

Halton Borough Council Local Plan Site Screening

**Level 2 Strategic Flood Risk
Assessment – Site MUA2 Screening**

Draft Report

June 2019

www.jbaconsulting.com



Municipal Building

Kingsway

Widnes

WA8 7QF

JBA Project Manager

Mike Williamson
Mersey Bank House
Barbould Street
WARRINGTON
Cheshire
UNITED KINGDOM
WA1 1WA

Revision history

Revision Ref/Date	Amendments	Issued to
P01 / June 2019	N/A	Alasdair Cross

Contract

This report describes work commissioned by Anne Moyers, on behalf of Halton Borough Council, by an email dated 3 May 2019. Hannah Bishop, Joseph Landells-Molloy and Mike Williamson of JBA Consulting carried out this work.

Prepared by Hannah Bishop BSc (Hons)

Technical Assistant

Joseph Landells-Molloy MEng (Hons) GMICE

Assistant Engineer

Reviewed by Mike Williamson BSc MSc CGeog FRGS EADA

Principal Flood Risk Analyst

Approved by..... Howard Keeble MPhil BEng BSc CEng CEnv CSci CWEM
MICE MCIWEM MCMi IMaPS

Technical Director

1 MUA2 (DALP Sub)

Proposed Site	MUA2 (DALP Sub)
Site area (ha)	2.84
Existing use	Mixed use
Existing flood risk vulnerability classification	More vulnerable
Proposed use	Mixed use
Proposed development flood risk vulnerability classification	More vulnerable
Proposed development impermeable area (ha)	2.41

