



LEGISLATIVE ASSEMBLY
FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ENVIRONMENT AND TRANSPORT AND CITY SERVICES
SUZANNE ORR MLA (CHAIR), CANDICE BURCH MLA (DEPUTY CHAIR), JAMES MILLIGAN MLA

Inquiry into referred 2017–18 Annual and Financial Reports
ANSWER TO QUESTION ON NOTICE

Asked by NICOLE LAWDER: To ask the Minister for the Environment and Heritage

Ref: EPSDD, Heritage, 3.1

In relation to: Glenburn Homestead Pise Building Engineering Assessment

- 1) What works did the June 2018 engineering assessment assess where required to the Glenburn Homestead Pise Building?
- 2) Has the Government set aside funding for this works?
- 3) How much is this work going to cost?
- 4) When will works commence?
- 5) Could you please provide a copy of the engineering assessment?
- 6) How much did the building engineering assessment cost?

MICK GENTLEMAN: The answer to the Member's question is as follows:–

- 1) The Glenburn Homestead Scope of Conservation Work report finalised in June 2018 recommended conservation works to structurally stabilise the homestead as a high priority. Further works to discourage erosion and to install measuring devices for monitoring were recommended as medium priority, ideally undertaken directly after completion of high priority works.
- 2) Implementation of the conservation works is subject to future funding. The Parks and Conservation Service are seeking to deliver the works through the 2019-20 Better Infrastructure Fund upgrade program.
- 3) The Glenburn Homestead Scope of Conservation Work report did not provide a cost estimate.
- 4) Works are subject to future funding.
- 5) A copy of the report is at [Attachment A](#).
- 6) The report cost \$8,840 ex GST, this included site investigations and preparation of the report.

Approved for circulation to the Standing Committee on Environment and Transport and City Services

Signature:



Date: 30 (4) 18

By the Minister for the Environment and Heritage, Mick Gentleman MLA



Glenburn Homestead

Scope of Conservation Work

27 June 2018

Prepared for ACT Parks and Conservation

by
Pip Giovanelli

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1 PRELIMINARIES

1.1 Background

Glenburn Homestead is a significant component of the larger Glenburn Precinct that has been entered in the ACT Heritage Register. The place is managed by ACT Parks and Conservation who have commissioned this report to address structural issues identified in late 2017 and early 2018.

In particular the structural stability of the western doorway was assessed as being potentially dangerous and as a consequence the lintel was temporarily propped and signage installed to discourage the public from entering that part of the building. Closer inspection of the building has since revealed that an internal lintel is also precarious and that other elements of the building would benefit from conservation work.

Following on from the above, a meeting was held on site on 21 May 2018 with engineer Scott Bland from Northrop, Craig Egle and Sophie Clement from PCS, Jenny Dunn and Kate Harrison from ACT Heritage and heritage consultant Pip Giovanelli.

Pip Giovanelli was subsequently engaged to prepare a scope of work for the stabilisation / restoration of walls around the windows and doorways.

It is understood that a conservation management plan for the Glenburn Precinct is currently being prepared by David Hobbs of Phillip Leeson Architects.

1.2 Description

The pise` building known as Glenburn Homestead was built in 1900. It had a verandah on its eastern side and a covered link on the west connecting it to the slab building that had been constructed three years earlier in 1897 (*A Work in Progress* Colin McAlister 2013). The building was apparently in reasonable condition in 1947 (McAlister) but by 1971 the roof and verandah of the pise` building had gone and most of the roof framing had collapsed. In 1978 the NCDC erected a stand-alone roof structure over the building which is still extant in 2018.



Glenburn Homestead 1971 showing collapsed roof
-photo by David Read in collection of NLA sourced from McAlister.

The structure is located on a small rise in an area exposed to high winds. Several meters to its west is a single-storey slab building and both structures are now within a fenced enclosure.

The rammed earth walls are approximately 400mm thick and supported on a stone footing that on the western side is covered by earth but on the east is exposed about 100-200mm above the surrounding ground. The floor plan comprised four rooms and a short corridor or hall, with two windows on the western elevation and two on the east. There are no windows in the north or south gable elevations. The roof ridge runs south to north although the ridge is not central to the building and there is a brick chimney on the south elevation.

