


Bassetlaw Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables	
Site details	
Site Code	HS3
Address	Land off Radford St, Worksop S80 2NE. Grid Reference: SK 59330 78305
Area	3.59ha
Current land use	Greenfield
Proposed land use	Residential
Sources of flood risk	
Location of the site within the catchment	The site is within the catchment of the River Ryton. The River Ryton is an Environment Agency designated main river and flows in an easterly direction through Worksop towards its confluence with the River Idle.
Existing drainage features	The site is located 550m south of the River Ryton. The Chesterfield Canal is located 650m north of the site.
Fluvial	<p>The proportion of site at risk:</p> <p>FZ3b – 0% FZ3a – 0% FZ2 – 0% FZ1 – 100%</p> <p><i>The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).</i></p> <p>Available data: The Environment Agency’s Flood Zone mapping and detailed modelling undertaken in 2009 has been used in this assessment. The River Ryton Flood Zones through Worksop are based on a 1D only model undertaken in 2008 so depths are not available. We understand that the Environment Agency is currently updating this modelling. Modelling of the 1% AEP and 1% plus climate change scenarios was undertaken as part of the Level 1 SFRA in 2009. These outputs have been used to understand the risk of flooding during this scenario.</p> <p>Flood characteristics: The site is not at risk of fluvial flooding from the River Ryton.</p>
Coastal and Tidal	The site is not at risk of coastal or tidal flooding.
Surface Water	<p>Proportion of site at risk (RoFfSW):</p> <p>3.3% AEP – 0% Max depth 0m, Max velocity 0m/s 1% AEP – 1% Max depth <0.15m Max velocity 0.5-1m/s 0.1% AEP – 1% Max depth 0.15-0.3m Max velocity 0.5-1m</p>

	<p><i>The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP extent includes the 3.3 % AEP extent)</i></p> <p>Description of surface water flow paths:</p> <p>Surface water flooding on the site is minimal and only affects a small proportion of the site.</p> <p>The site is not at risk of flooding in the 3.3% AEP event.</p> <p>In the 1% AEP event, a small area of surface water ponding is present in the east of the site. Flood depths are shallow and are less than 0.15m. This area has a flood hazard rating of 'caution'.</p> <p>In the 0.1% AEP event, the extent of surface water flooding is marginally increased from the 1% AEP event. Flood depths remain below 0.3m and have a flood hazard rating of 'Caution.'</p>
Reservoir	The site is not shown to be at risk of reservoir flooding from the available online maps.
Canals	The site is a significant distance from the Chesterfield Canal and would be unlikely to be affected if the canal was to breach.
Groundwater	<p>The Environment Agency Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows an area's susceptibility to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> The majority of the site has a >25% - <50% susceptibility to groundwater flood emergence from superficial deposits. <p>This assessment does not negate the requirement that an appropriate groundwater regime assessment should be carried out at the site-specific FRA stage.</p>
Sewers	The Level 1 SFRA indicates that six incidences of sewer flooding have occurred in the S80 2 postcode area.
Flood history	The Environment Agency's historic flooding map does not hold a record of flooding at the site. NCC has two records of flooding within 100m of the site. The source of flooding is unknown.
Flood risk management infrastructure	
Defences	This site is not protected by any formal flood defences.
Residual risk	There is no residual risk to the site from flood risk management structures.
Emergency planning	
Flood warning	The site is not located in an Environment Agency flood warning or flood alert area.
Access and egress	<p>Access to the site is available from an unnamed access road from Radford Street, where an access road leads up to the main building.</p> <p>Access to the site will not be restricted by fluvial or surface water flooding.</p>
Climate change	
Implications for the site	<p>Detailed modelling from the 2009 Level 1 SFRA was available for the River Ryton for the 1% plus 30% climate change scenario. The site is not at risk of flooding during this scenario.</p> <p>Surface water flooding is unlikely to be significantly affected by climate change.</p>
Requirements for drainage control and impact mitigation	
Broad scale assessment of possible SuDS	<p>Geology & Soils</p> <ul style="list-style-type: none"> Geology at the site consists of: <ul style="list-style-type: none"> Bedrock- Chester Formation- Sandstone, Pebbly (Gravelly). Superficial- None recorded. Soils at the site consist of: <ul style="list-style-type: none"> Freely draining slightly acid sandy soils. <p>SuDS</p>