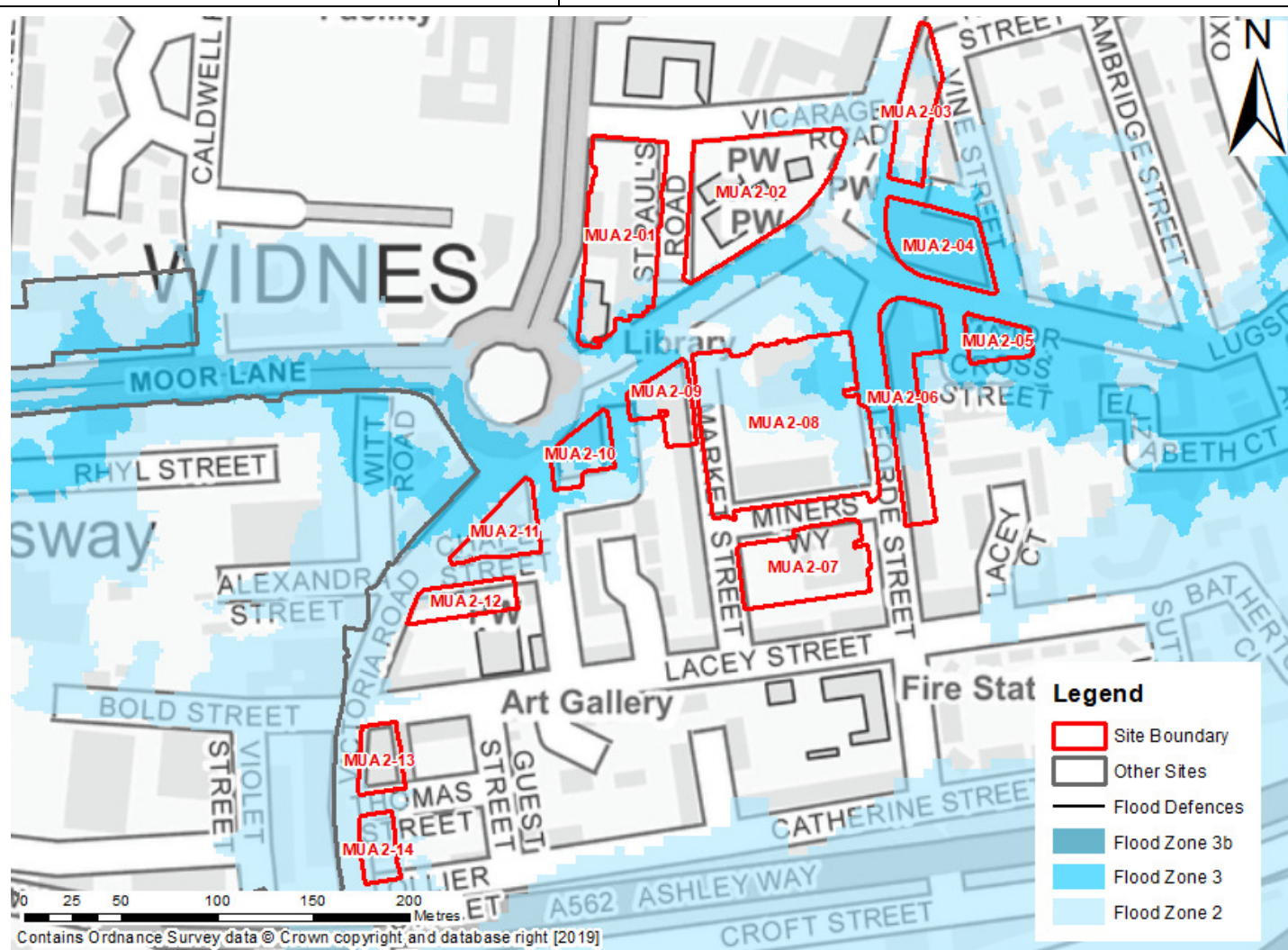


Figure 1-1: Flood zone mapping for the 14 land parcels (there are no flood defences located close to the site)

Proposed Site

MUA2 (DALP Sub)

