Clear Engineering Services

Civil and Structural Engineers

Engineers Initial Visual Report

Address:	16 Aaran Close, Endeavour Hills, VIC 3802
Client: ENData PTY	Reference number: 6210261821
Clear Engineering Services	Reference number: 12222007

Record of Issue

Company	Revision	Date Issued	Method of Delivery
ENData Claim Ltd	Rev 0	23/01/2023	ENData Claims System

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Executive Summary

This report will assess the damages to the property following a storm event in November 2019 and the subsequent claim of defective repairs that have occurred over the process of this claim.

It is our understanding that in November 2019 a storm event caused damages to the tiled roof cladding resulting in water ingress into the roof cavity that continued into the main living area and also the subfloor cavity. This inundation caused claimed water damage to the internal plasterboard wall and ceiling linings, flooring, cabinetry, light fixtures, and furnishings. Additional defects to the installation of the external pergola roof, masonry pavers, and rendered brick cladding have been claimed to have occurred over this period.

The purpose of our inspection on 9 January 2022 was to perform a quality audit on the repairs conducted by the contractors appointed by the insurance company. BlueRMS provided a scope of works that formed the bases of the repairs, but they did not undertake the physical works. We note the pergola roof, masonry ground pavers, and rendered brick cladding were not in the scope of works provided to us.

Our internal inspection of the dwelling found plasterboard cracks, gaps between cabinetry and internal linings, and cupping timber floor coverings. Poor workmanship in the internal painting was also identified.

Our external inspection found cracks in the rendered brick cladding, undulating pavers, and evidence of leaking from the pergola roof cladding.

We are unable to comment on the damages that occurred during the original claimed event as these have been covered over. We have been provided with a supplementary report from CRD Building Consultants & Engineers dated 7 March 2022. The CRD report will provide a reference to the repairs conducted following the scope of works provided by BlueRMS for the remediation of the dwelling after the initial claim.

In summary, there was no significant change or exacerbated foundation movement or crack damages between the CRD report and our inspection.

Numerous cracks, gaps, and paint discontinuities were noted in the two areas proposed for repairs as outlined in the scope of works provided by BlueRMS.

In our professional opinion, the repairs and decorations to the internal plasterboard wall and ceiling linings have been poorly conducted and will require re-work.

1. Introduction

1.1. ENData Claims Ltd has engaged Clear Engineering Services Australia Ltd. (Clear Engineering Services) to attend site at 16 Aaran Close, Endeavour Hills, VIC with the following instruction:

- **REQUEST FOR ENGINEER (30/12/2022)**
- Hi Team please arrange an engineer to perform a quality audit on the scope of works provided by RMS blue. We will upload a report from CRD relating to works conducted by Townsend builders on another claim currently being managed by the external loss adjusters at Crawfords. We need to identify if the workmanship performed by the builder on this claim is poor, not to Australian standards or are related to the current issues being addressed by Crawfords currently. Most work carried out by Blue Rms was plastering and painting are any of the cracks related to thier workmanship or caused by other issues at the property.
- Please note engineer does not need to comment on any works not related to the works carried out by Blue RMS. This report is only to identify workmanship and causation, or damaged areas related to the works they carried out.
- Following heavy rainfall we have had water enter through the ceilings in the dining room and bathroom.
- Make Safe Description: ceiling is about to collapse

1.2. A representative from Clear Engineering Services attended site on 9 January 2023. Our inspection was carried out in the presence of the Insured.

2. Structural System

2.1. The free-standing, western-facing, single storey habitable dwelling is estimated to be built circa the 1960s-1970s. The true compass direction that the dwelling faces is northwest; however, for the purpose of this report, the dwelling is deemed to be facing west.

2.2. The dwelling comprises a timber floor with cavity, plasterboard linings, and a tiled roof. The northern, western, and a portion of the eastern elevation comprises rendered brick cladding. The eastern and southern elevation consist of un-rendered brick cladding.

2.3. The dwelling is constructed on a moderately sloping site with an entry on the western elevation.

2.4. The dwelling is rectangular in plan.

2.5. The dwelling is accessed by a concrete strip driveway that terminates at a parking bay along the western elevation of the property.

Picture 1: Layout of dwelling (*Mapshare.vic.gov.au)*

3. Additional Background Information

3.1. We have been informed of the following by the Insured, James:

- The initial claim made related to damage caused by impact damage to the roof during a storm. The Insured was unaware that during the storm multiple roof tiles had broken causing water ingress into the roof cavity and the dwelling.
- Water soon began to leak from the plasterboard ceiling causing damage to the plasterboard wall and ceiling linings, trims, cabinetry, light and AC power system, and cupping floors.
- The roof cladding was repaired soon after the initial claim.
- The Insurance company then sent contractors who installed four large exhaust fans in the house to dry out moisture in the dwelling that had occurred from the impact damage.
- After the dry-out period, the Insurance company sent four separate groups of contractors to conduct internal repairs to the dwelling.
- Numerous trades attended the site and seemed confused about the process/responsibility of each contractor.
- One contractor installed new plasterboard directly over a section of plasterboard with mould damage.
- An additional storm occurred on 14 February 2020 causing further damages to the dwelling.

