



CONSULTING CIVIL & STRUCTURAL ENGINEERS

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Dr Masayuki Otani
125 Canterbury Road
Westgate-on-Sea
Kent

By email only to: massotani@gmail.com

Your Ref :
Our Ref : TS529

24 February 2016

Dear Dr Otani

125 Canterbury Road, Westgate-on-Sea, Kent Feasibility of Proposed Structural Alterations

Introduction

We write further to our visit to the above property on 22 February 2016. The purpose of the visit was to inspect the building and advise on the feasibility of a number of proposed alterations from a structural engineering perspective.

Limitations and Exclusions

The inspection was limited to the four specific areas discussed below and did not extend to the assessment of any other part of the property. The inspection was not a 'building survey' of the type normally carried out by Building Surveyors and does not therefore cover any defects there may be in structural and non-structural materials including, but not limited to, steel, concrete, timber, masonry and plastered finishes. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such parts of the property are free from defect. Furthermore we have not inspected or considered defects related to damp, rot or mould, nor for any deleterious or toxic materials such as high alumina cement or asbestos, and are therefore unable to report that the building is free from risk in these respects.

The inspection was visual only. No intrusive investigations were carried out, including the 'opening-up' of hidden structural elements, trial pits to investigate foundations and the surveying or testing of drains, nor was access available to the adjoining properties. No dimensional measurements, including by means of level and verticality surveys, were taken except where specifically mentioned below.

The findings and recommendations of this report are therefore limited to that which could reasonably be inferred from visual inspection alone. No responsibility can be taken for other defects which were either not visible or not evident without dimensional measurements or intrusive investigation.

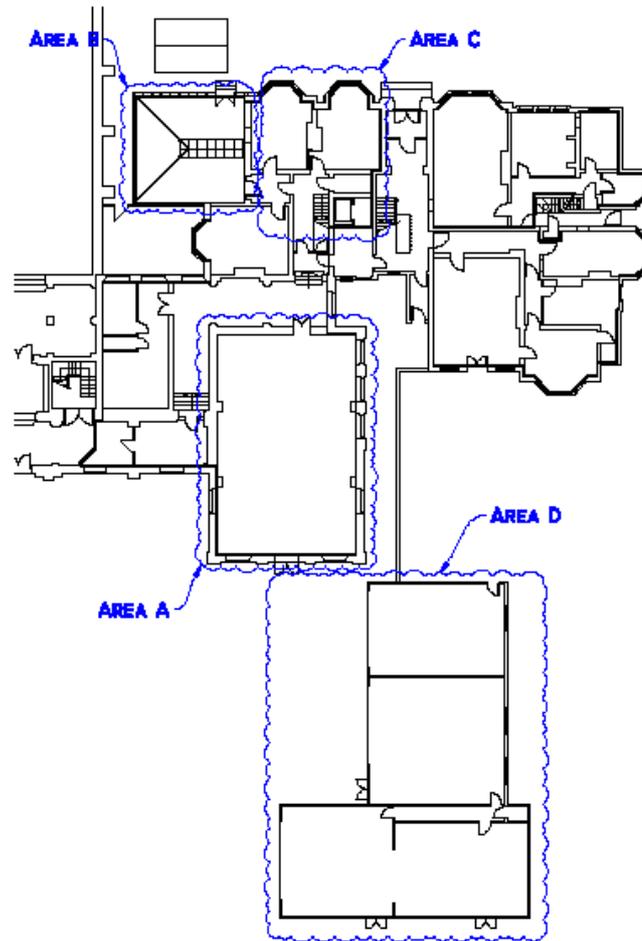
Background

The main part of the building has up to five storeys with a basement under part. It is attached to the adjacent property, which is a similar sized building, and to a single storey outbuilding at the rear. The main part of the building appeared to be of conventional construction with timber roofs, timber first, second and third floors, concrete ground floors except over the basement which were timber, and solid masonry external walls. The outbuilding is of timber-framed construction, including timber roof trusses, and has concrete ground floors. The photographs below show the front and rear elevations of the main building.



Extent of Inspection

Four specific areas were inspected. These have been called Areas A to D for reference purposes only and are located where shown on the plans below. No parts of the building outside these areas were inspected.



Area A

At ground floor level there is a single room approximately 14m x 9m in plan (photograph below).



The first and second floors are divided into rooms off a central corridor. The third floor is open over two-thirds of the area (photograph below) with a stairwell in one corner and another stairwell and other rooms in the remainder, sub-divided by partitions which appear to be non-loadbearing timber.



As far as can be seen from limited opening-up, it would appear that the roof, which is part vaulted and part flat, spans between the external side walls. The first, second and third floors are all timber and appear to span between the walls at each end of this area and internal loadbearing walls which are directly above the two downstand beams which can be seen in the ground floor ceiling. All other walls at first, second and third floor levels appear to be non-loadbearing and of timber stud construction. The two downstand beams appear to be supported on substantial masonry piers within the masonry external side walls.

