

DRAINAGE
REPORT
TIMBER
BARN
ROUSE HILL
HOUSE

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For: Historic Houses Trust of New South
Wales

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INTRODUCTION

The two most obvious causal factors in relation to the deterioration of the timbers of the barn are rotting and termite attack. This report looks at the evidence of former drainage systems, as revealed on the surface of the site and by the excavation of small-scale trenches, test squares, or sondages, at strategic locations. The study undertaken required a "brief report".

EXCAVATION METHODOLOGY

Small test trenches or squares were located in areas judged to be near 'activity convergences' (near doors, gates, corners), areas which might best yield evidence as to former drainage systems. As these excavations were considered as part of the maintenance program, care was taken not to remove any significant deposit or artefact.

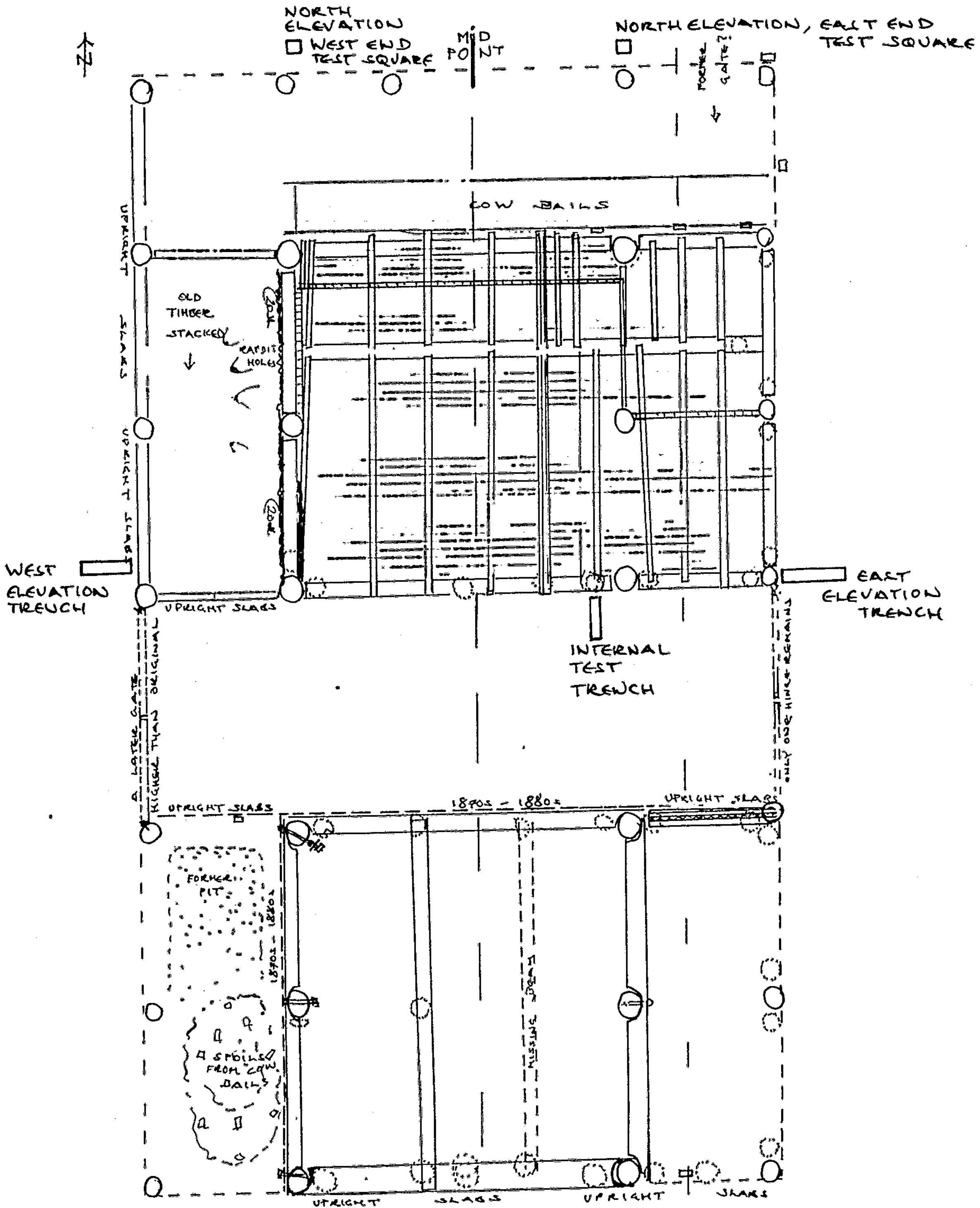
Excavation was done by hand and recorded by means of drawing, notes and photography. The changes in soil and stratigraphy were subtle, except for the brick fragment deposits, so best understood through the drawn cross-sections.

