

EH5 - BISH3, Bishops Stortford, The Goods Yard

OSNGR:	549168,220788	Area: 6.66ha		Green & Brownfield (40/60)
Flood Zone Coverage:	FZ3b	FZ3a	FZ2	FZ1
	0.3%	0.3%	38%	61.4%

Proposed Development Details:

400 homes, employment and retail

Exception Test Required?

Yes, if 'Highly Vulnerable' development is located in FZ2.

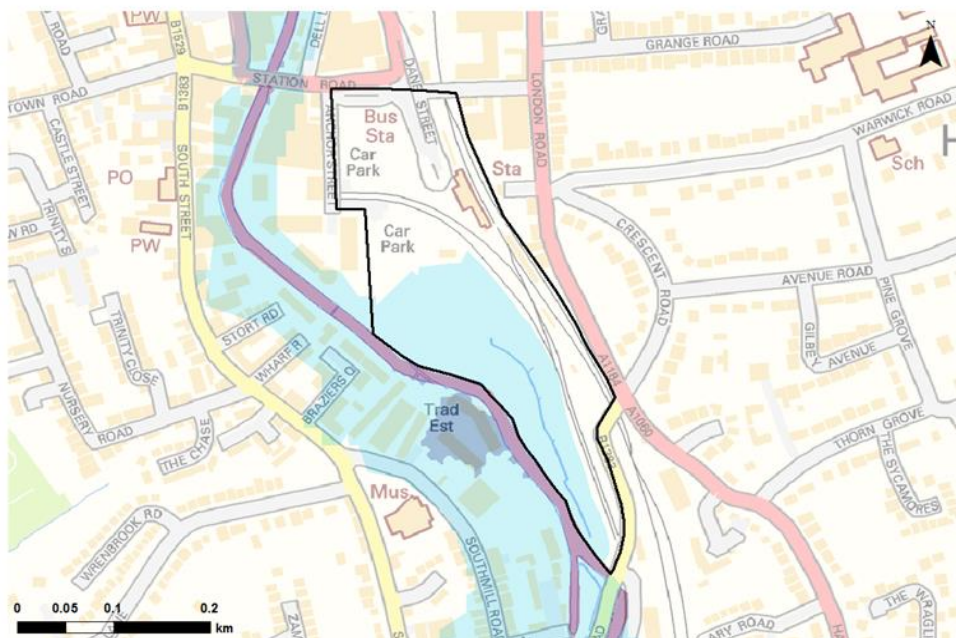
NPPF Guidance:

- 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 Stort (Navigation) and spilt to the south by an unnamed watercourse. Approximately two-thirds of the site is located within Flood Zone 1 and is considered at very low risk of fluvial flooding. The fluvial risk is located to the south-west of the site in Flood Zone 2. Surface water flooding is shown as a flow path along the railway lines and the unnamed watercourse.