- The Insured noticed the bench in the kitchen and the plasterboard wall linings started moving soon after the internal repairs.
- The Insured has conducted minor internal repairs to mitigate the failed repairs that were completed after the initial claim (i.e., patching plasterboard cracks, bracing internal cabinetry and benches).
- During repairs, the dwelling became inundated with airborne fibreglass particles causing damage to the contents in the kitchen, furnishings, and various appliances in the lounge area.
- The plasterers that attended left multiple gaps between linings and trims and stated that particular damages weren't outlined in the scope of work.
- The subsoil drain at the north-western corner of the property became blocked with debris that the Insured believes occurred as a result of the initial impact damage allowing debris from the damaged tiles to enter the gutters and the stormwater system.
- The subsoil drain was inspected by a plumber approximately two years after the initial impact to the roof occurred.
- The plumber estimates that there was tree root intrusion at the north-western corner of the property which contributed to the blockage of the subsoil drain.
- The council sewer drain at the northeast corner outside the property boundary became blocked in June 2022. Southeast Water claimed responsibility for the damages associated with the blockage.
- The repairs to the patio structure that projects from the eastern elevation have been condemned and deemed to be bad workmanship by a builder for the Insured.
- Initial damages that have occurred from the impact damage:
    - Undulating pavers
    - Leaking pergola
    - Cracks to plasterboard ceiling and wall linings
    - Cupping timber floor coverings
    - Subsoil drain damage
    - Cracks to rendered brick cladding
- New damages that have occurred after the initial repairs include:
    - Cracks to plasterboard ceiling and wall linings
    - Flaking paint
    - Rust to the downlights in the kitchen and lounge

4. Observations

4.1. **General**

- The dwelling is situated diagonally on a rectangular property, offset from the street at the northern boundary.
- The topography of the site moderately slopes towards the north along the length of the block.
- The ground against the footings is uncapped along the northern elevation and part of the eastern and western elevations.
- The ground against the footings along the northern half of the eastern elevation is partially capped by masonry pavers.
- The ground against the footings along the southern elevation and the southern half of the eastern and western elevations is capped by a concrete apron slab.
- A mature shrub is situated adjacent to the footings in the uncapped ground along the southern elevation.
- A mature tree with a very large canopy is situated near the footings along the eastern elevation.
- The downpipe at the south-eastern corner discharges directly into a strip drain built into the concrete apron slab.

Photo 1 shows a typical view of the northern elevation.

Photo 2 shows a typical view of the western elevation (northern end).

Photo 3 shows a typical view of the western elevation (southern end).

Photo 4 shows a typical view of the southern elevation.

Photo 5 shows a typical view of the eastern elevation looking south.

4.2. **External Damage**

4.2.1. Western Elevation

- Hairline horizontal crack in the render at the north-western corner of the porch that extends around from the northern side of the porch
- Stair-pattern hairline crack and horizontal hairline crack in the porch render.

Photos 6 and 7 show the crack in the cold joint through the render.

4.2.2. Northern Elevation

- Hairline horizontal crack and slight delamination in the porch render that extends to the western side
- Horizontal displacement of the porch slab from the rendered cladding
- Hairline cracks along the junction of the base of the western wall and the porch concrete slab. This wall is at the exterior of the lounge room wall.
- Hairline stair-patterned crack towards the north-eastern corner

Photos 8 and 9 show the crack and delamination in the porch render and horizontal displacement.

4.2.3. Eastern Elevation

- Hairline to 2.0 mm stair-pattern crack through the mortar of the brickwork
- Loose brick above the subfloor hatch; the adjacent mortar is fretting.
- A gap of up to ~60.0 mm was noted between the footings and the paved ground starting adjacent to the subfloor hatch.
- Fretting of the brickwork adjacent to the window casing (southeast corner). The fretting is more severe on the southern side. Patching has been conducted here.
- Undulating masonry pavers along the eastern side of the building.

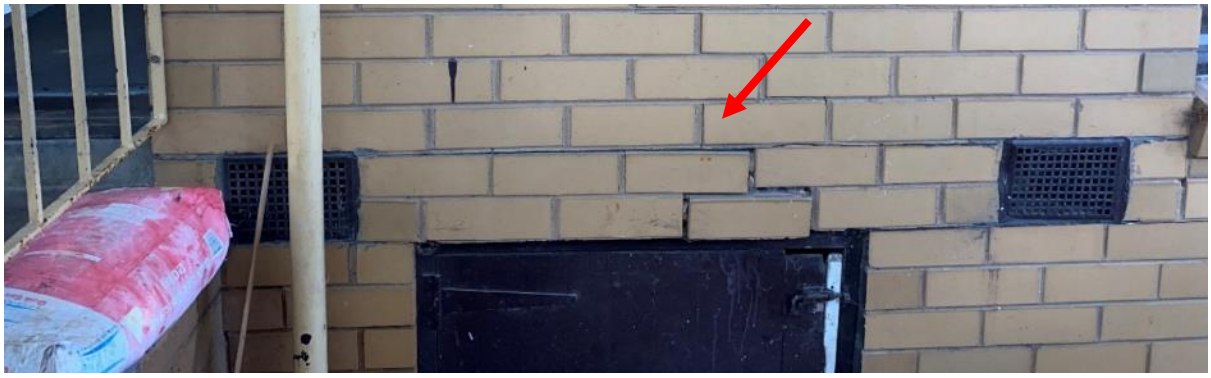


Photo 10 shows the stair-pattern crack and the loose brick.

Photos 11 and 12 show the gap along the footings and the poorly repaired brickwork.

Photo 13 shows undulating pavers along the eastern side of the building.

Photo 14 shows the condition of the tiled roof cladding at the south-eastern corner.

4.2.4. Pergola (Eastern Elevation)

- The Insured claims that the sheet roof cladding of the eastern pergola leaks during regular rainfall.
- Roof battens are 25 mm thick, whereas the minimum in AS1684: *Residential Timber Framed Buildings* is 35 mm.

Photo 15 shows a typical view of the sheet roof cladding of the pergola looking north.

Photo 16 shows a typical view of the underside of the timber pergola structure.

