



RAMBRIDGE CONSULTING

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Structural Assessment: 24 Parry Road

Client: Homii

28 April 2022



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Homii

40 AB Xuma Street, Durban

Consultant

Shivan Rambridge Pr Eng (20170278)

Rambridge Consulting

Tel: 072 211 6372

Email: Rambridge.Consulting@gmail.com

Registered Address:

Rambridge Consulting (Pty) Ltd (2018 / 089006 / 07)

20 Turfwood Place, Havenside,
Durban, 4092

Quality Management


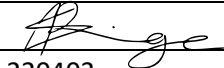
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Table of Contents

1. INTRODUCTION	1
1.1. PROJECT LOCATION AND BUILDING DESCRIPTION	2
2. SANS CODES AND STANDARDS.....	3
3. STRUCTURAL ASSESSMENT	4
3.1. BUILDING EXTERIOR.....	4
3.2. GROUND FLOOR	4
3.3. FIRST FLOOR	4
3.4. ROOF	5
4. LIMITATIONS.....	5
5. RECOMMENDATIONS	5
5.1. BUILDING EXTERIOR.....	5
5.2. GROUND FLOOR	5
5.3. FIRST FLOOR	6
5.4. ROOF	6
6. CONCLUSION.....	7
7. APPENDIX A	8

LIST OF FIGURES

Figure 1: 24 Parry street building	1
Figure 2: Building location	2
Figure 3: Cracks on ground floor doorways and windows	8
Figure 4: Cracks over the ground floor doorways	8
Figure 5: Traces of water ingress on ground floor	9
Figure 6: Damage to existing wooden staircase	9
Figure 7: Ceiling water damage and floor fire damage on first floor.....	10
Figure 8: Further water damage noted on first floor	10
Figure 9: Ceiling damage and floor damage on the first floor	11
Figure 10: General condition of roof trusses and damage noted	11
Figure 11: Water damage and wood rot observed in certain areas of trusses	11

List of Tables

Table 1: SANS codes and standards adopted

3



1. Introduction



Figure 1: 24 Parry street building

Rambridge Consulting was appointed by Homii to undertake a structural assessment of the building located on 24 Parry Road, Durban CBD. The objective of the visual assessment is to evaluate the general condition of the structure and identify any elements which require repair or removal. A visual assessment of the structure was undertaken as material testing and proving of foundations have not been accounted for.

The structural assessment includes a assessing the structural elements from the ground floor to the roof structure. The assessment will also provide insight on the stability of the structural elements and the highlight any potential safety hazards noted.

1.1. Project location and building description

The building is located on Parry Road which is a narrow street located off Anton Lembede Street in the Durban CBD. The structure is flanked on either side by multi-story buildings with a direct entrance to the road level. The building is listed as a heritage building and has been left derelict for a considerable amount of time.



Figure 2: Building location

The building is double story and is brick and mortar structure. The interior of the building is partitioned by double skin brickwork walls. The original ground floor flooring was constructed with wood that was elevated about 300mm of the natural ground, leaving a crawl space between the ground and the floor level. The second story is has a mixture of concrete and wooden flooring, and is partitioned by double skin brickwork. The roof structure is constructed with corrugated sheeting supported on wooden trusses which is directly support by the perimeter brickwork.

2. SANS codes and standards

The design will comply with the requirements of the South African National Standards (SANS) codes and standards as applicable. Where no SANS documents are available the design will be in accordance with recognized international standards or codes.

Table 1: SANS codes and standards adopted

NATIONAL STANDARDS	
Standard No.	Description
SANS10160 (Part 1-8)	Basis of structural design and actions for buildings and industrial structures
SANS1200-G	Concrete (structural)
SANS 10100	The Structural Use of Concrete
SANS 10160	Basis of Structural Design and Actions for Buildings and Industrial Structures
SANS 10162	Structural Use of Steel
SANS 10400	The Application of The National Building Regulations

3. Structural assessment

3.1. Building exterior

The exterior of the building does not display any structural cracking or evidence of settlement. The paintwork displays water damage due to broken gutters and lack of maintenance (see Figure 1). The overall lower brickwork does not display any cracking indicating that there is no significant settlement in the foundation, however the foundations could not be exposed to verify this. The building does display several broken windows and plaster cracking. The external gutters show significant damage and a large portion of the roof drainage system is either damaged or completely broken.

