

Hawes Associates

11 Church Walk, Aldeburgh, Suffolk, IP15 5DU

Tel 01728 452535

Email andrewhawes@outlook.com

For: Bob Camping

Geotechnical and hydrological report for pond construction at Viola Hill, Steep.

Introduction.

Following a ground investigation completed by Hawes associates at the site it has been possible to introduce best design practice to the landscape pond proposed. This report details the following:

- a) Ground conditions.
- b) Embankment design.
- c) Design top water level safeguards.
- d) Uncontrolled release of water.
- e) Maintenance

Ground conditions.

The British Geological Survey details Head deposits (hill wash) overlying chalk. A site investigation was completed to identify the actual ground conditions beneath the pond site.



The hill wash deposits consisted of a 2m thickness of pale grey clayey silt. This material would be suitable to engineer into a low permeability internal blanket to retain the 1.5m water depth proposed.

To “engineer” the clayey silt found at the site, a sheep’s foot compactor would be required to compact 3 No. 200mm thick layers to construct a blankets across the floor and up the shallow 1 in 5 (11 degree) sides.

Embankment design.

No slopes will be steeper than 11 degrees (1:5) and no embankment higher than 1.5m. Constructed in compacted layers with a 2m wide crest will create a 17m wide embankment at the base of the highest section. The slack embankment slopes are to soften the landscape impact and facilitate marginal planting, material of this type would be stable at an 17 degree angle (1:3).

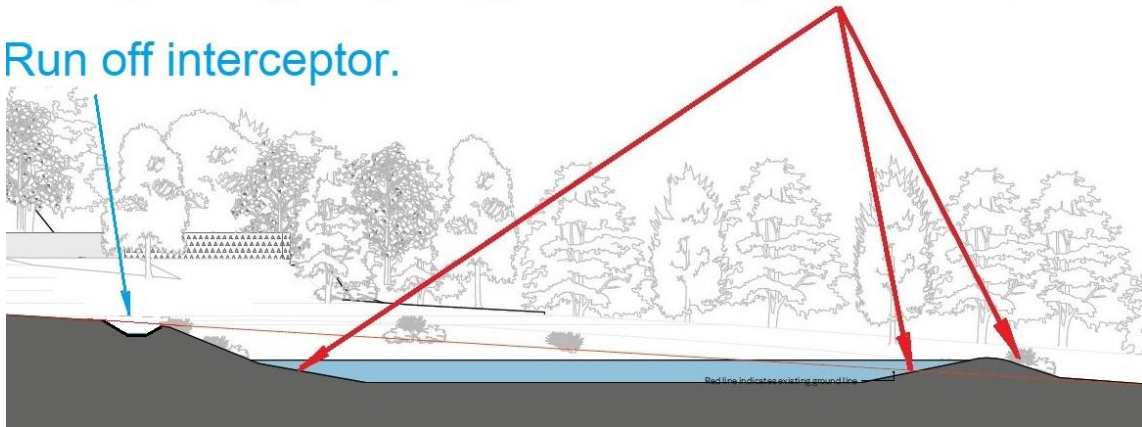
Andrew Hawes

BSc Hons Eng Geology & Geotechnics

FGS CEng MICE

1:5 (11 degrees) engineered clay embankments.

Run off interceptor.



Design top water level safe guards, Ref. Plan Schematic below.

The design has been amended to remove the ability of the pond to fill accidentally in a storm event, this has been achieved by introducing a run off interceptor ditch around the up gradient boundary.

All hill run off will now simply continue as in the green field condition, most soaking away in the adjacent wood.

