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04 Dec 2023

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Attention: Carla Colasimone

Project Name: Building Appraisal – Bathing Huts | Meadowvale
Project No: 23E-0526

Introduction

Two bathing huts are currently being stored at a Council depot located at Heales Rd. The subject huts are denoted in Figure 1.

As we understand,

- The huts were originally constructed in circa 1920.
- They were originally located at Nielsen's Beach in Bargara and used by the public.
- In circa 1970, they were relocated to an address at Thabedban St in Avenell Heights and used as a 'Scout Clubhouse'.
- In the early 2000's they were moved to their current location at the depot, where they have been stored for an extended period.
- The huts are perceived by some interest groups and the like to potentially have some heritage value, and restoration of huts is being considered with the intention of returning them to Nielson Park for public use.
- We have been requested to undertake an appraisal of huts in their current condition to assist in informing decision making by others.

There are two huts, which we have typically referred to as the "green" and "cream" hut in this letter.

Figure 1 – Existing huts in storage at depot.

Limitations

The appraisal we have undertaken has limitations, including,

- It was unsafe to enter or go under the huts. They could only be viewed from the perimeter. Our appraisal was visual only.
- The huts where elevated, and some structure was not fully accessible or visible to inspect.
- No original drawings were made available.
- Full structural analysis of existing was not in our scope. Including the temporary supports
- Structural design or documentation of any strengthen or rectification works was not in our scope.
- This letter in no way implies any warranty, guarantee or certification, and does not cover any latent defects.
- The contents of this letter is our professional opinion based on what we were able to observe and the information provided.

Existing huts

The plan dimensions of the huts is approx. 3.6m x 3.6m.

The general floor framing is denoted in Figure 2,

- Red lines. Denotes 70x90 timber bearer.
- Blue lines. Denotes 50x90 timber joists at approx. 500crs.
- Gray circles. Denotes assumed locations of the original stumps.

The timber studs were generally 50x70 at approx. 600crs, with a 'mortise and tenon' joint directly into the bearer.

The roof framing could not be accessed or fully viewed, but appeared to generally consist of,

- A central ridge with gable ends.
- Approx 50x90 timber rafters at approx. 900crs.
- Approx 50x70 timber battens at approx. 1100crs

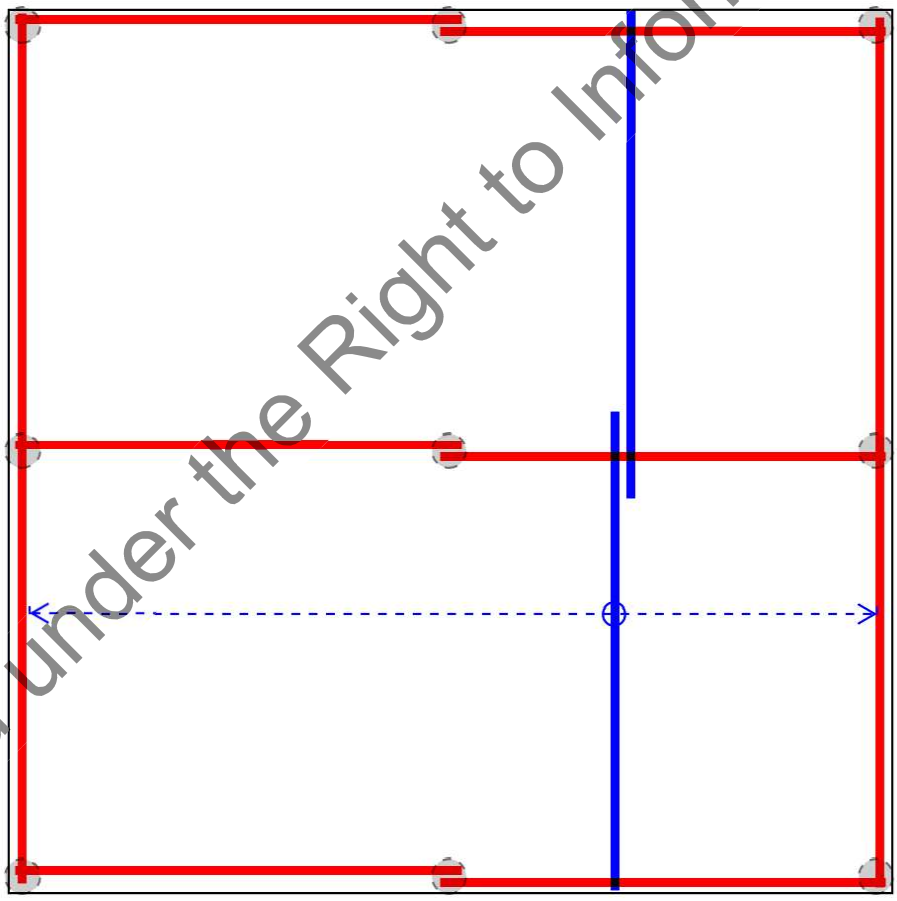

Figure 2 – Indicative timber floor frame

Assessment of existing framing

We were unable to assess all structural framing, and a full assessment was beyond our scope.

