m/hr)

D1 (1km) E (1km) Safety Factor

D2 (1km) F (1km) Climate Change (%)

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 524 m³ and 808 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Climate Change between -100 and 600



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