

Halton Borough Council Local Plan Site Screening

**Level 2 Strategic Flood Risk
Assessment – Site MUA10 Screening**

Draft Report

July 2019

www.jbaconsulting.com



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Revision history

Revision Ref/Date	Amendments	Issued to
P01 / July 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.

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1 MUA10 (DALP Sub)

Proposed Site	MUA10 (DALP Sub)
Site area (ha)	3.97
Existing use	Offices
Existing flood risk vulnerability classification	Less vulnerable
Proposed use	Mixed use
Proposed development flood risk vulnerability classification	More vulnerable
Proposed development impermeable area (ha)	3.37

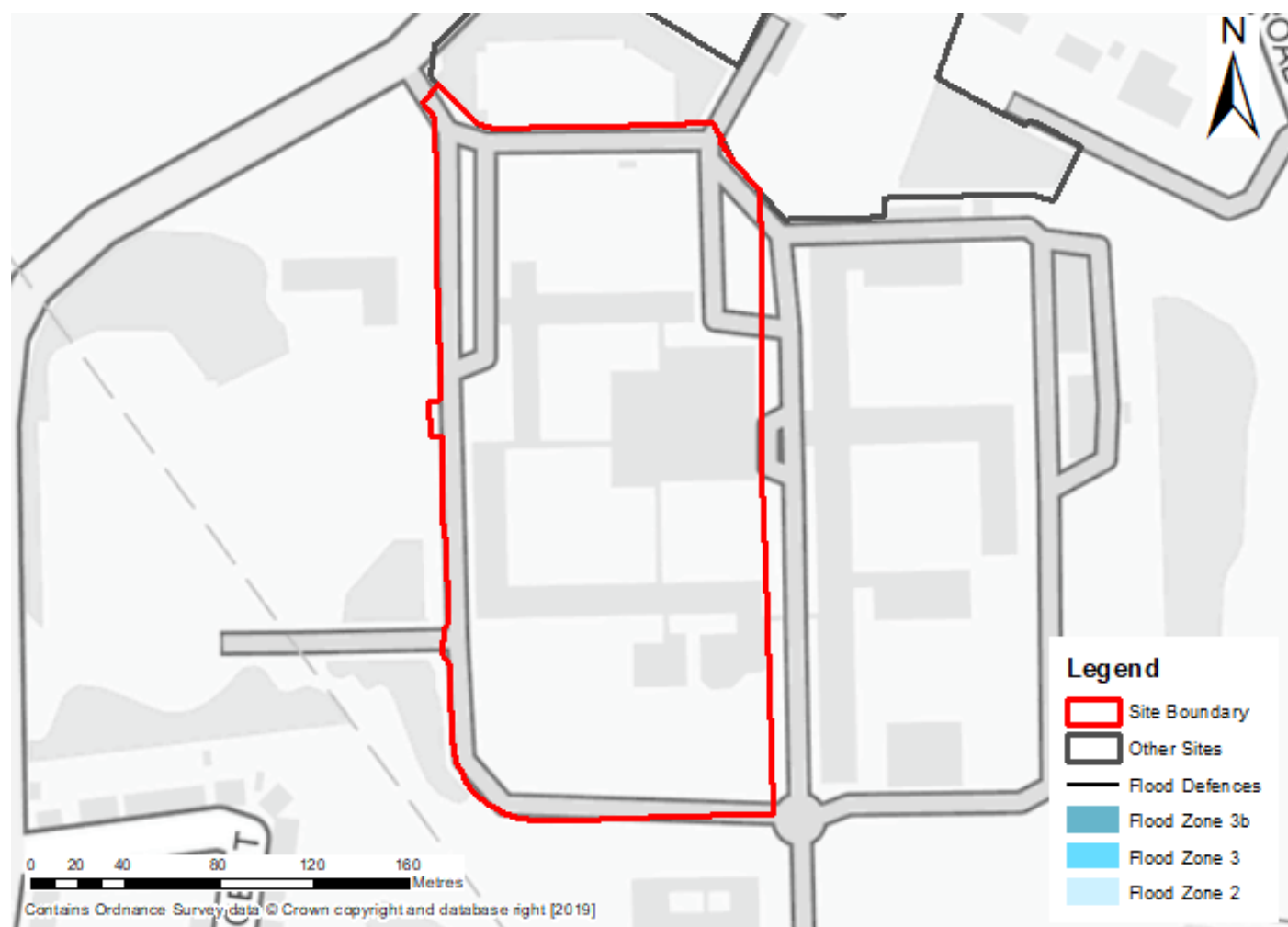


Figure 1-1: Flood zone mapping of the site (no flood zone mapping located near the site)