Making some reasonable assumptions, we have undertaken some high-level checks of the main members to current standards and requirements.

Our general findings can be summarised as follows,

- Bearers would generally be considered undersized.
- Joists would be considered undersized
- Wall framing member are likely generally undersized.
- Roof framing members are likely to be generally undersized.

We expect that the huts would need to be made structurally safe for public use. Based on our initial high-level assessment we would anticipate that for practically all timber structural framing members, one of the following would be required,

a) Laminating a new additional structural member to an existing structural member to adequately strengthen it. Assuming this is possible or practical.

b) Replace insufficient existing members with new stronger members.

To complete this effectively, we expect it would likely involve essentially fully reconstructing the existing structure.

Tiedown and bracing

Standard requirements for tiedown and bracing were largely introduced in the aftermath of cyclone Tracy in 1974. Since introduction, the standards and requirements for tiedown and bracing have gradually increased over time with each update of the standards.

It is expected that the construction of the huts predates cyclone Tracy. No tiedown and bracing relatable to modern standards were apparent.

In the Australian Wind code the general Bundaberg area is considered to be within a cyclonic wind zone.

If the huts are returned to use, in our view they would need to be brought up to current standards to be considered safe to the public.

We expect that retrospectively installing bracing and tiedown would require quite extensive modifications. In summary, we expect it would involve:

- Roof sheeting to be screw fixed to cyclonic requirements.
- Additional roof battens, to provide adequate support to roof sheeting.
- Strengthening of the connections of roof battens to rafters.
- Generally strengthening of all roof connections (ridge board to rafters, ceiling ties to rafters, etc)
- Installation of an adequate tiedown connections between the roof frame and the top of stud walls. Refer to figure 3 for a general example.
- Install tiedown to the wall framing.

  This is typically in the form of M12 threaded rods, which extend to and bolt through the wall top plate and floor bearer. Refer to figure 4 for a general example.

  Wall tiedown is also required at wall openings, which is typically provided by metal strap.
- Install adequate wall bracing to each wall. This is typically provided by ply braces, refer to figure 5 for typical example.
- For new stumps, a tiedown fixing would be required between the bearer and stump. Refer to Figure 6 for a typical traditional tiedown detail.

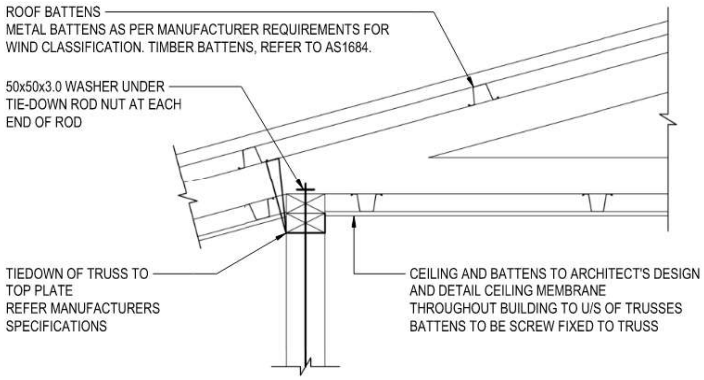

Figure 3 – Typical roof to wall tiedown.

