TEICNIUIL-PRIORY CONSULTING ENGINEERS Ltd

Structural Report and Condition Survey

Location: **Whispering Pines, Coolick, Killarney. Co. Kerry, V93 E9P5**

Client: **Julie Rogers**

Dates of inspection: 4/9 /2024

ENGINEER: Matt Clarke Bsc(hons) MSc C. Build E FCABE MIEI
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Appendices

Appendix 1 – Floor Plan

Also see Photographic Schedule

0.0 Caveats

A visual inspection was carried out at the above address on the above date, and the following comments and recommendations in this report should be noted.

Please note that the writer did not supervise the construction of this Building and cannot be responsible for any 'hidden' defects. However, some limited destructive testing of building elements was carried out

This report is intended to give a general overview of any Structural issues, defects, faults, and associated recommendations as viewed on the day(s) of inspection.

This report does not pertain to be a report for the Compliance of Planning Permission or Building Regulations, although any obvious concerns are mentioned in the relevant sections.

This report is not a measured or dimensional survey of the property, nor mechanical or electrical survey, although any obvious concerns are mentioned in relevant sections.

This report is not intended to be a valuation of the property. Any valuation of a property for lending or borrowing finances should be carried out by a qualified and registered Valuer.

'Snagging' issues are not structural issues. This report is not intended as a snag list and generally this reported is not concerned with 'snags'.

The type of foundation is unknown, no excavation trial pits or foundation inspection was carried out.

This report is intended for the relevant building only, at the above mentioned address.

This report is intended for the sole use of the aforementioned client and his/her representatives, and no other external third party without permission. This report is presented to the above-mentioned client and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, Teicniuil Priory Consulting Engineers Ltd is obliged to exercise reasonable skill care and diligence in the performance of the services as required and shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence and this report shall be read and construed accordingly.

This report has been prepared by Teicniuil Priory Consulting Engineers Ltd and no individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise Teicniuil Priory Consulting Engineers Ltd has used reasonable endeavours to provide information that is correct and accurate and the report sets out reasonable conclusions that have been reached on the basis of the information provided and from visual observations of the property.

0.1 Introduction

The writer, Matt Clarke, is Principal and Senior Engineer within Teicniuil-Priory Consulting Engineers Ltd, with over twenty-five years in Engineering and Surveying of Buildings. He is a Fellow of the Chartered Association of Building Engineers, a Member of the Chartered Institute of Building, a Member of the Institution of Engineers of Ireland and a Registered Building Surveyor with the Society of Chartered Surveyors Ireland.

0.2 Executive Summary

Teicniuil-Priory Consulting Engineers Ltd have been commissioned by the aforementioned client, to conduct a survey of the relevant building and to provide a Structural Report of same.

This relevant building is a single storey dwelling, measuring circa 169m2. (c. 1818 sq ft), on the ground floor. The dwelling comprises the original dwelling (c.1970's) and a more recent rear extension (estimated guess c. 1980's). An attached garage structure exists measuring c 36m2. A fuller description of the building is given in section 0.3 – Building Description.

The purpose of this report to provide a commentary on the structural and constructional condition of the building, as determined by the on-site survey, carried out by this office.

Any structural or construction defect, non-compliance with Regulations, or any Health and Safety issues, within the building will be noted, along with any other causes of concern, that are, or may lead to, any structural compromise of the building or of proper and safe use by the occupants. Any necessary remedial works, or recommended improvement works will be addressed within this report.

The original building pre-dates the Building Control Act 1990, and thus predates the Building Regulations.. Elements of the building that are not compliant with current Building Regulations, will be referred as 'non complaint' to current Regulations.

This report is to be read in-conjunction with the Photographic Survey.

0.3 Location and Building Description

The address of this dwelling is as follows;

Whispering Pines,

Coolick,

Killarney.

Co. Kerry

V93 E9P5

Location Coords: 52º 03' 53'' N, 09º30'46''W

The original property was constructed circa 1970's as evidenced from constructional visual evidence, and local knowledge. The rear extension, and garage structure was most likely constructed shortly after the main house, probably in the early 1980's. Construction throughout is predominately concrete block walls, concrete block internal walls, 'cut' timber roof. The pitched roof is artificial tile. The ground floor consists of a concrete slab throughout.

This is not occupied and has been vacant for circa 3 years

0.4 Statutory Requirements

As per S.I No 497/1997 Building Regulations, any "*works*" is defined as "*any act or operation in connection with the construction, extension, alteration, repair or renewable of a building*".

