

**Bassetlaw Level 2  
Strategic Flood  
Risk Assessment  
Detailed Site  
Summary Tables**



**Site details**

<b>Site Code</b>	<b>SEM01</b>
<b>Address</b>	Land to the east of Mantonwood Business Park, A57, Clumber and Hardwick, S80 3AX. Grid Reference: SK 63495 78185
<b>Area</b>	188.7ha
<b>Current land use</b>	Greenfield
<b>Proposed land use</b>	Employment

**Sources of flood risk**

<b>Location of the site within the catchment</b>	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.
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<b>Existing drainage features</b>	The site is located 1.5km south of the River Ryton. The Chesterfield Canal is located 1.3m north of the site. No other watercourses are situated near the site.
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<b>Fluvial</b>	<p><b>The proportion of site at risk:</b>  <b>FZ3b – 0%</b>  <b>FZ3a – 0%</b>  <b>FZ2 – 0%</b>  <b>FZ1 – 100%</b></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><b>Available data:</b>  The Environment Agency’s Flood Zone mapping has been used in this assessment. This is based on 2D generalised modelling data.</p> <p><b>Flood characteristics:</b>  The site is not at risk of fluvial flooding from the River Ryton.</p>
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<b>Coastal and Tidal</b>	The site is not at risk of coastal or tidal flooding.
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<b>Surface Water</b>	<p><b>Proportion of site at risk (RoFfSW):</b>  <b>3.3% AEP – 1%</b>  Max depth 0.6-0.9m,  Max velocity 0.25-0.5m/s  <b>1% AEP – 1%</b>  Max depth 0.9-1.2m  Max velocity 0.25-0.5m/s  <b>0.1% AEP – 2%</b>  Max depth 0.9-1.2m  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. 100-year includes the 30-year %)</i></p> <p><b>Description of surface water flow paths:</b>  In the 3.3% AEP flood event, several small areas of surface water ponding are present around the site in topographic low points. These areas of ponding are predominantly shallow and are primarily</p>
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	<p>below 0.3m. Small parts of the ponding areas are deeper and range between 0.3-0.6m. The surface water ponding areas have a flood hazard rating of 'caution' to 'dangerous for some'. A larger ponding area in the north of the site has a higher flood hazard rating of 'caution' to 'dangerous for most'.</p> <p>In the 1% AEP flood event, the surface water ponding areas' extent is marginally increased. As in the 3.3% AEP flood event, surface water flooding is predominantly shallow, with some small parts of the ponding areas reaching depths of up to 1.2m. The surface water ponding areas on the site have a flood hazard rating of 'caution' to 'dangerous for most'.</p>
<b>Reservoir</b>	The site is not shown to be at risk of reservoir flooding from the available online maps.
<b>Canals</b>	The site is a significant distance from the Chesterfield Canal and would be unlikely to be affected if the canal was to breach.
<b>Groundwater</b>	<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"> <li>• The north western part of the site has a &lt;25% susceptibility to groundwater flood emergence from superficial deposits.</li> <li>• No data is available for the rest of the site.</li> </ul> <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>
<b>Sewers</b>	The Level 1 SFRA indicates no incidences of sewer flooding have occurred in the S80 3 postcode area.
<b>Flood history</b>	The Environment Agency's historic flooding map does not hold a record of flooding at the site. NCC has three records of flooding within 100m of the site. The source of flooding is unknown.
<b>Flood risk management infrastructure</b>	
<b>Defences</b>	This site is not protected by any formal flood defences.
<b>Residual risk</b>	There is no residual risk to the site from flood risk management structures.
<b>Emergency planning</b>	
<b>Flood warning</b>	The site is not located in an Environment Agency flood warning or flood alert area.
<b>Access and egress</b>	It is presumed that the site would be accessed from the A57 to the south of the site. Access to the site will not be restricted by fluvial or surface water flooding.
<b>Climate change</b>	
<b>Implications for the site</b>	<p>No detailed modelling was available for the River Ryton. As such, Flood Zone 2 has been used as a proxy, as the upper-end climate change allowance extent is usually in a similar order of magnitude to Flood Zone 2. As noted above, the site is not located in Flood Zone 2; therefore, it is unlikely to be affected by climate change.</p> <p>Surface water flooding is unlikely to be significantly affected by climate change.</p>
<b>Requirements for drainage control and impact mitigation</b>	
<b>Broad-scale assessment of possible SuDS</b>	<p><b>Geology &amp; Soils</b></p> <ul style="list-style-type: none"> <li>• Geology at the site consists of: <ul style="list-style-type: none"> <li>○ Bedrock- Chester Formation- Sandstone, Pebbly (Gravelly).</li> <li>○ Superficial- Glaciofluvial deposits, mid-Pleistocene- Sand and Gravel</li> </ul> </li> <li>• Soils at the site consist of: <ul style="list-style-type: none"> <li>○ Freely draining slightly acid sandy soils.</li> </ul> </li> </ul> <p><b>SuDS</b></p> <ul style="list-style-type: none"> <li>• The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</li> </ul>

