



Building Inspection Report -

BARING HEAD's Keepers Houses

| | |
|---------------------|---|
| Inspection Date: | 02/12/2010 |
| Prepared for: | Greater Wellington Regional Council Department of Conservation |
| Prepared by: | HCC Building Team |
| Weather conditions: | Fine |

Foreword

The following report has been produced to give a perspective on the viability and costs associated with upgrading the two cottages at Baring Head. This is achieved by undertaking the visual assessment of the current status of the cottages.

The assessment involved the making of still photograph record of the current condition of the exterior and interior of the properties, and written records of observations on construction and condition. The assessment was, however, carried out in non invasive/destructive manner.

The proposed report does not consider *change of use* for the buildings. If the *change of use* is occurred, it is strongly recommended to discuss with a relevant Territorial Authority.

The Executive summary highlights the main conclusions of this report.

Section 1 gives background information on the properties at Baring Head.

Section 2 and 3 indentifies the current status of the two properties and lists recommendations with attention being paid with potential for change in the future.

The appendix to this report contains the cost calculation for the recommendations made in the Section 2 and 3 only. It does not include any other external fees.



Figure 1 Baring Head¹

¹ <http://www.niwa.co.nz/our-science/atmosphere/baring>

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Executive Summary

This report documents the remedial building works found during the visual inspection of the keeper's dwellings, North and South buildings at Baring Heads.

From the inspection of the buildings considered within the scope of this assessment, the buildings structurally appear to be in reasonable condition considering its age and historical usage, and do not require urgent works. However, the external claddings show signs of deterioration and cracks due to the environmental factors, and require repairs and maintenance. It is also strongly recommended to replace the existing roofing which contains Asbestos.

The condition of the inspected interior of both buildings is generally good, although there were some instances of minor damages in some areas. The kitchen and bath room in the North Building requires new fittings and fixtures, and new flooring and wall finishes are required for both buildings to make look good.

To improve energy efficiency around the buildings, heat pumps as alternative heating systems are suggested and new insulations for floor and ceilings are proposed. It is also considered to use combination of solar and gas energy for hot water system and cooking.

The existing sewer systems appear to be in poor conditions, and it requires new systems with new septic tanks. It is recommended to install a storm water system with water tanks in order to improve water efficiency on the site.

A number of other recommendations are also made for upgrading the buildings. However, these require further investigation and analysis beyond the scope of this report.

The estimated total cost of the recommended building works in this report is approximately \$143,000; \$75,000 for North Building and \$68,000 for South Building.

1. Introduction

1.1 Building Description

Baring Head is situated on the southern headland of Port Nicholson, Wellington Harbour.

The construction of a new lighthouse begun in 1934 and the first lit on 18th of June, 1935. It was the second to last manned lighthouse to built in New Zealand. Originally the two keepers were engaged, and it later reduced to one only.

The lighthouse was first run with a diesel powered generator. In 1950 the light station was connected to the main electrical grid and the diesel generators were used as a backup. In 1989 the lighthouse was automated.²

The light keepers' two cottages at Baring Head were assessed for the current status in this report. These buildings are also believed to have been constructed in 1934 and originally used to house the light keepers and their families. Since the lighthouse was automated, it is believed that the cottages have been unoccupied since this period.

For the purposes of this report we will refer to the buildings as North and South Building. Both North and South houses are a single storey timber framing building with tongue & groove floor over timber joists and bearers and piles. All walls are constructed with light timber framing supporting timer rafters with sarkings. The wall is clad with timber Bevel-backed weatherboards and the roof is clad with Fibrous Asbestos Cement (FAC) corrugated roof sheeting. All window and door joinery is timber.

