Flood Risk Assessment in accordance with PPS25

for

Developments at Kelsa Truck Parts

and

Former Bowden Hey Mill

at

Bowden Lane, Chapel en le Frith.

Peter Mason Associates
Goodyear Busines Park
New Street
Mawdesley
Lancashire
L40 2QP

17 August 2011

Flood Risk Assessment in accordance with Planning Policy Statement 25 (PPS25)

This Flood Risk Assessment has been prepared in accordance with the requirements of PPS25, in particular, the pro-forma contained in Appendix C of PPS 25 Practice Guide and Environment Agency FRA Guidance Note 1.

1.0 Existing Site Description and Location

1.1 The adjacent subject sites are located at site centred grid references

Bowden Hey Mill (Mill)	NGR 406150E, 381260N
Bowden Hey Mill (Industrial)	NGR 406190E, 381290N

at Bowden Lane, Chapel en le Frith. The sites are identified within the enclosed plans prepared by Mattin McLean Limited, Architects and are shown also on the aerial photograph attached at Appendix A.

1.2 The drawings confirm the subject site areas to be

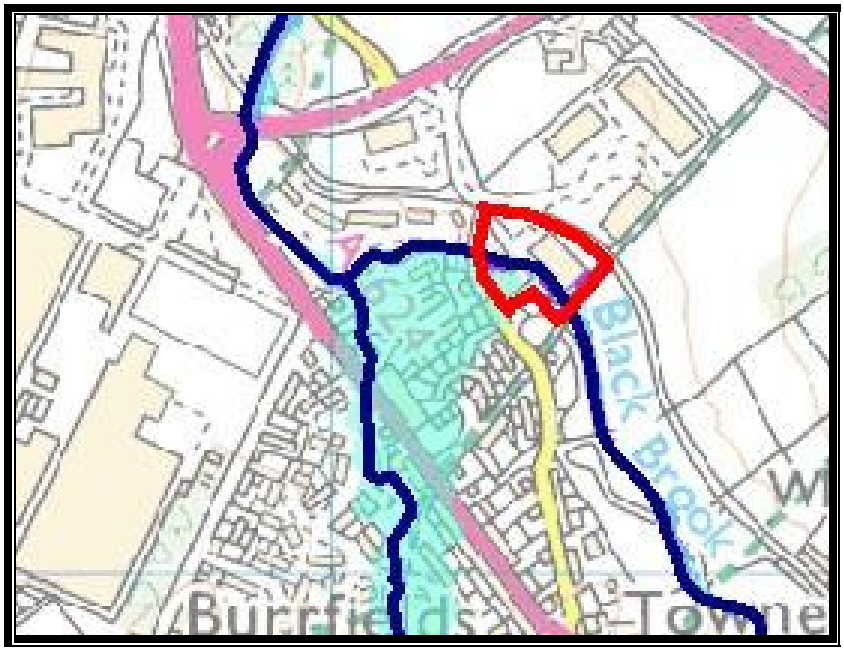
Bowden Hey Mill (Mill)	0.04 hectares
Bowden Hey Mill (Industrial)	0.14 hectares

1.3 The Mill site is currently occupied by original Mill buildings, used as offices and workshop areas, car park yards, open land and includes a section of Black Brook in open channel.

1.4 The Industrial site is currently occupied by existing steel and masonry industrial buildings, used as production areas, yards, some landscaped open land and includes sections of Black Brook in culvert and open channel.

1.5 The extract of the Environment Agency web-based Flood Risk Map overleaf indicates that the Industrial site is within an area classified at Flood Zone 1 – Low Probability and the Mill site is within Flood Zone 2 – Medium Probability.

1.6 Table D1 of PPS25 confirms that Flood Zone 1 is representative of land assessed as having less than a 1 in 1000 (0.1%) annual probability of flooding from rivers and coastal inundation in any one year and Flood Zone 2 is representative of land assessed as having between a 1in 100 and 1 in 1000 annual probability or river flooding (1% - 0.1%) or between a 1in 200 and 1 in 1000 annual probability or river flooding (0.5% - 0.1%) in any one year.