Our understanding of the proposal is that the rooms at first and second floor will be partly reconfigured. This mainly involves changes to non-loadbearing and lightweight stud partitions but also the formation of four new openings in the internal loadbearing masonry walls, one at first floor level and three at second floor level. At third floor level only the addition of one non-loadbearing lightweight stud partition is envisaged. We would need to see detailed proposals and assess the proposed changes in detail to satisfy Building Control requirements, but our view at this stage is that the proposed changes would not significantly alter the way in which the structure works. In general the loads on existing structural elements will remain the same or may decrease slightly. There are a few areas where a slight increase in loading may occur, but it should be possible to provide measures to address the increase or determine that it is not significant. It will not be possible to justify the existing beams, piers, foundations etc. by calculation without very extensive opening-up, but we consider it reasonable to assume that the structure can be considered as adequate provided that the loading is not increased, or if it is increased slightly in parts by only a small amount.

Area B

This area is a single storey timber-framed conservatory structure, attached to the main building, as shown in the photographs below:



The structure appears to be stable and undistorted but is in poor condition with much rot, damp and deterioration evident, seemingly mainly related to water ingress.

It appears that some remedial work has been carried out in the past, notably the introduction of a steel beam under one of the two timber beams along the sides of the lantern light. The horizontal steel angles between the two slender steel posts may also have been added post-construction, possibly due to concerns about the slenderness of these posts which are about 3.9m high and only about 60mm in diameter.



Our view is that the existing structure would be unlikely to satisfy Part A (Structure) of the current Building Regulations, not least because of the slender posts and overall stability issues. However the conservatory has clearly stood for many years with no major signs of structural distress apart from the apparent addition of a remedial steel beam. If the decay and deterioration can be addressed we see no reason why the structure should not be retained, although we would suggest the addition of another steel beam to the lantern to match the one already installed. We assume that the existing single glazing will not be replaced with double or other heavier glazing as this would clearly be a significant additional load that the structure would be unlikely to be able to support.

Area C

This area includes the installation of a lift up to the third floor and alterations to an existing roof void to form a new room.

We understand that the lift being considered will be supported at its base, probably on a reinforced concrete slab or lift pit. All vertical load will therefore be transferred down to foundation level and should not need to be supported on the existing structure. A substantial masonry wall exists at all levels adjacent to the lift location which will probably be suitable for fixing guide rails etc. to and for lateral stability of the lift. This wall, and a corresponding one on the other side of the rooms into which the lift will be introduced, can be used to support the floors and their trimming around the lift well and openings. Alterations will be required to the roof structure at the top of the lift as its position conflicts with the existing dormer window shown in the photograph below.



Opening-up and survey work is required to establish how the existing roof structure is arranged in this area, so as to enable the design of a suitable trimming or other support arrangement.

The nearby roof void and roof structure is shown in the photograph below:



In its current configuration this area is unsuitable for use as a habitable room due to the large number of purlins, struts, ties and binders which intrude into the space. The rafters, and probably also the ceiling joists, will need to be replaced or strengthened with additional timbers to suit insulation and other details and to strengthen them for the additional loads and altered configuration. We envisage a series of ridge and valley beams supported off the gable walls and the chimney which would allow all the internal timbers to be removed.

We therefore conclude that this area is structurally suitable for the alterations proposed, subject to further survey and detailed design.

Area D

This area comprises a pitched roof single storey 'T' shaped outbuilding, currently linked to the main house by a further single story building which is to be demolished, as shown in the photograph below.



The structure comprises a felted roof supported by fibre board sarking spanning between proprietary low pitch timber trusses. The trusses are supported off external and internal timber stud walls. The ground floors are tiled and assumed to be ground-bearing concrete slabs.

The general condition of the structure is poor and water ingress was seen in several places. Parts of the roof and ceiling have collapsed, as shown in the photograph below.



The ground floor slabs appeared to be in reasonable condition and suitable for retention, subject to the loading to be applied to them.

We believe that the existing structure can be retained, provided that all elements damaged directly or indirectly by water ingress are repaired or replaced, and that any replacement roof covering does not exceed the weight of the materials currently being supported. The truss nail plate connections also need to be inspected to ensure that they have not corroded.

We understand that the intention is to form openings in the external for folding doors which will be up to 4.8m wide. This can be achieved with steel 'goal post' frames (beams with supporting posts at each end) to support the roof and folding doors, as well as providing additional lateral stability. Pad foundations under each post may be required, depending on the details of the existing foundations and ground conditions.

Conclusions

Based on these visual observations, our view is that all of the proposed alterations are likely to be structurally feasible. This assumes that opening-up to determine details of the existing structure confirms the assumptions we have made from our visual observations.

Recommendations

Further investigations are needed to establish the details needed for detailed design. These should include:

1. Opening up to establish the location, span, details etc. of all existing structural members in the areas to be being altered, or where additional loads may be imposed due to change of room use.
2. Trial pits to establish details of the existing foundations to the single storey outbuilding (Area D) and ground conditions, sufficient to enable checking of the existing foundations for the additional posts loads and the design of new pad foundations if necessary.
3. A survey to check for the possible presence, location and type of asbestos and high alumina cement.

Please do not hesitate to contact us if you have any queries or need any further advice.

Regards

Graham Harris



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