Our ref: MVFA/2986/PC/09/gb

12th August 2010

Ms J Orton
Hinckley & Bosworth Borough Council
Planning Department
Council Offices
Argents Mead
Hinckley
LE10 1BZ

DEVELOPMENT SERVICES
16 AUG 2010
RECEIVED

Dear Ms Orton

Re: Proposed Development on Land West of The Pinfold and South of Station Road, Ratby, Leicester, LE6 0JN
Your reference number – 10/00453/FUL

Further to receipt of your letter dated 15th June 2010, regarding the above application, please find enclosed four copies of the Flood Risk Assessment, as requested.

Should you have any queries please do not hesitate to contact me.

Yours faithfully

Malcolm Foulkes-Arnold

Enc

CORPORATE ARCHITECTURE LIMITED Chartered Architects
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E office@corporate**architecture**.co.uk **W** www.corporate**architecture**.co.uk
M. V. Foulkes-Arnold Director **R. Coppock** Associate Director **Registered Office** 35 Leicester Road, Blaby, Leicester LE8 4GR **RIBA Registered No.** 2489505

Hannah · Reed

STATION ROAD RATBY

FLOOD RISK ASSESSMENT

DEVELOPMENT SERVICES

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ace

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Hannah, Reed and Associates Limited
Telford House
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CB21 5HB

C210120/AJB/August 2010

Revision: P1

STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

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EXECUTIVE SUMMARY

1. INTRODUCTION

The following report has been prepared in accordance with Planning Policy Statement 25: Development and Flood Risk (PPS25) to accompany the planning application of 6 residential properties to the south west of Ratby, Leicestershire.

2. SITE LOCATION

2.1 Location and existing development

2.1.1 Description of existing site

The site is a greenfield site forming part of a former bus depot, located to the south west of Ratby, bounded by existing residential development on Station Road to the north, residential development on Pinfold lane to the east, a industrial unit described as a bakery to the west. The south of the site is bounded by a tributary to the Rothley Brook, as shown on the enclosed location plan in **Appendix 1** and site photographs in **Appendix 2**. The existing site is considered 100% impermeable.

2.1.2 Site Topography

The topographic survey of the site shows site levels ranging between 79.36mAOD at the southern boundary of the site, and 79.58mAOD at the northern boundary of the site as shown in **Appendix 3**. The very southern end of the site is observed to slope downhill to the watercourse with a level of 78.4mAOD showing a clear drop in level from the site.

2.1.3 Current drainage systems

As the site is a greenfield site there is no existing surface or foul drainage on the site, as shown in the Severn Trent sewer plans in **Appendix 4**.

There is a drainage ditch indicated on the topographic survey along the eastern boundary of the site, which is overgrown in the upper site and had some standing water at the southern end at the time of the site visit.

2.1.4 Nearby watercourses, water-bodies and structures

A tributary to Rothley Brook is located within 10-15m of the sites southern boundary, with Rothley Brook located approximately 350m to the south of the site. In addition there is an offline pond located 180m upstream of the site. There is a road bridge located approximately 300m upstream of the site. This may provide some benefit to the site by potentially restrict flow downstream under high flows conditions.

2.1.5 Site Geology and indication of permeability

The geology of the site comprises a Mercia Mudstone as the bedrock, with surface deposits of Alluvium comprising sand, silt, clay and gravel on the south of the site, with River Terrace Deposits of sand and gravel on the northern margin of the site. The British Geological Map Extracts are enclosed in **Appendix 5**.

2.1.6 Existing mitigation measures/defences

There are no existing defences or mitigation measures at the site.

2.1.7 Reference to local development documents

The site off Station Road is detailed in Hinckley and Bosworth Borough Councils Housing Land Availability Assessment as reference AS483 with extracts relating to the site enclosed in **Appendix 6** for reference.

2.1.8 Sequential test and Exception test

The southern part of the site is located within Flood Zone 3 however the proposed site layout has considered this and located the proposed residential properties in the northern half of the site and a proposed area of public open space in the area of the site located in Flood Zone 3 therefore providing a wider benefit to the area.

3. ASSESSMENT OF EXISTING FLOOD HAZARD TO THE SITE

3.1 Environment Agency Flood Zones

The majority of the site is located in Flood Zone 1, with the southern boundary of the site in Flood Zone 3 as shown on the enclosed Environment Agency Flood Map in **Appendix 7**.

3.2 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment was completed in November 2007 as a partnership with Hinckley and Bosworth Borough Council, Blaby District Council and Oadby and Wigston Borough Council. Ratby is referenced in the report as a key rural centre with a detailed comment on the Bakery site which borders our site. The extracts are enclosed in **Appendix 8** and confirm the majority of the site is located in Flood Zone 1 with the southern portion located in Flood Zone 2 and 3.

3.3 Potential sources of flooding (Annex C, PPS25) and a description of flooding from potential sources with reference to historical records and any Environment Agency data including any modelling work

3.3.1 Fluvial flooding from main rivers

The 1% (1 in 100 year) modelled flood level of Rothley Brook at node R200 downstream of the confluence with the tributary is 75.92mAOD, which when compared with site levels of 79.5mAOD confirms a significant difference of 3.5m.

3.3.2 Fluvial flooding from minor watercourses

The Environment Agency maps confirm the watercourse is not main river and that the southern part of the site is located in Flood Zone 2 and 3 as shown in **Appendix 9**. In addition the data includes a historic flood outline from 1977 and modelled flood levels for Rothley Brook as outlined above.

Although modelled data is not available for the minor watercourse adjacent to the site the difference between the site levels and the modelled flood levels downstream on Rothley Brook would suggest the site is protected under the 100 year event.

The detailed maps of the site enclosed from the SFRA in **Appendix 8** show the extent of Flood Zone 3 for the minor watercourse located within the proposed area or public open space where no modifications to existing ground levels are proposed. This also shows the proposed car parking area located in Flood Zone 2 where modifications to the existing ground levels would be permitted.

The available flood data has been considered in line with the site layout minimising the risk of flooding to the properties, further benefit will be provided by the proposed raising of the northern area of the site.

3.3.3 Flooding from high groundwater levels and springs

There is no data available for groundwater levels at the site and no springs are noted in close proximity to the site.

3.3.4 Overland Flow

The site is not considered to be at risk of overland flow from adjacent sites, and topographic survey in **Appendix 3** indicates the site is relatively flat.

3.3.5 Flooding from sewers

There are no sewers located within the site, with the closest located in Pinfold Road to the east of the site.

3.4 Probability

3.4.1 Site specific assessment of the probability of flooding

The southern portion of the site is located in fluvial Flood Zone 2 and 3, therefore it is anticipated this area of the site would be flooded in the first instance. The proposed development has considered this and has proposed an area of public open space in this portion of the site, with car parking located next to this area therefore minimising the risk of flooding to the proposed properties.

3.4.2 Description of any structures in proximity of the site that may influence flooding

The bridge upstream of the site on Desford Lane may influence flooding at the site potentially providing benefit throttling flows downstream.

3.5 Climate Change

3.5.1 Estimated effects of climate change on the site – pre development

The estimated impacts of climate change on the site can be seen in the extract from the SFRA in **Appendix 8**, however the predicted impacts from PPS25 Table B2 predict rainfall will increase by 5% between 1990 and 2025, increasing up to 10% by 2055, 20% by 2085 and finally 30% by 2115. The peak river flows are predicted to increase by 10% between 1990 and 2025, increasing by 20% between 2025 and 2115.

4. DEVELOPMENT PROPOSAL

4.1 Description of proposed development

The proposed development comprises 6 residential properties with car parking as shown in **Appendix 10**. All the properties are 2 bed with provision for 2 car parking spaces per property with access from The Pinfold.

4.2 Vulnerability classification of site

The site use is classified as 'More Vulnerable' and therefore not considered appropriate in Flood Zone 3. The proposed development has considered this and located the proposed residential units within Flood Zone 1, with car parking facilities for 4 of the properties in an area of Flood Zone 2 and an area of public open space in Flood Zone 3 at the southern most part of the site therefore mitigating the risk of flooding.

4.3 Proposed location plans highlighting areas of concern and any flood protection measures planned (Byelaw Distance from Main River)

The proposed site is not within the byelaw distance of the minor watercourse. The proposals incorporate an area of public open space and car parking in the area at greatest risk to fluvial flooding, therefore providing additional protection to the proposed residential properties.

4.4 Finished Floor Levels and other relevant levels relative to the source of flooding

Finished floor levels have not been confirmed at this stage with levelling and raising required on the site to tie in with the existing development on The Pinfold.

As no flood levels are available for the watercourse adjacent to the site, a recommend finished floor level has not been confirmed. The proposed properties are located in an area of Flood Zone 1, with further discussions with the Environment Agency required to confirm an appropriate finished floor level.

4.5 Proposed site drainage and its capacity during flood events

The proposed site drainage involves connection into the existing surface water and foul network in The Pinfold subject to consultation with Severn Trent.

4.6 Post development surface water runoff

The existing site is considered 100% permeable and has a peak 1 in 100 year greenfield runoff rate of 1.52l/s as shown in **Appendix 11**.

The proposed development will create 545m^2 of impermeable area (31% of the total site area) on the site, comprising the building footprints and main roads on the development, in total approximately 545m^2. The impact of the proposed development has been mitigated by the provision of permeable paving in the car parking areas of the site as indicated on the enclosed plan in **Appendix 12**. This has reduced the proposed impermeable area by approximately 140m^2. The proposed increase in impermeable area results in an increased 100 year peak runoff rate to 2.51l/s.

Alternative attenuation methods may be considered if Severn Trent cannot accept the additional surface water runoff and if attenuation to the greenfield runoff rate is required 42m^3 of storage will be required to mitigate the 100 year event which includes an allowance of 30% for climate change as shown in **Appendix 13**.

5. IMPACTS & MITIGATION

5.1 Impacts elsewhere

The proposed development will not impact the existing floodplain, with a proposed wetland area or public open space at the rear of the site, located in Flood Zone 3 and part of Flood Zone 2 when compared with the SFRA extracts in **Appendix 8**. The existing ground levels will remain unchanged in the area of the site located in Flood Zone 3 and therefore there will be no displacement of the floodplain.

The proposed development will increase the impermeable area on the site, resulting in an increase in surface water runoff, however as outlined above the impact can be mitigated by providing a reduced impermeable area or by an attenuation facility, or by Severn Trent having sufficient capacity to take the surface water runoff proposed.

5.2 Mitigation measures

5.2.1 Proposed on-site

The proposed development has taken account of the flood risk and proposed an area of public open space in the area at greatest risk of flooding. In addition the proposed site layout has located the properties in the northern half of the site away from the watercourse, therefore minimising the risk of flooding to the properties.

Finished floor levels without any modification to existing site levels provide approximately 3m freeboard above the known 1 in 100 year flood level downstream of the site, therefore mitigating against flood risk.

The increase in impermeable area will be mitigated however as outlined above the details of this have not been confirmed at this stage.

5.2.2 Proposed off-site

There are no offsite mitigation measures proposed.

5.3 Impact of flooding on the site

5.3.1 Likely speed of surface runoff with which flooding may occur

The time to peak is 4.5 hours based on the Flood Estimation Handbook.