SURFACE REMAINS OF FORMER DRAINAGE SYSTEMS

There are small-scale open trenches contiguous to the east and west elevations, most obvious along the northern half of the structure but these are due to the drip-line from the eaves of the present roof and water run-off. These unplanned trenches are not efficient because they are narrow and situated too close to the structure. Water is retained due to the dense growth of fine grasses along the perimeter of the structure (in contrast to the coarse grasses further out). Evidence of a previous small-scale open trench (now silted) was found further out by about 100 mm from the structure and overlapping the newer trench. This was probably caused by the water run-off from the previous roof, though may have been deepened by human agency.

No obvious remains of early drainage systems are to be seen on the surface around the Barn but there was evidence that the land sloping away from the barn on the east, south and west sides were once more pronounced.

BARN ROUSE HILL HOUSE



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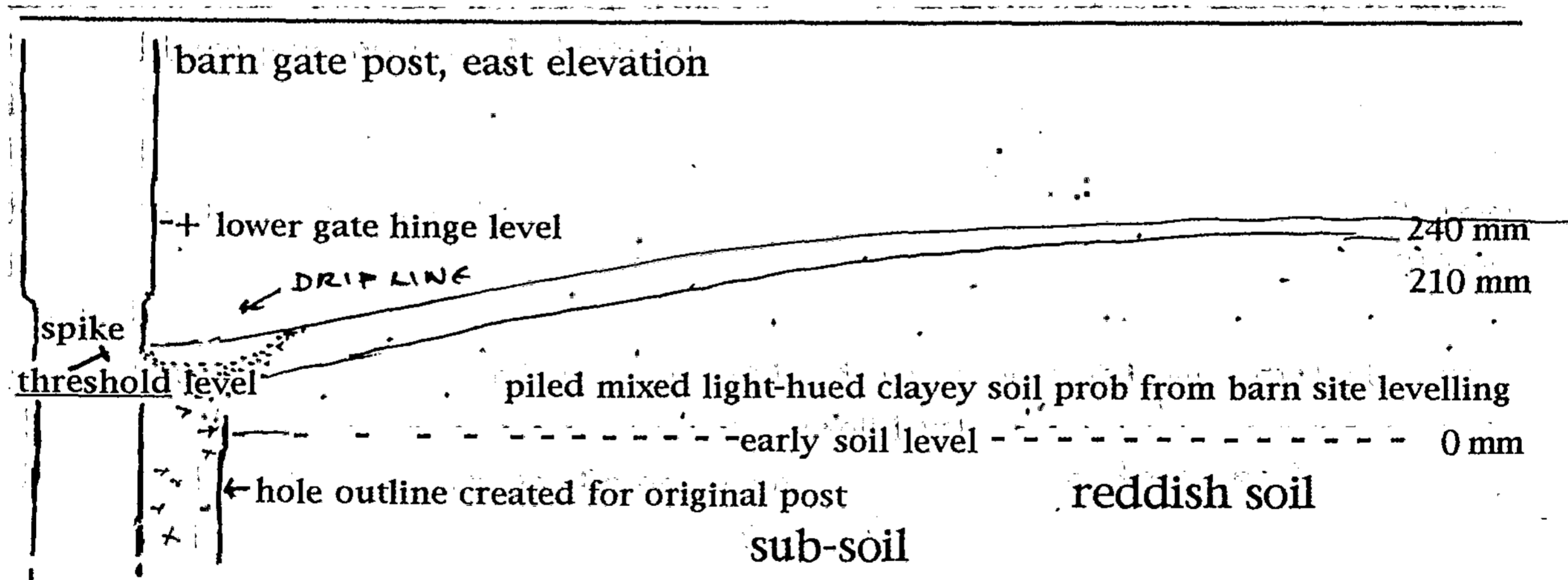
EXCAVATION

