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FOOTINGS INSPECTION REPORT

JOB NO [redacted]

[redacted]

Purpose
To visually assess the adequacy or otherwise of the current foundations to the current extension for the provision of a possible first floor over, making recommendations as required. **(For Location ref Plate 1 in Appended desk study – See Appendix A**)

Philosophy
Two trial pits to formation level were requested prior to the visit as shown in **(figure 1)** below, these being at the connection point of the extension and the original house. Attending site, observed foundation formation and soil type found there. Identifying the soil type by visual methods, assessing a sample for strength and plasticity by hand / field methods.

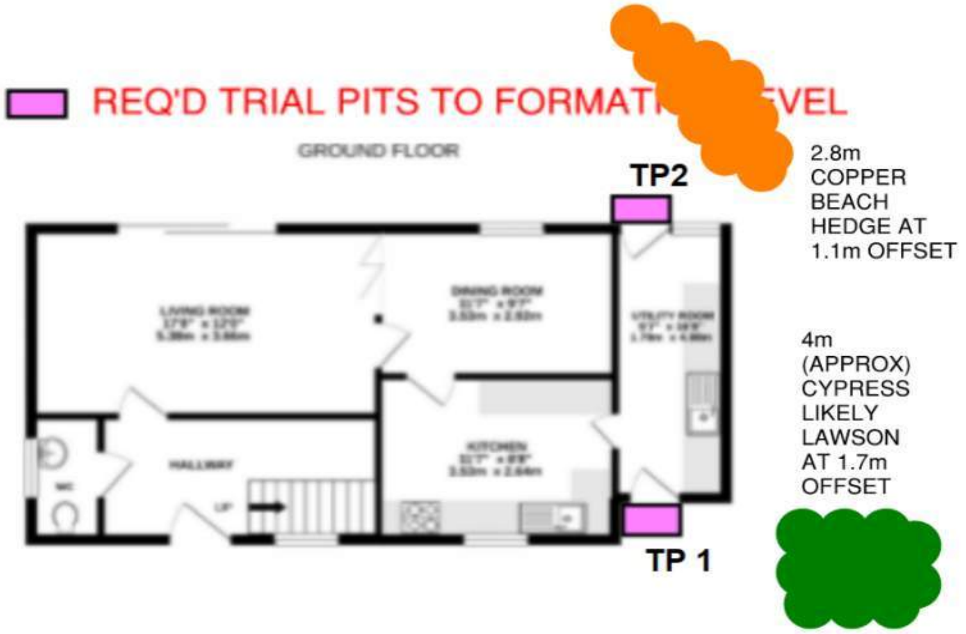

Figure 1 – TRAIL PIT LOCATIONS

Summary Findings

Trial pit 1 – Front elevation (photo 1), exposed an approximately 550mm deep concrete footing.

Trail pit 2 – Rear Elevation (photo 2) exposed an approximately 650mm deep concrete footing.

Photo's 3-4 Physical features appear to identify a Cypress Lawson at 1.7m offset from the front corner of the property.

Photo's 5-6 - Physical features appear to identify Copper Beach Hedge at 1.1m offset from the rear corner of the property.

Photos 7 Shows the weathered clay soil samples taken from arisings from the bottom of Trial pit 1. 3mm sample roles fracturing after only two to three working cycles by rapid assessment method, this inferring low plasticity.
Also , shows the sandy clay soil samples taken from arisings from the bottom of Trial pit 2 . 3mm sample roles fracturing during the first working cycle by rapid assessment method, this inferring low plasticity.

Above DPC/DPM higher level cracking was observed in the facade walls, as shown in **Appendix B** photos 9 – 10 the cracking pattern is not considered indicative of subsidence – more likely thermal movement, due to the absence of an induced movement joint when the extension was constructed and the facade lengthened.

Conclusions.

