Harborough District Council

Level 2 Strategic Flood Risk Assessment

Detailed Site Summary Table

Site details

Site Code	**10240: Proposed Allocation MH7**
Address	**St Marys Road, Market Harborough**
Area	0.9 hectares
Current land use	Brownfield
Proposed land use	Mixed use
Flood Risk Vulnerability	More vulnerable

Sources of flood risk

Location of the site	The site is located along St Mary's Road in Market Harborough, in the south of Harborough District. The site is located approximately 90m north of the River Welland.
Topography	The Environment Agency's (EA) 1m resolution 2022 Composite LiDAR shows that the topography of the site declines from the northwest at approximately 84mAOD, to the east at approximately 77mAOD.
Existing drainage features	With the exception of the River Welland to the south of the site, no other existing drainage features have been identified. As the site is previously developed, it likely drains into the surface water drainage network, and discharges into the River Welland south of the site.
Fluvial	**Available data and mapping:** The EA Flood Map for Planning for Rivers and Sea/River Welland Model (2016). **Data analysis:** Details of the sites location within each Flood Zone are provided within the SFRA Site Screening Appendix.

	Flood characteristics: The site is entirely located within Flood Zone 1. Flood Zone 1 represents areas which have less than 1 in 1000 (0.1%) chance of river flooding in a given year.
Fluvial plus climate change	Modelling of the River Welland shows that the site is not at risk of fluvial flooding during a climate change scenario. Given the elevation of the site, it is very unlikely that the site will be at risk from the River Welland in future.
Surface water	**Available data and mapping:** The EA's Risk of Flooding from Surface Water dataset for the 3.3%, 1% and 0.1% AEP events. **Data analysis:** **3.3% AEP (1 in 30 year) event:** Proportion is 11% Max Depth is 0.58m Max Velocity is 0.35m/s Max Hazard is 1.29, Danger to Most Mean Depth is 0.3m Mean Velocity is 0.09m/s Mean Hazard is 1.01, Danger to Some **1% AEP (1 in 100 year event):** Proportion is 15% Max Depth is 0.67m Max Velocity is 0.44m/s Max Hazard is 1.34, Danger to Most Mean Depth is 0.34m Mean Velocity is 0.11m/s Mean Hazard is 1.03, Danger to Some

	0.1% AEP (1 in 1000 year) event: Proportion is 22% Max Depth is 0.84m Max Velocity is 1.26m/s Max Hazard is 1.51, Danger to Most Mean Depth is 0.43m Mean Velocity is 0.2m/s Mean Hazard is 1.12, Danger to Some **Flood characteristics:** The site is shown to flood during all three events, doubling in extent from 11% during the 3.3% AEP event, up to 22% during the 0.1% AEP event. During the 3.3% AEP event flooding occurs in two areas within the east of the site, connecting into a much larger extent during the 0.1% AEP event. The most significant flood depths are shown to be located to the northeast of the site, highlighting a significant flood risk to the eastern portion of the site. Significant flooding is also located along the A4304 adjacent to the southeastern corner of the site. Whilst the site itself is less affected, there is significant flood risk associated with the River Welland immediately to the south of the site and much of the surrounding area which will pose significant challenges for access and egress. The average depth, velocity and hazard during the 0.1% AEP event are 0.43m, 0.2m/s and a 'Danger to Some' respectively.
Surface water plus climate change	**Available data and mapping:** EA's Risk of Flooding from Surface Water dataset for the 3.3% and 1% AEP events with both upper and central climate change scenarios. **Management Catchment:** The site is located within the Welland Management Catchment. The EA guidance recommends that the Upper End allowance is considered for both the 3.3% and 1% AEPs for the 2070's epoch, unless the allowance for the 2050's epoch is higher, in which case this should be used. This is

	appropriate for development with a lifetime beyond 2100. The recommended uplift on peak rainfall intensity for the 3.3% AEP central and upper estimates are 25% and 35%, and 25% and 40% for the 1% AEP event. **Data analysis:** **3.3% AEP (1 in 30 year) central climate change event:** Proportion is 17% Max Depth is 0.72m Max Velocity is 0.7m/s Max Hazard is 1.39, Danger to Most Mean Depth is 0.37m Mean Velocity is 0.13m/s Mean Hazard is 1.1, Danger to Some **3.3% AEP (1 in 30 year) upper climate change event:** Proportion is 18% Max Depth is 0.74m Max Velocity is 0.79m/s Max Hazard is 1.4, Danger to Most Mean Depth is 0.37m Mean Velocity is 0.15m/s Mean Hazard is 1.08, Danger to Some **1% AEP (1 in 100 year) central climate change event:** Proportion is 20% Max Depth is 0.77m Max Velocity is 1.12m/s Max Hazard is 1.48, Danger to Most