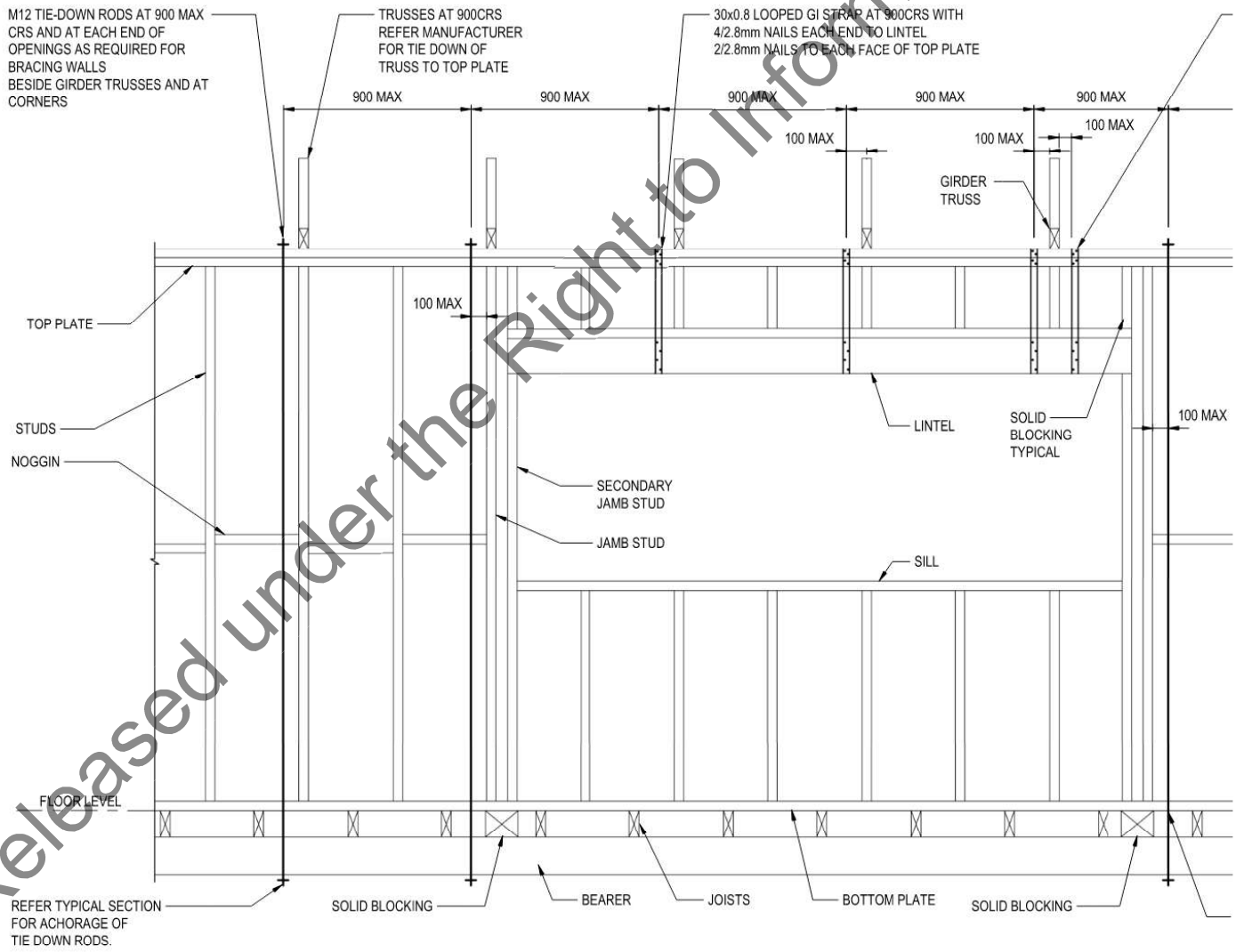

Figure 4 - Typical wall framing tiedown.

