PROPOSED DEVELOPMENT
NEW STREET / LOWER THOMAS STREET, BARNSLEY
FLOOD RISK ASSESSMENT

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ON

PROPOSED DEVELOPMENT

NEW STREET / LOWER THOMAS STREET

BARNSLEY

FOR

BARNSLEY RETAIL PARTNERSHIP APPLICANT

RED PROPERTY SERVICES

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FLOOD RISK ASSESSMENT IN ACCORDANCE WITH PPS25

FOR

PROPOSED DEVELOPMENT

AT

NEW STREET / LOWER THOMAS STREET

BARNSLEY

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Proposed Development at New Street / Lower Thomas Street, Barnsley

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Proposed Development at New Street / Lower Thomas Street, Barnsley

Flood Risk Assessment in accordance with Planning Policy Statement 25 (PPS25)

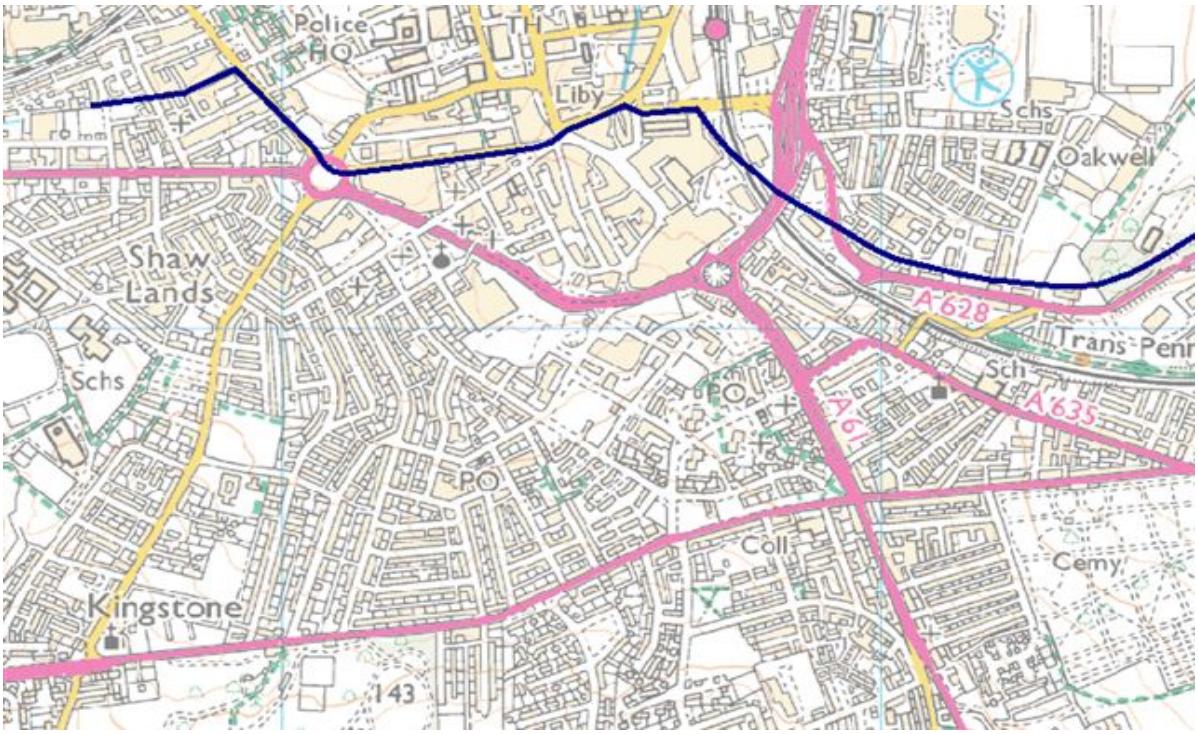
The following Flood Risk Assessment has been prepared to support an application by Red Property Services as lead consultant on behalf of their client, Barnsley Retail Partnership. This Flood Risk Assessment has been prepared in accordance with the requirements of PPS25, in particular, the pro-forma contained in Appendix C of PPS 25 Practice Guide and Environment Agency FRA Guidance Note 1.

1.0 Existing Site Description and Location

1.1 The subject site is located at NGR 381000E, 399200N off the A628 West Way, Barnsley. The Site Location Plan is attached at Appendix A, and it confirms the subject site is a mixture of industrial units, derelict land and car parking, with falls of 12m South to North and West to East.

1.2 Proposed Site Layout is also attached at Appendix A, as Michael Hyde Associates Drg. drawing number 07

1.3 The extract of the web-based Environment Agency Flood Risk Map below confirms that the site is within an area classified at Flood Zone 1 – Low Probability. Table D1 of PPS25 confirms that this is representative of land assessed as having less than a 1 in 1000 (0.1%) annual probability of flooding from rivers and coastal inundation in any one year.



