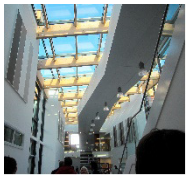

scott hughes

Twinbrook Barn,

Up-Brooks,

Clitheroe

Flood Risk Assessment

Project number: 3051

Date: July 2016

Revision: 1

Document Control Sheet

Client: Andrew Thornburn

Project No.: 3051

Project Title: Twinbrook Barn, Clitheroe

Report Title: Flood Risk Assessment

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Issue	Organisation	Quantity
0	Wilson Mason	1
1	Wilson Mason	1

Scott Hughes Design

Table of Contents

Executive Summary

The proposal is for the conversion of a barn for domestic living purposes on Upbrooks, Clitheroe. The overall site is approximately 0.025Ha in plan footprint and to address the requirements of the new National Planning Policy Framework (NPPF) a Flood Risk Assessment is appropriate.

The development holds a Flood Zone 2 classification, i.e. land assessed as having a 1 in 1000 or greater annual probability of river flooding (>0.1%) in any year. This is due to the surcharging of the adjacent Mearley Brook.

This Flood Risk Assessment has considered all forms of flooding and overall, has found that the site is at low risk of flooding from all other sources.

The development target has been assessed against the NPPF 'Sequential Test'. Taking into consideration that the application is for domestic use in Flood Zone 2, Tables 1, 2 & 3 of the NPPF Technical Guidance have been appraised to confirm that development is 'Appropriate'. The 'Exception Test' is consequently not required.

EA has a flood policy of a minimum of 300mm cover against flooding to any dwelling for the 100 year flood event. The development has a finished floor level of over 800mm above the 100 year flood event, therefore the risk of flooding to the dwelling is acceptable.

A flood warning system will be in place. This will ensure that during the extreme flood events safe egress for the occupants is assured for higher order storm events up to and including the 1000-year event through leaving the building in advance of the flood and moving to higher ground.

The development matches the footprint of the current dwelling. In light of this there is no increase in the rate of surface water discharge. As such there is no residual flood risk from the development site to the surrounding district from storm water flow rates to Mearley Brook and the downstream catchment.

Foul water generated by the development will be discharged to the adjacent combined water drainage network and ultimately the combined water public sewer. The foul discharge does not present an increased flood risk to the surrounding district to this being a domestic extension.

1.0 Introduction

1.1 Scott Hughes Design (SHD) has been appointed by Andrew Thornburn, to prepare this Flood Risk Assessment to support a detailed planning submission for the conversion of a barn into domestic accommodation. The assessment has been undertaken in line with Section 10 of the 'National Planning Policy Framework' plus the accompanying Technical Guidance on Flood Risk.

1.2 This Flood Risk Assessment (FRA) has been commissioned by Andrew Thornburn and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A. This report may not be assigned.

1.3 The report has been commissioned to identify any flood related issues associated with the proposed development and any likely constraints that could be imposed. The following issues have been suggested by the Environment Agency (EA) & Ribble Valley Borough Council (RVBC) and subsequently addressed within this report.

- Identify available data relating to flood risk at the site.
- Review this data in relation to existing and new building levels.
- Determine whether the site is at risk from flooding from all sources, including but not exhaustive, from breach or overtopping of any existing flood defences, watercourse flooding, surface water flooding and/or ground water flooding.
- If at risk from any source, devise appropriate measures to prevent flood risk whilst not compromising the flood risk elsewhere.
- Consider the flood risk from all other sources.
- Determine the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
- Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any increase in surface water runoff and include for climate change.
- Consider the recommendations of the RVBC Strategic Flood Risk Assessment (SFRA).
- Prepare the Flood Risk Assessment report.
- Assess mitigation measures & off site impacts, and define any residual risks.

2.0 Development Description and Location

2.1 Site Location

The site is referenced in Table 1, and a site location map is provided in Appendix A.

Table 1: Site Referencing Information

Item	Brief Description
Site name	Twinbrook Barn
Site address and location	Upbrooks, Clitheroe, Lancashire, BB7 1PL
Council Area	Ribble Valley Borough Council
Approximate Grid Reference	OS: 375386, 442266
General Locality	The site is located on Upbrooks, on the north-east outskirts of Clitheroe, approximately 15km north/north-east of Blackburn.

2.2 Existing site Description

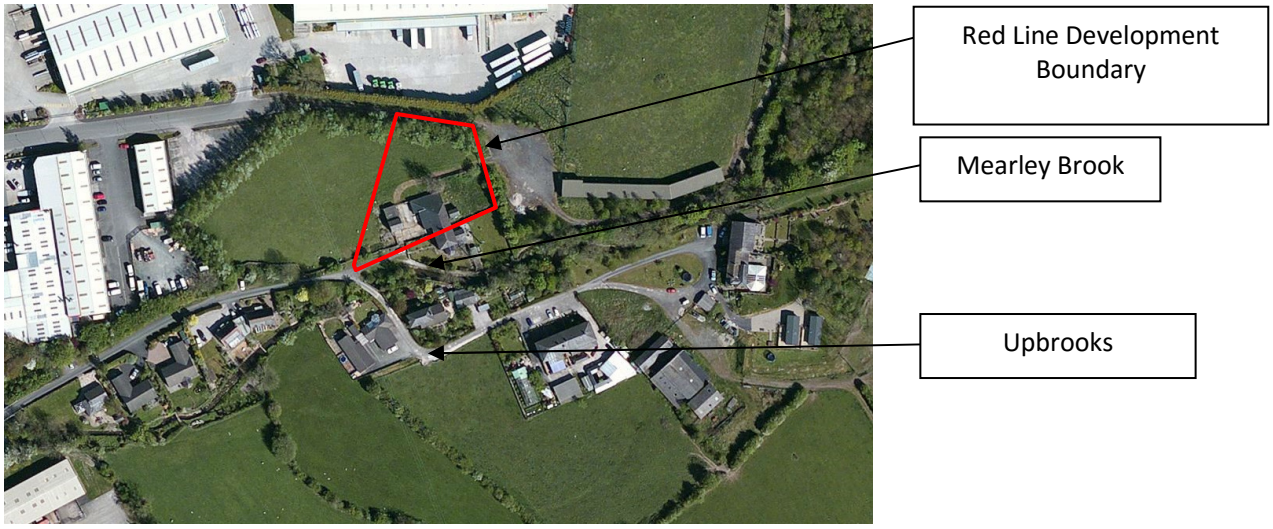
2.2.1 The existing development site (Red Line Boundary) encompasses both brownfield and greenfield areas. In summary the proposal is for a domestic conversion of an existing barn building. The total area is some 2,500m^2 (0.025 Hectares).

2.2.2 The site is located to the north-east of Clitheroe town centre and to the north/north-east of Blackburn Town Centre. The site is bounded by an access road to the north and east, Mearley Brook to the south and farmland to the west.

