Sutcliffe

Flood Risk Assessment

At: Haregate Community Centre, Haregate Road, Leek ST13 6QQ

Client: Ascent

Date: September 2012
Job No: 26331LRD

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Date: September 2012
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SUTCLIFFE

SITE SPECIFIC FLOOD RISK ASSESSMENT

DOCUMENT VERIFICATION

Report Reference: LRD26331 Issue: 02 Date: May 2013

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Revision History:

Rev	Date	Description	Prepared	Checked	Approved
02	**05/13**	**Site Plan Amended**	**DS**	**SB**	**JRS**

Introduction

It is proposed to redevelop the Community Centre site at Haregate Road, Leek ST13 6QQ with social housing.

The site is currently occupied with a community Centre and associated car parking.

The proposed development consists of 15 dwellings with associated access road and external paving.

The site area is approximately 4300m^2 and is located within an established residential area.

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 Staffordshire Moorlands District 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 could 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
- Over Land Flows

Flooding Assessment

Rivers / Streams

An inspection of the Environment Agency Flood Maps, which were revised in November 2011, indicates that the site is not affected by flooding caused from Rivers or Sea. The site is located in a Zone 1 flood area, low risk.

In addition to the above, an inspection of the Strategic Flood Risk Assessment, 2008, for Staffordshire Moorlands District Council was made and no specific mention of the site or the area surrounding was made 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 not potentially affected by reservoir flooding.

Approximately 1.1km to the north of the site is Tittesworth Reservoir. Anticipated flooding for the reservoirs is identified on the Environment Agency map but the extent of the anticipated flooding, in the event of a dam failure, is located some 0.56km to the north of the site. Suitable access and egress from the site, in the event of reservoir flooding occurring is available to the site.

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

An inspection of the Environment Agency Flood Maps was made and the map for ground water indicates that the site is not within a potential flood area.

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

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

Should sewers flood, for whatever reason, then the site is potentially affected as it is located within a developed area that is fully serviced by sewers and drains.

The site falls downwards from south to north.

Running through the site are 2 surface water sewers and a foul water sewer. The surface water sewer to the south of the site is 300mm Ø and at a depth of approximately 2.2m. The surface water sewer running through the north of the site is 225mm Ø and is also at a depth of approximately 2.2m.

The surrounding topography falls generally from south to north. As the site fall is south to north we would expect that flooding from sewers, whether it is caused by surcharging, blockages or capacity issues would flow through the site, due to the gradients of the land. We would expect shallow depths of flood water from surcharging sewers due to the diameter of the sewers being small.

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.

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.

Should overland flooding occur on this site then overland flow will pass generally in a north to south direction, following the general topography of the land.

Due to the topography of the preceding and adjacent land we would expect flow depths to be shallow.

As flows are anticipated as being shallow we would not expect the flows to be a risk to life or property.

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

Therefore, there is a low risk of 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.

An inspection of historical maps, google maps google earth shows us that the site is developed car parking. The total impermeable area of those developments has been calculated as being 1945m^2.

It is proposed to develop the site with 16 dwellings and associated infrastructure. The total impermeable area of the development has been calculated as being approximately 2555m^2.

In accordance with NPPF it is, therefore, necessary to reduce the drained impermeable areas to less than the previous impermeable areas. However, it is the intention of the NPPF and SFRA to reduce offsite surface water discharge as much as possible, 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 private drives, paths and patios 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.

An intrusive ground investigation confirms that the area is overlain by boulder clay at shallow depth and would suggest that the use of soakaways is not feasible. The desk top survey identifies boreholes that have been carried out remote from the site and indicate silty clays at shallow depth. This may also suggest that the use of soakaways is not feasible.

However, by draining paths and patios to grasses / landscaped areas it is possible to reduce the positively drained areas by approximately 410m^2.

Having viewed Severn Trent Water sewer record plans it can be seen that there are available 225mm and 300mm Ø surface water sewers running through the site.

