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139 Derby Street, Burton
Flood Risk Assessment

25 January 2013

Version 1.0

RAB: 458

Revision History

Version	Date	Amendments	Issued to
1.0	25.01.2013		Mr. Rashid

Quality Control

Action	Signature	Date
Prepared		22.01.2013
Checked		24.01.2013
Approved		25.01.2013

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1.0 Introduction

RAB Consultants has prepared this Flood Risk Assessment, in support of a proposed development of a two and half storey building to house two retail units on the ground floor with 6 flats above and with car parking at the rear.

Technical Guidance to the National Planning Policy Framework requires a Flood Risk Assessment to be carried out to ensure that new development is safe from flooding and will not increase the risk of flooding elsewhere.

2.0 Site Location

The proposed site is 139 Derby Street, Burton-on-Trent, Staffordshire, DE14 2LF; Grid Reference: SK 24621 24031. Refer to Appendix A for site location plan. Both vehicular and pedestrian access to the site is available via Derby Street.

3.0 Site History and Development Proposals

Planning permission is being sought to develop the property at 139 Derby Street into a two and a half storey building with car parking at the rear. Access to the properties will be via Derby Street. The current site area is approximately 450m²; the proposed buildings will have a footprint similar to the current area. Figure's 1 and 2 show the current development site; the building in the red dashed line is currently derelict and is to be demolished. The plans supplied by the developer can be found in Appendix B.



Figure 1: Photo of the site pre development looking north east along Derby Street



Figure 2: Photo of the site pre development from the front of the property

The site lies within Flood Zone 2, between 1% and 0.1% annual flood probability (a.p.), according to the Environment Agency's indicative flood map. The proposed development is classed as a 'more vulnerable' development in accordance with Table 2 Flood Risk Vulnerability Classification of the National Planning Policy Framework (NPPF). It is therefore subject to the sequential and exception test in accordance with Table 3 Flood Risk Vulnerability and Flood Zone 'Compatibility' of the NPPF. The Local Planning Authority has found these tests to be acceptable and agrees with the findings (Appendix F).

4.0 Flood Risk

The nearest watercourse and primary source of flood risk to the site is the River Trent which has been modelled by the Environment Agency to show the flood risk around Burton. The development site is approximately 775m west of the River Trent and lies within Flood Zones 2 as described in Technical Guidance to the National Planning Policy Framework (see Appendix A). Flood Zone 2 contains areas that are likely to be affected by an extreme flood event and contains land that is described as having between 1% and 0.1% annual probability of river flooding (1 in 100 and 1 in 1000 annual return period).

The Environment Agency has provided predicted flood level data from a 2D model of Burton that includes a series of breach scenarios. The 1% a.p. plus climate change flood level outline does not reach the site. At closest approach the predicted 1% a.p. plus climate change flood level is 45.35 mAOD (refer to Appendix C for Environment Agency flood level data).

A GPS verified topographic survey of the site was undertaken by Mapmatic on 20 November 2012 (Appendix D). It can be seen that ground levels across the site are within the range 45.80-46.02 mAOD and are higher than the 1% a.p. plus climate change flood level.

The Environment Agency also provided the 0.1% a.p. flood level for the site as 46.31 mAOD. During this flood event flood water is expected at the site.

4.1. Climate Change

In assessing the impacts of climate change on flooding from rivers, Table 5 of Technical Guidance to the National Planning Policy Framework recommends a 20% increase on peak river flows. For this assessment the 1% a.p. plus climate change flood level from the closest approach to the proposed development from the 2D breach analysis model will be used, i.e. 45.35 mAOD.

4.2. Previous Flood History

The current owners of the site have no knowledge of the site flooding in recent years.

The Environment Agency holds no records of historical flooding at the site (Appendix C).

Severn Trent Water has no records of any public sewer flooding in their statutory floods register within the area of the site (Appendix E).

4.3. Risk of Flood Defence Breach or Overtopping

There are purpose built flood defences protecting most of Burton against flooding from the River Trent with a standard of protection up to 0.5% a.p.

The latest 2D modelled data incorporates a breach and overtopping scenario at 10 key locations. This work shows that flood water is not expected to reach the site during a 1% a.p. plus climate change flood event.

During a 0.1% a.p. flood event, water is expected to reach the site with a maximum depth of 0.4m. Given the distance from the defences, water velocity is expected to be low, no more than 0.25m/s, suggesting a hazard rating of between 'danger for some' and 'danger for most' with reference to Table 13.1 of the Flood Risk Assessment Guidance for New Development Report FD2320/TR2.

4.4. Recommended Finished Floor Levels

In order to afford a level of protection against flooding in Burton, it is normally recommended that finished floor levels are set 300mm above the 1% a.p. plus climate change flood level for new builds in flood risk areas.

In this case, the level would be below the existing ground levels at the site. Therefore, it is recommended that the finished floor level for the proposed development is set no

lower than the existing floor level of 45.92mAOD, 0.57m higher than the 1% plus climate change flood level.

It should be noted that the ground floor use will be for retail shops and the upstairs use will be residential.

4.5. Safe Access and Exit

The Environment Agency normally require there to be dry access for a development during the 1% flood event. The normal access route to the site is via Derby Street; this access should be dry during a 1% plus climate change flood event. In a flood event emergency egress should be taken to the north via Horninglow Road as flood water is expected to the south.

As the site lies within the Environment Agency's Flood Warning Area, it is recommended that the residents of the new properties/businesses register to receive the Environment Agency's Flood Warning Service. The Environment Agency issue flood warnings to specific areas when flooding is expected.

5.0 Surface Water Runoff

The area of the site is approximately 0.045ha and is almost entirely impermeable surfaces. The development is unlikely to increase the impermeable area, but the current surface water drainage system could be improved. The development may provide an opportunity for betterment by introducing sustainable drainage techniques.

