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Hanson Garden Centre

Mr C Hanson

Flood Risk and Drainage Impact Assessment

February 2013

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1 INTRODUCTION

Avie Consulting Ltd has been commissioned by Mr C Hanson to carry out a flood risk assessment for the redevelopment of the Hanson Garden Centre site, Whalley Road, Barrow, Clitheroe to form new residential development.

The aim of this report is to allow Ribble Valley Borough Council to assess the site in accordance with the National Planning Policy Framework published by the Department of Communities and Local Government. The site lies in Flood Zone 1 and the proposed site area is in excess of 1Ha therefore a Flood Risk Assessment is therefore required as part of the site evaluation.

2 PROPOSED DEVELOPMENT

The site is in a rural location approximately 2km south of Clitheroe at Ordnance Survey grid reference SD738388.

The site is bounded to the east by Whalley Road, to the west by Clitheroe Golf Club and to the north and south by open farmland.

The site is currently occupied by Hansons Garden Centre which comprises a series of steel portal frame buildings, glasshouses and lightweight re-locatable buildings set within gravel and tarmac hardstandings.

The site falls down from the west and east boundaries and the general fall of the surrounding topography is down towards the south.

The proposed development is located in the valley bottom and is bounded by the River Holme to the north and the A6024 Woodhead Road to the south.

The site is shown on the location plan in Appendix A is approximately 1.95 hectares.

The topography of the site varies between 87.850m and 83.49m AOD.

3 FLOOD RISK ASSESSMENT CRITERIA

The site under consideration is within Zone 1 on the latest version of the Indicative Floodplain Map (IFM) produced by the Environment Agency. As the site area exceeds 1Ha there is a need to carry out a flood risk assessment of the site. An extract from the Indicative Floodplain Map is enclosed in Appendix A.

Zone 1 is defined as land assessed as having less than a 1 in 1000 annual probability of river or sea flooding in any year (0.1%).

As the site lies within Flood Zone 1 the flood risk assessment needs to consider the following:

- Flooding from other sources such as rivers ,tidal, sewers and overland flooding
- The potential for the development to increase flooding elsewhere through the addition of hard surfaces
- The effect of the new development on surface water run-off

4 HISTORICAL FLOODING

We have had discussions with the site occupiers and they have confirmed that there are no records of the site flooding also the site is not identified to be in a flood warning zone as indicated on the Environment Agency mapping, please refer to Appendix B.

The Ribble valley Strategic Flood Risk Assessment, map extract enclosed in Appendix C identified flooding incidents in Clitheroe and Barrow.

5 SOURCES OF FLOODING

As part of the flood risk assessment consideration should be given to following sources of flooding and what effect these could have on the development.

5.1 Flooding from Rivers / Watercourses

The closest watercourse is Barrow Brook which is approximately 100m to the south east of the site and below site the level , the watercourse flows in a south westerly direction and therefore will not be a flood risk to the site.

5.2 Flooding from the Sea

The site is approximately 40km east of the Irish Sea and therefore flooding from the sea is not a risk.

5.3 Flooding from Land

The effect of intense rainfall needs to be considered and the local Topography of the land assessed.

The development site is currently a garden centre with buildings, tarmacadamed and gravelled external areas which discharge via a gravity piped surface water system into the ground and perimeter field ditches.

The proposed works should be designed to not produce any additional offsite surface water discharges.

5.4 Flooding from Groundwater

Groundwater flooding occurs when water levels in the ground rise above surface elevations, particularly in low lying areas.

There are no records of flooding to the site due to groundwater, and as with rainwater, any groundwater present would dissipate directly into the ground and perimeter field ditches.

5.5 Flooding From Sewers

United Utilities have provided an extract from their sewer records which shows that there are no sewers in the vicinity of the site to cause flooding.

6 FLOOD RISK SUMMARY

Sources of Flooding	Risk			Control Measures
	High	Medium	Low	
Rivers:			X	None
Watercourses			X	None
Sea			X	None
Land		X		None
Groundwater		X		None
Existing sewers			X	None

7 INCREASE TO OFFSITE FLOODING

The total site area is 1.95 Ha, the buildings and hard standings create an impermeable area is 0.745 Ha with gravel / hardstanding areas contributing 0.62Ha .

The general fall in the topography is southwards towards the field ditch on the southern boundary of the site.

The existing impermeable areas create a run off of 146 litres per second for a 1 in 1 year storm duration.

The new development should be designed to limit the surface water run-off to existing surface water discharge flows rates or better.

Current industry practice is to reduce off site flows from brownfield developments by 30% so as to reduce the impact of the development and new drainage systems.

Therefore by reducing off site flows the risk of increasing flooding off site is mitigated.