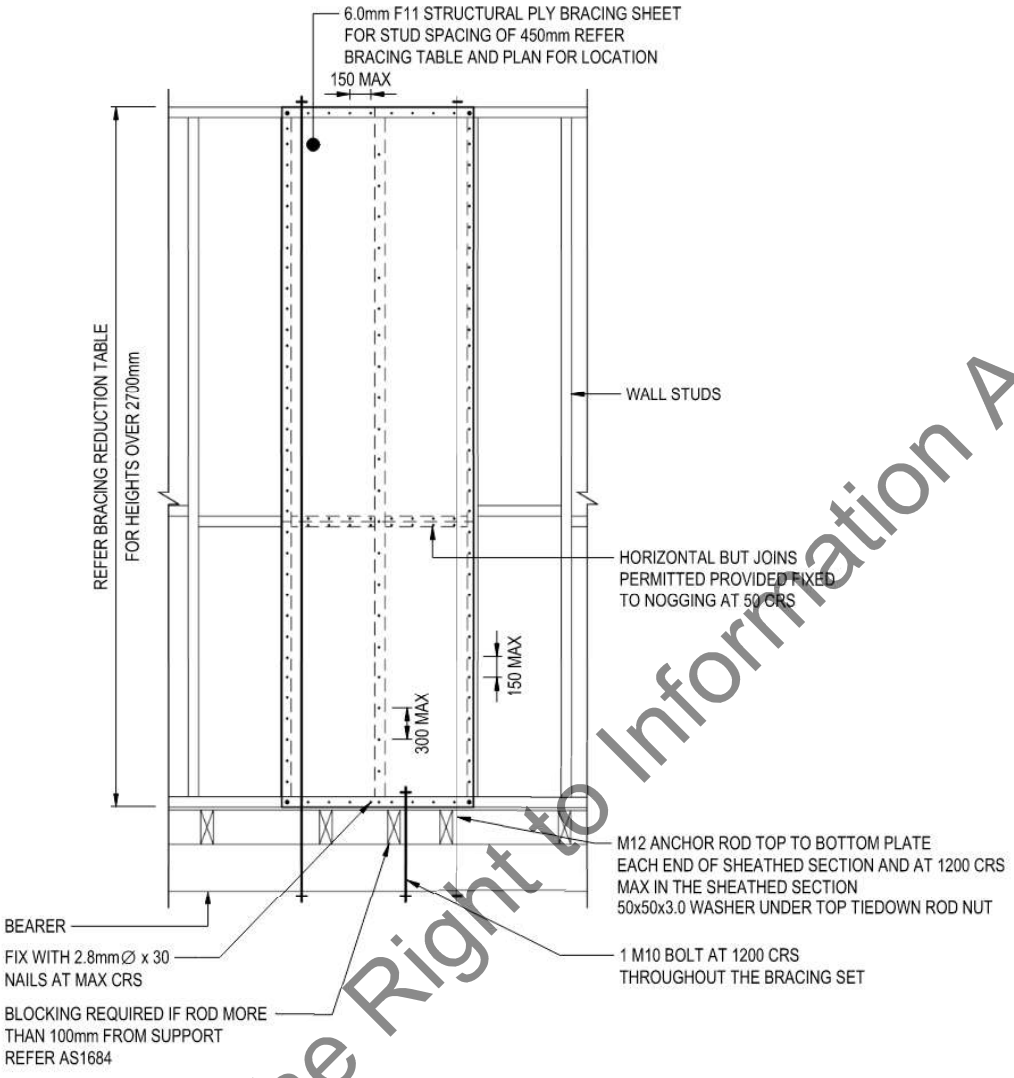

Figure 5 - Typical wall brace detail.

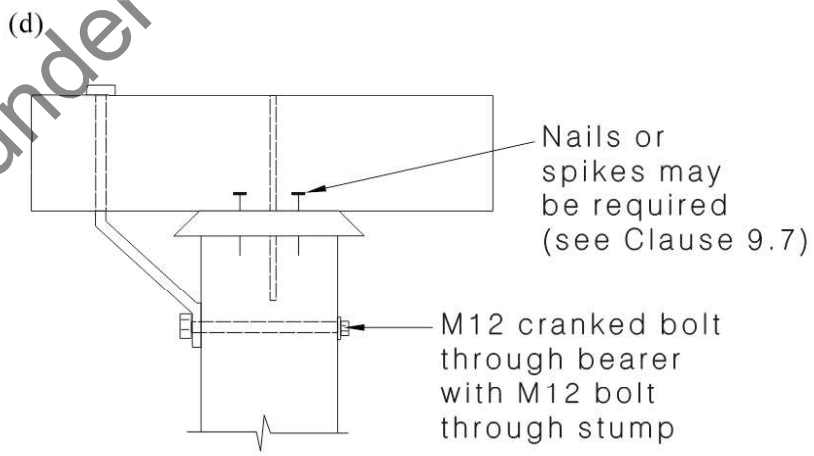

Figure 6 – Traditional stump tiedown.

Deformation.

Although it could not be reasonably measured or quantified at the time, visually it was apparent that the huts were significantly distorted out of shape. This includes,

- The walls were generally significantly 'out of level'.
- General framing 'out of square'.
- Significant distortion or curvature of walls in any dimension. Refer to figure 7.
- Many structural members such as bearers were significantly deflected or distorted out of shape. Refer to figure 8.

Figure 7 – Existing wall frame distorted.

Figure 8 – Existing bearer distorted.

Missing Framing

Many structural members from each hut were missing.

An example is a missing bearer as denoted in Figure 9, which has caused further local distortion of the floor and wall frame.

In our view missing structural members such as bearers make any potential relocation highly problematic.

Figure 9 – Existing bearer missing.

Timber Fixings.

