HTA PRECISION SHEET METAL LTD
PROPOSED INDUSTRIAL DEVELOPMENT
LAND OFF A5
CLIFTON UPON DUNSMORE
NEAR RUGBY
WARWICKSHIRE

FOR
G W DEELEY LTD

Report Reference: 4224R002 FRA

Date: January 2010
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1.0 Introduction

1.1 This report comprises a Flood Risk Assessment for the proposed development of two industrial units to be located at land off the A5 Watling Street, Clifton upon Dunsmore, Rugby, Warwickshire. The site is located adjacent to the Europark Industrial Estate. The location of the site is shown on the plan enclosed in Appendix A.

1.2 The objective of this report is to provide the Planning Authority and Environment Agency (EA) with sufficient information to consider flood risk in the planning process. The report will consider the issues set out in Appendix E 'The Assessment of Flood Risk' set out in Planning Policy Statement 25: Development and Flood Risk (PPS 25).

1.3 This report has been prepared for the sole use of the named client and consequently, is confidential to the client and his professional advisors. The Contracts (Rights of Third Parties) Act 1999 does not apply, nothing in this report confers or purports to confer on any third party any benefit or right. No responsibility whatsoever is accepted to any other person than the named client and, consequently, the contents of this report should not be relied upon by third parties for the whole or any part of its contents.

1.4 This report is made on behalf of BCAL, no individual is personally liable, and by receiving this report and acting upon it, the client - or any third party relying on it - accepts that no individual is personally liable in contract, tort, or breach of statutory duty (including negligence).

1.5 This report is a risk-based assessment based on data currently available at the time of preparation. If the available data is found to be inaccurate or incomplete, the results could differ. BCAL accepts no liability should this prove to be the case. The information presented and conclusions drawn are for guidance purposes only and offer no guarantee to the accuracy of the predicted water levels described.
2.0 Development Description and Location

2.1 Site Location and Existing Use

2.1.1 The development site is located on land off the A5, near Rugby, Warwickshire as shown on the location plan enclosed in Appendix A. The site is currently used for a small industrial development (455m² gfa) located in the southwestern corner of the site, these units will be demolished as a result of this development. A petrol filling station was once located on the eastern boundary of the site.

2.1.2 The site is located adjacent to two artificial lakes created as a result of the quarry works on the site and within approximately 100m east of a tributary of the River Avon. The site does not have a natural water course located within or adjacent to the site boundary.

2.2 Proposed Development

2.2.1 It is proposed to redevelop the site into two industrial units with ground floor areas of approx 3000m² and 2020m². The proposed development is shown in Appendix B.

2.3 Geology of the Area

2.3.1 The site was subject to quarrying operations between 1926 and 1955. The site generally has a top layer of 0.1m – 0.3m brown clay topsoil over made ground between 0.1m and 3.5m thick. The made ground is underlain by an interbedded sequence of Glaciofluvial sand/gravel and Boulder Clay.

2.3.2 Due to the backfilled nature of the site it would not be appropriate to use infiltration techniques on the site. Infiltration techniques could lead to settlement of the backfilled material.

2.4 Vulnerability Classification

2.4.1 It is proposed to redevelop the site into a B2 industrial use, this is classified as Less Vulnerable within PPS 25 table D2. An extract of table D2 is enclosed in Appendix E.
3.0 Definition of Flood Hazard

3.1 Flooding from Rivers

3.1.1 A tributary to the River Avon is located approximately 100m to the west of the proposed redevelopment. The tributary flows in a north to south direction towards the River Avon.

3.1.2 The River Avon is located approximately 620m to the south of the proposed redevelopment. The River Avon flows from East to West.

3.1.3 We are not aware of any historical river flooding on the proposed development site.

3.1.4 The risk of flooding from this river is considered in section 4.0.

3.2 Flooding from the Sea

3.2.1 The site is located inland a significant distance from the coast with a minimum height of approximately 106.67m AOD. We therefore do not consider flooding from the sea to be a potential source of flooding for the proposed redevelopment site.

3.3 Flooding from Land

3.3.1 There is always a risk of potential flooding from overland surface water flow during an exceptional rainfall/storm event. We are not aware of any historical flooding caused on the development site by overland flooding.

3.3.2 The development site will be designed to ensure appropriate management of overland surface water flows.

3.4 Flooding from Groundwater

3.4.1 The site is underlain by clay made ground and will therefore not contain an aquifer. Ground water was found at depths of 2.8m to 9.7m during the geotechnical investigation. We do not consider groundwater to be a potential source of flooding for the proposed development site.

3.5 Flooding from Sewers

3.5.1 We are not aware that drains or sewers have caused any flooding on the proposed site in the past. We therefore do not consider flooding from sewers to be a potential source of flooding for the proposed development site.
3.6 Flooding from Artificial Sources

3.6.1 Two artificial lakes, probably unbackfilled gravel workings, are located on the western boundary of the site. The lakes are located downhill of the proposed redevelopment. We are not aware of any historical flooding caused by artificial sources on the proposed redevelopment site.

