

Land North East of Junction 10, M42

Flood Risk Assessment

for

Hodgetts Estates

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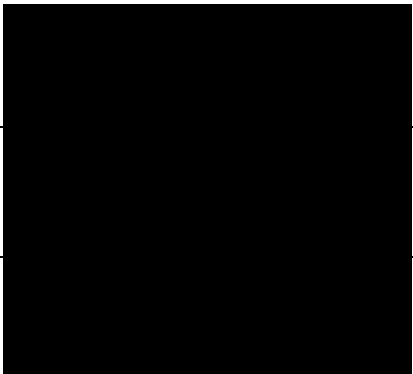
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1.0 EXECUTIVE SUMMARY

Outline planning consent is sought for a mixed employment development comprising Class B2, B8 and E(g)(iii) uses, an overnight lorry parking facility and ancillary infrastructure and works on a 32.36Ha greenfield site located on the land to the north east of Junction 10 of the M42 motorway, North Warwickshire. An initial review of the site topographical survey indicates that the surface water drainage currently falls south-westerly generally with some low points across the site.

In accordance with the NPPF and local strategic flood risk assessment, this report has studied and assessed the flood risk to the site by all sources.

A review of the EA Flood Maps shows that the site is located entirely within Flood Zone 1 (land defined as having less than a 1 in 1000 annual probability of flooding from of river or sea water) and is defined as 'less vulnerable' leading to the conclusion the development is considered 'appropriate' in accordance with NPPF guidelines.

Further to this, the site is considered to be at 'low risk' from all sources of flooding; fluvial, pluvial, tidal, sewer related, groundwater and artificial sources.

As the site is within Flood Zone 1, the sequential and exception tests are not required by the local authority.

The drainage strategy as outlined below is to restrict the proposed flow rate to ensure that the flood risk to the site and surrounding catchment is not increased by development.

The drainage hierarchy has been considered in the drainage strategy discussed in section 5, the surface water runoff will be collected from the impermeable areas and directed via the underground network to the outfall at a restricted rate of 4.4l/s/Ha to the existing manhole which forms part of the culverted watercourse in the south west corner of the site.

Foul flows will be collected by an independent network and discharge to the nearest foul sewer located to the east of the development adjacent to the A5. A section 106 agreement will be applied for an agreed with Severn Trent Water at detailed design stage.

2.0 DEVELOPMENT DETAILS

2.1 CONTEXT

This report has been prepared by Burrows Graham Ltd. on behalf of Hodgetts Estates to support an outline planning application for a mixed employment development comprising Class B2, B8 and E(g)(iii) uses, an overnight lorry parking facility and ancillary infrastructure at the land north east of Junction 10 of the M42 motorway, North Warwickshire, as indicated on the Site Location Plan in Appendix A.

2.2 LOCATION

Site Name: Land North East of Junction 10, M42

Site Location: Land North East of Junction 10, M42, nearest postcode B78 1TB

Grid Reference: 424829 , 300888

Site Area: 32.36 Ha

Site Description: The development proposal seeks outline planning consent for a mixed employment development comprising Class B2, B8 and E(g)(iii) uses, an overnight lorry parking facility and ancillary infrastructure and works on a 32.36Ha greenfield site located on the land to the North East of Junction 10, M42. An initial review of the site topographical survey indicates that the surface water drainage currently falls south-westerly generally with some low points across the site.



Figure 1 : Site Location

3.0 PLANNING OBLIGATIONS

Local planning authorities are advised by the National Planning Policy Framework (NPPF) to consult the Environment Agency (EA) and Lead Local Flood Authorities (LLFA) on all developments of an area greater than 1Ha and those that are at an increase risk of flooding.

This report has been prepared to assess the requirements of the NPPF in accordance with the current EA and LLFA policies and will primarily assess the following;

- Determining whether the site is likely to be affected by flooding and whether it would increase flood risk elsewhere;
- Assessing whether the proposed development is appropriate in the suggested location;
- Detailing any measures necessary to mitigate any flood risk identified, to ensure that the proposed development and occupants would be safe, and that flood risk would not be increased elsewhere.

3.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

On review of the EA Flood Maps, the site is situated entirely within Flood Zone 1 (land defined as having less than a 1 in 1000 annual probability of flooding from river or sea water). This site is therefore classified as 'less vulnerable' and the development is acceptable in line with the National Planning Policy Guidelines.