2.2.3 Historically the site has had a barn of the same size and scale present since at least 1845 and it therefore considered to be of historical interest. It is also noted that there is evidence of changes to the barn during its working life.

2.2.4 Figure 1 below identifies the overall site location details. Further details of the existing layout can be seen on the Red Line Plans in Appendix A and the Topographical survey in Appendix B. Topographical information indicates that the site is slopes uniformly from 83.50m AOD in the north-east to 82.00m AOD in the south west corner of the site, closest to the watercourse.

Figure 1: Site Location



2.3 Photos

Photo 1: View of current building and Upbrooks

2.4 Development Proposals

2.4.1 As discussed in the earlier sections, the report is prepared to support a planning application for a proposed conversion of an existing barn for domestic purposes with a small rear extension.

2.4.2 The outline Site Master Plan as indicated in Appendix A provides details of the proposed development intent.

2.4.3 The proposal is for the barn to be converting into domestic living space, utilising the ground floor at a level of 82.640m AOD.

3.0 Planning Policy and Consultation

3.1 Planning Policy Framework

3.1.1 The flood maps provided by the Environment Agency locate the site within Flood Zone 2 i.e. land defined as having an annual probability of fluvial flooding of less than 1 in 100 (<1.0%) but greater than 1 in 1000 in any year (>0.1%). As a requirement of the new NPPF (2012), Annex D, the proposed development has to satisfy the requirements of the Sequential Test and where applicable the Exception Test.

3.1.2 Sequential Test:

Under the NPPF (2012), Flood Zone 2 is defined as medium probability flood risk. The proposed development is classed as a residential dwelling, which in line with Table 2 is classified as 'More Vulnerable'.

Placing both these criteria into Table 3 (Flood Risk Vulnerability and Flood Zone 'Compatibility'), More Vulnerable development in Flood Zone 2 determines that the 'Development is Appropriate' and that the Exception Test is not applicable to this development proposal.

It must be noted however that issues relating to Planning Policy Guidance, offsite impacts and evacuation measures need to be satisfied.

3.2 Local Planning Policy Guidance

3.2.1 There are a number of Lancashire County Council (LCC) Policies that need to be considered.
LCC states that all new developments should be safe from flooding and not increase the risk of flooding.
Any application that is considered to be at a risk of flooding, or increase the risk of flooding elsewhere materially, will need to be accompanied by a formal flood risk assessment that should accurately assess the level of flood risk involved. Where appropriate, it should clearly identify the mitigation or other measures to be incorporated into the development or undertaken on other land which are designed to reduce that risk of flooding to an acceptable level.
Development will not be permitted unless adequate provision is made for the discharge of foul and surface water associated with the proposal.

3.3 Strategic Flood Risk Assessment (SFRA)

3.3.1 SFRA's assess the risk associated with all types of flooding and provide the information required to identify the amount of development permitted in an area, how drainage systems in the area should function and also how risks in vulnerable areas can be reduced and/or mitigated. The NPPF states that regional planning bodies (RPB's) or Local Planning Authorities should prepare SFRA's in consultation with the EA.

3.3.2 The site sits within the coverage of the Ribble Valley Borough Council Strategic Flood Risk Assessment Level 1. The published SFRA identifies current and future broad scale flood related issues in the Ribble Valley. The report is dated March 2010 and remains current at the time of this assessment. The purpose of the SFRA is to assess and map all known sources of flood risk including fluvial, surface water, sewer, groundwater and all impounded water bodies, taking into account future climate change predictions

3.3.3 The development site lies within the Mearley Brook catchment. Mearley Brook is classified as a 'Main river' by the Environment Agency. The SFRA identifies the extent of the fluvial flooding for Mearley Brook and suggests the development lies in Flood Zone 2.

3.3.4 The SFRA exposure and the location of the site have been considered by Sequential Testing and the test has been passed.

3.3.5 A summary of the main elements from the SFRA associated with the district is detailed below. The full report can be obtained from the Ribble Valley Borough Council website.

- SFRA provides a detailed understanding of flood risks across all areas from all sources.
- SFRA maps indicate the site to be at medium risk of fluvial flooding (FZ2).
- EA has a defined policy for development requiring occupied flood levels to be no less than 300mm above the active 100 year flood level.
- Full sequential and exception tests to be carried out (where applicable).
- Flood resilient construction to be used where applicable.
- Safe dry access and egress to be assured.
- Development should be designed so that there is no flooding to the development in a 1 in 30 year event and so that there is no property flooding in a 1 in 100 year plus climate change event. Where possible sustainable drainage should be incorporated.

3.4 Statutory Authority Correspondence

No specific meeting have been held with the statutory Authorities. However flood level data has been received from the Environment Agency and is discussed later in the report.

4.0 Definition of Flood Hazard

Flood risk to the proposed development site is considered from all sources of flooding, as defined by the NPPF (2012).

4.1 Sources of information

THE NPPF (2012) requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the developments footprint. Further, the report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk.

Section 5 then discusses in further the probability of flooding and the likely impacts.

Table 2 summarises the main sources of information used in the identification of flood risk.

Table 2: Sources of information used in the identification of flood risk

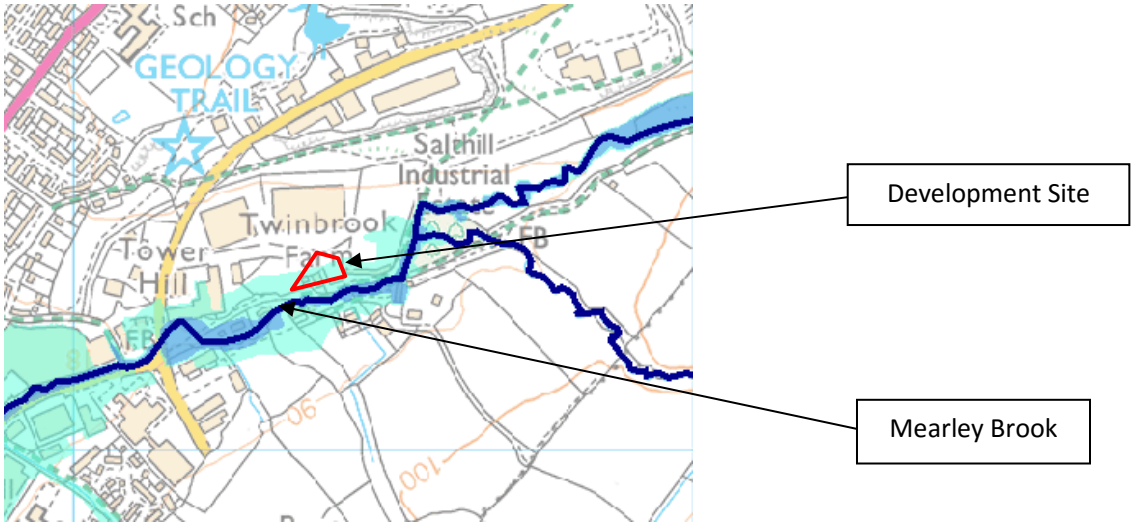
Source of Information	Details
Environment Agency Flood Map	From EA website
United Utility Sewer Records	Various Maps
Historic Maps	From various websites
Ribble Valley Borough Council SFRA	Report & Various Maps
Environment Agency	Flood Levels

4.2 Flooding from Rivers (Fluvial)

4.2.1 The closest watercourse is Mearley Brook which is classified as 'Main River' and flows along the southern boundary of the site from east to west.

