

Civil & Structural Engineers Building Surveyors Geo-Environmentalists

Flood Risk Assessment

of

Unit 5

Watford Bridge Industrial Estate

Watford Bridge Road

New Mills SK22 4DN

Liverpool T: 0151 227 3155

Manchester T: 0161 817 5180

> T: 01978 664071 T: 020 74 584136

Wrexham Client Name: GT Electrical Ltd Our ref: LRD27044 **London** Date: January 2015

Head Office 18-20 Harrington Street Liverpool L2 9QA

T: 0151 227 3155 F: 0151 227 3156 E: enquiries@sutcliffe.co.uk www.sutcliffe.co.uk

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SITE SPECIFIC FLOOD RISK ASSESSMENT

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Prepared by:

1 7	
Name:	Dave Samuels
Title:	Executive Associate
Qualifications:	BEng (hons) CEng MIStructE

Checked / Approved by:

Name:	John Spencer
Title:	Director
Qualifications:	BEng (hons) CEng MICE MIStructE

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Introduction

It is proposed to develop a site located within the Watford Bridge Industrial Estate accessed off Watford Bridge Road, New Mills SK22. The industrial estate is approximately 5500m² with the area of the new build being approximately 675m², and is surrounded by other industrial development.

The site is currently undeveloped but was previously developed as part of the former Print Works that occupied the site.

It is proposed to develop this site with an industrial small industrial unit.

This flood risk assessment has been prepared for submission with the Planning Application.

The purpose of this flood risk assessment is to assess existing flood risk to the site by reviewing the strategic flood risk assessment (SFRA), produced for High Peak Council, and to assess the proposed flood risk for the propose development and apply recommendations given in the SFRA and recommend how any outstanding flood risk issues will be managed throughout the lifetime of the proposed development.

Sources of Flooding

There are many sources of flooding that need to be considered within a flood risk assessment, which are:

- Rivers / Streams
- Sea
- Reservoirs
- Canals
- Ground Water
- Sewers
- Over Land Flows

It is unlikely, or very rare, that any one site will be affected by all sources of flooding. Therefore, we must assess which forms of flooding are required to be assessed within this flood risk assessment.

Having reviewed the Environment Agency flood maps, sewer records, land topography and OS Maps we can assess the subject site as being potentially affected by the following sources of flooding, which will be individually assessed within this flood risk assessment.

- Rivers / Streams
- Reservoirs
- Ground Water
- Sewers
- Surface Water / Over Land Flows

Flooding Assessment

Rivers / Streams

An inspection of the Environment Agency Flood Maps indicates that the site is potentially affected by flooding caused from Rivers or Sea. The site is indicated as being located in a Zone 2 flood area, a 0.1% (1 in 1000) chance of occurring in any given year.

However, flood maps and flood data was obtained from the Environment Agency and the 1 in 100 year flood depth is given as being 146.82m AOD.

An inspection of the topographical survey shows the site to have a lowest level of 147.50m AOD, which is above the given flood level of 146.82m AOD. The proposed FFL is proposed to be at a level of 148.60m AOD, some 1.78m above the given flood depth.

The High Peak Strategic Flood Risk Assessment makes no specific mention of the site or the area surrounding it in relation to potential flooding from rivers or streams.

Therefore, there is a low risk of flooding from rivers / streams for this site.

Reservoirs

An inspection of the Environment Agency Flood Maps was made and the map for reservoir flooding indicates that the site is potentially affected by reservoir flooding.

The Reservoir affecting the site is the Kinder Reservoir, located approximately 5.5Km to the north east of the site. The reservoir is owned and maintained by United Utilities.

In the event of reservoir flooding the given depth of potential flooding at the development site has been estimated as being 0.3m and 2m depth and the velocity of flow between 0.5m/s and 2m/s.

Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensures that reservoirs are inspected regularly and essential safety work is carried out.

An inspection of the strategic flood risk assessment was made. No mention of reservoir flooding in relation to the development site is made within the SFRA.

Therefore, there is a low risk of flooding from reservoirs.

Ground Water

At the time of preparing this flood risk assessment no intrusive investigations had taken place so it is not known if there is a ground water table that may cause potential flooding issues.

During a site inspection of the site there was no evidence to suggest that ground water flooding does or would affect the site.

Therefore, there is a low risk of ground water flooding.

Sewers

Sewers, including site drainage, can flood for several reasons. The reasons are.

- Blockages
- Surcharged
- Undersized pipes

There are no surface water sewers in the vicinity of the site. There is a culverted water course to the north of the Watford Bridge Industrial Estate but is not intended to be used for this development.

The River Sett is located within 50m of the development and will be used to discharge surface water runoff at a rate to be agreed with the Environment Agency or Flood Defence Officer as may be appropriate.