5.1. SuDS – Sustainable Drainage Systems

Paragraph 1.3.2 from the SuDS manual (C697) discusses the SuDS 'management train', which is intended to mimic the natural catchment process as closely as possible. Table 2 gives examples of the hierarchy of techniques that can be used to achieve the management train.

Table 2: Hierarchy of techniques and their descriptions	
Technique	Description
Prevention	The use of good house design and housekeeping measures to prevent runoff and pollution; rainwater reuse/harvesting
Source control	Soakaways, porous and pervious surfaces, water butts, green roofs
Site control	Routing water to large soakaways, infiltration or detention basins
Regional control	Balancing pond, wetlands, swales, retention ponds

Regional techniques are not feasible due to the size of the proposed development; however, prevention, source and site control techniques may be applicable. Table 3 highlights the SuDS techniques which may be applicable within the development.

Table 3: Feasibility of techniques at the proposed site		
Technique	Issues	Feasible? Y / N
Prevention		
Good building design and rainwater harvesting	Ensuring that drains and guttering are properly located and laid could enable water to be collected for re-use.	Y
Source Control		
Porous and pervious materials/Soakaways/Green Roof	A permeable surface on the proposed driveway and parking areas will provide an opportunity for some run-off to infiltrate into the ground.	Y
	Soakaways could be used to manage runoff from the buildings, although ground tests would be needed to demonstrate suitability.	Y
	The use of a green roof would not be in-keeping with the local properties.	N
Site and Regional Control		
Infiltration / detention basins / balancing ponds / wetlands / swales / retention ponds	It is feasible to provide extra surface water storage (oversized pipes, below ground tank or a pond) such that the outflow from the site can be controlled for betterment or if ground conditions are unsuitable for infiltration.	Y

The development provides some scope for the introduction of SuDS techniques. Permeable surfaces should be used on the proposed driveway and parking areas. The use of soakaways should be investigated for the disposal of runoff from buildings or an attenuation storage system if the ground is found to be unsuitable for infiltration. With the introduction of the above SuDS techniques runoff betterment should be achieved.

6.0 Conclusion

It is proposed to develop the land at 139 Derby Street which will include a two and half storey building to house two retail units on the ground floor with 6 flats above and with car parking at the rear.

The site is located within Flood Zone 2 due to its proximity to the River Trent. The Environment Agency's 2D breach and overtopping model shows the site to be outside the 1% a.p. plus climate change flood outline. The site is predicted to flood during the 0.1% a.p. event. During a 1% plus climate change a.p. flood event dry emergency access and egress will be available.

Burton upon Trent is well protected from flooding and in the event of the flood defences breaching, flooding at the site is not expected during the 1% a.p. plus climate change flood event.

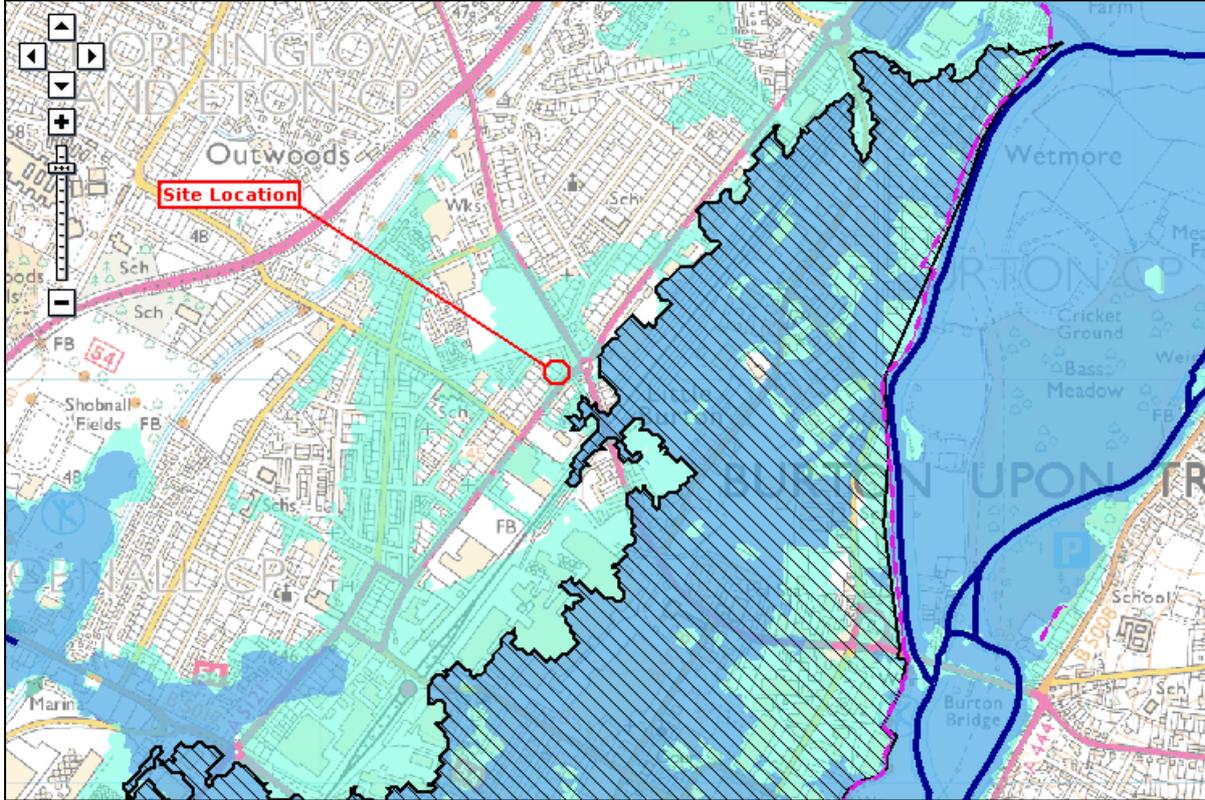
There will be no increase in impermeable area under the proposal and hence no change in the rate and volume of surface water runoff is expected. Betterment could be provided through the use of SUDS; however ground conditions would have to be suitable for this approach.

