

EH3 - HERT2, Hertford, Mead Lane North

OSNGR: 533258,213225	Area: 4.19ha		Brownfield	
Flood Zone Coverage:	FZ3b 0.5%	FZ3a 8%	FZ2 27%	FZ1 64.5%

Proposed Development Details:

193 homes and employment land

Exception Test Required?

Yes, if "More Vulnerable" and "Essential Infrastructure" development is located in FZ3a and for "Highly Vulnerable" development located in FZ2.

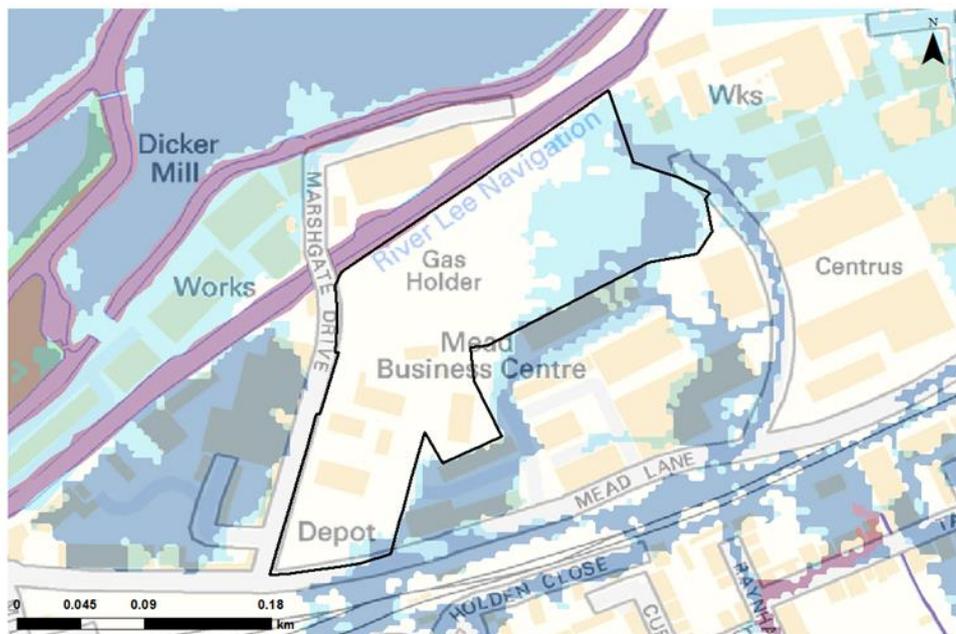
NPPF Guidance:

- For development proposals on sites comprising one hectare or above in Flood Zone 1 the vulnerability of flooding from other sources as well as from river flooding should be incorporated into a FRA.
- 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.

Sources of Flood Risk:

The site is bounded by the River Lee Navigation to the north. In addition, there are two drains situated to the south of the site; The Gulphs and Rowleys Road Drain. Fluvial flooding from these drains means almost 30% of the site is within Flood Zone 2 and a smaller proportion in Flood Zone 3; the areas affected being in the eastern corner of the site. Extensive surface water flooding is shown to occur in the eastern half of the site.

Flood Zone Map

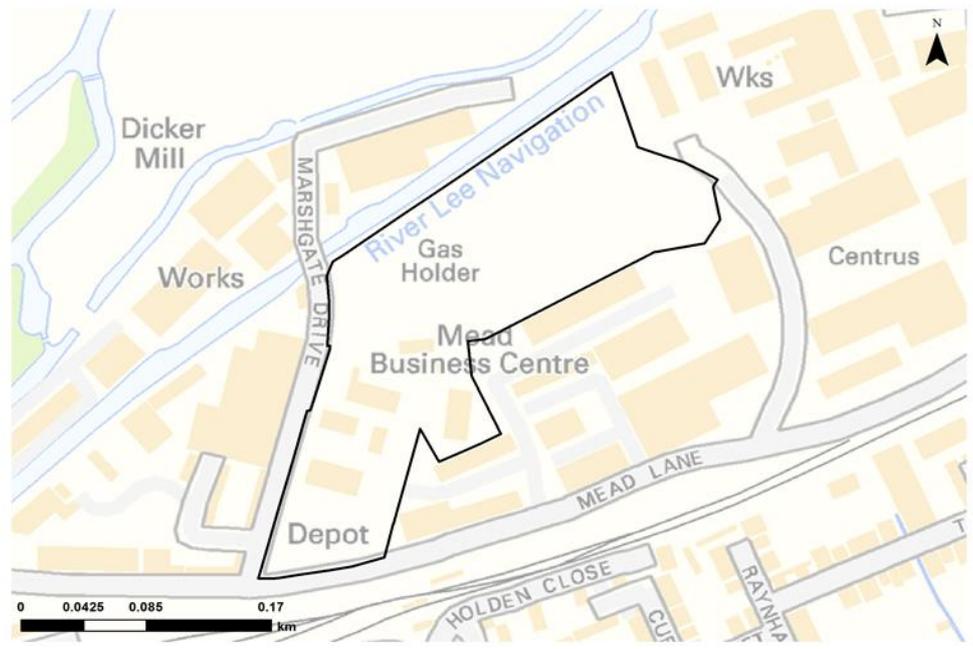


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The Flood Zone maps above are derived from the existing Environment Agency hydraulic model of the River Lee, using the 20-year extent as FZ3b, the 100-year extent as FZ3a, and the 1,000-year extent as FZ2.