The SFRA directs that sustainable urban drainage systems (SUDS) should be employed to ensure that no worsening of existing flooding problems elsewhere within the area.

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.

From the proposed layout it has been found that there is an approximate increase in drained area, from the predevelopment site condition, is in the order of 10%. Therefore, a further reduction of surface water discharge from the site will be required if possible. To achieve the required policy within the SFRA it will be necessary to attenuate flows to provide a 20% reduction of the existing runoff discharge rate.

In addition to the above the site will also need to be considered for Category 4 of the Code for Sustainable Homes.

From the assessment we can, therefore, deduce that it will be likely that surface water will be required to be discharged to the combined sewer network. Whilst the

peak flow rates and volumes off site are anticipated as being reduced it will still be necessary to:-

- Agree a location for and maximum discharge rate with Severn Trent Water.
- Reduce the surface water discharge rate from the proposed development to reduce discharge rates from site by 20% of the pre development site conditions. It is likely that this will be achieved by attenuation as clay is present at shallow depths.

Conclusion & Recommendations

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

From the above assessment it is not required to provide attenuation but an allowable surface water discharge rate will be required to be agreed with Severn Trent Water, which may require the provision of attenuation.

The SFRA states that there is a 20% reduction of existing discharge rates applied to the surface water drainage to reduce runoff rates to account for future runoff volumes expected as a result of climate change. The design provided for the proposed layout does not meet this requirement and fall short by approximately 10%. Therefore, it is likely that attenuation will be required to meet the requirements of the SFRA.

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.

To enable the surface water site drainage to be progressed it will be necessary that the following be carried out. It will then be possible to design a suitable surface water drainage system that satisfies the criteria of the SFRA, LPA and other stake holders, such as the Developer and Severn Trent Water.

- Communication with Severn Trent Water will be required to agree a maximum surface water discharge rate and its connection point with the public sewer.

Appendix A

Proposed Site Plan

15

KEY

LANDSCAPING

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- NEW LARGE TREES
- NEW ORNAMENTAL TREES
- NEW SPECIMEN SHURBS
- NEW ORNAMENTAL SHURBS
- NEW ORNAMENTAL HEDGE
- GRASS
- 450 X 450m PERIMETER PAVING AT FRONT + REAR
- CHARCOAL BLOCK PAVED TO ALL DRIVEWAYS
- 50mm EDGING SURFACE
- Plot Slab Level t.b.c by Struct Eng
- GARDEN SHED
- CLOTHES DRIER
- WATER BUTT
- COMPOST BIN
- WHEELIE BINS (3NO.)

BOUNDARIES

- A - 2.1m HIGH CLOSE BOARDED TIMBER FENCE
- B - 1.8m HIGH CLOSE BOARDED TIMBER FENCE
- C - 1.5m HIGH TIMBER FENCE, WITH 2.0m HIGH x 1.8m WIDE PRIVACY SCREEN ADJACENT HOUSE
- D - 0.9m HIGH METAL RAILINGS
- E - TIMBER KNEE RAIL
- F - 0.9m LOW BRICK WALL
- G - RETAINING WALL

(Please refer to drawing L009 for boundary details)

ACCOMMODATION SCHEDULE

3 x 3b5p Houses for rent @ 86m2 inc 1 with assisted living space
3 x 3b5p Houses for SHO @ 86m2
2 x 3b5p Houses for sale @ 86m2

3 x 2b4p Houses for rent @ 75m2
1 x 2b4p Houses for SHO @ 75m2
3 x 2b4p Houses for sale @ 75m2