It is concluded that the proposed development is appropriate for the flood risk and is not expected to increase the risk of flooding elsewhere.

7.0 Recommendations

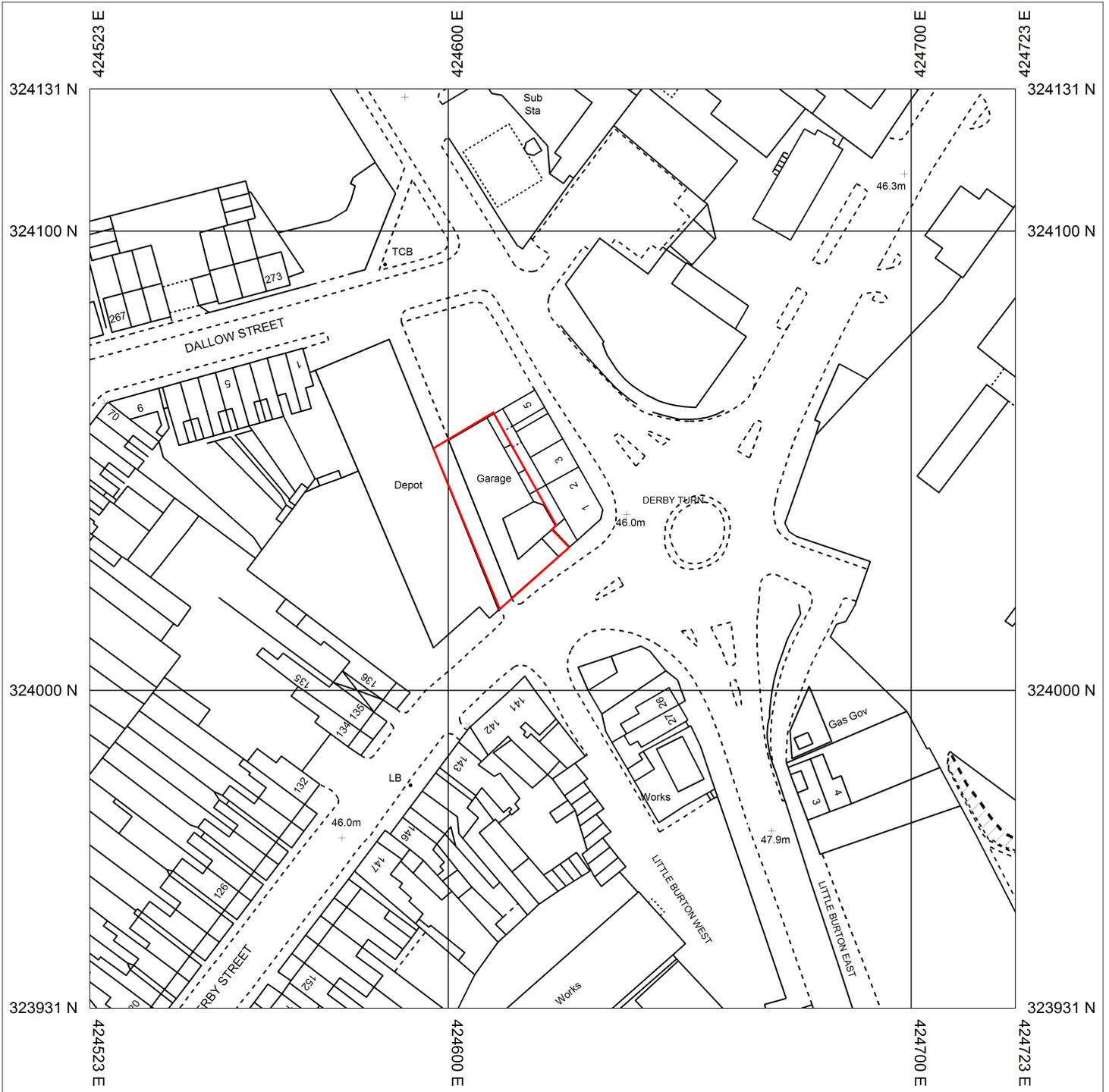
- Set finished ground floor levels no lower than the existing floor level of 45.92mAOD.
- It is recommended that the shop tenants, residents and landlord of the property register with the Environment Agency's Flood Warning Service.
- Implement a SuDS drainage scheme to reduce surface water runoff and improve the management of rainwater at the site such as a permeable surface on the parking areas.

Appendix A - Location Plan and Flood Map



Screen shot taken from the Environment Agency online flood map on 12/12/2012 showing the site location and the River Trent.

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The representation of a road, track or path is no evidence of a right of way.

The representation of features as lines is no evidence of a property boundary.



