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ENVIRONMENT

Liberty Properties Developments Ltd
Westbridge Park
Stafford Road, Stone

FLOOD RISK ASSESSMENT

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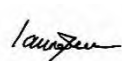



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DOCUMENT ISSUE RECORD

Document Number	WBP-BWB-EWE-XX-RP-EN-0001_FRA
BWB Reference	NTE-2229-FRA

Status	Revision	Date of Issue	Author:	Checked:	Approved:
S2	P1	31/03/2016	Lauren Tewson PhD BSc, (Hons)	Keith Alger BSc (Hons), MSc	Daniel Allum BSc (Hons) MSc
					
S2	P2	13/04/2016	Lauren Tewson PhD BSc, (Hons)	Keith Alger BSc (Hons), MSc	Daniel Allum BSc (Hons) MSc
					
S2	P3	29/07/2016	Lauren Tewson PhD BSc, (Hons)	Keith Alger BSc (Hons), MSc	Daniel Allum BSc (Hons) MSc
					
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EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Liberty Properties Development Ltd. in respect of a commercial planning application for the proposed redevelopment of a brownfield site off Stafford Road, Stone, Staffordshire (390280, 333590).

This report demonstrates that the proposed development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented.

The Flood Map for Planning from the Environment Agency, as well as Environment Agency consultation, confirms that the site lies within Flood Zones 2 (Medium Probability) and 3 (High Probability). The site lies within close proximity of the Scotch Brook (Main River), and it is thought that the Flood Zone extents are associated with this watercourse. A detailed review of modelled flood levels compared to the topographical survey confirm the site to be elevated above the 100 year + 20% climate change flood level, with depths of flooding in the 1000 year event considered minimal.

A blockage assessment of the syphon and culvert has shown that there is minimal risk to the site and that flood depths reach between 100 and 200mm on the site car park, and does not influence the building footprint. It is recommended that the proposed finished floor levels should be raised to 86.18m AOD, 300mm above the modelled 100 year + 20% flood levels as this is more than sufficient for any residual risk caused by a syphon blockage.

Other sources of flood risk such as reservoirs, sewer flooding and pluvial run-off have been considered and there is no significant flood risk posed to the sites from any other source. There is no evidence of historical groundwater flooding within the vicinity of the site according to the Stafford Borough Council Strategic Flood Risk Assessment (SFRA).

The proposed development will introduce an increase in impermeable areas to the site which could lead to an increase in surface water run-off rates. A Sustainable Drainage Statement outlining the approach to the site drainage has been completed as a separate document to this report.

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

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1.0 INTRODUCTION

- 1.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Liberty Properties Developments Ltd. in respect of a commercial planning application for the proposed redevelopment of a brownfield site off Stafford Road, Stone, Staffordshire (390280, 333590).

Table 1.1 - Site Summary

Site Name	Westbridge Park, Stone
Location	Stone, Staffordshire
NGR (approx.)	390288, 333590
Application Site Area (ha)	0.5 (Approximately)
Development Type	Retail Food Hall
NPPF Vulnerability	Less Vulnerable
EA Flood Zone	Flood Zone 2 & 3
EA Region	Staffordshire, Warwickshire and West Midlands
Local Planning Authority	Stafford Borough Council

Sources of Data

- 1.2 The report is based on the following information:
- (i) Proposed Block Plan by RGP Architects (Drawing number 9642 PL03 V)
 - (ii) Topographical Survey by RGP Architects (Drawing number 9642 PL11 B)
 - (iii) OS Explorer Series mapping
 - (iv) Environment Agency consultation
 - (v) Stafford Borough Council Consultation
 - (vi) Local Authority Surface Water Flood Risk Maps
 - (vii) Stafford Borough Council Strategic Flood Risk Assessment
 - (viii) Trent Catchment Flood Management Plan
 - (ix) Site visit undertaken by BWB Consulting Ltd March 2016
 - (x) Severn Trent Water Sewer Records
 - (xi) British Geological Survey Drift & Geology Maps

Existing Site

- 1.3 The site is located approximately 50m to the south of Stone town centre. The site currently comprises of tennis courts, a building used for Girl Guides and a car parking area for the local fitness centre, with associated green spaces. A site location plan is included as Figure 1.1.
- 1.4 The site is bounded to the south by a private access road and beyond this Westbridge Park. The Trent and Mersey Canal can be found to the north of the site with residential properties beyond this. Stafford Road is found to the west of the site with the Scotch

Brook and Crown Meadow Local Nature Reserve found beyond this. To the east are further greenfield and wooded areas.

- 1.5 Topographical survey information (Appendix 1) shows that the site is relatively flat with a slight fall to the north east from 86.15mAOD to 85.72mAOD.
- 1.6 The site can be accessed via a private road situated to the south of the site, via Stafford Road. Current site drainage is to an existing sewer network. British Geological Survey Information shows that the bedrock geology beneath the site comprises of Mercia Mudstone Group – Mudstone and Halitstone, with superficial deposits of Alluvium – Clay, Silt, Sand and Gravel.

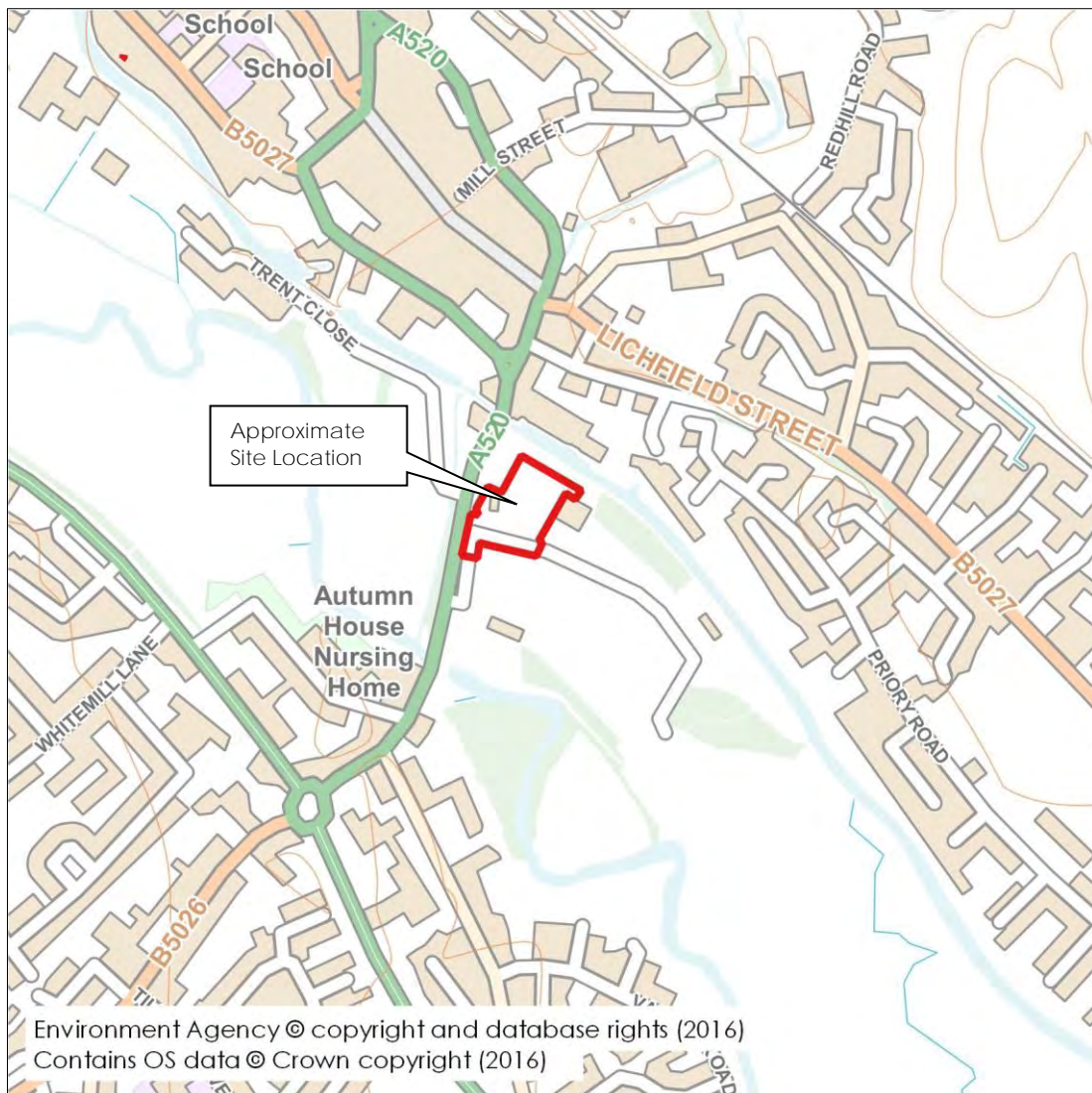


Figure 1.1 - Site Location

Proposed Development

- 1.7 The proposals comprise demolition and relocation of the girl guides building and the construction of a Marks and Spencer Foodhall. Access via a private road will be retained as part of the proposals. The current proposed site layout plan is provided in Appendix 2.

Flood Risk Planning Policy

National Planning Policy Framework

- 1.8 The NPPF¹ sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online².
- 1.9 The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible, and stresses the importance of preventing increases in flood risk off site to the wider catchment area.
- 1.10 The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.
- 1.11 This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.

Flood Zones

- 1.12 The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping showing Flood Zones relative to the site is included as Figure 1.2.

¹ National Planning Policy Framework, CLG, March 2012

² Planning Practice Guidance. <http://planningguidance.planningportal.gov.uk/>.

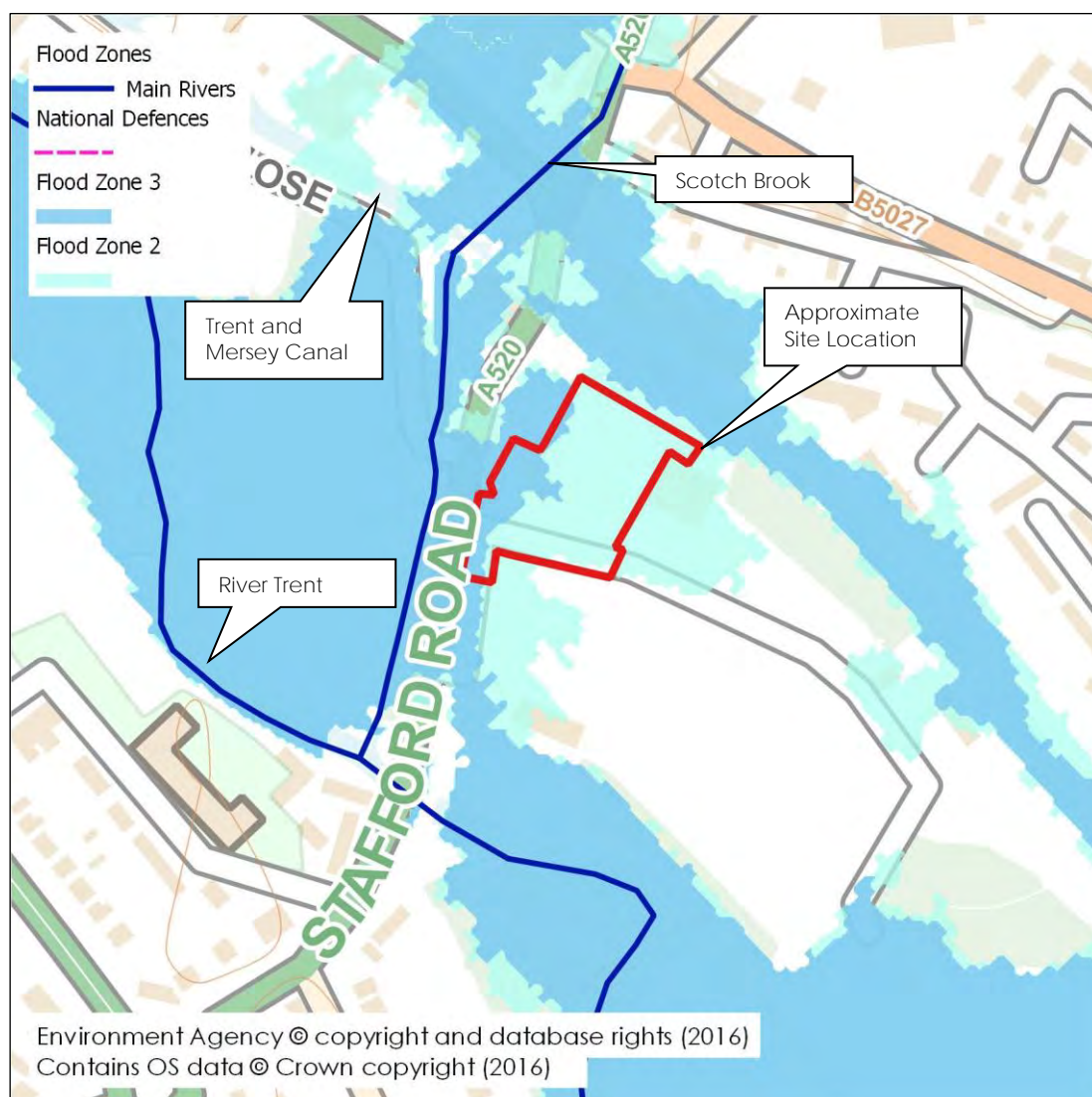


Figure 1.2 - Environment Agency Flood Zone Mapping

- 1.13 Correspondence from the Environment Agency (included as Appendix 3) and online Flood Zone mapping shows the site to be located entirely within Flood Zone 2 (Medium Probability) and 3 (High Probability). These zones are identified as land assessed as having between a 1 in 100 [1 in 200 tidal] and a 1 in 1000 or greater annual probability of river/tidal flooding, and land assessed as having a 1 in 100 or greater annual probability of river flooding and/or a 1 in 200 annual probability of flooding from tidal sources, respectively.
- 1.14 The NPPF also defines Flood Zone 1 (Low Probability). This Flood Zone is defined in the NPPF as land assessed as having a less than 1 in 1000-year annual probability of river/tidal flooding.
- 1.15 Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed development use; Buildings used for shops, is considered to be 'Less Vulnerable'.
- 1.16 Table 3 of the Planning Practice Guidance identifies that a 'Less Vulnerable' development within Flood Zone 2 & 3 is considered to be 'appropriate'.

