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CONSULTING ENGINEERS



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STRUCTURAL SURVEY REPORT FOR ST. JOHN'S LODGE, READING.



Prepared by:
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In behalf of Riddwood Consulting Engineers

Prepared for:
Mr. & Mrs.

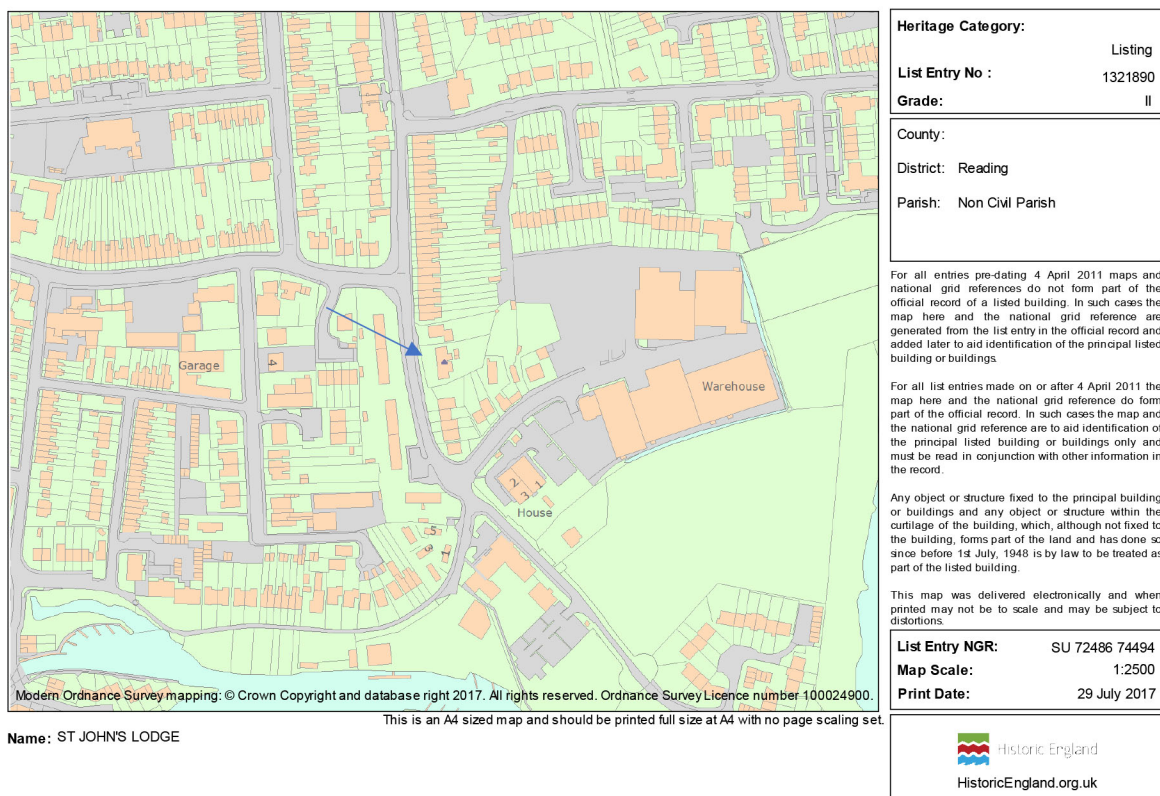
Introduction

Riddwood Consulting Engineers Ltd. was contracted by the owners of St John's Lodge to conduct a structural survey concerning a gable wall at the rear side of the property mentioned supra.

The owners observed that the rear gable wall of the property had a significant horizontal displacement which appears to have worsened over a very short period. The purpose of this report is to provide a structural opinion and advice in relation to the structural integrity of the above mentioned part of the property only.

The Property

St. Johns Lodge is listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 as amended for reasons of architectural or historic interest. It was first entered into the register of listed buildings on the 22nd of July 1976. The property had two extensions. The original building is believed to have been built in the 17th century, while the extensions were built on the 18th and 19th century. The original building is of stone and timber construction with tiled roofing, while the extensions were made of other masonry materials. The deflected gable wall adopted a timber box frame with brick infill.



The Author

The main author of this report , Mr. Christopher Quebral is a professional engineer with at least 20 years of experience of combined structural design and construction. The author was first registered as a professional engineer in Manila and is regulated by the Philippine Professional Regulations Commission in 1997. He was then given the title Chartered Engineer in 2009 by the Institute of Engineers of Ireland. The author continue to practice the same profession under the banner of Riddwood Consulting Engineers.

The co-author of this report Mr. Derek Penn, has over 54 years of experience as a structural engineer. Mr. Penn had been working on all types of domestic structures since 1962.

The Inspection

Inspection of the property described above was carried out by the author during the third week of July 2017. The inspection was carried out on an overcast morning, between the hours of 7:30AM and 8:30 AM. The Property was occupied by a family, believed to be the current owners of the property. Mr. Quebral was escorted around the property at all times during the inspection. The method involved in the inspection was purely visual, and no mechanical testing was involved. There are no invasive procedures conducted. Non-structural related items are not included in the inspection, and is only limited to the area affected by the deflected gable wall at the rear of the property.

During the ocular inspection, it has been observed that the rear portion of the property adopts a box type timber frame system, which is the norms in the 17th century. In between the box frame are brick infills. At the time of the visit, the brick infills appear to be bulging and much of the timber frame is decayed.





Discussion:

The structural framing system of the above mentioned section of the property is a box timber frame . The backbone of the structure is the timber material that can be seen as vertical, horizontal and diagonal members. The brickwork infill serves as an external wall, albeit, that it also offers some structural support. However, in theory, the structure must be able to stand without the brick infill.

At present, the physical state of some of the timber members are now decayed. Further, the bond between the brickwork has deteriorated. Since the brick infills sit on the decayed timber members, portions of the brick infill are no longer sufficiently supported. The combined effect of the decayed timber and the poor bonding between the bricks resulted in a fault which is evidenced by the bulging of the brick infill.



Conclusion

The wall in question is structurally unstable. It is not safe to use the area of the property until remedial measures are made. The structural stability of the structure discussed above is primarily dependent on the timber members. Therefore, the decayed timber members must be addressed, while remedial measures must be taken to prevent further movement of the brick infills.

Recommendations

Primarily, temporary support must be provided to prevent the walls to move further out. A scaffolding system designed to support the wall may be a good option, as it may also be used to carryout repair works. Also, it is recommended to remove all vibration causing equipment in the area, such as the washing machine. The said area must not be used for storage or habitation until it is repaired.

The heavily rotten timber members can be repaired by way of carving out the decayed part and reinserting green timber to match the existing. However, suitable bonding agents such as injected epoxy resin must be employed. The bulging brick infills maybe repaired by providing permanent lateral support system, such as those provided by Newman Building Solutions, Helifix or other similar anchorage systems. To address the bond between the brick infills, the soft part between the bricks must be removed and replaced by a suitable material, normally a bonding grout. All bonding agents have different curing periods, and must therefore be taken into account when deciding whether the structure is already stable.

Further, it is recommended that a specialist restoration contractor must be employed to conduct the repair works.

Alternatively, the wall may be dismantled in stages and rebuilt using salvaged materials. However, whichever repair method is adopted, it is recommended that a method statement is produced prior to embarking on the work, along with the necessary permits obtained.

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