

### L16 - Grange Farm

<b>OSNGR:</b>	435670,284381	Area: 4.0ha		Greenfield	
<b>Flood Zone Coverage:</b>	<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>	
	0%	0%	0%	0%	

#### Sources of flood risk:

Fluvial flood risk to the site is negligible; the unnamed watercourse flowing through the site is shown to stay within bank. However, the pond upstream of the canal may act to store and attenuate water before reaching the site. If the capacity of the pond were to change (by silting, for example) then the amount of water it could attenuate may be reduced and flood risk to the site could increase. Surface water poses a larger flood risk to the site, particularly in the west of the site around the watercourse before it flows under the M6. There is also residual risk of flooding from the Coventry Canal.

#### Exception Test Required?

No. The site is Flood Zone 1 with the watercourse remaining in bank.

#### NPPF Guidance:

- The majority of the site is shown to be located within Flood Zone 1. However, sites over 1 hectare will require a site-specific Flood Risk Assessment (FRA), in which the vulnerability to flooding from other sources should be considered.
- The potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off should be considered.
- Developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond, through the layout and form of the development and through appropriate sustainable drainage techniques.

#### Flood Zone Map



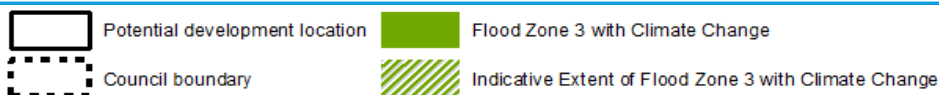
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	Potential development location		Flood Zone 3b		Flood Zone 3a
	Council boundary		Indicative Extent of Flood Zone 3b		Flood Zone 2

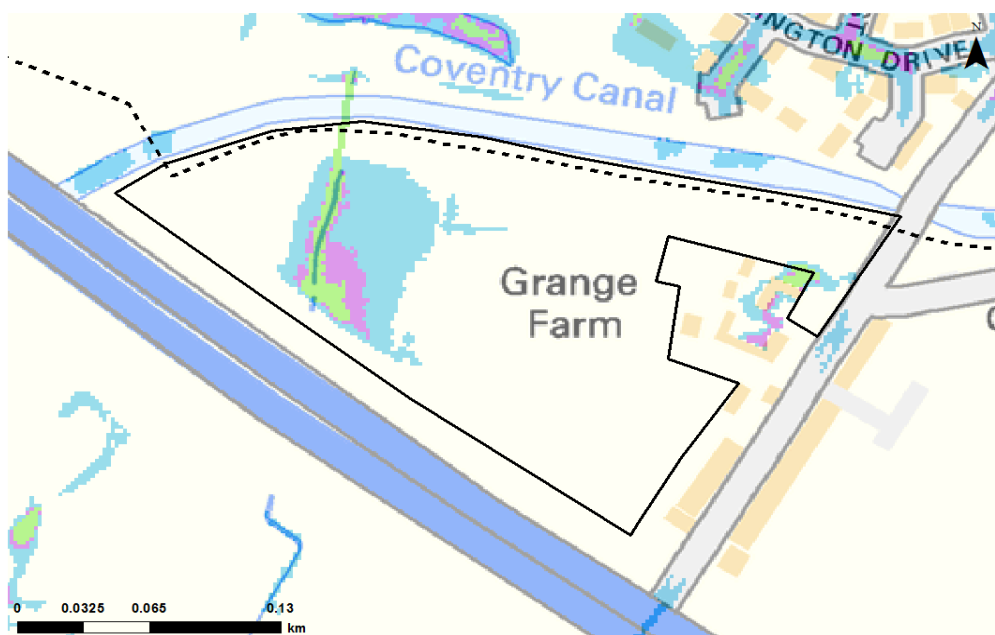
### Climate Change Map



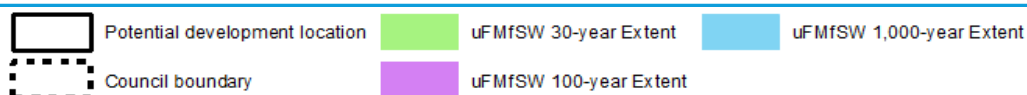
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### Surface Water Map



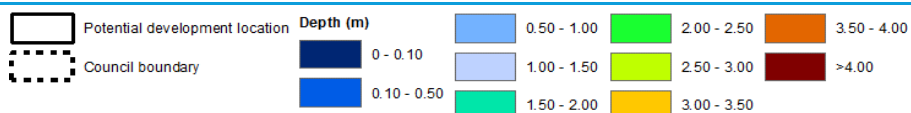
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### Depth Map - fluvial flooding (1 in 100-year event)



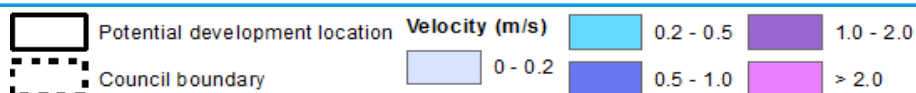
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### Velocity Map - fluvial flooding (1 in 100-year event)









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# Hazard Map - fluvial flooding (1 in 100-year event)