The doors and window sashes are missing however the frames are mostly present and it is presumed from subsidence of timbers and lintels that the base of the door jambs has been degraded. Some former termite activity is visible in at least one jamb. The base of the door jambs can't be seen because a new layer of earth/gravel was added over the floor a number of years ago. As part of this process chicken wire was laid around the perimeter of the walls and covered by introduced gravel.

1.3 Previous work

It seems the first attempt at conserving the structure was the installation of the new roof in 1978. This corrugated galvanised iron roof is structurally independent from the pise` building and supported on a timber frame and bush pole posts. There is some evidence that a few sheets of iron have been replaced over time and guttering and downpipes were added in 2012 to feed roof water into a new galvanised iron tank (see the report 'A Work in Progress' by Colin McAlister, July 2013 and photos from 2010).

In 2010 the homestead underwent structural stabilisation that involved encircling the building in a steel cable that was tightened each week after the base of the wall was softened by moistening with water. This process, described as 'clinching', continued from March until June and closed several major gaps in the external walls. The top of the wall was then capped by a ring-beam of steel-reinforced concrete and some of the larger gaps in the walls plugged with more concrete. The work was undertaken by Joel Dunn from Binutti Constructions.



Steel cable at door head height with vertical timber shutters on corners, 2010.
Source: *Pise` Photo comparison* -courtesy Louisa Roberts, Act Gov



In 2013 the south western window was restored by careful and sensitive reinstatement of earth around the window frame on both exterior and interior surfaces. The repair was also extended to ground level on parts of the west and south elevations to address deep undercutting at the base of these walls. The earth was gathered locally.

At some stage chicken wire was laid around the entire internal perimeter at the base of all walls and extended under a layer of introduced earthen gravel.



2013 restoration of pise` (A Work in Progress Colin McAlister 2013).
Note the use of metal rods or starter bars (arrowed) protruding from the old wall.

1.4 Analysis of structure

The structure comprises rammed earth walls (pise`) supported on a stone footing. The size and depth of the footing has not been established but given the cracking that has occurred there must have been some settlement of the footing over time, and most probably after the roof was lost.

There is no evidence of a damp proof course and in most parts of the external wall there has been some loss of earth most probably due to rising damp. The most problematic area had been on the south west corner of the building and this was repaired in 2013. The cause elsewhere is not entirely clear and could be a result of rising damp, excess surface water, wind abrasion, rain splash and/or animals. The walls are not actively monitored and so it is not clear if most of the erosion occurred when the roof was off, or if it is more gradual.

Black material on the earth wall above ground has not been analysed but may have been an earlier attempt to arrest decay using sump oil.



Base of north wall 2018

The nature of the cracks and evidence in earlier photos suggests there is no horizontal reinforcing in the walls.

It is not known if an analysis of the sand/clay content has been undertaken however it seems the mix is very susceptible to water erosion, which is particularly obvious on some of the internal walls.



Water damage that would have occurred prior to re-roofing.

Lintels

The lintels above doors are supported by rough-hewn timbers that also acted as the door frame. These posts or jambs are roughly 100 x 100 mm and are centrally located within the width of the wall. The lintels on the other hand comprise two horizontal rough-hewn timbers of

about 200 x 75 mm side by side and as a consequence of the above the lintel is not fully supported by the jamb. The dimension of posts and lintels varies considerably.



North west window 2018

Like the doors, the earth above windows is supported by two parallel rough-hewn timber lintels laid side by side and embedded into the pise` wall by approximately 100- 150 mm. The window frame is of machined hardwood and sits midway in the thickness of the wall. The frame is secured to timber lugs embedded in the wall and appears to provide conditional support to the timber lintels above.

Lateral ties

Two sets of wall ties run through the building from the north gable to the south. They comprise four or so strands of fencing wire that are now rusty and presumed to date from the occupation phase, although they may have been added after the roof blew off - in an attempt to hold the walls together?. They are located just above the former ceiling level and are no longer tight. The south end wraps around the chimney and the north is fixed to a short external timber plate. The wires should not be tightened as there is a risk they will break.