Other Relevant Policy and Guidance

Strategic Flood Risk Assessment

- 1.17 The proposed development site falls within the Stafford Borough Council Strategic Flood Risk Assessment³ catchment completed by Halcrow Group in 2008.
- 1.18 The purpose of this Level 1 SFRA was to assess and map all forms of flood risk from groundwater, surface water, sewer and river sources, taking into account future climate change predictions, and use this as an evidence base to locate future development primarily in low flood risk areas. The outputs from the SFRA will help Stafford Borough Council to prepare sustainable policies for the long-term management of flood risk and improve existing emergency planning procedures.
- 1.19 The River Trent, Scotch Brook and the Trent and Mersey Canal are identified as the main water bodies flowing through Stone. Both the River Trent and Scotch Brook are designated as Main River.
- 1.20 The Scotch Brook is said to pose more of a threat to properties than the Trent. A number of properties located around the confluence of the two watercourses lie in Flood Zone 3. This may be due to reverse flow of the Trent up the Brook, rather from the Brook alone. However, Stone does not feature as a flood risk hotspot along the Trent corridor.
- 1.21 The Scotch Brook is identified to be prone to soil and bank erosion as it passes through Stone, made worse by aggregate being removed upstream. It transports and deposits significant amounts of loose material, including fine material, gravel, boulders and fallen trees. This can block the channel or any structures along the watercourse, reducing their capacity, and therefore presenting residual risk. Additionally, poorly maintained trash screens and rubbish inappropriately dumped in watercourses in urban areas can cause a residual risk if structures become blocked.

River Trent Catchment Management Plan

- 1.22 The River Trent Catchment Management Plan was completed by the Environment Agency in December 2010.
- 1.23 Stone is identified to fall within West Staffordshire where there is considered to be disruption to people and communities caused by flooding. However, flood risk is not expected to increase considerably in the future as a result of climate change and urban growth.

³ Stafford Borough Council Strategic Flood Risk Assessment, Halcrow Group, 2008

2.0 POTENTIAL SOURCES OF FLOOD RISK

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

Table 2.1 - Pre-Mitigation Sources of Flood Risk

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial	X				Site shown to be located in Flood Zone 2 and 3
Tidal				X	There is no tidal influence on the site.
Canals			X		The Trent and Mersey Canal runs to the north of the site.
Groundwater		X			Potential for groundwater flooding to occur at the surface.
Reservoirs and waterbodies				X	The site is shown to fall outside of the area at risk of reservoir failure.
Sewers			X		The sewer network around the site may have limited capacity, which could be exceeded in an extreme storm event.
Pluvial runoff			X		There is low pluvial risk to the site.
Effect of Development on Wider Catchment			X		Development will not result in impedance of surface water route.
			X		The development will increase the area of impermeable surfaces.

Fluvial Flood Risk

Main Rivers

- 2.2 The closest main river is the Scotch Brook, located approximately 65m west of the proposed development site. The brook has areas of Flood Zone 2 (Medium Probability) and Flood Zone 3 (High Probability) associated with it. The area of Flood Zone 3 is shown to encroach approximately 40m into the site from the western boundary. The remaining site area is shown to be located in Flood Zone 2.
- 2.3 The River Trent is located approximately 210m south of the proposed development site. Although the Flood Zone appears to be associated with the Scotch Brook, the flooding will most likely occur in combination with the River Trent backing up.

-
- 2.4 Environment Agency modelled flood levels (included as Appendix 3) show the site to be within the 100 year + 20% Climate Change flood extent. A spot level labelled A in Appendix 3 has been taken to the west of the site in Flood Zone 3. This shows that the flood level at this point is approximately 85.88mAOD in the 100 year + 20% CC event and 86.13m AOD for the 1000 year flood event.
- 2.5 Topographical survey information shows that site levels across the built footprint within the flood extent vary from 85.95mAOD to 86.04mAOD. Therefore the site is elevated above the 100 year + 20% CC flood level in this location, and depths of flooding in the 1000 year flood event may range from 90mm to 280mm.
- 2.6 A spot level labelled B in Appendix 3 shows flood levels to reach 85.56mAOD in the 100 year + 20% CC event and 85.96m AOD in the 1000 year event. Topographical survey levels show that levels within the site boundary that are within Flood Zone 2 range from 85.72mAOD to 86.00mAOD. Again, the site is elevated above the 100 year + 20% CC flood level, and in some cases also elevated above the 1000 year flood level. As a worst-case, depths of flooding for the 1000 year event could be up to 240mm.
- 2.7 As such, it can be considered that the mapping is overestimating the extent of floodplain throughout the site. It is acknowledged that the equipped play area immediately west of the site is at a lower elevation and so may be at risk, but the information supplied by the Environment Agency suggests that the site is elevated above the 100 year + 20% CC event.
- 2.8 In line with new Climate Change allowances released by the Environment Agency in February 2016⁴, additional assessments should be carried out to determine the appropriateness of the development into the future. The site is within the Humber River Basin district, and is considered a 'less vulnerable' development in Flood Zone 2. Therefore the central allowance category is deemed appropriate for assessing change anticipated to the 2050's, or 2080's for a conservative view on the lifespan of the development. A 15-20% Climate Change allowance is deemed appropriate and so no further assessment is considered necessary.
- 2.9 Results from blockage assessments carried out by the Environment Agency have also been supplied following further correspondence (included as Appendix 3).
- 2.10 The blockage assessment covers two possible scenarios; blockage of a nearby culvert, and blockage to the syphon located to the north/northwest of the site.
- 2.11 During the culvert blockage scenario (assuming 95% of the culvert flow area is blocked), flow enters the site from the western boundary only affected the very periphery of the site, areas that are proposed for landscaping and car parking. The applicable flood level provided by the Environment Agency is shown to be between 85.7m and 85.9m AOD. Existing ground levels on the site are generally at or above this level and so flooding on the site is considered negligible (Figure 2.1).
- 2.12 A blockage to the syphon (again, assuming a 95% blockage to the structure) results in flows entering the site and potentially affecting a large proportion of the site area. Applicable flood levels are reported as 85.96m AOD in the north, 85.98m AOD in the south west and 85.72m AOD in the east of the site (Figure 2.2).
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⁴ Environment Agency (2016): *Flood risk assessments: climate change allowances*; published on www.gov.uk

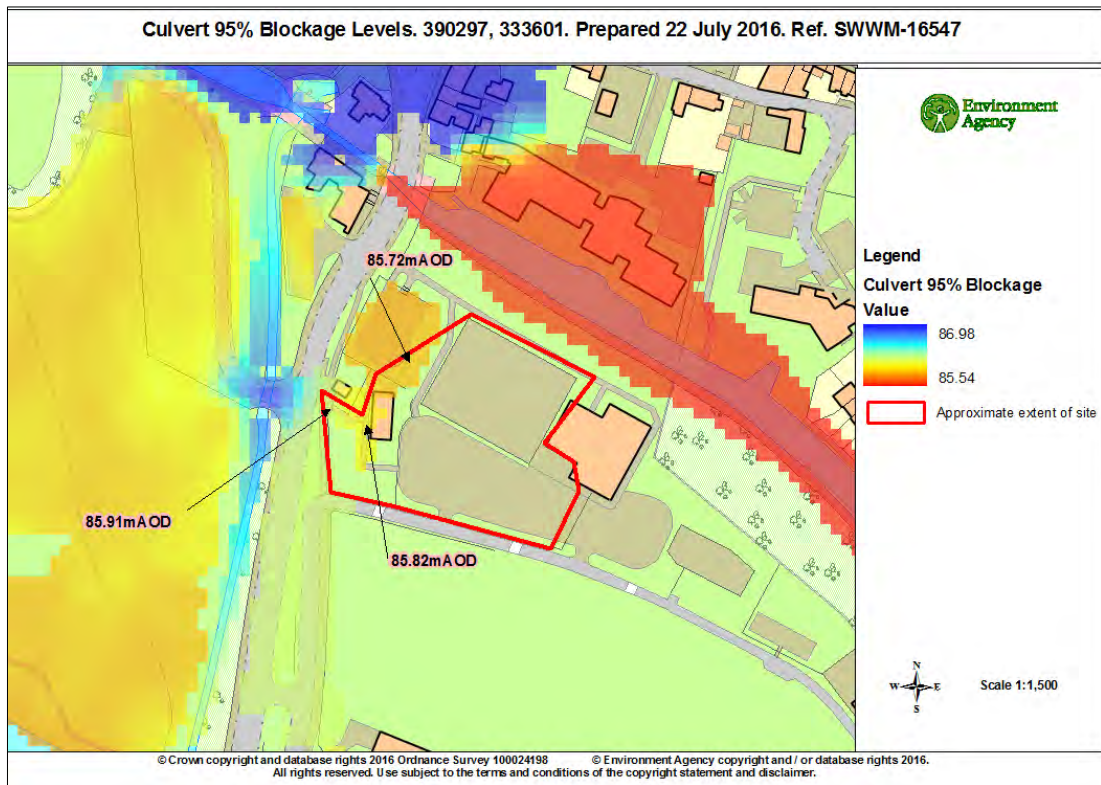


Figure 2.1 – Culvert Blockage Assessment

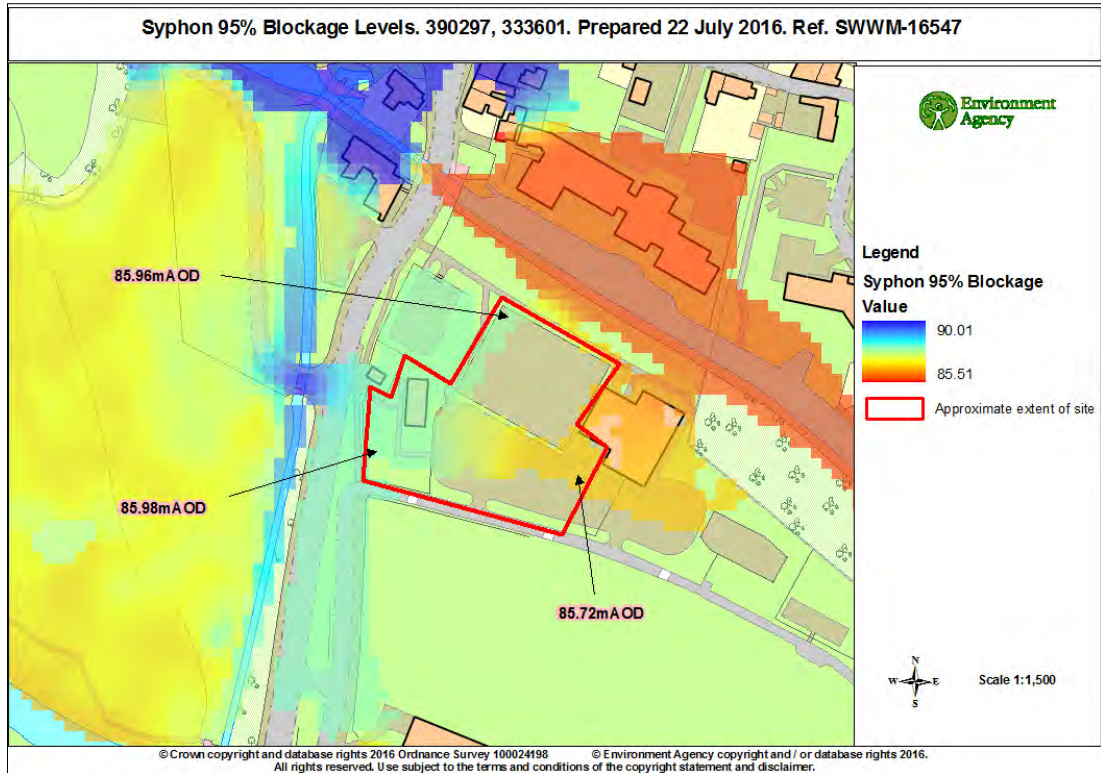


Figure 2.2 – Syphon Blockage Assessment

- 2.13 On review of the topographical survey, this results in flood depths across the site of less than 100mm, and in most cases 30-50mm. Any risk posed by such shallow flooding is considered negligible, particularly given the residual nature of the risk posed. Mitigation measures suggested to address other risks should adequately address any risk posed by blockage to the nearby structures on the Scotch Brook.
- 2.14 The overall risk posed to the site at this stage is still considered to be medium in line with the Flood Zone 2 designation. The depths of flooding anticipated during such an event are considered minimal and could readily be managed through appropriate mitigation, discussed in Section 3.0.