EAST TRENCH

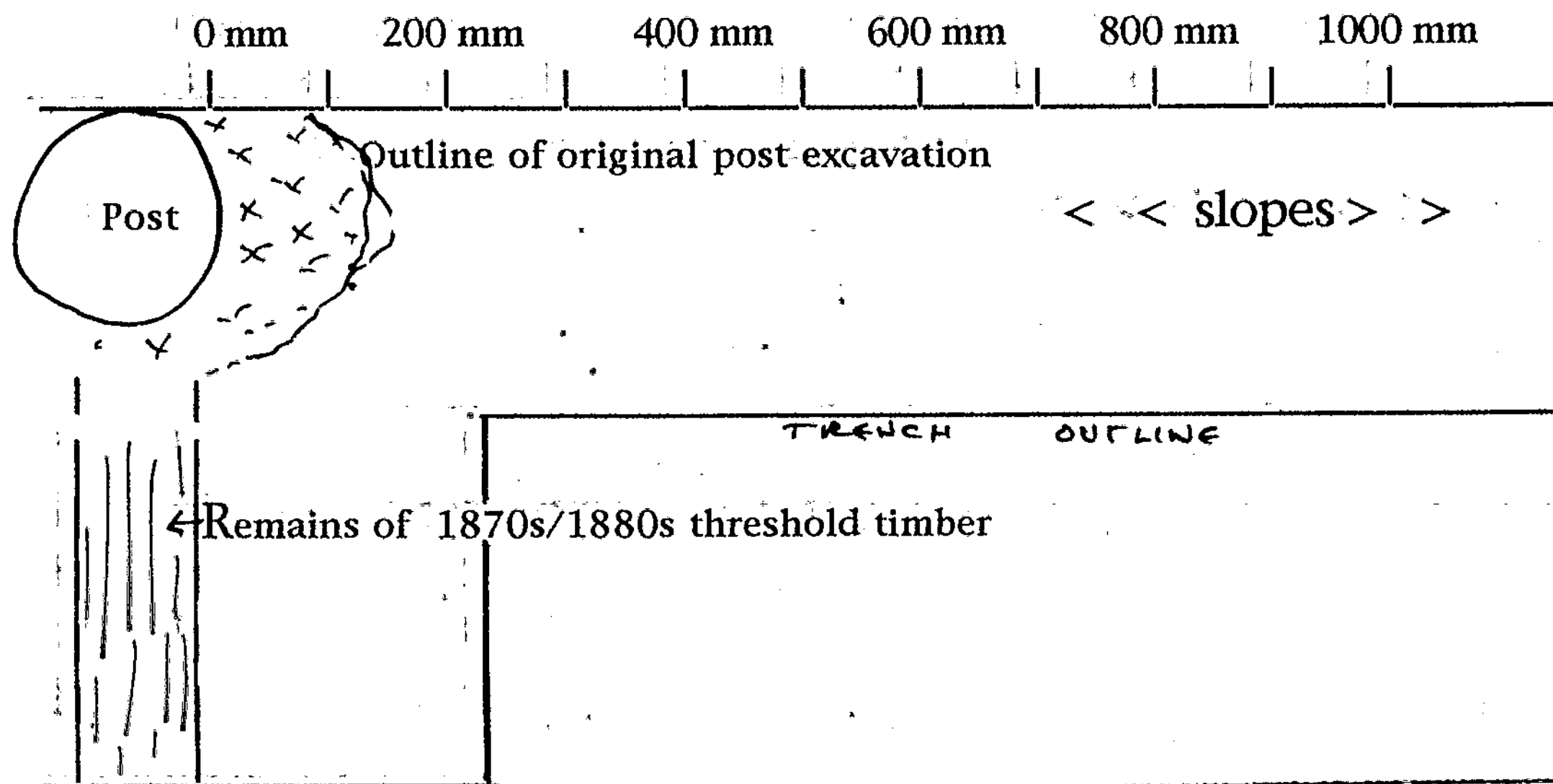
This trench was situated at the north side of the barn's east double gateway. Evidence was found that there used to be a threshold timber along the gateway, secured by a large spike at each end, on analogy with the ones seen securing the large floor plates, or bearers, seen in the south half of the structure (probably dating circa 1880s). This shows that there has been a slight build-up of surface soil over the last hundred and twenty or so years in this area.

