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INVESTOR IN PEOPLE

PEAK ASSOCIATES
ENVIRONMENTAL CONSULTANTS LTD

Flood Risk Assessment for Proposed Residential Property on Land Adjacent to 66 Hayfield Road, Chapel-en-le-Frith SK23 0JF (SITE 'D')

REPORT PREPARED ON BEHALF OF KAPETIL LTD

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Report QA No: 12090
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1. Introduction & Aims

The site comprises an area of land of approximately 200m^2 (0.02 hectares). The site (referred to by the developer as Site 'D') is located in a residential setting adjacent to number 66 Hayfield Road, Chapel-en-le-Frith SK23 0JF (see photo 7 and Location Plan 1). The National Grid Reference for the site (NGR) is 406029 381136. The site is bound by South Head Drive to the north and west (see photos 1 - 4) and a watercourse known as Warm Brook to the east (see photos 9 - 12). The site is currently an area of open grassed ground.

Warm Brook is classed as Main River and flows in a northerly direction as it passes the site. Warm Brook flows through two large culverts located towards the northeast of the site. These culverts will be referred to as Culverts 'A' and 'B' in this report (see Plan 1 and photos 14 and 17). The site is elevated approximately 2.6m above the bed of Warm Brook which flows along the eastern boundary (see photo 17).

The proposals for the development are for a detached house. Photographs of the site are presented in Appendix 1. This report is intended to assist in the discharge of planning conditions relating to flood risk.

The high point of the site is the southern tip where the ground elevation is 212.9m AOD. The land falls gently to the northeast where ground elevations are typically 211.8m AOD adjacent to the Brook (see photo 3). Warm Brook flows in a northerly direction along the eastern site boundary in a steep walled channel (see photo 10). A water level of 209.44m AOD was recorded in the brook upstream of Culvert 'B' on 11th August 2012. A topographical survey plan (to OS datum) of the existing site is presented as Plan 3.

The Environment Agency flood map in Appendix 2 indicates that the site is located largely within Flood Zone 2 of Warm Brook (medium flooding probability 1% - 0.1%). A small part of the site to the southeast is located within Flood Zone 1 (low annual flooding probability of <0.1%). Plan 2 shows the Flood Zones associated with Warm Brook superimposed onto an early sketch of the proposed development.

This report therefore seeks to assess the risks of flooding from and to the future site land use with consideration of climate change and to identify how these flood risks will be managed as part of the site's redevelopment. The report will also outline the potential opportunities to reduce the probability and consequences of flooding to the surrounding area.

2. Flood Risk Assessment

2.1. Site Flood Zones & Proposed Development

The Environment Agency flood zone map has been superimposed onto the proposed development map and this is included as Plan 2. The plan shows that the site is located largely within Flood Zone 2 of Warm Brook (medium flooding probability 1% - 0.1%). A small part of the site to the southeast is located within Flood Zone 1 (low annual flooding probability of <0.1%).

Residential properties are classed as 'more vulnerable' in terms of their flood risk vulnerability classification and as such, this type of development is appropriate in both Flood Zones 1 and 2 when referring to the Technical Guidance to the National Planning Policy Framework – ref ii.

2.2. Source of Flooding and Predicted Flood Levels

The main source of flooding at the site would be from overtopping of the banks of Warm Brook. This scenario could occur during extreme high flow conditions, in which case the capacity of the two culverts (Culverts A and B – see Plan 2) could potentially be exceeded. Local knowledge gained during the site walkover survey suggests that flooding of the northeastern corner of the site has occurred previously due to the blockage of the debris screen (see photo 14) upstream of Culvert B with debris such as litter and tree branches. The Environment Agency has not however provided any details of historical flooding of the site as part of their flood data in Appendix 2.

A remote water level measuring station is located in the channel of Warm Brook at the northeast corner of the site (see photos 15-17). It is understood that this measuring station provides real-time water-level monitoring data to the Environment Agency – who would respond to a rise in the brook's water level due to a blockage of the debris screen. The debris screen is a two stage raked screen with 1250mm and 1050mm vertical drops. The lower screen is 2250mm wide and the upper screen increases from 2250mm to 4750mm in width. Both stages have open mesh screen deck flooring.

The purpose of the debris screen is to prevent debris floating in the river channel from entering the culverted section (Culvert 'B') of Warm Brook beneath Hayfield Road. Assuming a blockage scenario of the debris screen upstream of Culvert 'B', coupled with an assumption that the Environment Agency could not respond in time to clear the blockage (a worst-case occurrence), flood waters would rise in the river channel between Culverts A and B and would eventually spill out onto the low lying land in the northeast corner of the site.

Examination of the topographical survey (Plan 3) suggests that the flood waters could potentially inundate the land adjacent to the large sycamore tree (see photo 2) before spilling out onto the carriageway at the junction of Hayfield Road and South Head Drive (see photo 6). A portion of these flood waters could then potentially re-enter the

Hayfield Road culvert via the highway drains in this location (see photo 8). Any remaining flood water would then flow in a northwesterly direction down Hayfield Road, away from the site.

The High Peak SFRA (Strategic Flood Risk Assessment - refer to section 2.4 and reference vi) confirms that there are no records of flooding from artificial sources but that surface water is also a contributing factor.