3.2. Ground floor

The flooring on the ground floor was removed due to damage and pest infestation. The underlying area under the existing flooring is uncompacted Berea red sand (Figure 5). It was noted that ventilation slots were present in the crawlspace to allow for ventilation under the floorboards (Figure 5). The partition walls display significant cracks above most doorways and under windows which may indicate that localized settlement may have occurred, or the doorways were constructed without lintels or load transfer beams present over the doorways (Figure 3). The consistent ingress of water to the ground floor may have compounded the effect of foundation settlement due to the continued expansion and contraction effects of expansive soils (Figure 5). The staircase leading to the first floor shows considerable damage due to material degradation and water damage (Figure 6). The supporting beams are intact in certain sections however the overall stability of the stairs is not fit for purpose and poses a safety risk for any persons taking occupation of the building.

3.3. First floor

The first-floor flooring is a mix of concrete floors in the bathroom area and wooden floors in the rooms. The existing wooden flooring shows signs of fire damage, and wear and tear (Figure 7). The current floor beams could not be assessed fully as the ceiling boards are intact, however the floor does not have any noticeable deflections or failures thus indicating that the floor beams are intact and can support itself. The partition walls do not show any signs of cracks however plaster cracks are apparent due to the lack of maintenance and the consistent water ingress (Figure 8). The ceiling and floorboards show significant water damage which will affect the overall structural strength of the material (Figure 9). The extent of the water damage may also decrease the carrying capacity of the supporting beams and its connections.

3.4. Roof

The roof shows signs of severe degradation and can be classified as unsafe for occupation. The roof sheeting is in poor condition and displays severe corrosion. The sheeting connections has failed in central areas of the roof and along the perimeter of the roof. The resulting failure of the roof sheeting led to the water damage to the supporting roof trusses (Figure 10). The roof trusses are in poor condition and shows signs of water damage, and damage due to lack of maintenance (Figure 11). The condition of the roof truss will pose a danger if any additional loading is imposed on the structure and the failure of the internal gutters will further compound the damage as time goes on. The internal roof rafters are also in poor condition and may result in further failures if left unchanged.

4. Limitations

The assessment was limited to a visual structural assessment only. The following limitations were highlighted:

- The roof structure could not be assessed from roof level due to safety concerns,
- No destructive material testing was conducted,
- Elements such as floor beams and slabs could not be assessed due to facades and ceilings still in place,
- Geotechnical tested and proving of foundations was not undertaken.

5. Recommendations

The recommendations shall be broken up into the various sections of the building assessed.

5.1. Building exterior

The building exterior did not any signs of deflections or structural cracks, therefore there is no significant structural interventions to undertake. From the observations noted, most of the defects noted where aesthetic in nature. It is recommended that new gutters and downpipes are built along with the construction of the roof structure, and the filling of any cracks or spalling with a structural concrete repair mortar.

5.2. Ground floor

The ground requires the construction of a concrete surface bed that would provide a suitable functional surface within the building. The ventilation holes left under the crawl space can be sealed to ensure that water ingress and pests are prevented, however other ventilation measures will have to be implemented in accordance with national building standards. The ground floor walls cracks are to be repaired with a suitable

concrete repair mortar, in areas in which cracks exceed 5mm, the brickwork would have to be redone and lintels installed to provide additional strength to the brickwork.

The potential walls to be demolished should be confirmed by verifying the type of slab/flooring used on the first floor as it may impact the viability of the wall demolition. It is recommended that any demolition of walls coincide with the erection of a structurally appropriate steel beam to redistribute any residual loads to the adjacent brickwork.

It is further recommended that the existing staircase be demolished and rebuilt to current engineering and safety standards. The staircase as it is, has numerous structural inadequacies and is a potential safety hazard.

5.3. First floor

The first floor flooring is in poor condition. The water and wear and tear damage is extensive. It is therefore recommended that the existing flooring be removed and reinstated. The supporting beams for the first floor would have to be assessed to verify if it will be capable to withstand any additional loads applied to it, however the water damage that the beams incurred will have to be taken into account as the age and damage will impact the performance of the beams. It is recommended that the beams be removed and replaced with current beams that would perform to the specified standard.