The Building Regulations came in force on 1st June 1992. The original dwelling aspect predates the current Building Regulations.

However any 'Works' carried out on the building, must be compliant to current Building Regulations. These are as follows;

Part A Structure (2012)
Part B fire Safety (2006, amended 2020)

Part C Site Preparation and Resistance to Moisture (2005)
Part D Materials and Workmanship (2013)
Part E Sound (2014)
Part F Ventilation (2009)
Part G Hygiene (2011)
Part H Drainage and Waste Water Disposal (2016)
Part J Heat Producing Appliances (2014)
Part K Stairways, Ladders, Ramps, and Guards (2014)
Part L, Conservation of Fuel and Energy (2017)
Part M Access and use (2010).

Reference to the Building Regulations, within this report, relates to be above relevant Technical Guidance Documents. (ie Parts A to M)

Structural Design for any new elements of the building, is to be carried out to current Codes of Practice, those being the following Design Codes:

EN 1991 (Eurocode 1) Part 1-1 Actions on Structures
EN 1991 (Eurocode 1) Part 1-4 Wind Loading
EN 1991 (Eurocode 1) Part 1-3 Snow Loading
EN 1992 (Eurocode 2) part 1-1 Concrete
EN 1993 (Eurocode 3) Design of Steel Structures
EN 1995 (Eurocode 5) Design of Timber Structures
EN 1996 (Eurocode 6) Design of Masonry Structures

The property is located in a rural area, and the site lies adjacent a small quite road. The driveway entrance is relatively small, and presents limited access / sightlines.

All works must conform to current Health and Safety (HSA) requirements. If required, the main relevant Project Supervisor roles (Project Supervisor for the Design Process (PSDP), and the Project Supervisor for the Construction Stage (PSPD) is to be appointed, prior to any works being carried out.

0.5Damp Measurements

A series of moisture content readings were taken throughout the building with a *Surveymaster POL5365 Protimeter* which can determine the moisture content (MC) within the material from surface to a 25mm depth.

A description of *Surveymaster MC* readings are as follows;

For concrete / masonry, indices as follows;

190 or less are considered dry.
190-250 are considered very borderline damp
250 to 400 are considered damp
400-600 damp to wet
600 – 999 wet to saturated

For timber

Moisture measured as a percentage moisture content.

8% to 12% 'Normal' internal dry timber
12% -14% acceptable
14% - 18% very minor borderline damp
18% considered damp and allow fungal growth / rot.
25% + wet / saturated

1.0 Floors

The floor throughout is constructed of a concrete slab, on hard-core. Upon exploratory works, some damp-proof membrane exists in the Lounge 1 area. No damp proof membrane appears to exist in the lounge 2 room.

The floor is substantially uneven in bedroom 3, indicating lack of compaction of hardcore under and generally original poor workmanship, and is therefore structurally inadequate.

The concrete floor within the hall is measured to have a Moisture Content (MC), of 605 (ie wet to saturated) (photo No 10). The concrete floor within Lounge No 2 is measured to have a Moisture Content (MC), of 999 (ie saturated) (photo No 19).

The internal perimeter skirting, in general, is noted to have a Moisture Content (MC), of 22.5%. (photo No 9)

Both visual and olfactory evidence of rot and timber degradation is present within the hall and lounge 2.

There is no indication of radon protection, and it is highly unlikely that radon protection exists within the rear extension. There would be no radon protection within the original property.

Upon review of the EPA radon maps, the dwelling is noted to on a borderline between an area with high radon concentrations (ie 1 in 5 dwellings) and with medium radon concentrations (ie 1 in 10 dwellings).

Exploratory works (ie 'opening up') works in the concrete floor was relatively 'easy' – concrete is considered 'weak', - probably lack of cement content. There is an absence of a damp proofing layer in Lounge no 2 (photos 20 and 21).

Recommendations

The concrete ground floor slab is considered structurally inadequate. Given high moisture content, lack of adequate damp proofing, lack of insulation, and the absence of a radon barrier, unlevel flooring, and generally a weak structural slab, it is strongly advised to remove this existing concrete floor, and instate a new floor. This should take place throughout. (see Summary section). The new floor should incorporate adequate concrete sub-floor, radon barrier/waterproofing / insulation and screed.