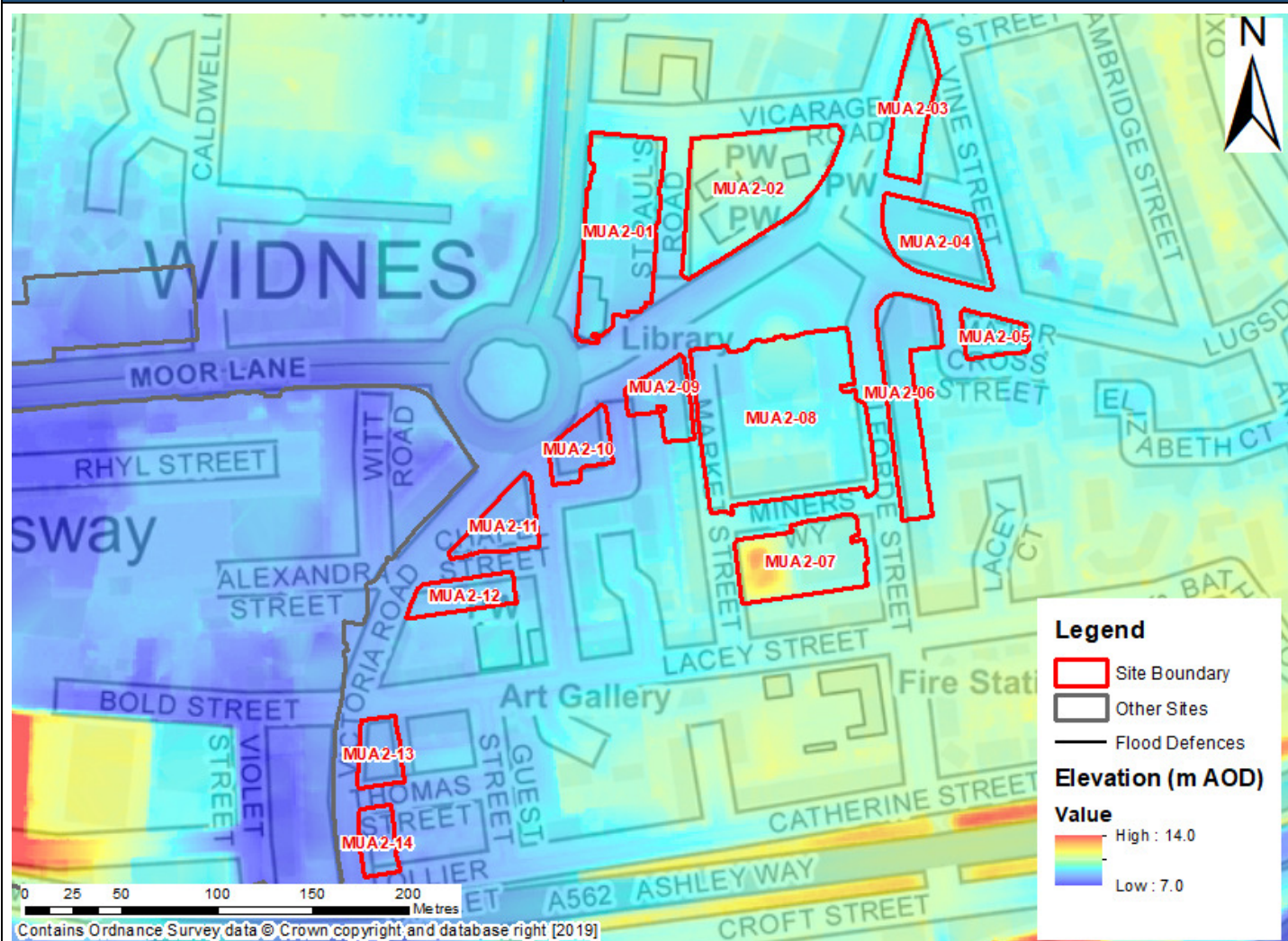


Figure 1-2: Site with 1m LiDAR (elevation data)

- The site has an average approximate elevation of 9.5m AOD which is consistent with the surrounding areas' elevations.

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Observations

- It should be possible for the majority of land parcels, that make up this proposed allocation, to pass the Exception Test at the FRA stage, assuming the advice provided in this Level 2 assessment is followed. Given this is proposed for mixed use, the higher vulnerability land uses should be directed away from Flood Zone 3a with 6 of the 14 land parcels (MUA2-02, 07, 11, 12, 13 and 14) lying entirely outside FZ3a. For example, any residential uses should be directed to these land parcels.
- 13 land parcels are currently developed thus the FRA should assess the current drainage system to ensure it is adequate for any change in site use. Runoff from these 13 sites should not exceed the current level and should better it if possible. One site, MUA2-12, is a

Proposed Site	MUA2 (DALP Sub)		
previously developed, currently grassed area of land where runoff rates should achieve betterment on previous rates or greenfield rates if feasible. • There is no change in risk classification for the overall site according to the NPPF. • Over 21% of the total area of each land parcel is located within Flood Zone 3a according to the Flood Map for Planning; this is corroborated by the Mersey Estuary 2016 modelled outlines. • There is no direct risk from tidal sources in the flood zone mapping, this is corroborated by the modelled outputs produced from the Mersey Estuary 2016 model. • Surface water and fluvial flood risk present the greatest risk to the land parcels. • A nominal 1% of the total site area is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m (see Figure 1-4). The extent of flooding in the 3.33% and 1% AEP events is limited to local highways, particularly the Lugsdale Road – Alforde Street junction. This is because the majority of the land parcels are currently developed and therefore will generally be shown to be at very low risk in the EA’s national surface water mapping. • The main access routes via Victoria Road and Widnes Road are at low risk of surface water flooding in the 1% AEP event.			
Flood Source: Fluvial/Tidal			
	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Flood Zones (%)	24.05	21.45	0.00
Tidal: Depth (m)	N/A	N/A	N/A
Tidal: Hazard	N/A	N/A	N/A

Proposed Site

MUA2 (DALP Sub)