Flood Risk from Canals

- 2.15 The Trent and Mersey Canal is located approximately 18m to the north of the proposed development site. This water body is not thought to pose a flood risk to the site due to its regulated nature and the strict maintenance regime of the Canal and River Trust.
- 2.16 The canal past the site is situated at a much lower level than the development site as shown in Figure 2.1.



Figure 2.3 – Photograph Showing Canal in Relation to the Site

- 2.17 As such, the site is not considered to be at significant risk of flooding from the nearby canal.

Groundwater Flood Risk

- 2.18 The site is located on bedrock comprised of Mercia Mudstone Group – Mudstone and Halitestone, with superficial deposits of alluvium – clay, silt, sand and gravel. The bedrock is designated as a ‘Secondary B’ aquifer, this is described as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
- 2.19 British Geological Survey data identifies a previous borehole excavated in 1973 between Stafford Street and the Girl Guiding hut. This log shows that groundwater was encountered around 1.8m below ground level. Another borehole log completed in 1996 adjacent to the north of the existing leisure centre struck water at 1.65m below ground level.
- 2.20 The Stafford Borough Council Strategic Flood Risk Assessment identifies that the site lies within an area susceptible to groundwater flooding. The site has the potential for groundwater flooding to occur at the surface based on rock type and estimated groundwater level during periods of extended intense rainfall. However, there have been no recorded incidences of groundwater flooding at the site or within the immediate vicinity.
- 2.21 A Phase 1 Geotechnical and Environmental Assessment report completed by BWB Consulting (reference: WBP-BWB-XX-00-RP-EN-0001_PH1) shows that there is at least 1.65m of made ground on the site, so groundwater flood risk is considered to be low.
- 2.22 Simple mitigation measures such as directing flows towards positively drained areas, will reduce the risk of any groundwater flooding, further details on potential mitigation are included within Section 3.0.
- 2.23 There is overall considered to be a medium risk posed by the groundwater source.

Flood Risk from Reservoirs & Large Waterbodies

- 2.24 Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide. An extract from the mapping is included as Figure 2.2.



Figure 2.4 - Environment Agency Reservoir Failure Flood Risk Map

- 2.25 The proposed development site falls outside of the inundation zone of any reservoir failure, the closest affected area is located to the west of Stafford Road. The flood risk from this source is considered to be low.

Flood Risk from Sewers

- 2.26 Sewer mapping (Appendix 4) identifies a number of sewers under the ownership of Severn Trent Water surrounding the site. A 450mm combined foul sewer that is shown to cross the site from west to east. The pipe is mainly located beneath the car park located to the south of the site.
- 2.27 There is one manhole cover associated with this sewer pipe found adjacent to the west of the site and one manhole cover found to the east of the site within the car park area.

- 2.28 The sewer network may have limited capacity, which could be exceeded in an extreme storm event, however, the manholes are considered to be significantly removed from the built footprint of the proposed development that the risk from this source is considered to be low.
- 2.29 As part of the proposed development consideration should be given to the sewer with a suitable standoff being provided. Further details relating to potential mitigation measures are included within Section 3.0.

Pluvial Flood Risk

- 2.30 Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.3.

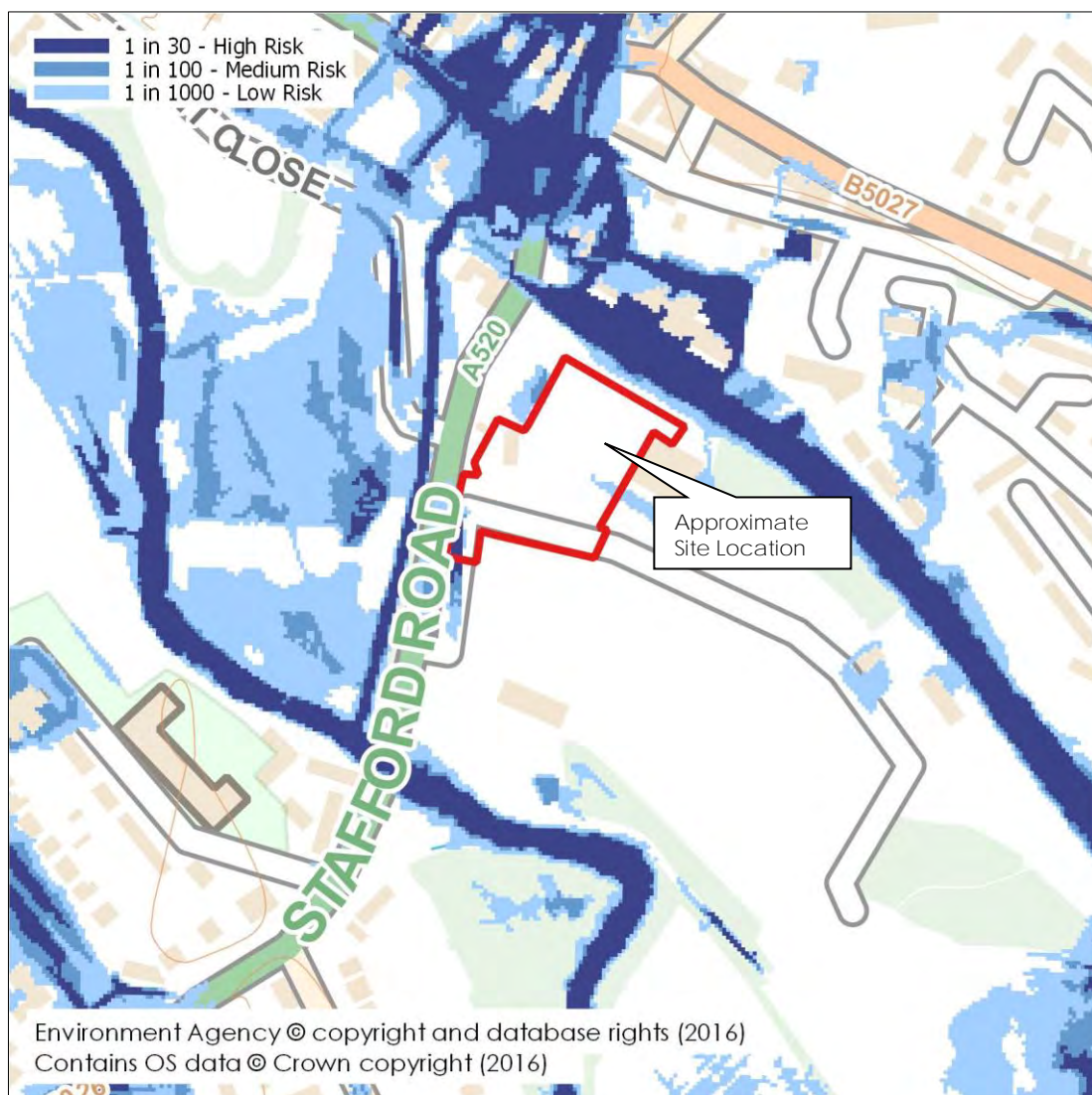


Figure 2.5 - Risk of Flooding from Surface Water Mapping

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- 2.31 Pluvial flood risk is considered to be 'Very Low' across the majority of the site and the majority of the surrounding land. There is a small area 'Low' Risk to the east of the site, associated with the car park. An area of 'Medium Risk' can be found to the north east of the site, however, this is related to a depression in the topography and will not influence site access and egress. Therefore, flood risk from this source is considered to be low.

Development Drainage

- 2.32 The development will result in a slight increase in impermeable surfaces which could potentially increase surface water runoff rates and volumes if no mitigation is put in place.

3.0 FLOOD RISK MITIGATION

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

Site Arrangements

Finished Floor Levels

- 3.2 Typically, finished floor levels are set with a freeboard of 300mm above local modelled flood levels. Therefore, it is recommended that finished floor levels are raised to 86.18mAOD. This will also manage the residual risk posed by a blockage of the syphon or culvert associated with the Scotch Brook, which represents a worst case scenario and is also raised with a 50mm freeboard above the modelled 1000 year flood level applicable to the site.
- 3.3 Raising finished floor levels 600mm above modelled levels is not feasible as this will require raising parts of the site over 0.5m above current ground levels. This provides significant engineering constraints in terms of tying into existing levels and build up over the gas main to tie in to existing levels, whilst achieving the gradient and falls that are required within the retail car park and pedestrian areas.
- 3.4 Therefore it is considered raising finished floor levels 600mm above the flood level is not achievable. This report has demonstrated that a 300mm freeboard above the modelled 100 year +20% flood level provides additional protection against climate change, blockage scenarios and even extreme flood events,

Ground Levels

- 3.5 Within the development, finished floor levels and/or threshold levels of the proposed buildings should generally be set to suit access and construction considerations. The finished floor levels of the proposed development should be set above surrounding finished external ground levels.
- 3.6 The natural profile of the land will encourage pluvial runoff away from the proposed development, however, where this is not the case, ground levels should be profiled to encourage pluvial runoff and overland flows away from the built development and towards the nearest drainage point.

Sewer Standoff

- 3.7 The 450mm combined sewer passing through the development is required to either be diverted or have a standoff where no planting or construction can take. Consultation from Severn Trent Water suggests 5m should be left either side of the sewer, which has been incorporated into the latest layout.

Safe Access and Egress

- 3.8 The site is within an Environment Agency Flood Warning Area known as 'River Trent at Stone'. The occupants of the site are encouraged to sign up to this, and should use this to form an appropriate Flood Management and Evacuation Plan tailored to their operations prior to occupation of the site.
- 3.9 The Flood Management & Evacuation plan should outline the measures to be taken upon receipt of the various flood warning levels. This could include evacuating the site if open/occupied and preventing access to the site to minimise flood risk once cleared.
- 3.10 The Management Plan should also detail any specific measures to be taken if flooding is expected, such as raising valuable stock off the floor, or removing stock piles of chemicals etc.
- 3.11 Safe access and egress should be achievable by following Stafford Road north towards the B027 and the centre of Stone, which is shown to be beyond the extent of flooding. The Scotch Brook is culverted through much of the town and so the risk posed along its route is limited.

Surface Water Drainage

- 3.12 A drainage strategy has been developed to direct surface water to adjacent sewers, and incorporates a flow restriction which would provide an improvement when compared to the existing site.
- 3.13 To mitigate the development impact on the current runoff regime it is proposed to incorporate surface water attenuation and storage as part of the development proposals. A Sustainable Drainage Statement has been completed as a separate document to this report.

4.0 SEQUENTIAL TEST

4.1 As the proposals are located within Flood Risk Zone 2 (and part Flood Risk Zone 3); as per NPPF Paragraph 103, a Sequential Test has been undertaken to determine whether the proposed development could be located in an area that has a lower flood risk level. Details of the sequential test have been provided by the client.

4.2 The national Planning Practice Guidance (PPG) provides guidance on the application of the flood risk sequential test for individual planning applications at Paragraph 033 (Reference ID: 7-033-20140306). As the application site is not allocated for development within the Plan for Stafford Borough and is not for a 'minor development' proposal there is a requirement to undertake the Sequential Test Assessment.

Vulnerability Classification of the Development

4.3 The first stage of the assessment is to identify the vulnerability classification of the proposed development in accordance with Tables 2 and 3 within the PPG.

4.4 As the proposed development is for a retail foodstore (Use Class A1) it falls within the category as 'less vulnerable' as identified by PPG Table 2. PPG Table 3 highlights that less vulnerable uses such as the proposals are appropriate in Flood Risk Zones 1, 2 and 3a. The only Flood Risk Zone that such as use is not appropriate is within the functional floodplain (Flood Risk Zone 3b).

Catchment Area

4.5 The second stage of the assessment is to identify a catchment area for the proposed development. In this regard PPG (Paragraph 033) states that;

4.6 *'...the area to apply the Sequential Test across will be defined by local circumstances relating to the catchment area for the type of development proposed. For some developments this may be clear, for example, the catchment area for a school. In other cases it may be identified from other Local Plan policies, such as the need for affordable housing within a town centre, or a specific area identified for regeneration.'*

4.7 As set out in the Retail Statement; the purpose of the store is to primarily serve residents living within and close to the town of Stone based on the M&S Foodhall business model and the identified retail need within the town. As such, for the purposes of the Sequential Test; Stone is a suitable catchment area to focus the search for sites that could be considered sequentially preferably in flood risk terms.

4.8 Any sites outside of Stone would fail to serve the same catchment and as such Stone is the sole focus for the purposes of this search. Environment Agency Flood Zone Mapping shows the flood risk within and on the edge of Stone as well as the catchment area/area of search.

4.9 In considering the area of search it is important to consider other planning policies contained within the Plan for Stafford Borough, namely;

- SP7 (Spatial Principle 7) – this seeks to direct development within settlement boundaries.
- Policy Stone 1 – Stone Town; this policy seeks to provide a new convenience store within Stone Town Centre.

- Policy E8 Town, Local and Other Centres; this policy seeks to protect the vitality and viability of Stone Town Centre acknowledging the town centres role as a key service centre.
- 4.10 Any site that does not accord with these planning policies could not be considered suitable in Flood Risk Sequential Test terms as they are unlikely to be supported by the local planning authority.
- 4.11 In terms of the settlement boundaries; these are provided in draft within the Plan for Stafford Borough Part 2 Publication draft Policies Map. Whilst only in draft; this plan is well progressed and is relied upon for this assessment. As such any site located outside of this area has not be considered within this Sequential Test assessment as it would not be compliant with other key strategic planning policies. Therefore, the search focuses on the defined Stone Urban Area.