The SFRA also raises some issues of the accuracy of the flood plans within the High Peak area; however at the location of this site i.e. adjacent to Warm Brook, there do not appear to be any recognised discrepancies. The nature of the land and geology with steep narrow river channels, leads to rapid rises in flood levels within the High Peak area and in a number of locations the flood zones coincide with a deepening of the flood waters during the higher return period events rather than a lateral spread of flood waters. Flood waters are often characterised by high flow velocities.

The EA flood data in Appendix 2 shows that **NODE POINT 3** is the flood modeling location which is most relevant to the site (this is the node point on Warm Brook that is in closest proximity to proposed dwelling). The modeled peak water levels for node point 3 are shown in the table below with respect to the relevant return periods:

AEP/Return Period	Modeled Peak Water Level (m AOD)
5% AEP (1 in 20 year)	210.93
1% AEP (1 in 100 year)	211.60
1% AEP (1in 100 year) + climate change	212.18
0.1% AEP (1 in 1000 year)	212.46

Given the proximity of the site to the brook, Peak Associates are suggesting a precautionary approach to the establishment of minimum finished floor levels for the proposed property. The precautionary approach (which will allow for climate change) is to take the predicted peak water level for the 1 in 1000 year return period (0.1% AEP) for node point 3 and add a 600mm freeboard allowance for the proposed building and a 300mm freeboard allowance for the access, parking and pedestrian areas.

The suggested minimum finished levels for the development are therefore:

- Minimum Finished Floor Level for the building = **213.06m AOD** (212.46 + 600 mm)

- Minimum Finished Level for access, parking, and pedestrian areas = **212.76m** AOD (212.46 + 300mm).

The raising of the property's finished floor levels, access, pedestrian and parking areas would occur within Flood Zones 1 and 2. There should therefore be no requirement to provide flood storage compensation for the area of the Zone 2 floodplain which would be taken up as a result of the land raising proposed. This was

confirmed to Peak Associates by Lesley Slaney of the Environment Agency's Development & Flood Risk team.

The construction of a perimeter brick wall around the property is also suggested as a 'belt and braces' measure in order to direct potential flood waters away from the building (see Plan 2). The top of the brick wall should be set at a minimum elevation of 213.56m AOD (0.5m higher than the proposed finished floor level of the building).

There is to be no change to the existing ground level in the proposed garden to the northern end of the property (within the root protection zone of the large sycamore tree). In this respect, the area to the north of the proposed property will be allowed to flood during an extreme event.

The property must not be constructed on top of the United Utilities combined sewer which flows beneath the western boundary of the site (see Plan 2 and Appendix 4). The advice of United Utilities should be sought at an early stage with regards to the construction of foundations close to the sewer and also for any proposed foul and surface water connections to their assets.

2.3. The Sequential & Exception Tests

The proposed end use of the site (residential dwelling) falls within the 'More Vulnerable' classification when referring to Table 2 of the Technical Guidance to the National Planning Policy Framework (ref ii). When referring to table 3 of the Technical Guidance, it is clear that the development of this land use is appropriate in both Flood Zones 1 and 2 without the need for the exception test.

The minimum finished floor level of the property should be compliant with the minimum levels stipulated in section 2.2.

2.4. Review of The High Peak Borough Council's SFRA

Warm Brook is a tributary of Black Brook which is in turn a tributary of the River Goyt, which ultimately flows into the River Mersey. It is within the area of the High Peak Borough Council.

The area covered by the High Peak Borough Council includes the Peak District National Park, where the Council has no planning powers. The area outside of the National Park is referred to as the High Peak plan area, for which the SFRA study area covers.

The plan area falls into 2 sections, of which the area including Chapel-en-le-Frith falls into the more west and southern area.

The following key information has been extracted from the High Peak Borough Council's Strategic Flood Risk Assessment (ref vi) in order to further inform this site specific FRA:

'Fluvial Flood Risk in the High Peak Area'

4.5. 'In general, the non-Main Rivers in the Borough have narrow flood zones, contained by the local steep gradients. The smaller tributaries which feed them occur in abundance, but due to their small size they do not have Flood Zones. It is clear that many of these watercourse, although small do pose local flood risk issues. In addition, local knowledge suggests that the Borough is covered by pipelines and springs which are not identified on OS maps. Site specific FRA's will be required for all new developments, to appropriately take these drainage systems into account.'

4.5.1. 'Black Brook rises south-east of Chapel-en-le-Frith where the Flood Zones are very narrow. Flowing north of Chapel-en-le-Frith the flood zones remain narrow and mainly affect industrial buildings. It is then met on the left bank by Warm Brook, which flows directly through Chapel-en-le-Frith. The flood plain is very narrow and flood risk is constrained by this, exhibited by the fact that Flood Zones 2 and 3 are identical in most places. The effect of the culvert under Market Street has also been modeled to show the actual risk, therefore only Flood Zone 2 affects this area. Downstream, Flood Zone 2 affects a large area encompassing a number of properties at the Black Brook/Warm Brook confluence'.

'….The onset of flooding in the plan area and indeed the Borough is deemed to be rapid due to the steep catchment, causing high water velocities. Certain types of flooding can be directly hazardous to people. Shallow, slow moving water presents very little threat to life, whilst fast flowing, deep water is more hazardous. The nature of flood risk in the High Peak is more characteristic of the latter description. River corridors are characterized by steep, incised channels which, when in flood, produce deep, sometimes fast flowing flood waters. Higher return periods do not tend to produce a greater aerial extent of flooding, rather, the flood depth increases. This is relevant across the plan area of the High Peak and indeed the Borough, and is illustrated by the fact that across the study area, the difference in the aerial extent of Flood Zones 2 and 3 is often marginal.'