Modelled
Fluvial Flood
Risk and
Climate
Change

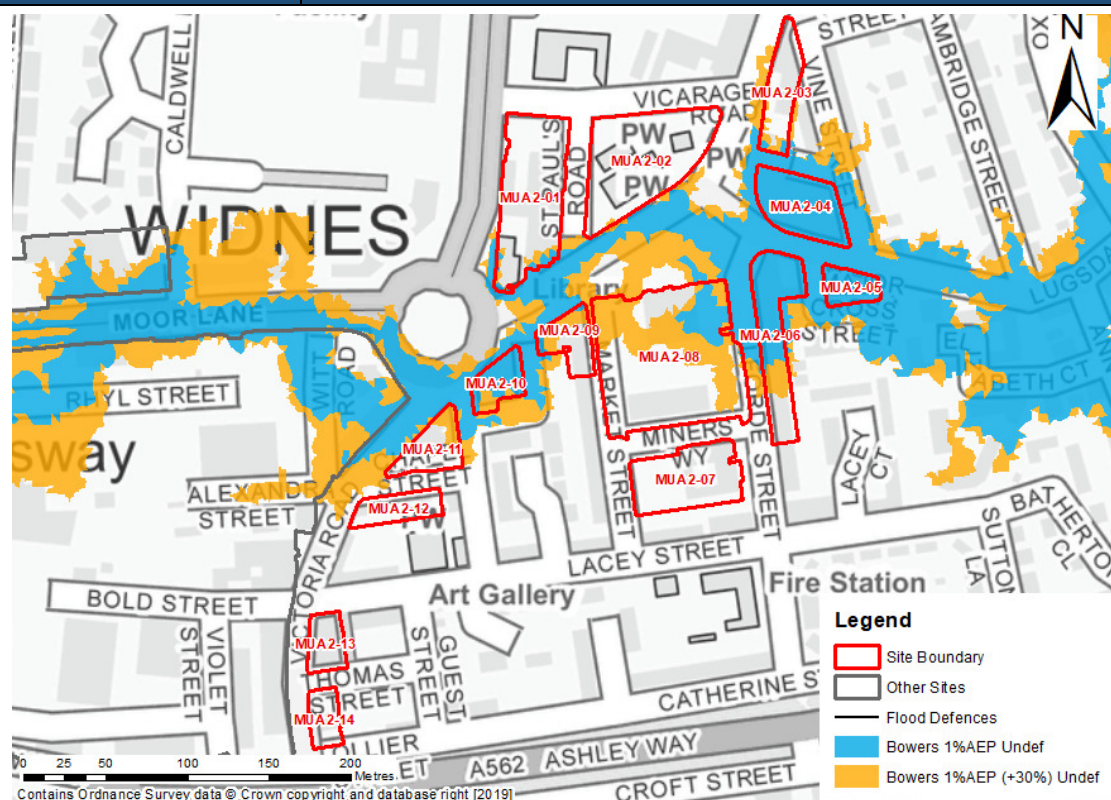


Figure 1-3: Undefended fluvial outlines for the present day 1% AEP and future risk 1% AEP with climate change (+30%).

- The Bowers Brook present day 1% AEP outline affects land parcels MUA2-01, 03, 04, 05, 06, 08, 09 and 10. This outline is equivalent to Flood Zone 3 of the Flood Map for Planning.
- The climate change uplifts then further affect land parcels MUA2-02 and 11.
- The land parcels MUA2-07, 12, 13 and 14 are left unaffected even with the 30% climate change uplift. These parcels remain unaffected by the extreme 0.1% AEP event.

Historic Flooding

- The land parcels lie outside of any Environment Agency's historic flood mapping.

Defences

- The land parcels do not benefit from any formal EA flood defences.

Flood Warning
Area (FWA)

- The land parcels are not located within any EA FWAs.

**Mitigation
options &
site
suitability**

- **It should be possible for the majority of the land parcels that make up this site to pass the Exception Test at the FRA stage, assuming the advice provided in this Level 2 assessment is followed.**
- **Six (MUA2-02, 07, 11, 12, 13 and 14) out of 14 land parcels are entirely outside FZ3a – health and residential development should be directed to these sites. Sites with a less vulnerable risk classification e.g. employment can be allocated within the Flood Zone 3a areas, according to the NPPF, though the FRA should investigate retrofitting flood**

Proposed Site		MUA2 (DALP Sub)
		resilience measures if current buildings are to remain, or raising existing floor levels, preferably above the 1% AEP plus climate change level.
Flood source: Groundwater		
Flood risk: groundwater		Data unavailable. Residual risk from groundwater must be assessed as part of the FRA.
Flood Source: Infrastructure Failure – Reservoirs		
Flood risk: reservoirs		The site is at no risk from reservoir inundation according to the EA's Reservoir Flood Map (RFM).
Flood Source: Infrastructure Failure – Canals		
Flood risk: canal		Data unavailable. Residual risk from canals (if applicable) must be assessed as part of the FRA.