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	Potential development location	<b>Hazard Rating</b>	 Danger for some	 Danger for all
	Council boundary	 Very low hazard - caution	 Danger for most	

## SuDS & the development site:

SuDS Type	Suitability	Comments
Source Control		Most source control techniques are likely to be suitable. Permeable paving should use non-infiltrating systems due to the risk of groundwater flooding.
Infiltration		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.
Detention		This option may be feasible provided site slopes are < 5% at the location of the detention feature. A liner maybe required if there any ground contamination or groundwater issues.
Filtration		This feature is probably suitable provided site slopes are <5% and the depth to the water table is >1m. If the site has contaminated land or groundwater issues; a liner will be required.
Conveyance		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. If the site has groundwater contamination issues, a liner will be required.

- Residential developments / mixed use developments should provide at least two independent SuDS features in series to provide a suitable level of water quality treatment. Industrial developments should provide at least three independent SuDS features in series to provide a suitable level of water quality treatment.

- The site is not located in an area designated by the Environment Agency as a landfill site.
- The site is not located within any Environment Agency designated ground source protection zones.

#### **Flood Defences:**

There are no flood defences at this site.

#### **Flood Warning:**

There are currently no flood warning areas covering this site.

#### **Access & Egress:**

Primary access and egress to the potential development site is via Grange Road. This is shown to be largely unaffected by both surface water and fluvial flooding.

#### **Climate Change:**

- Increased storm intensities.
- Increased water levels in the unnamed watercourse and Coventry Canal.

#### **Flood Risk Implications for Development:**

- At the planning application stage, a site-specific FRA will be required for any development or re-development within the potential development site as detailed by the standing conditions in the LFRMS. Site-specific FRAs should be produced to current national and local standards and consider all sources of flood risk (including residual risk). Strategic documents such as the SWMP, PFRA and SFRA should be used as sources of information.
- New development must seek opportunities to reduce overall level of flood risk at the site, for example by:
  - o Reducing volume and rate of runoff
  - o Relocating development to zones with lower flood risk
  - o Creating space for flooding.
- A assessment of flood risk from the Coventry Canal should be conducted as part of site-specific FRA. This should include simulation of a canal breach to assess the impact to the potential development site.
- The detailed hydraulic model for the unnamed watercourse should be used to investigate the impact of the pond located upstream of the site on flood risk. Modelling assumptions based on available data at the time of the study may influence the volume of water retained within the pond and have a direct influence on flood risk within the potential development site. The hydraulic model should also be used to assess blockage to culverts inlets located within the site boundary and their impact on flood risk.
- No ordinary watercourse should be culverted unless there is an overriding need to do so and justification is provided in line with current Environment Agency policy. This is to ensure risk of blockage is minimal and the ecological status of watercourses are not degraded.
- No building, structure (whether temporary or permanent), or planting of vegetation within 5 metres of an ordinary watercourse, even if the watercourse is culverted.
- The peak flows on the unnamed tributary should be considered when reviewing drainage.
- Any designated features of significance to flood risk should be removed or altered without prior consent from the designated authority.
- No overland flow route or channel is to become obstructed without appropriate interception and diversion of flows (agreed in writing with the LLFA). This is to prevent damage to property.
- Resilience measures will be required if buildings are situated in the flood risk area.
- New or re-development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. These should be predominately open air SuDS techniques and will be assessed in accordance with National and Local standards and guidance as agreed by the LLFA. The LLFA and relevant stakeholders should be consulted at an early stage to ensure SuDS are implemented and designed to overcome site-specific constraints.

- Rainwater runoff from a drainage systems shall discharge to one of the following (listed in order of priority)
  - 1) an adequate soakaway or some other adequate infiltration system
  - 2) a watercourse
  - 3) surface water sewer.
- Surface water discharge to foul or combined systems will not be accepted.
- Flows and volumes should be restricted to the Greenfield QBar less 20% for any site using the most appropriate form of calculation agreed with the LLFA. This is required for both new and redeveloped sites.
- Assessment for runoff should include allowance for climate change effects.
- Green infrastructure should be considered as part of the mitigation measures for surface water runoff from potential development. Consideration should also be given to using Flood Zones 2 and 3 as public open space.
- It is important to ensure that any new connections to sewer systems or watercourses do not have a detrimental impact to third party lands downstream. Any connection should be approved with the consent from the relevant flood risk management authority.
- On-site attenuation schemes would need to be tested against the hydrographs of the unnamed watercourse to ensure flows are not exacerbated downstream within the catchment.
- All developments need to utilise water harvesting techniques to reduce the use of fresh water within a development and reduce the discharge volumes from the site. This must be implemented unless evidence can be provided that it is unsuitable.
- Groundwater levels should be considered when developing or redeveloping areas of potential development sites. Development should not cause or increase groundwater flood risk.
- If required an intrusive ground investigation report should be provided to establish depth and type of strata, including percolation results in accordance with BRE 365 as well as the presence and risk with migrant contaminants.
- Safe access and egress will need to be demonstrated.
- Consultation with the Local Authority and the Environment Agency should be undertaken at an early stage.