Flood Zone Map

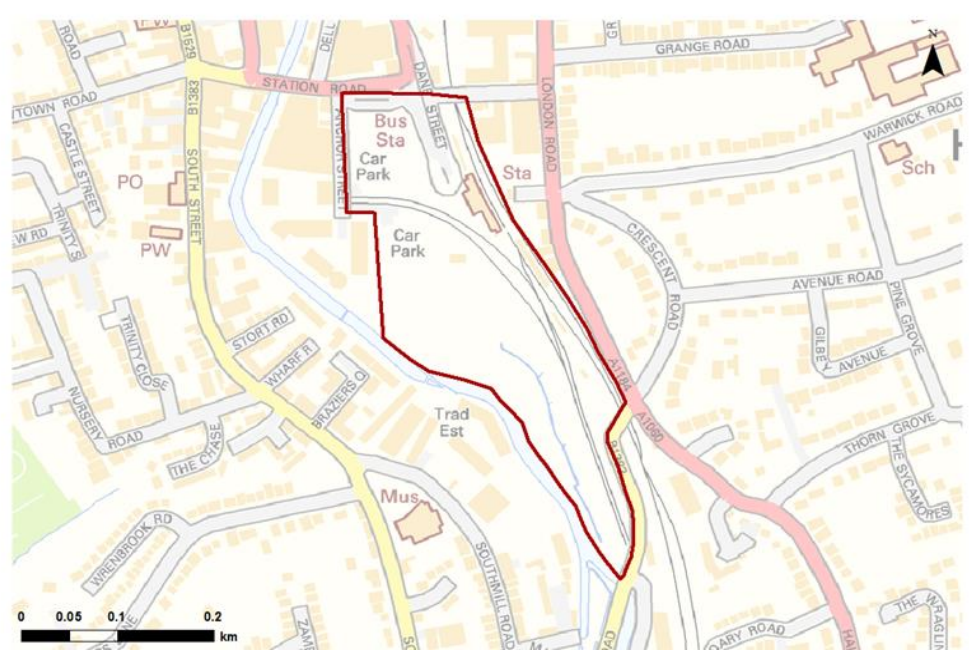


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The Flood Zone maps above are derived from the existing Environment Agency hydraulic model of the River Stort, using the 20-year extent as FZ3b, the 100-year extent as FZ3a, and the 1,000-year extent as FZ2.



Climate Change Map - to be updated when modelling completed

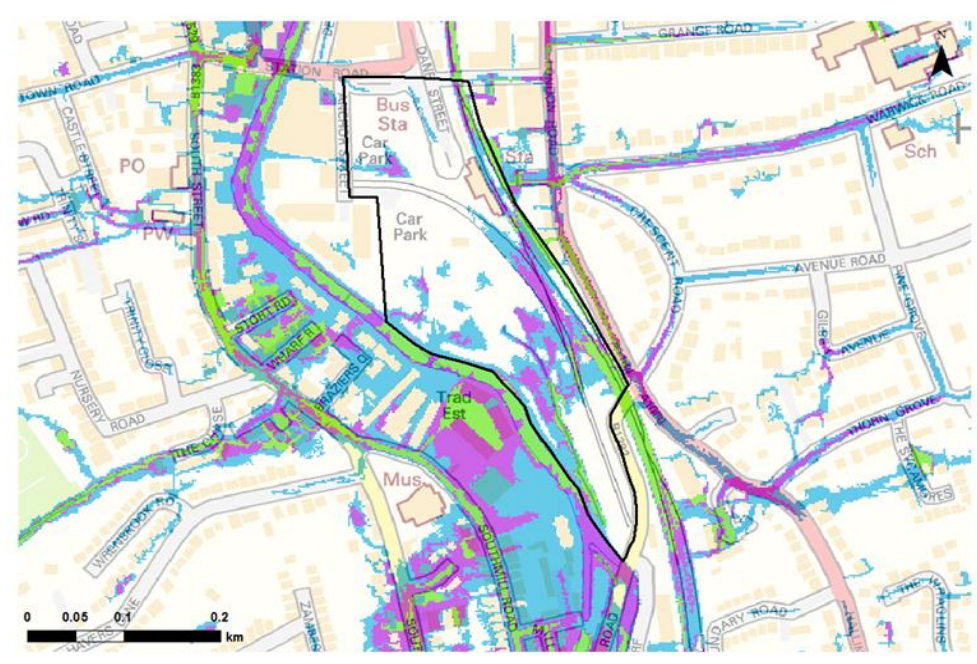


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Climate change was modelled for the 2080s epoch, applying the following climate change factors to the 100-year flow: 25%, 35% and 70%.
The map above shows the 100-year + 70% climate change scenario, therefore representing a 'worst case'.