Construction of the new floors should comply to the respective aspects of Building Regulations Parts A, C, D, L, and M)

2.0 External walls

The external perimeter walls consist generally of c.300mm concrete block walls.

The internal aspect of the perimeter walls have varied damp level reading. Most severe moisture content readings (ie MC index = 999 ie 'saturated') occur under, and in close locale, to flat roof junctions to the pitched roof. (photo no 15)

Otherwise, walls are generally 'dry', above approx 400mm over FFL. The internal aspect of the perimeter walls have been 'dry lined' (plasterboard sheathing). Some 'opening up' work was carried out, in removing the plasterboard, to expose the blockwork. Blockwork was generally read as 'dry. Some mineral wool insulation (approx 30mm thick) was noted withing the drylining – this type of insulation and small thickness of same is no-where near not appropriate as wall insulation.

Furthermore, some damp wall readings, in localised spots, are attributed to direct contact with a saturated floor.

The walls flanking the kitchen extension are measured to have MC 22.4% on the timber cladding (ie damp). (photo no 18)

Recommendations:

The external walls of the property are generally structurally sound. Any damp / wet conditions of the wall, is not due to a defective wall construction, but rather a consequence of other defective aspects of the dwelling (ie roof and floor)

3.0 Internal Walls

The internal walls appear generally OK – however the internal wall within the hall is deemed structurally unstable, as it is not 'keyed' in the the adjacent perpendicular wall – this is contrary to building Regulations, Part A – Structure. (photo No 8).

Note; removal and replacement of the floor is required. It is likely that the internal walls do not sit on a foundation, and removal of the floor, will then invariably mean removal and replacement of the internal walls.

Recommendations

Hall wall to be removed and re-built – obvious structural deficiency exists due to lack of 'keying in' wall.

The cost of providing internal foundations should be incorporated into the overall remedial works, as it is likely that no internal foundations exist – (ie internal walls likely to bearing directly on floor slab - which is itself to be removed.)

4.0 Ceilings

The plasterboard ceiling, has perished in the bathroom, hall, bedrooms 2 , 3, and side of house – all to be replaced.

Black mould presents extensively in localised spots (ie in bathroom / hall / lounge 2/ bedroom 2) (photos 24,25,29)

Recommendations:

Removal and replacement of all ceilings.

5.0 Internal Joinery

Condition of internal joinery (doors, skirting architraves etc) is considered very poor.

Kitchen installation / units are not in a workable condition. Timber cladding to walls is generally damp (ie due to wall substrate). (photos 18, 22)

Recommendations;

Removal and replacement of timber joinery.

6.0 Roof

2No pitched roof and 1 no flat roof exists.

Flat roof:

Structural inadequacy of timber members is substantial, due to sustained damp conditions over many years, poor workmanship, and initial undersizing of joists. Timber rot easily observed. Some fungal growth noted. Fixing details of timber joists to trimmer joist is inadequate – and, in any case, now rotten. Flat roof has failed due to water ingress over years and inadequate constructional detailing. Additionally, joists are undersized, given the span

Pitched roof 1 (rear)

Roof rafters are measured at a nominal 150x44mm spaced approx. 400mm c/c's. However, the roof is not adequately supported - 50x50mm and 50x100mm struts, approx 1.7, high exist, in an attempt to support the roof – these struts are wholly undersized (substantially too slender). Roof noted the 'sag' when viewed externally. (photos 23,26, and 30).

Purlin fixing on opposite side of roof, is weak and insufficient (photo 27)

Insulation is patchy and presents 'lumps' in localised spots, varying form nil to 100mm. This is wholly inadequate.

No roof ventilation exists. Roofing membrane felt is present, although is of the 'older' type, with limited breathability.. Evidence of condensation / water staining on the structural roof timbers is noted. White rot is present of the structural timber rafters.

Pitched roof over front (bedroom 2)

Rafters and joists are completely rotten at flat roof junction. Severe signs of decay, and cuboidal damage to rafters. Some ends of rafters can disintegrate when touched.

Roof timbers have elevated levels of moisture content, especially at the eaves level (MC = 21.3%), with worst at (MC = 54.5%) (photos 11,12, 14, 16)

Pitched roof at front over lounge and master bedroom 1

Joist sizing is generally Ok. However, undersized purlins, and excessive purlin spans exist. Purlin nominal size 63x200, spans over 6m - contrary to Building Regulations and is structurally inadequate. Visible deflection on purlins observed, causing substantial 'bowing' (photo 27)

Tile roof covering has reached 'end of life'. These are artificial tiles, with high probability of Asbestos Containing Material (ACM), tiles damaged, 'curling' and dislodged. Some tiles missing.

