



**COMPLEX CHALLENGES ...  
MADE SIMPLE**

## **Flood Risk Drainage Note**

**Pickerings Farm Penwortham**  
for  
**Taylor Wimpey**

13 November 2018

## Flood Risk Drainage Note

Pickerings Farm Penwortham  
for  
**Taylor Wimpey**

TITLE	NAME	SIGNATURE	DATE
Principal Civil Engineer	ANDY JAMES		13/11/18
Managing Director	RORY O'CONNOR		13/11/18
Revisions			
Report Reference	3826 PICKERING FARM FR&DRAINAGE NOTE/AJ/NAK/131118		
Report Status	FINAL		



# PICKERINGS FARM, PENWORTHAM MASTERPLAN DEVELOPMENT

## Flood Risk and Drainage Constraints

### Existing Site & Topography

The site comprises approximately 90 hectares of land and is located immediately south of the existing residential area of Kingsfold. Penwortham Way (A582) is present to the west of the site which connects the area to Preston, Leyland and the M6 Motorway. To the south is Chain House Lane and Coot Lane with associated commercial businesses and residential properties. Finally, to the east are three railway lines namely the West Coast Mainline, Ormskirk Branchline and East Lancashire Line.

The site itself can be considered to be greenfield as it comprises predominantly agricultural use. Existing field boundaries are marked by hedgerows, ditches and light tree cover. There are a number of farm buildings, small holdings and existing residential properties across the site. Overhead power lines are also present, crossing the site through the south east and north west corner.

Bees Land and Flag Lane provide points of access into the site with a number of smaller roads off these servicing the various existing properties.

The topography is generally flat, and the topographic survey shows that levels range from around 33.0m AOD along the eastern boundary to a low of 26.0m AOD in the north west corner adjacent to Penwortham Way.

Penwortham Way is constructed on embankment in relation to the site with levels generally 2-3m higher than the surrounding land.

### Flood Risk Constraints

RoC has obtained current data on Flood Risk at the site through an Envirocheck Flood Screening Report. The site is in an area identified as having a 'low' probability of flooding on the Environment Agency Flood Data Map and is located in Flood Zone 1.

The proposed development site is located approximately 50m east of Mill Brook which is a tributary of the River Ribble which itself is located approximately 1.5km north of the site. The River Lostick is located approximately 700m southeast of the site beyond Farington.

There are a number of Ordinary Watercourse features present within the site itself which generally drain the south and east of the existing site. These are primarily open channels located along field boundaries adjacent to hedge and fence lines. Mapping also identifies sections of culvert within the site linking these open channels. It is important that where possible these surface water features are maintained within the development to ensure that existing area of the site can continue to drain as the existing regime. Should any modifications to these be required then land drainage consent would be required from the Lead Local Flood Authority.

Pluvial flood maps identify areas of the site at risk of flooding for the 75, 100, 200 and 1000 year return periods; these areas are generally at low points in the topography. It is considered that existing ground conditions are not conducive to infiltration drainage and therefore it is possible that during intense rainfall events, saturated ground may lead to overland flow across the site and potentially onto adjacent land. However, it is recognised that the site is generally drained by a series of ordinary watercourses/ drainage ditches and parts of the site do not appear to have any form of runoff interception which would contribute to the issue.



Groundwater Flood Data provided by the British Geological Society suggests that the site is primarily in an area that has the potential for Groundwater Flooding to occur at the surface. It is understood that some residents in the area have existing issues in relation to groundwater flooding which were raised during the consultation event. Site investigation work will be required to identify the true potential for groundwater flood risk. This information can then be used in the design of any mitigation measures for the development and its infrastructure.

A Level 2 Flood Risk Assessment was undertaken by Arup in 2009 to inform Taylor Wimpey of key potential sources of flood risk affecting the Pickerings Farm development site. Following on from this a further Hydrological and Hydraulic Modelling Assessment was commissioned to specifically investigate the potential fluvial flood risk associated with Mill Brook and any key upstream tributary.

The work undertaken by Arup suggests that there are areas of fluvial flooding within the development which are not identified on current EA flood mapping.

Some limited flooding is identified to the south west of the site between Chain House Road and the A582 embankment. This is considered to be to be caused by water backing up behind the highway embankment with conveyance limited by the existing culvert beneath the A582.

Significant flooding is shown to the north west from the tributary drain along the northern boundary. This length of watercourse is primarily in culvert and is shown on United Utilities drainage records as a private drain. It serves both the development site itself and the adjacent residential areas outside the northern boundary. Flooding here is caused by water backing up behind the culvert and ponding in the low-lying topography. Modelled flood depths are typically less than 0.5m but extend over a large area.

Further flooding was also identified downstream outside of the western site boundary. This was primarily caused by direct out of bank flow across the left floodplain with flood depths typically less than 1.0m.

It is recommended that where possible, development is directed to areas outside of the suggested fluvial flood zone. Where this is not considered practicable then further modelling should be undertaken to inform potential mitigation measures for alleviating/ managing flood risk. This should also extend to the wider watercourse network within the site, consider overland flow routes, frictional losses across the floodplain and incorporate blockage scenario sensitivity analysis of key structures along Mill Brook and its culverted tributary.

## **Drainage Constraints**

There is limited existing drainage infrastructure present within the vicinity. As identified above, surface water runoff from the site is managed through a network of existing ordinary watercourses and limited natural infiltration. There are no foul or combined sewer present within the site boundary and it is expected that the existing properties are served by Septic Tanks and Cesspits.

It is intended that surface water runoff from the site will be restricted to Greenfield Rates with discharge to Mill Brook either directly or indirectly through the existing watercourses within the site or the culverted tributary to the north. Restricted rates, attenuation volumes and points of connection will be proposed once the Masterplan has been developed further. Based on anticipated ground conditions and the potential for shallow groundwater, infiltration is not considered as a suitable method of surface water disposal.



RoC has undertaken initial consultation with United Utilities with respect to foul water discharge from the site. They have advised that due to the scale of the development, modelling will be required before they can provide a response. Notwithstanding this, Arup also consulted with UU in 2009 as part of the FRA process and were advised the following:

- There are network capacity issues in Kingsfold and at Lathom Road. The network is hydraulically overloaded
- Leyland WwTW is now operating at full capacity and cannot accept additional flows from a development of this size
- The south area towards Longton is too flat and considered unsuitable
- The north area is also flat and would require foul flows to be pumped over long distances with inherent septicity problems

At this stage it is not clear whether any investment associated with Leyland WwTW or the associated sewerage infrastructure has come forward since this initial enquiry. It is also not clear what level of development, if any, could be supported from the existing infrastructure surrounding the site. A response is awaited from United Utilities on these matters and will be circulated when received.