The internal partitioning walls do not show any significant cracks however the water damage to the walls is extensive. The water damage will have an impact on the plaster and overall strength of the plaster, therefore remedial work will be necessary to ensure that the walls are water tight and that minor cracks are repaired.

5.4. Roof

The roof structure is in extremely poor condition with several failures noted, which resulted in extensive water damage to the building. The roof structure, as it is, cannot be deemed structurally stable. Taking into account the current state of the roof structure and the prolonged exposure to the elements and wildlife, it is recommended that the roof be completely removed and reinstated to modern standards. The internal gutters are also to be removed and reconstructed to conform modern practices. The connections between the sheeting and the purlins shows signs of failure. The resulting failure could be due to corrosion, which will potentially require removal and reinstatement of the entire roof sheeting.

6. Conclusion

The overall condition of the building does not provide any immediate concerns regarding the structural stability. The external walls and façade do not show any significant cracking or deflections. The roof structure shows signs of substantial damage due to long periods of neglect. The sheeting and supporting purlins have numerous failure points throughout the roof. Therefore, the critical element to be replaced, to ensure that the building complies to health and safety regulations, is the roof structure. The stability of the roof structure and associated drainage would have to be significantly upgraded so that adherence to national building standards is followed.

Further to the replacement of the roof, the multiple cracks on the walls on the ground floor do not pose any structural risks at present, however the cracks will have to be repaired with a structural repair mortar or completely rebuilt in sections depending on the severity of the crack.

The first-floor flooring will also have to be removed and replaced with suitable flooring due the age and damage incurred by the original flooring.

In its current state, the building is not suitable for occupation and numerous issues such as the roof, first floor flooring, ground floor cracks and flooring, will have to be repaired and reconstructed to comply with national building standards.