Application of the Sequential Test

- 4.12 This search focuses on sites that are large enough to accommodate the proposed development (circa 0.49ha) within draft settlement boundaries as set out in the Plan for Stafford Borough Part 2 Publication draft Policies Map. As can be seen in the plan; the settlement boundaries have been drawn tight to the existing built up areas which effectively reduce potential alternative sites.
- 4.13 Nevertheless the following sites have been identified and explored:
- Site 1 – Strategic Development Location – land north of Eccleshall Road – west of Stone
 - Site 2 – land south of Eccleshall Road – west of Stone
 - Site 3 – Whitemill Lane Sports Pitches
 - Site 4 – Walton Allotments and Sports Ground
 - Site 5 – Walton Industrial Estate
 - Site 6 – Stone Cricket Club
 - Site 7 – Land to the rear of Stone Law Tennis and Squash Club

Site 1 – Strategic Development Location – land north of Eccleshall Road – west of Stone

- 4.14 This site is identified as a Strategic Development Location and is primarily within Flood Zone 1. As such it is within a lower flood risk zone than the application site. Despite this, the site benefits from outline planning permission for up to 500 dwellings (application ref. 13/19002/OUT) and as such is not available to accommodate the proposed development.
- 4.15 Additionally, the site is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were available.

Site 2 – land south of Eccleshall Road – west of Stone

- 4.16 This site is within Flood Zone 1 and as such it is within a lower flood risk zone than the application site. This site benefits from planning permission for up to 92 dwellings (application ref. 14/20854/OUT) and as such is not available to accommodate the proposed development.

- 4.17 As with Site 1, it is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were available.

Site 3 – Whitemill Lane Sports Pitches

- 4.18 This site is within Flood Zone 1 and as such it is within a lower flood risk zone than the application site. Given that the site is in use for sports pitches/open space, its redevelopment would not help to improve provision and could result in a shortfall of such facilities within the town. As such, the redevelopment of this site would not accord with the NPPF of The Plan for Stafford Borough Policies.

- 4.19 In addition to this, the site is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were suitable to accommodate the proposed development.

Site 4 – Walton Allotments and Sports Ground

- 4.20 This site is within Flood Zone 1 and as such it is within a lower flood risk zone than the application site. Given that the site is in use for sports pitches/open space/allotments its redevelopment would not help to improve provision and could result in a shortfall of such facilities within the town. As such, the redevelopment of this site would not accord with the NPPF of The Plan for Stafford Borough Policies.

- 4.21 In addition to this, the site is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were suitable to accommodate the proposed development.

Site 5 – Walton Industrial Estate

- 4.22 Walton Industrial Estate is located within Flood Zone 1 and there are a number of undeveloped sites within the industrial estate. Despite this, these are located off internal access roads with no main road frontage and as such are unsuitable for the proposed use. Notwithstanding this, the site is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were suitable to accommodate the proposed development.

Site 6 – Stone Cricket Club

- 4.23 This site is within Flood Zone 1 and as such it is within a lower flood risk zone than the application site. Given that the site is in use for sports pitches/open space, its redevelopment would not help to improve provision and could result in a shortfall of such facilities within the town. As such, the redevelopment of this site would not accord with the NPPF of The Plan for Stafford Borough Policies.

- 4.24 In addition to this, the site is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were suitable to accommodate the proposed development.

Site 7 – Land to the rear of Stone Law Tennis and Squash Club

- 4.25 This site is within Flood Zone 1 and as such it is within a lower flood risk zone than the application site. This site benefits from planning permission for 33 dwellings (application

ref. 14/21338/FUL) and as such is not available to accommodate the proposed development.

- 4.26 As with Site 1, it is located a significant distance from Stone Town Centre and would not promote linked trips to the centre. As such, it would not accord with relevant retail policies even if it were available.

Summary

- 4.27 As highlighted in this text; none of the sites which could be considered sequentially preferable in flood risk terms can be considered to be suitable or available to accommodate the proposed development.

5.0 CONCLUSIONS AND RECOMMENDATIONS

- 5.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Liberty Properties in respect of a commercial planning application for the proposed redevelopment of a brownfield site off Stafford Road, Stone, Staffordshire.
- 5.2 This report demonstrates that the proposed development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented. The identified risks and mitigation measures are summarised within Table 5.1.

Table 5.1 - Summary of Flood Risk Assessment

Flood Source	Proposed Mitigation Measure
Fluvial	Development finished floor levels and thresholds to be set to 86.18m AOD, 300mm above modelled flood levels. External ground levels to direct any overland flows away from proposed building, generally conveying flows away from site. Occupants encouraged to sign up to EA Flood Warning Service and prepare a Flood Management & Evacuation Plan prior to occupation of the site.
Groundwater/sewers/ pluvial runoff	External levels to be arranged to direct potential overland flows away from buildings and towards positively drained areas. Sewer Standoff incorporated within the proposed development.
Impact of the Development	A Sustainable Drainage Statement has been completed as a separate document to this report to demonstrate how surface water runoff will be managed in a sustainable way.
This summary should be read in conjunction with BWB's full report . It reflects an assessment of the Site based on information received by BWB at the time of production.	

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

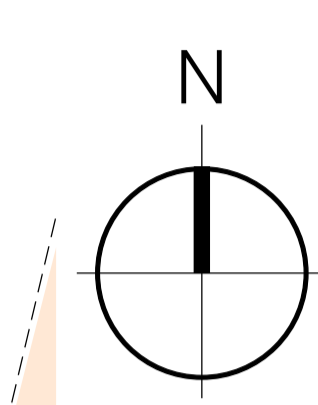
APPENDIX 1

Topographical Survey

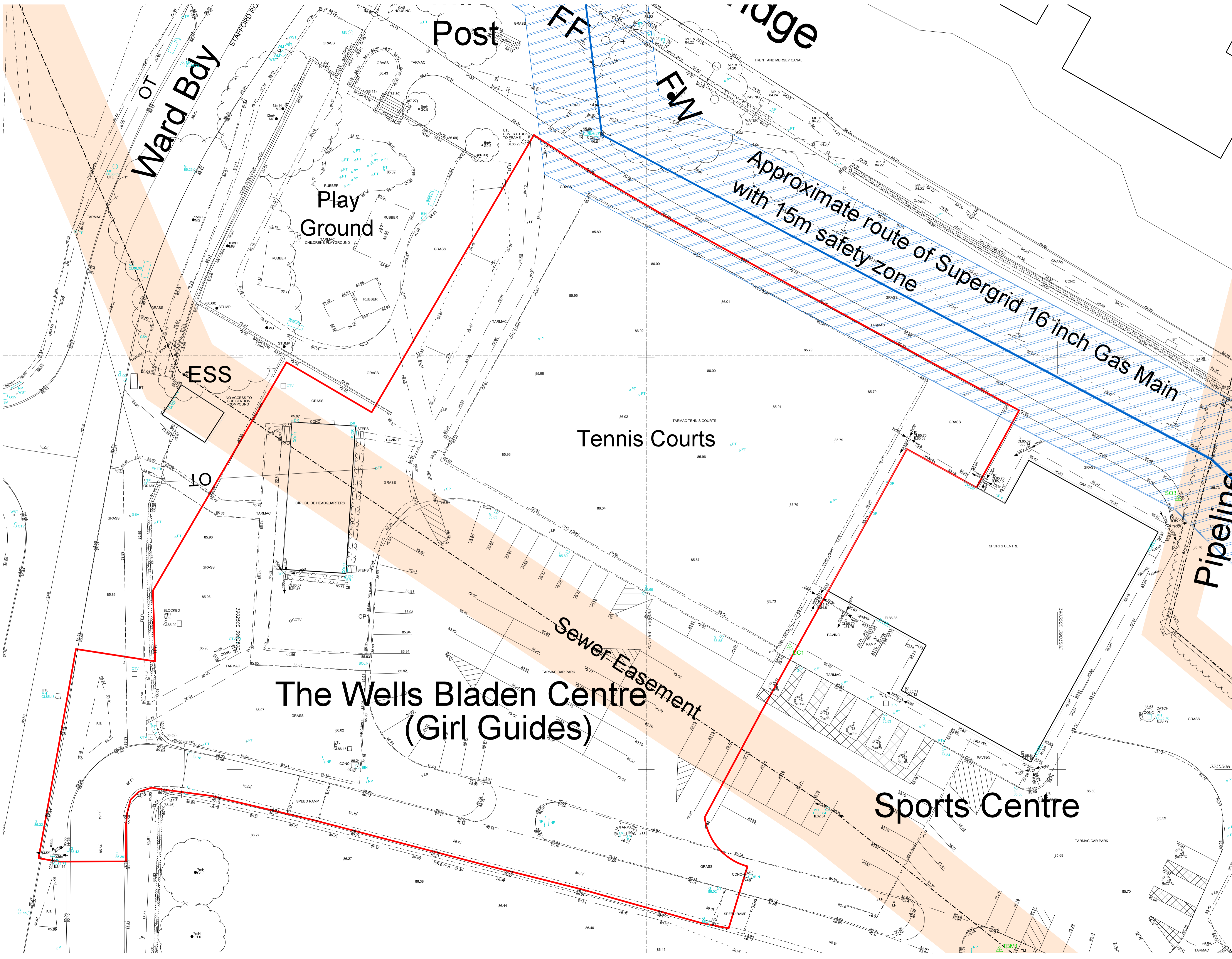
THIS DRAWING IS PROTECTED BY COPYRIGHT AND MUST NOT BE COPIED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF R-G PARTNERSHIP LIMITED. NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS AND SEES TO BE CHECKED ON SITE. NORTH POINTS SHOWN ARE INDICATIVE. G

SITE SPECIFIC HAZARDS

IN ACCORDANCE WITH THE REQUIREMENTS OF THE CDAM REGULATIONS 2015 THE FOLLOWING SIGNIFICANT RESIDUAL HAZARDS HAVE NOT BEEN DESIGNATED OUT OF THIS PROJECT AND MUST BE TAKEN INTO CONSIDERATION BY CONTRACTORS PLANNING TO UNDERTAKE THE WORKS SHOWN ON THIS DRAWING.



N.B. ROUTE OF GAS MAIN TAKEN FROM PDF FILE OF WEST MIDLANDS GAS BOARD'S DRAWING NO SG/SS/19



REV.	DATE	NOTES	WIT.
J	08.04.16	APPLICATION BOUNDARY ADDED	DHB
H	23.02.16	DEMISE BOUNDARY CORRECTED.	DHB
G	10.11.15	DEMISE BOUNDARY AMENDED.	DHB
F	04.11.15	DEMISE BOUNDARY AMENDED.	DHB
E	03.11.15	DEMISE BOUNDARY AMENDED.	DHB
D	03.09.15	GAS MAIN EASEMENT AMENDED.	DHB
C	13.07.15	GAS MAIN EASEMENT ADDED.	DHB
B	10.07.15	SUPERGRID GAS MAIN ADDED.	DHB
A	30.06.15	DRAWING RE-SHEETED.	DHB

CLIENT / PROJECT
LIBERTY PROPERTIES
WESTBRIDGE PARK
STONE
DRAWING TITLE
EXISTING BLOCK PLAN

STATUS: **PLANNING**

DATE: 10.03.15 | DRAWN: DHB | SCALE @ A1: 1:200

PROJECT NUMBER	UNIT	CL / SPS	TYPE A	REVISION
9642			PL 02	J

THE RATCLIFFE GROVES PARTNERSHIP

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www.rgp.com

LONDON
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LONDON WC1R 4EJ
T: 020 7600 6666 E: london@rgp.com

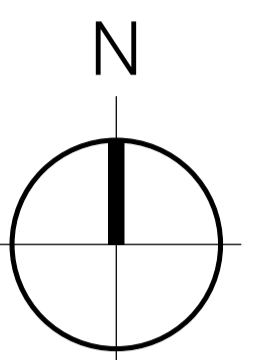
APPENDIX 2

Development Proposals

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N.B. ROUTE OF GAS MAIN TAKEN FROM PDF FILE OF WEST MIDLANDS GAS BOARD'S DRAWING NO SG/SS/19

APPLICATION BOUNDARY

-  tarmacadam
-  hot rolled asphalt
-  flush jointed buff paving slabs 600 x 600
-  concrete
-  soft landscaping

SURFACING MATERIALS

REV.	DATE	NOTES	INT.
V	05.07.16	APPLICATION BOUNDARY AMENDED. ROAD MARKINGS UPDATED.	DHB
U	02.08.16	PARKING BAYS AMENDED. TERRACE PAVING AMENDED. CONCRETE LORRY HARDSTANDING EXTENDED.	DHB
T	28.07.16	BUILDING RELOCATED. PARKING AMENDED.	DHB
S	22.04.16	POSITION OF PROPOSED TOTEM SIGN ADDED. TROLLEY BAY RELOCATED. CAFE DOORS AMENDED. NOTES RE ACQUATIC FENCES ADDED.	DHB
R	18.04.16	FINISHED LEVELS ADDED.	DHB
Q	11.04.16	DRAINAGE EASEMENT WIDENED. APPLICATION BOUNDARY AMENDED.	DHB
P	07.04.16	POSITION OF GAS MAIN CORRECTED. NEW ROAD AND SITE ENTRANCE AMENDED.	DHB
N	31.03.16	SURFACING MATERIALS ADDED.	DHB
M	11.03.16	GAS MAIN EASEMENT WIDTH CORRECTED. APPLICATION BOUNDARY CORRECTED.	DHB
L	15.02.16	SERVICE YARD AMENDED. PARKING AMENDED. APPLICATION BOUNDARY CORRECTED. CYCLE STANDS ADDED.	DHB
K	21.12.15	TROLLEY BAYS REPOSITIONED.	DHB
J	10.11.15	DEMISE BOUNDARY AMENDED.	DHB
H	04.11.15	DEMISE BOUNDARY AMENDED.	DHB
G	03.11.15	INTERNAL LAYOUT ADDED. GLAZING AMENDED. DEMISE A ROAD BOUNDARIES ADDED.	DHB
F	03.09.15	GAS MAIN AMENDED.	DHB
E	12.08.15	FLOOR & SITE PLANS AMENDED.	DHB
D	13.07.17	GAS MAIN EASEMENT ADDED.	DHB
C	10.07.15	GAS MAIN ADDED.	DHB
B	30.06.15	FLOOR PLAN AMENDED. DRAWING RESHEETED.	DHB
A	20.05.15	BUILDING MOVED. PARKING & SERVICES AMENDED.	DHB