Recommendations

Total replacement of flat roof and rear pitched roof.

All tiles to be removed (specialist removal if ACM present in tiles). Front roof to be structurally strengthened.

Ventilation to be provided, in addition to new breathable membrane

New Flat roof to be covered with single ply PVC membrane, and appropriately insulated (150mm PIR insulation). Correct 'falls' required (ie 1:40).

7.0 Windows

Windows are double glazed. However, these would have a very poor thermal performance by current double glazing standards. Thickness of 'air gap' approx 4mm (this is very 'thin')

There is a lack of natural ventilation within the property.

Some windows damaged.

Recommendations

Replacement of windows through out. Propper and correct installation of ventilation throughout.

8.0 Electrical

Electrical wiring should be tested, by a registered and qualified electrician. All wiring to be to current IEE standards. It is unlikely that the electrical wiring will be compliant. Wiring and sockets in the garage are not IP rated for semi-exposed area, and is deemed unsafe to use. Electrical wiring, where visible, is shoddy.

There no fire detection devices within the property. Smoke detectors should be installed in all habitable rooms, and the hallway. A heat detector should be installed within the kitchen.

CO detectors should be installed within the kitchen, living room, and max 4.5m from bedroom doors.

9.0 Plumbing / Heating

An oil fired boiler exists externally. It is most likely not working.

It is likely that radiator pipes within the concrete floor are ‘pitted’ and leaking

Recommendations

Replacement of entire plumbing and heating system. Ideally, and air-to-water heating system is recommended, on the proviso that the insulation aspect throughout the property is upgraded, to ensure the property has a ‘Heat Loss Index ‘ of < 2.0. (BER assessor to advise under a technical assessment)

10.0Drainage

The foul water (FW) system is connected to an on-site septic tank (exact location or effectiveness unknown.) However, conveyancing pipework is not compliant to building regulations and presents as a shallow ./ inadequate gradient. Evidence of historical blockage is noted. Drainage manholes have structurally failed, and workmanship very poor All manholes (AJ's) are severely substandard. (Photos 39,40, 42,43,44 and 45)

The storm water land-drain at the rear of the property is poor most likely blocked. An inspection storm water manhole has structurally failed. The location of a soakaway, if one exists, is unknown.

The outlet of a rainwater pipe is off-set from the gulley (photo 37) – this should be rectified. Such drainage failure may cause subsidence – although it is acknowledged that no subsidence currently exists.

Recommendations

Drainage replacement (foul water and storm water) is required, and new manholes throughout network and the conveyancing pipework system. It is most likely that septic tank replacement and new percolation area is required.

11.0 External

The rear garage, attached to the house is constructed from a concrete block single leaf and is structurally inadequate. The roof timbers are undersized, and no 'holding down straps' are present. Roof structural is very weak (Photos 49,50,51)

The rear gable is potentially forming a retaining wall – this gable is not adequate for this purpose. (photo 51, 52)

Retaining wall at rear of the house has failed – structural cracking presents (>20mm wide), and the wall is leaning some 100mm from the vertical in places (photo 47,48)

Recommendations

- Replacement of garage roof
- Excavation of ground immediately behind garage gable wall / or construction of adequate retaining wall and drainage system
- Replacement of rear retaining wall

12.0 Summary

The aforementioned structural issues, demonstrates that it would be a critical requirement to undertake structural remedial works to this property. Currently this property is not deemed ‘habitable’.

Predominantly structural remedial works are summarized as follows:

1. Complete replacement of flat roof and rear pitched roof
2. Remedial works to strengthen front pitched roof (note: requires all roof tiles to be removed.)
3. Demolition of internal hall wall and replacement of same
4. Removal and replacement of the concrete floor slab throughout
5. rear retaining wall replacement
6. replacement of garage roof
7. Replacement of drainage conveyancing pipework and all manholes, frames and covers

It is the writer’s professional opinion that this property is currently uninhabitable. The writer has serious concerns relating to the health and safety aspect of any occupation of the dwelling due to its current condition, as a direct consequence of unsafe and defective structural elements.

It is the writer’s professional opinion that the roof is unsafe and structural unsound, due to sustained water ingress over a period of years, substantial rot of timbers and inadequate design and construction during original build .