The original, roughly circular, excavation and backfill for the gateway post became distinct during the excavation. The area directly against the post was of a dark hue, basically loam, the result of timber rotting. The build-up of the loam was not dense because of ant excavation activity. Grass was found to be exploiting the loam against the post, the roots extending into the cracks along the post. Live termites, probably the Latex Termite (*Coptotermes acinaciformis*), were seen along the edge of the post and other posts of the structure. There was no sign of a drainage system, other than informal or natural drip-line trenching.

EAST ELEVATION TEST TRENCH CROSS-SECTION



EAST ELEVATION TEST TRENCH---PLAN



The most important features were found to be:

[A] A reddish clayey soil level, representing the near original ground level. This level was also found on the west side trench with later fill over it. Evidence from the north side of the barn suggests that the original surface soil was of a grey hue.

[B] The compacted dumped clayey soil mix, representing material left over from the levelling of the site for the barn and the excavation of the holes for the upright posts. The soil dump feature slopes both towards and away from the Barn because of the slight hump and the drip line trench along the side of the barn. The latter feature causes the flow of rain water to run along the drip-line trench at the edge of the Barn. The flow of the water is slowed down by the grass and a percentage of the water eventually sinks into the subsoil directly along the side of the Barn, adding to the moisture already under the barn from other sources.

INTERPRETATION

During the initial construction period, excess soil was dumped along the east side of the barn. The excess soil was the result of site levelling and the excavation of holes for the main posts of the barn. The unintended effect of this was to reduce the rate of water run-off away from the barn.

WEST TRENCH

Here the remains of an early silted drip-line drain trench was found, similar to the one noted on the east side of the barn. The present drip-line trench has eroded about half of the previous one. No evidence was detected of a formally constructed drain.

The most important features were found to be:

[A] A reddish clayey soil level, representing the original near sub-surface but evidently the surface had been cut up unevenly (cattle, sheep, dray wheels?) because the dumped material over it was uneven along the horizon (border) between the two levels.

[B] A dump of soil mixed with brick fragments. The most likely source may relate to the brick fragment compacted floor of the cow bails of the north side of the Barn. The deposit may be fairly recent, say, within the last fifty years, judging by a thin 'v'-shaped length of metal within this deposit. The latter may suggest that this is a secondary deposit, perhaps removed from the broken surface of the Cow Bails floor at a time when the owners decided to resurface it and dump the material along the west side of the barn.

This brick fragment deposit extends along the length of the west side of the barn, as evidenced by the series of termite traps which were bored at regular intervals along this area during the study period (which seemed to suggest, misleadingly, a drain or path at the time).

The brick fragments may have ultimately come from the demolition of a structure on the property, the softer bricks being hammered into fragments and used for the floor in the Cow Bails. There is evidence of an overhaul of the Cow Bails area sometime during the 1890s to 1920 period but the brick floor seems to relate to an earlier phase. The posts for the trough seem later than the brick rubble floor, note how the flooring does not extend to the edge of the posts. It seems that at a later date the brick rubble floor surface became unstable and was substantially replaced: the brick etc., was probably then dumped along the west side of the Barn.