Photo 17 shows the underside of the timber pergola structure.

Photo 18 shows the screw connection and thickness of the roof batten.

4.3. **Internal Damage**

4.3.1. Bedroom 1 (Master)

- Hairline to 20 mm gap between the plasterboard wall lining and the wardrobe
- Patching was noted along the junction of the wardrobe and wall lining.

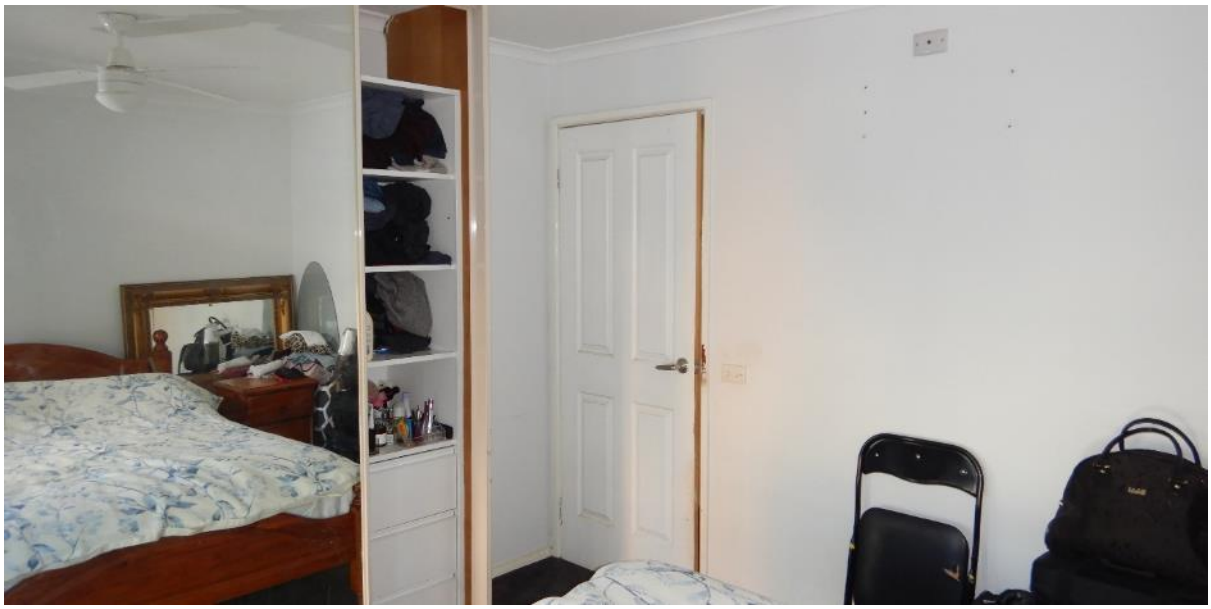
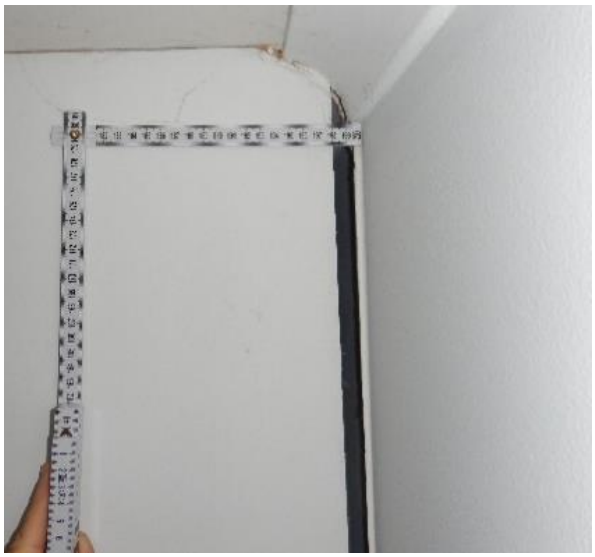


Photo 19 shows a typical view of bedroom 1.



Photos 20 and 21 show poorly finished repairs and movement of fixtures.

4.3.2. Bedroom 3

- A 1.0 mm vertical crack in the plasterboard wall lining extends across the height of the wall.
- Hairline vertical crack in the plasterboard wall lining extends from the door architrave.
- Dislodgement of the door casing at the entrance door
- Flaking paint/moisture damage to the plasterboard ceiling linings