Scale 1:1250

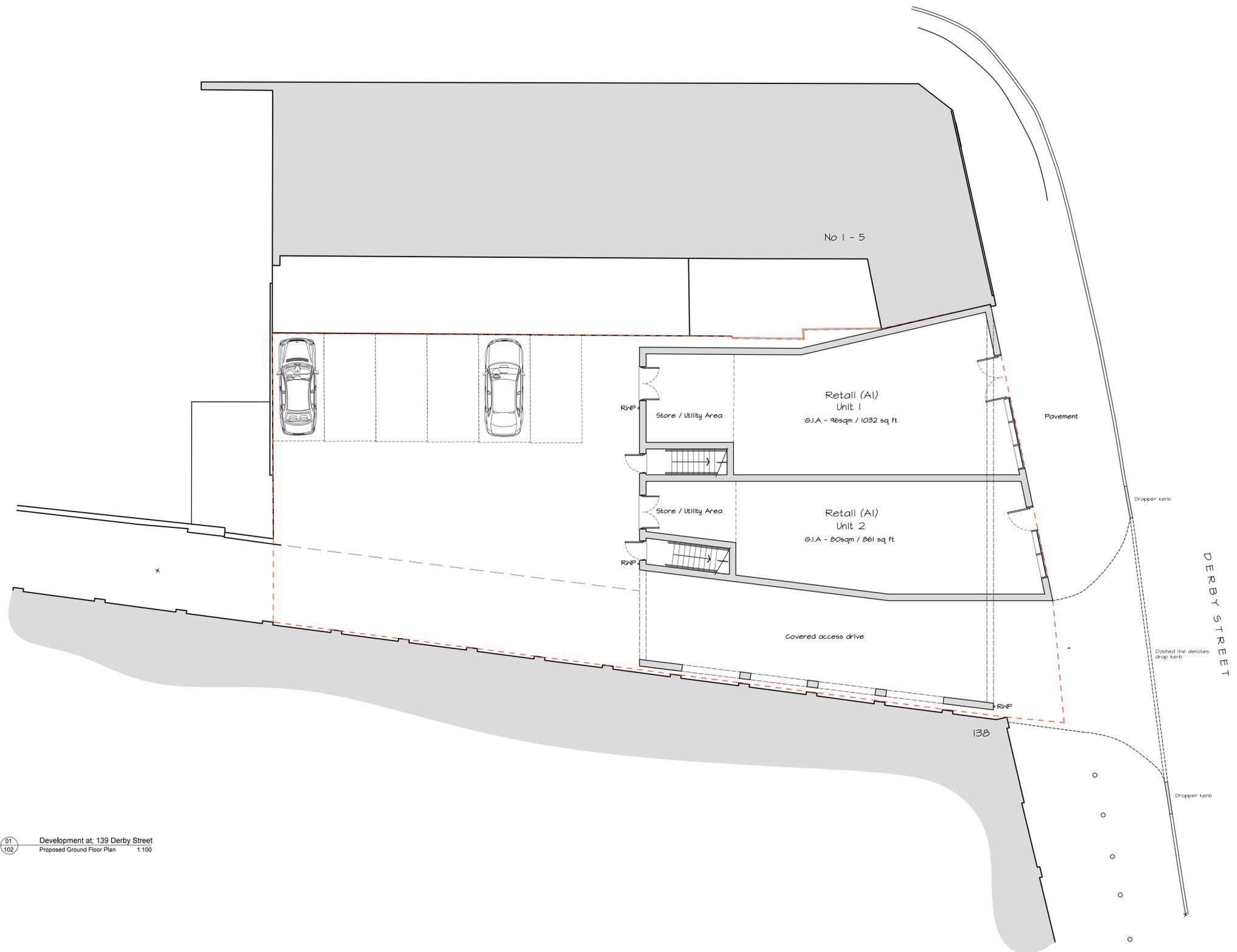
Supplied By: Derby John E Wright

Serial number: 001077128

Plot Centre Coordinates: 424623, 324031

Appendix B – Proposed drawings

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01
102 Development at: 139 Derby Street
Proposed Ground Floor Plan 1:100

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			PROJECT Development at: 139 Derby Street, Burton on Trent	T: 01332 258350 E: mail@justin-smith-architects.co.uk W: www.justin-smith-architects.co.uk	
			DRAWING Proposed Ground Floor Plan	STATUS Planning	
			PROJECT NO. A12-063	DWG. NO. 102	SCALE 1:100

JUSTIN SMITH ARCHITECTS



01 Development at: 139 Derby Street
Proposed First Floor Plan 1:100



02 Development at: 139 Derby Street
Proposed Second Floor Plan 1:100

NOTES

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DRAWING INFORMATION
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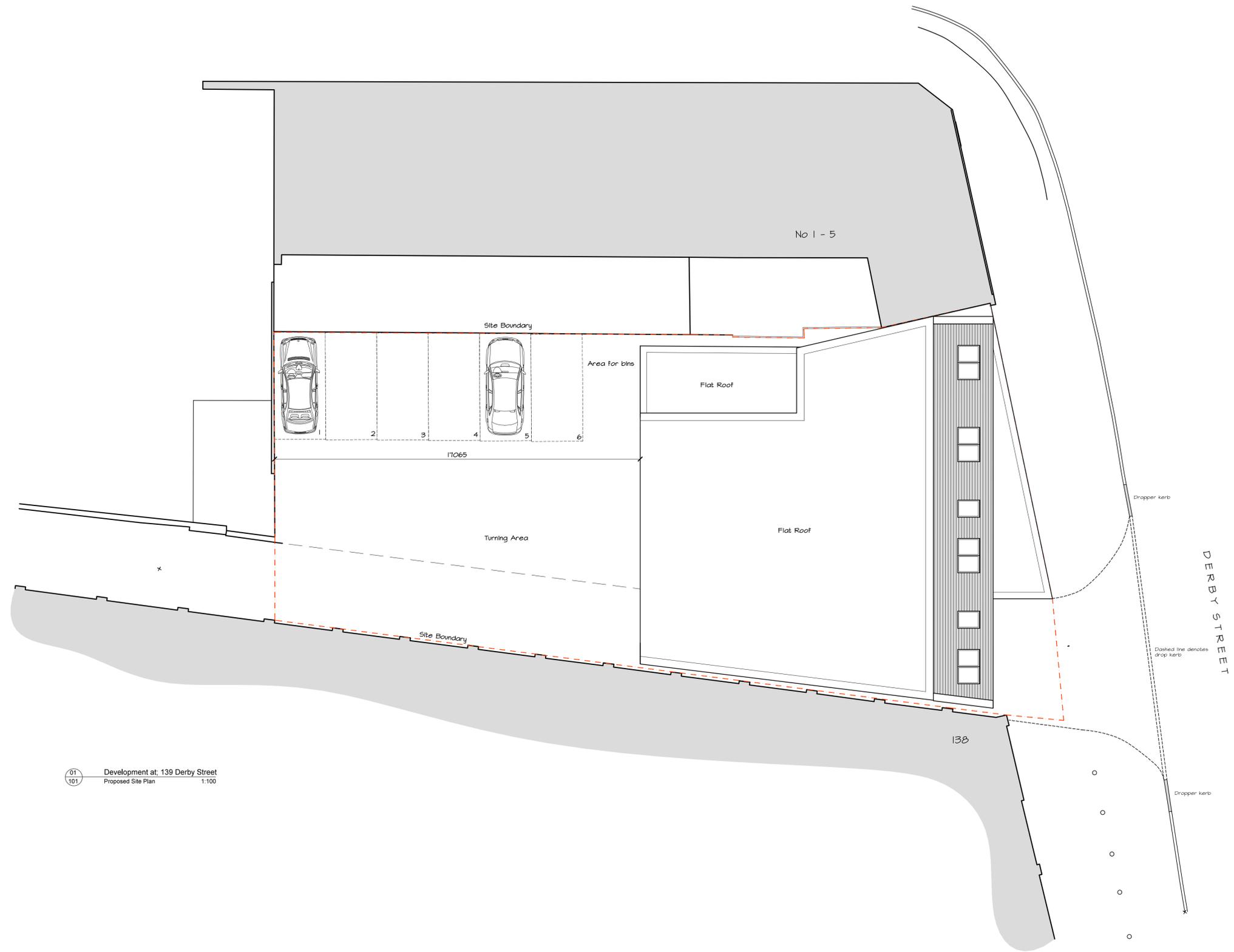