The soil samples, had no odour appearing to rule out organic materials, hand working also appeared to show little if any silt, some sand present at trial pit 2. The workability of the sample requiring moderate finger pressure with no exuding between fingers demonstrating a likely firm clay. This infers bearing capacities of the order of 75-150kpa [REF 1] – which should be adequate for many domestic buildings of up to 2 storeys.

The working time from liquid to plastic limit was quick - max 2-3 cycles only across the sub samples (photo 7) taken from the main samples.

Based on the above, the sub soil at formation appears to be of a low plasticity, firm inorganic clay of allowable bearing circa 100kPa. This further confirmed by the absence of cracking below dpc that might be associated with tree subsidence. With reference to the NHBC Chapter 4 assessment methods, the Cypress requiring a 2.12m deep footing for its current 4m height and offset, the copper beach requiring 1.44m.

Recommendations.

It is noted that current standards NHBC chapter 4.2 -[REF 2] – (Following table) require a minimum 750mm deep footing for low plasticity soils– this with no planting within influence zone.

Table 4: Minimum foundation depths

Volume change potential	A) Minimum foundation depth (m) (allowing for restricted new planting)	B) Minimum foundation depth (m) (where planting is outside the zone of influence of trees)
High	1.50	1.0
Medium	1.25	0.9
Low	1.0	0.75

With minimum 550mm formation depths measured, it has been recorded that the foundations under the extension fail to meet this depth requirement currently. However they do not appear to be exhibiting cracking that one might associate with subsidence / shallow footings.

Observations further showed that the dpc / air bricks here are relatively high over current external ground / path level, 230mm / 400mm respectively. Therefore, should any subsidence issues arise in the future, an additional 200mm could readily be added to the external landscaping to achieve the codified figure of 750mm stated as required by the NHBC Table 4.

With regard to the trees identified nearby, recommendations are as follows.

1. Cypress Lawson – This is a high water demand tree, with a potential mature height of 18m, theoretically as shown above with a current footing depth requirement of 2.12m subsidence damage could have already started. It is recommended that this tree be removed in a controlled way, and less onerous planting used instead as required. To remove it sensitively and to try and avoid adverse affect to the ground water, I would recommend it is pollarded to half height in late April / early May, to reduce its water uptake over the summer, and then grubbed out from the roots twelve months later.
2. The beach hedge – if maintained at approx 3m height, NHBC assessment shows that it should be removed, i.e. nott be allow closer than 13m from the house. It is appreciated that this likely means the removal of much of the hedge. Findings currently do appear to show a low plasticity soil / no subsidence damage, therefore a watching brief for damage may be preferred if the NHBC offset limit is not to be followed.

To sum up, with trees removed / planting adjusted as above, the NHBC 750mm depth requirement could be later achieved as/if required by adjusting the external levels up to 150mm below dpc. This should be much cheaper than underpinning. Therefore a deemed to satisfy approach, it seems should be acceptable, this based on the current absence of subsidence related cracking. It is appreciated that future raising of external finished might bring levels close to the underside of the air bricks. However with careful detailing such as a gravel / shingle strip next to the wall, water splash ingress into the air bricks from rain can be headed off.

Therefore based on current findings of performance with respect to subsidence, and the possible future contingency level changes / mitigations discussed above, these footing are likely to be acceptable for the proposed extension works.

This report (including any enclosures and attachments) has been prepared for the exclusive use and benefit of [redacted] *and solely for the purpose for which it is provided. This being to inspect and report on the exposed foundation and formation below the proposed extension works, advising on the current form. Assessment of further risk has been provided when appropriate, with suggested remedial measures to be taken forward. Unless we provide express prior written consent, no part of this report should be reproduced, distributed or communicated to any third party other than the building inspector as required. We do not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report.*

By Steve Johnson CEng MIStructE Beng Hons
Reg No. 024460435
[redacted]

References

[1] - Craig Soil Mechanics - 4th Ed – ISBN 0-278-00019-3

[] NHBC Chapter 4.2

Appendices

A – Pre Vist Desk Study

B - Survey Photographs

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APPENDIX A - **PRE - VISIT DESK STUDY**

