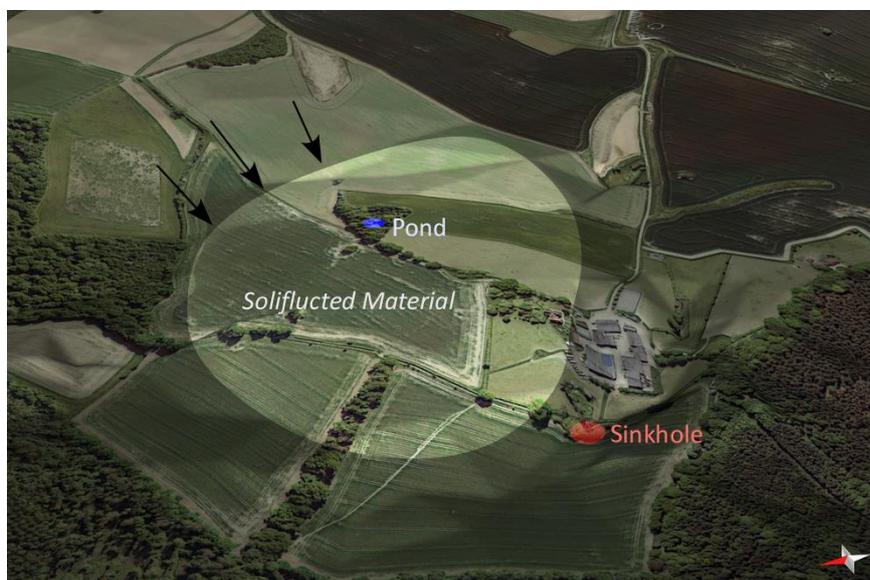


### Development at Symondshyde Farm: Geological Considerations

*This report, dated 13 March 2017, was prepared by Dr Richard Ghail and Dr Philippa Mason at Imperial College London. The authors express no opinion as to the proposed development but only to the ground conditions and potential hazards encountered on site.*

A walkover and drone survey of the proposed development was undertaken on 2 March 2017. Although the drone was flown, the conditions were too windy for the survey to be completed successfully, since the wind shear introduced distortions too severe to be corrected for in the imagery acquired.

The geology of the area comprises Lewes Chalk Formation overlain (draped) by glacial till of probable Anglian age (approximately 300,000 to 400,000 year ago). This material was later modified by periglacial solifluction (down-slope slip) in the Devensian (approximately 10,000 to 100,000 years ago), which is most apparent in the geomorphological model of the site (Figure 1). Solifluction strongly shears the fabric of the glacial till and can lead to further, unexpected, slope failure during and after construction.



**Figure 1** – Geomorphology of the site. Highlighted area shows potentially soliflucted glacial till. Note the vertical exaggeration is 10 : 1

Chalk is susceptible to dissolution in groundwater, forming a karst landscape consisting of sinkholes, caves and other cavities. The walkover survey of the site clearly identified significant geological hazards including a textbook example of a chalk sinkhole (Figure 2). This sinkhole forms a clear circular hollow in the ground that is dry, while the surrounding ground above the sinkhole is wet, demonstrating that water is draining into the hole at the present time. Any change in drainage across the site, either artificial or as a result of climate change, may lead to collapse of the sinkhole. It should be noted that the recent crown hole collapse that took place in St Albans in October 2015 has been attributed to the existence of ancient chalk mines.



**Figure 2** – Sinkhole encountered near Symondshyde Farm, approximately 12 m wide, 4 m deep.

A further probable sinkhole was identified in the form of a pond-filled hollow (Figure 3), the pond indicating that the hollow is blocked at present but again, changes in drainage and rainfall may lead to future collapse. It is noted that gravel extraction takes place in the area and may be responsible for the pond, but the morphology and location are consistent with a sinkhole. A barrow is located close to this pond, indicating that there may be an archaeological interest in the site.



**Figure 3** – Pond encountered near Symondshyde Farm, approximately 18 m x 5 m.

Extensive ploughing masks any evidence of other features but further sinkholes are likely to be encountered across the whole site.