INTERPRETATION

The soil retains considerable moisture, in contrast to the situation at the east side of the Barn. The soil appears to have been so soft and boggy that it may have been decided to consolidate it by dumping the brick fragment deposit over it.

INTERNAL TEST TRENCH

A very small trench was dug alongside the north side of the mid east-west passage of the Barn against one of the uprights supporting a large joist. This was to act as a 'control' to compare with the external trenches.

After the removal of the loose surface material, a very compacted deposit of disturbed deeper subsoil was found which was probably the result of material dumped from the excavation of the post holes, after the site had been levelled. Below this was undisturbed subsoil of the same type of material.

Missing was the softer reddish clayey 'near sub-soil' soil found in the east and west trenches. The reason for the absence of this soil seems to be that the site was levelled before the Barn was built. The ridge then, originally, must have been very slightly more curved than is evident these days.

Live termites, probably the Latex Termite (*Coptotermes acinaciformis*), were seen along the edge of the post. The below ground rotting of the timber is approximately twice the extent of rotting seen at the base of the post above ground (but is otherwise solid).

NORTH ELEVATION

Two small test squares were excavated along the north elevation of the barn, one toward the east end, the other toward the west end. No evidence of a former drain was detected.

NORTH ELEVATION, EAST END, TEST SQUARE

grass

-----0mm

loose loamy soil

-----50mm

firm compacted old surface layer

of grey soil, slither of beer bottle (amber) glass at 110mm.

The presence of shale fragments and grey soil seems to relate to the resurfacing of the Cow Bails floor.

-----160mm

very firm compacted old surface layer of reddish-hued clayey soil, indicating a period of site disturbance. The soil below is more of a tan colour (grey and red soil mix?).

-----200mm

The soil becomes very soft and is of a lighter tan than above.

X charcoal fragment X- - - - - 250mm

possibly from the land clearing period.

-----300mm

undisturbed sub-soil, a white and red clayey combination and some naturally occurring shale fragments.

This test square revealed that the early surface was some 160mm below the present surface. There was a period of soil build-up (approximately 110mm) during the resurfacing of the Cow Bails floor and a further build-up after the barn became to be abandoned.

There was no sign of a drain. A to be abandoned drain drain stone which was found half buried in the Cow Bail area may indicate nothing at all but it remains a possibility that a line of these could have existed along the north side of the cow bails.

NORTH ELEVATION, WEST END TEST SQUARE

grass

-----0mm

loose build-up of dark loam and surface material

-----100mm

surface hard and compacted--some brick and stone fragments. Brick fragments becoming increasingly dense lower in this layer but resting on a fairly level older surface. Probably relates to the removal of loose brick fragments from the earlier Cow Bails floor.

-----170mm

dense compacted former surface

light tan colour soil, shale/stone fragments

soil becomes softer with depth. ∞- brick fragment with glaze - -at 210/220mm

softish light tan soil- - small brick fragment - at 240mm

Small charcoal fragments

-----280mm

Soil becomes hard again, probably the original subsoil
stone fragments

Tree root at about 310 - 330mm from a tree removed nearby some years ago

This square provides us with a similar picture as the other north elevation test square, the early surface was some 170mm below the present surface. There was a period of soil build-up (approximately 70mm) during the resurfacing of the Cow Bails floor, resulting in the rich brick fragment deposit. Whether the brick deposit was accidental or was meant to stabilize or make higher the surface is uncertain. There was a further build-up of loam (100mm) after the barn became to be abandoned.

No sign of a drain was detected.