Wire 'tie' above former ceiling level

Modern cross tie

A steel cross-tie runs on top of the east west internal wall and is presumed to have its ends embedded into the 2010 concrete topping beam. The old lateral wire ties can also be seen in the image below



Timber wall plate

A timber wall plate is located on top of the internal north/south wall and includes a rebate for a former ceiling rafter. The plate is most likely to have supported ceiling rafters and would have had minimal impact on the building's overall structural system.



Bush round wall plate between lounge room and western bedroom.

Door jambs

From subsidence and some evidence of former termite activity it is assumed that the bases of the door jambs /posts have been eaten by termites. As the post has subsided the weight of the earth-bearing lintel above has placed pressure on the adjacent earth wall causing it to shear away in several instances.



Subsidence of door jamb leading to shear of adjacent earth

1.5 Current condition

Overall the building is not habitable and there is significant potential for collapse of lintels above windows and doors. The remainder of the walls are relatively stable. There is likely to be ongoing loss of earth walling around windows and doors, and erosion around the base of external walls. The building has benefited from partial stabilisation of the walls in 2010 and the addition of the concrete top-beam.

The condition of the roof has not been assessed in detail although it appears to be sound. The roof is supported on timber posts and it is not known if these are protected from termite attack or general decay. The depth of their embedment has not been established.

1.6 Conservation strategy

A discussion on site with representatives from ACT Heritage suggested the building should be structurally stabilised but not fully restored. In essence this is interpreted as repairing the timber around windows and doors to the extent that it continues to support the lintels and prevent collapse of earth across openings.

The conservation work will also include reinstating pise` around windows and doors to the extent necessary to provide additional support to lintels and jambs and retard ongoing decay. The model for the nature and degree of intervention is the work done around the south west window in 2013.



All windows and doors should be brought to a stable condition to take full advantage of the skills of the specialist trades person who is engaged to do the work.

There is the potential to undertake further infill of large cracks, as this will enable better visual monitoring of building movement and will utilise the same skills and materials as lintel stabilisation.

Preventative measures should also be undertaken to reduce further erosion of the western wall. This involves shallow excavation of the ground between the pise` and slab building to expose the stone footing and drain water away from the area. Note that there is understood to have been a covered link between the two buildings and it is possible there are subsurface

remains and artefacts indicating former use of the area. Exposure of this area should be done as an archaeological exercise.

Half of the slab hut's roof drains into the area between the two buildings and it would be beneficial to install a gutter to the slab hut and drain roof water away from both buildings.

1.7 Recommendations

High priority

Undertake stabilisation of the door and window openings of the pise` building in accordance with the scope of work set out in Parts 2.1 to 2.3 of this report.

Because of the safety risk this work should be undertaken as soon as funds become available and ideally within the 2018-19 financial year.

Prepare a photographic record before and after any work that is done and present this as a short 'Completion of work' report to be lodged on the agency's file for Glenburn Homestead.

Medium Priority

Undertake archaeological investigation and modification to soil levels around the building, including between the slab building and the pise` building in accordance with the scope of work at 2.4 of this report.

Install guttering on the eastern roof of the slab hut and ensure it drains well clear of both structures.

Install 'tell-tales' or similar measuring devices across relevant cracks to enable on-going monitoring of any movement in the building. Installation is usually guided by an engineer however on-going recording can be undertaken by agency staff.

Ideally the medium priority tasks will be undertaken immediately following the high priority tasks above to discourage erosion of the conserved work, especially on the western side.

1.8 Sources of Information

The Glenburn Complex- Restoration and Beyond by Louisa Roberts in National Parks Association Bulletin, 2010