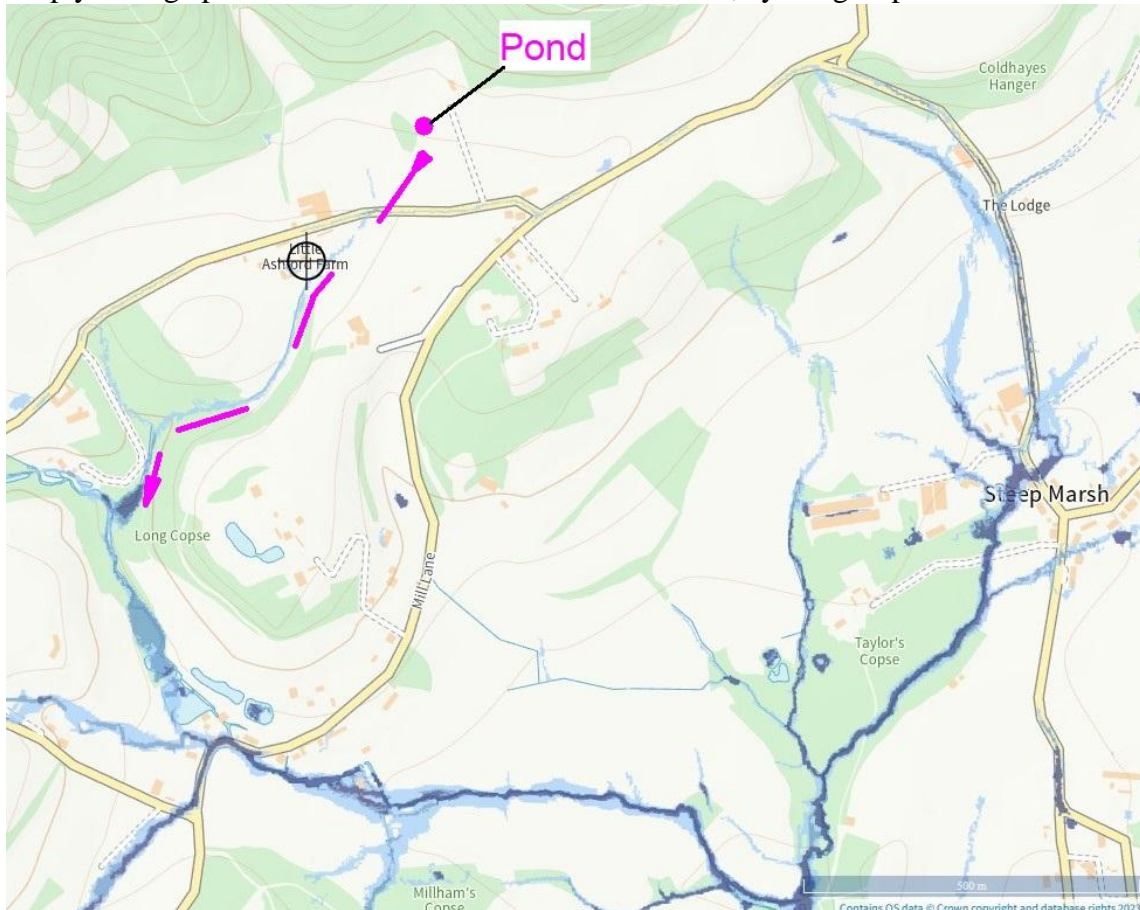
A further safeguard to prevent accidental overfilling of the pond is the introduction of a 200mm dia. overflow pipe preventing a water level above a 0.5m freeboard (freeboard is the vertical height between the overflow level and the embankment crest). The overflow has been sized to remove the chance of debris obstructing the low flow discharges the design has allowed for.



Uncontrolled release of water Ref. Flood Map below.

Whilst there is no mechanism for an uncontrolled release of water now that the pond is a non impounding structure not influenced by severe storm events it is important that reassurance is provided even in the event of the improbable. The floor route below shows where water would flow if the embankment was removed when the pond was full.

It should be noted that the pond would not release its full volume of 3,200 litres as half of that is impounded below original ground level. A maximum volume release of only 1,600 litres is possible. The Environment Agency flood map allows the release to be routed, the water simply ending up in a small lake lower down the catchment, by Long Copse.



Maintenance.

To ensure long term stability and erosion resistance best practice dictates that a healthy grass sward is developed across the outer banks and crest. Good grass cover has two functions, firstly it provides a high level of erosion resistance and secondly increases dew fall this reducing long term desiccation. Marginal planting within the pond is proposed, *Phragmites Australis* (Norfolk Reed) is particularly effective at reducing top water level erosion. Due to the very small water surface area and sheltered location wave erosion has not been considered.