

Halton Borough Council Local Plan Site Screening

**Level 2 Strategic Flood Risk
Assessment – Site R58 Screening**

Draft Report

July 2019

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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 R58 (DALP Sub)

Proposed Site	R58 (DALP Sub)
Site area (ha)	1.74
Existing use	Carparking, amenity greenspace
Existing flood risk vulnerability classification	Water-compatible
Proposed use	Residential
Proposed development flood risk vulnerability classification	More vulnerable
Proposed development impermeable area (ha)	1.48

Flood outlines (current day)



Figure 1-1: Flood Zone Mapping (no flood zone mapping immediately close to the site)

Proposed Site

R58 (DALP Sub)

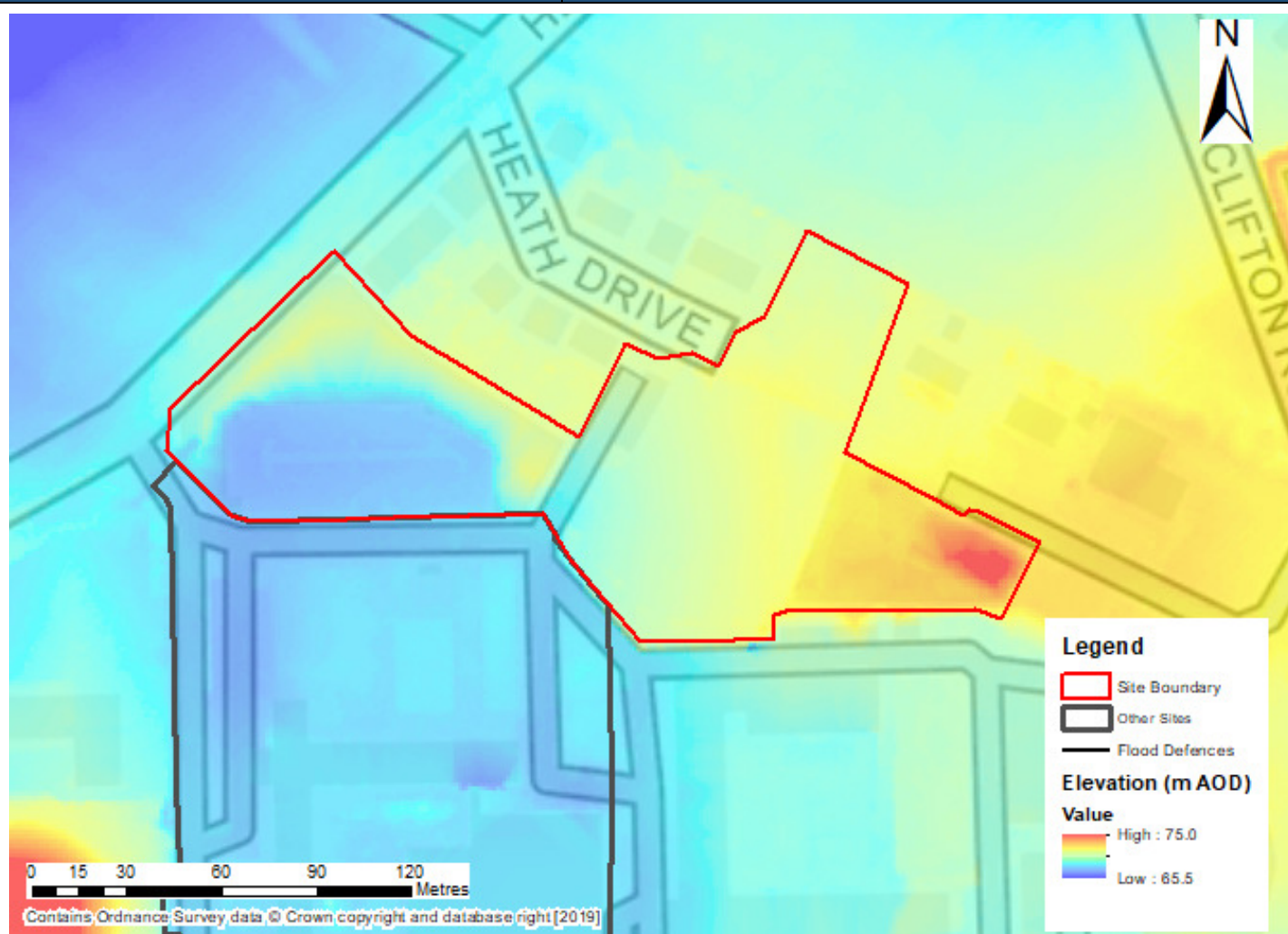


Figure 1-2: Site with 1m LIDAR (elevation data)

- The average elevation across the site is approximately 70m AOD with a high of approximately 74m AOD in the east of the site. There is a section of the site to the west where the elevation is lower than the site average (approximately 66m AOD) where surface water may pond.

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Observations

- Given the site is wholly within Flood Zone 1, allocation should be possible.
- Surface water ponds in two isolated areas (see Figure 1-3), most notably in the west, therefore it should be possible to control and mitigate the risk.
- Approximately 10% 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 localised to areas of low-lying existing hardstanding.
- Main access/egress route possible from Heath Drive.

Proposed Site		R58 (DALP Sub)	
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 lies outside any modelled flood risk from fluvial and/or tidal sources.		
Historic Flooding	The site lies outside of any Environment Agency historic flood outlines.		
Defences	There are no flood defences located close to the site according to the EA's spatial flood defence database.		
Flood Warning Area (FWA)	The site is not located within any current EA FWA.		
Mitigation options & site suitability	The entirety of the site lies within Flood Zone 1, outside fluvial or tidal modelled risk outlines. Allocation should therefore be permitted at this site following the FRA stage.		
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 residual risk of reservoir inundation at 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

R58 (DALP Sub)