'The incised nature of river channels means that there is limited flood plain for flood flows to spread, resulting in deeper flooding than would be experienced in flatter areas. The severity of the hazard (i.e. rise of water, water velocities and depth) will also have impact on the consequence of a flood event. The Flood Zone maps, however, only provide information on the likelihood of flooding and do not covey the impact of flooding. Whilst hazard maps do not currently exist for the study area, the local fluvial setting leads to the conclusion that flood hazard is deemed to be of particular relevance to the High Peak. The river catchments can cause high runoff and rapid response (exacerbated by the geological conditions, as described in section 1.7.3), resulting in flashy flows which can be conveyed downstream to the plan area'.

'Floods result from out of bank flows, though this is made worse by local channel restrictions and under capacity structures, i.e. some culverts are not big enough to adequately convey flood flows. This results in back-up of river flows and flooding. The combination of rapid runoff and the catchment's flashy responses, as well as steep gradients, means water velocities in the flooded areas can be high. If coupled with a depth of around 1 m, this would pose a high flood hazard (for example it would not be possible to stand in this water). If the need to apply the Exception Test is required in the High Peak, a level 2 SFRA would need to assess this hazard.'

4.7. Flooding from Other Sources Information

'Within this section of the SFRA, there are no records of flooding to properties within the SK23 postcode area, from artificial sources as recorded in the Water Company's DG5 Register'.

4.8.2. Surface Water Flooding

……'It is clear that the High Peak is sensitive to surface water flooding and this should be taken into consideration as part of future development. Sir Michael Pitt's interim report of the summer floods put forward a number of recommendations to improve the way that surface water is currently managed. These included:

1. Establishing Surface Water Management Plans….
2. Clarifying responsibilities for ownership and adoption of sustainable drainage systems- encouraging SUDS as a viable alternative to connecting into sewers.
3. Reviewing automatic right to connect (Section 106 of the water Industry Act 1991'

6.3 Summary of Environment Agency Policies and Options

'Goyt catchment (central part of plan area, including New Mills, Hayfield, Whaley Bridge, Chinley and Chapel-en-le-Frith): continue with existing or alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline.) Continuing the current level of maintenance will ensure that river conveyance and the river structures, such as culverts, bridges and weirs, are maintained to the appropriate standard'

2.5 Access and Egress

Access to the site will be from South Head Drive (see photo 4). The minimum finished level proposed for the parking and pedestrian areas (212.76m AOD) will therefore be sufficient to ensure safe access and egress to and from the property during flooding events. This minimum finished level will ensure that the site's vehicle and pedestrian infrastructure remains at least 300mm above the 1:1000 year flood plain of Warm Brook.

Safe refuge is available on the higher ground to the west of the site if necessary (see photo 5) however it is not anticipated that a formal flood evacuation plan will be required as part of this development. It would however be beneficial for the residents of the proposed new property to subscribe to the Environment Agency's flood warning service.

3. Conceptual Sustainable Drainage Scheme for the Site.

The site's current ground surface is an open lawn (see photo 1). The nature of the proposed development will inevitably increase the amount and velocity of surface water runoff during a rainfall event – through the creation of roofs, parking and paved areas. The SFRA (section 2.4 and ref vi), does refer to the issue of surface water flooding within the locality.

The developers of the site therefore have both obligation and opportunity to reduce the potential downstream impact of surface water runoff generated at the new development by the use of sustainable urban drainage systems (SUDS) to match the 1:30 year Greenfield runoff rate if possible. The feasibility and selection of appropriate SUDS techniques will be largely dependent on the results of intrusive ground investigations and subsequent infiltration tests at the site. SUDS techniques, such as permeable paving, have been used on the neighbouring housing estate on South Head Drive (see photo 5).

The concept of a sustainable urban drainage system (SUDS) has been incorporated into the conceptual drainage system for the site in order to comply with the Flood and Water Management Act 2010. This will involve surface water retention and/or infiltration features within the scheme that will retain rainwater for subsequent discharge to the watercourse at a slower rate of discharge, in line with the Greenfield runoff rate for the area. It is essential that such schemes do not compromise the new properties and present a risk of flooding downstream of the existing flood plain.

The geology for the site comprises glacial till (Devensian Diamicton – a sediment that consists of a wide range of non-sorted to poorly sorted terrigenous sediment, i.e. sand or larger size particles that are suspended in a mud matrix) overlying Millstone Grit (Namurian mudstone, siltstone and sandstone). Intrusive site investigations and infiltration tests will confirm the depth of the glacial till and its capacity for infiltration. A shallow test hole excavated in the grass in the centre of the site during the walkover visit confirmed the presence of topsoil underlain by a sandy subsoil with fragments of sandstone and slate. A copy of the Envirocheck geological report is included in Appendix 3.

The conceptual SUDS design is presented on Plan 4. This shows the storage areas and proposed drainage routes off the site. However the detailed design calculations and capacities have not been performed at this stage. Assuming that the conceptual design is acceptable to the Local Authority, a more detailed design will be presented. This may well require further consultation and agreement with the Authority's SAB.

The land falls gently to the northeast of the site and the conceptual SUDS design (see Plan 4) attempts to follow the natural drainage routes, as far as possible, with the ultimate discharge point (emergency overflow) being located towards the northeastern corner of the site via a new outfall to Warm Brook. The feasibility of connecting the emergency SUDS overflow to the existing public surface water sewer will require prior consultation with United Utilities.