7. Appendix A



Figure 3: Cracks on ground floor doorways and windows



Figure 4: Cracks over the ground floor doorways



Figure 5: Traces of water ingress on ground floor

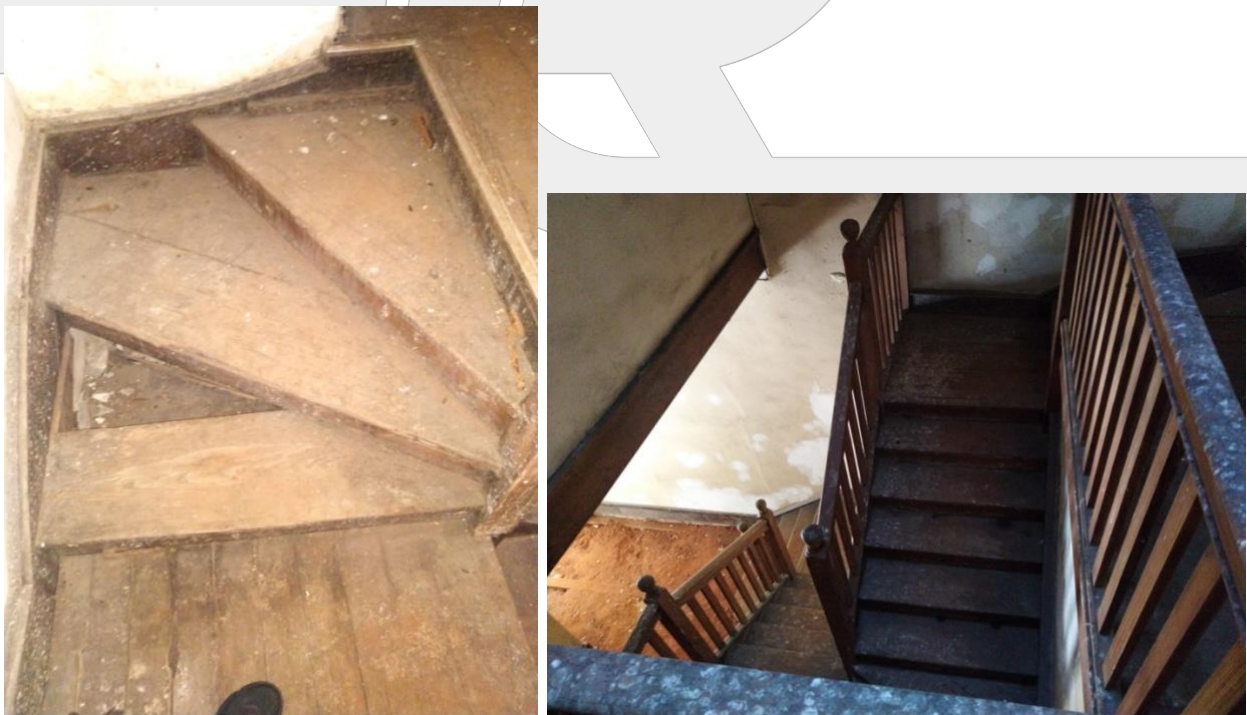


Figure 6: Damage to existing wooden staircase



Figure 7: Ceiling water damage and floor fire damage on first floor

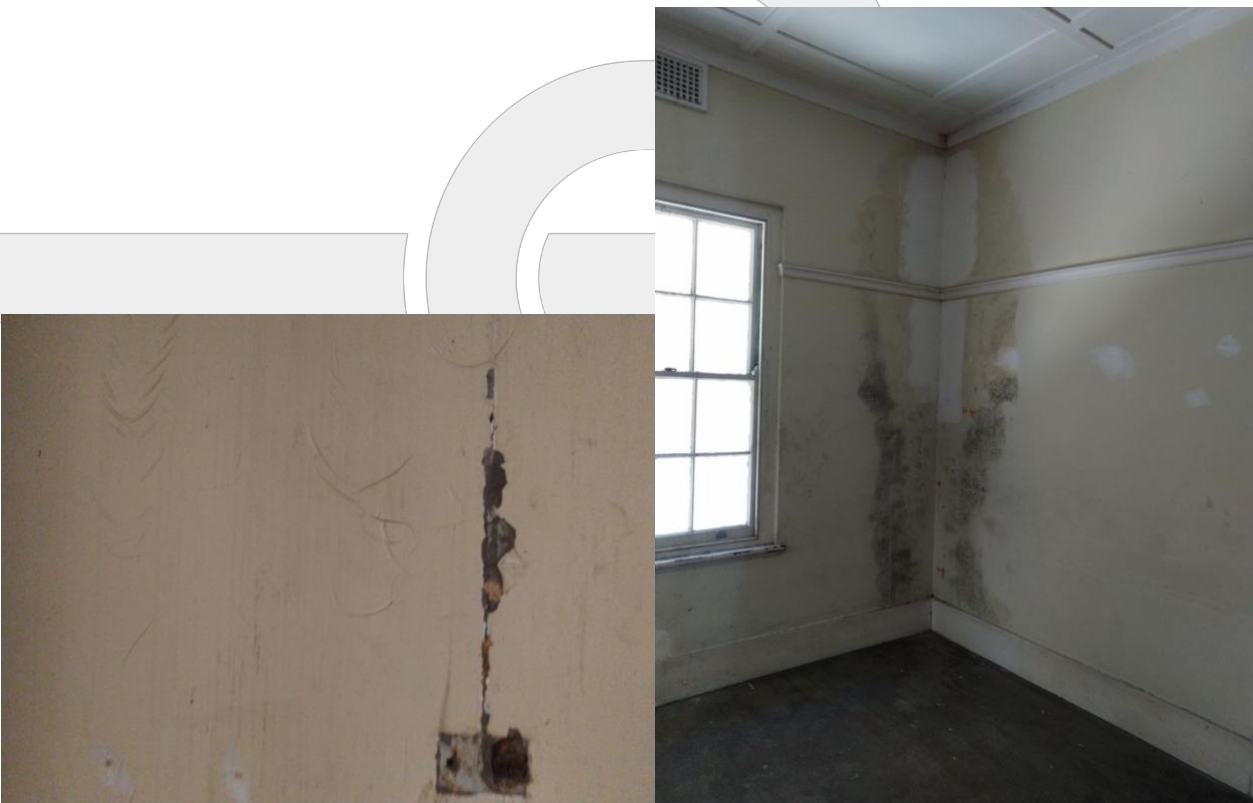


Figure 8: Further water damage noted on first floor



Figure 9: Ceiling damage and floor damage on the first floor



Figure 10: General condition of roof trusses and damage noted



Figure 11: Water damage and wood rot observed in certain areas of trusses