5.3.2 Predicted order of flooding to locations on the site

The area of the site at highest risk is located to the south, where the area of public open space is proposed, with the proposed car parking area the next area vulnerable to flooding. The proposed residential units at the northern area of the site are located in Flood Zone 1 and therefore are at the lowest risk of flooding on the site.

5.3.3 Likely duration of flood events

The likely duration of the flood event from the Flood Estimation Handbook is 7.5 hours.

5.3.4 Economic, social and environmental consequences of flooding to the site

Due to the site layout the economic and social impacts of flooding have been reduced with a low risk of damage to property anticipated under the 1 in 100 year event, mitigated by the area of public open space.

In an extreme event residents could always move the vehicles in the southern car park area to the northern area of the site hence further reducing the economic impact of flooding. The environmental consequences are low with the area at risk comprising public open space and car parking.

5.3.5 Past flooding information including extent, depth and location of previous events

As outlined in the Environment Agency response the southern end of the site is located in the 1977 flood extent however the depth and extent of the flood event are unknown with no flood levels available.

5.3.6 Identification of any structures which may influence local hydraulics

The bridge upstream of the site may provide some constraint to high flows, restricting the flows at the site, providing some benefit.

5.4 Likely impact of any displaced water on third parties caused by alterations

There is no displacement proposed by the development.

6 RESIDUAL RISKS

6.1 Remaining risks after mitigation measures are in place

The proposed car parking area may remain at risk of flooding despite the proposed area of public open space. However the proposed site layout has mitigated the risk of flooding to the properties.

6.2 Ongoing maintenance

If the site introduces an attenuation tank, this will require maintenance however if the surface water runoff is discharged directly to the existing drains there will be no ongoing maintenance.

6.3 Pollution Prevention

The proposed development will take into account pollution prevention guidance as required in line with Pollution Prevention Guidance (PPG) 3 if surface water drainage systems are installed on the site, PPG5 when working in or near an area liable to affect the watercourse and PPG6 when construction work is undertaken on the site.

7 SUMMARY & CONCLUSION

The proposed residential development has taken account of the level of flood risk posed to the site inline with the Environment Agency Flood Map and best available flood information. This has been observed in the proposed site layout locating the proposed residential development classified as 'More Vulnerable' in Flood Zone 1 and 'Water Compatible' land use including public open space and car parking facilities in the area of the site at the greatest risk of flooding.

The proposed development has also considered the wider impact of the development, minimising the proposed impermeable area by using permeable paving and or using Sustainable Urban Drainage Systems (SUDS) on the site mitigating the impact of the proposed increase in impermeable area.

In accordance with PPS25: Development and Flood Risk we consider the proposed development appropriate.

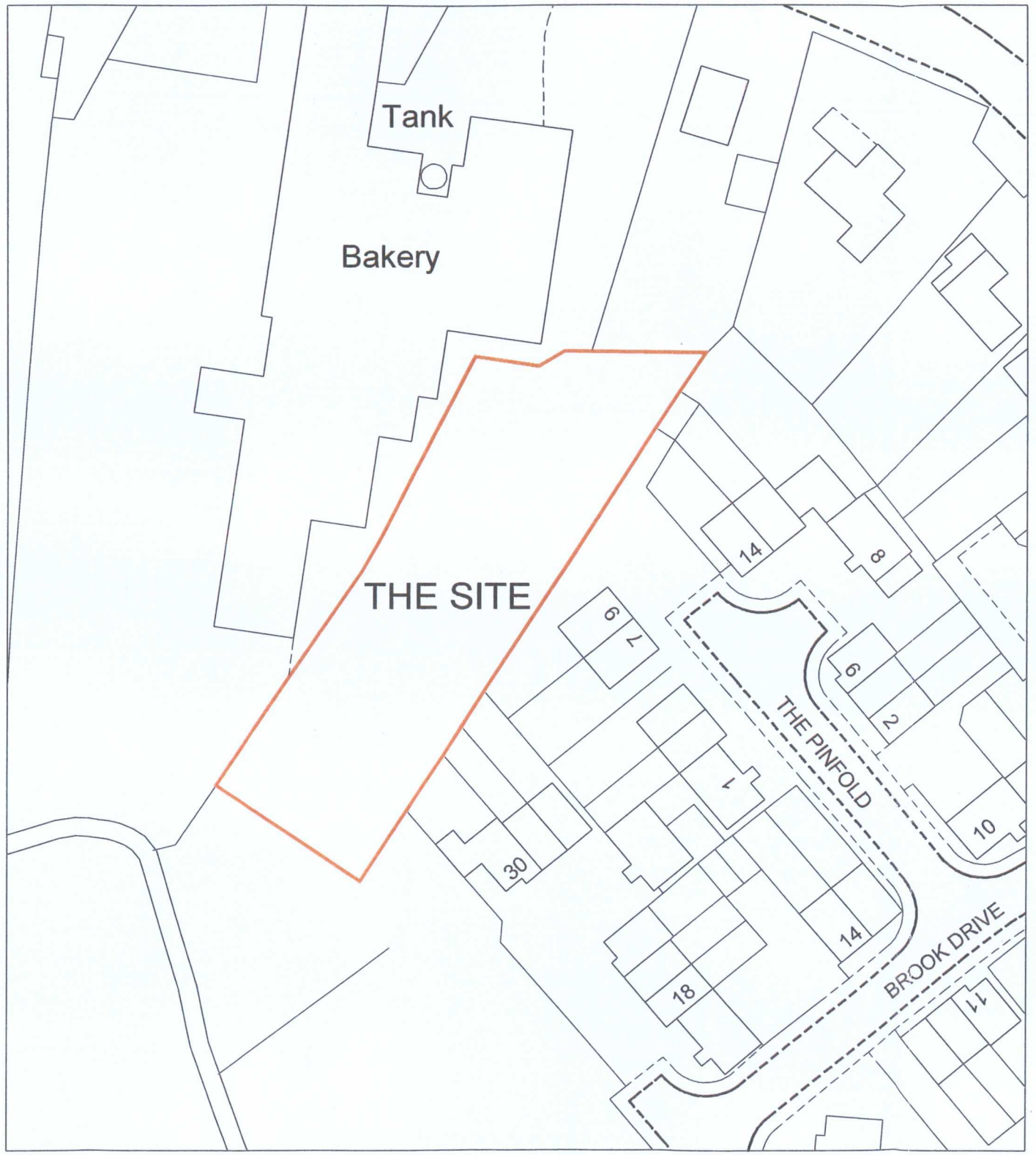
For a glossary of terms used in the above report please refer to **Appendix 14**.

STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

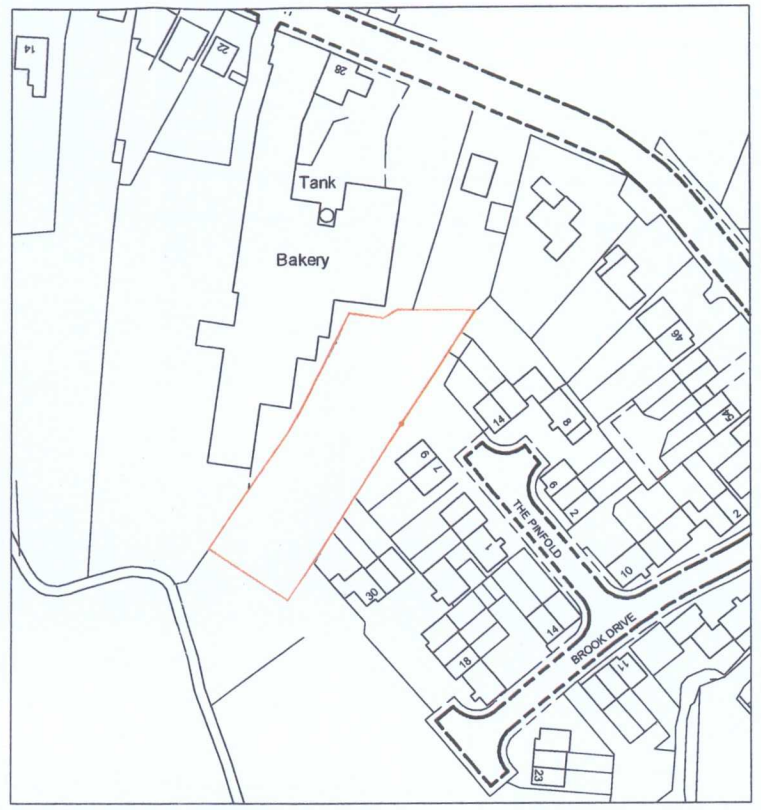
APPENDIX 1

Location plan and site plan



Block Plan
scale 1:500

0 5 10 15 20 25
Scale (m)



Location Plan
scale 1:250

0 10 20 30 40 50
Scale (m)

N

REV REF:	REVISION DESCRIPTION:	DATE:	BY:
Drawn by: SNL	Checked by:	Date checked:	

CLIENT
Mr P Creswell
Two Spinneys
28 Stoughton Lane
Leicestershire
LE2 2FH

TITLE
Proposed Development on Land West of The Pinfold and South of Station Road Ratby, Leicester LE6 0JN
LOCATION PLANS
1:500 & 1:1250

DATE: July '09
SCALE: VAR
DRAWING NO.: 2986 PC.09.001
ISSUE NO.: –

CORPORATE ARCHITECTURE LIMITED
CHARTERED ARCHITECTS
35 Leicester Road Ratby Leicester LE6 0 GR
Tel: 0116 278 9257 Fax: 0116 2788259

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STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 2

Site photographs

Site Photographs from site visit 22nd July 2010



Photograph 1: The Pinfold view towards site entrance



Photograph 2: View north from southern boundary of the site



Photograph 3: View west towards bakery site



Photograph 4: View along eastern site boundary from site access on The Pinfold



Photograph 5: View east from southern corner of the site



Photograph 6: Southern section of the site showing drop in level to the floodplain



Photograph 7: Watercourse at the south of the site



Photograph 8: View of area of raised land to rear of Brook Drive



Photograph 9 Watercourse downstream of the site



Photograph 10:Downstream face of the road bridge upstream of the site on Dewford Road



Photograph 11: View of watercourse upsteam of the roadbridge



Photograph 12: Watercourse upstream of the site adjacent to the football pitch

STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 3

Topographic survey,
provided by Corporate Architecture Ltd
(drawing 2986.PC.09.003)

STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 4

Site sewer record drawing,
provided by Severn Trent Water

Sewer Node — Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK51050101	77.60	73.96	73.63	C	U	C	525	nil	263.91	nill
SK51051101	76.25	73.63	73.35	C	U	C	525	nil	439.75	nill
SK51051701	84.17	82.31	81.22	S	VC	C	300	nil	31.25	nill
SK51051702	83.49	80.75	80.41	F	CO	C	375	nil	61.21	nill
SK51051703	83.36	80.38	79.59	F	CO	C	375	nil	135.67	nill
SK51051704	83.33	81.16	nil	S	CO	C	300	nil	0.00	nill
SK51051705	83.52	81.19	81.13	S	CO	C	300	nil	500.00	nill
SK51051801	88.28	86.52	85.58	F	VC	C	225	nil	16.82	nill
SK51051802	87.99	85.43	84.02	F	CO	C	300	nil	24.38	nill
SK51051803	88.32	86.26	84.51	S	VC	C	300	nil	26.44	nill
SK51051804	86.43	83.99	83.18	F	CO	C	300	nil	29.64	nill
SK51051805	86.51	84.48	82.34	S	VC	C	300	nil	27.71	nill
SK51051806	86.44	85.38	84.11	F	VC	C	150	nil	7.13	nill
SK51051808	85.62	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51051901	91.16	88.80	85.52	F	CO	C	300	nil	22.48	nill
SK51051902	89.13	87.52	86.64	F	VC	C	225	nil	51.39	nill
SK51052101	76.25	73.35	73.00	C	U	C	525	nil	275.00	nill
SK51052601	82.93	80.75	79.73	F	VC	C	225	nil	14.74	nill
SK51052602	82.82	79.57	nil	F	CO	C	375	nil	0.00	nill
SK51052603	82.93	80.22	79.71	S	CO	C	300	nil	97.37	nill
SK51052604	82.76	nil	79.39	F	nil	nil	nil	nil	0.00	nill
SK51052605	82.78	79.71	79.71	S	CO	C	300	nil	0.00	nill
SK51052701	86.40	85.61	80.96	F	VC	C	225	nil	11.56	nill
SK51052801	93.92	92.88	85.83	F	VC	C	225	nil	12.68	nill
SK51053201	76.18	73.00	72.77	C	U	C	525	nil	407.74	nill
SK51053402	80.64	nil	77.83	S	U	U	450	nil	0.00	nill
SK51053403	80.50	nil	79.08	F	U	U	150	nil	0.00	nill
SK51053501	82.43	78.76	78.18	F	CO	C	375	nil	29.36	nill
SK51053502	81.80	nil	78.20	S	U	U	450	nil	0.00	nill
SK51053503	81.72	80.46	79.06	S	CO	C	375	nil	34.72	nill
SK51053504	79.21	nil	77.29	F	U	U	150	nil	0.00	nill
SK51053505	81.39	nil	78.60	F	U	U	150	nil	0.00	nill
SK51053506	80.65	nil	79.06	S	U	U	225	nil	0.00	nill
SK51053601	82.81	79.38	78.78	F	CO	C	375	nil	122.93	nill
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SK51053802	93.74	92.60	87.76	S	VC	C	225	nil	17.37	nill
SK51054201	76.22	72.77	72.56	C	U	C	525	nil	250.52	nill
SK51054301	80.82	79.36	77.83	S	VC	C	225	nil	53.23	nill
SK51054302	80.83	79.08	77.46	F	VC	C	225	nil	46.48	nill
SK51054401	82.01	77.61	77.18	F	CO	C	375	nil	130.16	nill
SK51054402	82.10	78.16	77.62	S	VC	C	300	nil	141.78	nill
SK51054503	82.90	80.18	78.79	F	VC	C	225	nil	11.26	nill
SK51054504	82.79	80.79	80.48	S	CO	C	300	nil	106.28	nill
SK51054505	81.82	80.46	79.58	S	CO	C	375	nil	18.01	nill

MATERIALS

- - NONE
- AC - ASBESTOS CEMENT
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRC - GLASS REINFORCED CONCRETE
- RP - GLASS REINFORCED PLASTIC
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- ST - STEEL
- U - UNKNOWN
- VC - VITRIFIED CLAY
- XXX - OTHER

SHAPE

- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

PURPOSE

- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node birfurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

Severn Trent Water

Severn Trent Water Limited
Waterworks Road
Edgbaston
Birmingham
B16 9DD
Telephone 0845601 5615

SEWER RECORD DATA TABLE

O/S Map scale: 1:5000

Date of issue: 13.07.10

Sheet No. 2 of 6

This map is centred upon: O / S Grid reference:

x : 451280

y : 305605

Do not scale off drawing:
Disclaimer:
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Sewer Node — Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK51054506	82.19	78.69	78.16	S	VC	C	300	nil	148.21	nill
SK51054507	82.17	77.96	nil	F	CO	C	375	nil	0.00	nill
SK51054508	81.93	80.79	80.14	S	CO	C	375	nil	8.78	nill
SK51054509	82.27	78.18	77.98	F	CO	C	375	nil	240.10	nill
SK51054601	84.86	83.43	81.34	F	VC	C	225	nil	44.61	nill
SK51054602	85.58	83.96	83.51	F	VC	C	225	nil	46.40	nill
SK51054603	86.74	84.95	83.70	S	CO	C	300	nil	36.94	nill
SK51054604	84.78	83.64	82.50	S	CO	C	300	nil	47.96	nill
SK51054606	84.24	82.46	80.81	S	CO	C	300	nil	26.32	nill
SK51054607	85.47	83.94	83.87	S	VC	C	225	nil	301.00	nill
SK51054701	87.69	86.37	85.19	S	VC	C	225	nil	70.01	nill
SK51054702	90.94	89.82	88.70	S	VC	C	150	nil	39.22	nill
SK51054703	89.61	87.28	85.46	F	VC	C	225	nil	19.30	nill
SK51054704	91.82	89.37	89.17	F	VC	C	225	nil	115.00	nill
SK51054705	90.65	89.12	87.38	F	VC	C	225	nil	17.82	nill
SK51054706	89.35	87.23	85.00	S	CO	C	300	nil	22.46	nill
SK51054707	87.71	85.42	84.02	F	VC	C	225	nil	25.04	nill
SK51054708	90.27	88.08	87.30	S	CO	C	300	nil	20.51	nill
SK51054801	94.18	90.86	89.39	F	VC	C	225	nil	37.47	nill
SK51054802	93.53	90.46	88.10	S	CO	C	300	nil	34.75	nill
SK51054901	98.48	96.66	95.85	S	VC	C	225	nil	51.85	nill
SK51054902	97.23	95.77	92.41	S	VC	C	225	nil	23.28	nill
SK51054903	95.49	92.68	92.15	S	CO	C	375	nil	100.02	nill
SK51054904	95.51	92.02	90.05	S	CO	C	375	nil	29.53	nill
SK51055201	75.42	72.56	72.32	C	U	C	525	nil	420.83	nill
SK51055301	80.45	77.84	77.14	S	VC	C	225	nil	124.63	nill
SK51055302	80.54	77.40	76.71	F	VC	C	225	nil	143.79	nill
SK51055303	80.44	77.09	76.73	S	VC	C	225	nil	165.31	nill
SK51055401	81.79	80.40	79.49	F	VC	C	225	nil	87.25	nill
SK51055402	81.24	77.65	77.65	S	VC	C	225	nil	0.00	nill
SK51055403	81.30	77.07	76.66	F	CO	C	375	nil	112.44	nill
SK51055404	81.27	77.60	76.96	S	VC	C	300	nil	151.45	nill
SK51055405	81.46	77.14	77.08	F	CO	C	375	nil	427.17	nill
SK51055502	82.00	80.60	80.20	S	VC	C	150	nil	117.60	nill
SK51055503	81.69	79.20	nil	F	VC	C	300	nil	0.00	nill
SK51055504	81.46	80.19	79.85	S	VC	C	225	nil	119.97	nill
SK51055505	nil	80.08	79.40	F	VC	C	225	nil	25.80	nill
SK51055601	84.66	83.15	82.48	S	VC	C	150	nil	66.19	nill
SK51055602	84.15	82.52	80.85	F	VC	C	150	nil	7.24	nill
SK51055603	83.25	80.85	80.08	F	VC	C	225	nil	38.45	nill
SK51055604	81.82	80.08	79.40	F	VC	C	225	nil	98.29	nill
SK51055605	85.26	84.13	83.96	S	VC	C	150	nil	111.76	nill
SK51055701	89.44	88.07	87.44	S	VC	C	225	nil	89.02	nill
SK51055801	93.62	90.03	87.99	S	CO	C	375	nil	26.33	nill
SK51055802	91.45	87.94	86.48	S	CO	C	375	nil	38.26	nill
SK51055803	90.42	89.18	88.35	S	CO	C	225	nil	40.98	nill

MATERIALS

-	- NONE
AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
RP	- GLASS REINFORCED PLASTIC
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
ST	- STEEL
U	- UNKNOWN
VC	- VITRIFIED CLAY
XXX	- OTHER

SHAPE

C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

PURPOSE

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node birfurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

Severn Trent Water

Severn Trent Water Limited
Waterworks Road
Edgbaston
Birmingham
B16 9DD
Telephone 0845601 5616

SEWER RECORD DATA TABLE

O/S Map scale: 1:5000

Date of issue: 13.07.10

Sheet No. 3 of 6

This map is centred upon:
O / S Grid reference:

x : 451280

y : 305605

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Sewer Node / Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK51055804	91.62	90.36	89.23	S	CO	C	225	nil	48.22	nill
SK51055805	91.22	88.34	88.19	S	CO	C	375	nil	80.00	nill
SK51055901	92.64	90.38	89.76	F	VC	C	225	nil	81.25	nill
SK51055902	93.40	90.43	89.73	S	VC	C	225	nil	56.17	nill
SK51055903	92.02	89.71	89.45	S	VC	C	300	nil	69.23	nill
SK51055905	91.90	89.41	88.37	S	VC	C	300	nil	63.53	nill
SK51056201	75.42	72.32	72.02	C	U	C	525	nil	273.33	nill
SK51056301	79.99	76.69	75.75	F	VC	C	225	nil	104.78	nill
SK51056401	80.30	76.95	76.11	S	VC	C	300	nil	61.77	nill
SK51056402	80.95	76.66	75.70	F	CO	C	375	nil	94.40	nill
SK51056501	81.12	79.84	79.35	S	VC	C	225	nil	102.71	nill
SK51056502	81.08	79.56	79.21	F	VC	C	300	nil	226.00	nill
SK51056503	81.14	79.61	79.58	F	VC	C	300	nil	736.33	nill
SK51056504	81.21	80.16	79.87	S	VC	C	225	nil	128.00	nill
SK51056505	81.20	79.88	79.63	F	VC	C	300	nil	152.32	nill
SK51056506	80.68	78.63	78.32	S	VC	C	225	nil	116.35	nill
SK51056506	80.68	79.32	nil	S	VC	C	225	nil	0.00	nill
SK51056508	80.70	78.28	77.69	S	VC	C	225	nil	112.68	nill
SK51056509	80.85	79.00	78.91	S	VC	C	225	nil	255.00	nill
SK51056510	80.83	78.57	78.44	F	VC	C	225	nil	246.31	nill
SK51056511	80.99	78.41	78.34	F	VC	C	225	nil	131.71	nill
SK51056512	81.01	78.89	78.83	S	VC	C	225	nil	247.83	nill
SK51056513	80.71	78.31	78.09	F	VC	C	225	nil	64.65	nill
SK51056514	80.75	78.81	78.69	S	VC	C	225	nil	112.08	nill
SK51056515	80.63	78.07	77.79	F	VC	C	225	nil	133.86	nill
SK51056516	80.67	78.67	78.66	S	VC	C	225	nil	922.00	nill
SK51056517	80.62	77.77	77.22	F	VC	C	225	nil	146.65	nill
SK51056601	81.48	80.36	80.17	S	VC	C	225	nil	171.37	nill
SK51056602	81.97	80.60	80.38	S	VC	C	225	nil	124.14	nill
SK51056603	82.91	80.83	80.60	S	VC	C	225	nil	113.78	nill
SK51056604	81.50	80.20	79.90	F	VC	C	300	nil	89.70	nill
SK51056605	82.03	80.50	80.23	F	VC	C	300	nil	132.52	nill
SK51056606	84.30	82.44	81.03	S	VC	C	225	nil	42.15	nill
SK51056701	86.83	85.39	83.46	S	VC	C	225	nil	36.96	nill
SK51056702	85.19	81.59	81.32	F	VC	C	300	nil	96.37	nill
SK51056703	84.99	83.44	83.22	S	VC	C	225	nil	59.27	nill
SK51056704	84.50	83.17	82.47	S	VC	C	225	nil	98.74	nill
SK51056705	84.40	81.27	80.52	F	VC	C	300	nil	92.04	nill
SK51056802	91.18	88.19	84.11	F	VC	C	300	nil	7.72	nill
SK51056804	86.85	84.04	83.88	F	VC	C	300	nil	165.83	nill
SK51056805	86.87	84.92	83.00	S	CO	C	450	nil	28.67	nill
SK51056806	86.82	85.24	85.09	S	CO	C	225	nil	108.88	nill
SK51056807	86.92	83.83	81.64	F	VC	C	300	nil	28.81	nill
SK51056808	89.58	88.32	85.28	S	CO	C	225	nil	27.30	nill
SK51056809	89.27	86.45	85.00	S	CO	C	375	nil	37.73	nill
SK51056810	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill

MATERIALS

-	NONE
AC	ASBESTOS CEMENT
BR	BRICK
CC	CONCRETE BOX CULVERT
CI	CAST IRON
CO	CONCRETE
CSB	CONCRETE SEGMENTS (BOLTED)
CSU	CONCRETE SEGMENTS (UNBOLTED)
DI	DUCTILE IRON
GRC	GLASS REINFORCED CONCRETE
RP	GLASS REINFORCED PLASTIC
MAC	MASONRY IN REGULAR COURSES
MAR	MASONRY RANDOMLY COURSED
PE	POLYETHLENE
PF	PITCH
PP	POLYPROPYLENE
PSC	PLASTIC STEEL COMPOSITE
PVC	POLYVINYL CHLORIDE
RPM	REINFORCED PLASTIC MATRIX
SI	SPUN (GREY) IRON
ST	STEEL
U	UNKNOWN
VC	VITRIFIED CLAY
XXX	OTHER

SHAPE

C	CIRCULAR
E	EGG SHAPED
O	OTHER
R	RECTANGLE
S	SQUARE
T	TRAPEZOIDAL
U	UNKNOWN

PURPOSE

C	COMBINED
E	FINAL EFFLUENT
F	FOUL
L	SLUDGE
S	SURFACE WATER

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node birfurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

Severn Trent Water Limited
Waterworks Road
Edgbaston
Birmingham
B16 9DD
Telephone 0845601 5616

SEWER RECORD DATA TABLE

O/S Map scale: 1:5000

Date of issue: 13.07.10

Sheet No. 4 of 6

This map is centred upon: O / S Grid reference:

x : 451280

y : 305605

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Sewer Node — Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK51056811	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51056812	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51056813	nil	88.19	84.11	F	VC	C	300	nil	16.84	nill
SK51056901	92.00	90.28	89.92	S	VC	C	225	nil	111.72	nill
SK51056902	91.33	89.73	89.13	F	VC	C	225	nil	66.15	nill
SK51056903	91.52	89.06	88.23	F	VC	C	300	nil	36.71	nill
SK51056904	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51056905	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51056906	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51056907	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51056908	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51056909	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51056910	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51056911	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51056912	90.71	88.76	88.75	S	nil	nil	nil	nil	490.91	2010
SK51056913	90.66	88.39	88.18	F	nil	nil	nil	nil	151.95	2010
SK51056914	90.86	88.45	88.41	S	nil	nil	nil	nil	492.50	2010
SK51057201	74.73	72.02	71.62	C	U	C	525	nil	190.00	nill
SK51057306	78.33	74.94	74.88	F	CO	C	525	nil	680.00	nill
SK51057401	79.31	76.18	75.95	F	VC	C	150	nil	81.70	nill
SK51057402	79.48	76.25	76.18	S	VC	C	225	nil	95.86	nill
SK51057403	78.96	76.55	76.26	S	VC	C	225	nil	179.83	nill
SK51057405	79.36	76.11	75.48	S	VC	C	300	nil	90.97	nill
SK51057406	79.49	75.69	74.99	F	CO	C	450	nil	76.93	nill
SK51057502	80.27	79.22	79.14	S	VC	C	225	nil	243.89	nill
SK51057503	80.22	79.00	78.84	F	VC	C	225	nil	218.31	nill
SK51057504	80.42	78.81	78.63	F	VC	C	225	nil	147.47	nill
SK51057505	80.44	79.12	79.01	S	VC	C	225	nil	338.40	nill
SK51057601	80.74	79.14	78.84	F	VC	C	225	nil	134.37	nill
SK51057602	80.73	79.48	79.12	S	VC	C	225	nil	114.83	nill
SK51057606	81.35	79.62	79.22	F	VC	C	150	nil	108.55	nill
SK51057607	81.28	79.84	79.50	S	VC	C	225	nil	135.52	nill
SK51057701	85.32	82.98	82.08	S	CO	C	450	nil	61.16	nill
SK51057703	83.64	82.44	82.36	S	VC	C	225	nil	779.63	nill
SK51057901	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51057902	nil	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51057905	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51057906	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51060001	103.38	101.17	97.77	F	VC	C	225	nil	20.86	nill
SK51060002	103.11	101.36	94.22	S	VC	C	225	nil	21.19	nill
SK51060102	103.95	101.81	101.19	F	VC	C	225	nil	27.47	nill
SK51061001	100.41	97.72	93.71	F	VC	C	225	nil	21.19	nill
SK51061002	94.70	92.61	86.32	S	VC	C	300	nil	19.72	nill
SK51062001	95.94	93.62	92.04	F	CO	C	300	nil	18.70	nill
SK51062002	97.45	nil	94.23	S	nil	nil	nil	nil	0.00	nill
SK51062003	97.31	95.35	93.67	F	CO	C	300	nil	25.26	nill

MATERIALS

-	NONE
AC	ASBESTOS CEMENT
BR	BRICK
CC	CONCRETE BOX CULVERT
CI	CAST IRON
CO	CONCRETE
CSB	CONCRETE SEGMENTS (BOLTED)
CSU	CONCRETE SEGMENTS (UNBOLTED)
DI	DUCTILE IRON
GRC	GLASS REINFORCED CONCRETE
RP	GLASS REINFORCED PLASTIC
MAC	MASONRY IN REGULAR COURSES
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PP	POLYPROPYLENE
PSC	PLASTIC STEEL COMPOSITE
PVC	POLYVINYL CHLORIDE
RPM	REINFORCED PLASTIC MATRIX
SI	SPUN (GREY) IRON
ST	STEEL
U	UNKNOWN
VC	VITRIFIED CLAY
XXX	OTHER

SHAPE

C	CIRCULAR
E	EGG SHAPED
O	OTHER
R	RECTANGLE
S	SQUARE
T	TRAPEZOIDAL
U	UNKNOWN

PURPOSE

C	COMBINED
E	FINAL EFFLUENT
F	FOUL
L	SLUDGE
S	SURFACE WATER

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node birfurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

Severn Trent Water

Severn Trent Water Limited
Waterworks Road
Edgbaston
Birmingham
B16 9DD
Telephone 0845601 5615

SEWER RECORD DATA TABLE

O/S Map scale: 1:5000

Date of issue: 13.07.10

Sheet No. 5 of 6

This map is centred upon:
O / S Grid reference:

x : 451280

y : 305605

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Sewer Node — Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK51062004	95.92	94.19	92.70	S	VC	C	300	nil	17.73	nill
SK51062005	94.79	91.93	88.87	F	CO	C	300	nil	21.37	nill
SK51062006	98.92	95.95	95.42	F	CO	C	300	nil	81.40	nill
SK51062103	99.28	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51063001	98.25	96.85	94.81	S	VC	C	225	nil	30.77	nill
SK51063103	100.66	99.79	97.20	F	VC	C	150	nil	22.63	nill
SK51063109	97.32	95.40	94.82	S	VC	C	225	nil	73.16	nill
SK51064001	94.99	92.28	nil	F	VC	C	225	nil	0.00	nill
SK51064002	95.49	93.12	92.71	S	VC	C	300	nil	97.10	nill
SK51064003	95.53	93.32	92.31	F	VC	C	225	nil	46.19	nill
SK51064004	95.53	93.78	93.20	S	VC	C	300	nil	80.38	nill
SK51064005	nil	nil	90.89	F	nil	nil	nil	nil	0.00	nill
SK51064006	96.50	94.35	93.37	F	VC	C	225	nil	56.36	nill
SK51064007	96.47	94.74	93.81	S	VC	C	300	nil	54.83	nill
SK51065001	93.20	90.91	90.46	S	VC	C	225	nil	152.11	nill
SK51065002	93.60	91.76	90.94	S	VC	C	225	nil	61.52	nill
SK51065101	94.79	93.11	92.41	S	VC	C	225	nil	34.56	nill
SK51065102	94.46	92.37	91.79	S	VC	C	225	nil	68.31	nill
SK51066002	90.60	nil	nil	S	nil	nil	nil	nil	0.00	nill
SK51066003	nil	nil	nil	F	nil	nil	nil	nil	0.00	nill
SK51066004	93.45	90.99	90.15	S	nil	nil	nil	nil	30.29	2010
SK51066005	91.62	89.07	88.98	S	nil	nil	nil	nil	308.69	2010
SK51066006	91.04	88.45	88.46	S	nil	nil	nil	nil	-150.77	2010
SK51066006	91.04	88.46	88.42	S	nil	nil	nil	nil	489.25	2010
SK51066007	92.60	90.08	89.37	S	nil	nil	nil	nil	45.45	2010
SK51066008	93.53	90.68	89.78	F	nil	nil	nil	nil	33.86	2010
SK51066009	91.39	89.56	88.39	F	nil	nil	nil	nil	20.09	2010
SK51066010	92.53	89.78	89.56	F	nil	nil	nil	nil	155.91	2010
SK51066011	92.72	90.35	90.30	S	nil	nil	nil	nil	102.20	2010
SK51066012	92.65	89.82	89.78	F	nil	nil	nil	nil	146.00	2010
SK51066013	90.88	89.58	88.39	F	nil	nil	nil	nil	6.30	2010
SK51066014	90.93	89.88	89.51	S	nil	nil	nil	nil	22.16	2010
SK51066100	94.48	92.55	90.99	S	nil	nil	nil	nil	22.99	2010
SK51066101	94.48	92.19	90.68	F	nil	nil	nil	nil	20.72	2010
SK51066102	94.60	92.41	92.19	F	nil	nil	nil	nil	152.01	2010
SK51066103	94.63	93.28	92.41	F	nil	nil	nil	nil	33.97	2010
SK51066108	94.65	92.95	92.79	S	nil	nil	nil	nil	157.13	2010
SK51066109	94.63	92.71	92.55	S	nil	nil	nil	nil	238.05	2010
SK51066113	94.58	93.25	92.86	S	nil	nil	nil	nil	11.75	2010
SK51066114	94.58	92.90	92.41	F	nil	nil	nil	nil	8.36	2010
SK51066118	94.70	93.35	92.70	S	nil	nil	nil	nil	12.35	2010
SK51066119	94.60	nil	nil	S	nil	nil	nil	nil	0.00	2010
SK51066120	94.63	92.41	92.19	F	nil	nil	nil	nil	27.28	2010
SK51067000	92.78	91.35	91.07	S	nil	nil	nil	nil	175.26	2010
SK51067001	90.75	88.42	88.41	S	nil	nil	nil	nil	192.00	2010
SK51067002	92.90	91.85	91.43	S	nil	nil	nil	nil	12.20	2010

