

Upbrooks, Clitheroe

**Flood risk assessment
for proposed building
and new parking area**

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1.0 Introduction.

The land area is at Upbrooks/ Lincoln Way, Clitheroe. It is next to Mearley Brook. A new commercial building on an existing yard area is proposed plus additional parking and this report covers flood risks from all sources and new drainage. The proposals were consented in 2018 but have now been revised-application 3/2017/1020.

2.0 Executive summary

The area for the development is floodzones 1, 2 and 3a and a new commercial building on an existing drained yard area is proposed plus a new parking area to the north of the existing building. The new parking area is on an existing grass area and will generate more surface water runoff - this will be collected and stored on site to enable the peak outflow rate to be limited to 5 l/sec in accord with DEFRA's SC030219 guidance document for new surface water flows from developments. This will improve the current situation of the existing grass area generating unlimited runoff flows to the local surface water systems in storms and this will slightly reduce and lessen runoff flows and downstream flood risk.

New limited flow rate surface water will flow to Mearley Brook and foul flows will drain to the existing public foul sewer network. The site is not at risk from other sources of flood risk and development will lessen downstream flood risk because of the on-site storage as required by DEFRA guidelines.

The site investigation has shown that the ground is relatively impermeable with very slow soakage and a new soakaways is not practical.

3.0 Existing site, flood risk, history, existing drainage mode.

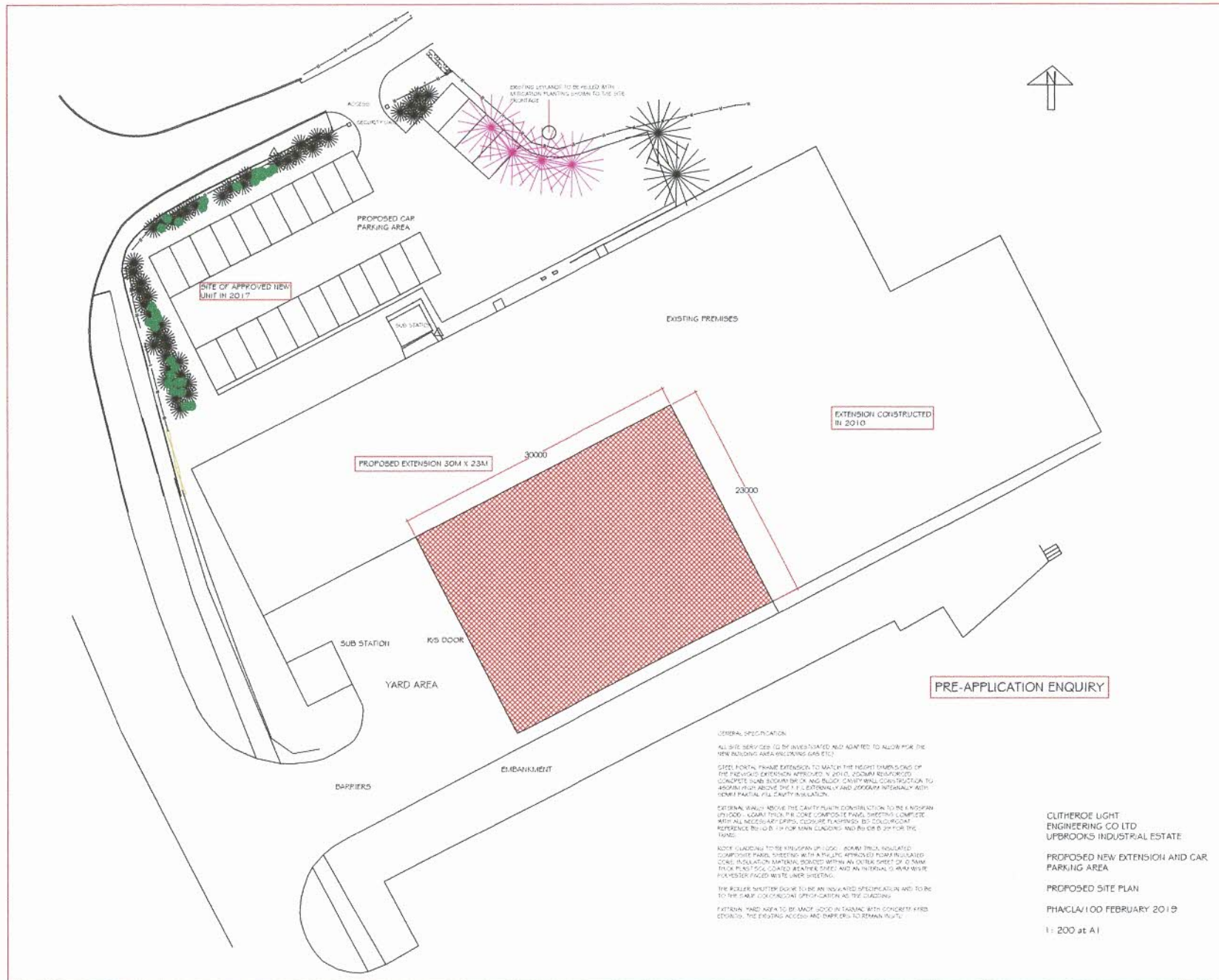
The existing site for the new parking is 0.12 ha gross and is a grass area at the junction of Upbrooks and Lincoln Way close to Mearley Brook.