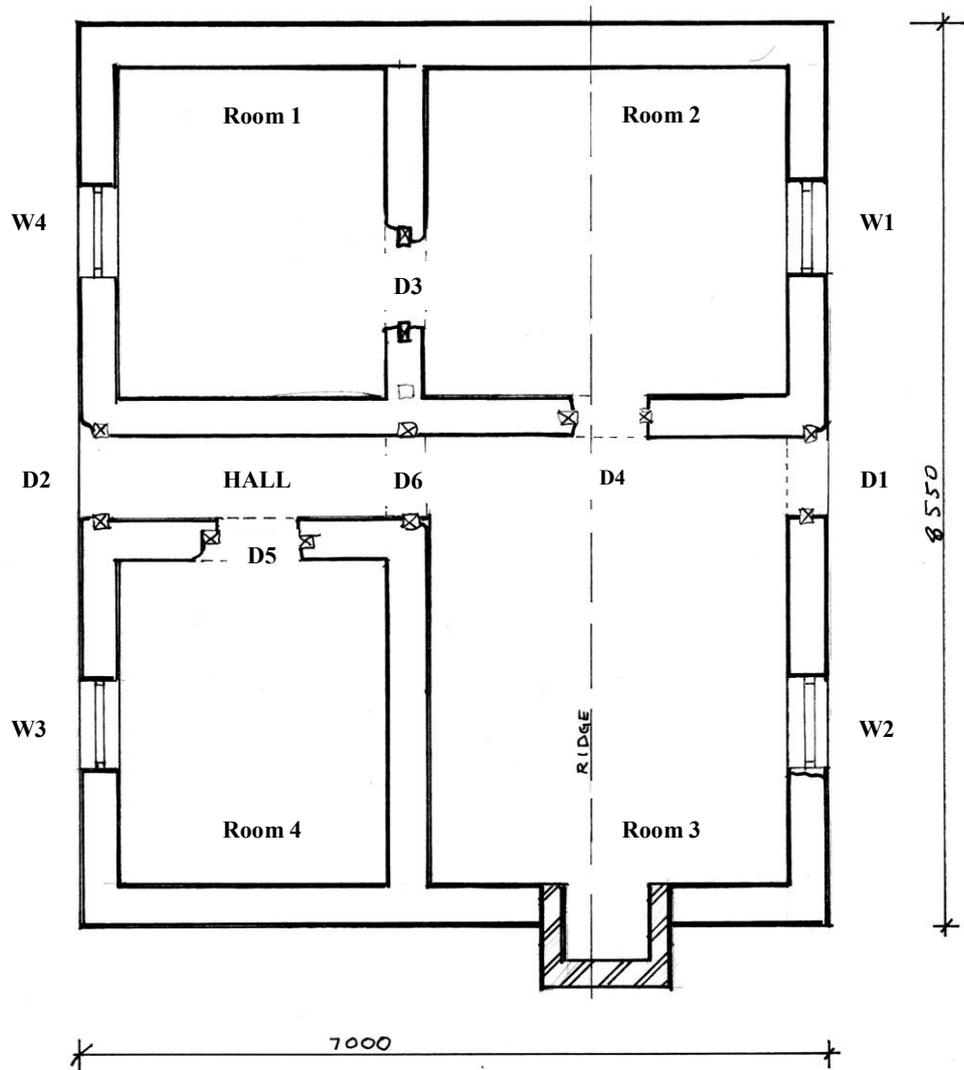
Pise Hut Restoration. An unauthored report comprising a collection of before and after photos of stabilisation work done between March 2010 and June 2010.

A Work In Progress -The protection and conservation of early European sites in the Glenburn/Burbong Historic Precinct in the Kowen Forest, ACT. By Colin McAlister July 2013

Conservation of Vernacular Architecture, unpublished report by Pip Giovanelli 1991