MATERIALS

-	- NONE
AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
RP	- GLASS REINFORCED PLASTIC
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
ST	- STEEL
U	- UNKNOWN
VC	- VITRIFIED CLAY
XXX	- OTHER

SHAPE

C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

PURPOSE

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node birfurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

Severn Trent Water

Severn Trent Water Limited
Waterworks Road
Edgbaston
Birmingham
B16 9DD
Telephone 0845601 6616

SEWER RECORD DATA TABLE

O/S Map scale: 1:5000

Date of issue: 13.07.10

Sheet No. 6 of 6

This map is centred upon: O / S Grid reference:

x : 451280

y : 305605

Do not scale off drawing:
Disclaimer:
1. This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

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STATION ROAD, RATBY

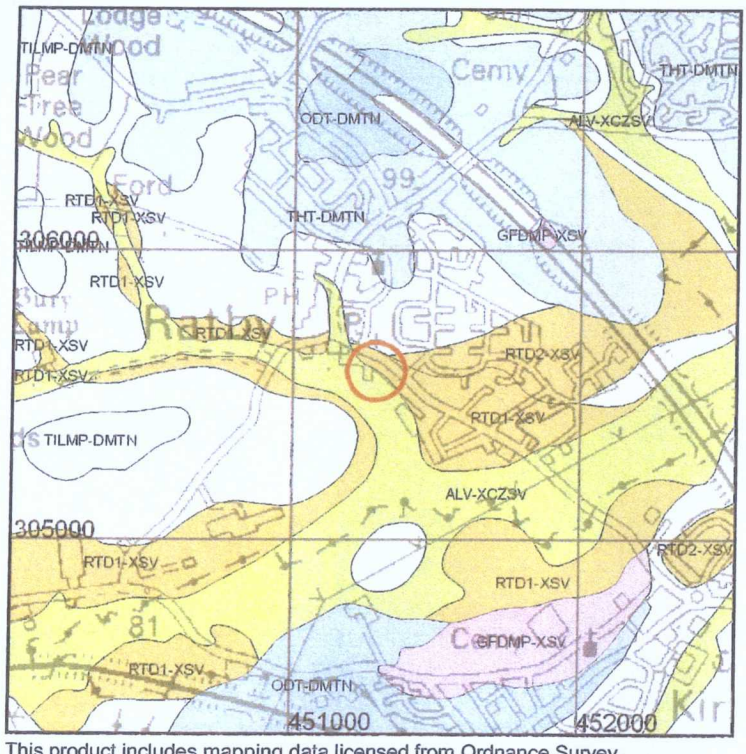
FLOOD RISK ASSESSMENT

APPENDIX 5

Geology map of site area,
provided by the British Geological Survey

Superficial deposits

These are relatively young geological deposits formerly known as 'Drift', which lie on the bedrock in many areas. They include deposits such as unconsolidated sands and gravels formed by rivers and clayey tills formed by glacial action. They may be overlain by landslide deposits or by artificial deposits, or both.



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Scale: 1:25 000 (1cm = 250 m)

Search area indicated in red

Key to Superficial deposits:

Map colour	Computer Code	Name of geological unit	Composition
	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
	ODT-DMTN	OADBY MEMBER	DIAMICTON
	THT-DMTN	THRUSSINGTON TILL	DIAMICTON
	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
	TILMP-DMTN	TILL, MID PLEISTOCENE	DIAMICTON
	RTD1-XSV	RIVER TERRACE DEPOSITS, 1	SAND AND GRAVEL
	RTD2-XSV	RIVER TERRACE DEPOSITS, 2	SAND AND GRAVEL

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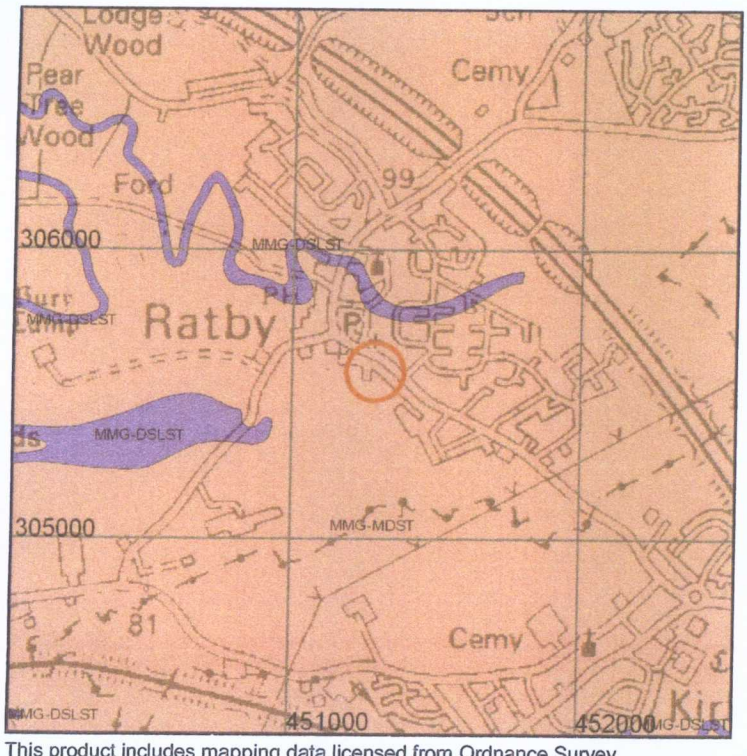
Bedrock

Bedrock forms the ground underlying the whole of an area, commonly overlain by superficial deposits, landslide deposits or artificial deposits, in any combination. The bedrock formations were formerly known as the 'Solid Geology'.



Search area indicated in red

Fault

Coal, ironstone or other mineral vein

Note: Faults are shown for illustration and to aid interpretation of the map. Because these maps are generalised from more detailed versions not all such features are shown and their absence on the map face does not necessarily mean that none are present. Coals, ironstone beds and mineral veins occur only in certain rock types and regions of the UK; if present here, they will be described under 'bedrock' below.

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Scale: 1:25 000 (1cm = 250 m)

Key to Bedrock geology:

Map colour	Computer Code	Name of geological unit	Rock type
	MMG-DSLST	MERCIA MUDSTONE GROUP	DOLOMITIC SILTSTONE
	MMG-MDST	MERCIA MUDSTONE GROUP	MUDSTONE

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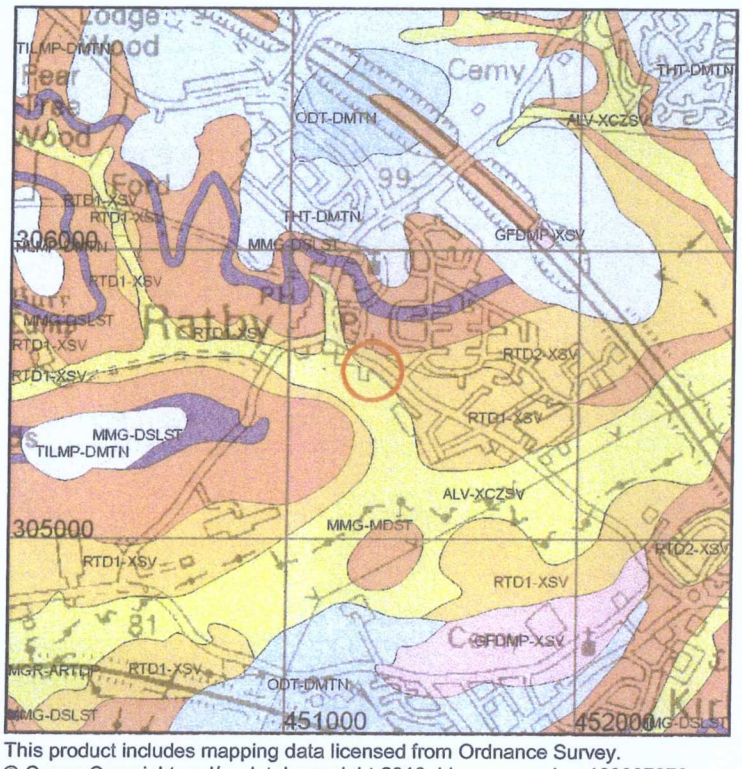
Combined 'Surface Geology' Map

This map shows all the geological themes from the previous four maps overlaid in order of age.



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Scale: 1:25 000 (1cm = 250 m)

Search area indicated in red

Please see the Keys to the Artificial, Landslide, Superficial and Bedrock geology maps.