The general ground slope is downhill towards Mearley Brook and the site level range is 80.23 to 81.37. The site is floodzone 2 and 3a as per the Environment Agency flood map for planning. Mearley Brook risk levels are as per the attached EA data and the site has river model node 6 alongside it. Risk levels from the EA river model data are:-

1 in 100 year risk level 80.54

1 in 1000 year risk level 81.31

The existing drainage mode of the site is sheet overland flow northwards towards Mearley Brook and runoff will reach the Brook via the local drains. The local catchment of Mearley Brook has an area of 8.27km² and an annual rainfall depth of 1295mm. DPSBAR the average bedslope is 140.7 m/km and BFIHOST is 0.354



indicating on average less absorbent catchment soils. A 6 hour 1 in 100 year rain depth is 78.43mm.

The catchment response time is approx 3.3 hours for a catchment wide storm to produce a peak flow at Upbrooks.

Catchment storm peak rainfall rates are:-

1 in 2.3 year storm -14mm/hr
1 in 30 year storm- 29mm/hr
1 in 100 year storm- 41 mm/hr
1 in 100 year + 20% climate change increase -49 mm/hr (see DEFRA guidelines 12 April 2016)

4.0 Proposals, new drainage, sustainable drainage.

The proposals are to build a 690m² industrial unit on an existing drained yard area and to provide a separate new parking area 1000m² on the north side of the existing building. The new building on an existing drained yard area will not change runoff flow rates or volumes. The new parking area access will be from Upbrooks and new drainage will connect to the public sewer network. Surface water will be stored on site in accord with current DEFRA guidance and discharged at the minimum greenfield runoff rate of 5 l/sec to Mearley Brook via existing drains. This limiting flow rate is from the HR Wallingford spreadsheet routine. The public sewer records show surface water manholes 1104 and 1105 with 1105 being in the public footpath next to the site boundary. These manholes will be lifted and dytested to confirm a connection to Mearley Brook prior to application to United Utilities for a new connection to the system.

The new parking area will be accessed from Upbrooks and the new surface water drainage system design criteria will be that all 1 in 100 year plus 30% climate change runoff flows will be accommodated below ground in cellular storage with an in principle storage volume of 25m³. The detail design of the new hard areas and drainage is a post consent item.

A small part of the existing site north of the existing building is in floodzone 3a below the 1 in 100 year risk level of 80.54. The new parking area will not be higher than the existing grass levels.

Ground conditions are now known. A ground investigation including percolation tests has been carried out and now that the proposals have been revised our letter and attachments of 4/5/18 applies and the new parking area will drain to a cellular storage unit of 25m³ (subject to detail post consent design).