The conceptual design has attempted to ensure that all runoff will pass through two treatment trains, in accordance with CIRIA. Plan 4 shows the main components of the drainage scheme to comprise permeable pavement for the parking areas, patios and pathways with service strips (locations to be agreed). These then subsequently link into filter drains around the perimeter of the property. These features should be installed to encourage downward percolation of the rainwater from the site.

If the results of the percolation tests are unfavorable, it may be necessary to consider a SUDS scheme based around storage and attenuation of surface water flows as an alternative to the infiltration techniques suggested.

The Environment Agency has advised that an 8m strip between the development and the riverbank should be retained in order to permit access for the inspection and maintenance of the watercourse. Whilst the proposed footprint of the detached property is as far away from the debris screen at Culvert 'B' as practically possible, the western wall of the building lies approximately 2.5m from the eastern bank of the brook. The Environment Agency should therefore be consulted at an early stage in order to enquire whether this is acceptable.

A flood defence consent will be required from the Environment Agency for any construction work occurring within 10m of the watercourse.

The United Utilities sewer plan is included in Appendix 4. This shows that the nearest public foul sewer (a combined sewer) is located within the western boundary of the site (see photos 20 and 21). The public sewers have also been drawn on Plan 2 for ease of reference. A foul drainage connection from the new property to this 375mm diameter sewer should be relatively straightforward. However, it is strongly recommended that a pre-development enquiry is sent to United Utilities to advise them of these proposals.

There is also a 450mm diameter surface water drain located within the northern boundary of the site (see photos 22-24) which discharges into Warm Brook via an outfall structure located downstream of Culvert 'B'. It may be possible to make a connection to this outfall from the overflow of the proposed SUDS features, however this will again be subject to the prior agreement of United Utilities.

4. Conclusions & Recommendations

The Environment Agency flood map shows that the site is located largely within Flood Zone 2 of Warm Brook (medium flooding probability 1% - 0.1%). A small part of the site to the southeast is located within Flood Zone 1 (low annual flooding probability of <0.1%).

The proposed end use of the site (residential dwelling) falls within the 'More Vulnerable' classification when referring to Table 2 of the Technical Guidance to the National Planning Policy Framework (ref ii). When referring to table 3 of the Technical Guidance, it is clear that the development of this land use is appropriate in both Flood Zones 1 and 2 without the need for the exception test.

The main source of flooding at the site would be from overtopping of the banks of Warm Brook. This scenario could occur during extreme high flow conditions, in which case the capacity of the two culverts (Culverts A and B – see Plan 2) could potentially be exceeded. Local knowledge gained during the site walkover survey suggests that flooding of the north eastern corner of the site has occurred previously due to the blockage of the debris screen upstream of Culvert 'B'.

Examination of the topographical survey (Plan 3) suggests that the flood waters could potentially inundate the land adjacent to the large sycamore tree before spilling out onto the carriageway at the junction of Hayfield Road and South Head Drive. A portion of these flood waters could then potentially re-enter the Hayfield Road culvert via the highway drains in this location). Any remaining flood water would then flow in a north westerly direction down Hayfield Road, away from the site.

Given the proximity of the site to the brook, Peak Associates are suggesting a precautionary approach to the establishment of minimum finished floor levels for the proposed property. The precautionary approach (which will allow for climate change) is to take the predicted peak water level for the 1 in 1000 year return period (0.1% AEP) for node point 3 (the closest EA modeling point to the proposed property) and add a 600mm freeboard allowance for the proposed building and a 300mm freeboard allowance for the access, parking and pedestrian areas.

The suggested minimum finished levels for the development are therefore:
- Minimum Finished Floor Level for the building = **213.06m AOD**
- Minimum Finished Level for access, parking, and pedestrian areas = **212.76m** AOD

Access to the site will be from South Head Drive. The minimum finished level proposed for the access, parking and pedestrian areas will therefore be sufficient to ensure safe access and egress to and from the property during flooding events. This minimum finished level will ensure that the site's vehicle and pedestrian infrastructure remains at least 300mm above the 1:1000 year flood plain of Warm Brook. Safe refuge is available on the higher ground to the west of the site if necessary however it is not anticipated that a formal flood evacuation plan will be required as part of this development. It would however be beneficial for the residents

of the proposed new property to subscribe to the Environment Agency's flood warning service.

The construction of a perimeter brick wall around the property is also suggested as a 'belt and braces' measure in order to direct potential flood waters away from the building (see Plan 2). The top of the brick wall should be set at a minimum elevation of 213.56m AOD (0.5m higher than the proposed finished floor level of the building).

There is to be no change to the existing ground level in the proposed garden to the northern end of the property (within the root protection zone of the large sycamore tree). In this respect, the area to the north of the proposed property will be allowed to flood during an extreme event.

The property must not be constructed on top of the United Utilities combined sewer which flows beneath the western boundary of the site. The advice of United Utilities should be sought at an early stage with regards to the construction of foundations close to the sewer and also for any proposed foul and surface water connections to their assets.

The nature of the proposed development will inevitably increase the amount and velocity of surface water runoff during a rainfall event – through the creation of roofs, parking and paved areas. The feasibility and selection of appropriate SUDS techniques will be largely dependent on the results of intrusive ground investigations and subsequent infiltration tests at the site, however the underlying glacial geology could potentially lend itself well to the use of infiltration techniques.

