

FAR Structures Ltd

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Our Ref: 20096/AR/01

Mr Jason Davies
Cilmaengwyn Uchaf Farm
Cilmaengwyn
Pontardawe
Swansea
SA8 4TX

10th December 2020

Dear Jason,

Ref: Structural Inspection of Barn, Dutch Barn & Cow Shed at Cilmaengwyn Uchaf Farm, Cilmaengwyn, Pontardawe, Swansea, SA8 4TX

I write to confirm your instruction for FAR Structures Ltd to carry out a visual structural inspection of the barn buildings at Cilmaengwyn Uchaf Farm, Cilmaengwyn, Pontardawe. I can also confirm our visit was carried out on Friday 27th November 2020.

The purpose of our visit was to inspect the barn buildings located at the above property and to establish their structural integrity and to note any deformations.

An inspection of the barn buildings was carried out from ground level internally and externally.

No intrusive tests were carried out during our on-site inspection.

No responsibility can be held for elements which were not visible or exposed at the time of the inspection.

Observations

Our inspection included the following buildings: -

- 1) South barn building.
- 2) Cow shed.
- 3) Dutch barn.

South Barn Building

The south barn building adjoins a second barn structure at its north west corner. Please refer to Photograph 1. The barn is a two storey building. Perimeter walls consist of solid random stonework. An

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inner block skin has also been constructed along part of the east elevation, the whole length of the south elevation and along part of the west elevation.

Timber first floor joists support a timber deck.

The barn roof structure consists of timber rafters and purlins with main timber A-frame support trusses. The roof has a slate covering. A mono pitch timber walkway canopy structure exists along the north courtyard elevation.

The barn east gable elevation appears in a stable condition. No cracking is noted within the stonework construction. A single opening exists allowing access onto the first floor level. Stonework around the opening is structurally stable with no signs of lateral deflections. Please refer to Photographs 2, 32, 33 and 34. An internal inspection of the barn east elevation also confirms no cracking or structural movement. Please refer to photographs 39 and 43.

The barn south elevation has no openings. The remaining walls of a cow shed butt up against the south elevation. Please refer to Photographs 3, 29, 30, 31 and 41. Some open jointing exists externally on the barn south elevation. However, this elevation appears structurally stable with no sign of lateral distortion of significant cracking.

The west gable elevation wall also appears in a stable condition. No signs of cracking or lateral movement are noted. External levels are lower than existing ground floor slab level and a single drainage outlet is evident just off the north west corner. Please refer to Photographs, 8, 10, 11 and 42.

The barn north elevation has a significant outward lean along the length of the wall. However, no cracking or differential vertical movement is noted. Timber first floor joists, where built into the internal face of the north elevation appear securely supported. An internal inspection at joist support locations does not suggest the wall has moved since installation of the timbers. Also the line of the roof structure does not show any sign of deflection at this location. Please refer to Photographs 1, 35, 36, 46 and 47.

Internally, a single block skin has been constructed along part of the east and west elevations and along the whole south elevation, up to first floor level. No cracking or sign of structural movement is noted. Please refer to Photographs 48 and 51.

The barn has a concrete ground bearing floor slab. Please refer to Photograph 45.

The first floor timber structure shows signs of localized areas of decay due to the ingress of rainwater over a prolonged length of time. The timber floor deck has decayed. Joists could not be inspected during our visit due to the ceiling finishes. Please refer to Photographs 44 and 49.

All timber lintels on the inner face of window and door openings appear in good condition. No cracking or splitting of the timber lintels was noted. No structural movement in the vicinity of each opening was noted. Please refer to Photographs 49 and 50.

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The barn roof structure consists of timber rafters on purlins which are in turn supported on main A-frame timber trusses. At each end of the barn, purlins are built into the end gable walls. On the whole the timber roof structure appears in a stable condition. However, timbers have been affected by the continuous ingress of rainwater through the roof slate finishes. Please refer to Photographs 38, 40, 41 and 43.

A timber mono pitch walkway canopy existing along the full length of the north (courtyard) elevation. The canopy roof is supported on 4no. timber posts. Small diagonal timber bracing members provide some stability to this structure. Timber members appear in good condition. However, the exposed steel shoe support brackets at the bottom of each of the timber posts show significant decay due to rust. Please refer to Photographs 52, 53 and 54.

Cow Shed

The remains of a cow shed structure exists in between the barn building and Dutch barn. Please refer to Photographs 4 and 7. A temporary lightweight timber roof has been erected over part of the cow shed area. The remaining section has no roof and is open to the elements. Please refer to Photographs 9, 13 and 28.

A surface drainage pipe discharge through the west elevation wall directly to the ground outside of the cow shed. Please refer to Photograph 12. Founds are exposed along the west elevation.

A temporary lightweight timber flat roof structure has been erected with a metal sheet covering as protection for the timber log store. Please refer to Photograph 30.

No windows or door exists in the cow shed.

Dutch Barn

A Dutch barn structure is located to the south of the cow shed. A concrete block wall exists along the north, south and west elevation to a height of 1.80m. Above this, the structure consists of a minimal timber frame and clad with corrugated metal sheets. No roof structure exists but instead relies on the diaphragm action of the connected corrugated sheets to span the curved profile across the width of the barn. No roof bracing or vertical bracing is noted within the Dutch barn. Please refer to Photographs 4, 5, 6, 7, 9, 21 and 22.

The external face of the Dutch barn blockwork has suffered from spalling. External block pillars have also suffered significant damage due to erosion. Please refer to Photographs 14 and 16.

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Small steel support posts are located externally and show signs of rust. Please refer to Photograph 17.

The Dutch barn foundations are exposed along the south and west elevations. Please refer to Photograph 18.

An internal inspection of the Dutch barn foundation slab confirmed significant failure of the concrete. Large cracks are apparent where the floor slab has suffered from differential settlement. Please refer to Photographs 19 and 20.

The excessive settlements of the concrete floor slab has also resulted in cracking at numerous locations of the perimeter block wall as the blockwork has been constructed directly off the perimeter of the slab. Please refer to Photographs 23, 24, 25 and 26.

Discussion & Recommendations

Based on my visual inspection, I am of the opinion the main barn building at Cilmaengwyn Uchaf Farm is in a structurally stable condition overall and is suitable for refurbishment.

There are localized areas which need minor remedial patch repairs of the stonework and replacement of structural timber members. However, all remedial works can be carried out without having a detrimental affect on the stability of the barn.

I have listed below bullet points of recommended structural remedial works for the existing barn as follows: -

- Timber roof structure to be replaced with new timbers if found to be structurally inadequate when design checked to support proposed roof loads.
- Would recommend replacing existing first floor timber joists with new timbers.
- Opening jointing in south elevation to be re-pointed with a lime based mortar.
- Replace all exposed metal work supporting walkway canopy with galvanised metal work.

Although the north (courtyard) elevation has a significant outwards lean, it would appear this movement is historical as there are no cracks within this elevation (externally or internally). Supported timber members do not show any signs of slipping out of support pockets. No movement is noted around window or door openings. Therefore, I would conclude any movement has ceased and is non-progressive.

With regards the cow shed and Dutch barn structures, I am of the opinion these structures have come to the end of their design life and recommend both structures be carefully taken down and removed. The cost to rectify, strengthen and underpin these buildings to provide stable structures in such an exposed environment is not considered to be feasible.

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I trust the above comments and recommendations are of assistance. However, should you have any queries, please do not hesitate to get back in touch.

Yours sincerely



Andrew Robbins
Director

For and on behalf of

FAR Structures Ltd
Consulting Structural Engineers