The sequential and exception tests are tools used by local planning authorities during the allocation of sites for development. As this site is within Flood Zone 1 neither are required.

3.2 STRATEGIC FLOOD RISK ASSESSMENT

The aim of a Strategic Flood Risk Assessment (SFRA) is to assess the risks in a particular area with regard to all types of flooding and to determine how much development is permitted in that area. It can assess this by looking at how drainage systems in the area should function and how risks in vulnerable areas can be reduced and/or mitigated. The NPPF states that regional planning bodies (RPB's) or local planning authorities should prepare SFRA's in consultation with the EA.

A summary of the main elements from the SFRA are detailed below. The full report can be obtained from the Warwickshire County Council website.

- To seek flood risk through spatial planning and site design.
- To reduce surface water runoff from new developments and agricultural land through the use of SuDS and betterment on greenfield runoff rates.
- To enhance and restore the river corridor.
- To protect and promote areas for future flood alleviation schemes.
- To improve flood awareness and emergency planning.

4.0 FLOOD RISK

The NPPF guidelines require the developer to assess the impact of the proposed development runoff on the downstream catchment in conjunction with assessing the risk of runoff from the surrounding area on the proposed development layout.

In the following sections the flood risk to the site from all sources will be assessed, given the site will restrict runoff from the site there is no increased flood risk to the downstream network.

4.1 FLUVIAL & TIDAL FLOODING

The site is not located near the sea or a tidally influenced watercourse, therefore the risk of tidal flooding is deemed to be low.

The site is situated entirely within Flood Zone 1 (land defined as having less than a 1 in 1000 annual probability of flooding from river or sea water), the risk of fluvial flooding is therefore considered to be low.

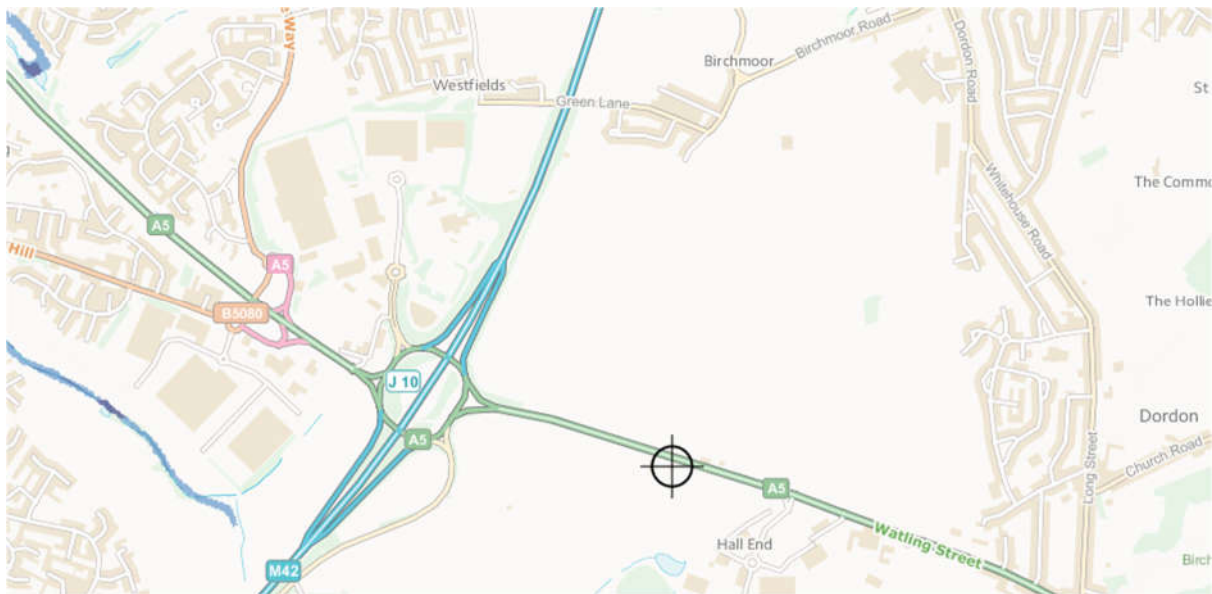


Figure 2: Extract from EA Fluvial Flood Risk Maps

4.2 SURFACE WATER FLOODING

A review of the EA surface water flood maps shows that the site is predominantly classified as 'very low risk' with some areas of 'medium/high risk' located in localised areas of the site. The areas of higher risk are primarily due to the existing topography, the development will mitigate against this risk by directing all areas into a new underground network and as such will not pose a significant flood risk to the development.