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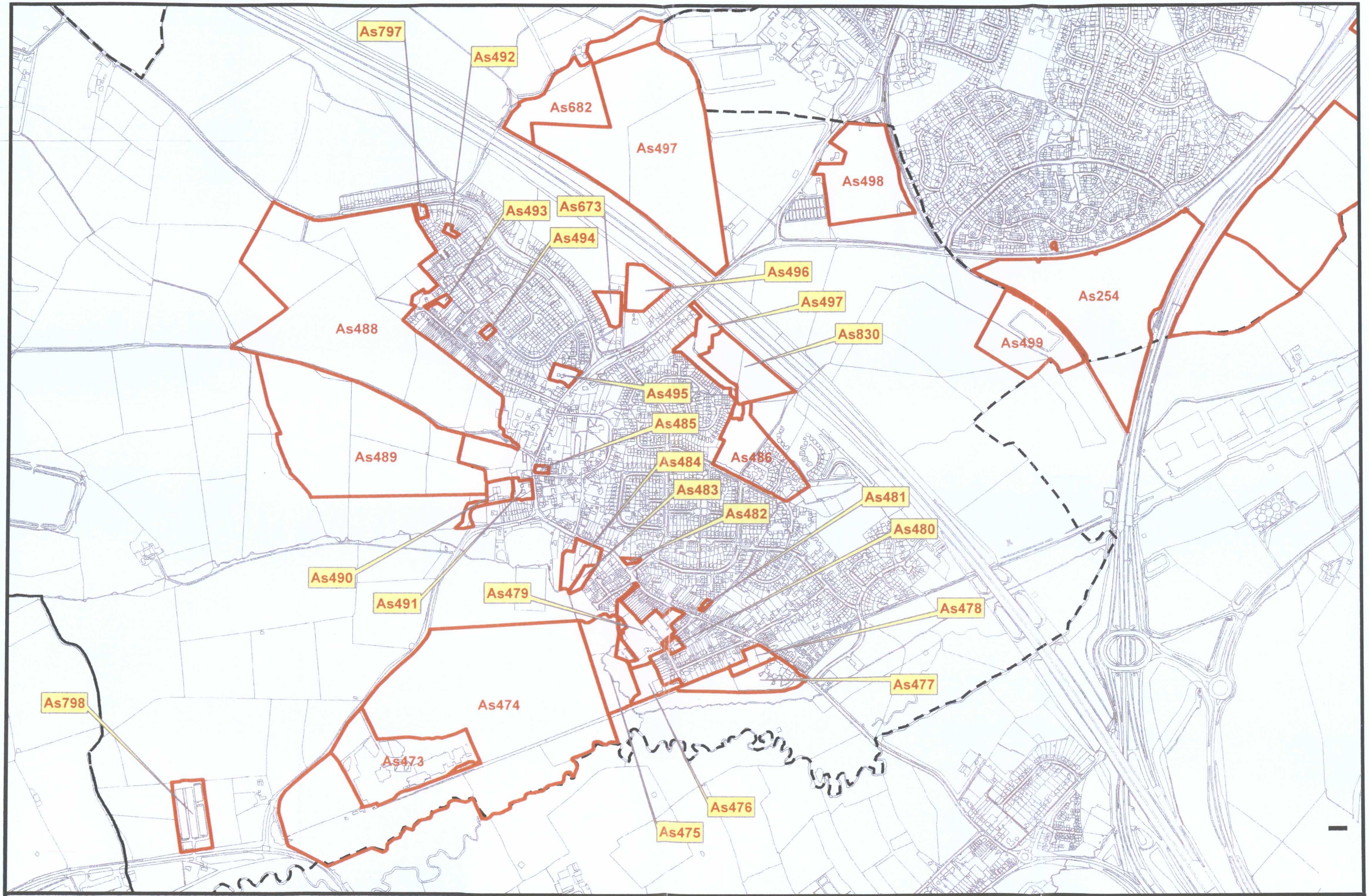
STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 6

Local Development Plan Extracts

Ratby Parish: Ratby (18/1)



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Drawn: 17/3/10

0 450 900 1,800 Meters

Strategic Housing Land Availability Assessment Proforma

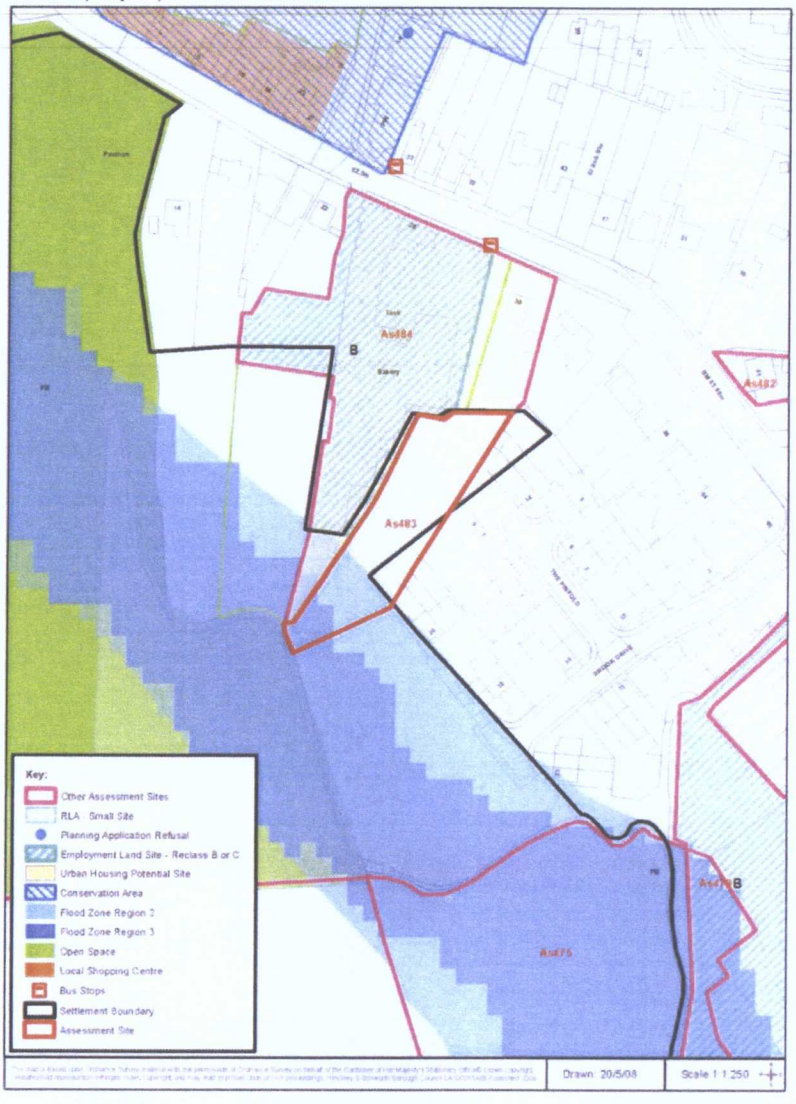
General Site Information				
Parish	Ratby			
As Ref	483			
Related/Previous Site References	EoI 166	Grid Reference	X	451276
			Y	305566
Site Description	Land off The Pinfold Ratby	Site size		0.19ha
Current Use	Paddock	Adjacent Uses		Residential Employment- Occupied Agricultural Recreation- amenity open space
Land Type	Greenfield			
Site Location	Adjacent to settlement boundary			
Character of surroundings	Mixed uses surrounding site			

Accessibility			
Distance to Bus Stop from centre of site	Within 400m	Distance to Bus Stop from site access	Within 400m
Distance to Primary School from centre of site	Within 400m	Distance to Primary School from site access	Within 400m
Distance to Local Centre from centre of site	Within 400m	Distance to Local Centre from site access	Within 400m
Distance to Post Office from centre of site	Within 400m	Distance to Post Office from site access	Within 400m
Distance to Health Centre from centre of site	Within 1000m	Distance to Health Centre from site access	Within 1000m
Distance to Secondary School from centre of site	Within 1500m	Distance to Secondary School from site access	Within 1500m
Distance to open space from centre of site	Within 400m	Distance to open space from site access	Within 400m
Additional Accessibility information	Site is very close to Station Road bus stops.		

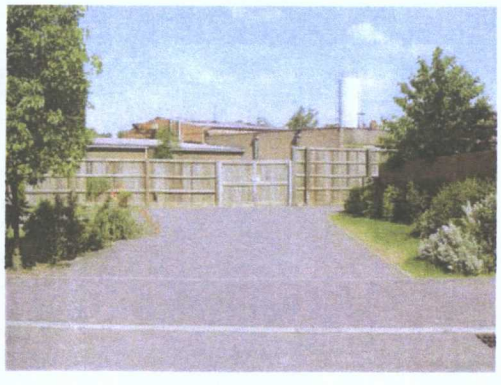
Constraints				
Identified Red constraint				
	Mitigatable		Comments	
Land & Soil Constraints	None known			
Environmental	Charnwood Fringe landscape character area Mature trees are present at the south-eastern tip of the site Site identified as having uncertain but potentially significant archaeological potential. The site is expected to represent a developable site with appropriate consideration and a completed archaeological assessment.			
Topographical	Flood zones 2 and 3 are present at the south-eastern tip of the site, however, this is not seen to be enough to be considered a red constraint.			
Planning Policy	Local Plan Policy NE5 may apply.			
Accessibility	The site has no frontage to an adopted highway, therefore the site is not appropriate for consideration.			
Ownership	None known			
Can the constraints be	Unknown			

mitigated	
Availability/ Achievability	
Market Interest	Medium
Timeframe for development	2014- 2019
Estimated number of dwellings	5
Estimated Density	30dph
Estimated Build Rate	60 pa
Suitable	Yes
Available	No
Achievable	No
Excluded from consideration	No
Comment	Site has been deemed suitable because access could be achieved through combining this site with As484, however this may have implications for availability and achievability because economic viability may be reduced or ownership constraints amplified. Suitability is dependent on adequate access provision there is possible access via the Pinfold.
Overall assessment	Developable
Additional information	Site is very close to Station Road bus stops. Access would be off The Pinfold Site is level Current access via The Pinfold Any proposal to build on the site should form part of the proposal to redevelop the bakery site.

Site As483 (Ratby 18/1): Previous ref no. EOI 166







AS Reference: 483

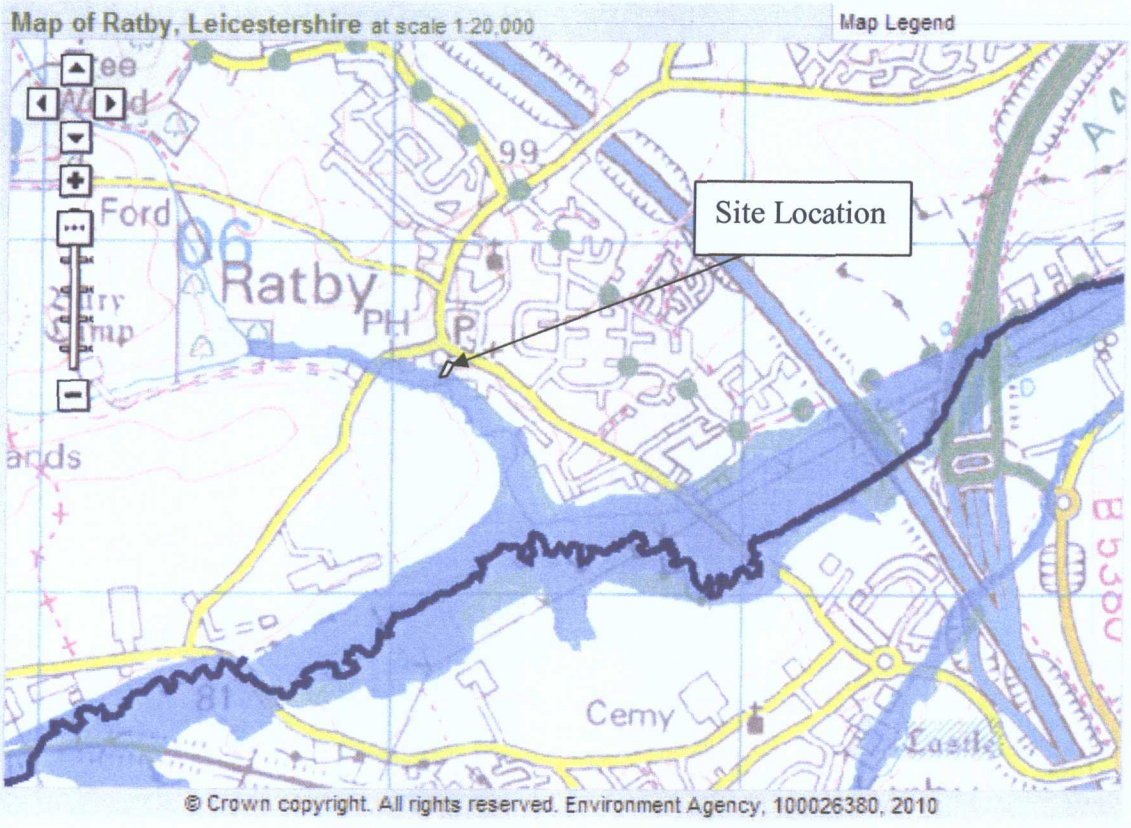
STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 7

Environment Agency Flood Zone Map and guidance notes

Environment Agency Flood Map



Before viewing the floodplain maps please read and understand the guidance notes below (as provided by the Environment Agency on their website: www.environment-agency.gov.uk).