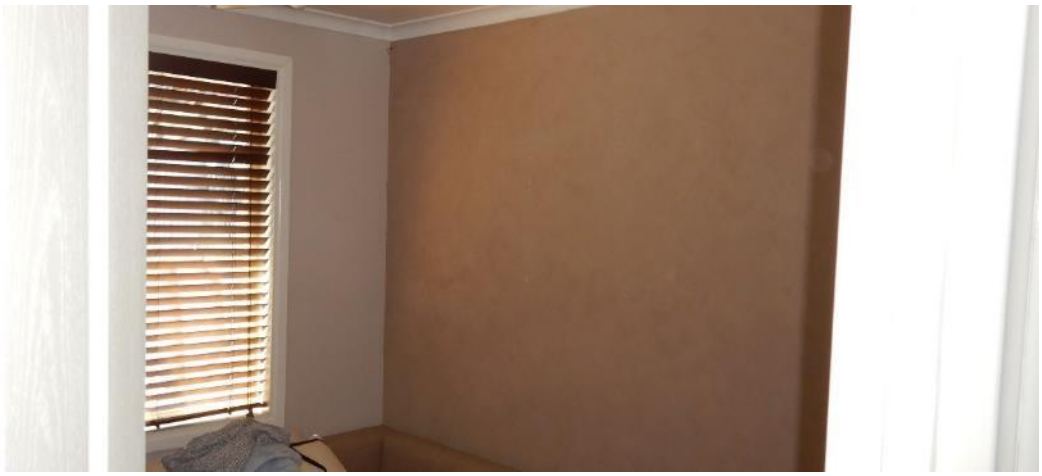
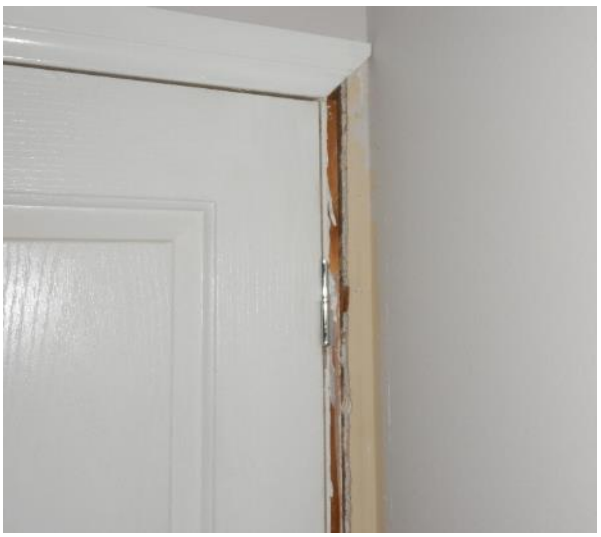


Photo 22 shows a typical view of bedroom 3.



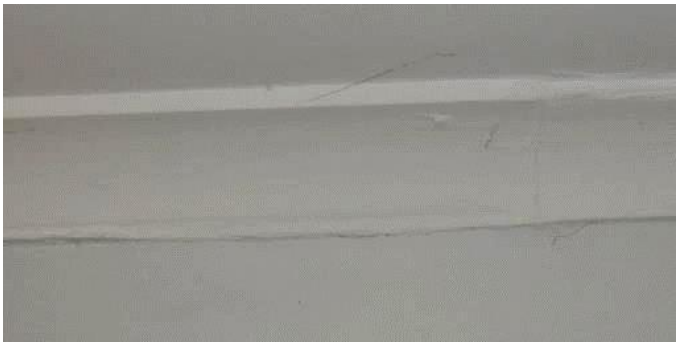
Photos 23 and 24 show the hairline crack in the wall lining and the dislodged casing.

Photo 25 shows poor repair quality in bedroom 3.

4.3.3. Kitchen

- Up to 1.0 mm vertical cracks in the plasterboard wall linings along the mitre joint of the wall
- Up to 1.0 mm horizontal cracks in the plasterboard linings at the wall-ceiling junctions
- Discontinuities in the workmanship of the paint and decorations
- Up to 1.0 mm cracks along the surface of the floor tiles

Photo 26 shows a typical view of the kitchen. Note the locations of the paint discontinuities where cabinetry was removed, and inadequate undercoat / primer was used.



Photos 27 & 28 show a crack along the wall-wall junction and anomalies along the cornice.

Photos 29 & 30 show rust to the lighting fixture and the damaged floor tiles.

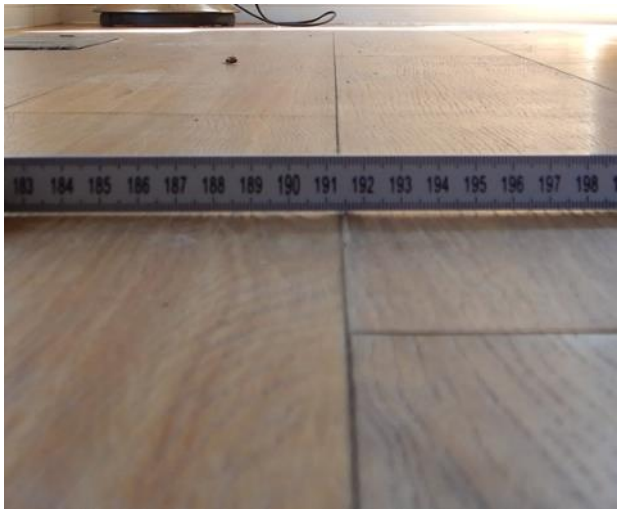
4.3.4. Lounge Room (Open Plan Area)

- Hairline vertical cracks in the surface of the wall lining that extend the height of the wall
- Hairline crack above the door architrave extending to the cornice
- The paint along sections of the cornice and ceiling has bubbled.
- Minor cupping at the junctions of the length and heads of several timber floor coverings in the north-western corner.
- ~3.0 mm gap between the window casing and plasterboard wall lining and along the skirting board
- The sliding door that connects the lounge to the hallway scrapes along the roller brackets and has resulted in a scrape mark forming along the lower section of the door.

Photo 31 shows a typical view of the lounge room.

Photos 32 and 33 show a typical view of poor crack repairs and unrepaired cracks.

Photo 34 shows the area of the claimed damaged floorboards.



Photos 35 and 36 show examples of cupped floorboards.

Photos 37 and 38 show misalignment of door trims.

4.3.5. Bathroom

- Hairline to 1.0 mm crack in the tile mortar at the wall-wall junction and wall-floor junction
- Hairline crack along the mitre joint of the architrave

Photo 39 shows a typical view of the bathroom.

Photos 40 and 41 show the crack in the tiling and door architrave respectively.

4.3.6. Hallway

- A hairline to 1.0 mm horizontal crack in the plasterboard wall lining extends from the architrave leading to bedroom 1.
- A 1.0 mm vertical crack in the mitre joint of the cornice

Photo 42 shows a typical view of the hallway, and the inserts show the noted damage.