Proposed Site

MUA10 (DALP Sub)

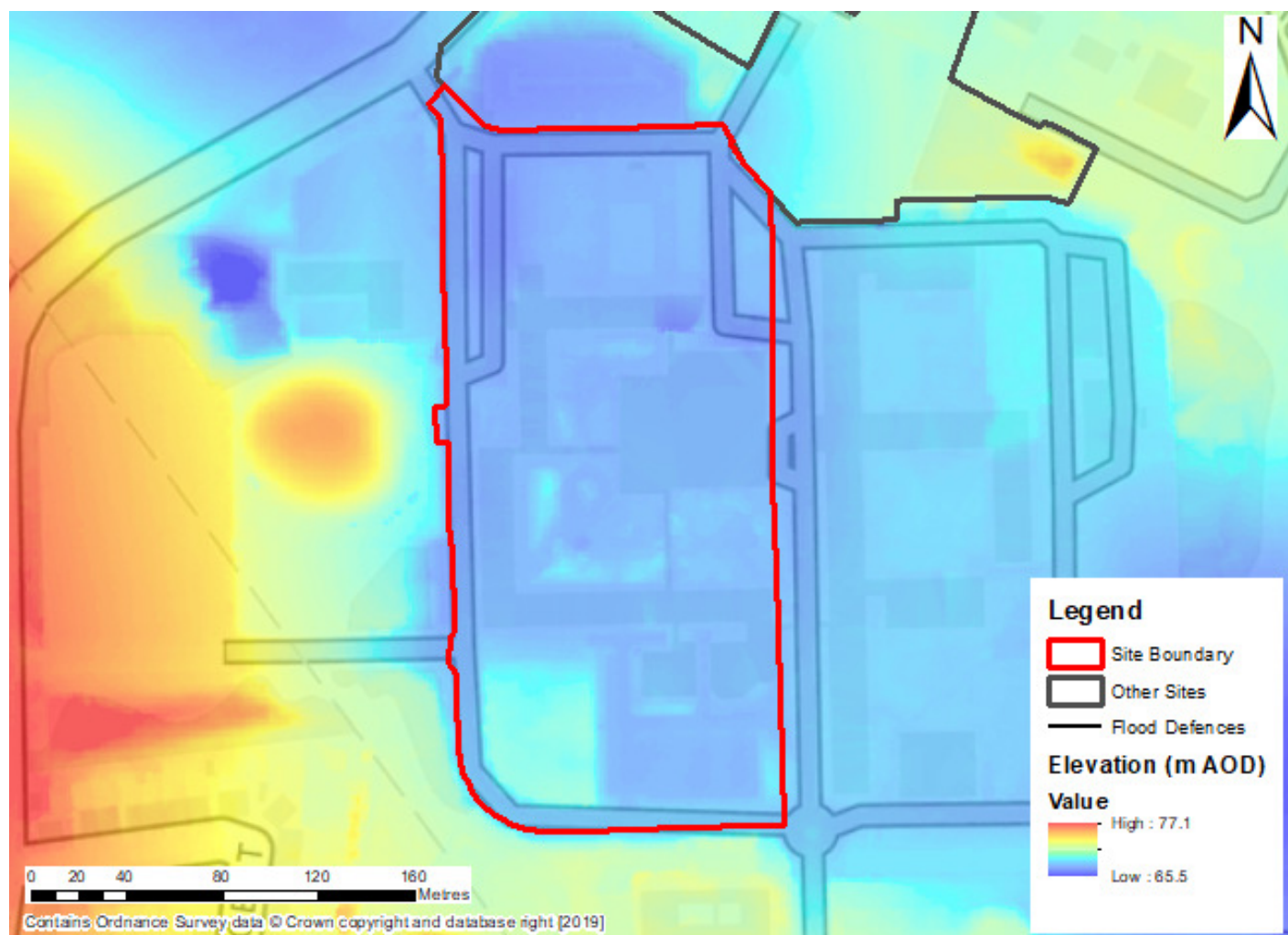


Figure 1-2: Site with 1m LiDAR (elevation data)

- The site has an average approximate elevation of 68m AOD with the area to the east of the site remaining consistent with that of the site. The area to the west of the site increases to around 71m AOD.

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Observations

- Allocation should be permitted at this site if the recommendations in this Level 2 assessment are followed. An FRA should assess the current drainage system to ensure it is adequate for the change in site use as runoff should not exceed current levels and should better it if possible.
- The proposed use of development would see a change in risk classification from less vulnerable to more vulnerable according to the NPPF.
- This site is completely within Flood Zone 1 with development allowed at this location.