REVISIONS

CLIENT			
Mr M. Rashid			
PROJECT			
Development at: 139 Derby Street, Burton on Trent			
DRAWING			
Proposed Second Floor Plan			
PROJECT NO.	DWG. NO.	REV.	STATUS
A12-063	103		Planning
DATE	SCALE	DWG. SIZE	DRAWN
Dec'12	1:100	A1	DC

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01 Development at: 139 Derby Street
101 Proposed Site Plan 1:100

NOTES

01
101

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This CAD drawing is plotted from file: A12-063A2.11101
This CAD drawing contains the Xref's: A12-063A2.2\Plan_Site_Plan_3



REVISIONS

NO.	DATE	DESCRIPTION

CLIENT Mr M. Rashid			
PROJECT Development at: 139 Derby Street, Burton on Trent			
DRAWING Proposed Site Plan			
PROJECT NO. A12-063	DWG. NO. 101	REV.	STATUS Planning
DATE Dec'12	SCALE 1:100	DWG. SIZE A1	DRAWN DC

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Appendix C – Environment Agency data

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100yr+CC Breach Level centred on Burton-Upon-Trent. Created December 2012.

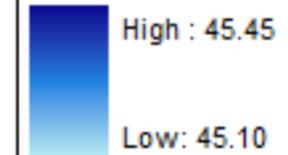
Ref: 4109



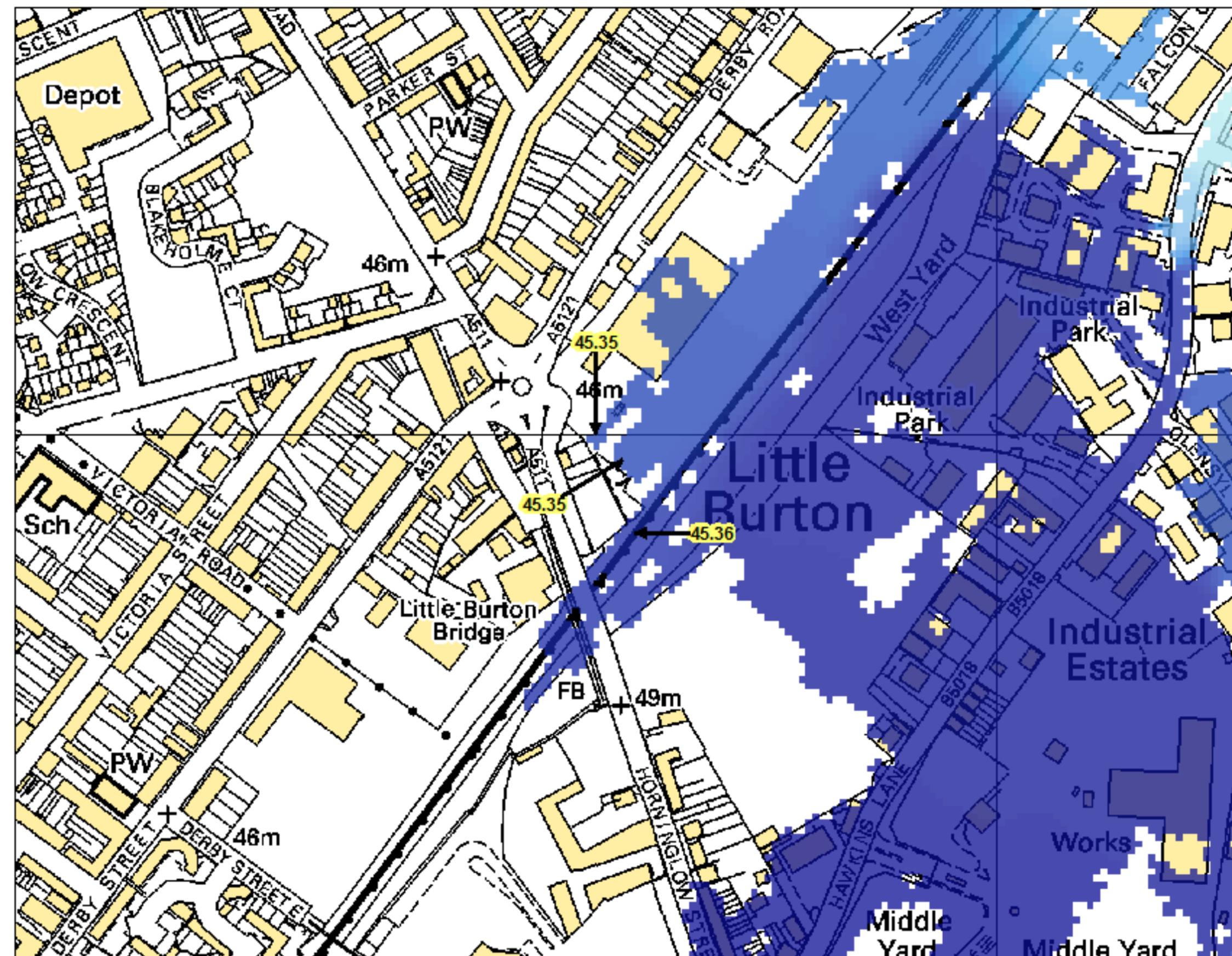
Legend

100YRCC Combined Breach mA OD

Value



Scale 1:4,000



1000yr Undefended Flood Level centred on Burton-Upon-Trent. Created December 2012.