4.4. Floor Level Survey

4.4.1. A floor-level survey was carried out using a “Nivcomp” digital level with an accuracy of +/- 2 mm.

4.4.2. The floor survey measured a 13 mm difference across the site with the lowest and highest points within a few metres of each other in the centre of the residence.

4.4.3. The floor survey conducted by CRD Engineers measured an 11 mm difference across the site.

4.4.4. The measurements obtained during our floor-level survey are congruent with the floor-level survey conducted by CRD Engineers on 7 March 2022.

4.4.5. We can confirm that no significant foundation movement has occurred since the most recent available floor-level survey from 7 March 2022.

4.5. Subfloor Inspection

4.5.1. An inspection of the subfloor was conducted which was accessed through an external hatch on the east side of the building.

4.5.2. The subfloor is constructed of concrete stumps, timber bearers, and timber joists.

4.5.3. The perimeter is constructed of an engaged brick pier sub wall.

4.5.4. There is evidence of prolonged dampness along the surface of the ground in the north-western corner and efflorescence.

Photo 43 shows a typical view of the western sub wall.

Photo 44 shows the north-western corner of the subfloor.

Photo 45 shows the centre of the subfloor cavity looking south.

4.6. **Roof Cavity Inspection**

4.6.1. The roof is constructed of pitched hardwood roof framing.

4.6.2. The pitch of the roof is 18 degrees.

4.6.3. No sarking has been installed between the underside of the tiled roof cladding and the timber roof battens.

4.6.4. Efflorescence deposits were noted along the underside of the roof tiles.

4.6.5. Watermarks were noted on the internal side of the plasterboard ceiling linings directly above the bathroom.

4.6.6. Newly installed plasterboard sheeting was noted directly above the area of water ingress.

4.6.7. Adhesive daub connections between the plasterboard sheeting and the ceiling joists are situated at 175 mm – 200 mm centres.

Photo 46 shows a typical view of the roof cavity.

Photos 47 & 48 show daylight through the roof tiles and efflorescence on the underside.

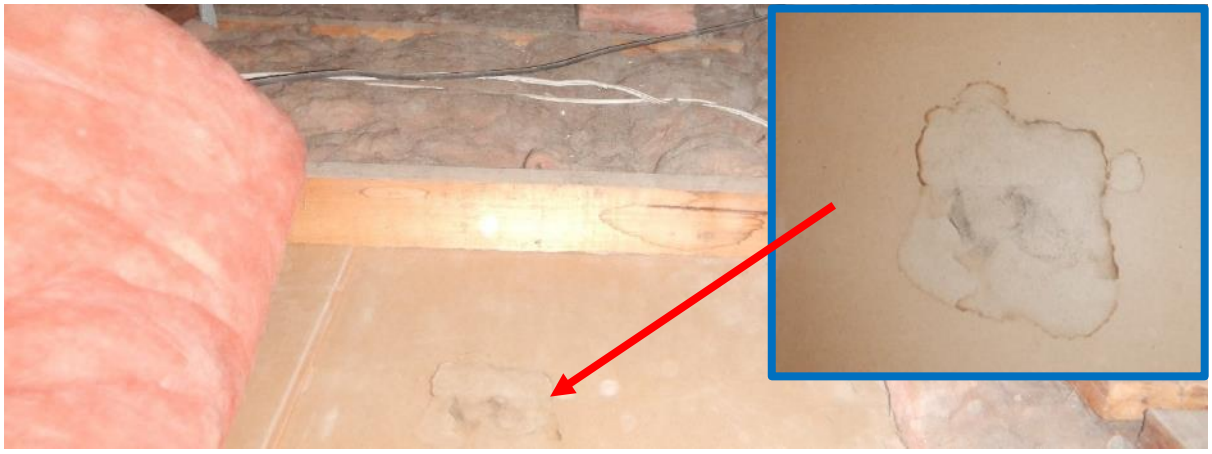


Photo 49 shows watermarks/mould along the internal side of the plasterboard ceiling linings.

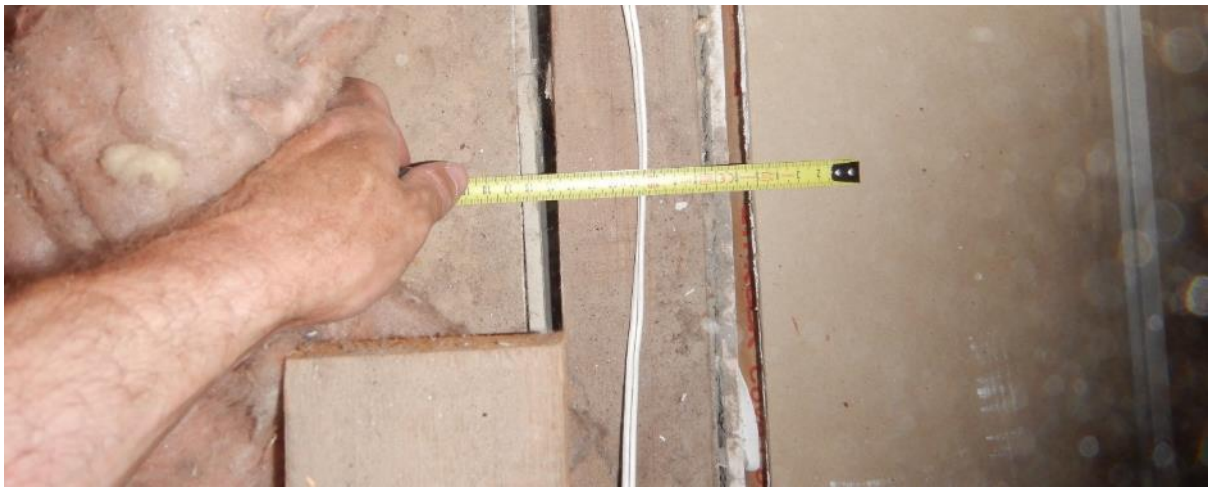


Photo 50 shows the newly installed plasterboard ceiling sheeting (right) and the original plasterboard ceiling sheeting (left) separated by the top plate of a wall frame.