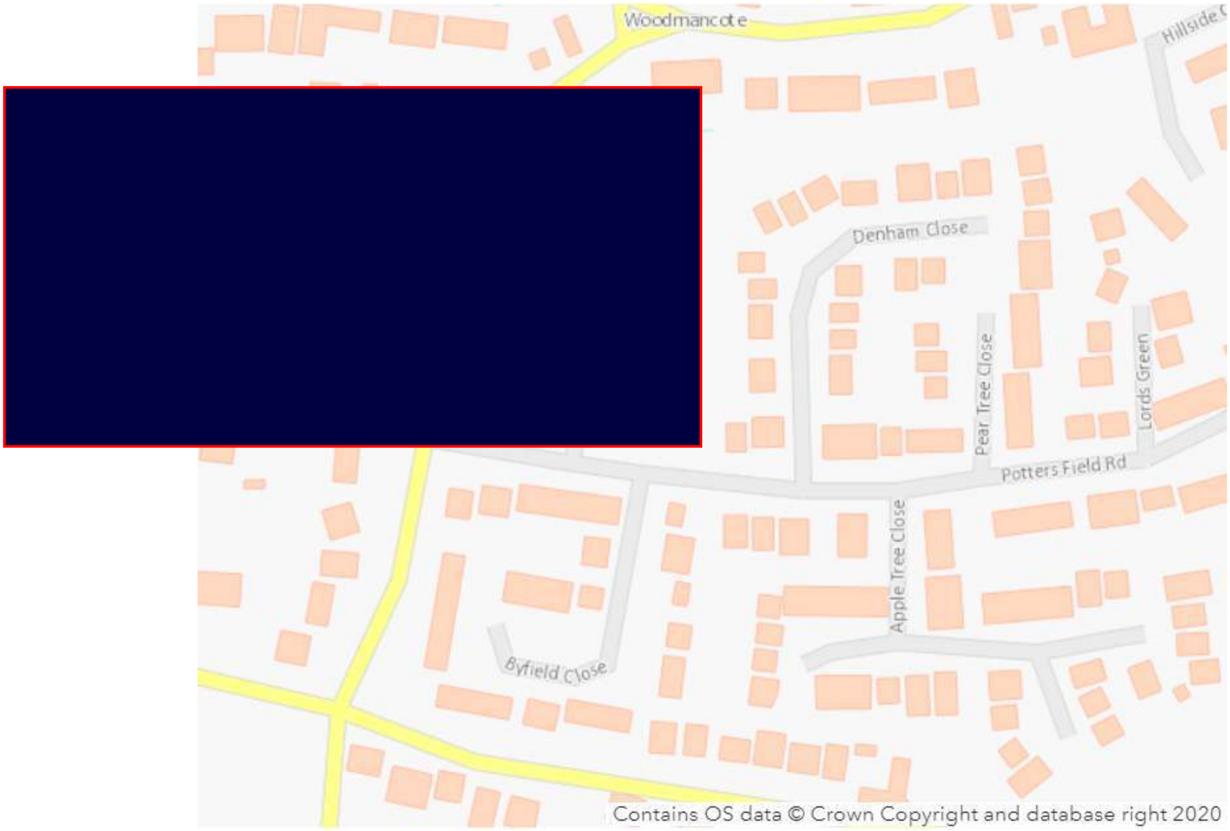

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PLATE 1 - STREET LAYOUT PLAN

