Executive Summary

Paul Waite Associates have been appointed to support a planning application for proposed redevelopment of existing farm buildings and land to provide residential development at Nether Mill Farm in Penistone, South Yorkshire.

The proposed development is intended to be phased over 2No individual areas within the Nether Mill Farm site and covers an area totalling 2.48 Hectares.

For reference purposes the areas of the farm to be redeveloped are labelled A and B; with Area A sub-divided into areas A1; A2; and A3.

Areas A3 & B are shown to be situated predominantly within Flood Zones 2 and 3 of the Environment Agency Flood Map; with Areas A1 and A2 located predominantly within Flood Zone 1.

A small part of Development Area A1, along the border with Barnsley Road, is located within Flood Zone 2.

The primary sources of flood risk to the proposed development are identified to be from the River Don and its tributary Scout Dike.

Following a comprehensive assessment through comparison of modelled flood levels for the River Don against topographical survey information, it is concluded that Development Areas A1 an A2 lie within Flood Zone 1; and therefore have a low risk from fluvial flooding.

In contrast, the assessment confirmed the location of Development Areas A3 and B within Flood Zone 3.

In order to mitigate against flooding within these proposed development areas it is proposed that ground floor levels within new build dwellings are raised to a minimum of 600mm above the 1 in 100 year plus climate change flood level; with flood resistance/resilience measures incorporated to this level within existing building structures to be refurbished, where site constraints prevent ground raising to occur.

This means that finished flood levels within Development Area B are elevated to a level of 194.5mAOD.

Proposals for the existing barn within Development area A3; involve building up of existing door and window openings on the front and gable elevations so that no opening will have a threshold that is lower than 194.0mAOD.

Furthermore the ground floor level of the former tractor shed, also within Development Area A34, will be elevated to a level of 193.80mAOD.

Flood resistance/resilience measures within Development Area A3 should be provided up to a level of 194.457mAOD i.e. 600mm above the 1 in 100 year plus climate change event.

Due to the proximity of the River Don and Scout Dike to these Development Areas, it is highly recommended that residents are advised to sign up to received flood warnings from the Environment Agency's free Flood Warnings Direct Service; and encouraged to develop a personal flood plan in the event that evacuation is advised.

Calculations indicate that in general escape from Development Areas A1 and A along Barnsley Road is low hazard. The hazard rating significantly increases for residents travelling via the site access at Development Area A3. As such an alternative escape route has been evaluated from this area of the site which will allow residents to escape via a low hazard route.

This route should be clearly marked with no obstructions to prevent safe egress from the site if necessary.

The escape route from Development Area B is northwards via Water Hall Lane. At the junction of the site with Water Hall Lane, the depth of flooding presents a hazard to pedestrians. In order to reduce the hazard to acceptable levels, the level of the road may be elevated slightly. It is however noted that raising the level of the access road/Water Hall junction will have a negative impact on the flood storage capacity within the site.

Undertaking an evaluation of pre and post-development flood storage capacity within Development Area B; indicates that due to the careful design of development, which includes conveyance routes through proposed stone boundary walls, there is minimal displacement of stored volumes as a result of the development works.

The impermeable area within the proposed development is generally increased as a result of the proposed works.

Development Areas A1, A2 and A3 are considered brownfield development. Increased surface water runoff from these areas will be restricted to existing rates incorporating a 30% reduction to accommodate climate change over the lifetime of the development. Post-development runoff emanating from these areas in excess of the restricted rates will be attenuated on-site prior to discharge.

Foul and surface water flows from the development areas to the north side of Barnsley Road are believed to currently discharge into the public combined sewer within the highway.

In accordance with the hierarchy set out within Approved Document H of the Building regulations, surface water should be directed to a) infiltration; b) watercourse; c) sewer in order of preference.

Investigations indicate that infiltration methods are unlikely to be feasible at the location of the development; and owing to topography and interception of the route to watercourse by Barnsley Road; discharge to the River Don also appears to be unfeasible.

As such it is recommended that existing outfalls into the public sewer system are re-utilised as part of the drainage strategy for the project.

It is noted however that Yorkshire Water do not have to accept surface water flows from the development; and as such it is recommended that early consultation with Yorkshire Water is sought during the detailed design phase of the project.

Development Area B is also considered to be brownfield development. It is proposed that surface water runoff will be directed via a new outfall to the River Don.

Surface water discharge will be restricted to existing rates, incorporating a betterment (as required) will additional flows attenuated within the development prior to discharge into the receiving watercourse.

In order to prevent backflows during high water levels within the River Don, it is recommended that a flap valve is installed at the proposed outfall structure.

An evaluation of Sustainable Urban Drainage methods indicates that permeable paving; online/offline underground storage; green roof technology; and rainwater harvesting are the most appropriate methods for inclusion within the surface water drainage strategy for the individual development areas at Nether Mill Farm.