The conceptual SUDS scheme presented on Plan 4 comprises filter drains and permeable paving with an emergency overflow to Warm Brook. These infiltration features will retain rainwater for subsequent discharge to the watercourse at a slower rate of discharge, in line with the Greenfield runoff rate for the area. If the results of the infiltration tests are unfavorable, it may be necessary to consider a SUDS scheme based around storage and attenuation of surface water flows as an alternative to the infiltration techniques suggested.

The Environment Agency has advised that an 8m strip between the development and the riverbank should be retained in order to permit access for the inspection and maintenance of the watercourse. Whilst the proposed footprint of the detached property is as far away from the debris screen at Culvert 'B' as practically possible, the western wall of the proposed building lies approximately 2.5m from the eastern bank of the brook. The Environment Agency should therefore be consulted at an early stage in order to enquire whether this is acceptable.

A flood defence consent will be required from the Environment Agency for any construction work occurring within 10m of the watercourse.

5. References

(i) National Planning Policy Framework. Department for Communities and Local Government. March 2012.

(ii) Technical Guidance to the National Planning Policy Framework. Department for Communities and Local Government. March 2012.

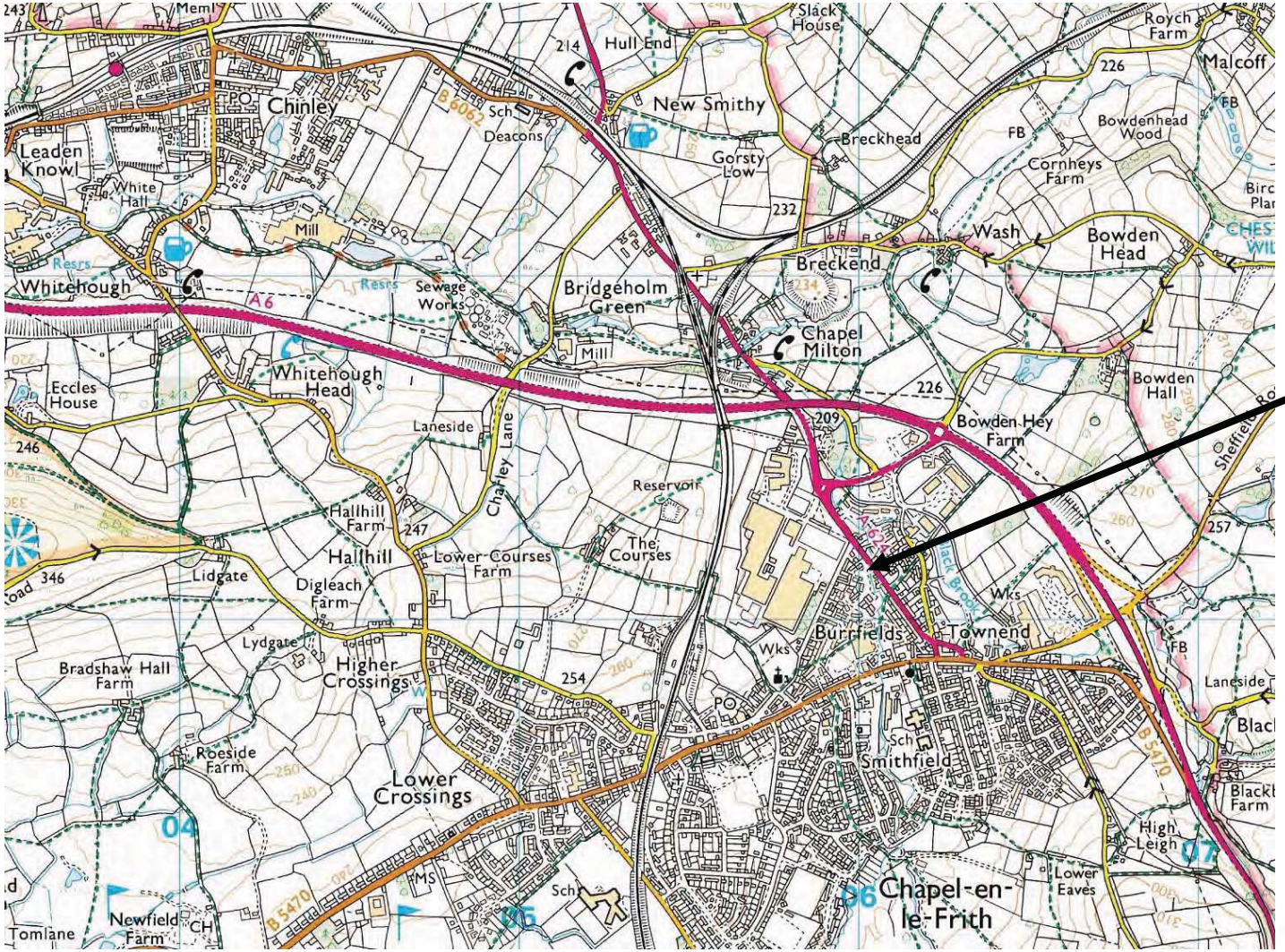
(iii) PPS25: Development and Flood Risk - December 2006.

(iv) BS EN 752:2008: Drain and sewer systems outside buildings.

(v) www.uksuds.com

(vi) Peak Sub Region STRATEGIC FLOOD RISK ASSESSMENT (SFRA) September 2008. Halcrow Group Ltd.