Flood Source: Surface Water

Surface Water Flood Risk to Proposed Development Site

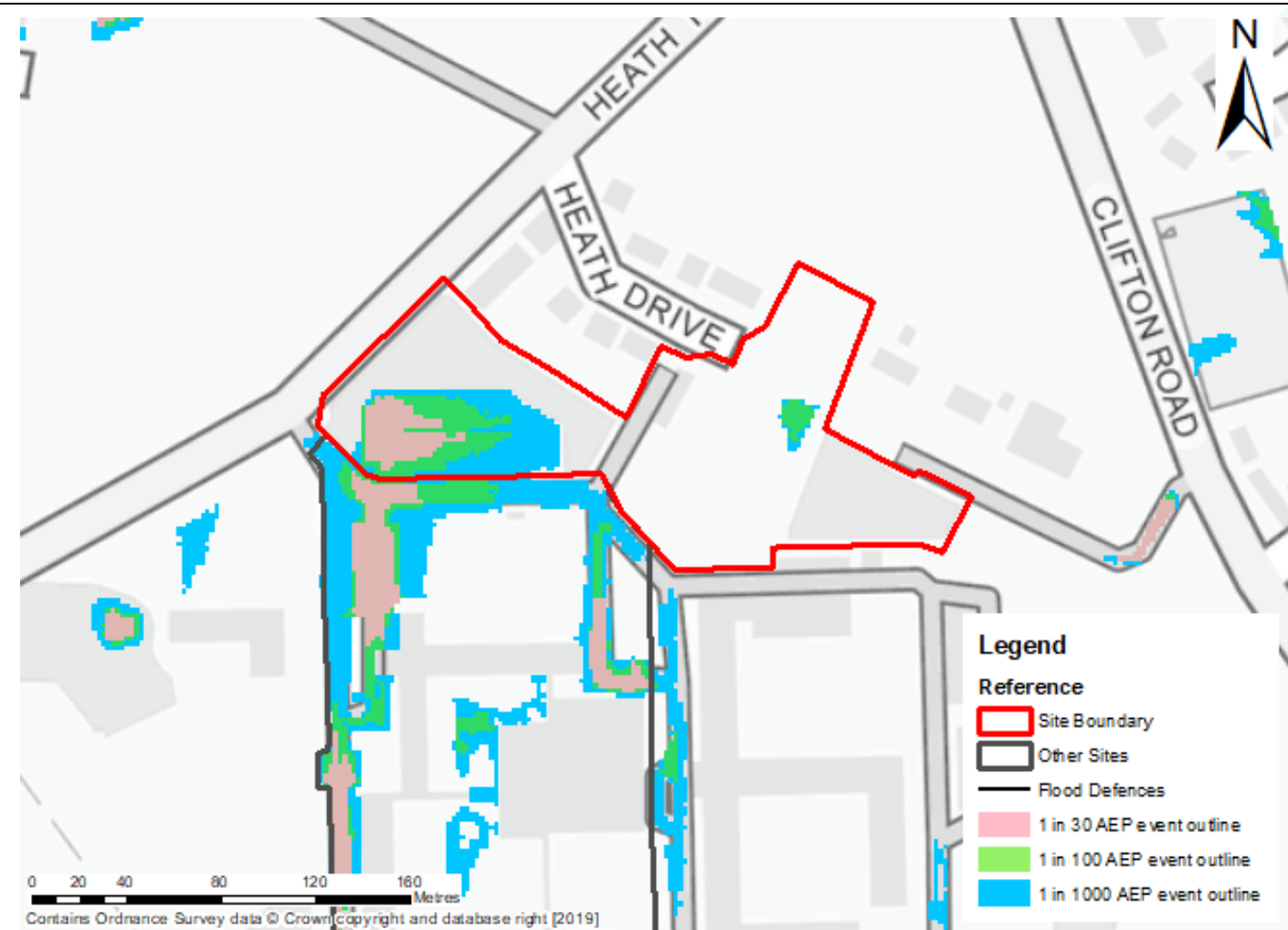


Figure 1-3: Surface Water Flood Risk to the site

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)
	4.18	10.14	17.83
Surface water flooding depths	Max: 0.15-0.30m	Max: 0.30-0.60m	Max: 0.60-0.90m
Surface water hazards	Max: Moderate Mean: Low	Max: Significant Mean: Moderate	Max: Significant Mean: Moderate
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		R58 (DALP Sub)
Surface water: flood risk to development site		- Approximately 10% 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 flood risk in all events is primarily localised to an area of low-lying land used for carparking in the west of the site. - The main access route via Heath Drive is at very low risk of surface water flooding.
Surface water: mitigation options & site suitability		Allocation should be possible at this site assuming the recommendations in this Level 2 assessment are followed. An FRA is required to address the surface water risk through appropriate site layout and design, including SuDS options as part of a drainage strategy. Development should avoid the 1% AEP outline – approximately 10% of the total site area. This should be possible given localised ponding of surface water. Safe access and egress are achievable via Heath Drive. Surface water runoff should be fully attenuated to the greenfield runoff rate. The required volumes of attenuation to achieve this have been calculated below. This provides a conservative estimate for the storage requirements that will likely be required. The site is currently used for carparking and contains open greenspace therefore infiltration SuDS should be possible depending on underlying ground conditions (subject to ground investigation and contaminated land assessment). Existing low-lying areas that are currently showing localised ponding should be utilised for attenuation.

Proposed Site		R58 (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: 6.5 l/s Q30: 11.05 l/s Q100: 13.52 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	808	181	627	22.4	0.042 ha 2.402 %
3.33% AEP Rainfall + 40%	8	988	223	765	27.4	0.051 ha 2.931 %
1% AEP Rainfall + 20%	7	1114	238	876 (249 exceedance storage)	25.6	0.058 ha 3.356 %
1% AEP Rainfall + 40%	8	1336	273	1064 (299 exceedance storage)	31.1	0.071 ha 4.077 %
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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