	Mean Depth is 0.38m Mean Velocity is 0.18m/s Mean Hazard is 1.09, Danger to Some **1% AEP (1 in 100 year) upper climate change event:** Proportion is 23% Max Depth is 0.82m Max Velocity is 1.22m/s Max Hazard is 1.52, Danger to Most Mean Depth is 0.41m Mean Velocity is 0.19m/s Mean Hazard is 1.11, Danger to Some **Flood characteristics:** The site is shown to flood across all four climate change scenarios, with the eastern portion of the site flooding up to 23% within the 1% AEP upper climate change event. The maximum flood depth during the 1% AEP upper event is shown to be 0.82m located to the northeast off the site, with an average depth, velocity and hazard of 0.41m, 0.19m/s and a 'Danger to Some'.
Reservoir	The site is not located in a Wet or Dry day reservoir flooding extent, according to the EA's reservoir flood mapping.
Groundwater	**Available data and mapping:** The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid. **Flood characteristics:** Groundwater levels on site are shown to predominantly be 'low risk' during a 1% AEP groundwater flood event, with small areas to the north and east with groundwater levels between 0.5m and 5m below the ground surface.

Sewers	Sewer flood records from Anglian Water were unavailable and therefore cannot be assessed as part of this assessment. The risk of sewer flooding should be considered within a site-specific assessment prior to development. Market Harborough is identified as an area of concern for sewer flooding in the future within Anglian Water's DWMP.
Flood history	The site is not shown to be located within the EA's Recorded Flood Outlines extent.

Flood risk management infrastructure

Existing defences	The EA's AIMS dataset shows that Engineered High Ground flood defences are present along the River Welland approximately 90m south of the site. This asset is maintained by the EA and a private individual/company.
Potential defences	There are no other potential defences in or near the site.
Residual risk	There are no residual risks to the site, as detailed modelling suggests the site is not at risk of fluvial flooding in the undefended scenario.

Emergency planning

Flood warning	The site has not been identified to be located within an EA Flood Warning or Flood Alert Area.
Access and egress	Access and egress will be affected during all surface water events, most significantly during the 1% AEP plus central and upper climate change events and the 0.1% AEP event. Flood depths along the A4304 significantly exceed 300mm, therefore preventing safe access and egress. Developers will need to demonstrate safe access and egress in the 1% AEP surface water event including an allowance for climate change (the design event). It should be noted that raising of access routes must not impede surface water flow paths or lead to an increased risk elsewhere. Access and egress should therefore be assessed in a site-specific assessment with consideration to the development of a Flood Response Plan and/or Flood Warning and Evacuation Plan.

Requirements for drainage control and impact mitigation

Broad-scale assessment of possible SuDS	**Geology and Soils** The geology consists of: • Bedrock geology of mudstone, siltstone, limestone and sandstone. • There are no superficial deposits identified within the BGS mapping at the proposed development site. The soils on site are shown to be loamy and clayey floodplain soils with naturally high groundwater. This suggests that infiltration is unlikely to be a viable means of surface water disposal. **SuDS** • JBA Groundwater mapping suggests the site is predominantly at 'low risk' of groundwater flooding during a 1% AEP flood event, with small areas to the south with levels between 0.5m and 5m below the ground surface, therefore infiltration may not always be appropriate. Offsite discharge may therefore be required to discharge surface water runoff during flood events. The infiltration potential of the site should be confirmed through infiltration testing, in line with BRE 365. • The site is located within a Nitrate Vulnerable Zone. Therefore, early engagement with the LLFA and the EA is recommended to determine requirements for the site to manage the impact to surrounding watercourses. Consideration of water quality is likely to be of high importance and demonstrated through the use of the Simple Index Approach. • The site has not been identified to be located within a historic landfill site or Source Protection Zone. • SuDS measures should follow the discharge hierarchy, and if it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner. • Due to the topography, any surface water not intercepted via infiltration will drain via gravity to the east of the eastern land parcel