PLANS



Location Plan—Site D
Plan Reference: 482/007 A
Scale: 1:25,000 @ A4

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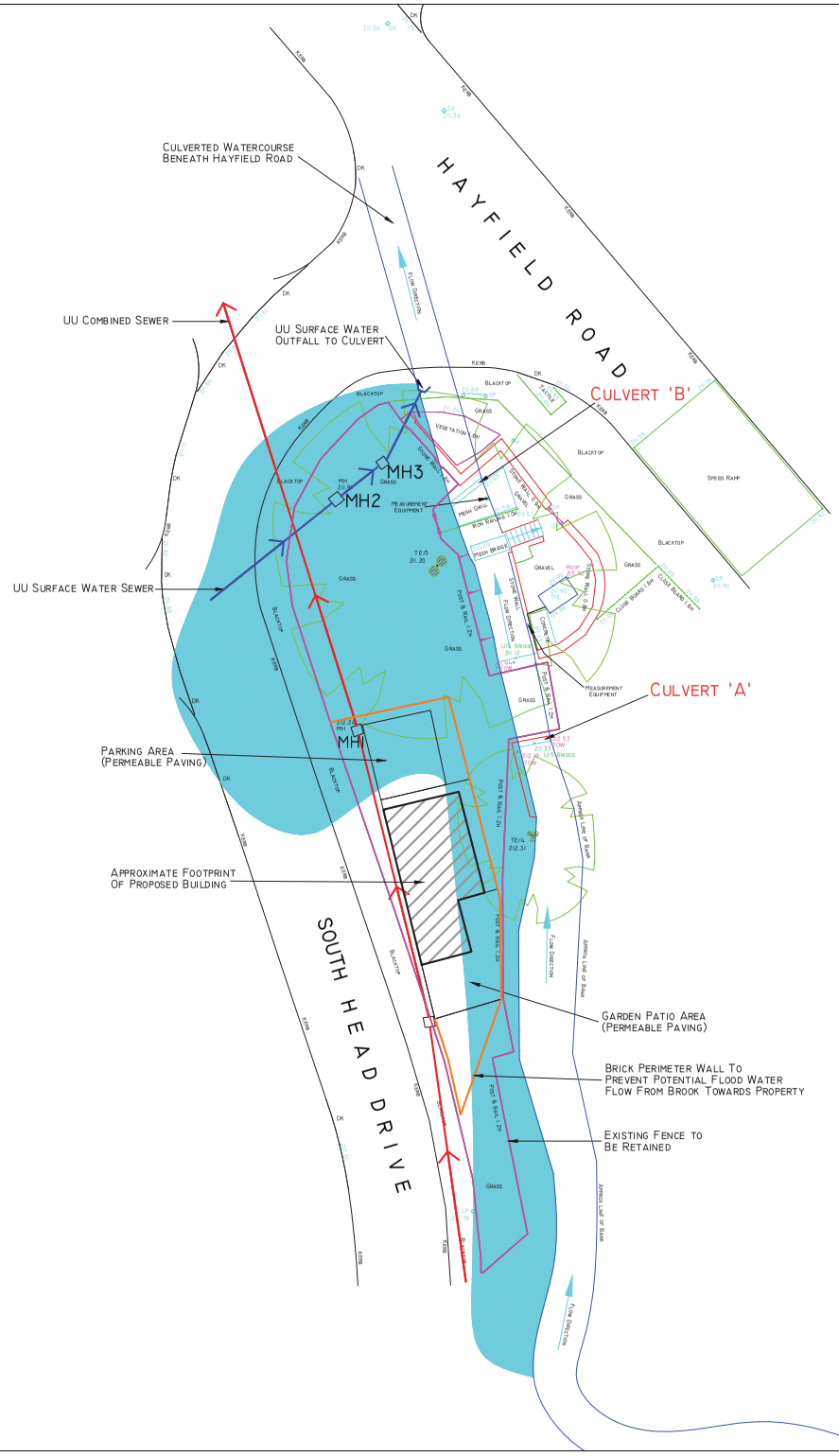


NOTES

A1

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings.
3. All boundaries are approximate.

KEY

- Approximate Site Boundary
- Flood Zone 2
- Slope
- United Utilities combined sewer
- United Utilities surface water sewer
- Brick Wall
- Proposed Building

DESCRIPTION	REV	DATE	CHKD	APPR

PEAK ASSOCIATES
ENVIRONMENTAL CONSULTANTS LTD

CLIENT: Kapetil Limited

PLAN NO.: Plan 2

PLAN TITLE: Site Layout with Approximate Location of Environment Agency Flood Zones Superimposed

DRAWN	AF	PROJECT ENGINEER	JJ
CHECKED	JJ	APPROVED	JJ
DATE	21/08/2012	SCALE	1:150 @ A1
DRAWING NUMBER	482/003	REVISION	A

General Notes

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL, THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