	<ul style="list-style-type: none"> The site is considered to have a low susceptibility to groundwater. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Groundwater monitoring is recommended to determine the seasonal variability of groundwater levels, as this may affect the design of the surface water drainage system. Below ground development such as basements may not be appropriate at this site. BGS data indicates that the underlying geology is Sandstone which is likely to be free draining. This should be confirmed through infiltration testing, with the use of infiltration maximised as much as possible in accordance with the SuDS hierarchy. The entire site is mostly located within Groundwater Source Protection Zone 1 (SPZ) and infiltration techniques may not be appropriate for anything other than clean roof drainage. If infiltration is proposed for anything other than clean roof drainage a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints. The site is not located within a historic landfill site. Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques. The Risk of Flooding from Surface Water (RoFSW) mapping indicates the presence of surface water flow paths during the 1 and 0.1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space. 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.
<p>Opportunities for wider sustainability benefits and integrated flood risk management</p>	<ul style="list-style-type: none"> Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. 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. Development at this site should not increase flood risk either on or off site. 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.
<p>NPPF and planning implications</p>	
<p>Exception Test requirements</p>	<p>The Local Authority will need to confirm that the sequential test has been carried out.</p> <p>No part of the site is within the national Flood Zones that show river flooding in the Borough therefore the Exception Test would not be required.</p>
<p>Requirements and guidance for site-specific Flood Risk Assessment</p>	<p>Flood Risk Assessment:</p> <ul style="list-style-type: none"> A site-specific Flood Risk Assessment will be required at the planning application stage as the development is more than 1ha in size. All flooding sources should be considered part of a site-specific flood risk assessment. The site-specific FRA should be carried out according to the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Bassetlaw Council's Local Plan policies, and the Nottinghamshire County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> As part of the site-specific FRA, surface water flooding risk should be quantified, including a detailed surface water flooding model and the existing drainage system using topographical and asset survey data. To further determine the site's risk and ensure that runoff from the development is not increased by development across any surface water flow routes, a drainage strategy should help inform site layout and design to ensure no increase in runoff beyond current rates. Surface water mitigation measures should be designed for the 1% plus climate change event. Areas at risk from surface water flooding should ideally be integrated into green infrastructure, which presents wider opportunities to improve biodiversity and amenity and climate change adaptation. An integrated flood risk management and sustainable drainage scheme for the site is advised. A detailed surface water flooding model using the existing drainage system, topographical and asset survey must be constructed at the FRA stage. This will determine the risk from surface water flooding further and ensure that overland flows do not overwhelm future sustainable drainage features.

	<ul style="list-style-type: none"> • New developments should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. This should include allowance for climate change. • Surface water should be attenuated at the Greenfield rate. • Developers should refer to Nottinghamshire County Council's 'Nottinghamshire County Council's Guidance Note on the Validation Requirements for Planning Applications' and the Level 1 SFRA for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to respond to planning applications.
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Key messages

The site is located entirely within Flood Zone 1 and therefore the Exception test need not be applied.

The development is likely to be able to proceed if:

- A site specific FRA, including a detailed model of surface water flooding and the existing drainage system using topographical and asset survey, is undertaken to further determine the risk from surface water to the site and ensure surface water flows do not overwhelm any planned SuDS features.
- Space for surface water to be stored on the site is provided, and rainwater harvesting should be considered. Given the degree of surface water flood risk and the location of the surface water flow path crossing the site, the density of the development may need to be lowered to make space for water.
- New developments should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. This should include allowance for climate change.

Mapping Information

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

Flood Zones	The Environment Agency's Flood Zone mapping has been used in this assessment. The River Ryton Flood Zones through Worksop are based on a 1D only model so depths are not available.
Climate change	Climate change modelling outputs were not available for this site. Climate change has been assessed using Flood Zone 2 as a proxy for Fluvial flooding and the 0.1% AEP event as a proxy for surface water flooding.
Fluvial depth, velocity and hazard mapping	Results from this assessment are based on 1D modelling undertaken by the Environment Agency in 2008.
Surface Water	The Risk of Flooding from Surface Water map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	The surface water depth and hazard mapping for the 1 in 0.1% AEP event is taken from the Environment Agency's Risk of Flooding from Surface Water mapping.