3.6.2 We therefore do not consider artificial sources to be a potential source of flooding for the proposed development site.

3.7 Existing Surface Water Drainage

3.7.1 We are not aware of any flooding associated with the existing surface water drainage located on the site. We therefore do not consider existing drainage to be a cause of flooding.

4.0 Probability

4.1 Flood Zone

4.1.1 The site is shown to be within the Flood Zone 1 as detailed on the Environment Agency's Indicative Floodplain Maps. A copy of the EA's indicative floodplain map is enclosed in Appendix C.

4.1.3 From the above information the site is shown to within Flood Zone 1. Flood Zone 1 has an annual probability of flooding of less than 1 in 1000.

4.1.4 Table D1 of PPS 25, enclosed in Appendix D, states that any development type is appropriate within Flood Zone 1. We therefore consider the proposed redevelopment appropriate at this location.

5.0 Climate Change

5.1 We understand that possible climate change effects have been taken into consideration in the Environment Agency's indicative flood mapping.
6.0 Flood Risk Management Measures

6.1 The site was quarried between 1926 and 1955, hence, the site has a top layer of made ground between 0.1m and 3.5m thick. Due to the backfilled nature of the site it would not be appropriate to use infiltration techniques on the site. Infiltration techniques could lead to uncontrolled settlement of the made ground.

6.2 The redevelopment will discharge surface water to the artificial lakes located adjacent to the site. The runoff flow will be attenuated to $Q_{BAR}$ runoff rates calculated using the Environment Agency’s document 'Preliminary rainfall runoff management for developments'. The total site $Q_{BAR}$ has been calculated as 7.54l/s, a copy of the calculation is enclosed in Appendix F.

6.3 The proposed development comprises two industrial units the construction of these units will be phased with the larger northern unit being constructed in the short term and the smaller southern unit built at a later date.

6.4 It is therefore proposed to provide individual surface water attenuation structures for each of the buildings. These attenuation structures will also be combined with two vortex flow control devices linked via a single outfall to ensure surface water discharge from the site is no greater than $Q_{BAR}$. An indicative drainage layout for the northern unit is shown in Appendix G. A drainage layout for the southern unit has not been determined to date as the final building design may change.

6.4 Surface water attenuation on the site will be provided as underground storage to accommodate the worst 1 in 100 year event plus a 20% allowance for climate change. From an initial design this equates to 414m3 and 448m3 for the northern and southern units respectively. Both attenuation volumes are subject to change when the final design is complete. Details of the surface water attenuation calculations are enclosed in Appendix H and I.

6.5 The proposed redevelopment will complete a normal maintenance regime to ensure that on site drainage is adequately maintained for the life time of the redevelopment.
7.0 Management of Residual Risks

7.1 There will always be a residual risk of overland flooding if the surface water drains are not maintained sufficiently or during an exceptional storm event when the surface water drainage system is unable to cope with the rate or volume of rainfall. Normal maintenance will be required to the on and off site drainage systems. If flooding occurs due to lack of maintenance or during an exceptional storm event, the speed of inundation should be slow and should not endanger human life.

7.2 The proposed redevelopment will complete a normal maintenance regime to ensure that on site drainage is adequately maintained for the life time of the redevelopment.

7.3 As the proposed redevelopment will not displace flood water and the rate of surface water runoff should not increase, the risk of flooding to downstream neighbours should not increase as a result of the proposed redevelopment.

7.4 The detailed level design of the buildings and surrounding ground levels should ensure that there are lowered routes between the buildings to ensure surface water is not trapped or forced into the buildings.
8.0 Conclusions

8.1 The development site is located on land off the A5, near Rugby, Warwickshire. It is proposed to redevelop the site into two industrial units with ground floor areas of approx 3000m² and 2020m².

8.2 The site to be redeveloped has no known history of flooding.

8.3 The site would appear to be in Flood Zone 1 – Low probability as set out in PPS25. The proposed redevelopment complies with the type of development permitted in PPS25, for Flood Zone 1.

8.4 As the proposed redevelopment will not displace flood water and the rate of surface water runoff should not increase, the risk of flooding to downstream neighbours should not increase as a result of the proposed redevelopment.

8.5 There will always be a residual risk of overland flooding if the surface water drains are not maintained and become blocked. The proposed redevelopment will complete a normal maintenance regime to ensure that on site drainage is adequately maintained for the life time of the site.
Appendix A

Location Plan

BCAL drawing no 4224-01
Appendix B

Site Layout Levels

G W Deeley drawing no. E6530-T-03
Appendix C

Environment Agency’s Indicative Floodplain
Appendix D

Table D.1: Flood Zones
(Note: These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences)

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<tr>
<td><strong>Definition</strong></td>
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<tr>
<td>This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (&lt;0.1%).</td>
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<tr>
<td><strong>Appropriate uses</strong></td>
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<tr>
<td>All uses of land are appropriate in this zone.</td>
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<tr>
<td><strong>FRA requirements</strong></td>
</tr>
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<td>For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.</td>
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<td><strong>Policy aims</strong></td>
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<td>In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.</td>
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