CLIENT / PROJECT
LIBERTY PROPERTIES
WESTBRIDGE PARK
STONE
DRAWING TITLE
PROPOSED BLOCK PLAN

STATUS
PLANNING

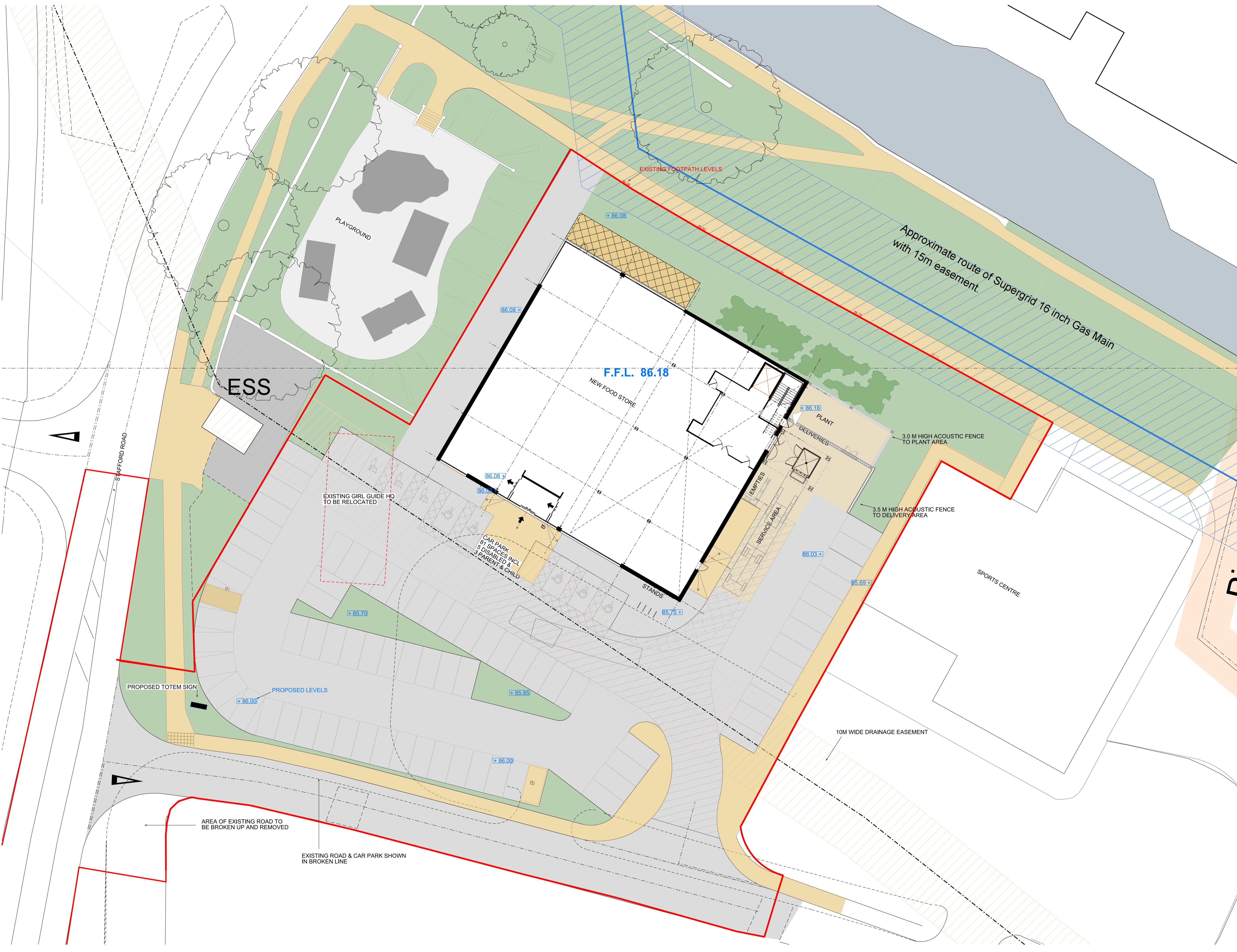
DATE	DRAWN	SCALE @ A1
20.03.15	DHB	1:200

PROJECT NUMBER	UNIT	CI / SITE CODE	TYPE & NUMBER	REVISION LETTER
9642			PL 03	V

Location	Rev	GA Plans	P	Drawings	E
Sections	S	Details	D	Prep	Colour

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LONDON WC1R 4EJ
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APPENDIX 3

Environment Agency Correspondence



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

Our Ref: 5405

Your Ref: NTE2229

Date: 31 March 2016

Dear Lauren

Request for information:- West Bridge Park, Stone, Staffs

Thank you for your enquiry which was received on 24 February and subsequent payment received on 2 March.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Flood Map

The model at this location shows the risk of flooding from rivers and does not take in to account other sources of flooding.

According to our published Flood Map for Planning, which provides a general estimate of the likelihood of flooding across England & Wales, part of the site is shown to be within Flood Zone 3. This refers to land where the indicative probability of flooding from Rivers is 1% or more in any given year, disregarding the presence and effect of any defences. The remainder of the site is in Flood Zone 2, where the annual probability of flooding is between 0.1% and 1%. The flood zones are associated with the River Trent; please find attached a copy of the Flood Map for the vicinity.

Modelled Levels

The nearest main rivers are the River Trent and Scotch Brook. There are modelled levels attached for example 2D model grid points at the site (see the Flood Map).

Please be aware that the 2D fluvial flood level modelling is based on a wide-area Digital Terrain Model. This has been created from ground elevations measured by an airborne Lidar system and has been spatially filtered to remove certain man-made features. If you are using detailed ground-based topographic survey data for a Flood Risk Assessment of the site, then the flood extents will need to be redefined by comparing the flood levels at the node points shown, with your topographic survey elevations.

Where the flood risk is shown to be different to that on our Flood Map, then more detailed assessment *may* be required. If you wish to submit an Evidence Review Request in order to have our Flood Map altered, then more detailed assessment *will* be required.

Scotch Brook modelling

The effect of blockage of the culvert on the Scotch Brook has also been extensively modelled, for various return period events on that watercourse along with a range of percentage culvert blockages. This information can be provided if required, however as this work was performed for internal use, there is no comprehensive report on the study.

Allowance for Climate Change

Flood risk data that includes an allowance for climate change is based on the 1% annual probability flood with an additional 20% increase on peak flows to account for climate change impacts, unless otherwise stated. You should refer to '[Flood risk assessments: climate change allowances](#)' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

The Bank Top ePlanning Tool

Local Authorities have the responsibility to consult the Environment Agency on any new development falling within 20 metres of the top of the bank of a Main River. The Bank Top Tool allows the Local Planning Authority to determine if new development falls within these areas and triggers the consultation.

Flood Defences

There are no Environment Agency raised flood defences benefitting this site. You may wish to contact the Local Authority to obtain further information regarding localised flooding from drains, culverts and small watercourses, and regarding existing or planned flood defence measures.

Historical Flooding

Following examination of our records of historical flooding (see explanation below) we have no record of flooding in the area. This does not mean that the site has never flooded.

You may also wish to contact your local authority or internal drainage board, to see if they have other relevant local flood information.

Our records of historical flooding show the extents of known flooding from rivers, the sea, and groundwater. It cannot show all the flooding that may ever have occurred – we can only show flooding where we have adequate records. As more data on historical flooding comes to light, and as flood incidents occur, then we will record this where we have adequate information to do so.

Surface Water Flood Map

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Environment Agency's website, <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw#x=357683&y=355134&scale=2>

Reservoir Flood Maps

The site is close to a modelled reservoir breach flood outline. Dam breach flooding happens when a dam impounding a reservoir breaches, causing water stored in the reservoir to be released through the breach and flooding areas downstream of the dam. The dam breach scenario simulated on the maps is a 'credible worst case' scenario. However there are other potential dam failure scenarios which could also happen. The maps do not in any way reflect the structural integrity of the dam or the chance of it failing, hence should not be used to assess likelihood or probability.

Further information can be found on the Environment Agency's webpage <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?lang=e&topic=reservoir&layer=default&scale=2&x=357683&y=355134#x=357683&y=355134&scale=2>

For further information about local emergency plans for these reservoirs you should contact Staffordshire County Council

Flood Warning Area

The site lies within a Flood Warning Area. If you wish to register for the flood warning service, please send your request to swwmcustomers@environment-agency.gov.uk

I have attached our Standard Notice or licence which explains the permitted use of this information.

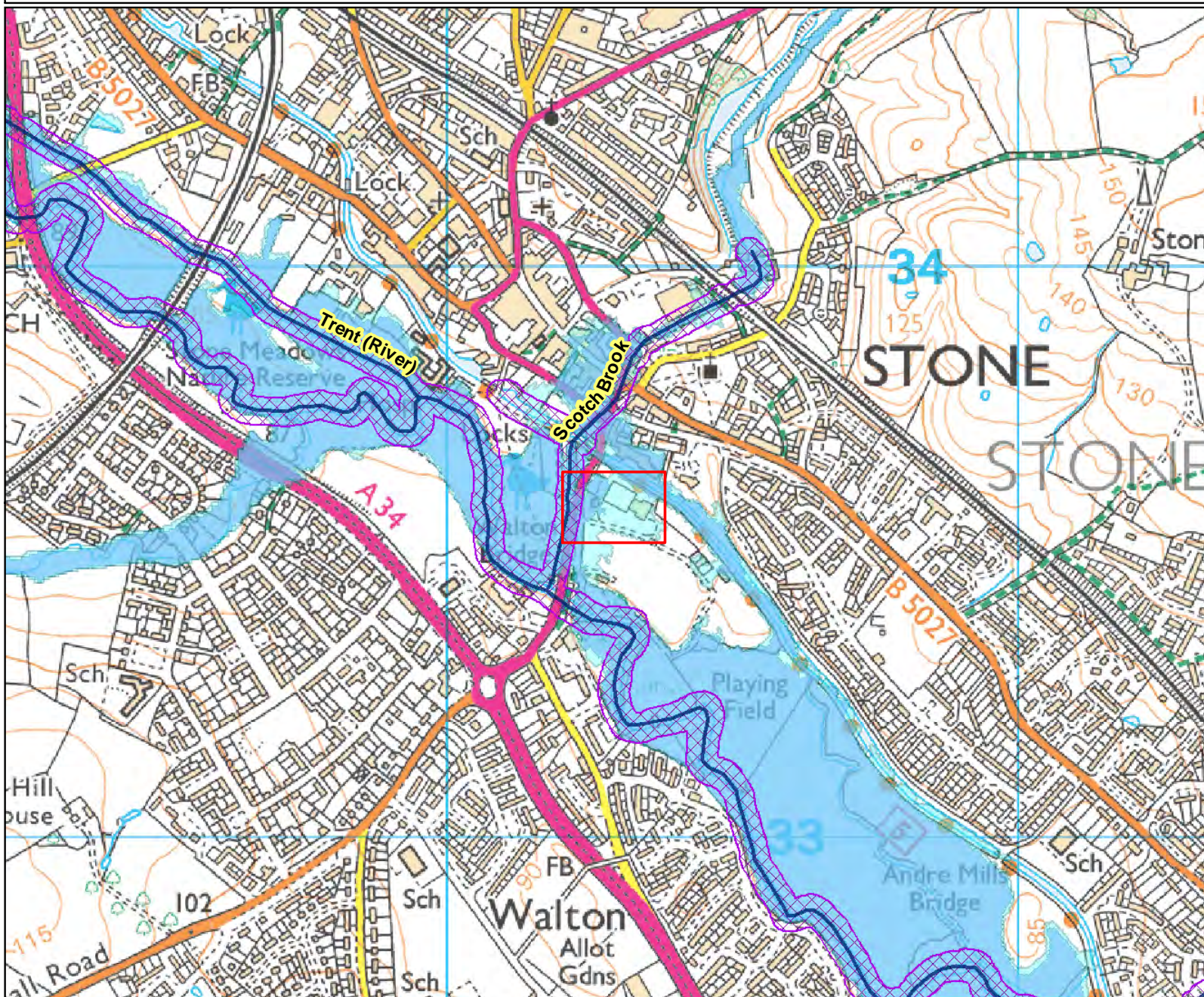
Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely






Diane Edwards
Customers & Engagement Officer
Staffordshire, Warwickshire & West Midlands