Extract of Environment Agency web-based Flood Risk Map

2.0 Development Proposals

2.1 The works will be the subject of separate planning applications:-

Industrial - The demolition of existing industrial buildings and replacement by new a steel framed portal framed building and a steel framed lean-to extension

Mill - The part demolition of existing masonry mill buildings and conversion of remaining mill buildings to three storey residential accommodation, together with the conversion of existing yard and office car parking areas to residential access and car parking.

2.2 The Industrial development type is classified in Table D2 of PPS25 below as within the "Less Vulnerable" category and the Mill development type is classified as within the "More Vulnerable" category in consideration of flood risk.

Table D.2: Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	• Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.[19]
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste.[20] • Sites used for holiday or short-let caravans and camping, **subject to a specific warning and evacuation plan**.
Less Vulnerable	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment plants. • Sewage treatment plants (if adequate pollution control measures are in place).
Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, **subject to a specific warning and evacuation plan**.

2.3 Table D3 of PPS25 below confirms the proposed development types are compatible with a location within Flood Zones 1 and 2.

Table D.3[22]: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✔	✔	✔	✔	✔
	Zone 2	✔	✔	Exception Test required	✔	✔
	Zone 3a	Exception Test required	✔	✗	Exception Test required	✔
	Zone 3b 'Functional Floodplain'	Exception Test required	✔	✗	✗	✗

Key:

✔ Development is appropriate

✗ Development should not be permitted

3.0 Definition of Flood Hazard

3.1 Reference has been made to the High Peak Borough Council Strategic Flood Risk Assessment Level 1 (SFRA) dated April 2008.

3.2 The possible history of flooding caused by blockage or lack of capacity in surrounding sewers has been considered.

3.3 United Utilities have been consulted in this respect and reference has been made to the SFRA for any historical record of flooding.

3.4 Derbyshire County Council has been consulted, as the authority responsible for highway drainage and land drainage maintenance in the Borough, in respect of any possible history of flooding from local culverts or highways drains and reference has been made to the SFRA for any record of flooding of properties as a result.

3.5 The site may be at risk of flooding as a result of flooding from other local watercourses or other open bodies of water.

3.6 Black Brook, designated "Main River", passes through the site ownership flowing in a generally north and westerly direction, forming the boundary between the two sub-site areas. The brook is part in open channel and part in pcc box culvert (beneath the yard area within the Industrial site). The open cut sections enjoy the benefit of local substantial mortared stone flood defence walls, varying in top level but in all cases at least 900mm above adjacent yard levels.

3.7 The Environment Agency has been consulted and has provided Black Brook undefended water levels from the Upper Mersey Flood Mapping Study 2009. Flood levels provided by The Environment Agency and flood plan are attached at Appendix B.

3.8 The site may be at risk of flooding as a result of groundwater levels reaching and exceeding existing ground levels on site. Reference has been made to the SFRA for any record of flooding of properties as a result.

3.9 Any increase in impermeable areas within the development site will increase the risk of overland flooding.

4.0 Probability of Flooding.

4.1 Whilst most of the Industrial site lies above the highest local undefended 1% AEP Black Brook water level of 210.26m at node M138A, but below the highest local undefended 0.1% AEP Black Brook water level of 210.57m at node M138A (and would therefore be classified as within Flood Zone 2) there are areas which if undefended would be classified within Zone 3a, ie at risk of flooding during 1% AEP events.

4.2 The Mill site lowest existing ground and floor level is 209.7m. This is above the highest local undefended 1% AEP Black Brook water level of 209.44m at node M136U but below the highest local undefended 0.1% AEP Black Brook water level of 210.82m and is therefore classified as within Flood Zone 2

4.3 Local defences protect all areas of the site to levels in excess of the 0.1% AEP water level.

4.4 There are areas of the site that may be at risk of overland flows in the event of failure of the local defences.

4.5 Drawing PM4146/100 at Appendix C shows anticipated flood risk levels

4.6 All areas on both sites are above local 5% AEP water levels.

4.7 Existing levels or local defences currently protect all parts of both sites for all including 0.1% AEP water levels.

4.8 The SFRA has identified inaccuracies in the Environment Agency Flood Maps. For Black Brook these have been described as “Misalignments at the upstream section of Main River, and at locations along its length”.

4.9 United Utilities have responded to our consultations with respect to properties on the flood risk register and historical flooding. Their response to this consultation is attached to this FRA at Appendix D.