Proposed Site		MUA10 (DALP Sub)	
- There is no fluvial or tidal flood risk associated with this site according to flood zone mapping, this is corroborated by modelled outlines from the Mersey Estuary 2016 model. - Surface water presents the greatest flood risk to the site. - The risk of surface water flooding is significant during the 3.33%, 1% and 0.1% AEP events to the south half of the site (see Figure 1-3). - Approximately 12% 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 1-3). The extent of flooding in the 1% AEP event is largely contained by existing development, either by existing buildings or within areas of low-lying hardstanding. - Safe access and egress are achievable via the south to north spine road to the east of the site based on the 1% AEP outline.			
Flood Source: Fluvial/Tidal			
	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Flood Zones (%)	0.00	0.00	0.00
Tidal: Depth (m)	N/A	N/A	N/A
Tidal: Hazard	N/A	N/A	N/A
Modelled Flood Risk and Climate Change	The site is outside any modelled fluvial and/or tidal outlines.		
Historic Flooding	The site lies outside any Environment Agency historic flood mapping.		
Defences	There are no EA defences that impact upon the site.		
Flood Warning Area (FWA)	The site lies outside any EA FWAs.		
Mitigation options & site suitability	The entirety of the site is located within Flood Zone 1, and outside of any fluvial and/or tidal modelled outlines from the Mersey Estuary 2016 model.		
Flood source: Groundwater			
Flood risk: groundwater	Data unavailable. Possible risk from groundwater must be assessed as part of an FRA.		
Flood Source: Infrastructure Failure – Reservoirs			
Flood risk: reservoirs	There is no risk of reservoir inundation to the site 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 an FRA.		

Proposed Site MUA10 (DALP Sub)