Ref: 4109



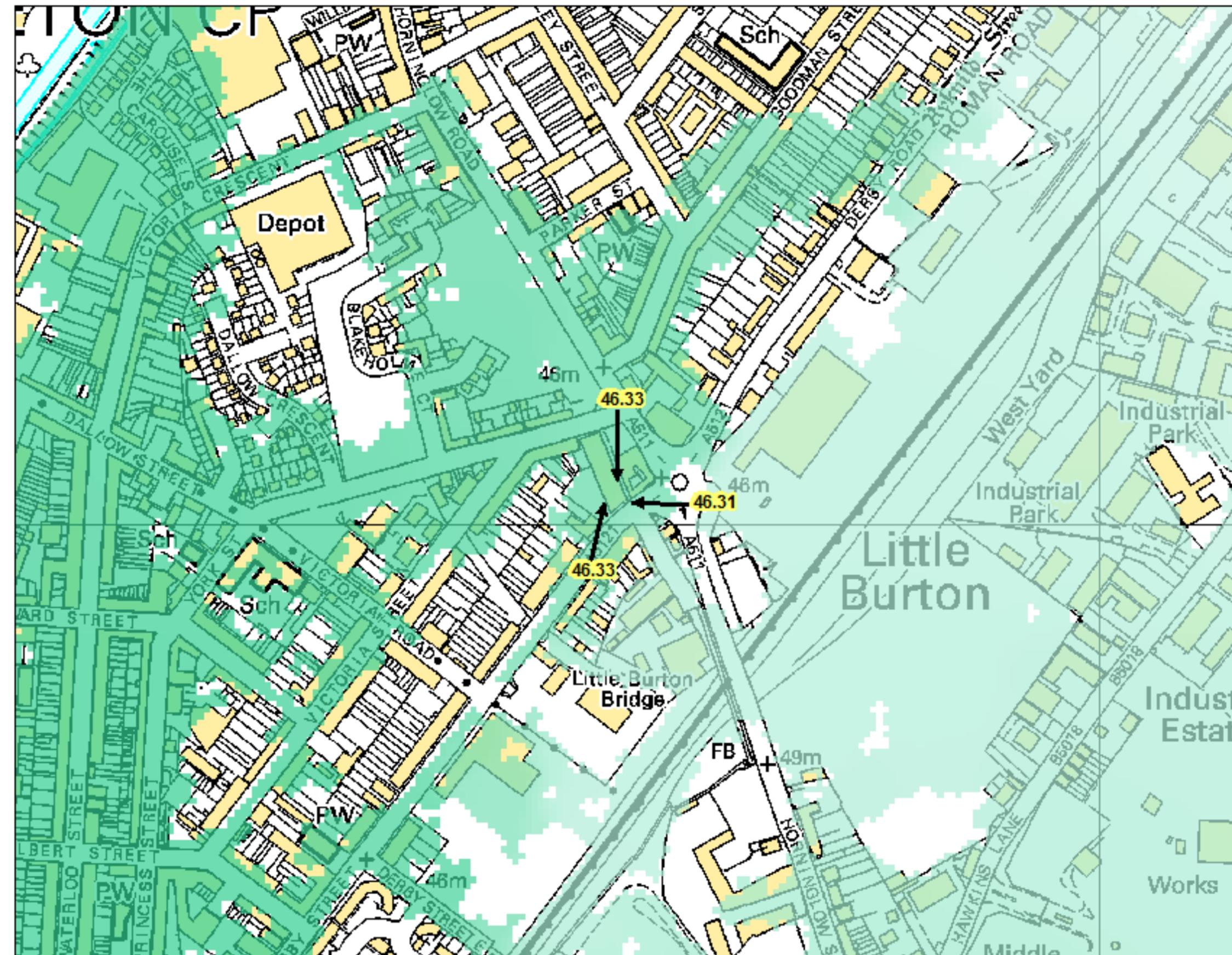
Legend

1000YR_UNDEFENDED

Value



Scale 1:4,500



Modelled Level Node Points centred on Burton-Upon-Trent. Created December 2012.