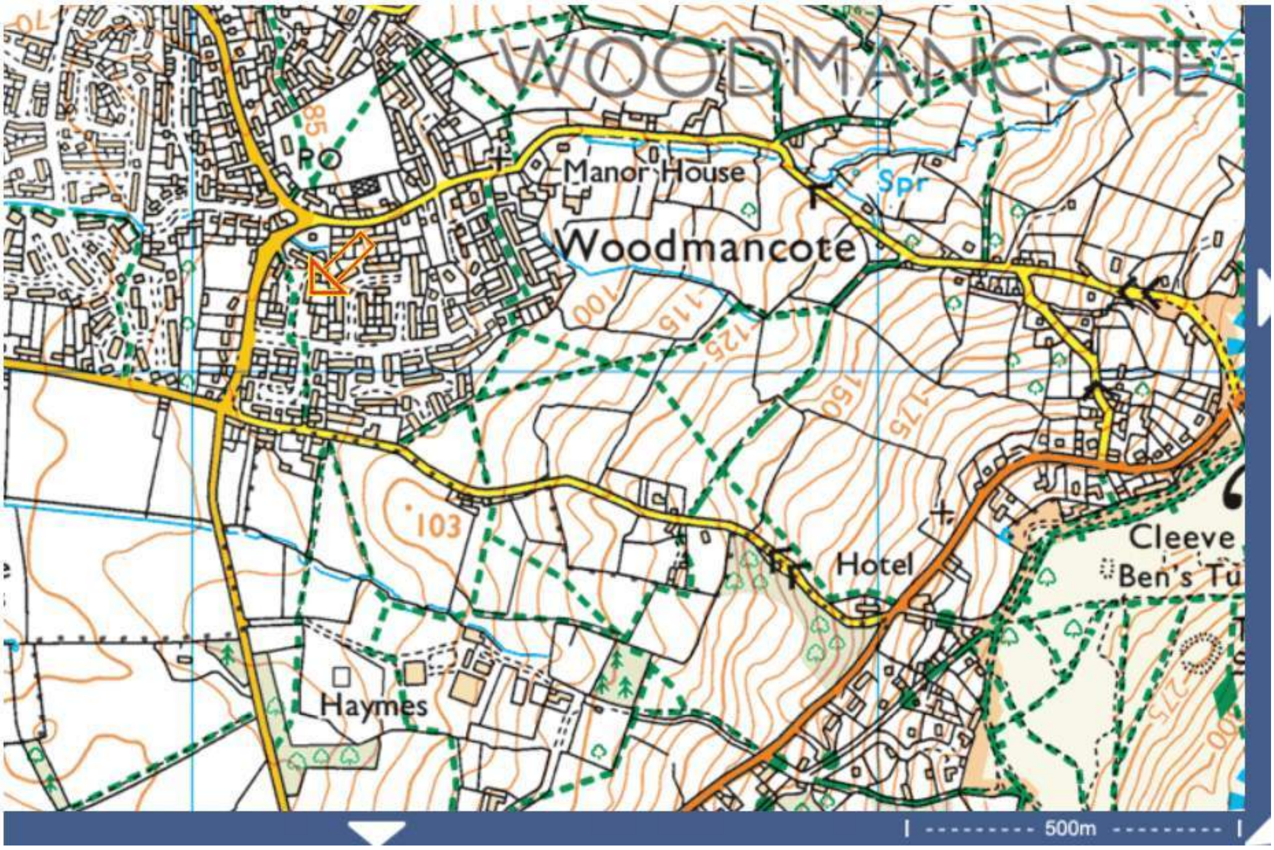


PLATE 2 - ORDNANCE SURVEY MAPPING - CONTOUR PROFILE