2 SCOPE OF WORK

Floor plan

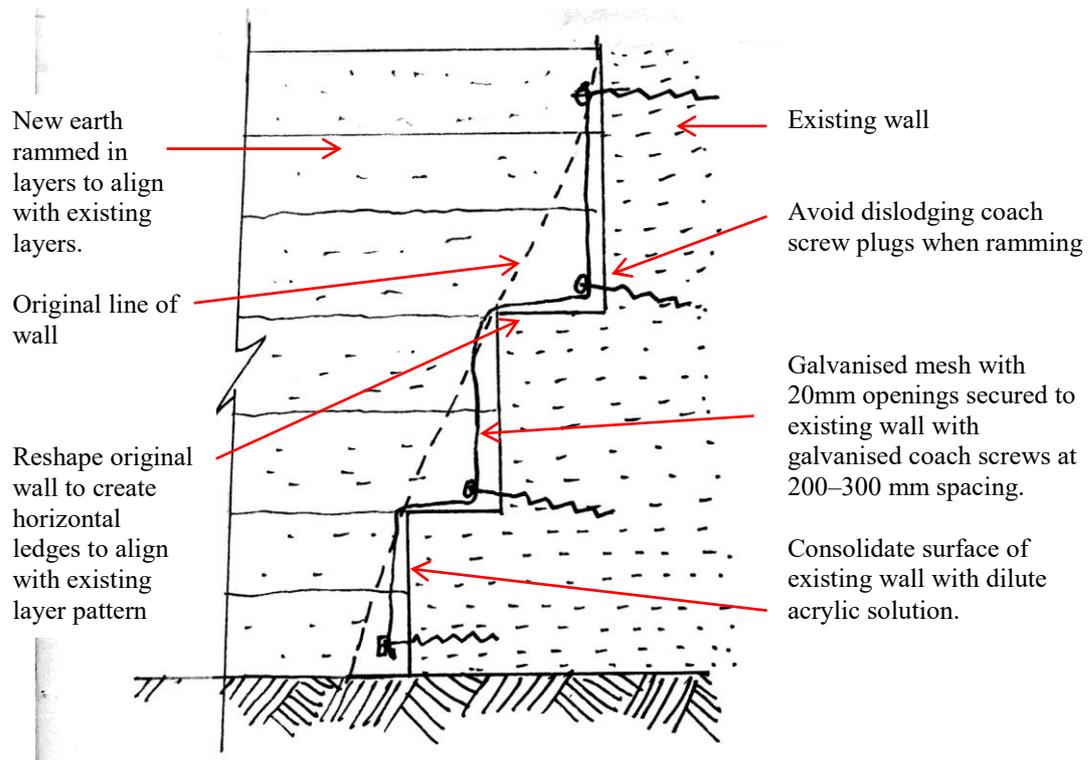


Plan of pise` building with north to top of page

2.1 Pise` Repair Methodology

Repairs should be based on the following methodology:

- Damaged areas should be cleaned of loose material by hand broom and gently reshaped with a trowel or similar tool to provide horizontal ledges.
- Consolidate the surface with a weak solution of clear acrylic sealer or binder.
- Form 20 mm by 20 mm galvanised mesh to fit the surface to be repaired, ensuring none of the mesh will protrude beyond the repair. Anchor the mesh loosely to the pise` surface with galvanised coach bolts, starter bars or similar. Screw fix or gently hammer in place to obtain a firm fit. Epoxy resin should not be necessary. The mesh can be tacked to door jambs where relevant. Add additional lugs or pins if warranted to ensure new material will lock onto the existing matrix.
- Form up shutter boards to closely follow the original surface and ram the new earth firmly into layers of approximately 75 mm high. Work well into the mesh and the original surface. Lightly re-moisten the original surface if appropriate to improve the bond.
- Pise` is a mixture of gravel, sand and clay. A favourable mix is 25-30 % clay to 70–75% sand and gravel. The desired moisture content is about 10%. A rough field guide is to squeeze the mix of earth and water in the hand so that it just adheres.
- Soil is to be gathered from the nearby creek and tested for sand/clay content, shrinkage and colour. The test can be a simple dissolve, shake and settle observation. Select soil from the creek bank from several locations. Place each sample in a glass jar, cover with water, shake, leave for several hours to soak and then shake again to fully disperse the material. Allow 24 hrs to settle. Gravel and sand will settle to the bottom, with the fine clays above. Aim for a mix of 75% sand and gravel and 25% clay (the lower three quarters of the sediment to be sand and gravel and the upper one quarter to be the fine clays). This is not critical but does provide a useful guide. The existing mix at Glenburn has not been tested but appears from its erosion pattern to have low clay content. The repair mix at the south west window appears to have been a mix with higher clay content or possibly with a binder added.
- Collect material based on the tests above. Conduct samples and adjust the mix accordingly.
- Do not use historic pise` that has fallen from the wall if it has come from near the base of the wall or the exterior as it may be contaminated with excessive salt.
- When dry the mix should be of acceptable colour and have minimal if any shrinkage. Ideally the colour will be similar to the wall, although minor variation is inevitable and acceptable as it will demonstrate the restoration/conservation process.



Indicative section showing repair methodology

2.2 Repair of Jamb at Doorways

It is assumed that decay or termite attack at the base of jambs has caused subsidence which will continue if strength at the base of jambs is not re-established.