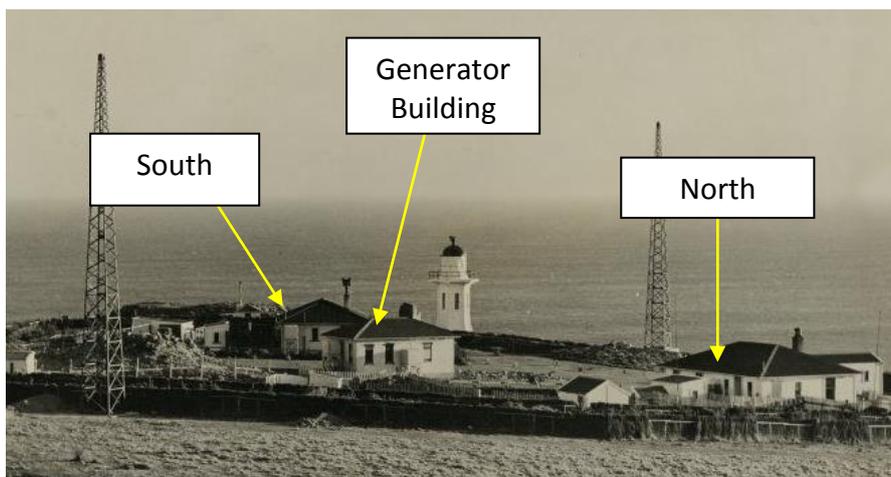


Figure 2 Baring Head's Buildings³

² http://www.newzealandlighthouses.com/baring_head.htm

³ http://www.newzealandlighthouses.com/baring_head.htm

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Each house comprises of three bedrooms, living and dining rooms with a kitchen, a bathroom, a toilet, and a laundry. The layouts of both houses are rectangular shaped and almost identical except that the North house has an additional room on west, and similar to a typical state house built in 1930.

There is no council's information or records available regarding the properties. Given that the structure is light timber framing, it is expected that its design fell within the scope of NZS3604 Timber Framed Buildings not requiring specific design.



Figure 3 North Building



Figure 4 South Building

2. CURRENT STATUS OF NORTH BUILDING

2.1 NORTH BUILDING EXTERIOR

2.1.1 Walls

The exterior wall claddings are painted timber Bevel-backed weatherboard with timber window/door joinery, and painted fibre cement base board for the subfloor cladding. The paint finish shows signs of wear and tear in general, and is flaking severely in certain places. The window flashings also show surface rust.

| | |
|------------------------|--|
| Exterior wall cladding | Painted timber weatherboards, Fibre cement board |
| Windows/Doors | Timber & Glass |
| Soffits/Eaves | Exposed timber rafters |
| Fascia/Barge boards | None |
| Flashing | Metal |

Recommendation

Replace the subfloor cladding. The estimated cost is around \$2,940.

Replace the area of the claddings and flashings detected defects and repaint the whole building. The estimated cost is around \$10,250.

Investigate whether the existing subfloor cladding contains Asbestos prior to demolition/replacement.

Reseal around plumbing penetrating the exterior cladding to prevent moisture getting in behind the cladding.

2.1.2 Roof

Due to the height of the building and its material the roof was inspected from the ground only. The overall condition is reasonable, but there are signs of weathering due to the location of the building. The existing roof cladding of 'Super Six' is asbestos based and irreplaceable, as it's been banned due to its asbestosis. Spouting have been removed from the roof, although some downpipes are remained.

Further accurate assessment may be undertaken when the roof cladding is removed. There is a possibility that the purlins and a few rafters may need to be replaced, as a result.

| | |
|-------------------------------|--------------------------------|
| Roof type and material | Pitched, FAC |
| Flashings | FAC |
| Eaves/Soffit | Exposed timber rafters painted |
| Vent pipes | Metal |
| Chimney | Concrete |
| Spouting | None |
| Downpipes | PVC |

Recommendation

Remove and replace the existing Asbestos based roof cladding with Colorsteel roofing with downpipes and spouting. The estimated cost is around \$18,100.

Check the condition of the existing roof framing and repair as required. Also check the condition of the existing skellion roof on west.

Remove the existing chimney if it is no longer required.

Consider installing a solar water heating system. Well designed and installed systems will meet 50 – 70% of hot water needs.⁴ The estimated cost is around \$5,000.