15 Total No. Dwellings

Existing tree retained
New footpath created through site
Landscaped area
Churnet View
Churnet View Middle School
Existing Houses
Sub Station
Existing open sub station
Location of substation cables to be confirmed
Existing community centre to be demolished and relocated to alternate site
Existing Hedges retained
Existing Hedges retained
Site Boundary
Retain access to existing garages
Retain and enlarge access
Haregate Road
Existing Houses
Plot 1
Plot 2
Plot 3
Plot 4
Plot 5
Plot 6
Plot 7
Plot 8
Plot 9
Plot 10
Plot 11
Plot 12
Plot 13
Plot 14
Plot 15
1
45
43

Site Area - 0.43 Hectares

Rev B 1 No plot omitted due to clash with existing tree CG Mar 13
Rev A Parking location on plot 1 amended due to clash with existing power cables CG Dec 12

PROJECT: Haregate Road (Site 45) Proposed Site Plan
Leek ST13 6QQ

TITLE

SIZE: A1
STATUS: Planning
PROJECT No: 1382
DRAWING No: 03B
DRAWN by: CG
CHECKED: ...
DATE: Aug 12
SCALE (b/w/d): 1:200

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Appendix B

Environment Agency Flood Maps

Rivers & Sea

Reservoirs

Prepared by: D Samuels
Date: September 2012
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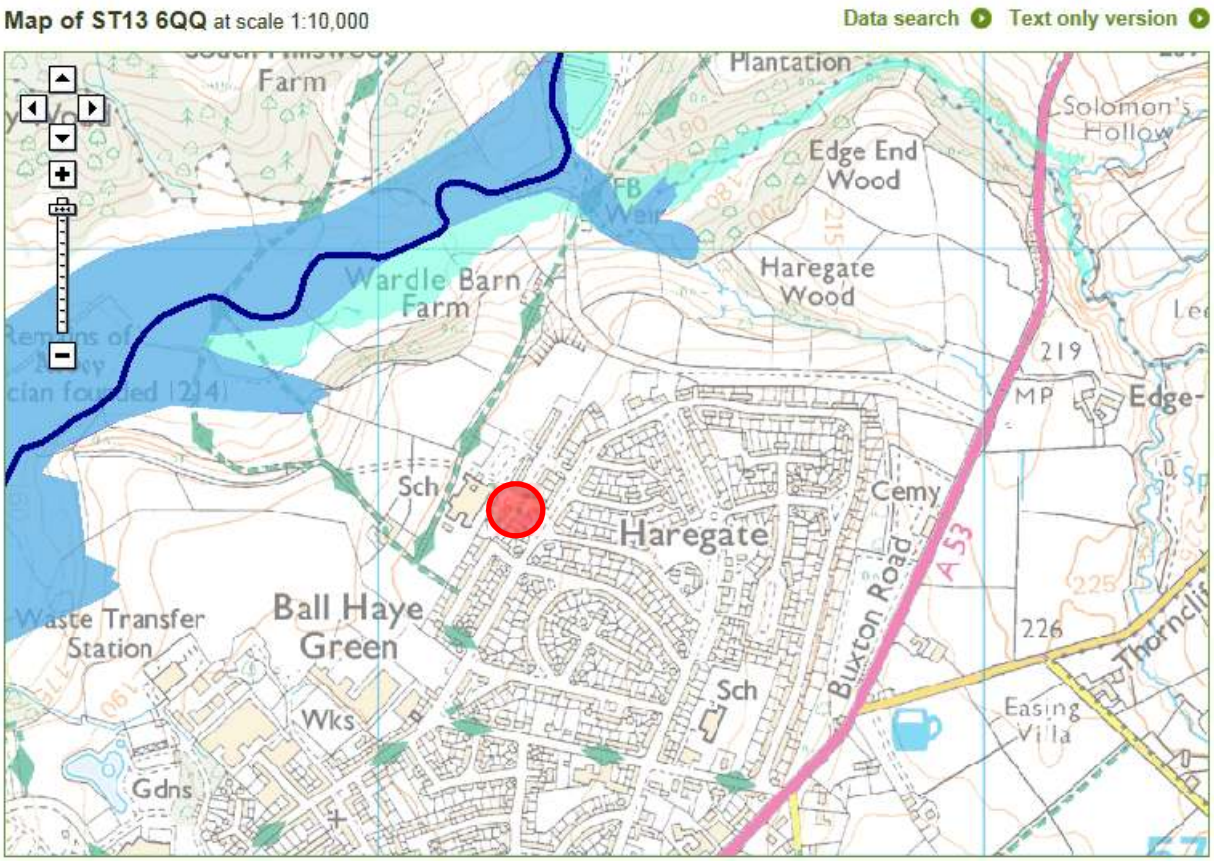