It is finally the writer’s professional opinion that the property will be structural safe, healthy and habitable once the above works are carried out.

Signed: 

Matt Clarke BSc(hons) MSc C. Build E FCABE MIEI
Chartered Building Engineer

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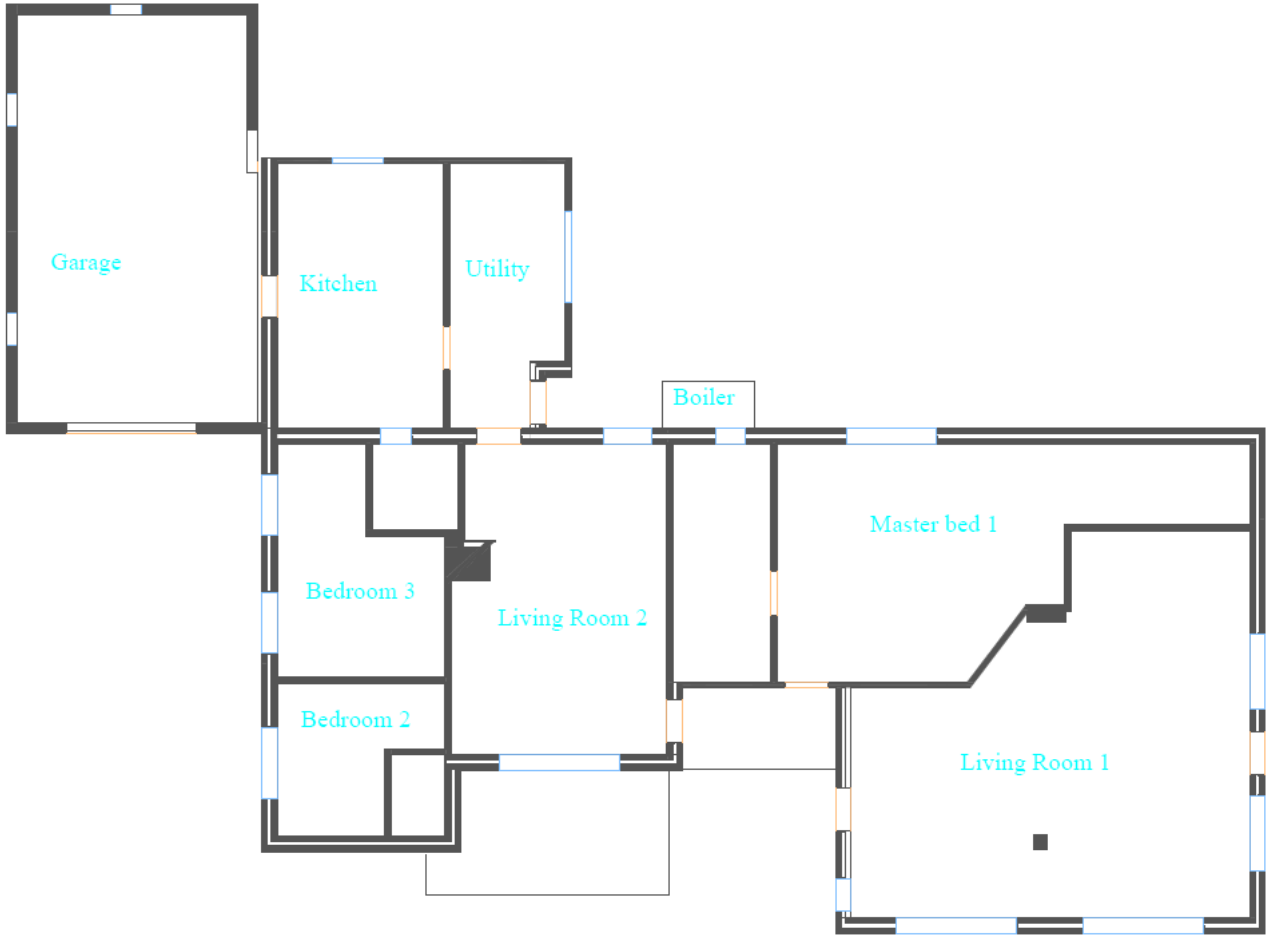
23/9/2024

Appendices

Floor Plan

(note: drawings for schematic purposes ONLY for the purposes of this report)


Garage
Kitchen
Utility
Boiler
Bedroom 3
Living Room 2
Master bed 1
Bedroom 2
Living Room 1