4.2.2 Figure 2 below locates the site on the Environment Agency's indicative flood plain map. The site is shown by EA's Indicative Flood & Coastal Map in an area considered at risk of fluvial flooding and is located within Flood Zone 2, therefore classified as 'Medium Risk'. This is land assessed as having a less than 1 in 100 (1.0%) but greater than 1 in 1000 (0.1%) annual probability of fluvial flooding in any year.

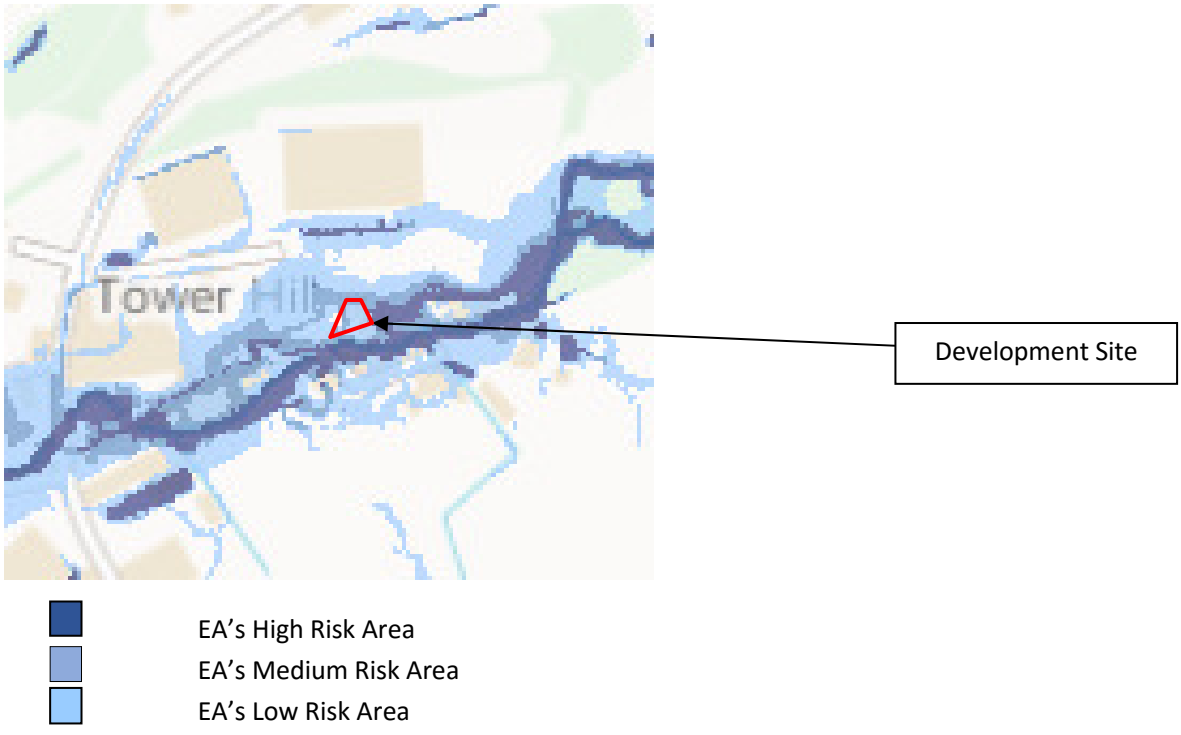
Figure 2 – The EA's Indicative 100-year Flood Plain Map



4.3 Flooding From Land (Overland Flow)

4.3.1 A review of the Surface Flooding maps from EA would indicate that the site holds a low/medium susceptibility risk from surface water. This map is generated from a variety of sources with an extract around the site area included in Figure 3 below.

Figure 3 – Environment Agency Surface Water Flooding Map



4.3.2 As the maps are linked to the fluvial flood maps here is no distinction between what is fluvial and what is surface water and so it has to be assumed that is fluvial linked, such that overland flood risk can be considered low.

4.4 Flooding from Sewers and Private Drainage

4.4.1 The United Utilities (UU) sewer records have been reviewed and confirm that there is a 300mm vitrified clay sewer running along through the north of the site from west to east. Plans of the records are located in Appendix C.

4.4.2 There are no historical records of sewer flooding in the region.

4.4.3 The topographical survey for the existing development site has been examined and the site is situated away from the falls of all surrounding manholes.

4.4.4 The large diameter UU adopted sewers and private drainage networks serving the surrounding area ensures that the development footprint is protected from the impact of both upstream and downstream runoff. It is speculated that complete protection may well exist beyond a storm event equivalent to the 30-year statistical event. Beyond this projection, there may be a small degree of peripheral 'Exceedance' flooding at the lowest ground levels which are set lower than the retained building.

4.5 Flooding from Groundwater

4.5.1 According to the Ribble Valley Borough Council SFRA, there have been no known reports of groundwater flooding in the area. There have been no intrusive ground investigations carried out on this site and although unrecorded groundwater flooding may have or will take place, however it is not considered to be a significant risk. Future ground investigations carried out for the development site will confirm groundwater levels.

4.6 Flooding from Artificial Sources

4.6.1 The Environment Agency maps indicate that there are no artificial water sources in the vicinity of the site.

4.7 Summary

Below is a table summary of the flood risks associated with the development site.

Table 3 – Flood Risk Summary

Source	Probability of Flood Risk	Impacts	Remarks
Tidal	Low	Low	Site not tidally influenced.
Fluvial (Watercourse)	Medium	Medium	Site located in Flood Zone 2 (Medium risk) but habitable spaces located above 1 in 100 year flood level.
Surface (Overland Flood Flow)	Low	Low	Site at a low/medium risk of surface flooding due being in Mearley Brook's catchment. However, raising above the 1 in 100 year flood level will reduce the risk.
Sewers	Low	Low	Public sewers bounding the site. Low risk as buildings raised up from surrounding areas and no historical records of sewer flooding.
Groundwater	Low	Low	There have been no reports of groundwater flooding for the site and they are not considered to be a significant risk at this time.
Artificial Sources	Low	Low	Site is not in the vicinity of any artificial water sources.