8 FLOOD RISK VULNERABILITY

The vulnerability of the proposed development is assessed in accordance with the Technical Guidance to the National Planning Policy Framework published by the Department for Communities and Local Government in March 2012.

The report should consider if the development is acceptable for the Flood Zone Classification in accordance with Table 3 within the NPPF.

The proposed development is residential and is therefore classified as “More vulnerable”

Table 3: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification (from Table 2)		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

Utilising the Flood Zone Compatibility Table above, the development is deemed appropriate for the site and flood risk classification

As part of the assessment the following development constraints require consideration and recommendation made as to how to mitigate any flood risk appropriately.

8.1 Finished Floor Levels

We recommend to mitigate against localised flooding caused by heavy / intense rainfall events, that the internal ground floor level of the residential units is set a minimum of 150mm above existing ground levels.

8.2 Existing Flood Volumes

No loss of existing flood volume will be experienced due to the redevelopment of the site.

8.3 Flood Routing

The site has clear flood routing paths should overland flows be experienced and as such we would recommend that the design of the site incorporates an open aspect to the boundaries thereby allowing flood routing to occur.

8.4 Emergency Access

The site is in flood zone 1 and as such emergency access is not an issue.

9 EXISTING SITE DRAINAGE

We have obtained public drainage records (please refer to Appendix D) which indicate that no public surface water or foul water drainage systems exist in the vicinity of the site.

We understand that the site currently utilises a cesspit for foul flows with surface water flows being positively drained to the southern boundary with the flows discharging to an informal watercourse and that sinks and untimely connects (it is assumed) to Barrow Brooke.

The site currently consists of greenhouses, display buildings and hardstandings, the existing Impermeable areas have been hatched to represent the different contributing areas and are presented in Appendix E.

100% (roofs and hardstanding) impermeable area 7450m^2

50% (gravel) Impermeable area 6200m^2

The above impermeable areas generate a flow of 146 litres / second for a 1 in 1 year return period

10 PROPOSED DRAINAGE

10.1 Surface Water

The proposed re development of the site will be residential, it is recommended and in accordance with good practice that the offsite surface water flows are reduced by 30% by the introduction of an attenuation system following the hierarchy as laid out in the approved document H of Building Regulations with respect to Sustainable Urban Drainage Systems (SUDS).

The use of soakaways is anticipated to be impracticable due to site constraints in this instance and therefore a limited discharge to Barrow Brooke of **102 litres per second is proposed** (146 l/s x 30% = 43.8 – 146=102l/s).

The proposed discharge route may well require a requisition sewer to Barrow Brooke depending on land ownerships alternatively a private easement agreement could be agreed.

Utilising a limited discharge to the watercourse will require a storm attenuation system designed appropriately to ensure all surface water remains on site above the allowable discharge rate during a 1 in 100 yr return period plus 30% climate change.

10.2 Foul Water

For the foul flows a number of options require further exploring.

- Package treatment plant discharging to Barrow Brooke
- New gravity foul sewer to the Head of the Public foul sewer in Barrow approx. 700m in length

11 GENERAL REMARKS

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12 RECOMMENDATIONS

- The site under consideration is located in Zone 1 latest version of the Indicative Floodplain Map (IFM) produced by the Environment Agency.

- There are No recorded historical flooding directly on or adjacent to the site. The risk of flooding to the site / residential units is considered to be **LOW**.

- Residential Development is classified as "More Vulnerable" and is appropriate under the National Planning Policy Framework on this redevelopment site in terms of Flood Risk in flood zone 1 areas.

- It is recommended that finished floor levels to the new residential dwelling are set at a minimum of 150mm above existing ground levels in order to mitigate against localised flooding caused by heavy / intense rainfall.

- It is proposed in accordance with industry practice for brownfield development sites to reduce the existing off site surface water flows by 30% in order to mitigate the effects of the development on downstream drainage assets.

- Surface water flows from the development are to be discharged via a new surface sewer(requisition or private easement agreement required subject to land ownerships) to the adjacent Barrow Brooke at a limited discharge 80 l/s with an appropriately sized attenuation tank for a 1 in 100 year return period plus 30% climate change allowance

- The proposed development will not affect flood routing, and as such flows/ flood routing will be maintained as per the pre-development layout.

- Foul water sewerage provision to be provided via either a package treatment plant and discharge to Barrow Brooke or offsite gravity foul drain discharging at the head of the public foul sewer in Barrow approx. 700m in length

APPENDIX A

Location Plan

APPENDIX B

EA Flood Maps

APPENDIX C

SFRA Map Extract

APPENDIX D

United Utilities Sewer Records

APPENDIX E

Existing Impermeable Areas