	and to the south of the western land parcel. It is therefore recommended that the LLFA and the EA are consulted about viable discharge locations for surface water from the site and their attenuation potential.
Opportunities for wider sustainability benefits and integrated flood risk management	• Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity, helping meet requirements for the Nitrate Vulnerable Zone. This could provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. • The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. • SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual. • SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements. • Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered.

	Conveyance features should be located on common land or public open space to facilitate ease of access. • SuDS should be designed in line with Leicestershire County Council's SuDS Guidance.

NPPF and planning implications

Exception Test requirements **(Local Authority Considerations)**	The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied. The NPPF classifies the usage as "More Vulnerable", this type is taken into consideration for the Exception Test. The site, although entirely located within Flood Zone 1, is located within the 0.1% AEP surface water flooding extent. Providing the development is proposed outside of the areas at risk, the Exception Test is not required for this site. Whilst the Exception Test specifically applies to sites within fluvial/coastal Flood Zones, given the significant surface water risk on and surrounding the site, Harborough District Council should carefully weigh the benefits of development against the risk and satisfy themselves that residents will be safe for the lifetime of the development. Detailed surface water flood modelling should be undertaken during a site-specific FRA.
Requirements and guidance for site-specific Flood Risk Assessment **(Developer considerations)**	**Flood Risk Assessment:** The Level 1 SFRA has more guidance on this section and any relevant policies and information applicable to development within Harborough District Council. • A site specific flood risk assessment should be prepared for the site, supported by detailed surface water modelling, to demonstrate that site users will be safe for the lifetime of the development, development of the site will not increase risk elsewhere, and any residual risk can be safely managed. • Given the surface water risk to the site, a site drainage strategy should be prepared alongside the flood risk assessment.

	• Consultation with Harborough District Council, Leicestershire County Council, and the EA should be undertaken at an early stage. • Developers should consult with Anglian Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan. • Development plans should use the Level 1 SFRA for Harborough District Council, as well as the Local Flood Risk Management Strategies to identify cumulative flood risk issues. It should also promote an integrated approach to water management. **Guidance for site design and making development safe:** • The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG). • The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates do not exceed greenfield rates. • Development should be steered away from areas shown to be at risk of surface water flooding (the east of the site), following a sequential approach to design and locating development in the lowest risk parts of the site preferentially. • Arrangements for safe access and egress are unlikely to be possible and will need to be considered further within a site-specific FRA for the surface water events with an appropriate allowance for climate change, using the depth, velocity, and hazard outputs. A Flood Response Plan may also need to be produced following the site-specific assessment.

Key messages

The site and its surrounding area are shown to be at significant risk of surface water flooding, and careful consideration will need to be given to develop safely. Development may be able to progress if:

- A site-specific FRA, supported by detailed surface water modelling, is undertaken to assess the risk of surface water flooding in relation to the proposed development, and the access and egress arrangements. Developers will need to demonstrate safe access and egress in the 1% AEP + climate change surface water event. It should be noted that a Flood Response Plan is likely to be required be required due to the significant challenges to providing access and egress arrangements. This should be assessed within the FRA.
- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, including a site-specific Surface Water Drainage Strategy, and SuDS maintenance and management plan and supported by detailed modelling (as above), with development to be steered away from the areas identified to be at highest risk of surface water flooding within the site. This is to be in line with the sequential approach to site layout.
- There is early engagement with the LLFA and the EA on the proposed SuDS measures and infiltration rate to discuss requirements on the site meeting relevant conditions due to the sites location within a Nitrate Vulnerable Zone.