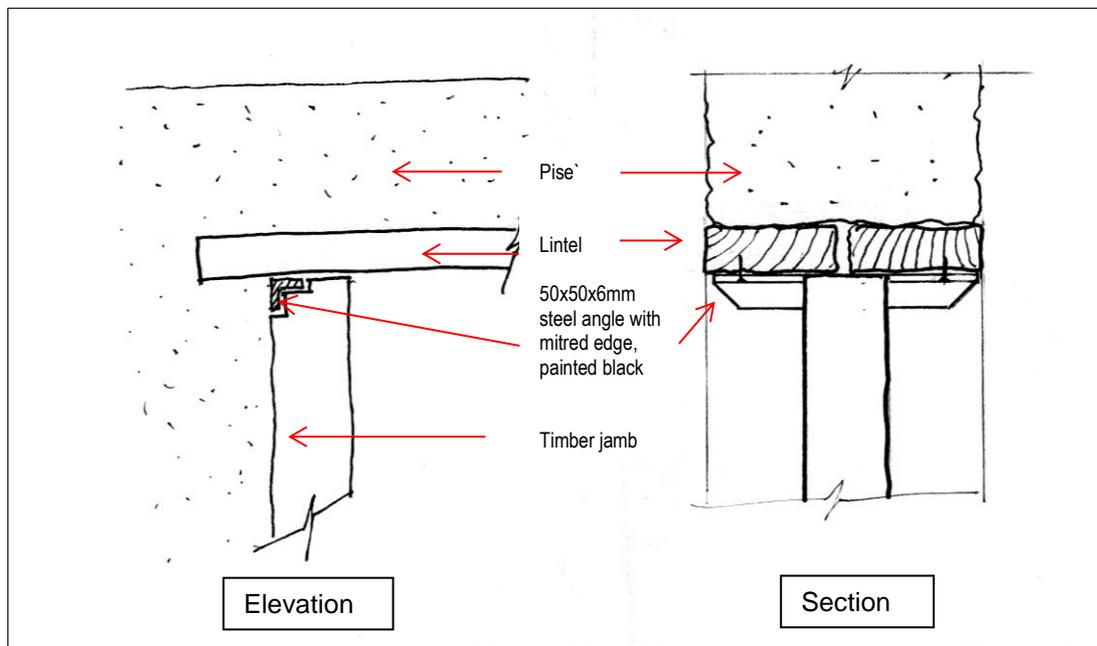
Gently, and only where necessary, prop the lintel. If possible apply upward pressure to slightly lift the lintel and prise back to level position and relieve weight off the jamb.

Expose the base of the jamb and if decayed carefully remove it for repair.

Excavate around the base of the jamb by about 250 x 250mm and pour a 125mm thick concrete footing to finish approximately 50mm below the original internal floor level. Monitor the excavation for artefacts, traditional construction techniques etc. If there is a timber threshold it should be reinstated.

Cut back the jamb to sound material and splice on a new base of termite-resistant Australian hardwood. The splice should be half-lapped, glued and bolted.

Where there is inadequate bearing between the top of jamb and underside of timber lintel, a 50 x 50 x 6mm right angled steel channel should be inserted as shown in the diagram below.