INTERPRETATION

The soil profile at 160mm-170mm and 50mm-100mm represent previous surface deposits because of the compaction of the soil at those levels and because of the sharp changes in the deposits above them. The dating of the lower surface level is difficult to determine but is unlikely to be earlier than circa 1880s/1890s because of the relationship with the two phases of the Cow Bails floor surfaces (brick fragments). If the lower surface level is contemporary with the brick fragment layer of the west elevation, that would suggest a date as recent as the 1940s. Because of the presence of brick fragments as deep as 240mm in the

west end test square (may represent the original construction period of the Cow Bails floor), I would conclude that the brick rubble deposit dates to the later period, that is, circa 1940s.

SITE RECOMMENDATIONS

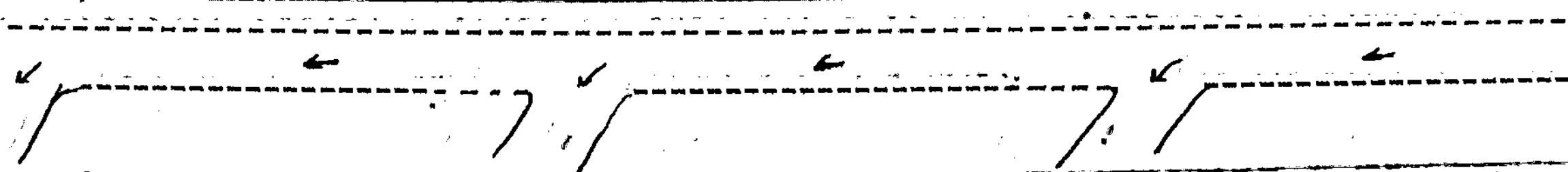
[1] Reduce the moisture content of the soil under the Barn.

Suggested Options:

[Option A] Modify the soil build-up to the east and west of the Barn to gently slope away from the Barn by removing soil no deeper than between 50mm-200mm. The 200mm represents the mild 'hump' along the east side of the Barn, east side of the drip line.

Grade the north end so that the rain water runs to either sides of the Barn rather than toward it as now happens. The soil disturbance should be no deeper than 160mm-170mm.

[Option B] Create wide and shallow earth, gravel or sealed spoon drains in the soil build-up (suggested 800 mm width by 150 mm - 200 mm graded depth) on the east, west and north sides. It may be advisable to have several branches lead away from the building:



The spoon drain would have to withstand the treading of cattle and the growth of grasses.

If the drain is not sealed and the grass is removed, some action will be needed to prevent the eaves drip-line excavating new trenches along the perimeter of the Barn along the east, west and north elevations.

[2] Termites.

Eliminate the termites from the timbers and soil. It might be advisable to set up termite traps on a regular basis around the Barn, particularly in the direction of timber fence lines to discourage underground termite feeding trails.

[3] Grass.

Eliminate grass growth directly next to the Barn to prevent future silting of the drain and to eliminate root feeding underground along the timbers, exacerbating splitting along cracks (particularly species like Couch and Kikuyu with vigorous adventitious rhizomes).

[4] Fungal attack.

Consider the impact of other agencies of change. Ants were found to excavate dirt along some of the upright timbers but may have mitigating beneficial effects by attacking termite feeding trails and discouraging fungal attack by aerating the soil. Monitor for fungal attack.

STATUTORY REQUIREMENTS

The removal of part or all of the soil build-up, should be done with the co-operation of the supervising archaeologist. Particular care should be taken along the north elevation because there should be some evidence of a former (probably earth) drive or path and evidence which may reveal what happened when the cow bails were added to the Barn.

The raised soil on the east side of the Barn may date from the construction of the Barn, a product of site levelling and excavation for the posts. The raised soil on the west side is of a much later date but contains artefacts, mainly brick fragments and the odd metallic object. The site should be examined during the course of excavation and at the conclusion. The removed soil should also be examined. Work should stop if artefact scatters are found and if anything of a structural nature comes up, until the archaeologist can make an assessment.

A Section 60 or Section 140 will be necessary before excavation commences because of the age and significance of the of the structure as an important element of Rouse Hill House farm.

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