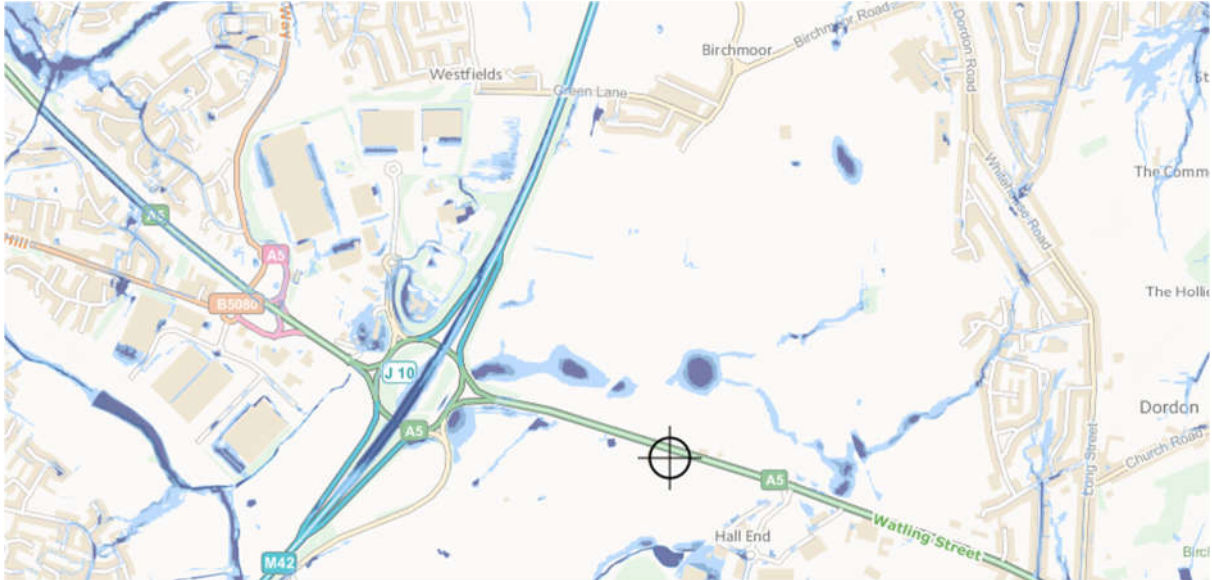


Figure 3: Extract from EA Surface Water Flood Risk Maps

4.3 GROUNDWATER FLOODING

A review of the recent intrusive site investigation confirms that although there are permeable soils and bedrock there is a negligible risk of groundwater flooding and as such this is considered to be low.

4.4 SEWER FLOODING

The nearest existing Water Board sewers are located in location on the offsite, appropriate easements and consents will be sought and as such the risk of sewer flooding is considered to be low.

4.5 ARTIFICIAL FLOODING

A review of the EA online mapping tool shows that the site is located in an area with low risk of flooding from reservoirs.

5.0 DRAINAGE STRATEGY

EXISTING DRIANAGE

The site is considered to be greenfield, therefore greenfield runoff rates have been applied. The existing topography generally falls to the south west of the site (as shown in figure 4).



Figure 4: Existing assumed flow paths

There will be a minor impact to the existing culverted watercourse during the construction of the development. This will result in the existing piped network being diverted around the development in the form of either open swales or pipes, therefore the existing flows will not be restricted or inhibited.

The table below taken shows the existing greenfield runoff rates per hectare for the site calculated using the IH124 methodology.

Return Period	Runoff Rate
1 year	3.7 l/s/Ha
Qbar	4.4 l/s/Ha
30 year	8.8 l/s/Ha
100 year	11.4 l/s/Ha

Table 1: Existing greenfield runoff rates

The SI has identified that the permeability of the underlying material is likely to be poor permeability and there is a presence of groundwater in areas of the site. As such, infiltration is not considered viable for the drainage strategy.

PROPOSED DRAINAGE

SURFACE WATER STRATEGY

Surface water generated from the proposed development will be directed to the underground drainage network, where it will be conveyed to the outfall and discharged at a controlled rate in line with the greenfield runoff rate of 4.4 l/s/Ha. This restriction introduces the requirement for attenuation, which will be provided in the form of a single large attenuation ponds as indicated on the outline drainage strategy drawing in appendix B.