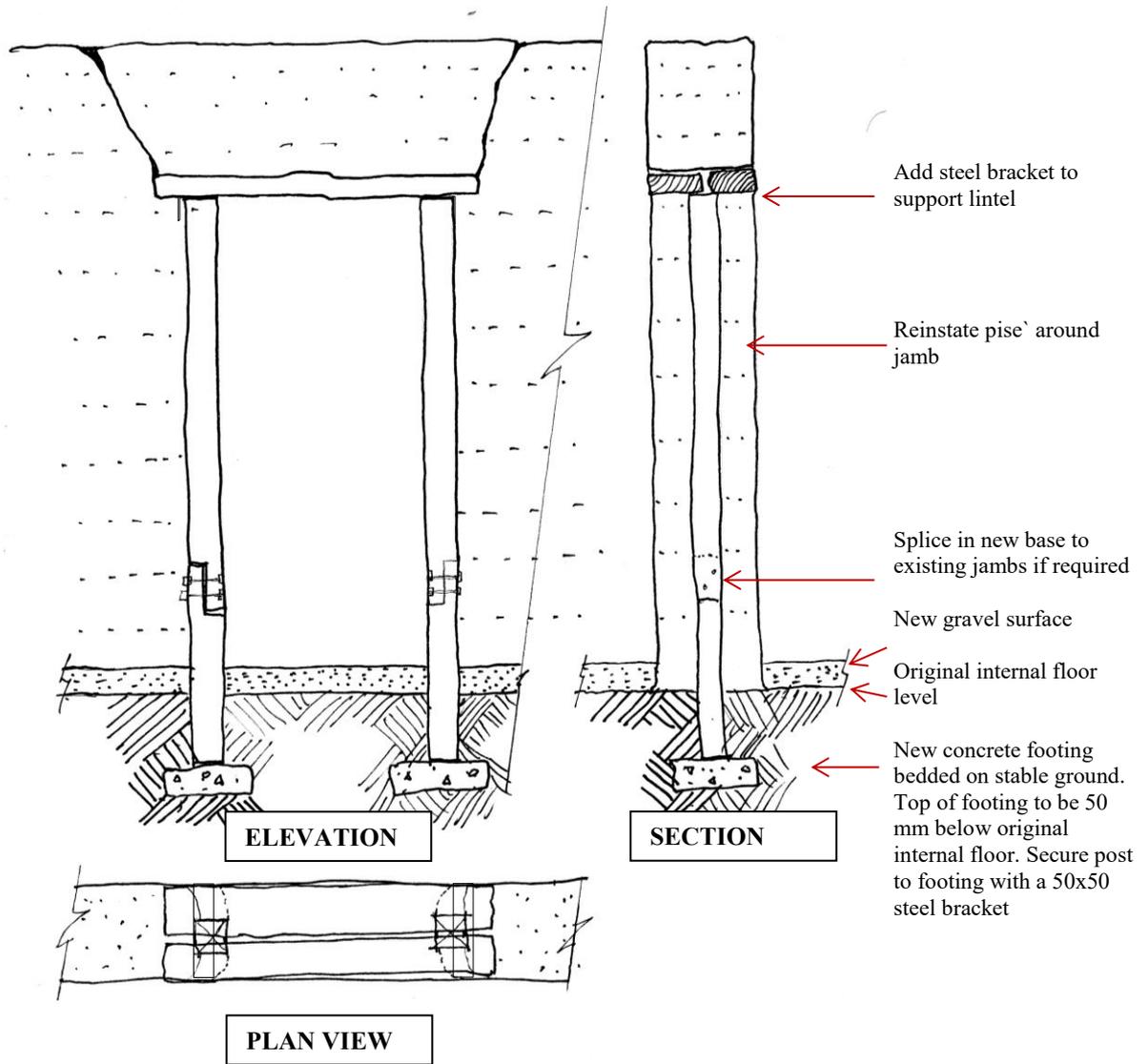
Detail showing steel angle to be introduced between top of jamb and underside of timber lintel

Reinstate the jamb to make a firm fit between the new concrete footing and the lintel.

Anchor base of post to the concrete footing with 50mm x 50 mm steel bracket or similar.

Reinstate missing prise on either side of the jamb to original detail.

Make good to disturbed soil at floor level.



Indicative repair to door jambs

Door 1 East entry door



Left hand (south) door jamb

Appears to be stable and should be left undisturbed unless problems are noted on closer examination.

The right (north) jamb

- Inspect base of jamb
- Remove and splice on new base if required
- Add steel angle under lintel
- Reinstate jamb on sound footing
- Reinstate pise` on front (east) corner.

Door 2 Rear entry door



Left hand (north) jamb

- Remove and repair base of jamb
- Install steel angle to underside of lintel
- Reinstate jamb on sound footing
- Reconstruct collapsed pise`.



Right hand jamb (south)

- Reconstruct as per north jamb.
- Repack between lintel and pise` on internal side.

Door 3 Between Rooms 1 and 2



View from east

Although there is no obvious cracking in the pise` above the lintel, both jambs are loose and not providing support:

- Remove jamb,
- repair base,
- install steel angle under lintel and
- reinstate jamb on a sound footing.



View from west

- Repair both jambs,
- reinstate lost mortar around the south jamb on west side.
- It is not necessary to reface the pise` above the lintel unless it is structurally fragile.

