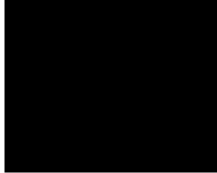


Absolute Consulting Engineers Ltd.

Structural and Civil Engineering Consultants

Mr Simon Barclay



Our ref: 3882
Date: 31st July 2022

Dear Mr Barclay,

**Re: Kennel Farm, The Common, Hanworth, NR11 7HP
Proposed conversion of existing barns to dwelling and studio**

We have been appointed to undertake an initial structural report of the above property, as part of a planning application, to establish the suitability for conversion of the agricultural barns into a habitable dwelling and studio.

The site comprises of pair of detached agricultural buildings set approximately 11m apart, with a courtyard between. Each unit comprises typically a single storey building with vaulted roofs, comprising tiles supported on timber purlins on trusses with structural wall plates supported on a solid 330 thick brick and flintwork walls.

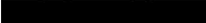
The units appear to have been used for varying agricultural purposes, with living quarters and are currently unused.

The site is set approximately 10m east from the main road, and 50m south of a small stream. From data provided by the British Geological Survey, maps indicate the ground conditions are likely to be typically sand and gravel, which we would anticipate would achieve a minimum allowable ground bearing pressure of around 100kN/m². No details of the existing foundations were available, although it is expected that these are spread brickwork, taken down approximately to around 300mm below ground level.

The proposal is to convert the main (southern most) building to a part two storey dwelling with the smaller unit converted to a studio.

Both buildings appear to have been used, in part, as habitable accommodation at some point during their life and are considered to be in fair condition as detailed below and with some degree of strengthening and rebuilding work, are considered satisfactory for conversion to a dwelling and detached studio.

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Norfolk NR9 3RE


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Barn South (Proposed Dwelling)

The main barn is a single storey building, generally of 330mm brick and flint work,. The roof is of cut rafters, supported onto structural wall-plates and purlins supported on tied trusses of varying sections. The floor is generally of solid concrete, although the thickness could not be determined at the time of the survey. No details were attained as to the size and depth of the existing foundation, although these are expected to be spread brickwork on to the sand sub-strata. The roof has partially collapsed to the central section.

Detailed below is a list of the expected works required to enable to the structure to be converted to a habitable dwelling.

- 1.1. Generally the barn is considered to be of fair condition and structurally suitable for conversion to a habitable dwelling with an expected degree of refurbishment required to the roof, floor and wall construction throughout. Conversion of the barn to a habitable dwelling would need to be undertaken by an experienced contractor under the guidance of a structural engineer to establish a rigorous method of refurbishment identifying any areas of decay to ensure the building is restored to meet current structural standards.
- 1.2. The tile cladding to the roof structure will need to be removed and re-laid on new battens and breathable felt to ensure completely water tight and insulated and braced with OSB to the underside of the rafter with general refurbishment of the roof structure to ensure longevity.
- 1.3. The wall plate will need to be assessed to meet current British Standards and may require nominal strengthening. They should be inspected for any deterioration and repaired as necessary and suitably anchored to the existing inner wall face with straps at each truss position and an intermediate tie between the trusses.
- 1.4. The existing trusses will need to be inspected for signs of local decay and where necessary locally repaired or replaced. Further structural assessment of the trusses may indicate some degree of strengthening be required, especially at the joints to ensure they meet current British Standards, although this can be implemented sympathetically to the structure. Where the roof has collapsed, the roof can be reinstated using either attic type trusses to allow for a first floor or alternatively a cut roof onto tied rafters.
- 1.5. The existing purlins will need to be assessed to meet current British Standards and, in some locations, may require nominal strengthening.
- 1.6. All timbers should be further inspected and repaired/replaced if the condition suggests the timber is inadequate. All timbers should be treated for rot and woodworm accordingly by a specialist.
- 1.7. To the western end of the barn a new first floor will be introduced, and it is anticipated that this will be built up off the new internally studwork anchored to the new concrete floor.
- 1.8. The existing concrete floor may need to be removed and replaced with a new reinforced concrete floor adequate to support the new internal lining studwork and insulated accordingly. However, once work commences, further investigation for the slab may prove the floors adequacy and over insulated accordingly.
- 1.9. The external walls are generally in fair to good condition. It is expected that some local re-pointing and replacement of brickwork and flintwork where weathering has occurred to match the existing construction. Installation of a DPC to the full perimeter would be

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advisable. Noted cracking to the brickwork at various locations will need to be stitched with resin anchor bars across the cracks. There are several locations where trees and shrubs are growing close to and onto the brickwork, and it would be advisable for these to be carefully removed. To assure laterally stability of the external side walls it would be advisable to tie the external wall to at least one of the internal division walls. An internal stud lining wall will be required to afford the insulation of the building and also to support the new timber first floor structure. The stud wall will need to be built up off a brick plinth off the concrete ground bearing slab, with the cavity ventilated accordingly.

- 1.10.** The roof should be suitably drained to a positive drainage system outfalling to a soakaway designed to the necessary percolation results.
- 1.11.** Proposed foul water drainage should be implemented either to an adopted drainage system or to septic tank/biogas digester outfalling to a suitably designed drainage field within the grounds of the property
- 1.12.** The existing foundations are expected to be spread brickwork 300mm deep on sands achieving an allowable ground bearing pressure of around 100kN/m². It is not expected that any underpinning works will be required to the foundations
- 1.13.** Existing lintels to each of the openings will need to be individually assessed and strengthened or replaced where necessary.