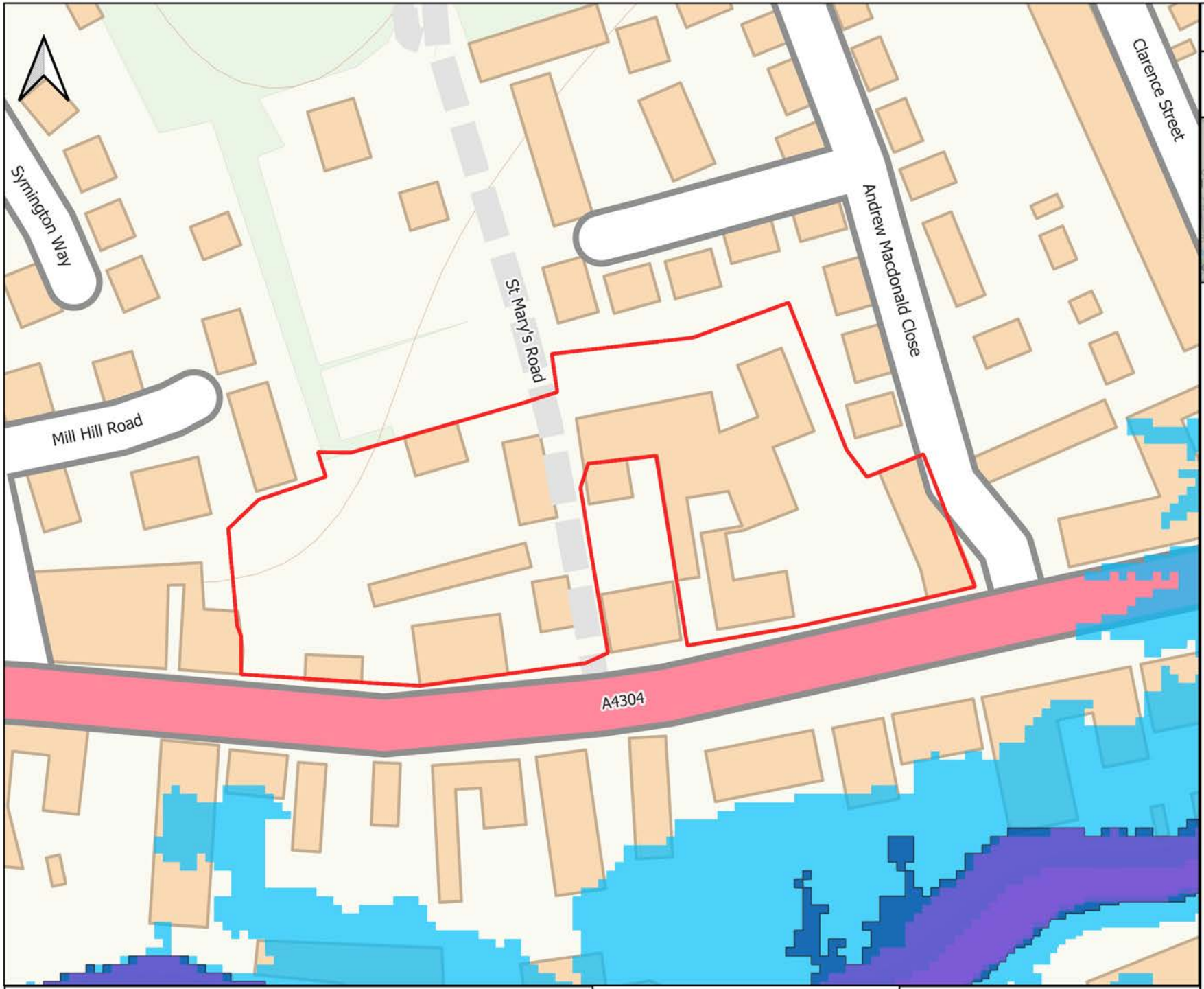
Mapping information

The key datasets used to make planning recommendations for this site were the EA's Flood Map for Planning and the EA's Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

Flood Zones	Flood Zones 2 and 3 have been taken from the EA's Flood Map for Planning mapping.
Climate change	The latest climate change allowances (updated May 2022) have been applied to the EA's RoFSW dataset.
Surface water	The EA's Risk of Flooding from Surface Water (RoFSW) map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	The EA's Risk of Flooding from Surface Water (RoFSW) has been used to define areas at risk from surface water flooding.