5.0 Assessment of Flood Risk on Development Site (Probability)

5.1 Summary

5.1.1 As discussed in Section 3 & 4, the development site has been categorised in accordance with the SFRA and EA Flood Maps as being located within a Medium flood Risk Area from fluvial flooding. This is related to flood risk from Mearley Brook that requires further assessment.

5.1.2 Other flood risk sources such as groundwater, sewer and overland flows have been considered and have been found not to be a flood risk generator to the site.

5.2 Flooding from Mearley Brook (Fluvial)

5.2.1 In order to give a more accurate assessment of flood levels Environment Agency flood data for Mearley Brook has been obtained. This provides flood levels for various storms at node points along the river. The most appropriate (and nearest) node point relating to the development site has been identified as node point 5. Flood levels for various storm events are given in Table 4 below.

Table 4: Flood Level Data

Node Point	1 in 100 year Return Period	1 in 1000 year Return Period
5	81.800m AOD	83.450m AOD

5.2.2 Mearley Brook flood levels are 81.800m AOD for the 1 in 100 year and 83.450m AOD for the 1 in 1000 year return period flood events. The proposed finished floor level for the development is 82.640m AOD. **This locates the development site above the 1 in 100 year flood level.**

5.2.3 EA require Flood Zone 2 developments to be a minimum of 300mm above the 1 in 100 year flood level. The proposed FFL places the development some 800mm above the 1 in 100 year flood level. However it is noted that the 1 in 1000 year return period event has been identified to be 810mm above the proposed FFL.

5.3 Managing Flood Risk

5.3.1 The Flood Risk Assessment has proved that the site is located in medium risk Flood Zone 2 only and so outside of the flood risk from the more extreme 1 in 100 year plus climate change event. However, there are other flood risk mitigation measures that need to be considered further.

Safety of People within the Building

5.3.2 An outline flood evacuation statement has been prepared in support of this assessment and can be found in Section 6. A full and detailed flood evacuation plan and strategy will be prepared and provided to the future residents in advance of occupation of the new development.

Safety of the Building

5.3.3 A risk to building services still remains. Ribble Valley Borough Council SFRA suggests that new development should adopt flood resilient construction methods where appropriate. The following typical flood resilient measures are suggested:

I. Power sockets and incoming service points be raised above the 1 in 1000 year flood level.
II. Electrical equipment such as freezers will be fed from high level supplies above the extreme flood level.
III. Blockwork walls and stud partitions will be protected with water resilient finishes.

6.0 Outline Emergency Planning Statement

6.1 Summary

6.1.1 The FRA has found that the site is expected to stay dry during the 1 in 100 year plus climate change fluvial flooding event from the adjacent Mearley Brook. However, there is a risk of flood inundation for the more extreme 1000 year flood event.

6.1.2 Providing the procedures outlined in the statement are followed, flooding at the site will only affect the actual buildings – and therefore the safety of their inhabitants during a more extreme fluvial flood event is reduced.

6.2 Flood Depths and Velocities

6.2.1 For the worst case scenario, flood levels of greater than 0.8m could occur at the site.

6.2.2 The speed of flood waters can be expected to be fast enough to pose a potential threat, due to the distance from the site to Mearley Brook. All residents will need to be aware that fast flowing, deep water will be sufficient to carry vehicles, knock people of their feet and pose a threat to life.

6.2.3 Other hazards and areas of particularly deep water may be hidden, for example where manhole covers have been blown off.

6.3 Flood Duration

6.3.1 Once the flood peak has passed, the site could remain affected by flooding for up to several days, depending upon the nature of the event. Floodwaters would leave the site via the site drainage network, soaking into the ground, and running over land into the adjacent Mearley Brook.

6.4 Flood Warnings

6.4.1 Any flooding to the building that could potentially occur will be through a persistent and prolonged rainfall event within the upper catchment of Mearley Brook. Flood water data loggers on this network will inform the EA that water levels are rising and that a risk to the downstream catchments could occur. The EA operate such a system and it will be the responsibility of the occupier to act.

6.4.2 The EA aims to provide a minimum two hours' notice of flooding, day or night, to enable people to take necessary action to protect themselves and their properties. This will take the form of automated phone calls and for the residents to log onto the EA website where there is potential for water levels to rise.

6.5 Site evacuation Procedures & Routes

6.5.1 Once a flood warning has been received, the property owners will have the opportunity to egress from the residential building to higher ground levels to the north of the site.

6.5.2 If immediate flooding is forecast and the opportunity to safely evacuate is gone then the occupants must either await rescue if necessary or wait until the flood levels recede. Higher ground to the first floor will place the occupants out of immediate danger.

6.5.3 Residents should not wade through floodwater to escape the area; there can be hidden dangers such as dislodged manhole covers and health issues from polluted water.

6.5.4 During a serious and widespread event when large numbers of people require rescue, it could take several hours to be evacuated; priority will be given to rescuing vulnerable people first.

6.6 Reoccupation of the Site

6.6.1 Reoccupation of the building will be a decision taken by the key stake holders such as the emergency services, RVBC and the Environment Agency.

6.6.2 Key checks will be to establish whether there is any damage to power supply etc. If all the checks confirm that there has been no damage to the building infrastructure and the flood incident has now passed, the building will be re-opened.

6.6.3 It will be up to the residents to coordinate any clear up works with the local authority and their respective insurance companies.

6.6.4 Restoration of services shall commence at the earliest opportunity subject to all requirements regarding health and safety being met.

6.7 Training & Exercising

6.7.1 All residents of the new development building will be made aware of the future Flood Evacuation Plan and where appropriate trained accordingly.

7.0 Outline Drainage Strategy

7.1 External Consultation

United Utilities

7.1.1 As discussed in Section 4, the UU sewer records have been reviewed and confirm that there is a combined water sewer running along the north of the site.

7.2 Existing Runoff

7.2.1 The existing site is currently developed and therefore in terms of runoff characteristics is considered to be 'Brownfield' it is noted that the impermeable footprint of the site will only marginally increase.

7.2.2 An initial inspection indicates that surface water from the site discharges in to Mearley Brook.

7.3 Outline Drainage Strategy

7.3.1 As there is only a minor change in the impermeable area of the site the surface water drainage strategy will remain the same.

7.4 Foul Water Strategy

7.4.1 The outline foul water drainage strategy is to discharge foul flows into the existing 300mm combined vitrified clay running along the north of the site.

8.0 Management Measures, Off Site Impacts and Residual Risk

8.1 Flood Risk Management Measures

8.1.1 The building is located above the 1.0% AEP event including the allowance for climate change but is at risk of flooding for the enhanced 0.1% AEP event. Thus the risk of flooding from the adjacent Mearley Brook is reduced to acceptable levels. All other flood risks have been considered and found not to be a flood risk generator to the development.