⁴ <http://www.energywise.govt.nz/how-to-be-energy-efficient/your-house/hot-water/solar-water-heating>

2.1.3 Foundation/Subfloor

The original timber piles have been replaced with new concrete piles, although the exact timeframe is unknown. They would appear to be down to solid as the floor shows no visible sign of subsidence. The bearers were of original timber, having been connected to the piles with galvanised wire as per the accepted practise to a concrete pile. The joists are also original, and have been connected to the bearer with 100mm hand driven nails. The grounds are generally dry and show no signs of dampness.

| | |
|-------------------------------|------------------------------|
| Foundation | Concrete piles |
| Piles to bearer fixing | Galvanised wire and staples |
| Flooring | Tongue & Groove timber floor |
| Insulation | None |
| Ventilation | Sufficient |
| Ground condition | dry |

Recommendation

Insulate the subfloor in order to improve energy efficiency and comfort. The estimated cost for installing expanded polystyrene is around \$1,500.

Check any moisture staining/damage to the underside of wet areas and any evidence of borer or pests.

Maintain subfloor vents clear where required.

2.2 NORTH BUILDING INTERIOR

2.2.1 Ceiling, wall & floor finishes in General Areas

At the time of the inspection, no lightings were available inside. Walls and ceilings are lined with a combination of plaster board, hard board and pinex board. Flooring is T & G timber finish without carpets and vinyl. In overall, the existing conditions of the finishes are in order.

| | |
|-------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | N/A |
| Insulation | Not known |
| Doors | Solid |
| Electrical | Not tested |
| Wardrobe | Single |

2.2.2 Ceiling, wall & floor finishes in Kitchen/Dining/Lounge

In general, the existing fittings and fixtures are found in poor condition.

| | |
|------------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | None |
| Doors | Solid |
| Electrical | Not tested |
| Heating | Gas burner |
| Sink | Stainless steel |
| Bench top | Stainless steel |
| Sink taps | Not tested |
| Plumbing | Braided wire |
| Waste pipes | PVC |
| Cabinetry | Painted timber |
| Stove and hobbs | Electricity |
| Rangehood | None |
| Dishwasher | None |

2.2.3 Ceiling, wall & floor finishes in Bath room/Toilet/Laundry

In general, the existing fittings and fixtures are found in poor condition.

| | |
|---------------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | None |
| Toilet operational | Handle |
| Toilet fixings | Solid |
| Bath | Seramic |
| Laundry tub | Stainless steel |
| Laundry taps | Not tested |
| Plumbing | Braided hose |
| Waste pipes | PVC |
| Dryer and vent | None |
| Electrical | Not tested |

2.2.4 Roof space

| | |
|--------------------------|--------------------|
| Roof framing | Pitched rafters |
| Insulation | Pink batts |
| Plumbing | Copper |
| Header tank | Plastic |
| Evidence of pests | Mouse poison found |
| Electrical | Not tested |

Recommendation

Remove and replace the existing floor finishes with new carpets and vinyl in wet areas. The estimated cost is around \$5,200.

Consider repainting the whole inside. The estimated cost is around \$6,700.

Replace the existing fittings and fixtures. The estimated cost is around \$6,300.

Check the existing insulation on roof space and determine whether further insulation is required. The estimated cost for installing R3.2 glass wool is around \$1,870.

Consider installing heat pumps in order to improve energy efficiency and comfort. The estimated cost is around \$4,000.

Investigate further significant pest or insect infestation.

2.3 NORTH BUILDING PLUMBING AND DRAINAGE

Roof spouting have been removed from the roof, although there are some existing PVC downpipes remained running under the house for storm water. The existing sewer system runs to the existing septic tank, which is in poor condition.

Water tanks in roof space are identified. However, it is required to check the performance of plumbing products. The source of Water supply is unknown. Further investigation is required to upgrade water supply systems to the building.

Recommendation

Install a new sewer system with a new septic tank. The estimated cost is around \$6,000.