Climate Change Map - to be updated when modelling completed

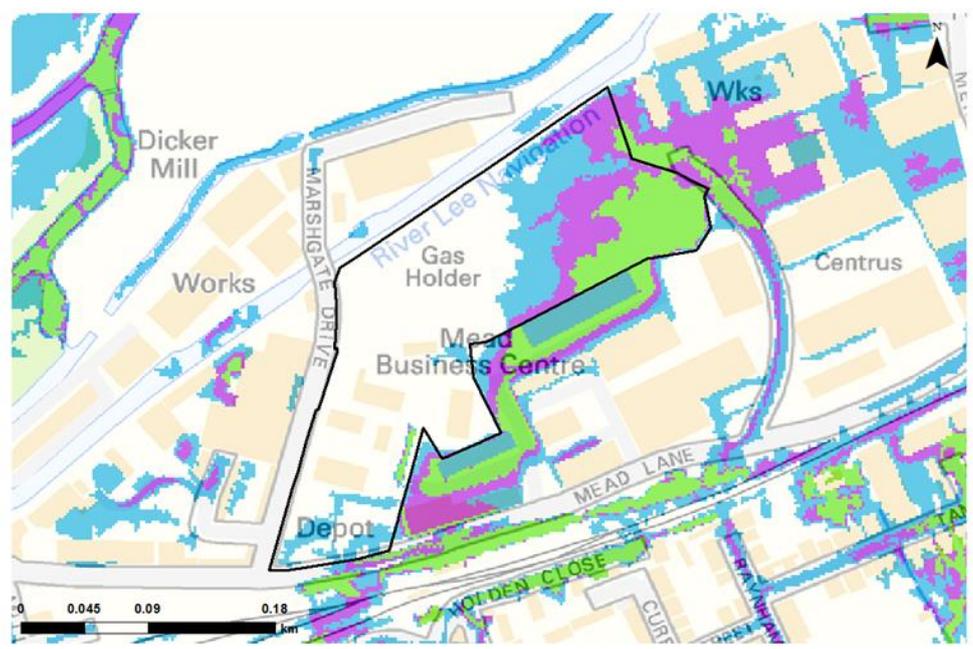


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Climate change was modelled for the 2080s epoch, applying the following climate change factors to the 100-year flow: 25%, 35% and 70%.
The map above shows the 100-year + 70% climate change scenario, therefore representing a 'worst case'.

- Potential Site Allocations
- Flood Zone 3 with Climate Change
- Council boundary

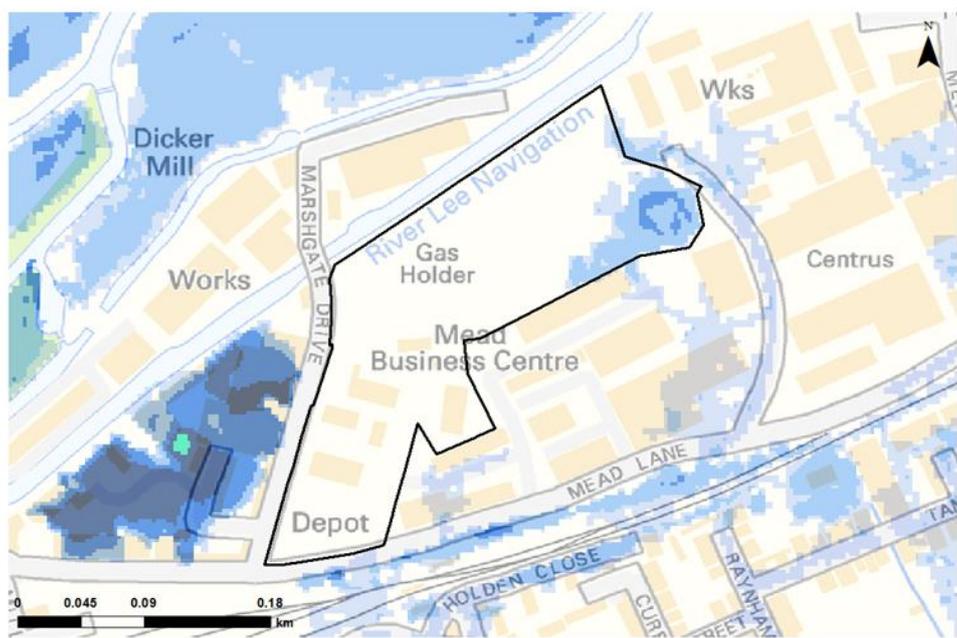
Surface Water Map



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- Potential Site Allocations
- uFMfSW* 30-year Extent
- uFMfSW* 1,000-year Extent
- uFMfSW* 100-year Extent
- Council boundary