8.1.2 A detailed flood evacuation plan will be prepared for the redevelopment and provided to all future occupants of the building. This will be a fluid document that is regularly updated when new information and flood data / strategies become available.

8.1.3 During the extreme flood events safe egress for the occupiers is assured for higher order storm events up to and including the 1000-year event to the upper floors. Alternatively higher ground levels exist to the north of the site.

8.1.4 The surface water drainage strategy for the development will remain as before to mimic current rates.

8.2 Off Site Impacts

8.2.1 Up to and including the 100-year plus increase in rainfall allowance due to climate change (CC) event, the report has justified that there is no risk of flooding.

8.2.2 The development is above the 100-year plus climate change flood water level for the adjacent watercourses. Floodwater displacement will not occur up to and including the 100-year plus climate change event.

8.2.3 The redevelopment of the site does not impair the hydraulic continuity of any watercourse and the current ‘‘local hydraulics’’ of distributing watercourses / outfalls.

8.2.4 The Development footprint does not cross or cover any existing or declared future catchment flood defences. Consequently, the Applicant does not propose to augment or compromise the current catchment defences.

8.2.5 Surface water runoff will mimic the pre development regime.

8.2.6 As there is no flood displacement or increased rate of runoff as part of this proposal into Mearley Brook, the proposed development will therefore not increase flood risk onto its locality.

8.3 Residual Risk

8.3.1 With careful design of the drainage elements as described above there will be no residual flood-related risks that will remain after the development has been completed.

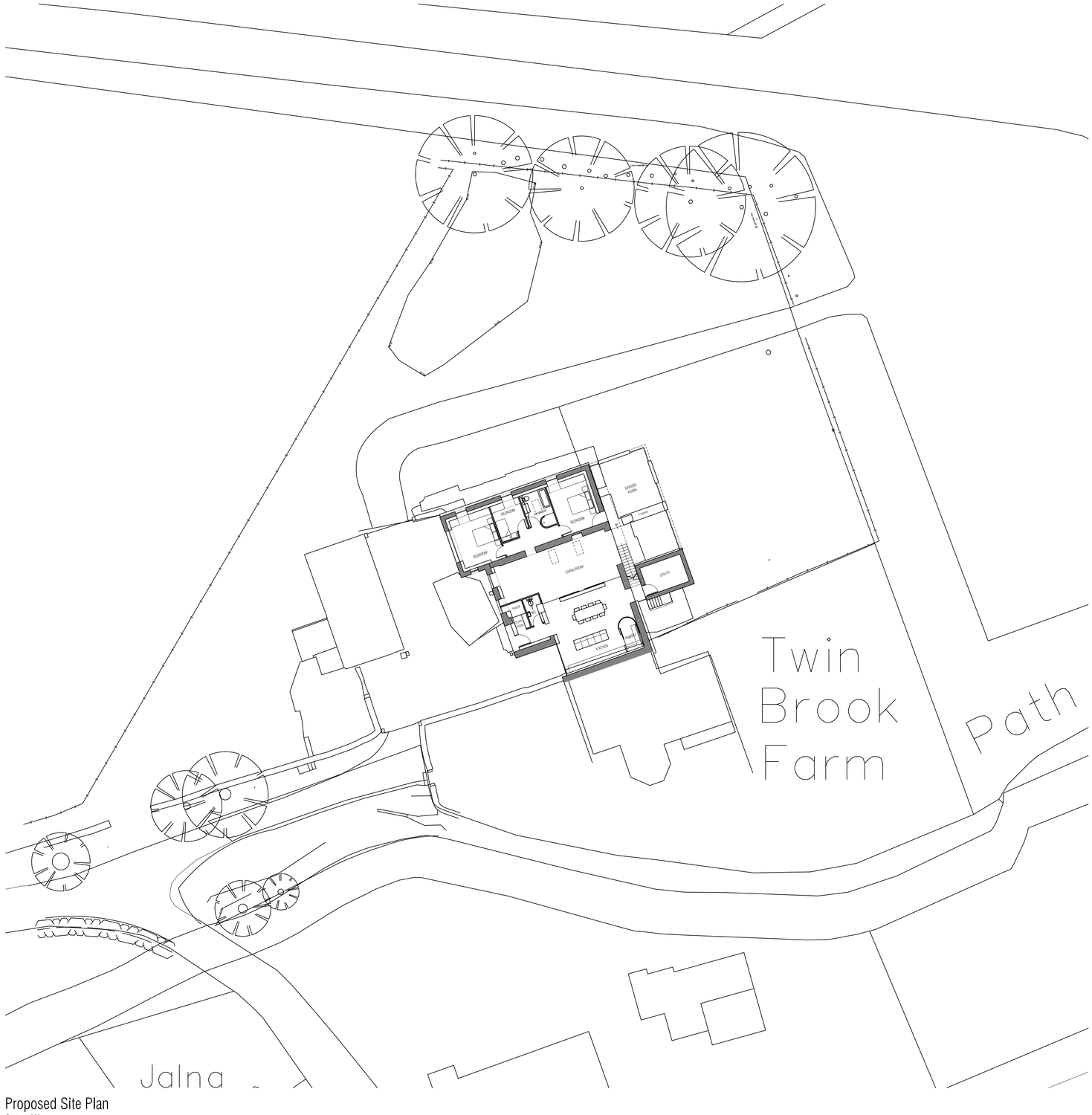
8.3.2 Flood risk to people and property can be managed but it can never be completely removed; a residual risk remains after flood management or mitigation measures have been put in place. The only known flood related risk that will remain will be the risk of a storm event in excess of that predicted.