5. Other Information

5.1. **Geotechnical Data**

5.1.1. We have reviewed the available historical geotechnical data.

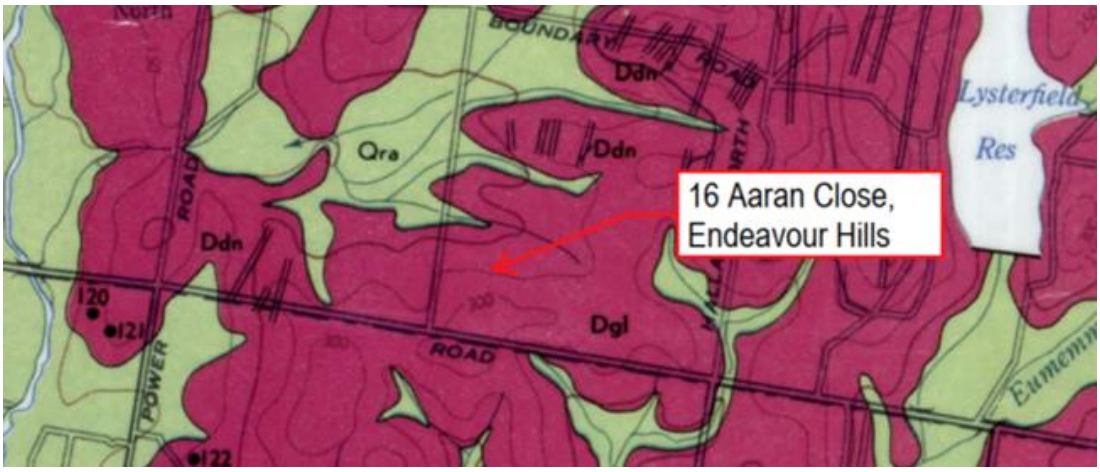
5.1.2. The property is situated on Victorian Geological Maps, 1:63360, Ringwood, Map No. 849, Zone 7.

5.1.3. The ground is predominantly classified as Dgl.

5.1.4. Dgl is described as Lysterfield Granodiorite, which is composed of Granodiorite, minor hornblende granodiorite.

5.1.5. Australian Standard 2870: Residential Slabs and Footings recommends a climatic zone of 2.

5.1.6. In accordance with Table D1, we expect a soil reactive classification of M-H1 (Moderate to High reactivity).



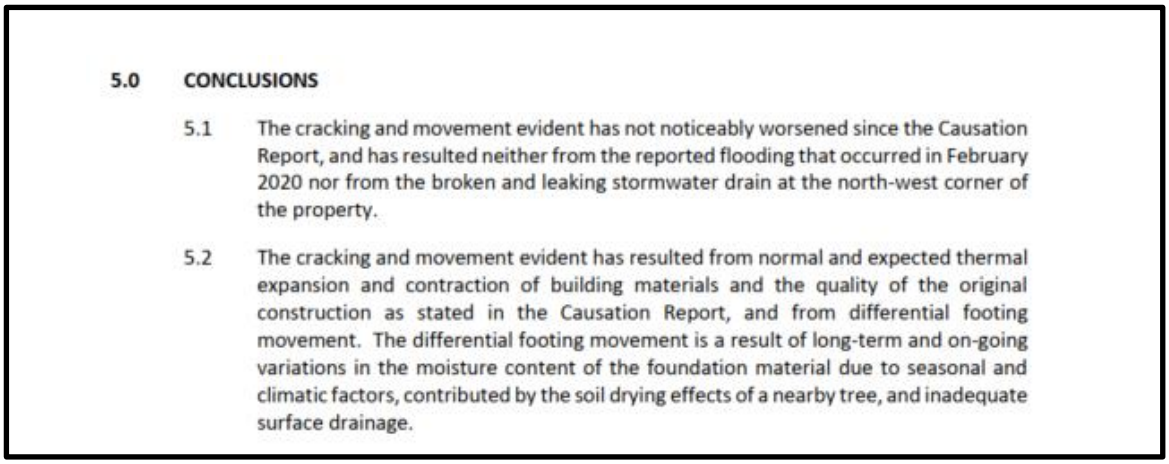
Picture 2: Extract from the Victorian Geological Maps

5.2. **Other Consultants**

5.2.1. We have been supplied with a Supplementary Report by CRD Building Consultants & Engineers.

5.2.2. The report was dated 7 March 2022.

5.2.3. The conclusion stated the following:



5.0 CONCLUSIONS

5.1 The cracking and movement evident has not noticeably worsened since the Causation Report, and has resulted neither from the reported flooding that occurred in February 2020 nor from the broken and leaking stormwater drain at the north-west corner of the property.