Door 4 Between Rooms 2 and 3



View from room 3 to room 2



View from room 2 to room 3

The pise` above the lintel is in a precarious position but should be retained if safe and feasible. Ensure the pise is restrained from lateral collapse before undertaking work.

- If safe and feasible jack up (or suspend from a temporary structure) the lintel and pise` block and reposition to a more level state.
 - If necessary remove debris from the cracks so that adjacent walls are not damaged or distorted.
 - Repair jambs and reinstate with steel angles under the lintels as per other doorways.
 - Fully re-grout cracks above the lintel with firm new pise` to anchor edges of pise to the adjacent wall.
 - Add additional restraint if necessary to prevent rotation of the lintel and earth above.
- Reinstate lost pise` to both sides of both door jambs.
 - If the pise` above the lintel cannot be saved, it should be dismantled, reconstituted with new material and re-compacted as per the traditional manner.

Door 5 Between Room 4 and Hall



View of D5 looking north

- Check base of jambs and repair if warranted using same method as on other jambs. If there is no evidence of subsidence leave as it is.
- Reinstall missing pise' on left hand side.



D5 West jamb

- Reinstall missing pise' on north side of west jamb and base of north side east jamb.

D6 Between Room 3 and Hall



View from west



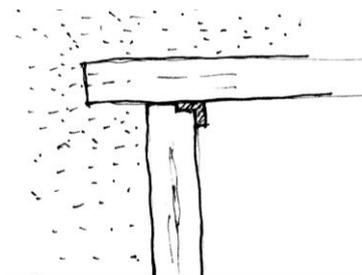
View from east



North jamb

The face of the left hand (north) jamb is flush with the wall but has subsided relative to the timber lintel.

- Inspect the base and repair the jambs as per elsewhere.
- Locate steel angle under lintels as shown below:



South jamb detail.

The jamb has subsided by about 50mm and a large section of corner pise`is breaking away.

- Stabilise the lintel.
- Remove existing steel hollow section and chicken wire.
- Repair the jamb as per elsewhere including steel angle to underside of lintels.
- Remove corner pise` and reconstitute with new material. Ram back into corner position using lugs and mesh to hold in place.

2.3 WINDOWS

W1



Temporarily support the internal face and carefully grout pise` into the void adjacent to the window jamb.

Also work pise` into the friable material on the inside face to enhance its stability

Taking care to ensure there is no damage to the surviving render, install a new additional timber window frame as per the drawing shown for Window 2.



The pise under the internal lintel on the north side of window is showing preliminary signs of weakness



Carefully grout pise` into cracks to stabilise the wall around the window

W2



Extensive decay has occurred around the south jamb and an additional piece of timber has been inserted to help carry loads. It is embed well into the matrix and should not be moved.

- Infill the space between the jamb and wall with new pise` after preparation by ledging and addition of mesh.

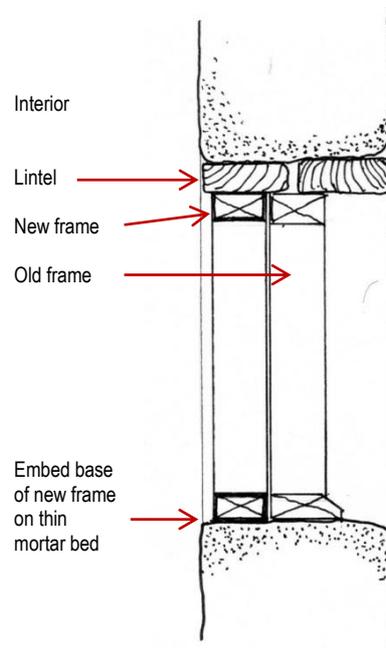


The north jamb has dislodged but cannot be safely returned to its former position.

- Clean the space beneath the jam and grout with a firm mix of 1 cement:1lime:6 sharp sand



- Insert a closely fitting additional timber frame to the inside face of the existing window frame to assist in supporting the lintel. Set base of frame in a mortar bed and secure the new frame to the historic item. Ensure firm engagement with the underside of lintel.



W4 – North West window



The timber sill has decayed although some of the original external render is still intact.

- Remove the damaged sill and replace with seasoned hardwood. Undercut the side window frames if necessary so that they are supported firmly by the new sill.
- Retain original render in place if possible.