Flood Source: Surface Water

Surface Water Flood Risk to Proposed Development Site

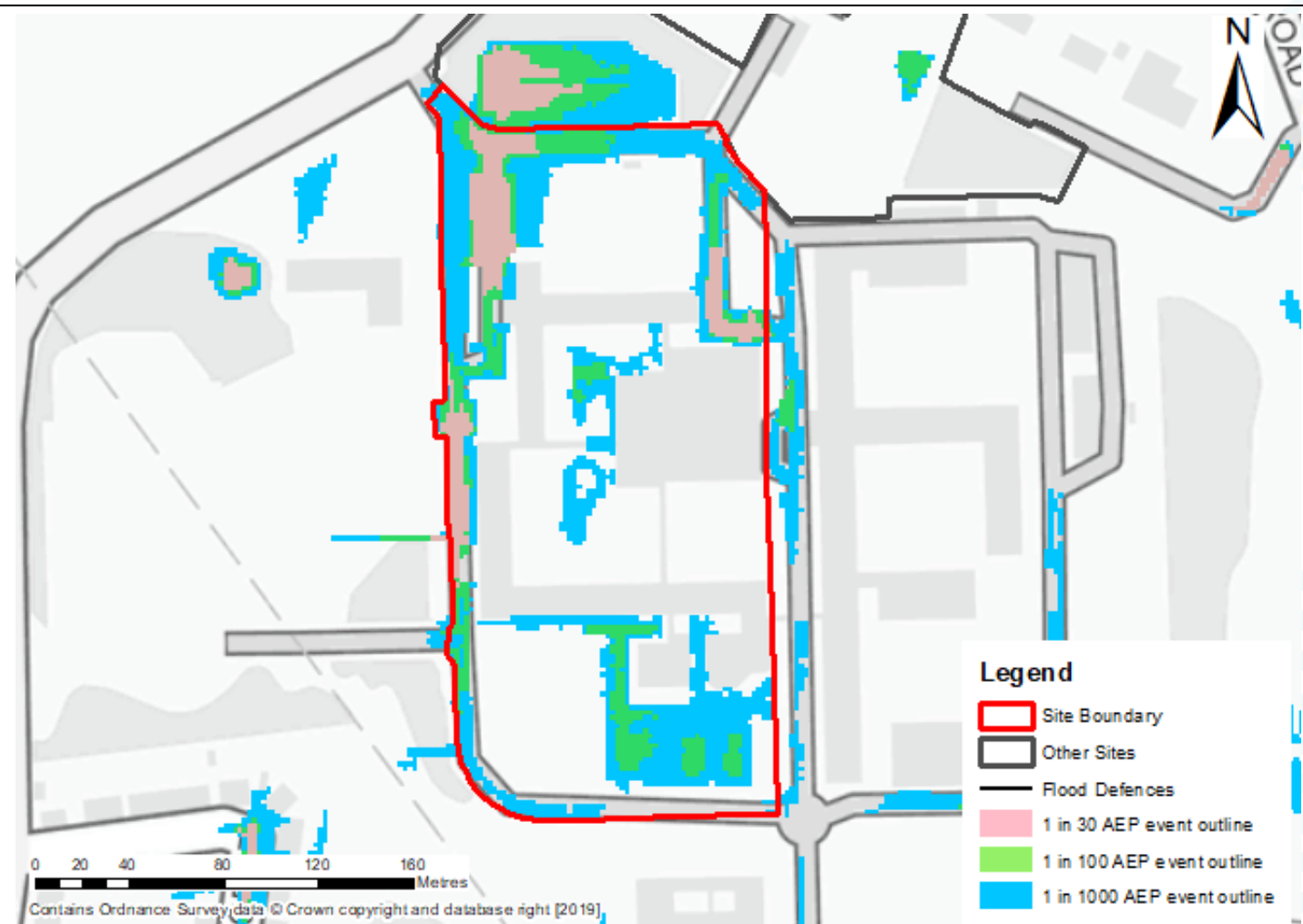


Figure 1-3: Surface water flood risk to the site

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)
	5.10	11.63	31.15
Surface water flooding depths	Max: 0.30-0.60m	Max: 0.30-0.60m	Max: 0.90-1.20m
Surface water hazards	Max: Moderate Mean: Moderate	Max: Significant Mean: Moderate	Max: Significant Mean: Significant
Climate change	The current day 0.1% AEP outline provides an indication of the likely increase in extent of the more frequent events.		

Proposed Site		MUA10 (DALP Sub)
Surface water: flood risk to development site		- Approximately 12% 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. - The extent of flooding in the 1% AEP event is largely contained by existing development, either by existing buildings or within areas of low-lying hardstanding. - Access points should be directed to the road to the south of the site.
Surface water: mitigation options & site suitability		Allocation should be permitted at this site if the recommendations in this Level 2 assessment are followed. An FRA should assess the current drainage system to ensure it is adequate for the change in site use as runoff should not exceed current levels and should better it if possible. Development should avoid the 1% AEP surface water flood outline – approximately 12% of the total site area. Safe access and egress are achievable via the south to north spine road to the east of the site, based on the 1% AEP outline, and the road to the south of the site. Surface water runoff should be fully attenuated to a pre-agreed runoff rate (typically, this is a betterment on the existing runoff rate for currently developed sites) and as such, ensure that there is no increase in surface water flood risk elsewhere. The required volumes of attenuation have been calculated below for discharge at the greenfield rate. This provides a conservative estimate for the storage requirements that will likely be required. The site is currently developed though also with several large green areas., The FRA or drainage strategy should assess whether infiltration SuDS can be feasible through ground investigation and possible contaminated land assessment. Options for surface water drainage, conveyance, storage depend on whether the site is to be cleared or whether existing buildings and layout are to remain. The current drainage system should be investigated for use with possible new development. Existing low-lying areas that are currently showing localised ponding may be utilised for attenuation. Surface water flood risk, although localised in the 1% AEP event, is largely contained by existing development and existing roads which act as flow paths; therefore, redevelopment of the site may significantly change the behaviour of surface water and this must be accounted for in an FRA.

Proposed Site		MUA10 (DALP Sub)				
Indicative Surface Water Flood Risk from Proposed Development (for Proposed Site in its Entirety)						
Proposed Development limiting runoff rate: Greenfield – FEH Statistical		Qbar: 14.83 l/s Q30: 25.22 l/s Q100: 30.86 l/s				
Design flood event (inc CC)	Critical storm duration (Hrs)	Inflow volume (m³)	Outflow volume (m³)	Attenuation required (m³)	Time to empty assuming no infiltration (Hrs)	Total storage required: Area (ha) and % of site area
3.33% AEP Rainfall + 20%	6.5	1839	413	1426	22.4	0.095 ha 2.395 %
3.33% AEP Rainfall + 40%	8	2250	508	1741	27.3	0.116 ha 2.924 %
1% AEP Rainfall + 20%	8.25	3092	642	2451 (1025 exceedance storage)	31.4	0.163 ha 4.116 %
1% AEP Rainfall + 40%	10	3752	778	2975 (1234 exceedance storage)	38.1	0.198 ha 4.996 %
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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