Ref: 4109



Legend

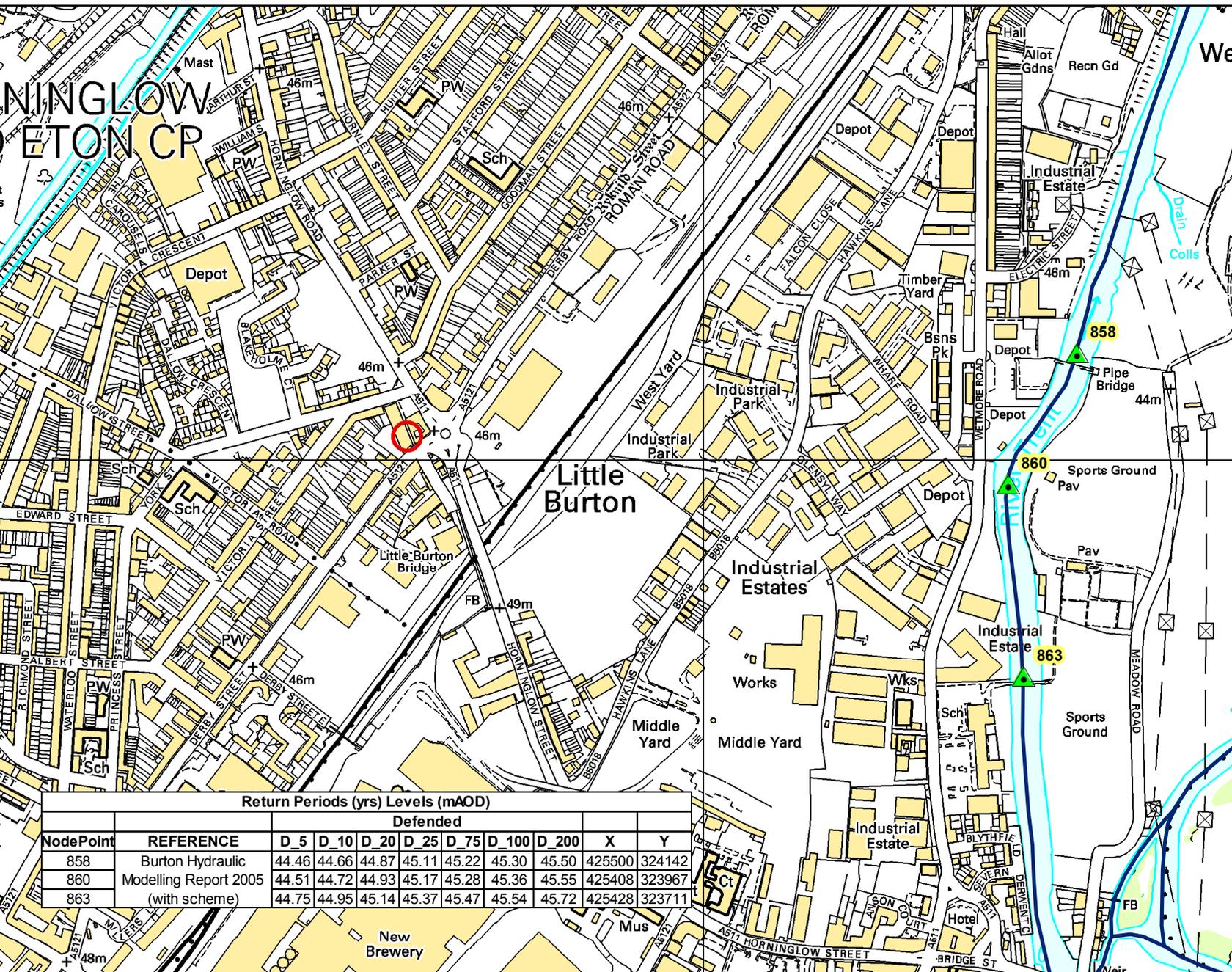
-  Modelled Levels
-  Main Rivers
-  Site Location



Scale 1:7,500

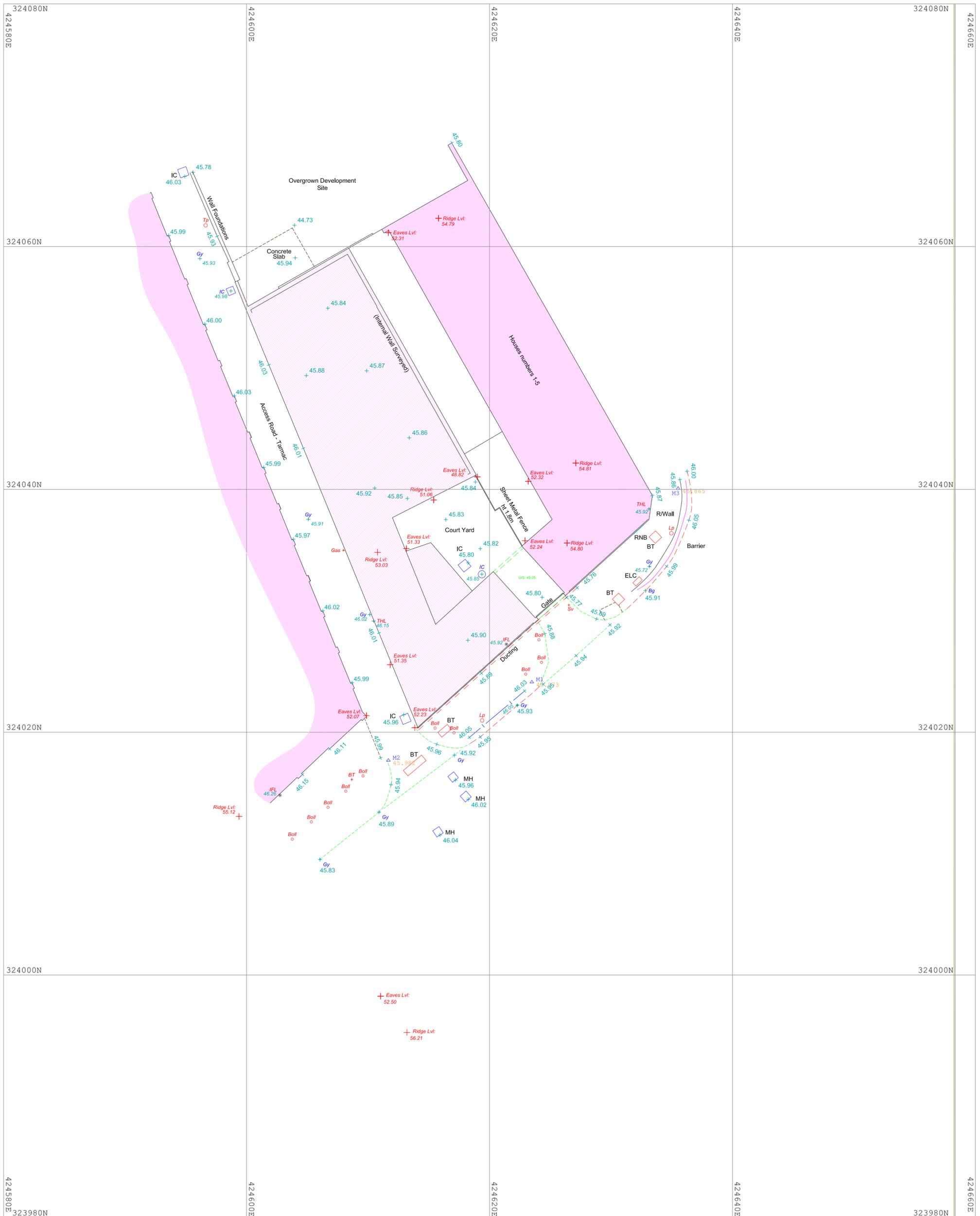
Return Periods (yrs) Levels (mAOD)

