



# ASMAL ENGINEERS (PTY LTD)

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**15th MAY 2023**

**Mr S LALJEETH  
927 UMGENI ROAD  
MORNINGSIDE  
Durban**

**For Attention: Mr S LALJEETH**

**Dear Sir**

**927 UMGENI ROAD: STRUCTURAL ASSESSMENT REPORT**

## **1.0 Terms Of Reference**

Asmal Engineers was requested by Mr S Laljeeth to undertake an assessment of the existing buildings, and report on the condition and stability of the existing structures.

Site inspections were conducted on the 04 April 2023, 02 May 2023 & 05 May 2023.

## **2.0 Site location & Description**

The site is located at 927 Umgeni Road, Morningside Durban.

The property consists of 3 structures as follows and referenced against in the Site Plan:

### **Building A**

Building A comprises of a double Story structure, the 1<sup>st</sup> floor was constructed as a conventional suspended Concrete slab supported externally by load bearing brickwork and internally supported on steel columns.

The roof over the 1<sup>st</sup> floor slab was a timber roof truss structure which was damaged by a fire.

### **Building B**

Building B links Building A and Building C.

Building B being is double Story structure with the 1<sup>st</sup> floor suspended slab system being originally constructed with a permanent shutter slab system. This slab is supported totally by load bearing brickwork.

The roof over the 1<sup>st</sup> floor slab was a timber truss structure, which was destroyed during a fire.

## Building C

Building C is positioned on the northwest edge of the property.

Building C consists of a two-story structure, where the first floor's suspended slab system was initially built using a permanent shutter slab system.

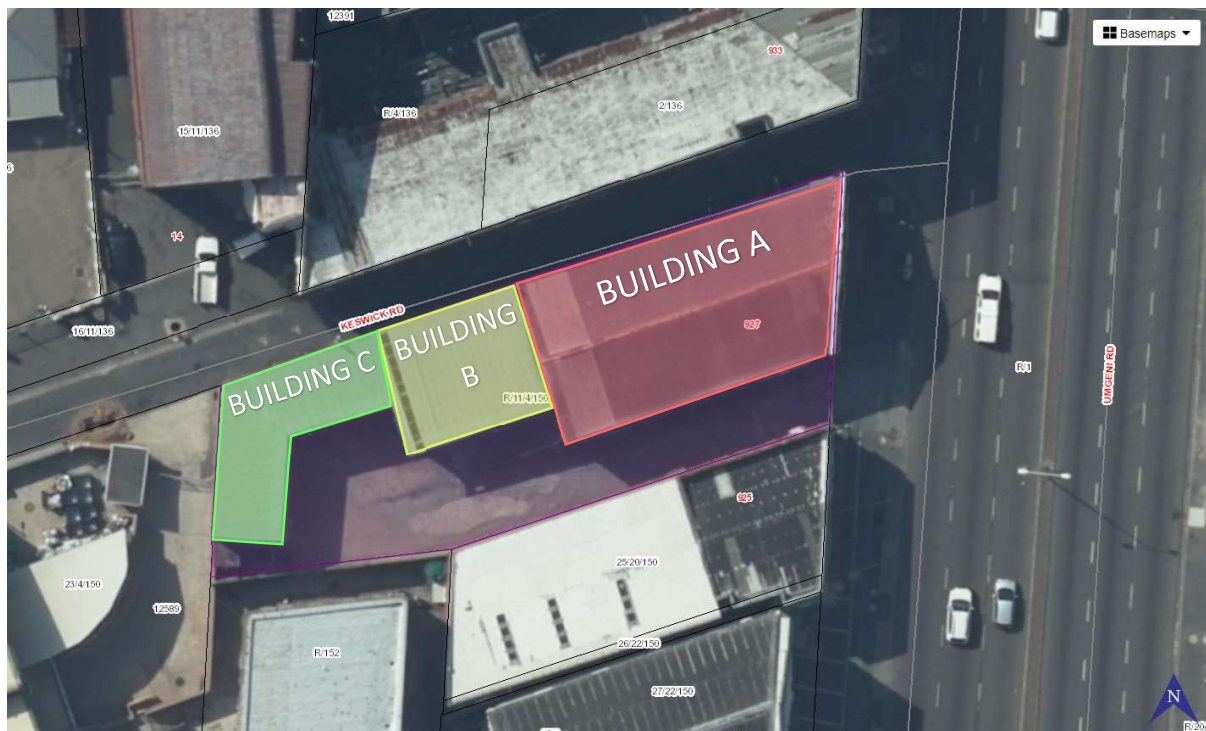
This slab is fully supported by load-bearing brickwork.