2.0 General Development Proposals

2.1 The site will be redeveloped by construction of a new retail food store and associated servicing over a surface level car park and PFS.

2.2 The area currently occupied by a mixture of light industrial units, derelict land and car parking.

2.3 This building development type is classified in Table D2 of PPS25 below as within the "Less Vulnerable" category in consideration of flood risk.

Table D.2: Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	• Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.[19]
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste.[20] • Sites used for holiday or short-let caravans and camping, **subject to a specific warning and evacuation plan.**
Less Vulnerable	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment plants. • Sewage treatment plants (if adequate pollution control measures are in place).

Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, **subject to a specific warning and evacuation plan**.

2.4 Table D3 of PPS25 below confirms the proposed development type is compatible with a location within Flood Zone 1.

Table D.3[22]: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✔	✔	✔	✔	✔
	Zone 2	✔	✔	Exception Test required	✔	✔
	Zone 3a	Exception Test required	✔	✗	Exception Test required	✔
	Zone 3b 'Functional Floodplain'	Exception Test required	✔	✗	✗	✗

Key:

✔ Development is appropriate

✗ Development should not be permitted

3.0 Definition of Flood Hazard

3.1 Reference to the Barnsley Metropolitan Borough Council SFRA (Level 1 SFRA September 2010), The SFRA confirms that this site to not be within a Critical Drainage Area, defined as one particularly sensitive to an increase in the rate of surface water runoff and/or volume from new development.

3.2 The possible history of flooding caused by blockage or lack of capacity in surrounding sewers has been considered. Yorkshire Water have been consulted in this respect and reference has been made to the SFRA for historical record of flooding.

3.3 Barnsley MBC has also been consulted, as the organization responsible for highway drainage and land drainage maintenance in Barnsley, in respect of any possible history of flooding from local watercourses or highways drains and reference has been made to the SFRA for record of flooding of properties as a result.

3.4 The site may be at risk of flooding as a result of flooding from local watercourses or other open bodies of water. Reference has been made to the SFRA for record of flooding of properties as a result.

3.5 The site may be at risk of flooding as a result of groundwater levels reaching and exceeding existing ground levels on site. Reference has been made to the SFRA for record of flooding of properties as a result.

3.6 Any increase in impermeable areas within the development site will increase the risk of overland flooding.

4.0 Probability of Flooding

4.1 The site is classified as within Flood Zone 1 and, in consequence, the risk of flooding on site is less than a 1 in 1000 (0.1%) annual probability from rivers and coastal inundation in any one year.

4.2 Yorkshire Water have responded to our consultations with respect to properties on the flood risk register and historical flooding.

4.3 Yorkshire Water have confirmed no record of flooding to properties caused by overloaded sewers in the vicinity.

4.4 There is no record in the SFRA of flooding of local properties caused by flooding from local sewers.

4.5 Barnsley MBC have not responded to our consultations with respect to flooding from highways and associated culverts.

4.6 Barnsley MBC have confirmed they have no record of any properties having flooded as a consequence of highway flooding in the area

4.7 There is no record in the SFRA of flooding of local properties caused by flooding from highway drains and culverts.

4.8 The SFRA makes no reference to any local flooding as a result of groundwater levels reaching or increasing above existing ground level.

4.9 There are no other bodies of open water local to the site likely to cause flooding.

4.10 Peak short storm rainfall intensities have been generated for a range of storm returns.

Storm frequency	Average rainfall intensity I (mm/hr) for 15-minute duration summer storm
YR1	29.85
YR30	73.53

YR100	99.4
YR100 + 20%	119.2

4.11 Standard Average Annual Rainfall (SAAR) for the catchment to the site is approximately 665mm. With a site area approximately 27750 square metres, the total annual volume of rainfall to fall on the subject site will therefore be 18,450 cubic metres.

4.12 The existing site is conservatively considered to be 90% impermeable. Peak short storm unattenuated run-off from the existing buildings and hardstandings will be:-

Storm frequency	Rainfall Intensity I mm/hr	Estimated former peak run-off litres/sec for site imp area 2.498 hectares
YR1	29.85	202
YR30	73.53	498
YR100	99.4	673

4.13 There is no proposal to increase the impermeable area on the site and therefore total drained areas will remain the same, with unattenuated peak run-off as follows:-

Storm frequency	Rainfall Intensity I mm/hr	Estimated unattenuated peak run-off litres/sec for site imp area 2.498 hectares
YR1	29.85	202
YR30	73.53	498
YR100	94.9	673
YR100 + 20%	119.2	807

4.14 The SFRA User Guide advises that development should aim for a minimum reduction in surface water runoff rates of 50% for brownfield sites, up to a 1% rainfall event with allowance for Climate Change.