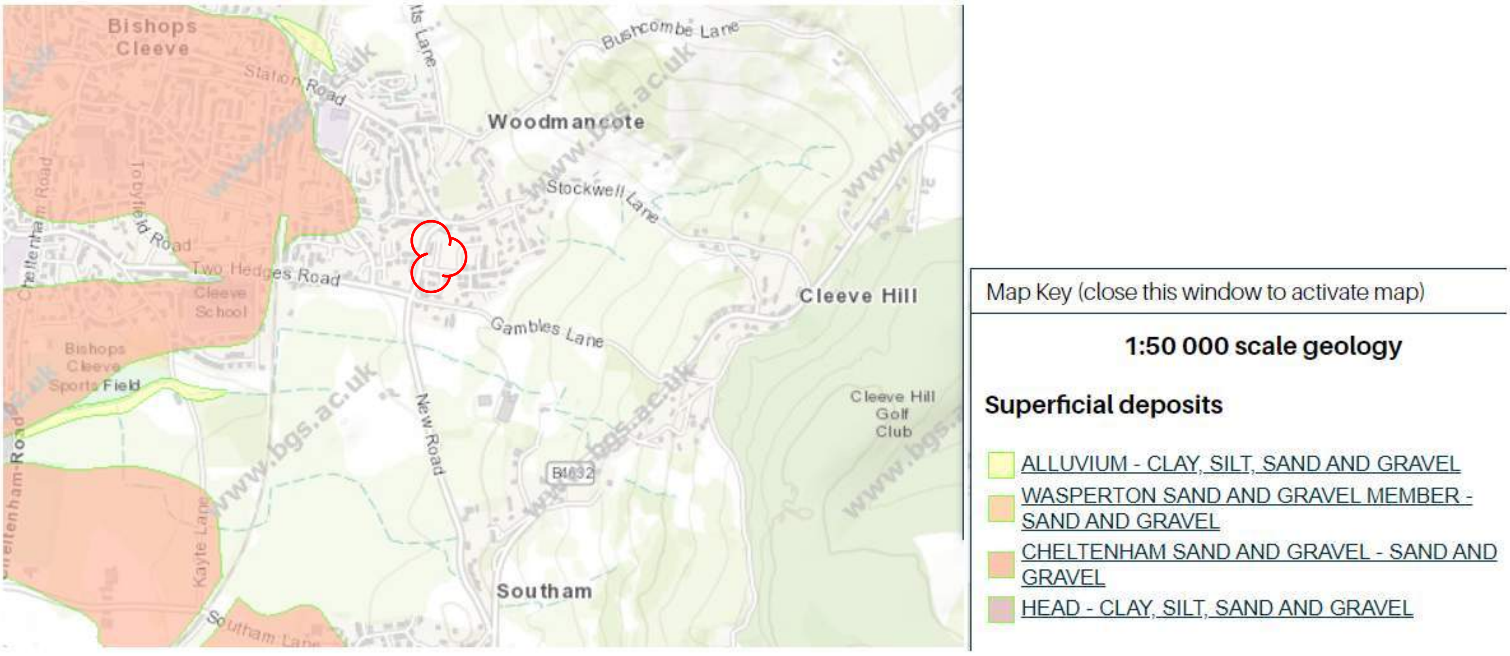


PLATE 3 - SUPERFICIAL GEOLOGY - REF. BRITISH GEOLOGICAL MAPPING (BGS)

