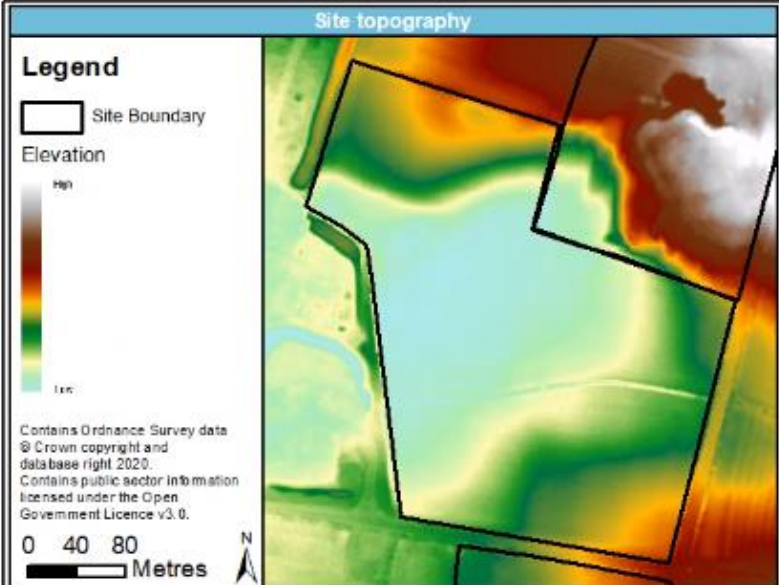


Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441			
	Address	Land North of Barkby Road			
	Area	8.33ha			
	Current land use	Greenfield			
	Proposed land use	Residential			
Sources of flood risk	Topography	 <p>The site generally slopes from northeast to south west with a large topographic depression in the centre of the site. The corners of the site boundary are on higher ground. There is an area of higher ground beyond the north east corner. The area of depression also extends south west from the centre of the site.</p>			
	Existing drainage features	There are no existing drainage features at the site; however, shortly downstream of the site a watercourse is shown, either to be here or is an outlet from a culvert to the south. This then feeds into the Barkby Brook.			
	Fluvial	Proportion of site at risk			
		FZ3b	FZ3a	FZ2	FZ1
0%		0%	0%	100%	
Highest zone of risk (Risk of Flooding from Rivers and Sea)					
N/A					
<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>					

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441		
	Address	Land North of Barkby Road		
	Area	8.33ha		
	Current land use	Greenfield		
	Proposed land use	Residential		
		<p>Available data: The site is covered the Environment Agency's Flood Map for Planning, which uses 2D generalised modelling data. There are no Flood Zones located at this site.</p> <p>Flood characteristics: The site is located within Flood Zone 1 and is therefore at a negligible risk of fluvial flooding. The site is at risk of surface water flooding.</p>		
	Surface Water	Proportion of site at risk (RoFSW)		
		30-year	100-year	1,000-year
		13%	19%	31%
		Max depths (m)		
		0.3-0.6	0.6-0.9	0.9-1.2
		Max velocity (m/s)		
		1-2	1-2	1-2
		<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>Description of surface water flow paths: There are significant surface water flows bisecting the centre of the site for all events. These extend from the eastern boundary to the western boundary. In all surface water events, surface water ponds in the large topographic depression in the middle of the site, against the higher ground along the western boundary, extending in size from the 30-year to the 1,000-year. This bisects the site's northern and south-eastern areas. Depths increase with return period and are quite high in the area of ponding.</p> <p>RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.</p>		

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441		
	Address	Land North of Barkby Road		
	Area	8.33ha		
	Current land use	Greenfield		
	Proposed land use	Residential		
	Groundwater	<p>The Areas Susceptible to Groundwater Flooding dataset shows the site is located within a 1 km grid square where $\geq 50\%$ to $< 75\%$ of the area is predicted to be at risk of groundwater flooding.</p> <p>The AStGWF data should be used only in combination with other information, for example local data or historical data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist. Ground investigations may be required at the site.</p>		
	Reservoir	The site is not shown to be at risk of reservoir flooding from the available online maps.		
	Flood history	<p>There are no records of historic flooding at this site from the Environment Agency.</p> <p>Leicestershire County Council may hold additional records which are not available at this time. These records detail historical flood incidents from all sources, whereas the Environment Agency dataset only records incidents of fluvial, tidal or coastal flooding. The Lead Local Flood Authority should be contacted to obtain further details.</p>		
Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition
		N/A	N/A	N/A
	This site is not protected by any formal flood defences.			
	Residual risk	The site is not at a residual risk of flooding.		
Emergency planning	Flood warning	The site is not situated within an Environment Agency Flood Warning or Flood Alert area.		
	Access and egress	<p>Dry safe access and egress could be available for the site during all fluvial events and surface water events via Barkby Road and Queniborough Road for the south-eastern portion of the site. Access and egress needs to be considered for the northern portion of the site, north of the surface water ponding. There may be access from the housing estate to the west, or via site PSH70 if this is possible.</p> <p>The depths, velocities, hazards, durations and speeds of onset of surface water and fluvial flooding along access/ egress routes should be investigated further in a site-specific assessment, to confirm whether access for emergency vehicles could still be obtained.</p>		

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441
	Address	Land North of Barkby Road
	Area	8.33ha
	Current land use	Greenfield
	Proposed land use	Residential
Climate Change	Implications for the site	<ul style="list-style-type: none"> Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding. Climate change also needs to be considered for surface water events; at the site-specific stage, the 100-year +40% event is considered as part of surface water drainage strategies, or surface water modelling. The current day 1,000-year surface water extent provides an indication of the likely increase in extent of the more frequent events. This would require a detailed FRA to assess the site layout and design. Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.
Requirements for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of mudstone, siltstone and sandstone.
	Superficial Geology	The site is underlain with River Terrace Deposits (undifferentiated) consisting of sand and gravel.
	Soils	The north of the site has slightly acid loamy and clayey soils with impeded drainage whilst the south has loamy and clayey floodplain soils with naturally high groundwater.
	Source Protection Zone	The site is not located within any Environment Agency designated Source Protection Zone.
	Historic Landfill Site	The site is not designated by the Environment Agency as previously being a landfill site.