Flood Source: Surface Water

Surface Water Flood Risk to Proposed Development Site

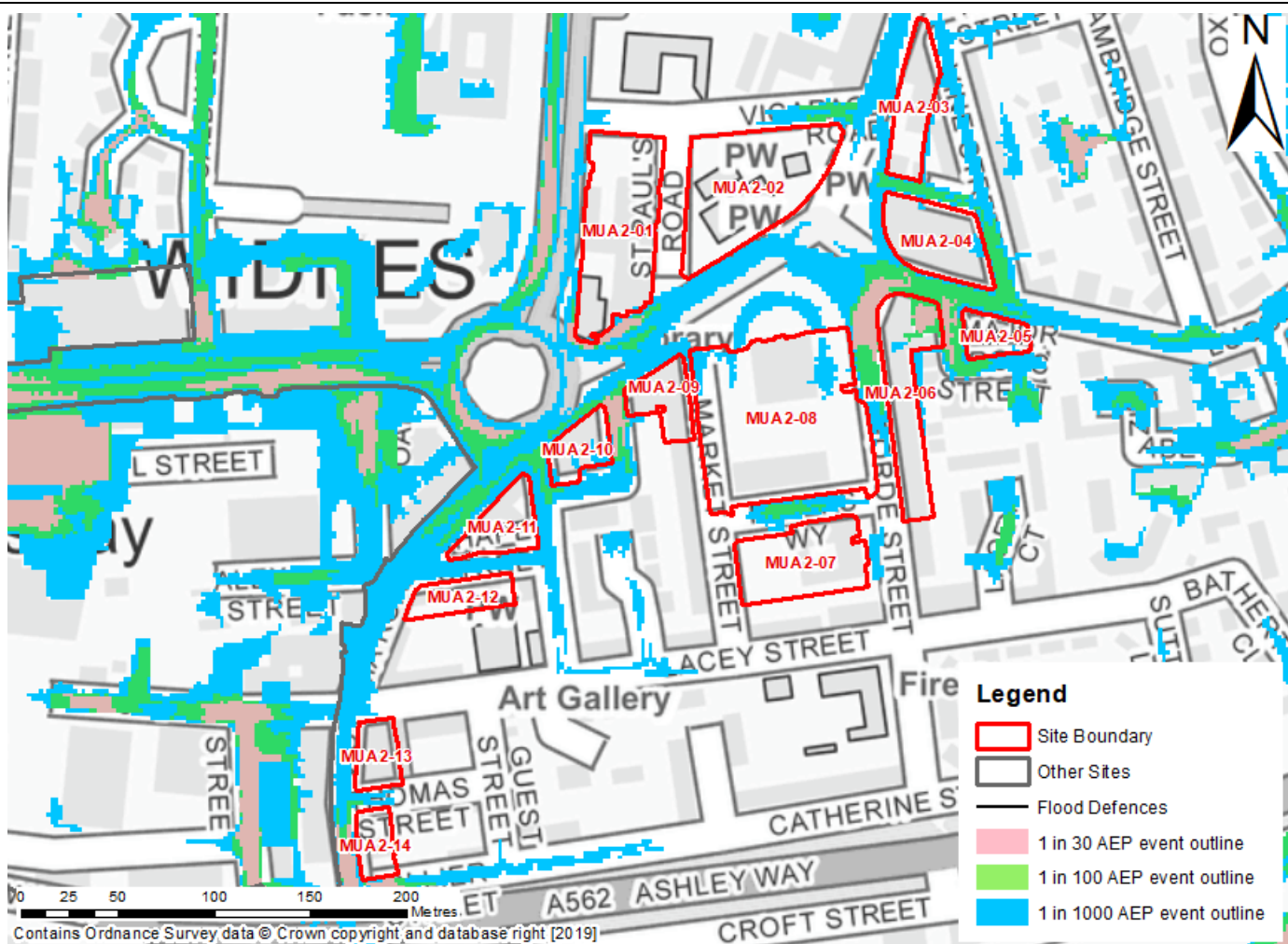


Figure 1-4: Surface water flood risk to the site

Existing development risk of flooding from surface water (%)	High Risk (3.33% AEP outline)	Medium Risk (1% AEP outline)	Low Risk (0.1% AEP outline)
	0.55	1.21	4.78
Surface water flooding depths	Max: 0.15-0.30m	Max: 0.30-0.60m	Max: 0.30-0.60m
Surface water hazards	Max: Low Mean: Low	Max: Moderate Mean: Low	Max: Moderate Mean: Low
Climate change	The current day 0.1% AEP outline provides an indication of the likely increase in extent of the more frequent events.		
Surface water: flood risk to development site	Approximately 1% of the total site area (land parcel MUA2-06) is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m.		

	• All of the other land parcels remain unaffected by the 3.33% and 1% AEP extent outlines. • The extent of flooding in the 3.33% and 1% AEP events is limited to local highways, particularly the Lugsdale Road – Alforde Street junction. • The main access routes via Victoria Road and Widnes Road are at low risk of surface water flooding in the 1% AEP event.
Surface water: mitigation options & site suitability	• It should be possible for this site to pass the Exception Test at the FRA stage, assuming the advice provided in this Level 2 assessment is followed. An FRA should assess the current drainage systems at each land parcel to determine if they are adequate and/or will be adequate for any change in use. • Safe access and egress are achievable via Victoria Road and Widnes Road based on the 1% AEP outline. • Surface water runoff should be fully attenuated to the greenfield runoff rate, and as such, ensure that there is no increase in surface water flood risk elsewhere. The required volumes of attenuation have been calculated below. It is noted that these are values per ha based