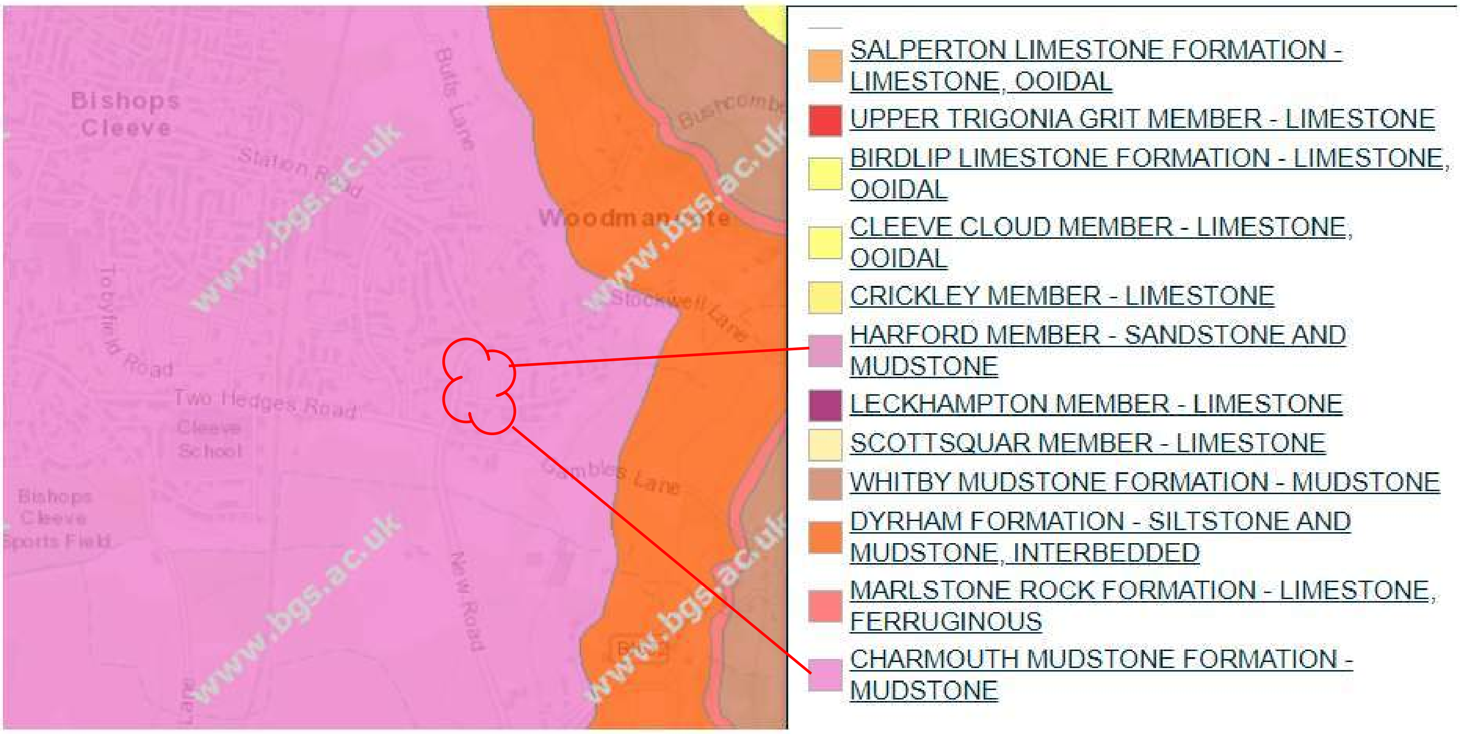
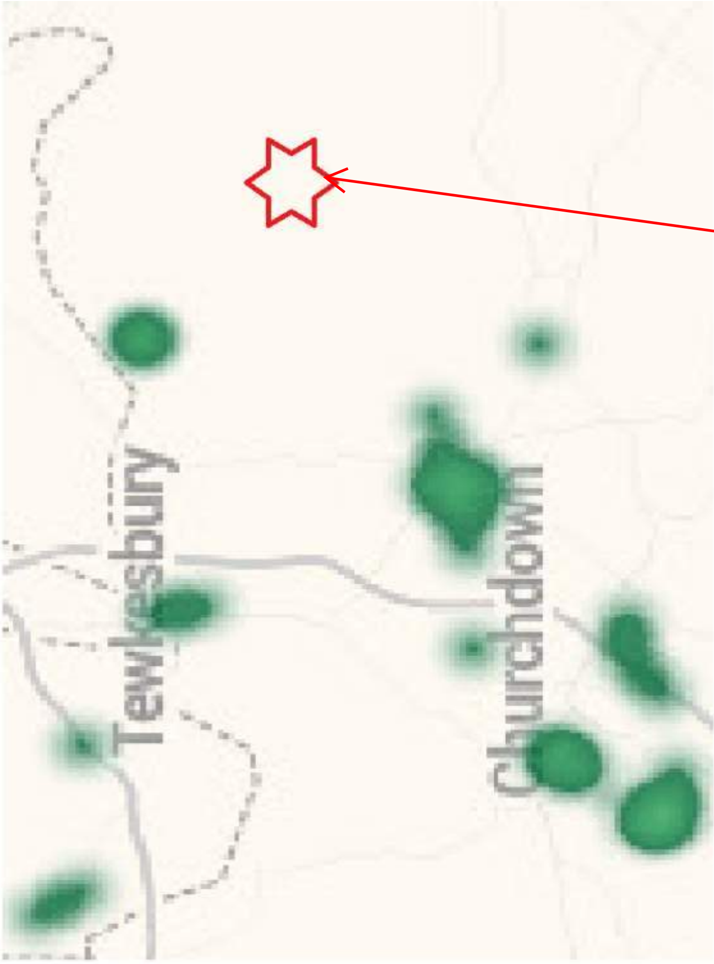