Depth Map

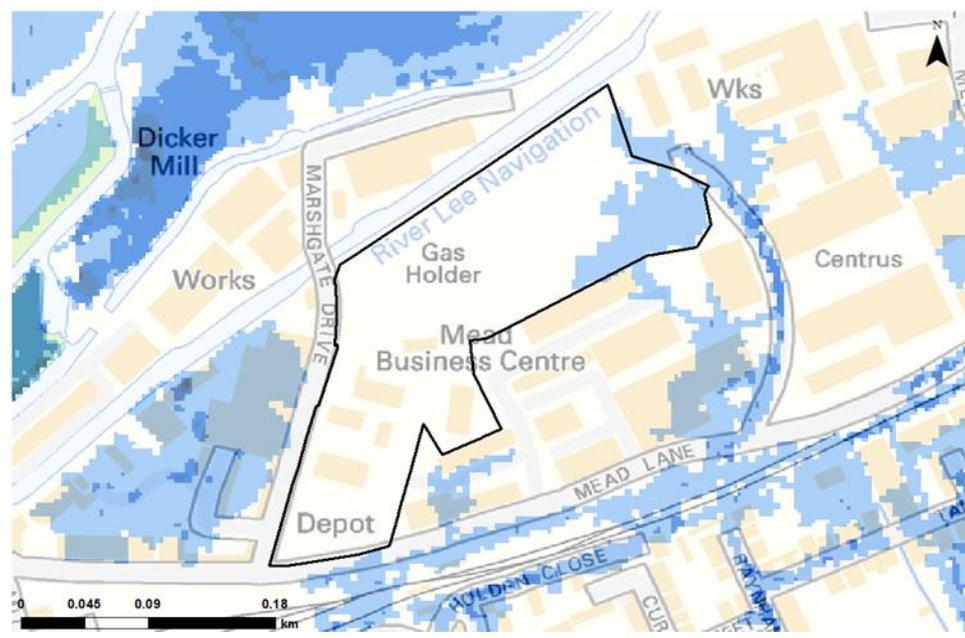


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This depth map is derived from the existing Environment Agency River Lee modelling and represents the 100-year event

Potential Site Allocations	Depth (m)	0.50 - 1.00	2.00 - 2.50	3.50 - 4.00
Council boundary	0 - 0.10	1.00 - 1.50	2.50 - 3.00	>4.00
	0.10 - 0.50	1.50 - 2.00	3.00 - 3.50	

Velocity Map

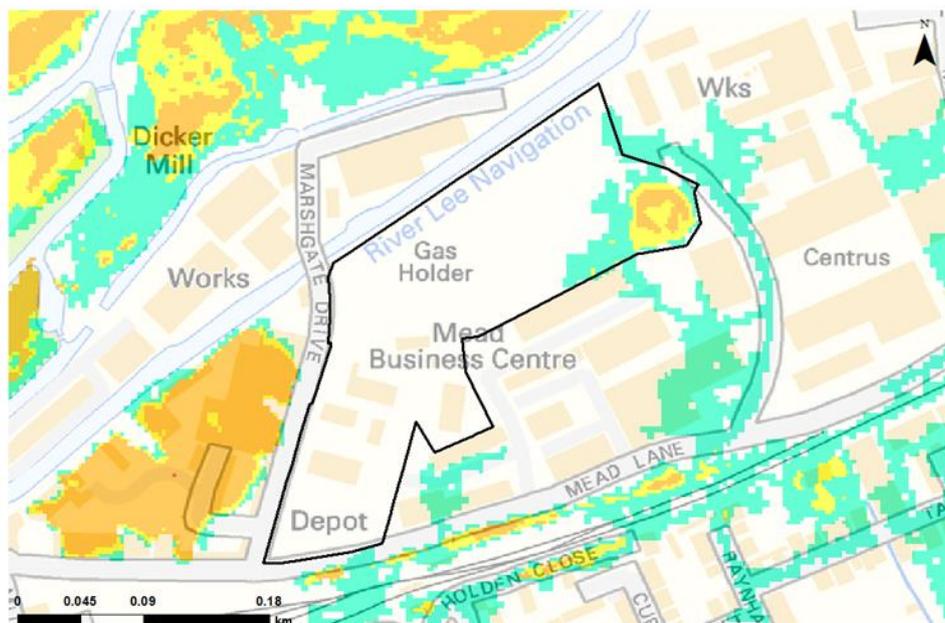


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This velocity map is derived from the existing Environment Agency River Lee modelling and represents the 100-year event