on the distinct areas of the proposed development site and as such, may underestimate the site storage requirements. It is recommended that the required volumes of surface water attenuation are confirmed for each distinct area as part of development proposals. • The land parcels are currently/previously developed and therefore, infiltration SuDS is unlikely to be feasible (subject to ground investigation and contaminated land assessment).

Indicative Surface Water Flood Risk from Proposed Development (for Proposed Site per hectare)						
Proposed Development limiting runoff rate: Greenfield – FEH Statistical		Qbar: 5.2 l/s/ha Q30: 8.84 l/s/ha Q100: 10.81 l/s/ha				
Design flood event (inc CC)	Critical storm duration (Hrs)	Inflow volume (m ³ per ha)	Outflow volume (m ³ per ha)	Attenuation required (m ³ per ha)	Time to empty assuming no infiltration (Hrs per ha)	Total storage required: Area (ha per ha) and % of site area (per ha)
3.33% AEP Rainfall + 20%	4	412	89	323	14.5	0.022 ha 2.153 %
3.33% AEP Rainfall + 40%	5	505	111	393	17.6	0.026 ha 2.620 %
1% AEP Rainfall + 20%	4.5	574	123	451 (128 exceedance storage)	16.5	0.030 ha 3.007 %
1% AEP Rainfall + 40%	5.25	692	143	549 (156 exceedance storage)	20.1	0.037 ha 3.660 %
Climate change	Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					
Surface water: flood risk impacts from development site & mitigation	- As part of this Level 2 Screening we have included calculations to provide an estimated land take if a pond with an assumed depth of 1.5m was included as part of the development. - Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.					

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Registered Office:

1 Broughton Park
Old Lane North
Broughton
Skipton
North Yorkshire
BD23 3FD
United Kingdom

+44(0)1756 799919
info@JBA - consulting.com
www.JBA - consulting.com
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