The above list is only indicative based on the observed elements, and once works commence on the property and further survey of the structure should be undertaken to determine the full extent of remedial works required.

Given the age of the property, extreme care should be observed during the refurbishment works to ensure that the building remains stable, and any necessary temporary buttressing' implemented to assure this. All health and safety measures should considered prior to works commencing to assure that safety of all operatives during the refurbishment works.

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Barn North (Studio)

Barn B is, again, single storey, generally of 330mm flint with brick quoins to the underside of the wall plate to three elevations with the presented front elevation generally 102mm brickwork. The roof is typically rafters on to structural wall plates and purlins strutted off a beam at wall plate level. To the western end, a tin covered extension has been introduced, which is a scheduled for removal.

Detailed below is a list of the expected works required to enable to the structure to be converted to a habitable dwelling.

- 1.14. Generally the barn is considered to be of fair condition and structurally suitable for conversion to a habitable building with an expected degree of refurbishment required to the roof, floor and wall construction throughout. Conversion of the barn to a habitable dwelling would need to be undertaken by an experienced contractor under the guidance of a structural engineer to establish a rigorous method of refurbishment identifying all areas of decay to ensure the building is restored to meet current structural standards.
- 1.15. The tile cladding to the roof structure will need to be removed and re-laid on new battens to ensure completely water tight and insulated and braced with OSB to the underside of the rafter with general refurbishment of the roof structure to ensure longevity.
- 1.16. The wall plate should be inspected for any deterioration and repaired as necessary and suitably anchored to the existing inner wall face with straps at each truss position and an intermediate tie between the trusses. The wall plates will need to be assessed to meet current British Standards and may require nominal strengthening
- 1.17. The existing trusses will need to be inspected for signs of local decay and where necessary locally repaired or replaced. Further structural assessment of the trusses may indicate some degree of strengthening be required especially at the joints to ensure they meet current British Standards, although this can be implemented sympathetically to the structure. Where the roof has collapsed, the roof can be reinstated with a cut roof onto a ridge beam or tied rafter pair.
- 1.18. The existing purlins will need to be assessed to meet current British Standards and in some locations may require nominal strengthening.
- 1.19. All timbers should be further inspected and repaired/replaced if the condition suggests the timber is inadequate. All timbers should be treated for rot and woodworm accordingly by a specialist.
- 1.20. The existing floor may need to be removed and replaced with a new reinforced concrete floor adequate to support the new internal lining studwork and insulated accordingly. However, once work commences, further investigation for the slab may prove the floors adequacy and over insulated accordingly
- 1.21. The external walls are generally in good condition. It is expected that some local re-pointing and replacement of flintwork and where weathering has occurred to match the existing construction. Installation of a DPC to the full perimeter would be advisable. Noted cracking to the brickwork at various locations will need to be stitched with resin anchor bars across the cracks.. There are several location where trees and shrubs are growing close to and onto the brickwork, and it would be advisable for these to be carefully removed. An internal stud lining wall will be required to afford the insulation of the building. The stud wall will need to be built up off a brick plinth off the concrete ground bearing slab, with the cavity ventilated accordingly. Again, the chimney would benefit from rebuilding above roof level with the necessary DPC.

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- 1.22. The roof should be suitably drained to a positive drainage system outfalling to a soakaway designed to the necessary percolation results.
- 1.23. Proposed foul water drainage should be implemented either to an adopted drainage system or to septic tank/biogas digester outfalling to a suitably designed drainage field within the grounds of the property
- 1.24. The existing foundations are expected to be spread brickwork deep on sands achieving an allowable ground bearing pressure of around 100kN/m². It is not expected that any underpinning works will be required to the foundations
- 1.25. Existing lintels to each of the openings will need to be individually assessed and strengthened or replaced where necessary.

The above list is only indicative based on the observed elements, and once works commence on the property and further survey of the structure should be undertaken to determine the full extent of remedial works required.

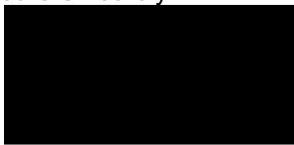
Again, as for barn(south), given the age of the building, extreme care should be observed during the refurbishment works to ensure that the building remains stable, and any necessary temporary buttressing' implemented to assure this. All health and safety measures should be considered prior to works commencing to assure that safety of all operatives during the refurbishment works.

The above recommendations are only indicative based on the observed elements, and once works commence on the property and further survey of the structure should be undertaken to determine the full extent of remedial works required.

The content of this report is limited to the exposed areas of the building during the survey and no destructive testing or exposure was undertaken to establish the condition of specific elements of the building. No inspection of historic survey data was made. It should be considered that the extent of repair necessary for the conversion of the building would be subject to an ongoing survey of the building during the conversion works to establish the condition and extent of any deterioration.

We hope the foregoing and enclosures are satisfactory; however, should you have any queries, please do not hesitate to call.

Yours Sincerely



Jon Ayling BEng(HONS) CEng MStructE
For and On Behalf of
Absolute Consulting Engineers Ltd.

Encs. Invoice 3882-01

cc. Howe and Boosey Architectural Services Ltd

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