Appendix A – Architect's Drawing

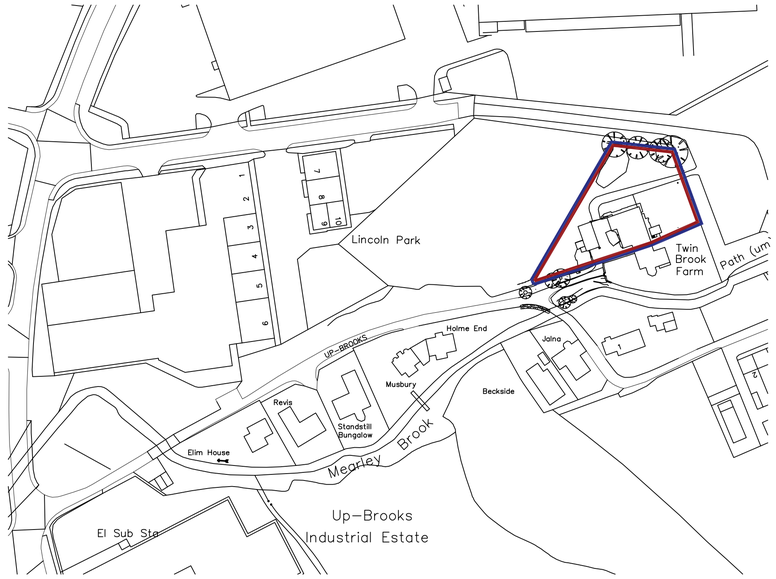
WILSON MASON

Upland House
Spring Lane
Samlesbury
Preston
PR5 0UX

T 01772 877455
F 01772 877456
E preston@wilsonmason.co.uk
www.wilsonmason.co.uk



Proposed Site Plan
Scale: 1:200



Site Location Plan
Scale: 1:1250

Extent of Ownership

Site Outline

no.	by	chk.	revision	date
01	EW	AW	First issue	2016 02 29

client

project: 6284 Twinbrook Barn

by	chk.	date	scale	sheet size
EW	AW	2016 02 16	As shown	A1

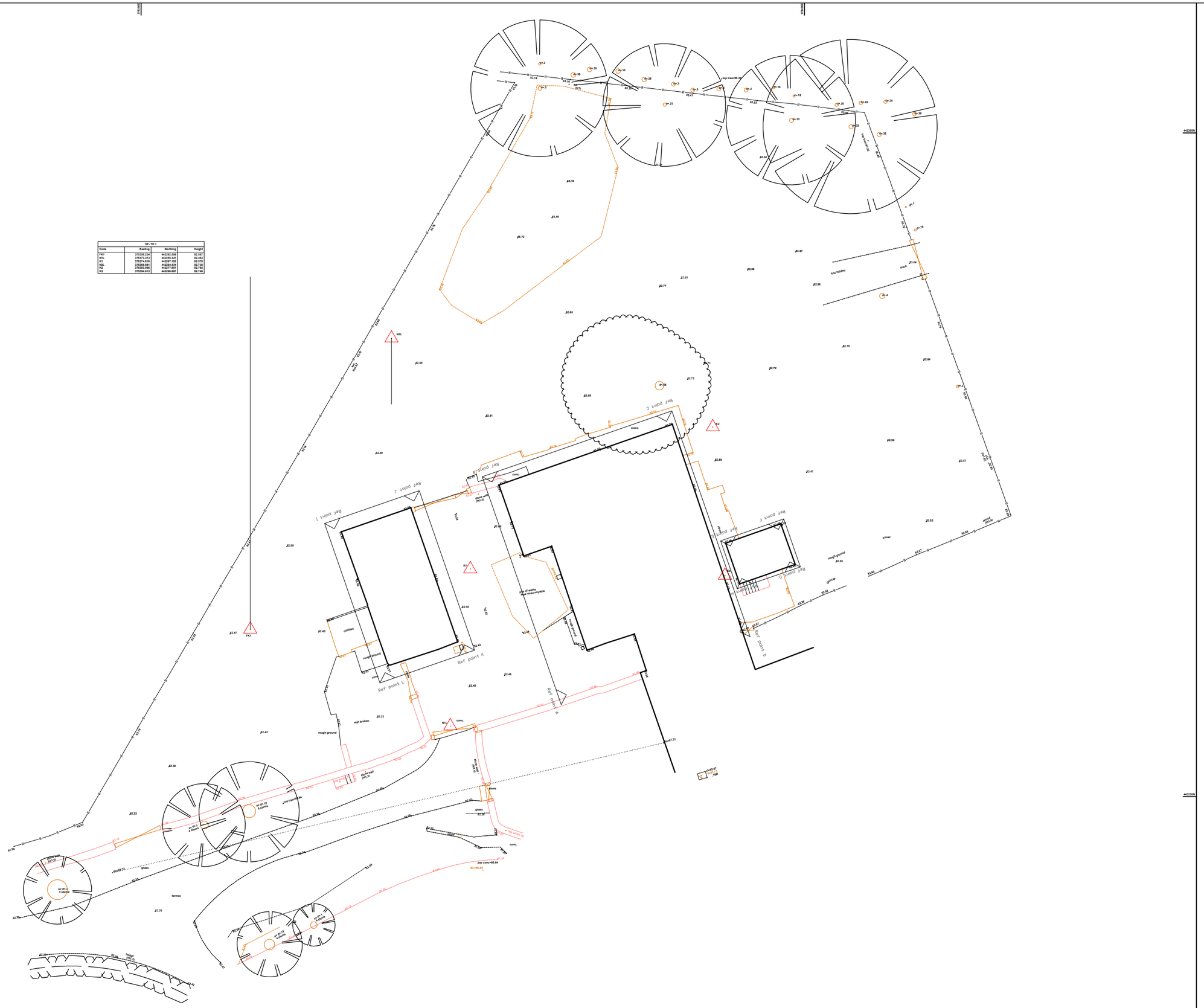
title: Site Plan and Site Location Plan

status	job no./ drg. no	revision
P	6229 L(00) 01	01

WILSON MASON

Appendix B – Topographical Survey

SP- TQ 1			
Code	Easting	Northing	Height
FK1	375359.234	442292.699	82.587
K1L	375373.310	442258.321	81.483
K1	375374.619	442267.182	82.679
K2L	375388.885	442294.534	82.726
K2	375393.695	442277.851	82.730
K3	375394.013	442266.667	82.748



deciduous tree
defined by one point at centre & one point on spread
dn:5
trunk radius as drawn
(ghosted to exact position +/- 300mm)

station
trial pit
bush
gate
borehole
window sample

coniferous tree (defined as above)

- note heights / points / lines all same colour
- e.g. for channel, all crosses / lines / heights are magenta

bottom of batter / wood / ridge / timber face / gutter

top of batter

break line / discontinuity

wall (see text nearby for height / width / type)

retaining wall (see text nearby for height / width / type)

channel (all levels at channel unless noted)

kerb levels (shown parallel to channel -)

railway

drain / river / canal

overhead lines / buildings (not surveyed unless specified)

concrete / ramp

building

stone

face of cladding / flower bed

canopy

verge

fence (see text nearby for height / width / type)
(panel / security / etc.)

