

ENGINEERING HERITAGE AUSTRALIA

ENGINEERING HERITAGE PRACTICE NOTES



ENGINEERS
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PRACTICE NOTE No. 6

ASSESSMENT AND CONSERVATION OF A TIMBER BUILDING

Purpose

The purpose of this practice note is to provide engineers and others with essential background information on the assessment and conservation of a timber heritage building.

Preamble

Working on a timber building requires investigation of the condition of both its fabric and structural condition.

Timber is strong in both tension and compression and fabric defects are generally associated with water entry into the fabric causing rot and loss of strength or fabric affecting its structural integrity. It is important that the sources of the water entry are determined and that water entry be prevented by appropriate remedial works.



Timber structural defects are often associated with past building design and construction techniques which have structural weaknesses requiring determination and correction. The assessment and conservation of a Heritage Timber Building adds extra considerations to this work and reference should be made to Practice Notes 1, 2 and 3. (The Notes are written for Engineering Heritage Items but the principles and processes are applicable to any item requiring engineering input.)

There will likely be roof movement under wind load with lateral buckling of members with excessive slenderness ratios such as collar ties, rafters, ceiling joists and truss bottom chords being a primary cause of problems.

The transfer of roof wind load to the building walls and the wall construction may lead to racking and twisting of the building.

Correction of these defects requires careful consideration of the conservation options and it is essential that new works have minimum visual impact.

New timbers are desirably of the same species and strength as the original.

The Assessment Procedure

The procedure gathers information and analyses it for use in the conservation procedure.

Determine:-

- The building history. Its importance.
- The history and achievements of the people involved with the building.
- The building design and construction features. Special or unusual components.

- Where possible, original construction, additions, alterations and previous repairs.
- The building technology used, eg. materials, weatherproofing, flashings, dampcourses, nailing, bolting, connections , joint treatments, structural techniques.
- Fabric and structural condition of the whole building and of its individual components. Check members and beam end bearing for termites where applicable and for rot. Note that termite deterioration and end bearing rot is often not visible and will require appropriate testing.
- The adequacy of the building structural elements for compliance with current loading codes.
- The usefulness of additions.
- The options for end use.

Dot points 1 and 2 can readily be carried out by others. All other dot points require engineering expertise.

The Conservation Procedure

The procedure applies the assessment to obtain the available options enabling a best choice decision to be made

The principles and techniques are those of the Australian Burra Charter set out in Practice Note 1.

Conservation of the building involves a number of ordered steps as follows:-

- Determine the significance of the building as a whole.
- Determine which components are highly significant, which components have some significance and which components have no significance
- Determine if there are individual components which require removal, restoration or reconstruction or adaptation and assess whether the impact of the alterations diminishes the significance of the item.
- Assess public safety issues. Consider structural and fabric consequences and their impact on conservation options.
- Examine the defects in design and construction and whether improvements can be made so as to not repeat past mistakes or to provide better performance of the fabric and structure.
- Evaluate whether an alteration is acceptable.
- Determine acceptable end uses of the building based on the above.
- Assess the practicality of carrying out the conservation works decided upon. This includes considering the impact of introducing new materials. The extent of new materials may be minimised by reuse of building material from elsewhere in the building which has to be replaced but which is sound over most of its length and capable of relocation.
- Carry out the conservation works to the above.