Consider installing a storm water system with a water tank to feed grey water system and possibly portable water with water main as back up. The estimated cost is around \$3,500.

Investigate the existing water supply system in order to upgrade the systems.

2.3.1 Hot water system

The condition of the existing hot water cylinder is good. However, it is not seismic restraint and no insulation found for the cylinder and pipes.

| | |
|-----------------------------|---|
| Location | Laundry |
| Maker | Reems, Lower pressure fed from tank in roof |
| Year of Manufacturer | Unknown |
| Capacity | 180 litres |
| Seismic restraint | None |
| Plumbing | Copper |
| Energy source | Electric |
| Insulation | None |

Recommendation

Insulate the hot water cylinder and pipes in order to achieve better energy efficiency. The estimated cost is around \$500.

Restrain the hot water cylinder for seismic purpose. The estimated cost is around \$60.

Consider installing continuous flow water heater supplied by gas bottle in order to improve energy efficiency. The estimated cost is around \$3,000. (The cost of gas bottle supply is not included.)

2.4 Electrical

No electrical inspection was done and no electrical certification found. To know the extent and condition of the electrics of the building would require an inspection by a registered electrical inspector.

3. CURRENT STATUS OF SOUTH BUILDING

3.1 SOUTH BUILDING EXTERIOR

3.1.1 Walls

The exterior wall claddings are painted timber Bevel-backed weatherboard with timber window/door joinery, and painted fibre cement base board for the subfloor cladding. The condition of the walls is similar to the North building. The paint finish shows signs of wear and tear in general. The window flashings also show surface rust. The timber stairs on west lead to the main entrance of the building.

| | |
|------------------------|--|
| Exterior wall cladding | Painted timber weatherboards, Fibre cement board |
| Windows/Doors | Timber & Glass |
| Soffits/Eaves | Exposed timber rafters |
| Fascia/Barge boards | None |
| Flashing | Metal |
| Stair | Timber |

Recommendation

Replace the subfloor cladding. The estimated cost is around \$2,700.

Replace the area of the claddings and flashings detected defects and repaint the whole building. The estimated cost is around \$9,700.

Investigate whether the existing subfloor cladding contains Asbestos prior to demolition/replacement.

Reseal around plumbing penetrating the exterior cladding to prevent moisture getting in behind the cladding.

3.1.2 Roof

Due to the height of the building and its material the roof was inspected from the ground only. The overall condition is reasonable, but there are signs of weathering due to the location of the building. The existing roof cladding is asbestos based 'Super Six', the same as the North building. Spouting have been removed from the roof, although some downpipes are remained.

Further accurate assessment may be undertaken when the roof cladding is removed. There is a possibility that the purlins and a few rafters may need to be replaced, as a result.

| | |
|-------------------------------|--------------------------------|
| Roof type and material | Pitched, FAC |
| Flashings | FAC |
| Eaves/Soffit | Exposed timber rafters painted |
| Vent pipes | Metal |
| Chimney | Concrete |
| Spouting | None |
| Downpipes | PVC |

Recommendation

Remove and replace the existing Asbestos based roof cladding with Colorsteel roofing with downpipes and spouting. The estimated cost is around \$17,500.

Remove the existing chimney if it is no longer required.

Consider installing a solar water heating system. Well designed and installed systems will meet 50 – 70% of hot water needs.⁵ The estimated cost is around \$5,000.

⁵ <http://www.energywise.govt.nz/how-to-be-energy-efficient/your-house/hot-water/solar-water-heating>

3.1.3 Foundation/Subfloor

The original timber piles have been replaced with new concrete piles, although the exact timeframe is unknown. They would appear to be down to solid as the floor shows no visible sign of subsidence. The condition of the foundation/subfloor is similar to the North building. The bearers were of original timber, having been connected to the piles with galvanised wire as per the accepted practise to a concrete pile. The joists are also original, and have been connected to the bearer with 100mm hand driven nails. The grounds are generally dry and show no signs of dampness.

| | |
|-------------------------------|------------------------------|
| Foundation | Concrete piles |
| Piles to bearer fixing | Galvanised wire and staples |
| Flooring | Tongue & Groove timber floor |
| Insulation | None |
| Ventilation | Sufficient |
| Ground condition | dry |

Recommendation

Insulate the subfloor in order to improve energy efficiency and comfort. The estimated cost for installing expanded polystyrene is around \$1,440.

