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30 August 2024

To: NL Consulting  
Attn.: Nicol Labuschagne

## Structural Roof Inspection Report

Building 4124, 495 Festival Str, University of Pretoria.



### Scope:

This report provides a summary of the observations that were made, following a visual inspection of the Timber Roof structure on 28 August 2024. The inspection was done from within and below the roof spaces in the general area marked in **green** above. No access was available in most short span rafter areas (sloped ceiling without trap door) but inspected where open like the garage. No part of this report may be copied or used without our prior written consent.

## Observations & Findings:

### Roof Type, Overhang, Covering & Underlay:

- Pitched roof, with hips and valleys (main roof).
  - Site-made trusses.
- Overhang: approx. 400 mm.
- Approximate Spans and Truss Type:
  - The span of the main full trusses was measured at approx. 11.3 m.
  - The main truss configuration was Howe type.
- Corrugated metal roof sheeting used as covering.

### Roof Pitch & Purlin/Batten/Truss Spacing:

- The roof pitch was measured at approximately 30°.
- Truss spacing: approx. 1150 mm c/c, where measured, with the middle 2 trusses being spaced 1690 mm apart.
- Purlin spacing: approx. 1120 mm c/c where measured.
  - Purlin size: approx. 50x76, on flat.

### Engineering System & Rational Design:

- The roof structure was framed by site-made trusses with no rational design available.
  - The timber quality was good but without any grading/identification markings.
  - Only nails were used for the connections, no bolts.
- No timber date stamps found on the original roof truss timber, but the roof structure is estimated well over 50 years of age.

### Non-Compliances, Failures & Findings

- Although no complete failures were apparent at the time of inspection, a few concerns and installation non-compliances were noted.
  - Some buckling of top chords and webs were noted, although not severe.
    - The relatively thick corrugated sheets (when compared to today's minimum thickness) are acting as a sheathing for the top chords.
  - Some parts of beamfilling were not reinstated after opening it for services and are contributing to a few heel joints twisting.
    - The beam filling can easily be reinstated during the refurbishment process.
  - No web runners, cross braces or t-bracing were installed, although web buckling was not severe.
  - Large untriangulated spaces are seen inside the roof void, especially near the hip ends but still appearing in fair condition.
  - The smaller and flatter pitched (measured at approx. 5°) garage roof, although not fully compliant to today's standards, only had shortcomings when dead and live loads were applied, and then only under deflection, not stress.
  - Addressing concerns related to water ingress are of utmost importance.
    - Some water marks were seen on purlins as well as truss members, but without any apparent structural damage on trusses, where checked.
      - The **ridgeline purlins will need replacing**. All purlins, hip boards and top chords are important to check along with regular maintenance.



- External maintenance is needless to say, very important, along with checking the roof covering, flashings, gutters, and the like. It is recommended that reputable industry professionals be used for waterproofing concerns.
  - Many internal walls, including single leaf walls are used as structural support for the trusses (even if not near truss nodes).
    - Therefore, **no internal walls should be demolished** during the refurbishment process, without adding steel or other beams to **support the trusses as they are now**.
    - Some were indicated for demolition on the drawings received, with the one near mid-span being the most pertinent one.
  - Some longitudinal splits in truss members were found but appeared stable.
- Prof. Burdzik recommends not disturbing the roof with remedial works, but to monitor it at least annually (and preferably within 6 months, after the refurbishment) according to the OHS Act's Construction Regulations of 2014.
- Owners of buildings to note that this is in fact a legal requirement for all buildings where employees or the public are present.
  - Please note that we cannot determine the exact condition of the site-made timber roof structure and with hips, valleys, and girders, this roof structure falls well outside the allowable scope of the SANS 10400 Part L (Application of the Building Regulations).

#### Pertinent Photographs:



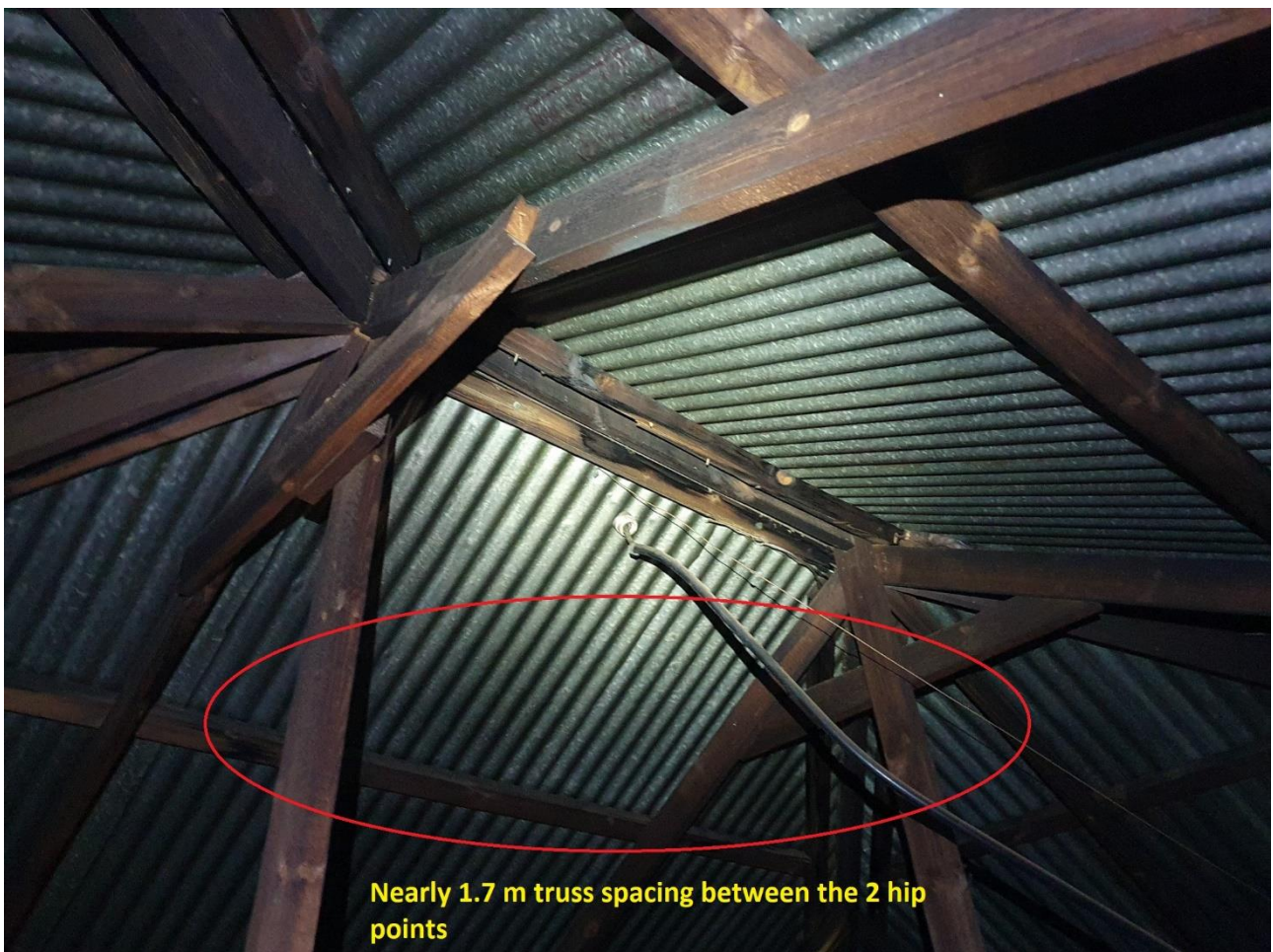
















### Conclusion:

This report is compiled to the best of our ability from within and below the roof spaces and we cannot be held liable for any other defects not reasonably apparent to me at the time of inspection. Should there arise any new concern on the roof or query on any matter, please contact me as soon as possible.

Any repair/remedial/maintenance work considered should be done by reputable industry professionals with the relevant expertise, insurances and health and safety protocols. Note that our recommendations are not site remedial instructions and that repair/remedial/maintenance work instructions are to be issued by and under the directions of the appointed contractor and falls under their responsibility. All redial/repair work would therefore have to be undertaken at the owner's own risk, and we cannot be held liable for any consequential damage.

Sincerely,

**Stian de Jager**

*ITC-SA: Cat. A Roof Inspector*