In line with SuDS principles, the drainage hierarchy approach has been considered for the drainage design;

- **Rainwater Reuse** – Rainwater harvesting will be considered at detailed design stage if suitable for the scheme.
- **Infiltration** – The SI has identified that the permeability of the underlying material is likely to be poor permeability and there is a presence of groundwater in areas of the site.
- **Culverted Watercourse** – Flows connected into the culverted watercourse at the existing manhole to the south west corner of the site.
- **Sewer** – Due to the site discharging via a watercourse there is no requirement to discharge via a public sewer.

As runoff has been restricted to 4.4 l/s/Ha for the assumed total impermeable area of 20.46 Ha. Table 2 shows the approximate outline attenuation volumes that will be required for different storm events. This attenuation will be provided on site for all events up to and including the 30 year return period.

Events exceeding this up to and including the 100 year plus climate change allowance will be assessed as part of detailed design. Any flooding from these events is classed as exceedance flooding and will be directed away from buildings, where it will be stored and drain into the surface water network as the levels recede.

A climate change factor of **20%** is deemed appropriate for this development which is primarily low risk (warehouse & car park) with a design life of 30 years.

Return Period	Approximate Attenuation Volume
1 year	3,400 cu m
30 year	9,000 cu m
100 year	15,000 cu m

Table 2: Outline approximate attenuation volumes

The outline attenuation volumes in Table 2 have been produced using source control software, these are estimates are based on an assumed impermeable area of 20.47 Ha and therefore equate to 440 cu m/Ha for the 30 year event. This will be refined at detailed design stage, once pipe sizes have been accounted for and the drainage layout has been fully designed in accordance with building regulations.

Runoff from roofs is generally considered to be clean and will be discharged directly into the surface water network. Runoff from the car parks and HGV yards will be directed via a bypass and full retention interceptors respectively. These will be selected and sized in accordance with the current guidance. Silt will be prevented from entering the drainage system by the use of trapped gullies, silt boxes and separators.

Consultation has taken place between Burrows Graham Ltd. and Severn Trent Water (STW) regarding the existing culverted watercourse that crosses the site, STW have confirmed this does not fall under their maintenance responsibility. As such, discussions are ongoing with the LLFA with regard to the discharge to the culverted watercourse.

The preliminary drainage strategy drawing and hydraulic calculations are within appendix B and C respectively. The volumes in the calculations supersede the estimates in table 2 above.

SUSTAINABLE DRIANAGE

Sustainable Drainage Systems (SuDS) are utilised in line with the CIRIA 753 guidance and aim to minimise the developments impact on the runoff quantity and quality and maximise amenity and biodiversity opportunities.

The management train approach is a fundamental principle of SuDS systems, it aims to primarily reduce pollution, flow rates and volume of runoff from the site. The main objective is to treat the runoff as close to the source as possible and it is imperative that at least two of the following should be included within the drainage strategy.

- **Prevention** – The use of good site design and rainwater re-use measures to prevent runoff.
- **Source Control** – Controlling the runoff as close to source as possible by using; green roofs, porous pavements and soakaways.
- **Site Control** – Use of water management techniques within local area, ie. detention basins and geocellular storage.
- **Regional Control** – Management of water from a number of sites in a specific location, ie. balancing ponds and wetlands.

The drainage strategy for this development will incorporate where possible prevention and site control. Prevention in the form of rainwater harvesting, filter drains and the large detention basin will form the site control.

Whilst it would be beneficially to include more of these techniques including green roofs, the space on site means it is not viable to include any additional measures. Infiltration is considered not possible until further testing is carried out, as such this method of water treatment and disposal has not been specified.

FOUL WATER STRATEGY

Foul flows will discharge to the nearest Severn Trent Water sewer located at manhole ref. 9405 to the east of the development adjacent to Dordon within the field at a pumped rate of approximately 5.25 l/s. A Section 106 agreement with STW will be sought at detailed design stage.

6.0 MANAGEMENT, MAINTENANCE AND RISK

A private management company will maintain the drainage infrastructure as part of the site wide management and maintenance strategy. Typically the maintenance regime will be in line with table on the drainage strategy drawing.

Access and egress to the development should exceedance flooding occur shall be from the main site access to the site from the A5.

Flood risk to people and property can be managed but it can never be completely removed; a residual risk remains after flood management or mitigation measures have been put in place. This relates to a rainfall event beyond what can be fully quantified.