5.0 Strategic Flood Risk Assessments

The Lead Local Flood Authority is Lancashire CC and the site is in the area of Ribbles Valley BC.

6.0 The effect of DEFRA surface water guidelines in SC030219

The basis of the former SR744 superseded by SC030219 is to restrict new surface water runoff rates from new developments to prevent an increase in flood risk to anyone or anything downstream. The DEFRA guidelines ensure that new surface water runoff is collected inside the site and stored and released at a specified low flow rate so that new developments lessen flood risk.

Greenfield sites which are developed for new hard drained areas have to follow DEFRA guidelines and store the new surface water runoff and release it at a low 1 in 2.3 year existing greenfield runoff rate (QBAR) to the local sewers watercourses or rivers. The 0.12 hectare existing area as it stands (rough grass approx 40% runoff) will at present produce an approx peak runoff rate during 3.3 hour length local catchment storms as follows:-

1 in 2.3 year storm - peak rainfall rate 14mm/hr- 2 l/sec
1 in 30 year storm -29mm/hr- 4 l/sec
1 in 100 year storm -41mm/hr- 6 l/sec
1 in 100 year + climate change 20% central allowance- 7 l/sec

The above calculations are approx to simulate an overhead storm and use the peak rainfall rates from the ReFSR/FEH spreadsheet routine for Mearley Brook local storms.

When development is complete and all the surface water storage is constructed plus the limiting flow controller on the site surface water outlet is installed the maximum new peak surface water flow rates to the local stream system from the development area will be as follows

1 in 2.3 year storm 5 l/sec
1 in 30 year storm 5 l/sec
1 in 100 year storm 5 l/sec
1 in 100 year + climate change 5 l/sec

This is a slight improvement on existing present day unlimited greenfield flow rates and will lessen downstream flood risk because the existing grass area will no longer discharge unlimited flow rates to the local Brook system.

7.0 National Planning Policy Framework and Technical Guidance and EA mapping.

The proposed new commercial building is classed as 'less vulnerable' in Table 2 and is 'appropriate' in floodzone 2 and 3a as per Table 3. There is no need for the exception test, or the sequential test.

Types of flooding that could affect the site are:-

1. River- the new building slab level will be
2. Sea- no tidal influence
3. Land- no undrained land slopes towards the site.
4. Groundwater- no springs on site.
5. Sewers- there are no local internet reports of sewer surcharge.
6. Reservoirs canals- none nearby.

Environment Agency mapping is as follows:-

Flood map for Planning- the site is floodzone 1, 2 and 3a

Risk of flooding from rivers and sea- this shows the effect of any flood defences.

Flood warning- this is not applicable to the site.

Groundwater- the site is not in a groundwater protection zone.

Risk of flooding from reservoirs- this shows reservoir risk- all utility company reservoirs are maintained to a 1 in 10,000 year risk standard under the Reservoirs legislation and this is a very rare and unlikely risk.

Risk of flooding from surface water- this mapping shows surface water flood risk and shows a surface water risk from Upbrooks into Mearley Brook. Pluvial mapping is the subject of a separate EA paper made public in November 2013 and is useful in locating possible ground low points and depressions. We quote- 'the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled' - so whilst the EA mapping shows pathways and confirms the stream paths the mapping generally takes little account of any existing drainage and in practice there is a very low risk. The mapping is based on Jflow software and the EA May 2013 notes -'National Scale Surface Water Flood Mapping Methodology'- state that the method does not take account of existing drainage systems except by subtracting an average rain depth from storm profiles.

8.0 Attachments

This report is a copyright email report and can be transmitted in an email series of attachments or it can be transmitted by 'we transfer' with joined up pdf's.

Attachments.

A4

Location plan

Floodzone plan

Mearley Brook EA data

HRW storage

Previous Lancashire LLFA correspondence plus our response

A3

Magic location plan

EA risk levels

Sewer records

Land survey

Proposals marked up with new parking drainage.

Exceedance diagram

Soakage calculations

J flow mapping

Should you need further data such as survey drawings please email

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Email files

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