4.10 There is no record in the SFRA of flooding of local properties caused by flooding from local sewers.

4.11 Derbyshire County Council have responded to our consultations with respect to flooding from local watercourses, highways and associated culverts. Their response to this consultation is attached at Appendix E.

4.12 There is no record in the SFRA of flooding of local properties caused by flooding from highway drains and culverts.

4.13 The SFRA makes no reference to any local flooding as a result of groundwater levels reaching or increasing above existing ground level.

4.14 There are no areas of new building or construction on greenfield land and, in consequence, there is no increased risk of surface water flooding as a result of the new development.

5.0 Climate Change.

5.1 According to Annex B of PPS25, it is anticipated that Climate Change will bring about an increase in rainfall intensities in the future.

5.2 See PPS25 Table B.2 below.

Table B.2 Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights.

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height	+5%		+10%	

5.3 With an estimated design life of up to 50 years for commercial developments and up to 100 years for residential developments, any necessary on-site designs for drainage, soakaways or other sustainable methods limiting surface water disposal flows will incorporate rainfall intensities that have been increased by up to 30% to take account of the effects of climate change up until the year 2115.

5.4 River flows provided by The Environment Agency have been enhanced for the effects of climate change and it is assumed that enhancement is +20% as Table B.2 above

6.0 Detailed Development Proposals.

6.1 The Industrial Site

6.1.1 It is proposed to demolish existing lean to buildings and replace with a new steel portal framed building at the northern end of the factory, and to extend the existing factory at the southern end of the site.

6.1.2 Finished floor level is to be set at 210.12m AOD, based upon extension of existing floor levels. This is below the local undefended Q100+cc level as Black Brook enters the site from the south, but above it elsewhere on site.

6.1.3 Only in the event of local failure of defences on the eastern channel adjacent river nodes M137 and M138 is this part of the site at risk of overland flows.

6.1.4 It is proposed that construction methods for the new units should give consideration to incorporating recommendations made in Communities and Local Government - "Improving the Flood Performance of New Buildings - Flood Resilient Construction".

6.1.5 External ground levels around the units will generally be set at a level 150mm below FFL to protect the buildings from overland flows

6.2.6 There will always be routes of safe emergency egress to parts of the site above the Q100+cc flood level.

6.2 The Mill Site

6.2.1 It is proposed to demolish part of the existing mill buildings and to convert the remainder to three storey residential accommodation, with existing office car parking being converted to residential access and parking.

6.2.2 Finished floor level of the ground floor construction will be set at 210.495m AOD, which is more than 600mm above local undefended Q100+cc level of 210.62m AOD

6.2.3 Only in the event of local failure of defences on the eastern channel adjacent river nodes M137 and M138 is this part of the site at risk of overland flows across the yards.

6.2.4 Construction methods for the new residential units will incorporate recommendations made in Communities and Local Government - "Improving the Flood Performance of New Buildings - Flood Resilient Construction". To this end, the following features are recommended in the construction:-

- The use of solid ground bearing floor construction.
- Wiring and servicing the properties such that sockets, meters etc are above design flood levels and cable routes to these sockets come from above.
- Avoid where possible the use of stud partitioning at ground level.
- The possible use of sealed garden gates and flood resilient boundary fence panels

This list of measures should be regarded as indicative only, not an exhaustive list.

6.2.5 External ground levels around the units will generally be set at a level 150mm below FFL to protect the buildings from overland flows

6.2.6 Ground levels to both the front and rear of the units are above the local Q100+cc flood level. There will therefore always be routes of safe emergency egress to parts of the site above the Q100+cc flood level.

6.3 There is no proposed increase in impermeable area anywhere on either site and all new drainage will be designed to discharge into existing systems on site. Existing surface water drainage from all parts of both sites has been established to discharge into the existing Black Brook channel. Discharges to the watercourse are protected by non return flap valves.

6.4 In general the design of on-site surface water drains will be in accordance with good practice for no surface flooding during the critical 3.33% storm.

6.5 In addition to provision of any 3.33% + climate change rainfall event storage, PPS 25 requires that there is no risk of flooding to buildings or any overland flows offsite during a 1% + climate change storm.

6.7 Whilst storage to protect the site against flooding during a 3.33% event must be provided underground, additional attenuation storage up to the 1% + climate change event may be provided on the surface of the site provided it does not present risk of flooding to buildings or other vulnerable areas or risk of overland flows from the site.