River & Sea Flooding

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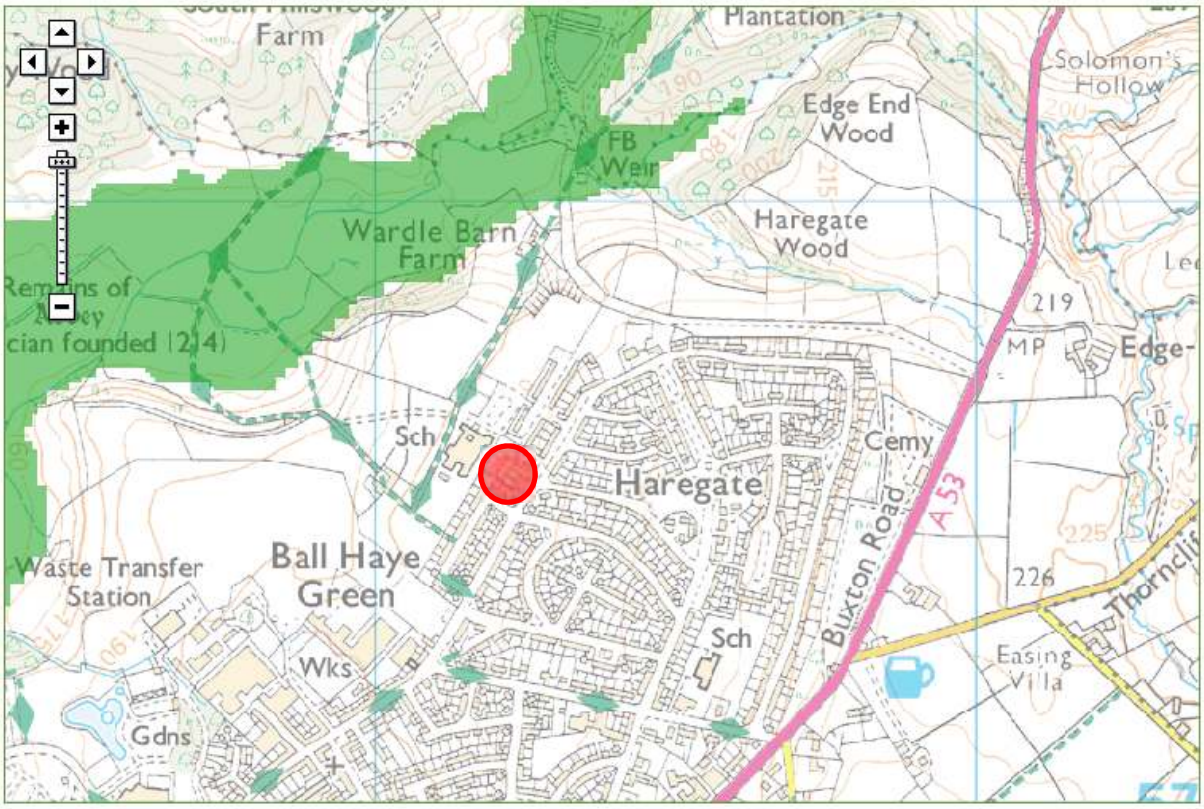
Map of X: 399,381; Y: 357,659 at scale 1:10,000 Data search Text only version



Reservoir Flooding

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