An inspection of the strategic flood risk assessment was made. No information regarding sewer flooding in relation to the development site is made within the SFRA.

Therefore, there is a low risk to human life and properties from flooding of sewers.

Surface Water / Overland Flow

Overland flow will occur when rainfall cannot be collected by the designed drainage system or/and the ground becomes waterlogged, or when sewers become full and cannot accept additional water.

An inspection of the EA surface water flow maps indicates that the site not to be affected by surface water flows.

An inspection of the strategic flood risk assessment was made. No specific reference regarding overland flow in relation to the development site is made within the SFRA.

Therefore, there is a low risk of surface water / overland flooding.

Development Drainage

The National Planning Policy Framework (NPPF) directs us to ensure that the rate of discharge leaving a development site is no more than its previous use, and, where possible, to reduce that discharge.

The site is currently occupied by industrial use buildings and contains buildings and hard standings.

The existing impermeable area of the site has been calculated as being 635m². This information has been obtained from historic maps.

It is proposed to develop the site with an industrial unit where engineering works will be carried out. The total impermeable area of the proposed development has been calculated as being approximately 635m².

In accordance with NPPF the aspiration is to reduce the drained impermeable areas to less than the previous impermeable areas. However, this is not possible and therefore it is the intention of the NPPF and SFRA to reduce offsite surface water discharge so that the existing discharge is not exceeded by the proposed, and where possible to greenfield runoff rates. This can be achieved by employing sustainable urban drainage systems (SUDS). These techniques may typically include infiltration. Other simple ways of reducing surface water discharge off site is to free drain paths to landscaped areas, such as grass and planted areas, where natural surface infiltration and evaporation can occur. Careful detailing will be required to ensure that surface water runoff will flow to appropriate areas when this methodology is adopted.

An intrusive ground investigation has not been carried out at this stage of the design development and so it is not known if infiltration methods can be used. However, due the proximity of the River Sett it is, at this stage of the project, assumed that no infiltration is available. This would suggest that SUDS cannot be used due to the underlying soil / rock types. In addition, it is known that there is a depth of uncontrolled fill material within the location of the development that is unsuitable for infiltration methods.

The High Peak SFRA Level 1 directs that sustainable urban drainage systems (SUDS) should be employed to ensure that no worsening of existing flooding problems elsewhere within the area occurs. However, where SUDS is not practical or cannot be used the most likely method of achieving the proposed aims would be to limit the site discharge using a flow control device and the end of the proposed system, and attenuate the flows that exceed the designed discharge rate.

Section 10.0 of the SFRA lists the type of SUDS systems that could be employed on site developments. It also states that the Environment Agency require that a reduction of 20% to discharge rates to account for Climate Change and its effect on future runoff volumes that climate change will have. However, it must be considered that not all discharge rates can be suitably managed throughout the lifetime of the development and a practical minimum discharge rate should be applied, and agreed. It is usual to adopt a minimum discharge rate of 5 I/s but this can be reduced, if required, by using careful design and detailing of the drainage design

From the areas calculated it is apparent that there is no increase in the drained areas for the site to those that have previously been drained historically. The area of

the development is reasonably small and in accordance with the NPPF and SFRA it will be necessary to reduce the discharge rate by 20% to allow for future anticipated climate change. As discussed in this section of the FRA attenuation will be the preferred method of controlling the flows to reduce discharge rates by 20%.

To discharge into the River Sett it will be necessary to liaise with the EA and Lead Flood Defence Engineer (Local Authority) to gain necessary approvals to discharge into the rover and to construct the outfall detail

Conclusion & Recommendations

From the above we can conclude that there is an overall low risk of flooding to the development site.

At this stage of development design detailed calculations have not been carried out and will be required as part of the design development process which will follow on from Planning Approval.

This flood risk assessment confirms that the design of the development meets the requirements of the SFRA. As the surface water will be discharged into the River Sett it will be necessary to liaise with the EA and the lead flood defence team from the Local Authority

To progress the design for this project it will be necessary to gain Planning Approval after which any planning conditions can be discharged.

Appendix A

Proposed Site Plan



Preliminary 24.10.14

All dimensions must be checked on site and not scaled from the All materials and workmanship are to be in accordance with p Standards. Codes of Practice Building Regulations manufact	his drawing.
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Building Design & Surveying Co	nsultante
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Havfield High Beat SK22.2	Street,
Tel:01663 742903 Fax:01663 74	1247
Mobile: 07984 007 087 Email: info@s	idesign.ne
www.sjdesign.net	
Client	
GT Electrical	
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Appendix B

Environment Agency Flood Maps

Flood Risk from River



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Flood Risk from Reservoirs

Map of X: 400,375; Y: 386,294 at scale 1:10,000

Data search O



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Flood Risk from Surface Water / Overland Flow



Map of X: 400,374; Y: 386,293 at scale 1:10,000

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