

Richard Maudsley

Subject: FW: Waddington Old Hall - Query

From: Richard Lines [REDACTED]

Sent: 08 March 2025 17:06

To: Richard Maudsley [REDACTED]

Subject: Re: Waddington Old Hall - Query

Dear Richard,

RE: The proposed floor buildup and underfloor heating at Waddington Old Hall, Waddington.

I am writing following your queries into the proposed reduction in thickness of the existing concrete slabs at Waddington Old Hall as raised in the recent Archeological report from Lancashire County Council, dated 28th February 2025. We have visited the site, but not explicitly to inspect the floors and therefore the information supplied in the document supplied by you (Drawing numbers 6423 -PRD1 to PRD 6) has been relied upon to draw these conclusions. We also confirm that we did not notice any excessive settlements or deviations from level of the existing floors during our visit, with the caveat above in mind.

Summary:

Concern was expressed in the Archaeological report regarding the structural suitability of the reduced thickness of concrete, which in some cases is as little as 50mm. These concerns are valid and have correctly been raised, however we believe that whilst a brand new reinforced concrete slab would be the gold standard from a pure engineering perspective, the proposed works do carry limited and predictable structural risks which when balanced by the need to maintain historical value is likely to justify the proposal. The following paragraphs describe our logic behind this conclusion and our thoughts on the practicality of excavating a small portion of a concrete slab's depth.

Construction method:

With regards to the proposed preparatory works for installation of the underfloor heating in the Monk's Room, Morning Room, Main Reception Hall, Drawing Room, we understand that the proposal is to create a series of saw cuts in the concrete slabs at close centres down to the desired level, and then break out the remaining concrete in between these cuts. Whilst this approach is time consuming and costly, if the cuts are sufficiently close to one another it is likely to form a level base from which to lay the proposed floor build up and avoid breaking through to the materials below.

Structural considerations:

Our conclusion has been arrived at by the following reasoning:

- A structural slab is intended to bridge any areas of softer ground present below the slab to avoid an uneven finished floor surface once the materials directly below the slab have compacted in the following years and decades in response to an applied loading.
- The greater the variability in the soils below the slab and the greater the loads applied to the slab, the more robust the slab should be to bridge any soft spots. Conversely, if the ground below the slab is fully compacted and consistent in its compaction across the footprint of the floor area, the less robust the slab needs to be. The degree of compaction isn't a particular issue, but rather the consistency of compaction across the floor area as it is the differential settlements between two locations which cause cracks.
- An unreinforced concrete slab has very little capacity to bridge any of these potential areas of lesser compaction and it would be our expectation that the existing slabs are already cracked; if not due to any uneven compaction in the material below, then almost certainly due to the stresses developed within the unreinforced concrete during the long-term drying of the thin layer of brittle unreinforced concrete over a relatively large area (large in relation to its thickness). Even reinforced concrete will often crack in this manner.
- In this particular instance, the materials under the floor have been in service as a floor for decades and are likely to have been subject to a variety of uses. This implies that the ground is likely to be well compacted across its footprint. The current floor is not understood to be compromised or subject to any significant unevenness.
- If the slab has cracked, then it is no longer functioning as a structural element in this location and is reliant on the properties of the supporting material beneath to maintain an even floor level and manage settlement. To our knowledge, no adverse outcomes are understood to have been noted in the existing floor finishes. If the unreinforced slab is not cracked then it follows that the materials under the slab are extremely well compacted, the slab is not required to bridge any soft spots and the slab enjoys good, consistent support.

We can therefore conclude that the current slab is most likely not performing any significant structural function, and therefore any reduction in its depth is unlikely to imply a poor future performance if the materials below the slab are not disturbed (leading to a reduction in compaction). This conclusion is supported by the evidence in the existing Reception Hall and Dining room, where no slab has been provided and it is our understanding that an adequate long term service as a floor has been observed.

Associated risks:

In terms of the general risks associated with this conclusion, we do not believe that there is any risk to the stability of the rest of the structure if the floor should fail. No reasonable catastrophic failure of the floor in isolation can occur unless there are any unknown geological features such as a sink hole directly beneath the house, which cannot reasonably be known before time.

The function of the slab is not of providing stability against catastrophic failure which has implication on the safety of the building users; but rather as a serviceability concern - i.e. a failure has implications on the continued function and service of the building and comfort to the users.

I hope that this answers your questions, please get in touch if you have any further queries.

Your sincerely,

Richard Lines

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Richard Lines M.Eng, Ph.D, C.Eng, MIStructE

Structural Engineer, Director

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w: www.norikerconsulting.co.uk

Noriker Consulting Engineers Ltd. 10887467, England, Coleby House, Broughton Hall, BD23 3AG