CONTENTS

1. Understanding the Flood Map
2. Your Questions Answered
3. Flood likelihood explained

1. Understanding the Flood Map

The map and associated information is intended for guidance, and cannot provide details for individual properties.

To find out how to be prepared for all types of flooding go to our Floodline pages or call Floodline on tel: 0845 988 1188.

Key

1. Floodplain

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.

There are two different kinds of area shown on the Flood Map. They can be described as follows: -

- Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:
- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.
- Light blue shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

For a fuller explanation of flood likelihood, follow the link at the bottom of the page.

2. Flood Defences

The purple line shows all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. Flood defences that are not yet shown, and the areas that benefit from them, will be gradually added.

Hatched areas benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would be flooded.
Flood defences do not completely remove the chance of flooding, however, and can be overtopped or fail in extreme weather conditions.

For information on flood defences which are not yet shown on the map, contact your local Environment

Agency office.

3. Significant, Moderate or Low Likelihood of Flooding

Our assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels, and ground levels. By clicking within either of the blue areas of floodplain, you can see which of three further categories of likelihood of flooding (significant, moderate, or low) apply there.
For a fuller explanation of flood likelihood, follow the link at the bottom of the page.

4. Flood Warning - Flood Warning Areas

Flood warning schemes have been set up for a number of areas that are considered to be at particular risk from flooding. These areas are called Flood Warning Areas. Within these areas, we can warn residents in advance when flooding may be likely and how severe the flooding could be.
For advice about flood warning please click here. We also publish a number of flood warnings that are in force on this site.

---

2. Your Questions Answered

1. What is the Flood Map?

The Flood Map is a new multi-layered map which provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

2. What does it show?

The key for Flood Map consists of the following layers of information:

- Flooding from rivers or sea without defences – the natural flood plain area that could be affected in the event of flooding from rivers and the sea
- For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year
- For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year
- Extent of extreme flood – the extent of a flood with a 0.1% (1 in 1000) chance of happening each year
- Flood defences – flood defences built to a certain standard in the last five years
- Areas benefiting from flood defences – areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

The Flood Map does not provide information on flood depth, speed or volume of flow. It doesn't show flooding from other sources, such as groundwater, direct runoff from fields, or overflowing sewers. Your local Environment Agency office may have more information on these.

3. How does the Flood Map differ from the map previously available online?

We have published floodplain maps on our website since December 2000. The previous version, known as the Indicative Floodplain Map (IFM), used information from a variety of sources, from flood events of differing severity and from some basic modelling – it could tell you where there was a risk of flooding but not how often and not very reliably.

The new Flood Map combines detailed local data with information from a new national mod el of England and Wales, which gives a more consistent picture of flood risk and also enables us to identify flooding associated with smaller rivers than the IFM.

The Flood Map shows the potential extent of an extreme flood, which may be experienced as a result of climate change, and it also starts to show flood defences and indicate where the risk is reduced because of these defences.

4. Who will use the Flood Map and why?

The Flood Map is designed to increase awareness among the public, local authorit ies and other organisations of the likelihood of flooding, and to encourage people living and working in areas prone to flooding to find out more and take appropriate action.

The Flood Map can also be used by those people who wish to apply for planning permission in England to see whether the site they plan to develop is in a flood risk area. Further information is available by following the link to Development and Land Use Planning at the bottom of the page.

5. Will the Flood Map be updated?

As further appropriate information becomes available, it will be included in quarterly updates to the published Flood Map. It is anticipated that this will take place in January, April, July and October.

Flood defences not yet shown will be added gradually through these quarterly updates.

6. Why will you need to update the map?

We are committed to provide the best latest information to the public on flood risk. Our models are predictive and in the event of actual flooding we will need to revise the maps to take account of the new information received.

We also have an ongoing programme of improvement; as more detailed models are developed, we will have access to more information and will update the maps with it.

7. How accurate is the data?

Flood mapping is a complex, detailed and extensive process which will never be completely accurate, but we will always provide the best currently available information, using national consistent data. The Flood Map gives a good indication of the areas at risk of flooding in England and Wales. However it cannot provide detail on individual properties.

8. I thought that I was protected by a flood defence but it isn't shown on your map

Not all defences are shown yet; only defences built in the last five years to a certain standard are currently shown. More will be added as part of the updating process.

9. What do you mean by likelihood of flooding?

The probability or likelihood of flooding is described as the chance that a location will flood in any one year. The likelihood is expressed as a percentage i.e. 1%, or as a chance expressed for example as 1 in 100 chance in any given year. Find a link at the bottom of the page to this, labelled 'Flood likelihood explained'. It is important to remember that the risk of a flood occurring is there at all times - this year, next year and future years.

10. How do I find out whether I can insure my home for flooding?

Insurance companies decide whether to offer flood insurance to properties. However, an agreement reached between the ABI and Government in 2002 known as the ABI Statement of Principles, means that insurance companies will be able to offer insurance to many more properties that are at risk of flooding.

The Agency has helped to ensure that as many people as possible are able to obtain insurance by providing information on the risk of flooding across the whole of England and Wales from a National Flood Risk Assessment. This is a snapshot of flood risk at a national scale taken in summer 2004. The information from this assessment is provided on the website to support the Flood Map. By clicking on the "learn more" button anyone can find out what insurance category the general area where they live is in, either significant, moderate or low. These categories are based upon the likelihood of flooding from rivers and the sea at a location, taking into account the presence and effect of flood defences. As it is a national assessment, it is not able to state what the actual likelihood of flooding is to any specific property.

11. Will my insurer use the Flood Map?

Insurers have been given the same information on flood risk as that on the Internet. The flood maps do not show the risk at a particular property as the Environment Agency carries out flood mapping for areas of land. This is because we cannot know all details about all properties, for example how high the floor level is above ground level. Insurers can therefore only use the information as a first stage in assessing the flood risk for a general location. For more information, follow the link below to "Does this affect my home insurance".

12. How has the likelihood of flooding been calculated?

The likelihood of flooding has been calculated using predicted water levels and taking the location, type and condition of any flood defences into account, whether or not they are currently shown on the Flood

Map.

13. Why is there no information on the likelihood of flooding for my area?

The method for calculating the likelihood of flooding is independent of the method for calculating flood extents. The likelihood calculations are more complex and require more detailed input datasets. For some locations this extra data was not available at the time of production of the likelihood of flooding. We are working to update the data and fill in the data gaps over the next few months.

14. Why does 'learn more' tell me that my area is outside the extent of an extreme flood, when the map shows my area clearly in the floodplain?

The information accessed through 'learn more' is a snapshot of flood likelihood, at a national scale. There are two possible reasons why it may tell you that you are outside the extent of an extreme flood when the map shows your area in the floodplain. One possible reason is that the area you are looking at falls in or within three metres of a river, estuary or sea. In this case you may wish to try clicking slightly further away.
The second possible reason is that we have updated the mapped extent of extreme flood – which we will do every three months if we have better information – but have not yet updated the assessment of likelihood of flooding. The likelihood of flooding is based on an assessment that we intend to carry out annually.

15. Why does an area behind a defence still have a "significant" or "moderate" flood likelihood?

Flood defences do not completely remove the risk of flooding, but they do reduce it. Defences are built to withstand a flood of a certain magnitude but can be overtopped or fail either in extreme weather conditions or due to poor condition. Defences are built to different design standards according to local needs. Information on the likelihood of flooding takes account of the condition of defences as well as the standard of protection they provide. Your local Agency office may be able to provide more information on the defences in your area.

16. Why does the flood probability data occasionally indicate a significant risk for locations within the light blue shaded area?

The flood extents shown on the Flood Map and the flood probability data accessible by clicking on the 'learn more' button above the map have been calculated using two different and independent methodologies. The flood probability data takes account of defences which could be breached or fail i n a major event.

17. I don't agree with the map for my area. I want to challenge your information.

If you believe that a particular property is not at flood risk or if you have information that you believe we may not have taken into account, please contact your local Environment Agency office, who will consider your comments and will advise on the appropriate procedure. However we would be unlikely to be able to consider an amendment to the Flood Map based only on anecdotal evidence.

18. My property has never been shown as being in the floodplain before but it is now, why is this?

The floodplain as defined in the new Flood Map is more extensive in some areas than that in our previous map for two reasons. Firstly we are now able to identify flood risk areas associated with smaller rivers, and secondly the Flood Map shows the extent of the flood with a 0.1% (1 in 1000) chance of happening in any year. New information from local studies is continually becoming available and will be used to update the flood map quarterly.

19. Is a flood warning service available to me?

By using the link on the flood map, you will be able to find out whether you can get an advance flood warning. To find out how to be prepared for all types of flooding go to our F loodline pages or call our 24 hour Floodline service on tel: 0845 988 1188.

20. I've lived in my village for 50 years and I know this property has never flooded. Why is it shown on your Flood Map?

A flood with a 1% (1 in 100) or 0.1% (1 in 1000) chance of happening in any one year may well not occur within the space of 50 years. Being in a floodplain doesn't mean your home or business will definitely be flooded - many other factors come into the equation. The maps are a guide and should prompt people who live near a river or the sea to be aware and find out more.

21. I don't live near a river or the sea, why am I shown on your Flood Map?

Flood flows follow the natural contours of the ground – therefore the area that may flood could be some distance from a river. The location may be on a route that floodwater will take. Alternatively there may be culverted watercourses under the property or nearby, which you may not be aware of - during a flood these may not be able to carry all of the flood flow, and some water will flow above ground.
Flooding can occur from other sources such as groundwater and surface water runoff, but flooding from these sources is not shown on our map.

3. Flood likelihood explained

What we mean by the likelihood or probability of flooding
The probability or likelihood of flooding is described as the chance that a location will flood in any one year.
If a location has a 1.3% chance of flooding each year, this can also be expressed as having:

- a 1 in 75 chance of flooding in that location in any year
- betting odds of 75 to 1 against a location being flooded in any year

However, this doesn't mean that if a location floods one year, it will definitely not flood for the next 74 years. Nor, if it has not flooded for 74 years, will it necessarily flood this year.

When we describe the chance of flooding, we give it one of three descriptions or put it into one of three categories:

Significant: the chance of flooding in any year is greater than 1.3% (1 in 75)

Moderate: the chance of flooding in any year is 1.3% (1 in 75) or less, but greater than 0.5% (1 in 200)

Low: the chance of flooding in any year is 0.5% (1 in 200) or less

The **lower the percentage** then the **less chance** there is of flooding in any one year; the **higher the percentage** then the **more chance** there is of flooding in any one year.