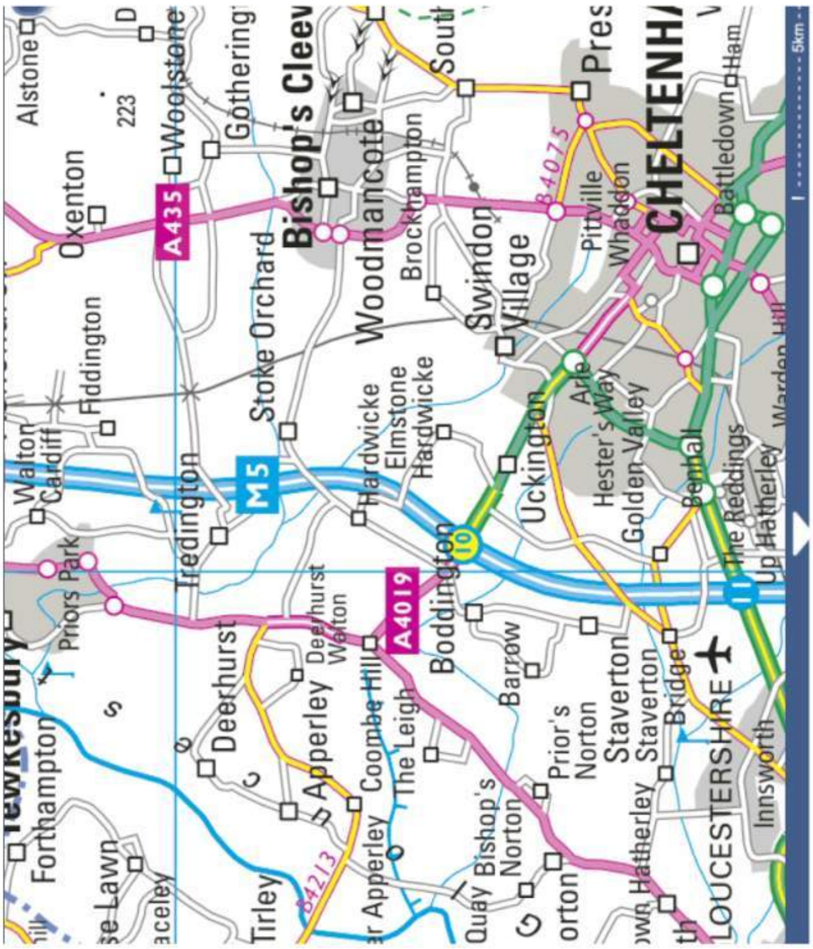