NodePoint	REFERENCE	Defended							X	Y
		D_5	D_10	D_20	D_25	D_75	D_100	D_200		
858	Burton Hydraulic	44.46	44.66	44.87	45.11	45.22	45.30	45.50	425500	324142
860	Modelling Report 2005	44.51	44.72	44.93	45.17	45.28	45.36	45.55	425408	323967
863	(with scheme)	44.75	44.95	45.14	45.37	45.47	45.54	45.72	425428	323711



Appendix D – Topographic survey

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MAPMATIC
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Tel/Fax: 01332 650580
MAPMATIC.COM
EMAIL: INFO@MAPMATIC.COM

CLIENT
Saj Rashid
PROJECT
139 Derby Street, Burton
TITLE
Topographical Survey

Scale 1:200
Date 20/11/2012
Drawn AW
Level datum O.S GPS
Grid orientation O.S GPS
Job number 644

NOTES:
All critical measurements should be checked on site prior to design. No liability will be taken for this plan if passed on to 3rd parties.
THIS SURVEY HAS BEEN ORIENTATED TO THE ORDNANCE SURVEY (O.S.) NATIONAL GRID (OSGB36) VIA A GLOBAL POSITION SYSTEM (GPS) AND THE O.S. ACTIVE NETWORK (OS NET). A TRUE OSGB36 COORDINATE HAS BEEN ESTABLISHED NEAR TO THE SITE CENTRE VIA A TRANSFORMATION USING THE OSTN02 & OSGM02 TRANSFORMATION MODELS. THE SURVEY HAS BEEN CORRELATED TO THIS POINT AND A FURTHER ONE OR MORE OSGB36 POINTS ESTABLISHED TO CREATE A TRUE O.S. BEARING FOR ANGLE ORIENTATION. NO SCALE FACTOR HAS BEEN APPLIED TO THE SURVEY THEREFORE THE COORDINATES SHOWN ARE ARBITRARY & NOT TRUE O.S. COORDINATES WHICH HAVE A SCALE FACTOR APPLIED. PLEASE REFER TO SURVEY STATION TABLE TO ENABLE ESTABLISHMENT OF THE ON-SITE GRID.

Station	Easting (m)	Northing (m)	Level (m)

Ordnance Survey information is provided for a guide only.

- OS GENERAL HATCH
- OS BUILDING OUTLINE
- OS DETAIL
- OS BUILDING HATCH
- OS ROAD HATCH

KEY:					
IC	Inspection chamber	Fh	Fire Hydrant	Tp	Telegraph Post
CL	Cover level	St	Stop tap	Tl	Traffic Light
IL	Invert level	Sv	Stop valve	Bs	Bus Stop
P.Inv	Pipe Invert	Wc	Wash Out	Fl	Floodlight
Gy	Gully	Wm	Water Meter	Fp	Flagpole
Bq	Back Gully	Mkr	Service Marker	Pb	Post box
MH	Manhole	Re	Rodding eye	Lb	Litter Bin
EC	Electric	Lp	Lamp Post	Bo	Bollard
BT	British Telecom	Sp	Sign Post	TCB	Telephone call box
		Ep	Electricity Post	Fs	Flagstaff
				Wl	Water level
				Ht	Height
				IFL	Internal floor level
				THL	Threshold level
				Dk	Drop kerb
				Gs	Gas
				Er	Earth rod
				BH	Bore Hole
				TH	Tidal Hole
				BM	Benchmark

Appendix E – Information from Severn Trent

From: Gareth.Renshaw@severntrent.co.uk on behalf of
net.dev.west@severntrent.co.uk

Sent: 08 January 2013 15:27

To: rob.shenton@rabconsultants.co.uk

Subject: Re: Fw: Request for historical flood records

Hi Rob,

Many thanks for your email.

I am happy to inform you that according to our statutory floods register that there are no instances of public sewer flooding within the area at the address you have specified.

Should you require any further information then please don't hesitate to contact us.

Kind regards,
Gareth Renshaw
On behalf of Asset Protection Wastewater West
Tel: 01902 793871
Fax: 01902 793971
net.dev.west@severntrent.co.uk

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Appendix F – Sequential and Exception Test response

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Philip Somerfield B.A. Dip T.P., D.M.S. M.R.T.P.I
Head of Regulatory Services

Date: 24th January 2013

Direct Line: 01283 508644
Direct Fax: 01283 508388
Reply to: Michael Brown
Our Ref: QU/2012/ENQ/0820

Rob Shenton
RAB Consultants

(please quote this reference on all correspondence with us)

Dear Sir

**Re: Sequential and Exception Test,
139 Derby Street, Burton upon Trent, Staffordshire, DE14 2LF.**

Further to your e-mail and attachment submitted regarding the above, which were received on 4th January 2013, I can confirm that the submitted sequential and exception tests, as required under the National Planning Policy Framework are acceptable, and the Local Planning Authority agrees with the submitted findings.

If you have any further queries please do not hesitate to contact me on the above direct dial number.

Yours faithfully

A handwritten signature in blue ink, appearing to read "Michael Brown", is written over a light blue rectangular background.

Michael Brown
Planner
michael.brown@eaststaffsbc.gov.uk