4.15 Development drainage should also be designed to avoid surface flooding up to a 3.33% rainfall event and no flooding of property during a 1% + Climate Change event.

5.0 Climate Change

5.1 According to Annex B of PPS25, it is anticipated that Climate Change will bring about an increase in rainfall intensities in the future.

5.2 See PPS25 Table B.2 below.

Table B.2 Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights.

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

5.3 With an estimated design life of up to 50 years for commercial developments, any necessary on-site designs for drainage, soakaways or other sustainable methods limiting surface water disposal flows will incorporate rainfall intensities that have been increased by 20% to take account of the effects of climate change up until the year 2085.

6.0 Detailed Development Proposals

6.1 Unattenuated peak run-off based upon the proposed impermeable area and the calculated short storm rainfall intensities would be as follows:-

Total Drained Area (hectares)	YR1 (100%) peak flow (litres/sec)	YR30 (3.33%) peak flow (litres/sec)	YR100 (1%) peak flow (litres/sec)	YR100 (1%) + cc peak flow (litres/sec)
2.498	202	498	673	807

6.2 Implementing the target minimum reduction in runoff of 50% will result in the peak run-off rates limited as follows:-

Total Drained Area (hectares)	YR1 (100%) peak flow (litres/sec)	YR30 (3.33%) peak flow (litres/sec)	YR100 (1%) peak flow (litres/sec)	YR100 (1%) + cc peak flow (litres/sec)
2.498	101	249	336	404

6.3 Ground conditions on site will be investigated in order to establish if a sustainable method of surface water disposal is feasible on the subject site.

6.4 In general the design of on-site surface water drains will be in accordance with good practice for no surface flooding during the critical 3.33% storm.

6.5 Where a sustainable method of disposal is not viable and surface water is discharged to sewer or watercourse, this will incorporate consideration and design of underground attenuation storage. In accordance with the directions in the SFRA User Guide, this will be designed such that surface water flows into local sewers and watercourses will not exceed 50% of the existing run-off rates for all rainfall events up to and including the critical 1% storm.

6.6 In addition to provision of 3.33% + climate change rainfall event storage, PPS 25 and the SFRA requires that there is no risk of flooding to buildings or any overland flows offsite during a 1% + climate change storm.

6.7 Whilst storage to protect the site against flooding during a YR30 event must be provided underground, attenuation storage up to the 1% + climate change event may be provided on the surface of the site provided it does not present risk of flooding to buildings or other vulnerable areas or risk of overland flows from the site.

6.8 calculations for the estimated required storage volumes for the subject site for both the 3.33% and 1% + climate change rainfall events.

3.33 % rainfall event storage estimate (cubic metres)	1 % + climate change rainfall event storage estimate (cubic metres)
224-448	360-720

6.9 Finished floor level should be set at least 150mm above external ground levels to ensure reduced risk of damage as a result of overland flows around the site.

6.10 Foul drainage from the site should connect with the existing foul and combined sewers local to the site via new sewer connections in accordance with S.106 of The Water Industry Act 1991.

7.0 Flood Risk Management Measures

7.1 Pitching finished floor level at least 150mm above external ground levels will ensure reduced risk of damage as a result of overland flows around the site

7.2 In the event of extreme emergency the local authority and other emergency services have contingency plans for dealing with the consequences of flooding.

7.3 The design of surface water drainage will ensure that there are no uncontrolled off-site overland flood flows created by the proposed development. Where possible, site surfaces will be modelled so that flood flows generated on site from events beyond the stipulated drainage design criteria will flow to, and be contained on site within, landscaped or paved areas such that there is no increased risk of flooding to buildings and other vulnerable areas. Such flood flows will not be allowed to flow from the site onto adjoining property or highways.

7.4 Flood flows onto the sites from adjoining property will either pass across the site or will be contained on site within landscaped or paved areas such that there is no increased risk of flooding to buildings and other vulnerable areas.

8.0 Off-site Impacts.

8.1 There will be no additional off-site impacts as a result of this development.

8.2 Proposed on-site drainage will be designed and constructed in accordance with The Building Regulations.

8.3 This will also be designed so as not to compromise the existing Yorkshire Water's public sewerage system and the local land drainage system.

8.4 All on-site roofs and paved areas are to drain into the designed surface water drainage system, thereby ensuring there will be no off-site flood flows generated by the development.