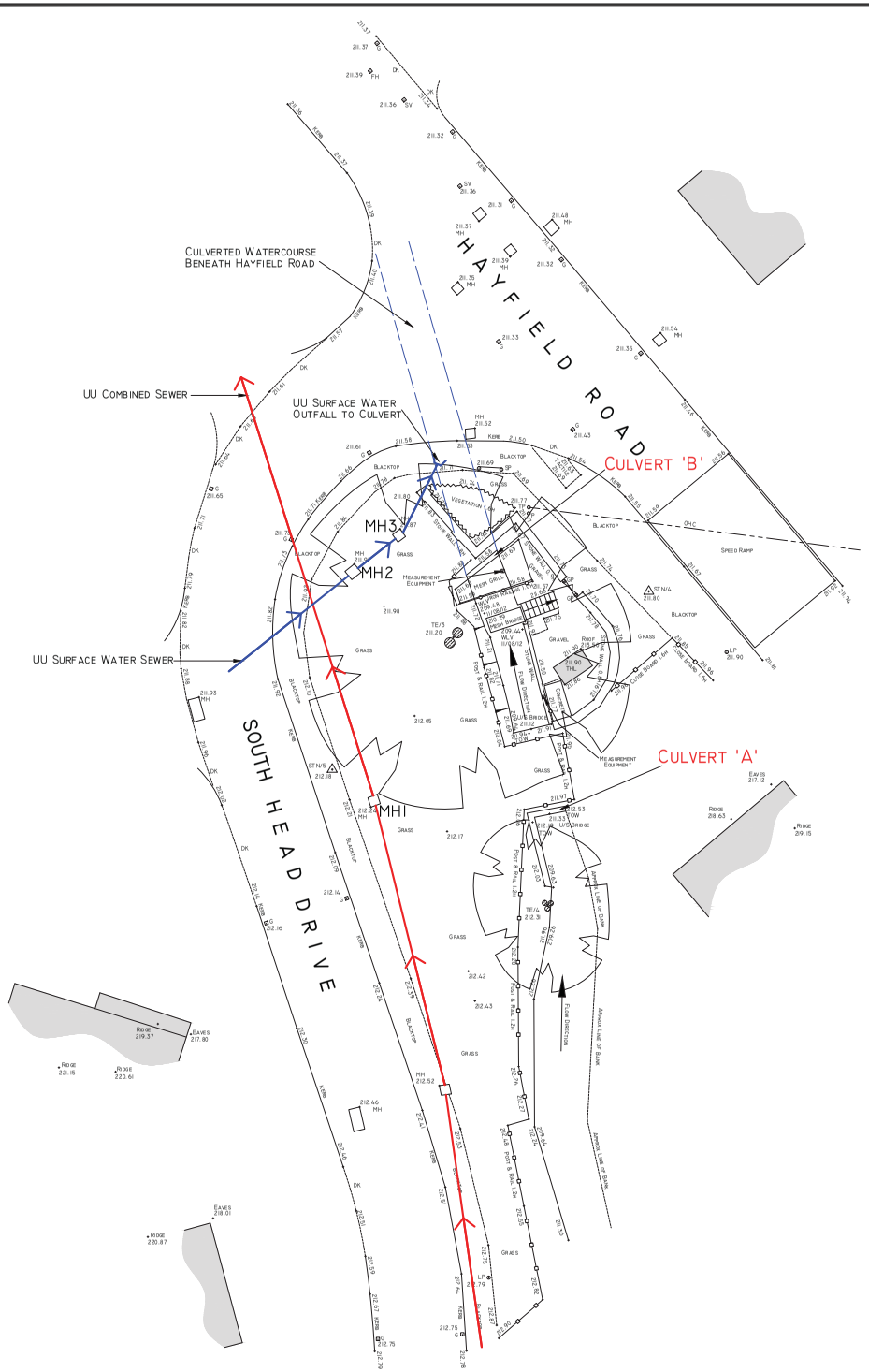
THE CONTRACTOR IS TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES EMPLOED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY.



LEGEND

- BUILDINGS
- UNITED UTILITIES COMBINED SEWER
- UNITED UTILITIES SURFACE WATER SEWER

ABBREVIATIONS

DK	DROP KERB
FH	FIRE HYDRANT
G	GULLY
GP	GATE POST
IC	INSPECTION CHAMBER
LP	LAMP POST
MH	MANHOLE
OHC	OVERHEAD CABLE
P	POST
SP	SIGN POST
SV	STOP VALVE
TE	TREE
THL	THRESHOLD LEVEL
TOW	TOP OF WALL LEVEL
TP	TELEGRAPH POLE
WLV	WATER LEVEL

MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

TREE SCHEDULE

No.	DIA.	SPREAD (N-E-S-W)	HEIGHT
T03	2X0.60	30	14
T04	3x0.30	8	10
T05	0.50	11	12
T06	0.40	10	11
T07	0.50	14	14
T08	2X0.20	6	10
T09	0.10	3	8
T010	0.10	3	8
T011	2X0.05	2	8
T012	0.20	4	8
T013	0.20	4	8
T014	0.10	2	8
T015	0.10	2	8
T016	0.10	2	8
T017	0.10	2	8
T018	0.20	4	8
T019	0.20	4	8
T020	0.25	4	8
T021	0.45	8	10
T022	4X0.20	7	10
T023	0.10+0.20	6	9
T024	0.40	10	12
T025	0.25	12	12
T026	MB	13	12
T027	0.15	3	8
T028	0.20	3	8
T029	0.20	2	8
T030	0.30	8	10
T031	0.25	6	8
T032	0.30	6	10
T033	0.40	8	10
T034	2X0.20	6	10
T035	0.20	5	9
T036	0.20	5	9

SAXON HOUSE
21 MARKET SQUARE
SANDBACH
CHESHIRE
CW11 1AT
TEL: 07540 418 628
FAX: 01270 527 597
EMAIL: INFO@REDBOXSURVEYS.CO.UK