For further information please contact the Customers & Engagement team on 02030 253140 / 02030 252958 / 02030 252977
Direct e-mail:- SWWMcustomers@environment-agency.gov.uk

Flood Map for Planning, Stone NGR 390297mE, 333601mN. RFI 5405 Prepared 24 March 2016



Legend

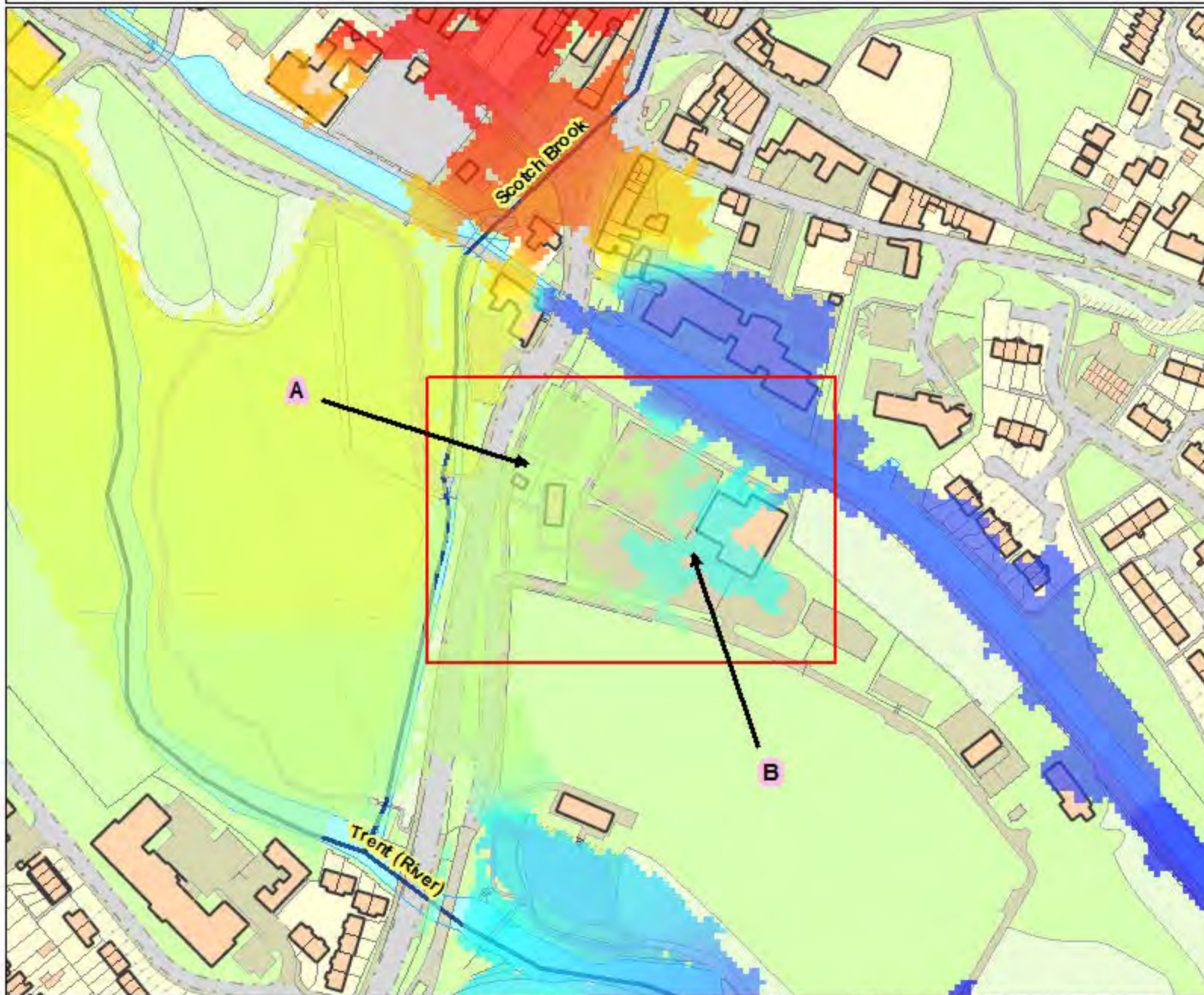
-  Main Rivers
-  Bank Top ePlanning Tool
-  Flood Zone 2
-  Flood Zone 3
-  Approximate location of site

Flood Map Areas (assuming no defences)
 Flood Zone 3 shows the area that could be affected by flooding from a river with a 1 in 100 (1%) or greater chance of happening each year.
 Flood Zone 2 shows the extent of an extreme flood from rivers with up to a 1 in 1000 (0.1% - 1%) chance of occurring each year



Scale 1:10,000

Flood level map, 100CC event. Stone NGR 390297mE, 333601mN. RFI 5405 Prepared 24 March 2016



Legend

Stone 100CC event, 10H032 level, m AOD



— Main Rivers

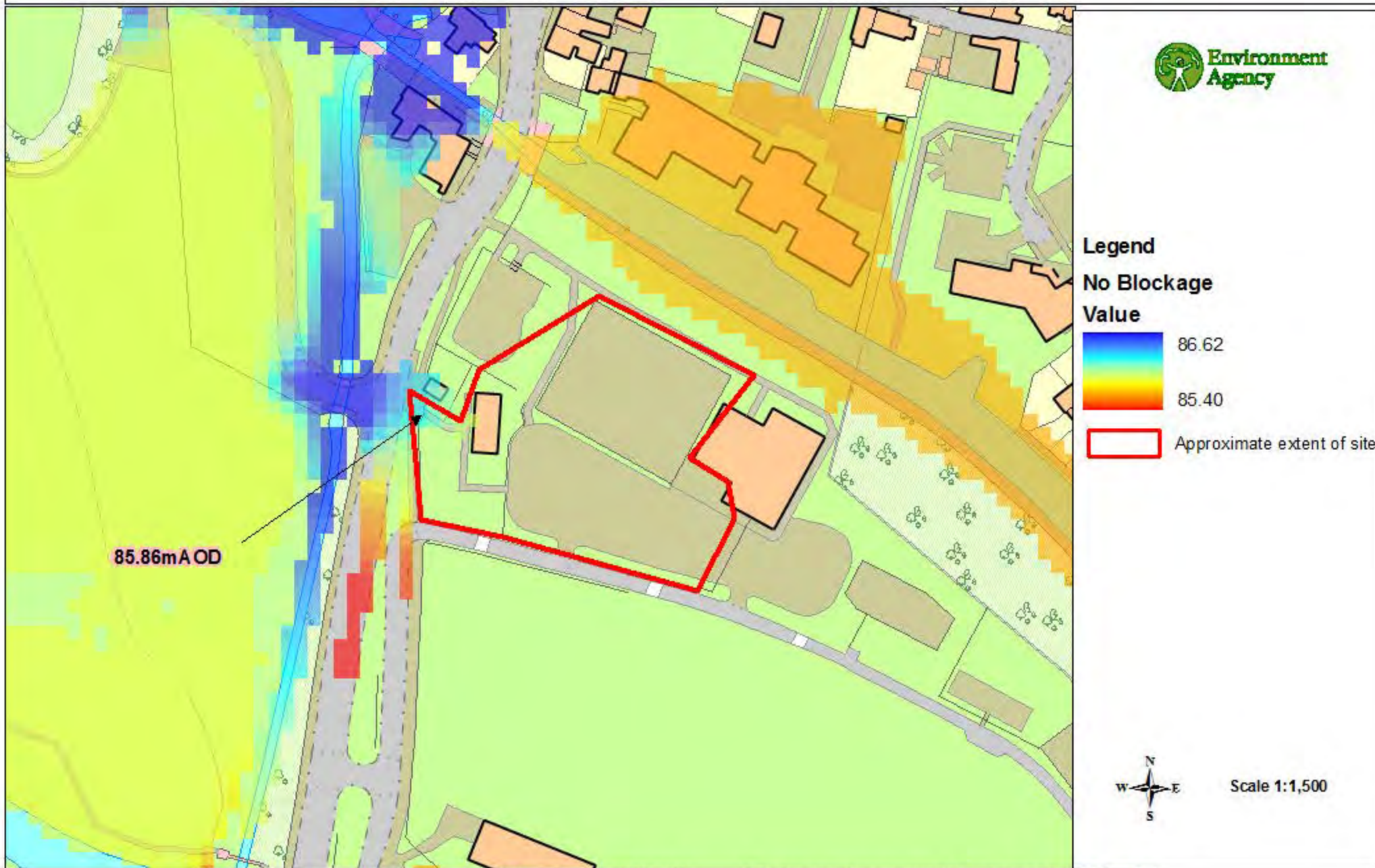
□ Approximate location of site

This data is from the 2009 R Trent (Stone) Enhancement model
 CC: with allowance for climate change of 20% more flow. See text.

RFI 5405	Return period, yrs, levels, mAOD		
	100	100CC	1000
A	85.76	85.88	86.13
B	-	85.56	85.96



Scale 1:2500



Lauren Tewson
BWB Consulting Ltd
5th Floor Waterfront House
Station Street
Nottingham
NG2 3DQ

Our Ref: 16547

Your Ref:

Date: 25 July 2016

Dear Lauren

Request for information:- Blockage assessment Scotch Brook, Stone

Thank you for your enquiry which was received on 29 June.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I enclose culvert map, flood map, no blockage level and syphon map.

Flood Map

According to our published Flood Map for Planning, which provides a general estimate of the likelihood of flooding across England & Wales, the site is shown to be within Flood Zone 3. This refers to land where the indicative probability of flooding from Rivers is 1% or more in any given year, disregarding the presence and effect of any defences. Please find enclosed a copy of the Flood Map for the area in the vicinity of the property.

Modelled Levels

The nearest main river is the Scotch Brook. The flood stage grid maps (*16547ScotchBrook.noblock.png*, *16547ScotchBrook.C95%.png* & *16547ScotchBrook.S95%.png*) show example levels on the site from 2D modelling of no blockage, culvert 95% blockage levels & syphon 95% blockage levels.

Please be aware that the 2D fluvial flood level modelling is based on a wide-area Digital Terrain Model. This has been created from ground elevations measured by an airborne Lidar system and has been spatially filtered to remove certain man-made features. If you are using detailed ground-based topographic survey data for a Flood Risk Assessment of the site, then the flood extents will need to be redefined by comparing the flood levels at the node points shown, with your topographic survey elevations.

Where the flood risk is shown to be different to that on our Flood Map, then more detailed assessment *may* be required. If you wish to submit an Evidence Review Request in order to have our Flood Map altered, then more detailed assessment *will* be required.

Allowance for Climate Change

In the flood risk data supplied the allowance for climate change is based on the 1% annual probability flood including an additional 20% increase on peak flows to account for climate change impacts, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

The Bank Top ePlanning Tool

Local Authorities have the responsibility to consult the Environment Agency on any new development falling within 20 metres of the top of the bank of a Main River. The Bank Top Tool allows the Local Planning Authority to determine if new development falls within these areas and triggers the consultation.

Flood Defences

There are no Environment Agency raised flood defences affecting this site. You may wish to contact the Local Authority to obtain further information regarding localised flooding from drains, culverts and small watercourses, and regarding existing or planned flood defence measures.

Historical Flooding

Following examination of our records of historical flooding (see explanation below) we have no record of flooding in the area. This does not mean that the site has never flooded.

You may also wish to contact your local authority or internal drainage board, to see if they have other relevant local flood information.

Our records of historical flooding show the extents of known flooding from rivers, the sea, and groundwater. It cannot show all the flooding that may ever have occurred – we can only show flooding where we have adequate records. As more data on historical flooding comes to light, and as flood incidents occur, then we will record this where we have adequate information to do so.

Surface Water Flood Map

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living

with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Environment Agency's website, <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw#x=357683&y=355134&scale=2>

Flood Warning Area

The site lies within a Flood Warning Area. If you wish to register for the flood warning service, please send your request to SWWMcustomers@environment-agency.gov.uk .

