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Flood Risk Assessment

of

Mackenzie Crescent

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SUTCLIFFE

SITE SPECIFIC FLOOD RISK ASSESSMENT

DOCUMENT VERIFICATION

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Revision History:

Rev	Date	Description	Prepared	Checked	Approved

Introduction

It is proposed to develop a site at Mackenzie Crescent, Cheadle ST10 1LU with a block of flats consisting of 9 apartments.

The site is currently occupied with a road, car park and garages.

The site area is approximately 1675m^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.

Reservoir flooding is noted approximately 200m to the east the source of which is Hales Hall Pool, located approximately 1.5km to the northeast.

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 services by sewers and drains.

The site falls downwards from south to north.

From Severn Trent Water sewer records there are no sewers directly adjacent to the site. The nearest sewer is located approximately 40m to the southwest of the site and is a 300mm Ø surface water sewer approximately 2.2m deep.

The site and surrounding topography falls from north to south. We would expect that flooding from the 300mm Ø sewer, whether it is caused by surcharging, blockages or capacity issues would flow within the road and flow away from the site. Flooding from the 300mm Ø sewer would not be expected to flow into the site.

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 with garages and associated paving. The impermeable area of the site has been calculated as being 770m^2.

It is proposed to develop the site with two houses and associated infrastructure. The total impermeable area of the development has been calculated as being approximately 820m^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.

However, by draining paths and patios to grass / landscaped areas it is possible to reduce the positively drained areas and allow surface infiltration / evaporation to occur. An approximate area of 135m^2 can be free drained.

An intrusive ground investigation has been carried out and found that sandy clays overlying mudstone were present. Ground water was observed in some boreholes in the sandy clays at relatively shallow depths. This would suggest that SUDS cannot be used due to the underlying ground water.

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 areas calculated there has been an approximate reduction in drained areas of 11%. To achieve compliance with the SFRA it will be necessary to provide attenuation to reduce peak runoff rates by 20% from predevelopment discharge rates.

As the proposed discharge off site has been reduced by less than 20% we have not fully complied with the recommendations of the SFRA. However, communication with Severn Trent Water will be required to agree a maximum surface water discharge rate, which may necessitate the need to attenuate additional surface water flows to that required to meet the 20% reduction.

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

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 does not meet the requirements of the SFRA unless attenuation is provided as SUDS cannot be used due to water being observed in the boreholes.

However, Severn Trent Water will be required to be consulted to confirm an acceptable discharge rate for surface water from the site, which may necessitate the need for attenuation.

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 United Utilities.

- Drainage investigation of both on and off site drainage to enable a suitable discharge location to be identified.
- 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

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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)

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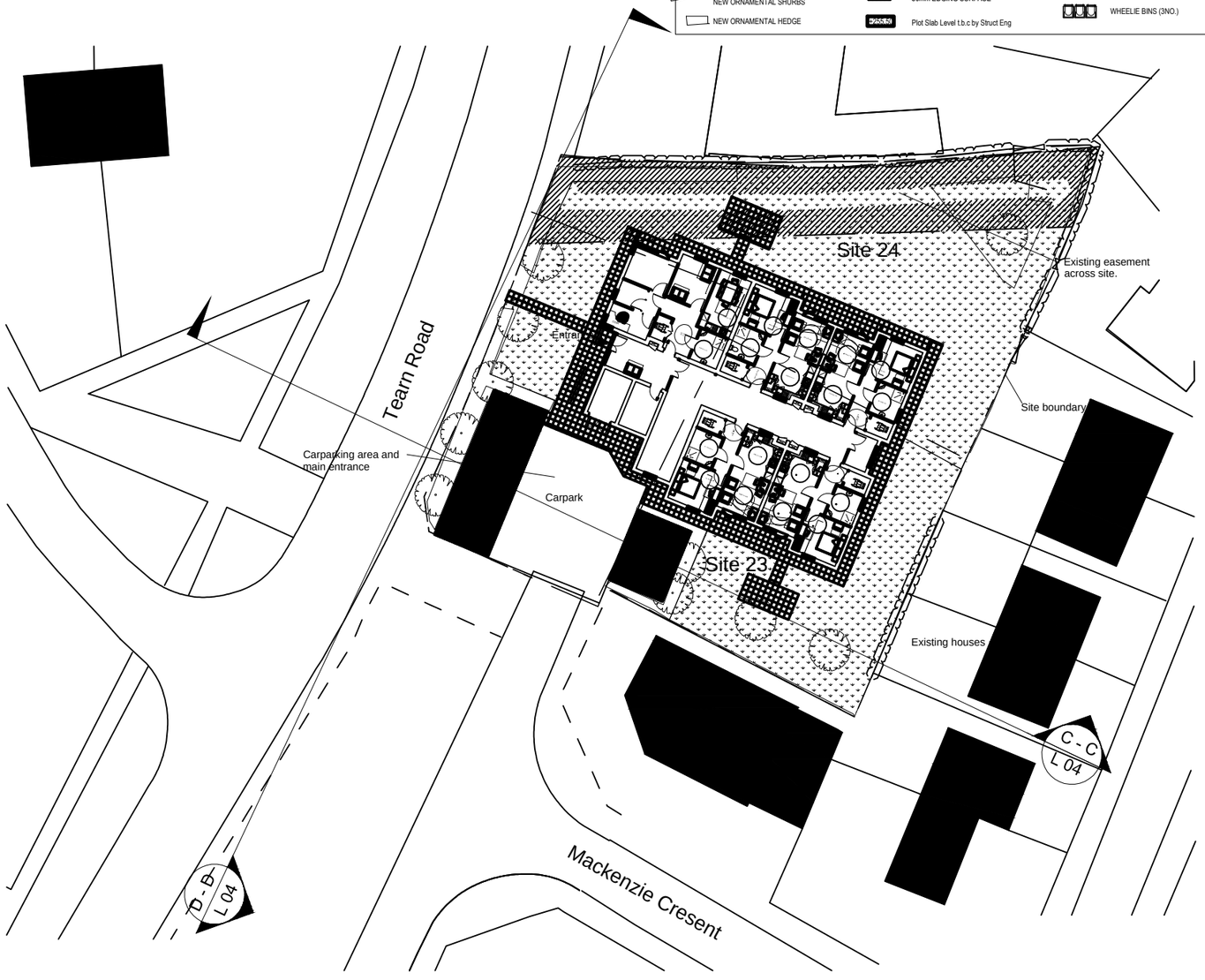
ACCOMMODATION SCHEDULE