6.8 Foul drainage from the sites will connect with the existing foul and combined sewers local to the site via new sewer connections in accordance with S.106 of The Water Industry Act 1991.

7.0 Flood Risk Management Measures.

7.1 Pitching finished floor levels of the industrial extensions at least 150mm above external ground levels will ensure reduced risk of damage as a result of overland flows around the site.

1.1 Pitching finished floor levels of the residential blocks at a level in excess of 600mm above Q100+cc levels will safeguard the development against flood levels during such events.

7.3 In the event of extreme emergency the local authority and other emergency services have contingency plans for dealing with the consequences of flooding.

7.3 The design of surface water drainage will ensure that there are no uncontrolled off-site overland flood flows created by the proposed development. Where possible, site surfaces will be modelled so that flood flows generated on site from events beyond the stipulated drainage design criteria will flow to, and be contained on site within, landscaped or paved areas such that there is no increased risk of flooding to buildings and other vulnerable areas. Such flood flows will not be allowed to flow from the site onto adjoining property or highways.

7.5 Flood flows onto the sites from adjoining property will either pass across the site or will be contained on site within landscaped or paved areas such that there is no increased risk of flooding to buildings and other vulnerable areas.

8.0 Off-site Impacts.

8.1 There will be no additional off-site impacts as a result of this development.

8.2 Proposed on-site drainage will be designed and constructed in accordance with The Building Regulations.

8.3 This will also be designed so as not to compromise the existing United Utilities public sewerage system and the local land drainage system.

8.4 All on-site roofs and paved areas are to drain into the designed surface water drainage system, thereby ensuring there will be no off-site flood flows generated by the development.

9.0 Residual Risks.

9.1 The risk of flood flows entering and leaving the site will remain after development. This risk will be reduced as far as possible because the design will be such that there will be no flooding during all rainfall events up to and including the critical 3.33% storm and no overland flows from the site up to the critical 1% + climate change storm.

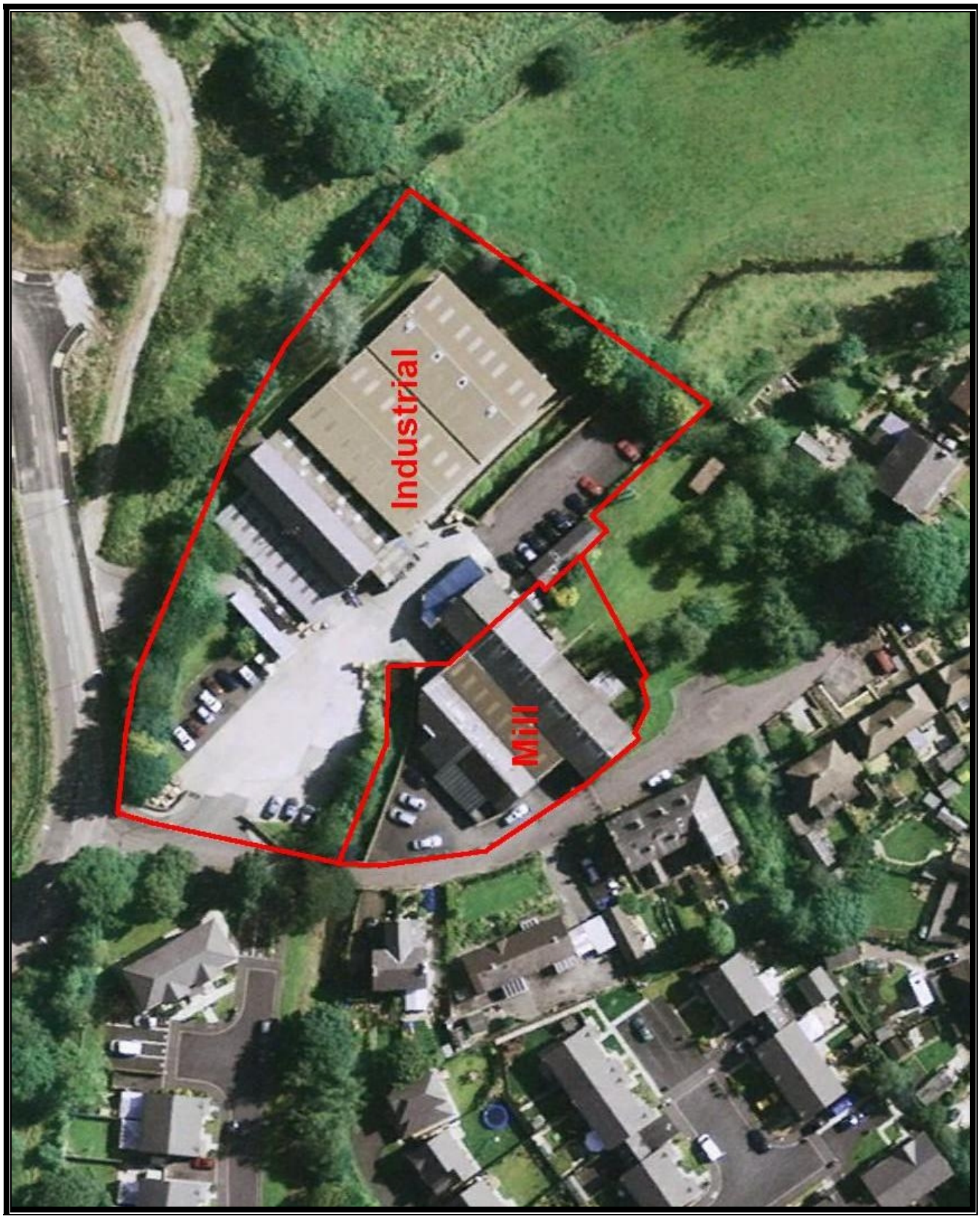
9.2 By implementation of the flood procedures and by careful design of the flood protection measures as described above, all residual flood-related risks will be minimized after the development has been completed.