Level 2 Flood Zone Mapping

Harborough District Council Level 1 Strategic Flood Risk Assessment



Legend

10240

Flood Zones

- Flood Zone 2
- Flood Zone 3a
- Flood Zone 3b

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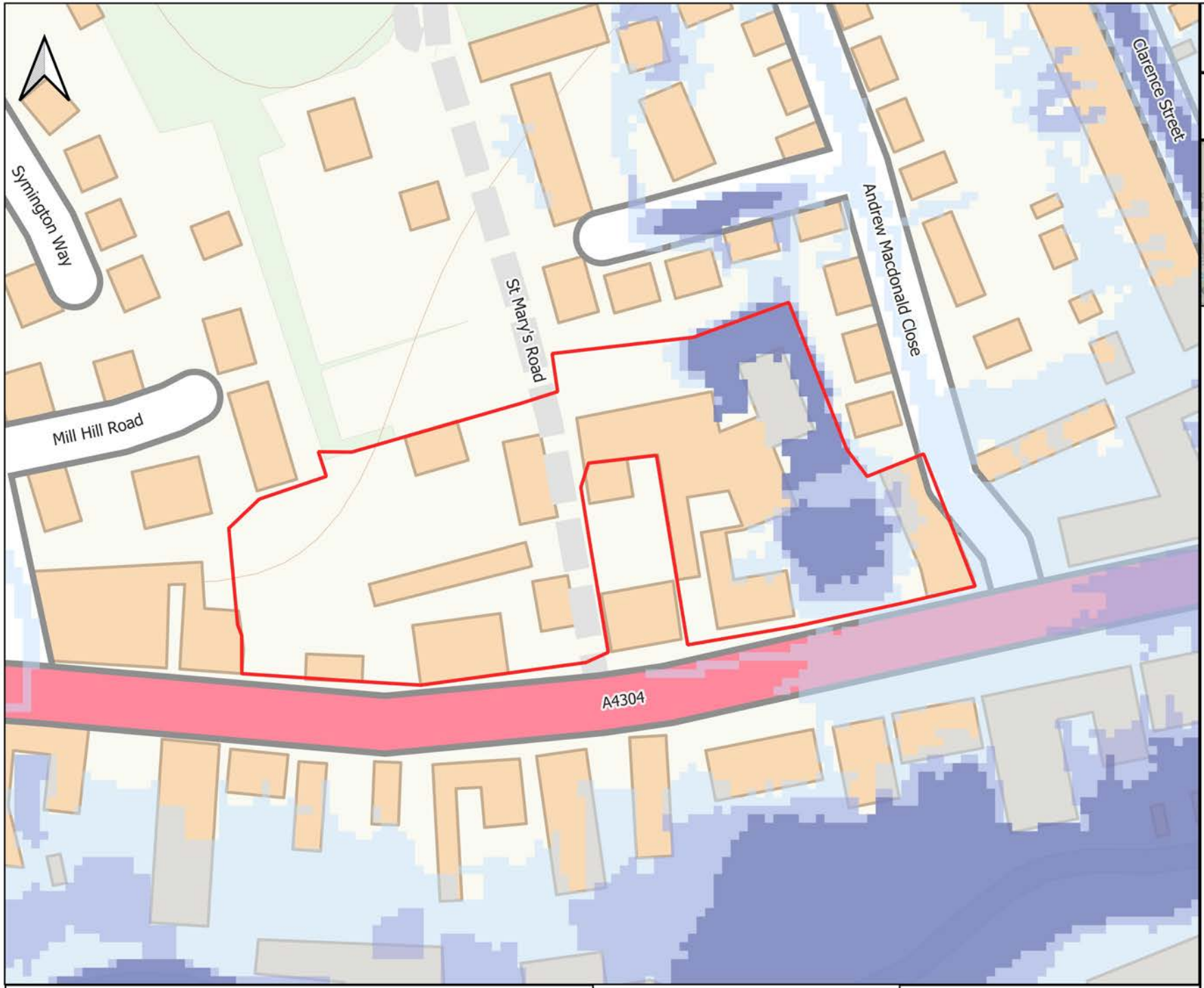

Level 2 Surface Water Flood Risk

Harborough District Council
Level 1 Strategic Flood Risk Assessment

Legend

10240

Risk of Flooding from Surface Water

- 3.3% AEP
- 1% AEP
- 0.1% AEP

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