8 x 1b2p Apartments @ 54m2

1 x 2b3p Apartments @ 75m2

9 Total No. Dwellings



Site 23 Area 0.067 Hectares
Site 24 Area 0.053 Hectares

PROJECT: Mackenzie Cresent (Site 23+24)
TITLE: Proposed Site Plan
Cheadle, ST10 1LU

SIZE: A1
STATUS: Draft
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DRAWING No: 03
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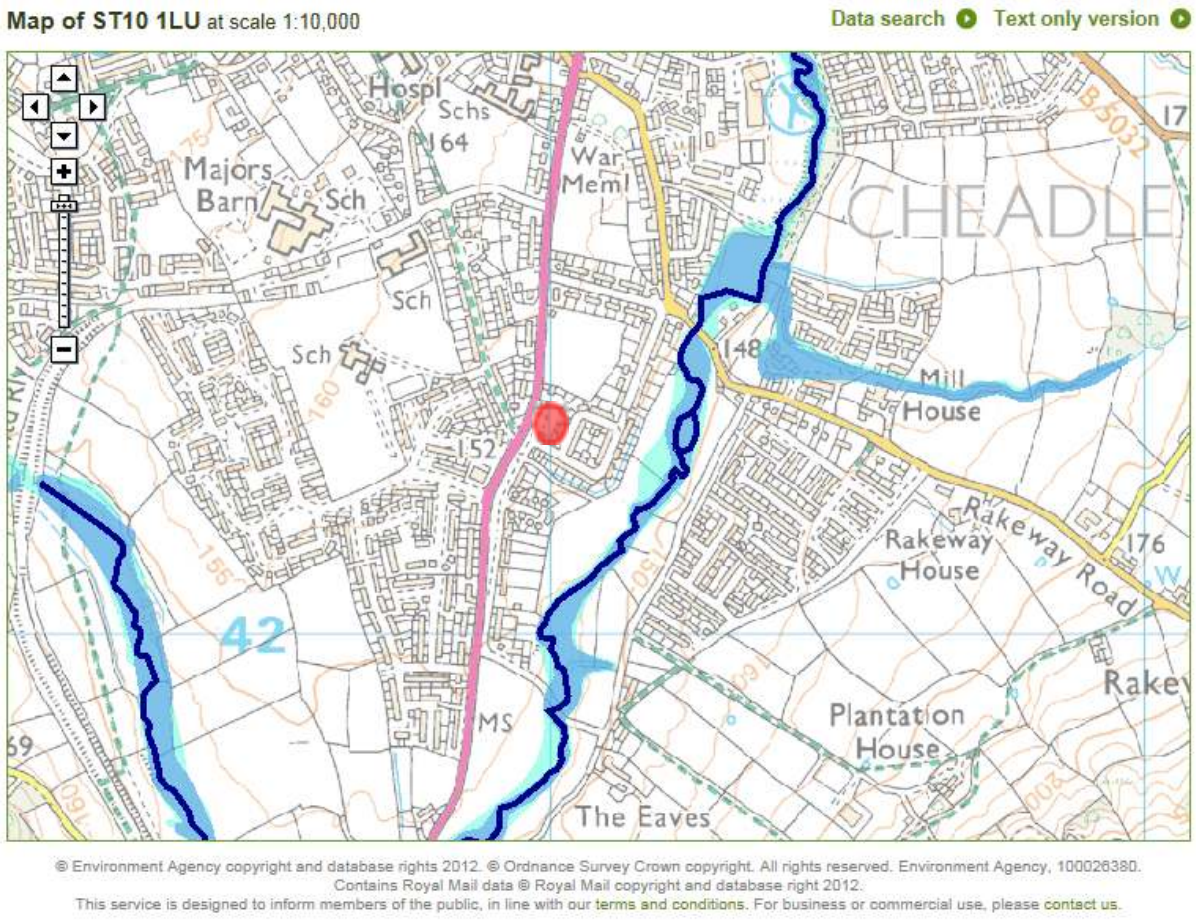
Appendix B

Environment Agency Flood Maps

Rivers & Sea



Reservoir

Map of X: 401,084; Y: 342,314 at scale 1:10,000

Data search Text only version