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

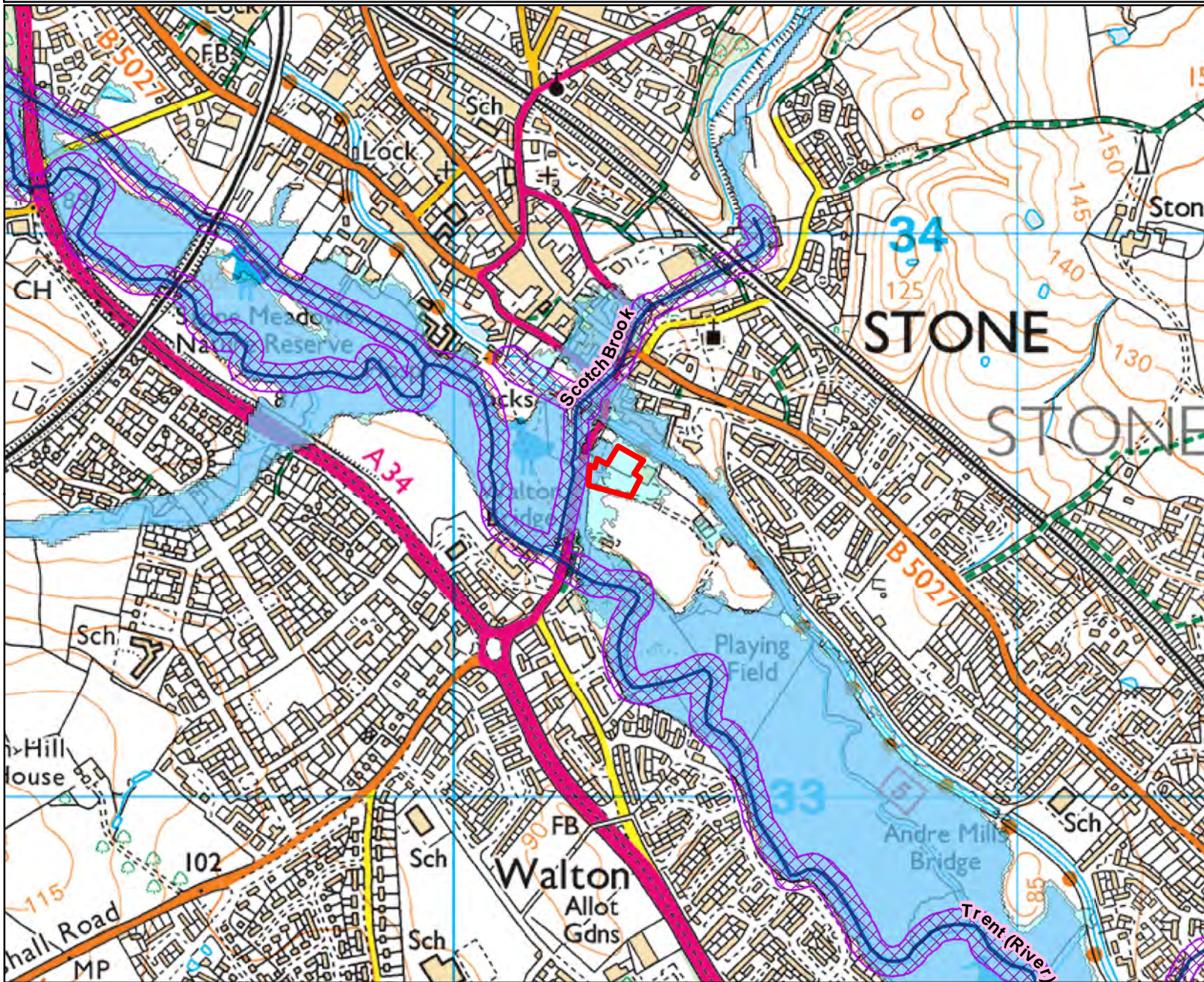
Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely






Diane Edwards
Customers & Engagement Officer
Staffordshire, Warwickshire & West Midlands

For further information please contact the Customers & Engagement team on 02030 253140 / 02030 252958 / 02030 252977
Direct e-mail:- SWWMcustomers@environment-agency.gov.uk

Flood Map for Planning. 390297, 333601. Prepared 22 July 2016. Ref. SWWM-16547



Legend

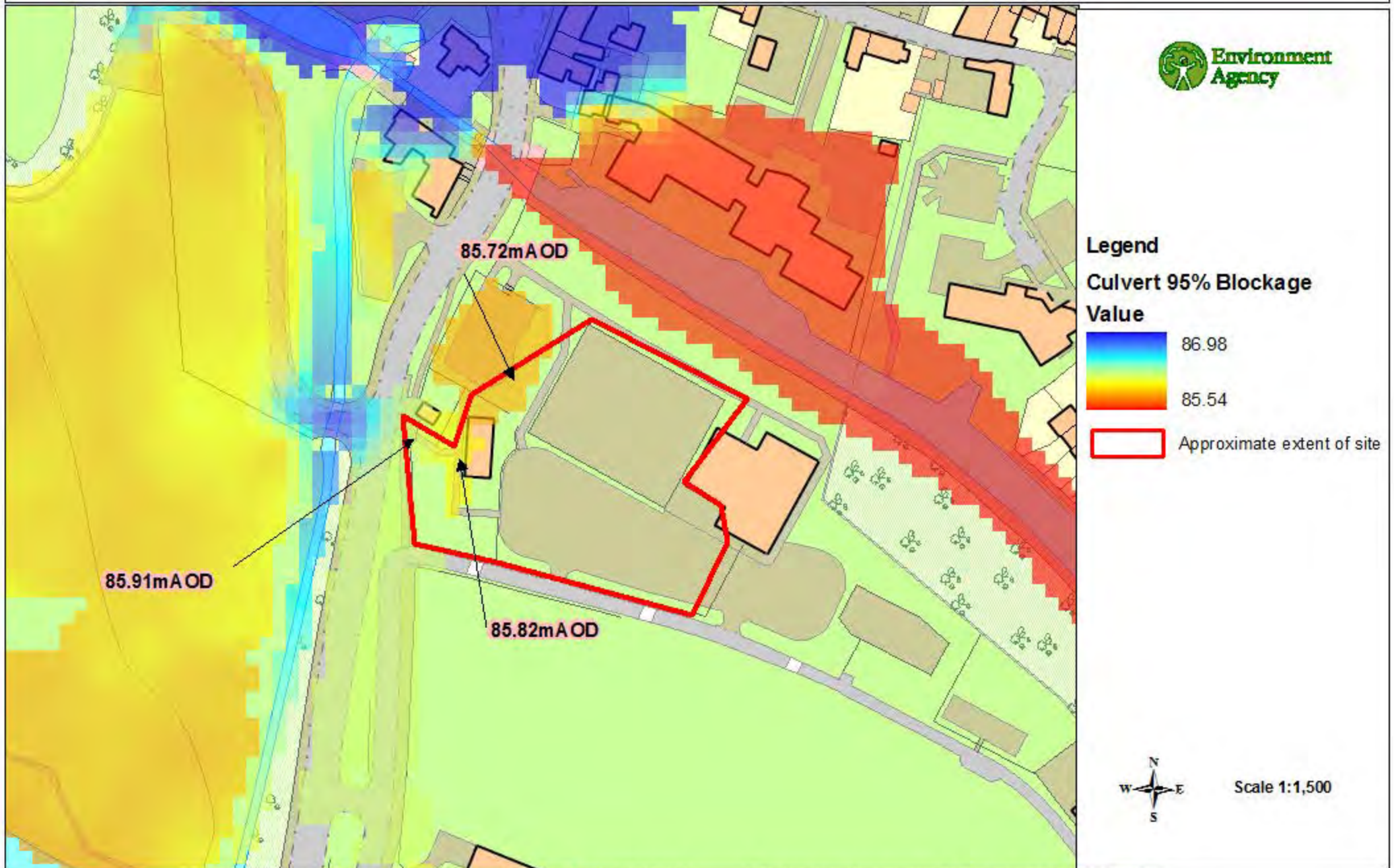
-  Main Rivers
-  Bank Top ePlanning Tool
-  Flood Zone 2
-  Flood Zone 3
-  Approximate extent of site

Flood Map Areas (assuming no defences)
 Flood Zone 3 shows the area that could be affected by flooding from a river with a 1 in 100 (1%) or greater chance of happening each year.
 Flood Zone 2 shows the extent of an extreme flood from rivers with up to a 1 in 1000 (0.1% - 1%) chance of occurring each year

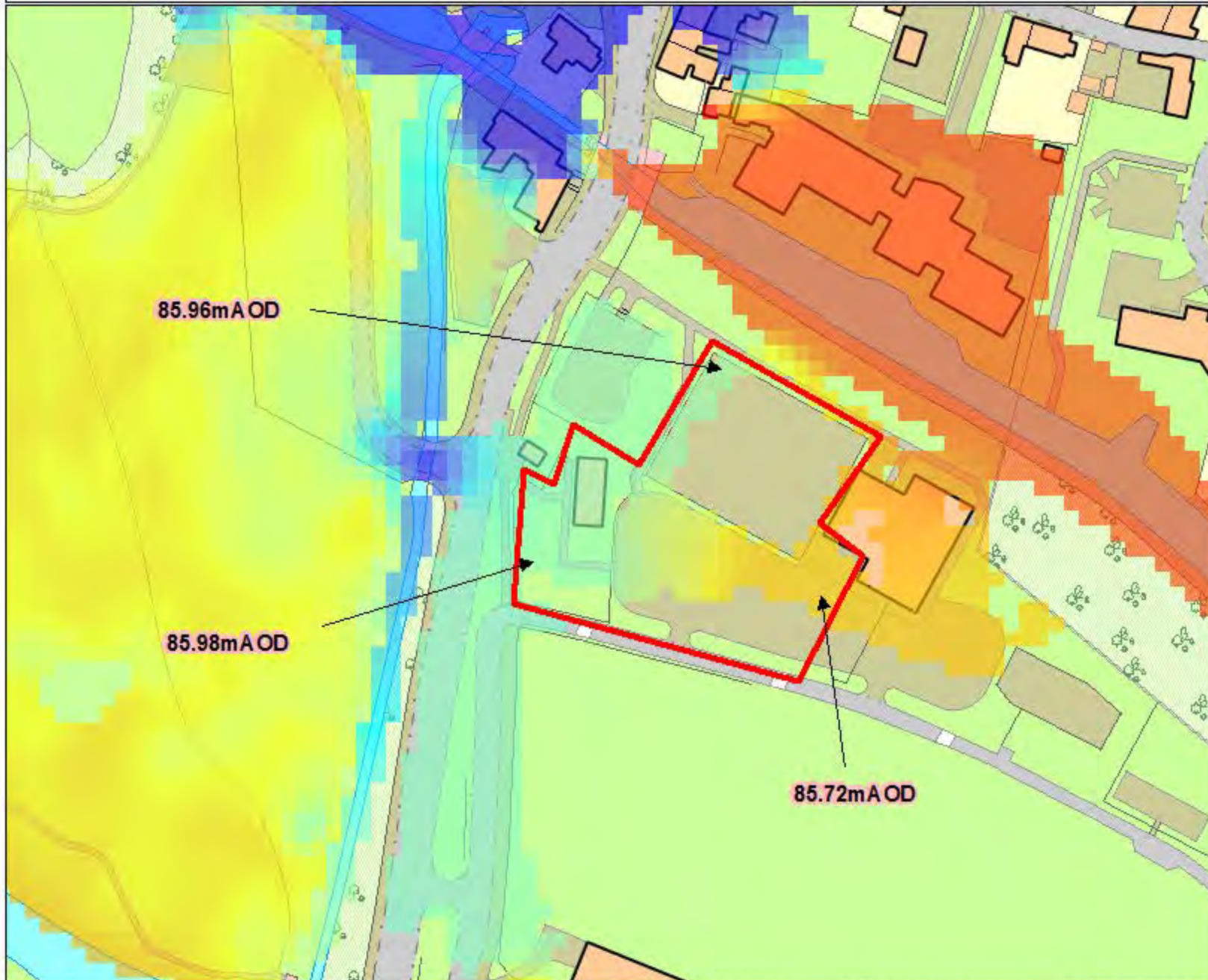


Scale 1:10,000

Culvert 95% Blockage Levels. 390297, 333601. Prepared 22 July 2016. Ref. SWWM-16547



Syphon 95% Blockage Levels. 390297, 333601. Prepared 22 July 2016. Ref. SWWM-16547



Legend
Syphon 95% Blockage Value

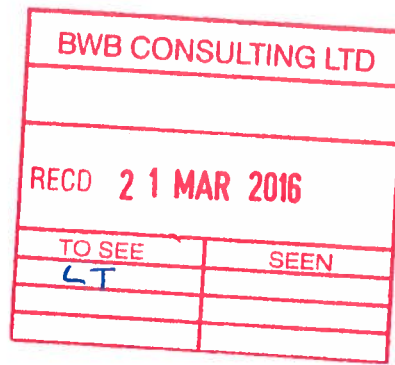
	90.01
	85.51
	Approximate extent of site



Scale 1:1,500

APPENDIX 4

Severn Trent Water Correspondence



17th March 2016

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

FAO - Dr. L Tewson

Severn Trent Water
Severn Trent Water Ltd
Regis Road
Wolverhampton
WV6 8RU

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www.stwater.co.uk

net.dev.west@severntrent.co.uk

Contact: Asset Protection

Your ref:

Our ref: ME/8216234

Dear Dr. Tewson,

Proposed Redevelopment at West Bridge Park, Stafford Road, Stone, Staffordshire, ST15 0HG

I refer to your Development Enquiry Request in respect of the above site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) referred to below.

Protective Strips

Due to recent change in legislation, there could be sewers which have transferred over to the Company that are not shown on the statutory sewer records, but are located on your clients land. These sewers will have protective strips that we will not allow to be built over. The sewers could well be identified whilst the land is being surveyed. If this is the case, please contact us for further guidance upon discovery.

Having viewed the statutory sewer records, I can confirm they demonstrate a 450mm diameter combined sewer passing through the site. For sewers of this diameter we have a protective strip of 5m either side of the pipe, measured from the centreline. You will need to design your layout to accommodate our requirements. If you're unable to achieve this, you could apply to divert the sewer under Section 185 of the Water Industry Act 1991. You may obtain copies of our current application form and guidance notes from either our website or by contacting our Developer Services Team (www.stwater.co.uk - Tel: 0800 707 6600).

Foul Water Drainage

The statutory sewer records indicate a 450mm diameter combined sewer passing through the site. I confirm that the foul flows from proposed retail store should not have an adverse hydraulic impact on the existing network. A connection to the combined system, at an appropriate point would therefore be acceptable to the Company, subject to formal S106 approval (see later). Please note we do not have any recorded flooding incidents within the area.

Surface Water Drainage

The site is redevelopment, therefore, identified as Brownfield development.