	<ul style="list-style-type: none"> <li>• 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.</li> <li>• The entire site is mostly located within Groundwater Source Protection Zone 1 (SPZ) and infiltration techniques may not 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.</li> <li>• The site is not located within a historic landfill site.</li> <li>• 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.</li> <li>• The Risk of Flooding from Surface Water (RoFSW) mapping indicates the presence of surface water flow paths during the 3, 1 and 0.1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.</li> <li>• 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.</li> </ul>
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<p><b>Opportunities for wider sustainability benefits and integrated flood risk management</b></p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>
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**NPPF and planning implications**

<p><b>Exception Test requirements</b></p>	<p>The Local Authority will need to confirm that the sequential test has been carried out. The Sequential Test will need to be passed before the Exception Test is applied.</p> <p>Employment development is classified as 'Less Vulnerable'. 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>
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<p><b>Requirements and guidance for site-specific Flood Risk Assessment</b></p>	<p><b>Flood Risk Assessment:</b></p> <ul style="list-style-type: none"> <li>• A site-specific Flood Risk Assessment will be required at the planning application stage as the development is more than 1ha in size.</li> <li>• All flooding sources should be considered part of a site-specific flood risk assessment.</li> <li>• 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.</li> </ul> <p><b>Guidance for site design and making development safe:</b></p> <ul style="list-style-type: none"> <li>• Any proposal should be accompanied by an overall Surface Water Management Masterplan and Strategy (SWMMS) which should cover: <ul style="list-style-type: none"> <li>○ How the cumulative effects of potential peak rates and volumes of water from development sites would impact on peak flows, duration of flooding and timing of flood peaks on receiving watercourses. This should be used to develop and implement appropriate drainage sub catchments and specific runoff rate and volume requirements for each phase of the development.</li> <li>○ The risk of flooding from all sources, including for rainfall events greater than the design standard of the surface water drainage system should be taken into account to ensure there is no flood risk to new properties and that exceedance flows in extreme events are safely routed around those properties.</li> <li>○ The consideration of how SuDS, natural flood management techniques, green infrastructure and green-blue corridors can be designed into the development master plan to facilitate drainage flood risk management and ensure wider benefits such as biodiversity, amenity, water quality and recreation are realised.</li> <li>○ Based on the above, a Drainage Phasing Plan should be developed, based on the SuDS train method (considering firstly how water can be infiltrated/stored at a plot</li> </ul> </li> </ul>
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	<p>level, then conveyed through the site and any regional storage needs at a settlement level).</p> <ul style="list-style-type: none"> <li>○ The provision of drainage during the building phase shall be based on the Drainage Phasing Plan to ensure adequate drainage is provided and implemented throughout the development life.</li> </ul> <p>The LLFA, Environment Agency and LPA should be consulted during the development of the Surface Water Management Masterplan and Strategy.</p> <ul style="list-style-type: none"> <li>• Surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to 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.</li> <li>• 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 further determine the risk from surface water flooding and ensure that overland flows do not overwhelm future sustainable drainage features.</li> <li>• The site should discharge surface water at the greenfield runoff rate.</li> <li>• 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 guidance on the information required by the LLFA from applicants to enable it to respond to planning applications.</li> </ul>
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## Key messages

The development is likely to be able to proceed if:

- Development is located outside of areas at risk of flooding.
- Space for surface water to be stored on the site is provided, and rainwater harvesting should be considered.
- It is ensured that surface water is discharged at the pre-development greenfield rate.

## 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.

<b>Flood Zones</b>	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.
<b>Climate change</b>	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.
<b>Fluvial depth, velocity and hazard mapping</b>	Results from this assessment are based on 1D modelling undertaken by the Environment Agency in 2008. Flood depth, velocity and hazard outputs were not available for this model.
<b>Surface Water</b>	The Risk of Flooding from Surface Water map has been used to define areas at risk from surface water flooding.
<b>Surface water depth, velocity and hazard mapping</b>	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.