9.0 Residual Risks

9.1 The risk of flood flows entering and leaving the site will remain after development. This risk will be reduced as far as possible because the design will be such that there will be no flooding during all rainfall events up to and including the critical 3.33% storm and no overland flows from the site up to the critical 1% + climate change storm.

9.2 By implementation of the flood procedures and by careful design of the flood protection measures as described above, all residual flood-related risks will be minimized after the development has been completed.

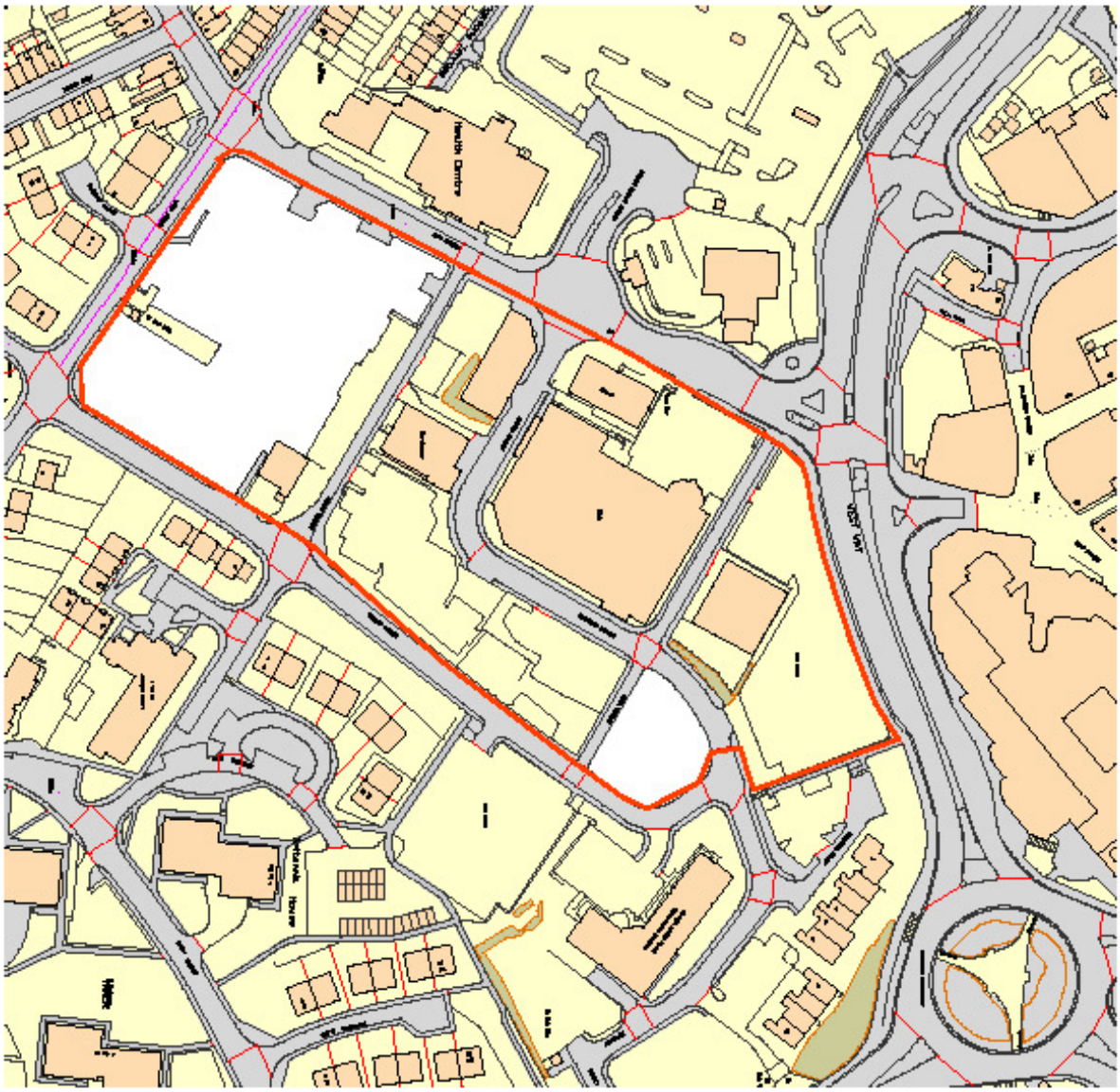
APPENDIX A

SITE LOCATION PLAN AND PROPOSED SITE LAYOUT

Proposed Development at New Street / Lower Thomas Street, Barnsley

EXISTING SITE PLAN

Proposed Development at New Street / Lower Thomas Street, Barnsley



PROPOSED SITE PLAN

Proposed Development at New Street / Lower Thomas Street, Barnsley