Check any moisture staining/damage to the underside of wet areas and any evidence of borer or pests.

Maintain subfloor vents clear where required.

3.2 SOUTH BUILDING INTERIOR

3.2.1 Ceiling, wall & floor finishes in General Areas

Walls and ceilings are lined with a combination of plaster board, hard board and pinex board. Flooring is T & G timber finish without carpets and vinyl. In overall, the existing conditions of the finishes are in order.

| | |
|-------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | N/A |
| Insulation | Not known |
| Doors | Solid |
| Electrical | Not tested |
| Wardrobe | Single |

3.2.2 Ceiling, wall & floor finishes in Kitchen/Dining/Lounge

The condition of the kitchen is very good and tidy.

| | |
|------------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | None |
| Doors | Solid |
| Electrical | Not tested |
| Heating | Wood burner |
| Sink | Stainless steel |
| Bench top | Formica |
| Sink taps | Not tested |
| Plumbing | Braided hose |
| Waste pipes | PVC |
| Cabinetry | Painted timber |
| Stove and hobbs | Electricity |
| Rangehood | None |
| Dishwasher | None |

3.2.3 Ceiling, wall & floor finishes in Bath room/Toilet/Laundry

In general, the existing fittings and fixtures are found in good condition.

| | |
|---------------------------|----------------------|
| Ceiling | Pinex board |
| Wall | Painted plasterboard |
| Flooring | None |
| Toilet operational | Two button flushes |
| Toilet fixings | Solid |
| Bath | Ceramic |
| Laundry tub | Stainless steel |
| Laundry taps | Not tested |
| Plumbing | Braided wire |
| Waste pipes | PVC |
| Dryer and vent | None |
| Electrical | Not tested |

3.2.4 Roof space

| | |
|--------------------------|-----------------|
| Roof framing | Pitched rafters |
| Insulation | None |
| Plumbing | Copper |
| Header tank | Plastic |
| Evidence of pests | Not found |
| Electrical | Not tested |

Recommendation

Remove and replace the existing floor finishes with new carpets and vinyl in wet areas. The estimated cost is around \$5,000.

Consider repainting the whole inside. The estimated cost is around \$6,500.

Install an oven in the kitchen. The estimated cost is around \$1,600.

Insulate the roof in order to improve energy efficiency and comfort. The estimated cost for installing R3.2 glass wool is around \$1,700.

Remove the existing wood burner and consider installing heat pumps in order to improve energy efficiency and comfort. The estimated cost is around \$4,000.

Investigate further significant pest or insect infestation.

3.3 SOUTH BUILDING PLUMBING AND DRAINAGE:

Similar to the North building, roof spouting have been removed from the roof, although there are some existing PVC downpipes remained running under the house for storm water. The existing sewer system runs to the existing septic tank, which is in poor condition.

Water tanks in roof space are identified. However, it is required to check the performance of plumbing products. The source of Water supply is unknown. Further investigation is required to upgrade water supply systems to the building.

Recommendation

Install a new sewer system with a new septic tank. The estimated cost is around \$6,000.

Consider installing a storm water system with a water tank to feed grey water system and possibly portable water with water main as back up. The estimated cost is around \$3,500.

Investigate the existing water supply system in order to upgrade the systems.

3.3.1 Hot water system

The condition of the existing hot water cylinder is very good. However, it is not seismic restraint and no insulation found for the cylinder and pipes.

| | |
|-----------------------------|---|
| Location | Laundry |
| Maker | Reems, Lower pressure fed from tank in roof |
| Year of Manufacturer | Not known |
| Capacity | 180 litres |
| Seismic restraint | None |
| Plumbing | Copper |
| Energy source | Electric |
| Insulation | None |

Recommendation

Insulate the hot water cylinder and pipes in order to achieve better energy efficiency. The estimated cost is around \$500.