The sewer records do not indicate any surface water sewers within the area. You will need to undertake a survey to determine the presence of any unmapped sewers and to determine if they have transferred to the Company or not. Please feel free to submit your findings for guidance. A discharge to the adjacent canal should also be investigated.

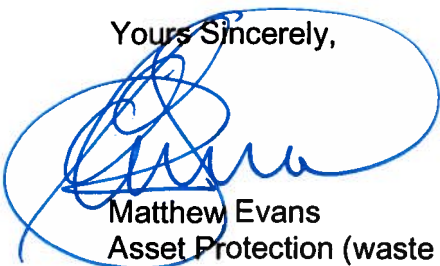
The statutory sewer records indicate a 450mm diameter combined sewer passing through the site. In the event that you are unable to locate a separate surface water sewer system, discharge to the canal and following comprehensive testing, it is demonstrated that soakaways would not be possible, evidence should be submitted. This would satisfy SGN1 (enclosed). A connection to the surface water system would then be appropriate with flows reduced and attenuated as guidance note 2 or as stipulated by the Lead Local Flood Authority (Local Council Authority) as statutory consultee in the planning process.

Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form And associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk

Please quote 8216234 in any future correspondence (including e-mails) with STW Limited. Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours Sincerely,



Matthew Evans
Asset Protection (waste water)
Severn Trent Water Ltd

Enc

SUPPLEMENTARY GUIDANCE NOTES

In 2006 the Government issued national advice in the form of "Planning Policy Statement 25: Development and Flood Risk" and in 2012 the "National Planning Policy Framework" with supporting technical guidance that seeks to reduce the impact of development on surface water runoff. This advice is generally followed by Local Authorities through both the Building Regulations (Approved Document H) and appropriate planning conditions. Furthermore, as of April 2015, the Lead Local Flood Authority (LLFA) will assume the role and responsibility for the management of surface water. Severn Trent welcomes this advice and supports such planning conditions that impose flow restrictions. It is considered that in accordance with current guidance, disposal of storm runoff from the development should be dealt with as follows:

1. By soakage into the site's subsoil. If ground soakage proves inadequate, evidence should be submitted to Severn Trent Water and the LLFA. The evidence should be either percolation test results (BRE Digest 365 – Soakaway Design) or a statement from the geotechnical consultant stating that soakaways would be ineffective. **A connection to public sewerage (existing or adoptable) would then be considered with flows assessed as:**
2. Brownfield development site: If storm runoff from the existing development is connected to the public sewerage system, then peak storm flows from the proposed development up to that generated from the previous connected impermeable area may be connected to the network subject to the details of the existing storm connection arrangements being submitted to Severn Trent Water. Existing flows should be assessed as the lower of $Q=2.78 \times 50 \times A_{imp}$ l/s (A_{imp} ha), based on a 2 year storm return period, and the unsurcharged capacity of the outfall pipe(s).

In addition to this restriction, for Brownfield developments, the Company would also request a minimum reduction in surface water flow to the public sewerage systems of 30% in line with current LLFA practice. It should be noted that the Company would like to see any flow attenuation based on a 30 year critical duration storm design in accordance with 'Sewers for Adoption' current edition unless the system connects directly to a watercourse in which case the Environment Agency (for main river) or LLFA will set the design storm criteria (usually 100 year plus climate change allowance)

For existing storm connections to the public foul sewerage system, any new storm connection to the public storm sewerage system (if available) should be limited to 2 to 5 litres/second/hectare depending on the scale of development, to be agreed (option A) OR a peak flow to be determined by the Company from its developer-funded hydraulic modelling of the public storm sewerage system (option B). The developer may choose either option.

3. Greenfield development site: If the site is a green field development i.e. not involving any demolition of buildings or paved areas connected to the public sewerage system, then the storm runoff from the proposed development may be connected to the public sewerage system subject to peak storm flows (30 year storm return period) being limited to a green field runoff of 5 litres/sec/ha (subject to a minimum of 5 litres/sec for Adoptable systems), applied to the gross area of the site, subject to sufficient capacity in the network.

It is recommended to consult with the LLFA as early as possible to ensure sustainable surface water management is implemented effectively in new development. It should be noted that discharge rates for all sites should be agreed with the LLFA.

- Abandoned Gravy Sewer
- Private Combined Gravy Sewer
- Private Foul Gravy Sewer
- Private Surface Water Gravy Sewer
- Public Combined Gravy Sewer
- Public Foul Gravy Sewer
- Public Surface Water Gravy Sewer
- Trunk Combined Gravy Sewer
- Trunk Foul Use Gravy Sewer
- Trunk Surface Water Gravy Sewer
- Combined Use Pressurised Sewer
- Foul Use Pressurised Sewer
- Surface Water Pressurised Sewer
- Highway Drain
- Combined Lateral Drain (SS)
- Foul Lateral Drain (SS)
- Surface Water Lateral Drain (SS)

- Culverted Watercourse
- Cable, Earthing
- Cable Junction
- Cable, Optical Fibre/Instrumentation
- Cable, Low Voltage
- Cable, High Voltage
- Cable, Other
- Housing, Building
- Housing, Kiosk
- Disposal Site
- Sewage Treatment Works
- Housing, Other
- Pipe Support Structure
- Sewage Pumping Facility
- Sewer Facility Connection Inlet / Outlet

- Blind Shaft
- Combined Use Manhole
- Flushing Chamber
- Foul Use Manhole
- Grease Trap
- Head Node
- Hydrant
- Lampole
- Outfall
- Overflow
- Penstock
- Petrol Interceptor

- Sewer Chemical Injection Point
- Sewer Junction
- Sewerage Air Valve
- Sewerage Hatch Box Point
- Sewerage Isolation Valve
- Soakaway
- Vent Column
- Waste Water Storage
- Pre-1937 Properties

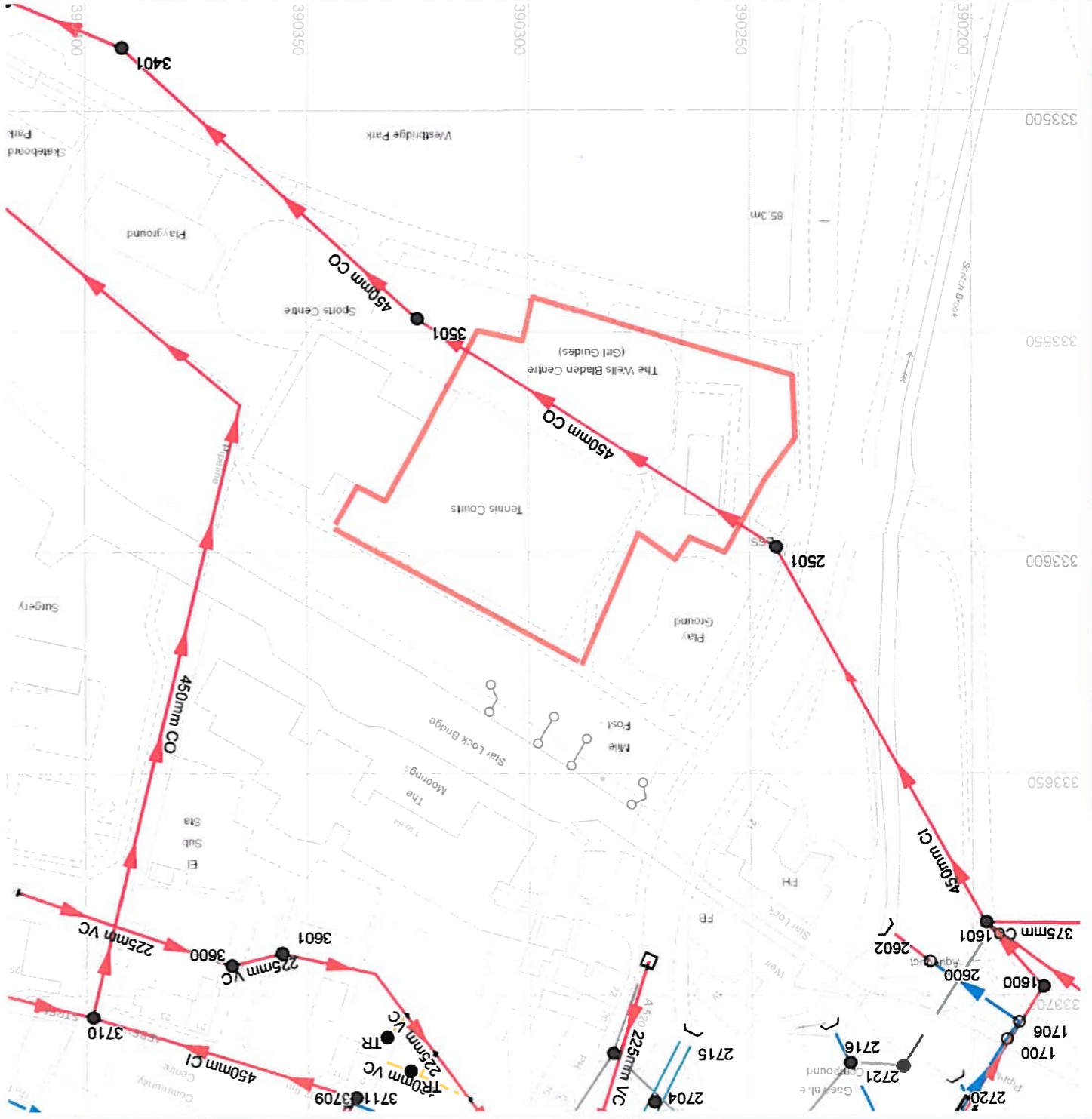
- TABULAR KEY**
- Sewer pipe data refers to downstream sewer pipe.
 - Where the node bifurcates (spits) X and Y indicates downstream sewer pipe.
 - Gradient is stated as 1 in...
- SHAPE**
- U - UNKNOWN
 - T - TRAPEZOIDAL
 - S - SQUARE
 - R - RECTANGLE
 - Q - OTHER
 - F - FUL
 - E - EGG SHAPED
 - C - CURULAR
 - C - COMBINED
 - E - FINAL EFFLUENT
 - S - SURFACE WATER
- PURPOSE**
- W - WEIR
 - C - CASCADE
 - DB - DAMBOARD
 - SE - SIDE ENTRY
 - FL - FLAP VALVE
 - BA - BACK DROP
 - SD - SIPHON
 - HD - HIGHWAY DRAIN
 - SD - SECTION 104
- MATERIALS**
- AC - ASPHALT CEMENT
 - BR - BRICK
 - CC - CONCRETE BOX CULVERT
 - CI - CAST IRON
 - CO - CONCRETE
 - CSG - CONCRETE SEGMENTS (BOULDER)
 - DI - DUCTILE IRON
 - GRC - GLASS REINFORCED CONCRETE
 - MAC - MASONRY IN REGULAR COURSES
 - MR - MASONRY RANDOMLY COURSED
 - PE - POLYETHYLENE
 - PP - POLYPROPYLENE
 - PVC - POLYVINYL CHLORIDE
 - RPM - REINFORCED PLASTIC MATRIX
 - SI - SPUN GREY IRON
 - ST - STEEL
 - VC - VITRIFIED CLAY
 - XX - OTHER



CATEGORIES

Sewer Node Sewer Pipe Data

SEWER NODE	INVERT	UPSTR	DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
S190331600	83.48	83.40	83.40	CO	U	nil	nil	nil	254.12	nil
S190331601	86.03	82.81	83.29	CI	C	450	450	nil	202.22	nil
S190331700	86.55	83.91	83.91	CO	S	nil	nil	nil	0.00	nil
S190331706	86.10	83.79	83.79	CO	S	nil	nil	nil	0.00	nil
S190332501	86.05	82.81	82.39	CO	C	450	450	nil	229.17	nil
S190332600	86.91	83.79	83.79	CO	U	nil	nil	nil	-199.02	nil
S190332704	86.62	86.62	86.62	nil	nil	nil	nil	nil	0.00	nil
S190332721	86.62	86.62	86.62	S	nil	nil	nil	nil	0.00	nil
S190333401	86.82	82.16	82.03	CO	C	450	450	201.64	nil	nil
S190333501	86.15	82.39	82.16	CO	C	450	450	393.96	nil	nil
S190333600	87.59	85.28	85.21	VC	C	nil	nil	nil	0.00	nil
S190333601	87.31	87.05	86.97	CI	C	450	450	773.63	nil	nil
S190333709	87.82	87.82	86.40	CO	C	450	450	481.00	nil	nil
S190333710	87.85	86.92	86.40	CO	C	450	450	481.00	nil	nil
S190333711	87.95	86.08	86.08	VC	S	300	300	0.00	0.00	nil
S190333712	87.95	86.08	86.08	VC	F	nil	nil	nil	0.00	nil
S190333713	87.95	86.08	86.08	VC	C	nil	nil	nil	0.00	nil
S190333714	87.95	86.08	86.08	VC	C	nil	nil	nil	0.00	nil



O/S Map scale: 1:1250
Date of Issue: 16.03.16
Sheet No.: 1 of 1
Y: 333601
X: 390297

SEWER RECORD (Tabular)

This map is centred upon: O / S Grid reference: 390297
 Severn Trent Water Limited
 Asset Data Management
 PO Box 5344
 Coventry
 CV3 9FT
 Telephone: 0845 601 6616

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 3. On 1 October 2011, Severn Trent Water's sewerage and public water assets were transferred to the ownership of Severn Trent Water on or before 1 October 2011.
 4. Severn Trent Water does not possess complete records of these assets.
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