The roof above the first-floor slab was constructed using timber rafters.

## Site & Key Plan

Satellite imagery & Cadastral information from the eThekweni GIS.

The 3 buildings are referenced in this report as indicated on Site Plan below.



### 3.0 Site Observations

During the site inspections, various images of items of concern were recorded.

Our observations & Comments are separated Per building and are as follows:

#### Building A



Front Façade on Umgeni road - Moisture and dampness issues were evident on the concrete columns and beams. Significant plant growth within the brickwork has also been noted.



Northern Façade on Keswick Road – External brickwork was identified to be bulging and leaning inwards towards the building. The probable cause for this being due to the damage sustained to the internal roof.

A combination of the roof collapsing inwards and portions of this roof collapsing entirely has resulted in this brickwork to losing lateral restraint. This can also be seen in the images that follow.



1<sup>st</sup> floor of building A - depicting fire damaged trusses

These trusses are damaged beyond repair; the manner of failure has also resulted in the trusses pulling the external brickwork inwards.





1<sup>st</sup> floor of building A depicting fire damaged trusses – Imagery of failed trusses.



1<sup>st</sup> floor of building A- Umgeni Road facade  
Trusses damaged beyond repair.  
Brickwork also shows signs of moisture and dampness issues.



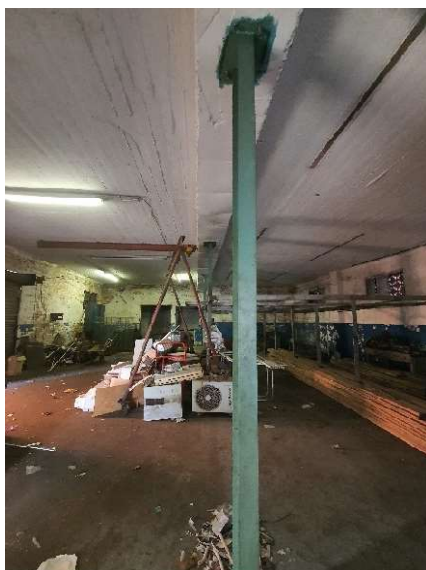
1<sup>st</sup> floor - Corner of Umgeni Road and entrance driveway  
Plant growth through the brickwork with dampness and moisture observed.



Extent of roof being collapsing during fire.  
Collapsed sections were subsequently removed.



1<sup>st</sup> Floor suspended slab – cracks in the suspended slab indicating either deflection or settlement issues.



Ground floor – internal structural steel columns.  
Steel columns appear to be bowed and are not vertical.  
A desktop analysis of these columns indicate that these steel columns do not have sufficient capacity for the anticipated loads. These steel column also appear to be retrofitted as an alteration to the existing structure.





#### Ground floor – External brickwork

Several vertical and diagonal cracks have been encountered at the ground floor of building A, indicating either differential settlement of the foundations, high stresses on the brickwork or a combination of both.



#### Ground floor – Internal Masonry beams

These Masonry beams indicate signs of shear failure.



#### Ground floor – Interior of Umgeni Road façade

Major moisture and dampness issues observed.

Images below depict extent of dampness issues.



Ground floor – Interior of Umgeni Road façade

Moisture and dampness issues observed.



Ground floor – Interior of Umgeni Road façade

Moisture and dampness issues observed.



A portion of the soffit of the 1<sup>st</sup> floor slab

Major spalling encountered here. A permanent shutter slab system was used in these areas, the permanent shutter was subsequently removed which would be the main reason for spalling encountered. In addition to the spalling, the permanent shutter was the slab systems main mode of tensile reinforcement, with this no longer being in place, these slabs are structurally vulnerable to failure as is evident in Building C.



## Building B



### Building B - 1<sup>st</sup> floor

Original roof was damaged during fire.

A new roof was subsequently installed; however, a desktop analysis indicates that this roof structure design is inadequate for the spans.



### 1<sup>st</sup> floor suspended slab

Numerous Surface Cracks are evident on the suspended slab.



### 1<sup>st</sup> floor eaves

Shear failure cracks evident on the eaves of the 1<sup>st</sup> floor.





Building B – Ground Floor- Soffit of 1<sup>st</sup> floor slab

Major spalling has been identified throughout this slab and its supporting beams. A permanent shutter slab system was used in these areas, the permanent shutter was subsequently removed which would be the main reason for spalling encountered. In addition to the spalling, the permanent shutter is the slab systems main mode of tensile reinforcement, with this no longer being in place, these slabs are structurally vulnerable to failure as is evident in Building C.



Building B – Ground Floor- Soffit of 1<sup>st</sup> floor slab

Diagonal cracks within the brickwork, and more evidence of spalling.

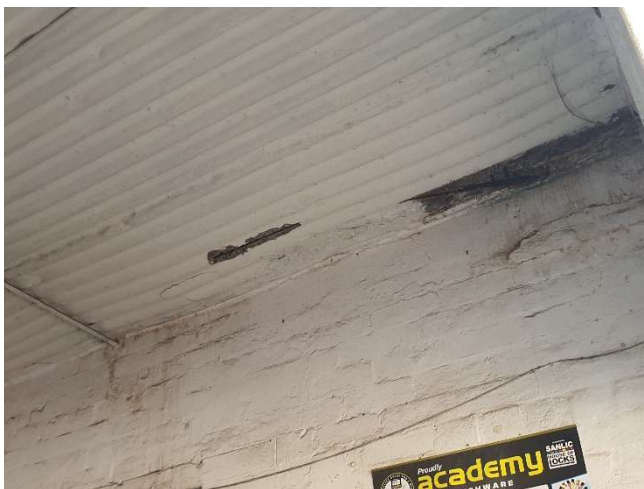
## Building C



Ground floor – Dampness and moisture issues evident at the ground level.



Ground floor – Cracks through the brickwork and concrete overhang slab noted.



Ground floor- Soffit of 1<sup>st</sup> floor slab  
A substantial amount of spalling noted throughout the soffit of the 1<sup>st</sup> floor slab.





Ground floor- Soffit of 1<sup>st</sup> floor slab  
Spalling at soffit of 1<sup>st</sup> floor slab.



Ground floor- Soffit of 1<sup>st</sup> floor slab  
Spalling at soffit of 1<sup>st</sup> floor slab.  
Diagonal cracks also noted in  
ground floor brickwork, indicative  
of differential settlement of  
foundations.



1<sup>st</sup> floor – A Large crack has formed through the length  
suspended slab which extends upwards through the  
brickwork to eaves level.  
The cause of the cracks are either due to differential  
settlement of the foundations, spalling of the slab or a  
combination of both.





1<sup>st</sup> floor – Another Large crack identified that has formed through the length of the suspended slab which extends upwards through the brickwork up to eaves level.

The cause of the cracks are either due to differential settlement of the foundations, the spalling noted at the soffit of the slab or a combination of both.

#### 4.0 Summary of findings

Based on our site observations the following issues been identified:

- **Spalling of concrete:**  
Multiple areas were identified to be affected by severe spalling, especially in the areas where the permanent shuttering slab systems were used.
- **Differential settlement of foundations**  
Various areas throughout the site have displayed signs of differential settlement of the foundations, this is evident from numerous typical settlement cracks throughout all 3 buildings.
- **Design deficiencies**
  - *Building A internal steel columns* – As stated in our site observations, a desktop analysis of the steel columns indicate that they do not have sufficient capacity for the anticipated loads.
  - *Building B & C timber roofs* – The original roofs were replaced by new sheeted roofs, however a desktop analysis indicates that these roof structure designs are inadequate.
- **Fire damage**  
Evidence of fire damage is prevalent, as a result the existing timber roofs have either collapsed or have been structurally compromised.
- **Moisture and dampness issues**  
A significant proportion of the structures on site have issues of rising damp and moisture related issues. From our experience in the area, the water table on Umgeni Road is relatively high, which suggests that inadequate measures were taken during the construction stage of these buildings to mitigate water related issues.

## 5.0 Conclusion & Recommendations

We conclude that the existing buildings have been adversely and severely affected by the common issues of spalling, differential settlement of foundations, design deficiencies, fire related damage & moisture related items.

Due to the extent and severity of the various issues encountered on this site as detailed in our findings above, **we believe that the 3 buildings in their current state are not fit for occupation** and that remedial works to correct the items of concern would be too extensive in nature and not be feasible.

**We therefore recommend that the existing buildings be demolished and reconstructed.**

This process of demolishing and reconstruction would need to follow the local authority's submission process, and considerations for the current issues encountered on site are taken into during the design process.

We trust that the above meets with your immediate requirements.

Yours faithfully



**Imtiaz Asmal**  
PrEng Reg No 910344