An example of chance is:
A horse running in the Grand National with odds of 200 to 1 (or 1 chance in 200) has less chance of winning than one running at 75 to 1 (or 1 chance in 75). Similarly if the **chance of flooding is 200 to 1 (or 1 chance in 200)** then there is **less chance of flooding** than somewhere believed to have a **chance of flooding of 75 to 1 (or 1 chance in 75).**

Author: Environment Agency | enquiries@environment-agency.gov.uk

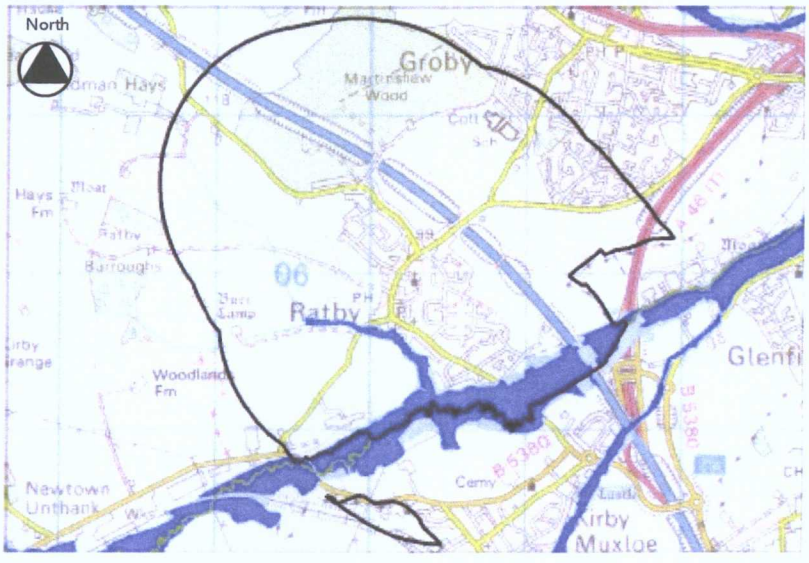
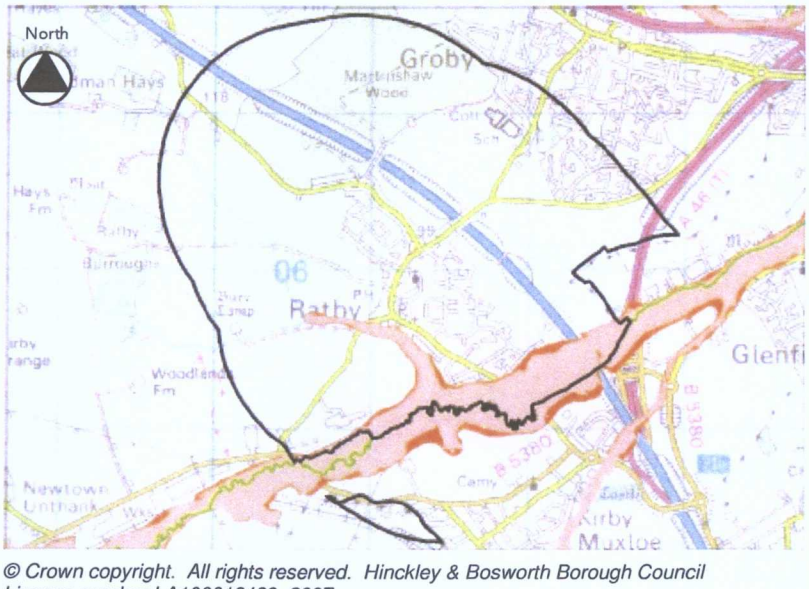
STATION ROAD, RATBY

FLOOD RISK ASSESSMENT

APPENDIX 8

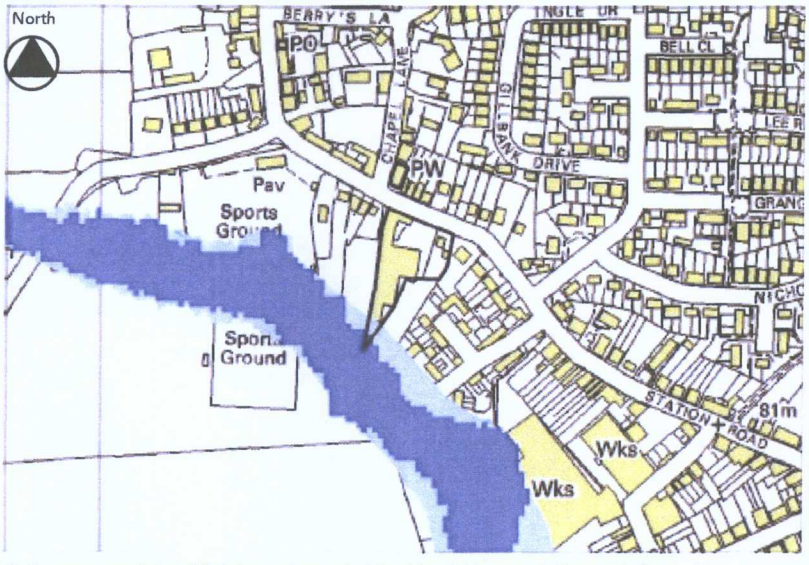
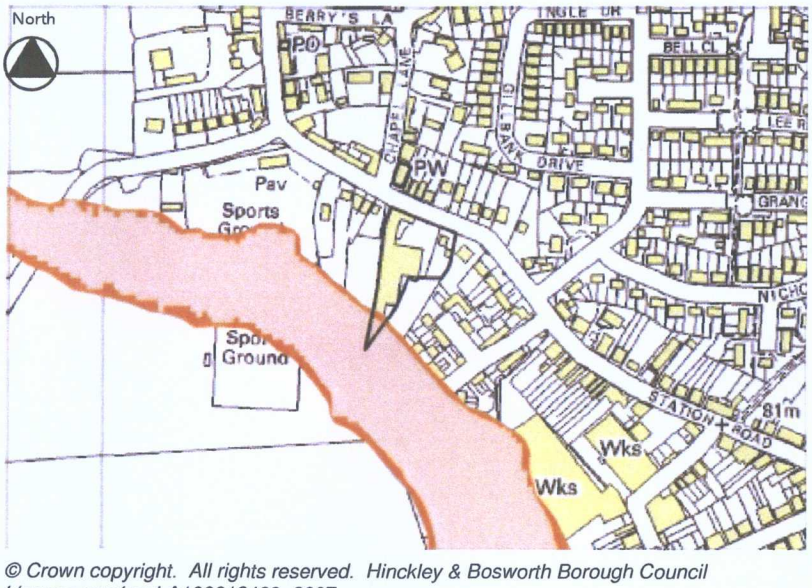
Strategic Flood Risk Assessment Extracts

Table 5-20 Ratby Key Rural Centre

Site:	Ratby Key Rural Centre
OS NGR:	SK 5133 0614
Flood Zone coverage: *Legend:* Main River Development Site Flood Zone 3 Flood Zone 2	FZ3a 5.5%, FZ2 1%, FZ1 93.5%  *© Crown copyright. All rights reserved. Hinckley & Bosworth Borough Council Licence number LA100018489, 2007*
Climate Change (CC) coverage: *Legend:* Main River Development Site Flood Zone 3 + CC Flood Zone 2 + CC	FZ3a+CC 6.5%, FZ2+CC 1.5%, FZ1 92%  *© Crown copyright. All rights reserved. Hinckley & Bosworth Borough Council Licence number LA100018489, 2007*
Tidal/Fluvial:	Fluvial – Rothley Brook.
Sources of Flooding:	Surface water run-off could be an issue due to the wet clay soil. This could potentially also lead to groundwater flooding problems. Tributaries of Rothley Brook known to be flashy in nature.
Defended:	Not defended
Historical flooding / Drainage on site:	Minor flooding known to have occurred at the western end of Park Road. Highway and garden flooding has occurred where the tributary of Rothley Brook crosses Desford Lane.

Site:	Ratby Key Rural Centre
	No drainage information available
Soil map data (Geology / Map symbol and subgroup / Soil and site characteristics):	Geology – Triassic mudstones Soil – Low permeability - clay content
Indicative suitability for SUDS:	Low for infiltration, although a local infiltration test could be undertaken. Other SUDS techniques should be thoroughly investigated in a FRA and serious consideration should be given to decreasing downstream flood risk through attenuation.
Brown / Greenfield:	n/a
Exception Testing	
Exception Test Applicable?	Yes, for areas within Flood Zones 2/3
Indicative likelihood of passing Test:	High
Recommendations:	Any development in the area west of Station Road must take account of flash flows in the tributaries of Rothley Brook. A FRA will be required to assess surface water run-off and how this will be managed. Flood risk to the site and existing sites further upstream and/or downstream must not be increased, and where possible should be decreased.

Table 5-21 Development site at Geary's Bakery, Station Road, Ratby

Site:	Geary's Bakery, Station Road, Ratby
OS NGR:	SK 5128 0562
Area (ha):	0.47
Number of Dwellings:	23
Flood Zone coverage: *Legend:* Main River Development Site Flood Zone 3 Flood Zone 2	FZ3a 2%, FZ2 3%, FZ1 95%  *© Crown copyright. All rights reserved. Hinckley & Bosworth Borough Council Licence number LA100018489, 2007*
Climate Change (CC) coverage: *Legend:* Main River Development Site Flood Zone 3 + CC Flood Zone 2 + CC	FZ3a+CC 4%, FZ2+CC 2%, FZ1 94%  *© Crown copyright. All rights reserved. Hinckley & Bosworth Borough Council Licence number LA100018489, 2007*
Tidal/Fluvial:	Fluvial – Tributary of Rothley Brook
Sources of Flooding:	Surface water run-off could be an issue due to the wet clay soil. This could potentially also lead to groundwater flooding problems.
Defended:	Not defended
Historical flooding /	No historical flooding records; however the site may be susceptible to flooding and/or have flooded in the past

Site:	Geary's Bakery, Station Road, Ratby
Drainage on site:	No drainage information available
Soil map data (Geology / Map symbol and subgroup / Soil and site characteristics):	Geology – Triassic mudstones Soil – Low permeability - clay content
Indicative suitability for SUDS:	Low for infiltration, although a local infiltration test could be undertaken. Other SUDS techniques should be thoroughly investigated in a FRA and serious consideration should be given to decreasing downstream flood risk through attenuation.
Brown / Greenfield:	Brownfield
Exception Testing	
Exception Test Applicable?	Yes
Indicative likelihood of passing Test:	High
Recommendations:	A FRA will be required to assess surface water run-off and how this will be managed. Flood risk to the site and existing sites further upstream and/or downstream must not be increased, and where possible should be decreased. It may be appropriate to adjust the site boundary so that the development site doesn't encroach into Flood Zones 3/2.

5.8 Waste & Mineral Development Sites

Due to their nature, waste and mineral development sites are potentially more hazardous when flooded, due to the risk of environmental pollution. It is recommended that waste facilities are planned to be located in Flood Zones 1 and/or 2, and wherever possible, mineral extraction sites should also be located in Flood Zones 1 and/or 2.