Potential Site Allocations	Velocity (m/s)	0.2 - 0.5	1.0 - 2.0
Council boundary	0 - 0.2	0.5 - 1.0	> 2.0

Hazard Map



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This hazard map is derived from the existing Environment Agency River Lee modelling and represents the 100-year event



SuDS & the development site:		
SuDS Type	Suitability	Comments
Source Control		Most source control techniques are likely to be suitable.
Infiltration		Mapping suggests that there is a high risk of groundwater flooding at this location, therefore it is likely infiltration techniques will not be suitable. This should be confirmed via site investigations to assess the potential for infiltration. If possible, proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints given that the site is located within a Source Protection Zone.
Detention		This should be investigated with more detailed site specific data as this option may be feasible provided slopes are <5% at the location of the detention feature. A liner maybe required to prevent the egress of groundwater and if there are any contamination issues with the site being brownfield.
Filtration		This feature is probably suitable provided site slopes are <5% and the depth to the water table is >1m. If the site has contamination 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 contamination or groundwater issues, a liner will be required
<p>The site is not designated by the Environment Agency as previously being a landfill site.</p> <p>The site is located with a Source Protection Zone. As such infiltration techniques should only be used where there are suitable levels of treatment although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.</p> <p>Drainage strategies should demonstrate that an appropriate number of treatment stages have been delivered. This depends on the factors such as the type of development, primary source of runoff and likelihood of contamination. Guidance should be sought from LLFA and other guidance documents such as the CIRIA SuDS Manual (C753).</p>		
<p>Flood Defences:</p> <p>The site is not formally defended; however, there is a flood defence present on the opposite bank (right hand bank).</p>		
<p>Flood Warning:</p> <p>This site is not covered by a Flood Warning Area; however, it is partly covered by the River Stort and Stansted Brook Catchment Flood Alert Area (062WAF51Stort).</p>		
<p>Access & Egress:</p> <p>Primary access and egress to the site is via Mead Lane and Marshgate Drive. Mead Lane is shown to be affected by Flood zone 3b and in the 100-year surface water event. Alternatively Marshgate Drive is shown to be largely unaffected by both surface water and fluvial flooding.</p>		
<p>Climate Change:</p> <p>Climate change mapping indicates the following impacts for the future:</p> <ul style="list-style-type: none"> • Increased storm intensities. • Increased water extent, depth, velocity and hazard in the watercourse. • Climate change may also increase the extent, depth and frequency of surface water flooding. 		

Implications for Development:

- Use of the Sequential approach to development means, given the size of the site, development can be placed away from the Flood Zones, with the area affected by the Flood Zones left undeveloped.
- Any 'Highly Vulnerable' development placed within Flood Zone 2 will be required to pass the Exception Test.
- Safe access and egress is not considered an issue along Marshgate Drive, although climate change may increase the extent of surface water and fluvial flooding in the future and have the potential to affect routes.
- Development should also ensure that there is no increase in flood risk that may exacerbate flooding to routes
- Broadscale assessment of suitable SuDS has indicated a number of different types may be possible, though infiltration may be unlikely due to groundwater constraints; this should be investigated further at site-specific level. Given the size of the site and the proportion of the site at risk from flooding, the type of SuDS system used may be influenced by amount of land available.
- The site is partially covered by the Environment Agency's Flood Warning Service (Flood Alert).
- The site is not known to benefit from any flood defences. Given the size and location of the site, it is unlikely the site could be used to implement strategic solutions to alleviate flood risk elsewhere in the catchment given the land requirement that any strategic storage solution would require.

Guidance for Developers:

- At the planning application stage, a site-specific Flood Risk Assessment will be required if any development is located within Flood Zones 2 or 3 or greater than 1ha in size. Other sources of flooding should also be considered.
- Consultation with the Local Authority and the Environment Agency should be undertaken at an early stage, to determine requirements for a FRA and to establish an approach to consider climate change in line with latest guidance.
- The peak flows of the unnamed watercourse should be considered when considering drainage.
- Resilience measures will be required if buildings are situated in the flood risk area.
- Safe access and egress will need to be demonstrated; currently some access and egress routes are affected by surface water flooding and fluvial flooding from a 100-year event but alternate route are available.
- Assessment for runoff should include allowance for climate change effects.
- 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.
- 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.
 - o Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.
- Onsite attenuation schemes would need to be tested against the hydrographs for any unnamed watercourses to ensure flows are not exacerbated downstream within the catchment.