It is proposed that foul or wastewater flows will be directed to the public combined sewer system within the vicinity of the development.

Yorkshire Water sewer records indicate that 225mm diameter and 100mm diameter combined public combined sewers traverse Development Area B; and it is noted that any proposed diversion works will need to be approved by Yorkshire Water under a Section 185 Agreement.

Any diverted sewers will require a minimum 3 metre easement either side of the pipe.

Furthermore the Environment Agency will require a minimum 8 metre easement from the river bank; and any works within this area; including installation of a new surface water outfall from Development Area B; will require their formal consent.

Any part of the proposed drainage system within the redevelopment at Nether Mill Farm in Penistone which is not to form part of Section 104 agreement with Yorkshire Water i.e. private drainage system, must be inspected and maintained on a regular basis, to prevent siltation at gullies and flow control chambers; thereby reducing the risk of surface flooding.

It is also noted that the current site owners propose to undertake works within the channel of Scout Dike at Barnsley Road Bridge, to remove excess silt, in order to reduce the risk of fluvial flooding from the watercourse as witnessed during the historical flood event in June 2012.

Any works proposed within the channel at this location must be approved by the Local Lead Flood Authority i.e. Barnsley Council.

1.0 Introduction

Paul Waite Associates have been appointed by Ms Rebecca Scott & Mr Ben Hinchliff to support a planning application for proposed redevelopment of existing farm buildings and land to provide residential development at Nether Mill Farm in Penistone, South Yorkshire.

The proposed development is intended to be phased over 3No individual areas within the Nether Mill Farm site and covers an area totalling 2.48 Hectares.

For reference purposes the areas of the farm to be redeveloped are labelled A and B; with Area A sub-divided into areas A1; A2; and A3.

Areas A3 & B are shown to be situated predominantly within Flood Zones 2 and 3 of the Environment Agency Flood Map; with Areas A1 and A2 located predominantly within Flood Zone 1.

A small part of Development Area A1, along the border with Barnsley Road, is located within Flood Zone 2.

Land and property within Flood Zone 1 has a low probability of flooding and is defined as being the zone comprising land as having less than the 1 in 1,000 annual probability of river or tidal/coastal flooding in any year (<0.1%).

Land and property within Flood Zone 2 has a medium probability of flooding is defined as land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Land and property within Flood Zone 3 has a high probability of flooding and is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

The primary sources of flood risk to the proposed development areas within the Nether Mill Farm site have been identified as the River Don; and its tributary known as Scout Dike. It is noted however, that other non-fluvial sources of flooding have been considered within this assessment.

It is usual for the Environment Agency to raise an objection to development applications within the functional floodplain or Zone 2 or 3 of the flood map until the question of flood risk has been properly evaluated. The Agency will also object to developments where the total site area is in excess of 1 Hectare until suitable consideration has been given to surface water runoff.

2.0 Approach to the Flood Risk Assessment

2.1 Approach

A topographical survey of Nether Mill Farm has been provided by the Client; and it is understood that it has been calibrated to Ordnance Datum. As such, the levels provided by the topographical survey have been utilised within this report.

The requirements for flood risk assessments are generally as set out in the 'Technical Guidance to the National Planning Policy Framework', published in March 2012; and in more detail from the Environment Agency's 'Standing Advice on Flood Risk' available from http://www.environment-agency.gov.uk/reasearch/planning/82584.aspx.

2.2 Application of the Sequential and Exceptions Test

The risk based sequential test should be applied at all stages of planning. Its aim is to steer new development to areas at the lowest probability of flooding, within Zone 1. The flood zones are the starting point for the sequential approach.

The proposed development areas are shown to be situated within Flood Zones 1, 2 and 3 of the Environment Agency Flood Map, and therefore some areas within the site are likely to be more prone to flooding then other areas.

Proposals for the site incorporate residential development, and as such Table 2 of the Technical Guidance to the National Planning Policy Framework (March 2012) indicates that the development is classified as 'more vulnerable'.

Table 1: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification		**Essential Infrastructure**	**Water compatible**	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**
Flood Zone	**Zone 1**	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	**Exception Test required**	✓
	Zone 3b	Exception Test required	✓	×	×	×

✓ Development is appropriate
× Development should not be permitted

In accordance with the vulnerability table above, residential development within Flood Zone 1 is deemed to be appropriate; whilst similar development within the areas shown to be situated within Flood Zones 2 and 3 will need to pass the Sequential Test and possibly the Exceptions Test before being considered appropriate for the site.

A Sequential/Exceptions Test has been undertaken by Paul Waite Associates to support development at the Nether Mill Farm site and is presented within PWA document reference 12051/I/01.