Steven P. Douglas B.Eng, C.Eng. MICE
Peter Mason Associates.

17 August 2011

Appendix A

Site Aerial Photograph


Industrial
Mill

Appendix B

Flood Risk Drawing PM4146/100

Legend:-

Extent of Q100+cc Flood level with benefit of existing local defences

Extent of local defence walls

Extent of areas at risk of effects from overland flows onsite in the event of local defences failure during Q100+cc watercourse event

Q100 level 209.09m
M134B---Q100+CC level 209.24m

M134B

Q100 level 209.30m
M135U---Q100+CC level 209.49m

M135U

Q100 level 209.44m
M136U---Q100+CC level 209.62m

M136U

Q100 level 210.10m
M137---Q100+CC level 210.37m

M137

Failure of local flood defences here at risk of causing overland flows affecting the site.

Q100 level 210.21m
M138---Q100+CC level 210.44m

M138

Q100 level 210.26m
M138A---Q100+CC level 210.46m

M138A

Area not surveyed

rev	Amendment	Date	Sig.

peter mason associates
consulting civil and municipal engineers

Goodyear Business Park,
New Street
Mawdesley,
Near Ormskirk,
Lancashire.
L40 2QP

Tel **01704 823245**
Fax **01704 823246**
email steve@petermasonassociates.co.uk

PROJECT
Bowden Hey Mill, Chapel en le Frith

TITLE
Flood levels affecting the development site

A1 - SCALE 1:200 DATE Jun 11

DRAWING No. PM4146/100 REVISION

Appendix C

Environment Agency

Black Brook undefended flood levels

Upper Mersey Flood Mapping Study 2009

Node	Eastings	Northings	5% AEP EVENT	1% AEP EVENT	1% + CC AEP EVENT	0.1% AEP EVENT
M138A	406212	381235	210.01	210.26	210.46	210.57
M138	406204	381245	209.85	210.21	210.44	210.57
M137	406191	381260	209.62	210.1	210.37	210.51
M136U	406148	381274	209.26	209.44	209.62	209.82
M135U	406138	381277	209.11	209.3	209.49	209.68
M134B	406117	381283	208.94	209.09	209.24	209.38

Upper Mersey Flood Mapping Study 2009. Black Brook Undefended Water Levels

Appendix D

United Utilities

Response to FRA Consultation

Subject: RE: Bowden Hey Mill, Bowden Lane, Chapel en le Frith SK23 0JQ
Date: Wed, 17 Aug 2011 09:06:02 +0100

From: "Wong , Josephine" <Josephine.Wong@uuplc.co.uk>
To: "Steve Douglas" <steve@petermasonassociates.co.uk>

Hi, Steve

Thanks for you email. I have consulted my colleague, John Lunt regarding the development of Bowden Hey Mill, Bowden Lane, Chapel en le Frith SK23 0JQ.