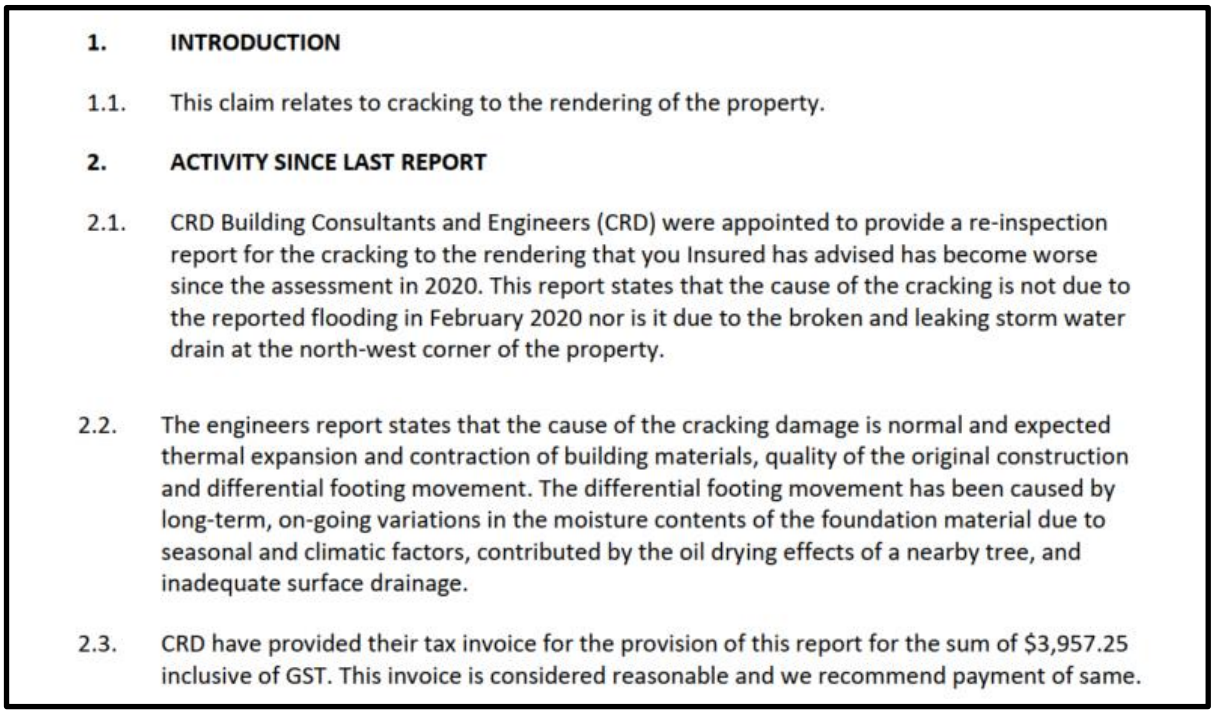
5.2 The cracking and movement evident has resulted from normal and expected thermal expansion and contraction of building materials and the quality of the original construction as stated in the Causation Report, and from differential footing movement. The differential footing movement is a result of long-term and on-going variations in the moisture content of the foundation material due to seasonal and climatic factors, contributed by the soil drying effects of a nearby tree, and inadequate surface drainage.

Picture 3: Extract from CRD report

5.2.4. We have been supplied with a Second Supplementary Report by Crawford.

5.2.5. The site was inspected on 26 February 2020. The report was dated 21 March 2022.

5.2.6. The report stated the following:



1. INTRODUCTION

1.1. This claim relates to cracking to the rendering of the property.

2. ACTIVITY SINCE LAST REPORT

2.1. CRD Building Consultants and Engineers (CRD) were appointed to provide a re-inspection report for the cracking to the rendering that you Insured has advised has become worse since the assessment in 2020. This report states that the cause of the cracking is not due to the reported flooding in February 2020 nor is it due to the broken and leaking storm water drain at the north-west corner of the property.

2.2. The engineers report states that the cause of the cracking damage is normal and expected thermal expansion and contraction of building materials, quality of the original construction and differential footing movement. The differential footing movement has been caused by long-term, on-going variations in the moisture contents of the foundation material due to seasonal and climatic factors, contributed by the oil drying effects of a nearby tree, and inadequate surface drainage.

2.3. CRD have provided their tax invoice for the provision of this report for the sum of $3,957.25 inclusive of GST. This invoice is considered reasonable and we recommend payment of same.

Picture 4: Extract from Crawford report

5.2.7. We have also been supplied with a Scope of Works by BlueRMS.

5.3. **Google Street View**

5.3.1. We have reviewed the images available on Google Street View to determine the timeline of the damage.

5.3.2. We note in January 2008 a group of mature trees/shrubs are situated adjacent to the footings along the northern elevation.

5.3.3. The group of mature shrubs along the northern elevation were removed between January 2008 and July 2014.

5.3.4. Cracks to the brick cladding around the porch (before the wall cladding was rendered) can be seen in July 2014.

Picture 5: Google Street View dated January 2008

Picture 6: Google Street View dated July 2014

Picture 7: Google Street View dated July 2022.

5.4. **Satellite Images**

5.4.1. We have reviewed the available satellite imagery (Google Maps) and note that new tiled roof cladding was installed between March 2006 and January 2014.

Pictures 8 and 9: Google Earth - March 2006 (left) and January 2014 (right).

6. Conclusion

6.1. Clear Engineering Services attended the site at 16 Aaran Court, Endeavour Hills to perform a quality audit on repairs to the dwelling conducted in accordance with the scope of works provided by BlueRMS.

6.2. The most recent available report and photoset issued by CRD Building Consultants & Engineers dated 07 March 2022 has been used as a reference to the quality of the workmanship after the repairs and to determine the presence of new damages to the dwelling.

6.3. The photoset in the report documents the damages including:

- Internal plasterboard wall and ceiling linings
- Internal trims (skirting boards, cornices, and architraves)
- Internal painting and decorations
- Internal cabinetry
- External brick and rendered wall cladding
- External roof cladding
- External masonry pavers (eastern elevation)
- External timber patio structure (eastern elevation)
- Subfloor inspection
- Roof cavity inspection

6.4. All damages documented during our inspection were noted to be similar or identical in size, shape, and methodology as what is outlined in the report from CRD Building Consultants & Engineers dated 07 March 2022.