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441
	Address	Land North of Barkby Road
	Area	8.33ha
	Current land use	Greenfield
	Proposed land use	Residential
	Broad scale assessment of possible SuDS	<p>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.</p> <p>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> <p>Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints.</p> <p>The following techniques are considered suitable for the site:</p> <ul style="list-style-type: none"> • Most source control techniques are likely to be suitable. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater. • Infiltration may be suitable. Mapping suggests a medium risk of groundwater flooding and underlying soils may be permeable. Further site investigation should be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in areas where the depth to the water table is <1m. • Mapping suggests that the site slopes are suitable for all forms of detention. A liner maybe required to prevent the egress of groundwater. • All filtration techniques are likely to be suitable. A liner maybe required to prevent the egress of groundwater. • All forms of conveyance are likely to be suitable. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the egress of groundwater.

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441
	Address	Land North of Barkby Road
	Area	8.33ha
	Current land use	Greenfield
	Proposed land use	Residential
NPPF and planning implications	Exception Test requirements	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception Test is not required as the site is not within Flood Zone 2 or 3 but a Flood Risk Assessment is still required, along with consideration of access and safety given the large amount of surface water ponding. See below for further details on requirements for a Flood Risk Assessment and surface water issues to be considered.</p>

Requirements and guidance for site-specific Flood Risk Assessment

Flood Risk Assessment:

- At the planning application stage, a site-specific Flood Risk Assessment will be required for this site as development may be subject to sources of flooding and the development may introduce a more vulnerable use. It will also be required where development sites:
 - contain land which has been identified by the Environment Agency as having critical drainage problems; or
 - contain land identified in the strategic flood risk assessment as being at increased flood risk in future.
- Other sources of flooding must be considered as part of any site-specific Flood Risk Assessment, including surface water and groundwater.
- Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development.
- Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these.
- Any FRA should be carried out in line with the National Planning Policy Framework, Flood Risk and Coastal Change Planning Practice Guidance, Charnwood Council's Local Plan policies and the LLFA's SuDS guidance.
- Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.
- The development should be designed using a sequential approach. Development should be steered away from areas of fluvial flood risk and surface water flow routes, preserving these spaces as green infrastructure. Development must be in line with Table 3: flood risk vulnerability and flood zone compatibility of the NPPG.

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).
- Safe access and egress will need to be demonstrated in the 1 in 100-year plus climate change fluvial and rainfall events, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.
- Resilience measures will be required if buildings are situated in the flood risk area. Raising Finished Floor Levels above the design event may remove the need for resilience measures.
- The risk from 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 placing development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond the current greenfield rates.

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441
	Address	Land North of Barkby Road
	Area	8.33ha
	Current land use	Greenfield
	Proposed land use	Residential
		<ul style="list-style-type: none"> On site attenuation schemes would need to be tested against the watercourse to ensure flows are not exacerbated downstream within the catchment. New or re-development should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. Assessment for runoff should include allowance for climate change effects. New development must seek opportunities to reduce overall level of flood risk at the site, for example by: <ul style="list-style-type: none"> Reducing volume and rate of runoff Relocating development to zones with lower flood risk Creating space for flooding. All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using areas of high fluvial or surface water flood risk as public open space. Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.
Key messages		<p>The flood risk element of the Exception Test is likely to be passed if:</p> <ul style="list-style-type: none"> Development is limited to the 69% of the site outside of the Risk of Flooding from Surface Water zones and therefore should be steered towards the northern and eastern side of the site. If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another). Space for green infrastructure should be considered in the areas of highest flood risk. Access and egress needs to be considered for the northern portion of the site, north of the surface water ponding. There may be access from the housing estate to the west, or via site PSH70 if this is possible. <p>Refer to the 'detailed guidance for developers' section (above) for further information on the measures that are appropriate for this site.</p>

Charnwood Borough Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PSH441
	Address	Land North of Barkby Road
	Area	8.33ha
	Current land use	Greenfield
	Proposed land use	Residential
Mapping Information		
<p>The key datasets used to make planning recommendations regarding this site was the Environment Agency's Risk of Flooding from Surface Water mapping. More details regarding data used for this assessment can be found below.</p>		
Flood Zones	There is no Flood Zone data available at the site as there are no watercourses in proximity of the site.	
Climate change	Climate change was based on the 1,000-year surface water flood extent to serve as an indication of possible extents associated with the unmodelled watercourse which flows through the centre of the site.	
Fluvial depth, velocity and hazard mapping	There is no risk at the site although this should be explored further at site-specific stage.	
Surface Water	The Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding.	
Surface water depth, velocity and hazard mapping	The surface water depth, velocity and hazard mapping for the 1 in 30-year (high risk), 1 in 100-year (medium risk) and 1 in 1,000-year (low risk) events is taken from the Environment Agency's Risk of Flooding from Surface Water mapping.	