In reply to your enquiry below, I can advise that we **have records** of public sewer flooding of properties in this vicinity as a result of overloaded sewers. i.e. properties on the 'at risk' register as compiled for our Regulator.

Please note that United Utilities Water plc (UUW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the 'at risk' register.

Also, this does not include any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which UUW has no control and not a facet of sewer capacity.

Further to the comments above, please also be aware of the following disclaimer and future declaration;

"United Utilities Water plc (UUW) will provide information on connection points and maximum permitted discharge rates to public sewers in response to enquiries by developers and in response to Planning Applications where Planning Authorities have elected to consult UUW on drainage matters.

However, the points of connection and discharge rates cannot be allocated and reserved for a particular development. UUW reserves the right to revise the connection point and discharge rate current at the time that a formal application for connection to public sewer is made, in order to take account of possible changes in discharges to the public sewer between the date of the enquiry and the date of the connection being required".

Please also note that the SUDS element of the Floods and Water Management Act is expected to come into force in 2012 and the responsibility for approval and subsequent adoption of surface water drainage systems will then rest with the appropriate SUDS Approval Body and not United Utilities.

Should you have any query, please feel free to contact me.

Regards,

Josephine

Date: Thu, 16 Jun 2011 10:05:10 +0100
To: planning.liaison@uuplc.co.uk
From: Steve Douglas <steve@petermasonassociates.co.uk>
Subject: Bowden Hey Mill, Bowden Lane, Chapel en le Frith SK23 0JQ

To whom it may concern

Site centre co-ords NGR 406150E, 381250N.

We are instructed to provide a Flood Risk Assessment in accordance with PPS 25 for development at the site,
land at Bowden Hey Mill, Bowden Lane, Chapel en le Frith SK23 0JQ

Will you please advise of your directions for inclusion in a Flood Risk Assessment for development on the site. In particular, we require advice on any record of local properties on the "at-risk" register, together with potential sources of flooding from public combined, foul or surface water sewers local to this site.

I confirm that we will be making similar consultation with the Highway and Land Drainage Authorities in respect of highway drains and culverts.

Regards,

Steve Douglas
Peter Mason Associates

Tel:- 01704 823245
Fax:- 01704 823246
Mob:- 07803 210383
email: steve@petermasonassociates.co.uk
www.petermasonassociates.co.uk

Appendix E

Derbyshire County Council

Response to FRA Consultation

From: "Biddlestone,James (Environmental Services)"
<James.Biddlestone@derbyshire.gov.uk>
To: 'Steve Douglas' <steve@petermasonassociates.co.uk>
Subject: RE: Kelsa Truck Products, Bowden Lane, Chapel en le Frith

Date: Mon, 11 Jul 2011 06:39:32 +0000

Dear Mr Douglas,

Thank you for your enquiry in regards to our records for highway flooding near to your proposed area of works/development.

The data to which we currently have access does not identify any historic highway flooding related issues in your area of interest.

If you require any further information please do not hesitate to contact me.

Regards

James Biddlestone
Project Engineer
Highway Asset Implementation Officer
Highway Asset Management
Derbyshire County Council
County Hall
Matlock
Email james.biddlestone@derbyshire.gov.uk
Tel - 01629 538563

From: Steve Douglas [mailto:steve@petermasonassociates.co.uk]
Sent: 16 June 2011 11:18
To: ES Netmanadmin (Environmental Services)
Subject: Kelsa Truck Products, Bowden Lane, Chapel en le Frith

To whom it may concern

Please see the attached location plan of the above site.

This practice is instructed to prepare a Flood Risk Assessment to accompany a Planning Application for this site. We would be grateful for your advice of any record you may have of flooding from highway drainage in the locality of Bowden Lane, Chapel en le Frith.

We have consulted United Utilities requesting their similar advice with regard to public sewers in these streets also.

Please reply directly via email to this address.

Regards,

Steve Douglas
Peter Mason Associates

Tel:- 01704 823245
Fax:- 01704 823246
Mob:- 07803 210383
email: steve@petermasonassociates.co.uk
www.petermasonassociates.co.uk