Numerous nail fixings were observed to have deteriorated. This was apparent across practically all building elements. There are numerous locations where failure of fixings has caused general framing, cladding and the like to simply fall apart.

Figure 10 provides an example of the observed state of the fixings. Nails had corroded to point where some cladding was effectively no longer attached.

Based on,

- The age of the huts
- The corrosive environment they were subjected to (coastal),
- Material qualities of nails at the time of construction.

The fixings are expected to be in very poor condition. We would expect that all fixings would need to be replaced.

Figure 10 – Example of failure of fixings

Timber degradation.

Extensive timber degradation could be observed throughout the huts. In our opinion very few (if any) timber elements would be free of degradation.

Figure 11 provides an example of apparent termites at the bottom of a stud.

Figure 12 provides an example of the general condition of the timber weather boards, which were found to be generally ridden with dry rot.

Although it could not be inspected closely, it appeared that the timber roof framing to the green hut is riddled with water damage and dry rot. This is common in old structures where roof sheets where originally nailed. The action of nailing the roof sheet would locally distort the sheet and would not fully seal in every instance. Water was prone to entering the nail fixings, causing slow decay of the timber.

Modern roof sheets are screw fixed with a rubber seal.

Figure 11 – Example of signs of termites

Figure 12 – Example of dry rot in cladding.

Figure 13 – Example of decay in roof framing.

Collapsed roof framing.

At the ‘cream’ hut, the roof has collapsed into the hut.

The loss of the roof has left the internal framing of the hut fully exposed to the elements. It appears this has significantly accelerated the degradation of the structure.

The roof framing is also important structurally to generally tie the structure together. The wall frames in particular would be much less stable without a secure roof structure.

Figure 14 – Collapsed roof framing

Figure 14 – Collapsed roof framing inside the hut

Floor Collapse

The floor frame on both huts appears to be progressively collapsing. At numerous locations there are obvious signs of localised structural collapse or failure.

Figure 15 provides an example of some floor collapse, where an edge bearer has deteriorated to the point of failure.

In our opinion, based on the visible condition of the timber floor framing the huts may be at risk of sudden collapse.

Figure 15 – Partial collapse to floor framing.

Restoration.

To restore the huts, we would expect that at least the following works would be required,

- Straighten, level, and 'make square' all the existing floor, wall, and roof framing so that the framing is within acceptable limits and tolerances. Based on the condition, this may not be feasible.
- Reconstruct damaged, collapsed, or missing structure
- Strengthen or replace practically all structural framing members to current standards.
- Install tiedown throughout the structure to current standards.
- Install wall bracing to current standards.
- Install new roofing, supported to current standards.
- Replace all damaged members (ie essentially all timber cladding, flooring, linings etc.
- Install new doors, windows, and the like, which are designed to current standards for cyclonic wind.

In our opinion, restoration of huts is not reasonably practical or feasible.

Due to the extensive issues, we expect that very little (if anything) could be salvaged.

It's likely a restoration would lead to practically every element being replaced or reconstructed, to the point that the building would effectively become an entirely new construction.

In addition to restoration effort that would be required, we consider the existing condition of huts to be unstable and unsafe. Both huts appear to be already progressively collapsing. At numerous locations in the floor frame, wall frame and roof frame, there are obvious signs of localised structural collapse or failure.

We expect this would be prohibitive to being able to safely conduct works of any nature in the vicinity of the huts. This would include any temporary strengthening works and the like, which would be required to make the huts safe to work on.

In our opinion it would not be possible to safely relocate the huts in their current form. There is potential for any effort to relocate the huts to cause them to collapse.

Recommendation

In our professional opinion, these existing bathing huts should be structurally condemned and demolished.

We would suggest that,

- The existing barrier remains in place, to prevent anyone from coming into close proximity of the huts.

  We would consider a safe horizontal distance from the huts to be greater than the total height measured from the ground to the highest point on the roof.

- No attempt is made to relocate or strengthen the structures. In our view, there is not a reasonable way this could be undertaken while effectively managing safety.

- An excavator demolishes the huts in their current position.

  For safety of the operator, we recommend that the excavator machine has a reach greater than the total height from the ground to the highest point on the roof.

- Material is suitable collected and disposed of. There is potential that the huts may contain hazardous materials such as lead based paint and the like.

If you have any questions regarding this letter, please contact the undersigned

Yours sincerely,

47(3)(b) RTI Act

Partner | Principal Engineer
RMA ENGINEERS PTY LTD

Attached; photographic record