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

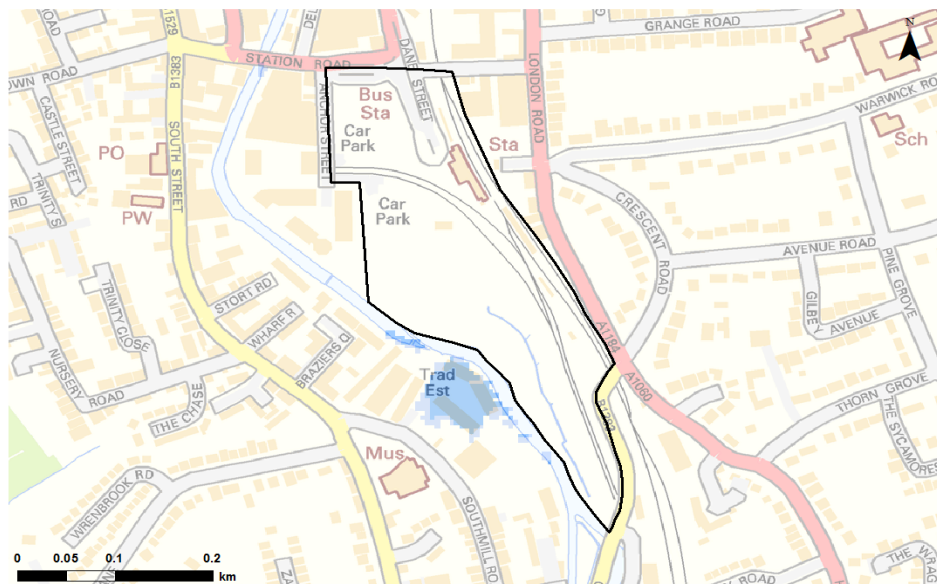
Surface Water Map



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

Depth Map

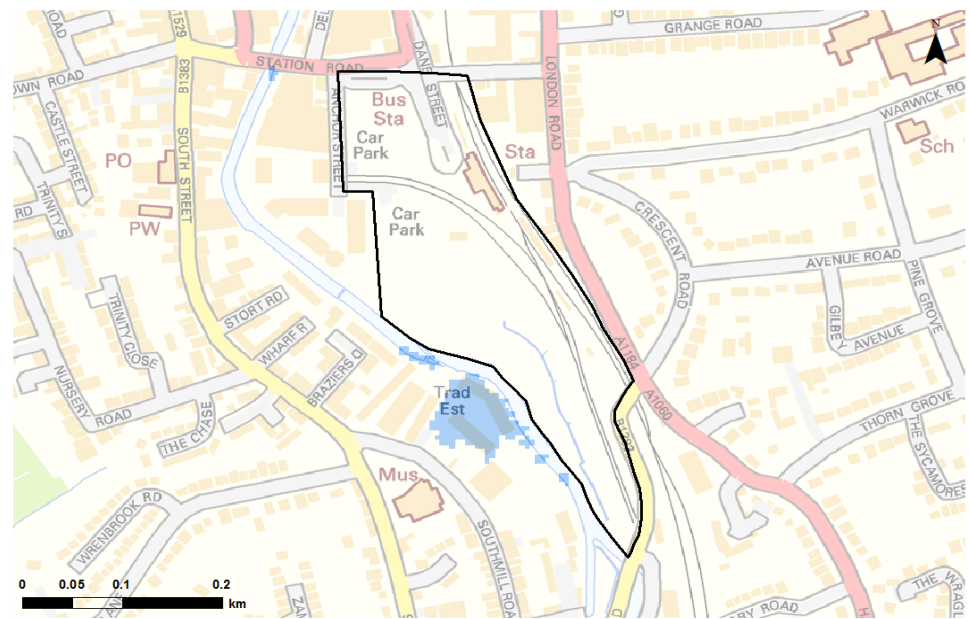


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This depth map shows only a visual representation of the river channel as hydraulic model results show water remains in-bank during the 100-year event, and therefore no depth map of the channel is available.



