

BUILDING STRUCTURE REPORT

Mr & Ms C Johnston,
13 Kononen Way
Geraldton WA 6530

Dear Mr & Ms Johnston,

Structural Inspection and Report on Single Residence at 262 Chapman Road, Beresford, Geraldton WA.

In accordance with your instructions, a Structural Inspection and Assessment has been conducted on the above residence to address the conditions detailed in the Brief below. The circumstances concerning this structure are that the Owners wish to demolish the existing structure and rebuild a new residence in its place. The existing dwelling, however, appears on the Municipal Inventory (MI) Register as a Category 4X place of "some significance". The residence is the current subject of a Heritage Impact Assessment by a heritage Architect.

The Owners have requested that Montgomery Engineering Consultants Pty Ltd make an assessment of the structural condition of the present building and the minimum works required to render it habitable and compliant with the Building Code of Australia (BCA).



Plate 1 – West Elevation

MANAGING DIRECTOR:

John C. Montgomery MIE Aust, CP Eng, NER APEC Engineer IntPE(Aus), RPEQ.

BRIEF:

The Brief is for Montgomery Engineering Consultants Pty Ltd to conduct a non-destructive inspection of the habitable residence and to assess and report on:-

1. The nature of the structure and its fitness in its present form to provide a “fit for purpose” dwelling in accordance with the BCA.
2. The amount of work required to render it “fit for purpose” as a residence.
3. The degree to which such works might conflict with the structure’s heritage listing.
4. To what extent is the refurbishment of the dwelling commercially sustainable?

Building Description:

The building is a timber and asbestos cement clad, timber-framed bungalow set on standard jarrah stumps. The roof is a pitched and gabled, timber framed, steel sheeted substructure with a skillion-roofed verandah of similar materials to the verandahs on the west and south elevations.

The construction is considered to have occurred well before World War II and has been subject to quite a number of changes since it was first built including, but not limited to, the enclosing of the verandahs, changing access, relocating bathroom, toilet and kitchen, removal of some internal walls.

There are additions to the whole development of the property including a steel framed and clad shed to the rear, a steel patio attached to the rear and a brick outhouse, believed no longer operational.

Building Condition:

Plate 2 - Kitchen

The dwelling has no working kitchen and inoperable bathroom and toilet. As such, it cannot be legally occupied, either as a residence or a lettable unit.

The main building elements are:-

- The stumps and floor. These are timber and a considerable degree of subsidence has occurred in places that are beyond acceptable limits for floor construction.



Plate 3 – Floor Subsidence

Most of the floors have “domed” with some instances of settlement exceeding 100mm as shown in Plate 3. The stumps were not able to be closely examined, but those that were showed signs of rot and termite attack.



Plate 4 – Stump Condition

- The walls and cladding.



Plate 5 – Wall Cladding (weatherboard)

The weatherboard dado is in an aged condition demonstrating dry splitting, nail weariness and shrinkage. The type of weatherboard around the house varies and some is possibly not the original. The upper cladding is counter battened asbestos cement sheet which has eased in places and is in a generally weathered condition.

Internal cladding has been the subject of recent painting, however, there are signs of the sheeting easing or “letting go” of its attachments to the frame behind. There are also broken sheets.

- Roof and Cladding.

Judging by appearance only, the roof cladding appears in fair condition, however, in its exposed location relative to the adjacent marine environment suggests that there is little residual serviceable life remaining. The roof lines are straight, suggesting that the supporting frame may be expected to be in good order.

Structural Condition:

Discussion:

Buildings consist principally, of two types of structural elements; primary structural elements and secondary structural elements.

Primary structural elements are the principal framing or bearing members that transfer applied loads by means of established load paths to the foundations. Typical primary members are rafters, beams, bearers, columns, walls, studs, slabs and the like.

Secondary structural elements are the members or materials that receive the applied loadings and distribute them to the primary structural members. Typical secondary members are cladding, purlins, girts, braces and the like.

Structural condition is assessed upon the structure's ability to meet the ultimate limit state (ULS) conditions of stability and strength and the serviceability limit states of deflection and durability.

Design Parameters:

Under the provisions of the BCA, the dwelling is a Class 1a structure of importance level 2. It has a typical service life of 50 years, provided it is maintained in a "fit for purpose" condition.

The wind loadings are for a Region 'B', Terrain Category 2 conditions

Assessment:

The **floors and stumps** require jacking, replacement, levelling and re-alignment. Due to limited headroom, this will only be achieved by removal of the floor in sections and systematic replacement of the structure. Most of the materials won't be able to be re-used and it is assessed that a 90% of this element's fabric will require demolition and replacement.

The **walls and cladding** will require cladding removal and re-fixing of frame connections where nail weary or corroded beyond serviceable condition occurs. It is estimated that approximately 60% to 70% of this element's building fabric will be demolished and replaced.

The **roof and cladding** will require re-sheeting and re-fixing of frame connections where nail weary or corroded beyond serviceable condition occurs. It is estimated that about 40 to 50% of this element's building fabric will be demolished and replaced.

In conclusion, for the structure to meet the required criteria, it seems that about 70% of the building fabric will need to be demolished and replaced. Such work would be considered replication rather than conservation and tends to conflict the aesthetics premises the heritage listing seems predicated upon. (Brief Points 1 & 2)

Other Issues:

In the process of conducting the works detailed above, the BCA would also invoke the relatively new conditions regarding energy ratings. To bring the structure into compliance will certainly require insulation and probably the swapping out of the "air leaky" louvre windows.

The works indicated are costly, especially the floor structure and the toxic waste disposal required for the asbestos materials. It is a commercial reality that the value of the land far exceeds the value of the structure, even if it were

in a fit for purpose state. A rental commensurate with the repayment of the principal and interest on the level of funding required is unlikely to be realised. Sale of the property would only realize the land value so the funds spent on the building are, effectively, "lost". (Brief Point 3)

Given the foregoing, it is considered that the work needed to return the structure to an operational state is commercially unsustainable.(Brief Point 4)

Conclusion:

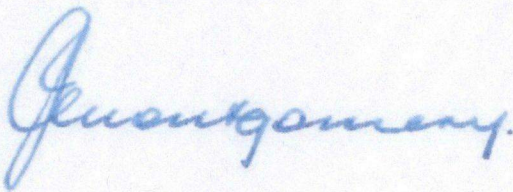
In order for the structure to meet the least conditions predicated by the BCA and its referenced documents, much of the existing structure (~70%) will require demolition and replacement.

The value of the land greatly exceeds the value of the structure even after the required works are completed yielding a situation of commercial unsustainability.

The works would remove much of the aesthetic claimed in the MI and therefore the works needed defeat the intention of the requirement for preservation.

Simply put, the dwelling cannot be occupied or let in its current condition, and yet, remediation work risks compromising the aesthetics the listing has been predicated upon. The only action compatible with the listing appears to be inaction, thereby risking the structure to become derelict.

Yours sincerely
Montgomery Engineering Consultants Pty Ltd



John Montgomery
MIEAust, CP Eng, NER APEC Engineer IntPE (Aus), RPEQ
Managing Director

8 February 2019