6.5. Moreover, our floor level survey recorded 13 mm of differential movement over the floor plan of the dwelling compared to the 11 mm recorded during the most recent inspection. The 2 mm disparity between the tests is considered negligible considering the accuracy of locations, measuring equipment and compressibility of floor coverings.

6.6. Based on the lack of new and exacerbated damages and the comparable results between the separate floor surveys, we can confirm that no new damage has occurred to the residence since the most recent engineering inspection.

6.7. The scope of works provided by BlueRMS to the contractors engaged in the remediation work to the dwelling gave itemised instructions for repairs to the following areas of the building:

- Bathroom (2.7 x 2.5 x 2.4H)
- Open Plan Area (45 m^2)

6.8. During our inspection, the Insured directed us to damages throughout the property including:

- Bedroom 1
- Bedroom 3
- Bathroom
- Open Plan Area (Lounge, Dining And Kitchen)
- External Wall Cladding
- Masonry Pavers (Eastern Elevation)
- Timber Pergola Structure (Eastern Elevation)

6.9. We note that any damages mentioned other than the bathroom or open plan area are outside the scope of works issued by BlueRMS.

6.10. Our inspection of the open plan area (lounge, kitchen, dining) found cracks to the internal plasterboard linings, cracks to the trims (cornices, skirting boards, architraves), and discontinuities in the paint finish where kitchen cabinetry was removed, and the paint finish has no undercoat/primer.

6.11. Our inspection of the bathroom found cracks along the grout joints of the tiled wall cladding and floor covering, mould, and gaps between the cabinet and the wall linings.

6.12. Remediation of these items was listed in the scope of works provided by BlueRMS and has either been poorly executed or has not been repaired at all by the attending contractor.

6.13. Additional damages that we were directed to were not listed on the scope including cracked tiles and deformation of the timber floor coverings in the open plan area.

6.14. The internal linings, trims, and decorations are in a generally poor state and not congruent with adequate repairs that would be accepted by professional contractors.

6.15. In our professional opinion, the observed damages in the open plan area and the bathroom are due to poor workmanship by the appointed contractors, and the repairs are unsatisfactory.

6.16. The scope of works provided by BlueRMS gave specific instructions on the repair methodology to the bathroom and open plan area which we can confirm were not met by the appointed contractor.

6.17. We have found no evidence to suggest that the failure of the contractor to meet the required standard of professionalism has been impacted by any external factors.

6.18. A comprehensive structural inspection was conducted on the dwelling which was compared with the photoset and floor level survey provided by CRD Building Consultants & Engineers dated 07 March 2022.

6.19. We note that all damages are in a similar condition to what was documented in the report, and there has been no significant change in the floor-level survey.

6.20. During our inspection, we noted multiple internal and external damages to the building that were not included in the scope of works issued by BlueRMS.

6.21. There are historical cracks in the brick cladding system, particularly around cold joints and penetrations.

6.22. This can be verified by reviewing historic photographs of the building that show problematic soil conditions near the footings from trees as well as external cladding damage that can be dated to 2015.

6.23. The general foundation movement in the property are consistent with seasonal resulting in non-structural cracks in wall linings, movement of trims, and cracks in the brittle brick cladding system which is typical for the age and construction type of the dwelling.

6.24. Despite the risk of ongoing seasonal foundation movement and crack damage to the building, these factors have not affected the repair quality in the prescribed rooms as directed by the Blue RMS scope which are a result of poor workmanship.

7. Recommendations

7.1. The following remedial work is required to be carried out and is intended to restore the structural integrity of the building to its pre-damaged condition.

7.2. The recommendations are not intended to be betterment, increase the performance of the building, or necessarily mitigate similar damage occurring in the future.

7.3. The works on site will need to be cross checked with the proposed scope by Blue RMS and the additional works verified.

7.4. Paint and decorations in the bathroom and open plan area will need to be redone.

7.5. The pergola frame roof will need to be cross checked against approved building plans as these are structure works.

7.6. The ground pavers will need to be re-laid according to approved works relevant to the claim.

8. Limitations

We have prepared this report in accordance with the brief as provided. Our brief is to carry out an initial visual inspection of the dwelling and confirm cause of damage. We have not seen the Insured's insurance policy and are unaware of what is contained in the policy. This site visual investigation and relevant engineering report has been carried out and prepared solely for the use of our client. No liability is accepted in respect of its use for any other purpose or by any other person or entity. It should be noted that Clear Engineering Services Australia LTD has not carried out any detailed structural assessment of the dwelling's capacity or in-ground testing when producing this visual engineering report.

Any opinions or recommendations expressed in this report are based on a visual site assessment only and are liable to change in the event of new evidence or information becoming available. Any concealed damage not identifiable from a visual site investigation will not be recorded or addressed in this report. Any information pertaining to the site which has not been available to Clear Engineering Services Australia LTD prior to the issue of this report and is made available to Clear Engineering Services Australia LTD after the issue of this report may render this report as null and void and a new visual assessment may be required.

We recommend any professional bodies or individual personnel, not employed by the client carry out their own assessment on the named dwelling to satisfy themselves that the information contained in this report is true and accurate prior to acting on the assessment in this report. Clear Engineering Services Australia LTD accepts no liability for incorrect interpretation of this report.

All recommendations stated in this report are intended to address existing and visible structural damage. The recommendations are not intended to improve the structural adequacy of the existing structure. Clear Engineering Services Australia LTD does not express or imply that the discussed dwelling is structurally safe.

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