Redbox SURVEYS

DO NOT SCALE OFF THIS DRAWING

1:50 0 1m 2m 3m 4m 5m 6m
1:100 0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
1:200 0 2m 4m 6m 8m 10m 12m 14m 16m 18m 20m
1:500 0 10m 20m 30m 40m 50m

CLIENT
BPUD LIMITED

TITLE
SITE D TOPOGRAPHICAL SURVEY

DRAWING DETAIL
TOPOGRAPHICAL SURVEY

ISSUE
FINAL

PLAN NO
PLAN 3

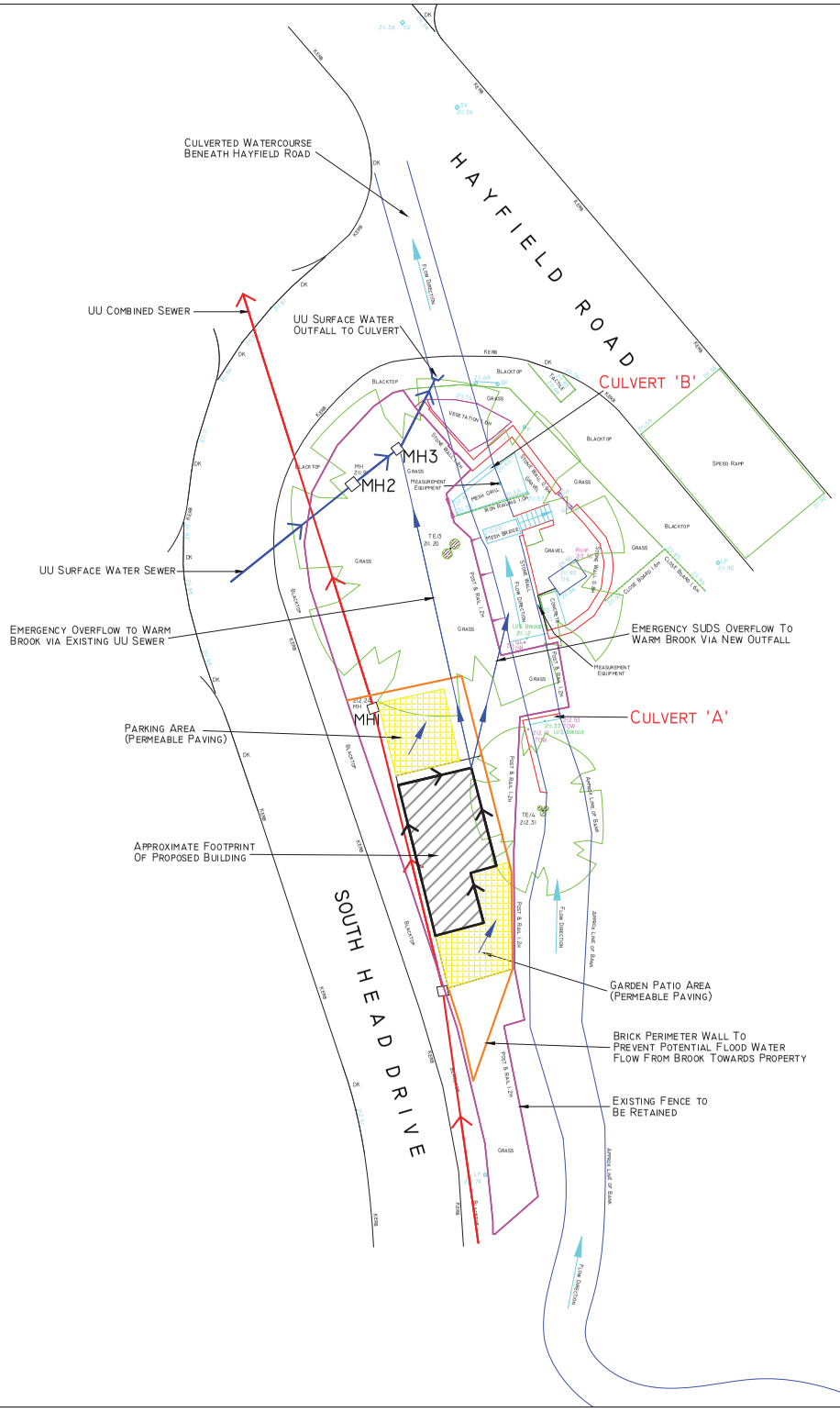
DESCRIPTION	REV	DATE
REVISION NUMBER		

DATE: AUGUST 2012
SCALE: 1:150 @ A1

LEVEL DATUM: OSBM LOCATED ON THE GRAPES INN VALUE = 211.35 METRES
GRID ORIENTATION: APPROX NORTH

DRAWING No: 482/010 A

A1



NOTES

A1

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings.
3. All boundaries are approximate.

KEY

- Approximate Site Boundary
- Slope
- United Utilities combined sewer
- United Utilities surface water sewer
- Surface water drain
- Brick Wall
- Proposed Building
- Permeable Paving
- Flow Direction
- Filter Drain

DESCRIPTION	REV	DATE	CHKD	APPR

PEAK ASSOCIATES
ENVIRONMENTAL CONSULTANTS LTD

CLIENT	Kapetil Limited
PLAN NO.	Plan 4
PLAN TITLE	Conceptual SUDS Plan

DRAWN	AF	PROJECT ENGINEER	JJ
CHECKED	BT	APPROVED	BT
DATE	05/09/2012	SCALE	1:150 @ A1
DRAWING NUMBER	482/011	REVISION	A