columns / gridlines / conveyors / column face

brick

cycle lane / bus lane / white line (see text)

tanks / decking

hedge scaled to width

line may be as above, if just one edge
i.e. for level specific surveys both sides
measured not to show level change
(see text for type / height / width / etc)

path / window / door

track

143
142.5

contours

pipe line

can't tilt - can't tilt
cl=65.23
il=59.78

tilt cable

electric cable

- only manholes found on site during survey marked
- other manholes may be present but covered
- all invert levels taken where possible at main channel
- all surveys to our specification based on RICS (see website)
- some surveying done with GPS - please contact us regarding accuracy

tarmac

footpath

?	unknown cover	STANDARD FENCE ABBREVIATIONS
ac box	air conditioning box	brw - barbed wire
av	air valve	cfl - chain link
bb	belisha beacon	cfb - close boarded
bin	bin	cfi - corrugated iron
bt	bt line	conjoan - concrete panel
bt	bt manhole	cr/ba - crash barrier
bt	bt post	hr/ - hand rail
bt box	bt box	ir/ - iron rail
bm	OSBM	pal - palisade
block	blocked manhole	panel - panel
bus shelter	bus shelter	p/b - public barrier
cable	cable	pick - picket
can't tilt	can't tilt	p/r - post & rail
cb box	cable tv box	p/w - post & wire
cb	cable tv manhole	sec. - security fence
data mh	data manhole	wood - wooden fence
dk	drop kerb	
ds/dg	down spout (with gulley)	STANDARD ABBREVIATIONS
dsr	recessed downspout	conc. - concrete
ds	building step back not surveyed	conc. bol. - concrete bollard
el. post	electric post	conc. wall - concrete wall
el.	electric	edg.cut grass - edge cut grass
el. mh	electric manhole	el.sub st. - elec. substation
el box	electric box	face conc. - face of concrete
earth	earth strap/spike	face clad. - face of cladding
f.hydt	fire hydrant	face tim. - face of timber
gas	gas	trel - trellis
gas mh	gas man hole	hi pr. gas - high pressure gas
gas box	gas box	no rt. turn - no right turn
gu=5.68	gulley trip	rough ground - rough ground
guy	guy rope/stay	ret. wall - retaining wall
.5 dia	pipe diameter	sur. drain - surface drain
light	light	ped. studs - pedestrian studs
lp	lamp post	
lt	left turn arrow	ch=5.32 (manhole cover level)
peg	peg	dpc=56.45 (dpc level)
phone box	phone box	eav=34.29 (eaves level)
post box	post box	ffl=5.34 (finished floor level)
pipe	pipe	gu=34.29 (gulley level)
planter	planter	gutter=34.29 (gutter level)
post	post	hip=34.29 (hip level)
rod. eye	rodding eye	il=5.34 (invert level)
rsj	steel rsj	oh=5.34 (overhead level)
rt	right turn	ramp=5.34 (ramp level)
salt	salt box	rid=34.29 (ridge level)
security cam	security camera	sill /=5.34 (sill level)
seat	seat	sill=5.34 (sill level)
si	sign - with indicative text	sill /=5.34 (sill level)
slab=3.19	slab (generally conc.)	slab=5.34 (slab level)
st.tap	stop tap	top conc=5.34 (top of concrete)
str.	straight on	tp=60.67/da.15 (top of pipe)
sv.	sluice valve	t.st.=10.36 (top of step)
tactile paving	tactile paving	twl=56.72 (top of wall)
ts.	traffic signal	wat=56.19 (water level)
ts. mh	traffic signal manhole	cfl=5.67 (cellar floor level)
ts box	traffic signal box	.05level step (level step)
trap	trap	gu &da=34.29 (gulley with downspout level)
utility	utility (unknown)	
utility mh	utility manhole (unknown)	
utility box	utility box (unknown)	
water	water	
water mh	water manhole	
water box	water box	
wo	wash out valve	
tap	tap	
parking meter	parking meter	
cycle rack	cycle rack	
cycle shelter	cycle shelter	

Location Plan
Sheet 1 of *

Site Surveying Services - A.M.I.C.E.S.
Suite 7
Grindleton Business Centre
Grindleton, Lancashire
BB7 4DH
Tel: 01200 438320
Fax: 07092376338
www.sitesurvey.co.uk
Land / Engineering Surveyors

Setting Out & Control Surveys
Topographic/Volumetric Surveys
GPS Specialists using also
GPS Post Process to tie any site to OS without trig point or BM
Construction Line Registered
TSA member

construction line

Client / Location: Wilson Mason LLP
Twinbrooks Barn, Clitheroe

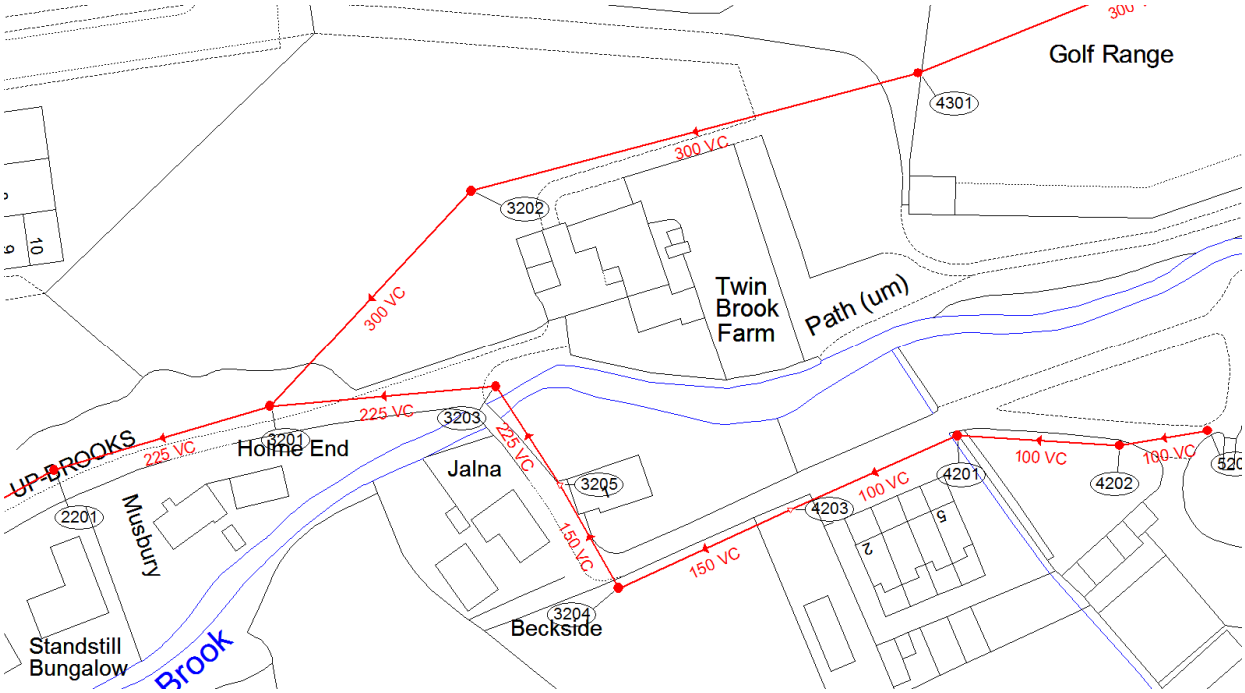
All work to our standard terms & conditions (see website)