Restrain the hot water cylinder for seismic purpose. The estimated cost is around \$60.

Consider installing continuous flow water heater supplied by gas bottle in order to improve energy efficiency. The estimated cost is around \$3,000. (The cost of gas bottle supply is not included.)

3.4 Electrical

No electrical inspection was done and no electrical certification found. To know the extent and condition of the electrics of the building would require an inspection by a registered electrical inspector.

Appendix

The calculation is based on approximately 110m² for North Building and 100m² for South Building in floor area for remedial works on two dwellings using Rawlinsons New Zealand Construction Handbook in comparison with randomly selected retailers' prices. The cost of cartage is built in cost.

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| Proposed Building Works | North building | | South building | | Total |
|---|----------------|-----------------|----------------|-----------------|------------------|
| | Units | Cost | Units | Cost | |
| New Subfloor Exterior Cladding | | | | | |
| Plaster base board for Sub floor | 45 m2 | \$1,690 | 40 m2 | \$1,500 | \$3,190 |
| Vents | 34 | \$500 | 34 | \$500 | \$1,000 |
| Labour | | \$750 | | \$700 | \$1,450 |
| Exterior Painting and Remedial works (Labour inclusive) | | | | | |
| Exterior painting with preparation | 135 m2 | \$9,500 | 128 m2 | \$9,000 | \$18,500 |
| Remedial works | | \$750 | | \$700 | \$1,450 |
| Removal of Asbestos Roofing and New Roofing (Labour inclusive) | | | | | |
| Asbestos roof and chimney removal | | \$8,000 | | \$8,000 | \$16,000 |
| Corrugated colorsteel roofing with preparation | | \$7,500 | | \$7,000 | \$14,500 |
| PVC Spouting/Downpipe system | | \$2,600 | | \$2,500 | \$5,100 |
| Solar Water Heating System (Labour inclusive) | | | | | |
| | 1 | \$5,000 | 1 | \$5,000 | \$10,000 |
| Interior Finishes (Labour inclusive) | | | | | |
| Wall painting | | \$6,700 | | \$6,500 | \$13,200 |
| Carpets and vinyl | 110 m2 | \$5,200 | 100 | \$5,000 | \$10,200 |
| Plumbing and Drainage (Labour inclusive) | | | | | |
| Waste water treatment system | 1 | \$6,000 | 1 | \$6,000 | \$12,000 |
| 25000 litre water tanks | 1 | \$3,500 | 1 | \$3,500 | \$7,000 |
| Infinity XR24/XR26 | 1 | \$3,000 | 1 | \$3,000 | \$6,000 |
| Heat Pump System (Labour inclusive) | | | | | |
| | 1 | \$4,000 | 1 | \$4,000 | \$8,000 |
| Insulation(Labour inclusive) | | | | | |
| Expanded polystyrene for Floor | 110 m2 | \$1,500 | 100 m2 | \$1,440 | \$2,940 |
| R3.2 Glass Wool for Ceiling | 110 m2 | \$1,870 | 100 m2 | \$1,700 | \$3,570 |
| Cylinder and Pipes | | \$500 | | \$500 | \$1,000 |
| Fixings and Fittings | | | | | |
| Gas hob with electric oven | | | 1 | \$1,600 | \$1,600 |
| Shower | 1 | \$1,200 | | | \$1,200 |
| WC | 1 | \$400 | | | \$400 |
| Vanity | 1 | \$700 | | | \$700 |
| Bath | 1 | \$500 | | | \$500 |
| Tub | 1 | \$500 | | | \$500 |
| Cylinder Seismic restraint | | \$60 | | \$60 | \$120 |
| Labour | 1 | \$3,000 | | | \$3,000 |
| Total | | \$74,920 | | \$68,200 | \$143,120 |

Table 1 Calculation of Recommendation Costs

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