PLATE 4 - BED ROCK - GEOLOGY - REF. BRITISH GEOLOGICAL MAPPING (BGS)



APPROX SITE
LOCATION - REF
GEOBEAR UK
SUBSIDENCE MAP
NO HOT SPOTS
NEARBYE



APPENDIX B

SURVEY PHOTOS

IMAGE 1 – TRIAL PIT 1

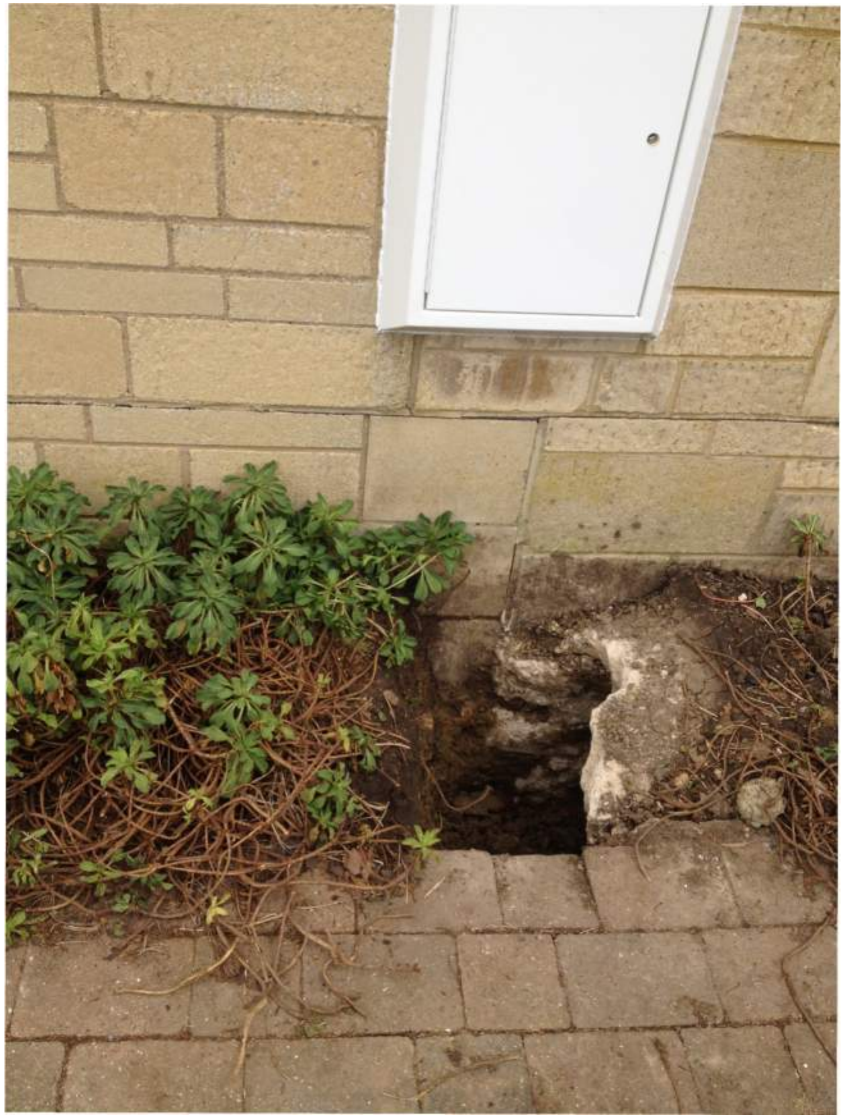


IMAGE 3
CYPRESS LAWSON FOLIAGE

IMAGE 5
COPPER BEACH CURRENTLY 2.8m TALL

IMAGE 6
COPPER BEACH FOLIAGE

IMAGE 8

SOIL SAMPLES AND RAPID ASSESSMENT ROLES

CLAY SAMPLE FROM TP 1 - 3mm ROLES BREAKING AFTER FIRST WORKING I.E. ON 2ND CYCLE

GRITIER / SANDIER CLAY SAMPLE FROM TP 2 - 3mm ROLES BREAKING UP ON FIRST ROLLING CYCLE BEFORE 3mm ACHIEVED

IMAGE 9

STEPPED
CRACKING
THROUGH JOINTS -
LIKELY CAUSATION
THERMAL

IMAGE 10

STEPPED CRACKING OVER THE LINTEL - WITH SNAPPED BRICK OVER WINDOW HEAD - CAUSATION LIKELY THERMAL MOVEMENT