THE SURVEY ASSOCIATION

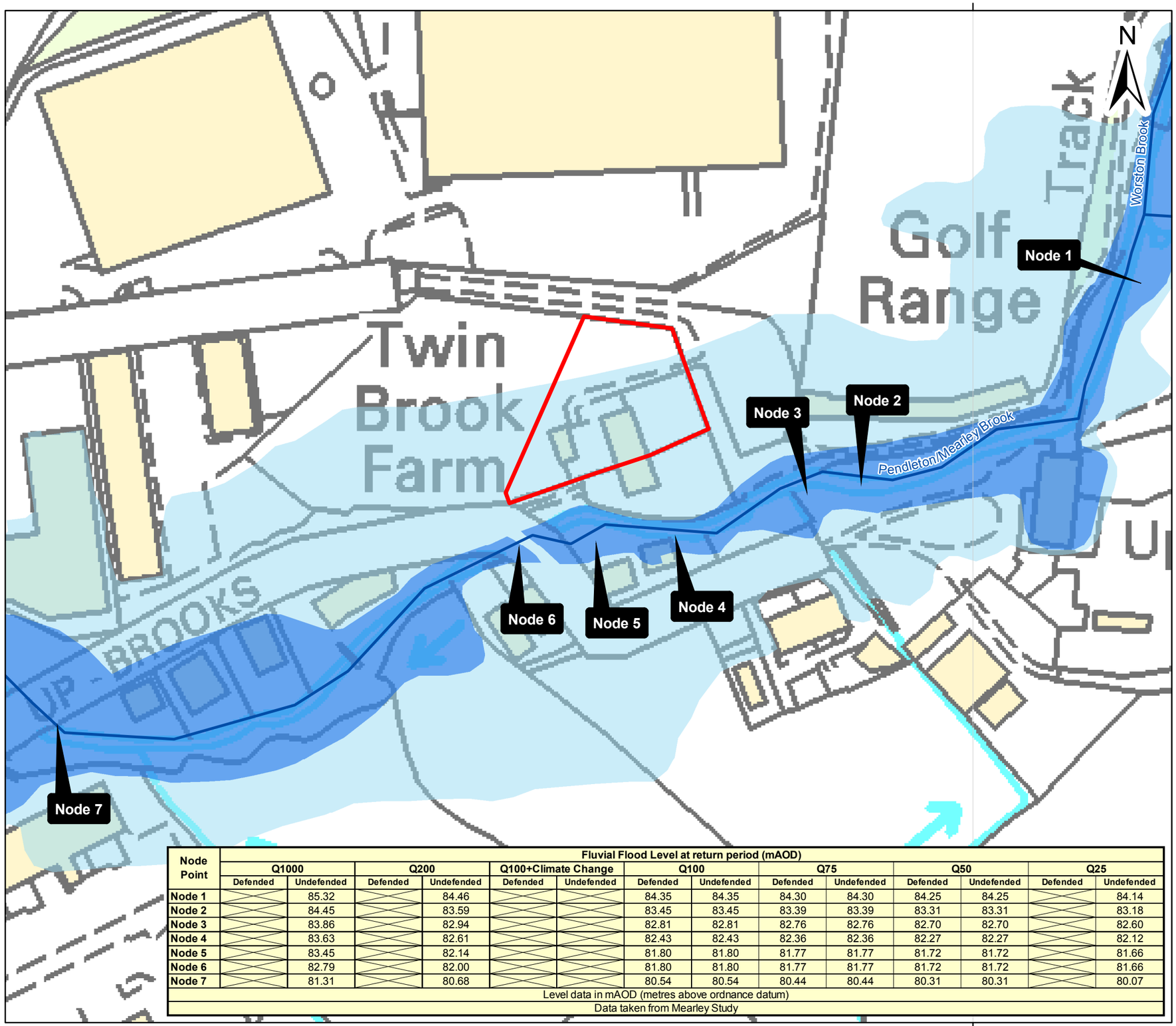
Additional Comments:
To local grid based on ostn02/osgm02 all work to sss specification, some by gps, contact us regarding details

Drawing Number:	sss-6424-Twinbrooks Barn, Clitheroe	Revision:	A
Drawn By:	MR	Checked By:	CG
Date:	04/11/2015	Scale:	1:100 @ A0

Appendix C – United Utilities Sewer Records



Appendix D – Environment Agency Flood Data



Node Point	Fluvial Flood Level at return period (mAOD)													
	Q1000		Q200		Q100+Climate Change		Q100		Q75		Q50		Q25	
	Defended	Undefended	Defended	Undefended	Defended	Undefended	Defended	Undefended	Defended	Undefended	Defended	Undefended	Defended	Undefended
Node 1		85.32		84.46			84.35	84.35	84.30	84.30	84.25	84.25		84.14
Node 2		84.45		83.59			83.45	83.45	83.39	83.39	83.31	83.31		83.18
Node 3		83.86		82.94			82.81	82.81	82.76	82.76	82.70	82.70		82.60
Node 4		83.63		82.61			82.43	82.43	82.36	82.36	82.27	82.27		82.12
Node 5		83.45		82.14			81.80	81.80	81.77	81.77	81.72	81.72		81.66
Node 6		82.79		82.00			81.80	81.80	81.77	81.77	81.72	81.72		81.66
Node 7		81.31		80.68			80.54	80.54	80.44	80.44	80.31	80.31		80.07

Level data in mAOD (metres above ordnance datum)
Data taken from Mearley Study

Environment Agency

Fluvial Flood Level Map: Twin Brook Farm, Up-Brooks, Clitheroe

Produced: 25 May 2016
Our Ref: CL13381
NGR: SD 75388 42277

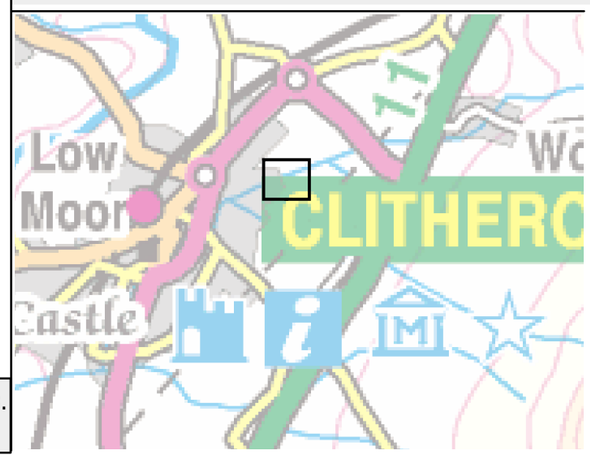
Key

- Main River
- Flood Zone 3
- Flood Zone 2

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 1 in 200 tidal, or 1 in 100 fluvial flood event.



Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk