



Abe-Struc Engineering Solutions CC
Drafting, Designing & Project Management

2 LION STREET, BO-KAAP, CAPE TOWN

For Attention: Mr. Enrico Nanziati

STRUCTURAL REPORT (A0137-R-100 REV A)



JOB No: A0137

18th August 2020

COMPILED BY:

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APPROVED BY:

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1. BRIEF

Abe-Struc Engineering Solutions CC was appointed by Mr. Enrico Nanziati to investigate the structural integrity of the remains of his house that was destroyed in a fire at 2 Lion Street, Bo-Kaap, Cape Town, ERF 1852. The client intends to develop a 3 storey apartment building on this erf. The client's question: Can the existing walls be incorporated in the proposed new build?

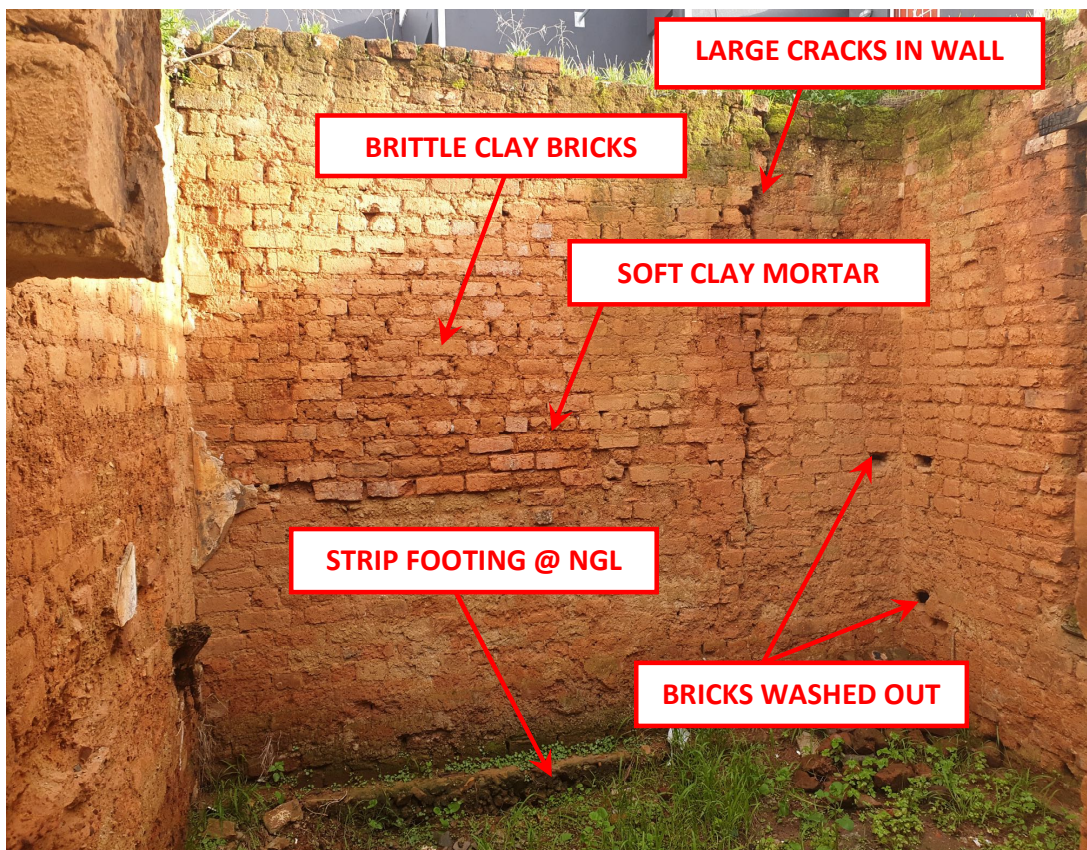
A site investigation was conducted on the 17th August 2020.

2. DESCRIPTION

The property is situated on the corner of Upper Leeuwen and Lion streets. The remains of the dwelling include brick walls and exposed strip footings. The roof and floors were completely destroyed by the fire.

3. OBSERVATIONS

The walls were built off strip footings that were constructed with rocks / boulders, laid in cement mortar and founded at Natural Ground Level (NGL). The compressive strength of the footings is unknown. The walls were constructed using clay bricks and clay mortar. Bricks are brittle, some have washed out and the clay mortar beddings are soft (see photograph 1 & 2 below).



PHOTOGRAPH 1: TYPICAL WALL CONSTRUCTION



Photograph 2: EXTERNAL WALL ON BACK BOUNDARY

Grass / shrubs are growing from the walls displacing bricks and mortar. Large cracks (greater than 3 mm and for full depth) induced by the heat of the fire run across wall panels. Timber lintels were damaged by the fire (see photograph 4). This is the case in all the walls.



PHOTOGRAPH 3: WALL PANEL WITH DOOR OPENING



PHOTOGRAPH 4: ORIGINAL WINDOW CONSTRUCTION



PHOTOGRAPH 5: BAY WINDOW IN LOUNGE



PHOTOGRAPH 6: STREET VIEW

The street boundary retains the grass patch / garden at mid-height. It is cracking at the lower portion of the wall with damp blemishes along the crack lines caused by the water logged ground. The boundary wall is also leaning over towards the street (see photograph 7 below).



PHOTOGRAPH 7: STREET BOUNDARY WALL

4. EFFECT OF FIRE EXPOSURE ON WALL STRENGTH:

According to SANS 10400 Part T (Clause 4.57.1a), walls that form part of building category 1, occupancy class H3, must have a fire resistance (stability, integrity & insulation) of at least 30 minutes.

Building fires reaches temperatures of about 1000 °C in short time frames as little as 4 minutes. Rooms within buildings affected by fire can reach temperatures of about 300 °C.

Masonry walls exposed to fire generally lose compressive. Masonry units are non-combustible, hence having excellent fire resistant qualities as individual units. However, it is the mortar joining these units that are subjected to spalling / deterioration and washout. Loss of bonding between the masonry units causes masonry walls to lose stability, integrity and insulation.

5. FINDINGS

The impact of the fire has weakened the stability, integrity, insulation and compressive strength of walls. Walls have lost its 30 minute fire rating.

The large cracks in wall panels have jeopardised wall stability. The displacements / washout of bricks and mortar have compromised the structural integrity of walls. The structural integrity of walls was further worsened by the brittle bricks, soft clay mortar joints and embedded growth of vegetation.

Hence, the walls are in a state of collapse. The remaining walls of the existing dwelling are unsafe and not conducive for incorporating in future development.

6. RECOMMENDATION

The existing walls must be demolished completely and the existing strip footings removed. The propose 3 storey apartment building must be built completely new to suit the client's requirements. The street boundary wall / retaining wall have failed its serviceability and therefore must be completely demolish. The new boundary wall must be built to suit the new building configuration and aesthetics.