Velocity Map

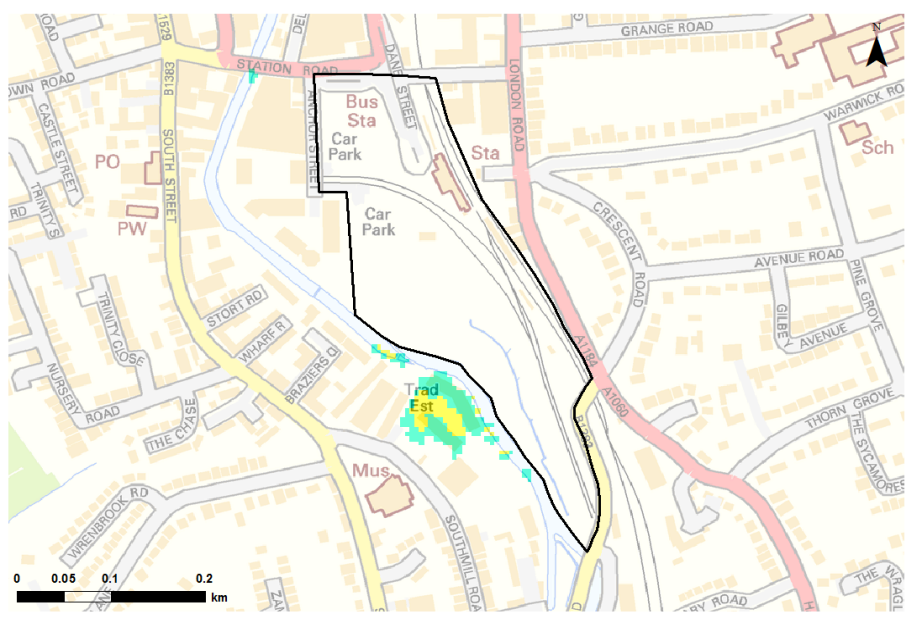


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This velocity map shows only a visual representation of the river channel as hydraulic model results show water remains in-bank during the 100-year event, and therefore no velocity map of the channel is available.









Hazard Map



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This hazard map shows only a visual representation of the river channel as hydraulic model results show water remains in-bank during the 100-year event, and therefore no hazard map of the channel is available.

 Potential Site Allocations	Hazard Rating	 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		All forms of source control are likely to be suitable.
Infiltration		Infiltration likely to be suitable. Mapping suggests a low risk of ground water flooding however, site investigations 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. A liner maybe required if there are any contamination issues within the site being brownfield
Detention		Mapping suggests that the site slopes are suitable for all forms of detention. If the site has contamination, a liner will be required.
Filtration		All filtration techniques are likely to be suitable. If the site has contamination 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 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 not located within any Environment Agency designated Source Protection Zone.</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>		

Flood Defences:

The site is not formally defended; however, there is a flood defence present on the opposite bank (right hand bank) providing an "area benefited by defence" for the trading estate.

Flood Warning:

This site is partially covered by 'The River Stort at Bishops Stortford including Spellbrook' Flood Warning Area as well as the 'River Stort and Stansted Brook Catchment' Flood Alert Area (062WAF51Stort).

Access & Egress:

Access and egress to the site is possible via Stations Road, London Road (B1282) and London Road (A1184). The majority of these roads are impacted by surface water flooding according to uFMfSW. Given that the site is shown to be significantly impacted by fluvial flooding to the south, consideration is needed to how safe access and egress can be achieved to the whole site in times of flood.

Climate Change:

Climate change mapping indicates the following impacts for the future:

- 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 is limited due to the amount of the site that is covered by Flood Zone 2; therefore any 'Highly Vulnerable' development placed within the Flood Zone will be required to pass the Exception Test.
- The main access and egress routes are affected by surface water flooding, therefore safe access and egress will be required by development, or safe refuge provided if evacuation is not possible during a flood.
- 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.
- Broad-scale assessment of suitable SuDS has indicated a number of different types may be possible; 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 covered by the Environment Agency's Flood Warning Service. Given the potential access and egress issues, development may need to consider provision of safe refuge in the event of occupiers being unable to evacuate.
- 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 access and egress is affected by surface water flooding.
- 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.