

## CALLINGTON MILL, OATLANDS - ITS HISTORY AND RESTORATION

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# Callington Mill, Oatlands - Its History and Restoration

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**SUMMARY** Tower windmills built in Tasmania during last century were a rarity and all but one have been completely demolished. Callington Mill at Oatlands, built in 1837, was burnt out in the early 1900's and remained in a state of deteriorating disuse until some preservation works were carried out in 1976. This paper reviews the history, research and restoration of this mill after funds became available in the late 1980's. Future stages to be undertaken as funds become available are also discussed.

## 1. INTRODUCTION

Callington Windmill, situated at Oatlands in the central Midlands of Tasmania was built by J J Vincent and began production of flour in October 1837 (1).

The mill is a tower mill some 50ft. 6in. (15.4 metres) high to the curb and is of typical Lincolnshire or East Yorkshire design and was built with a classic Ogee or 'onion' shaped cap of beautiful proportions.

Probably the only other windmill built in Tasmania in that era to rival Vincent's Callington was Pikes Mill at Battery Point of which unfortunately there are no visible remains as it was demolished before 1900 (1). Pikes mill, built from red brick was a famous landmark for mariners in the Derwent Estuary and navigation charts of the time were marked "Make For The Red Mill".

Other windmills were in use in various parts of Tasmania last century but these were generally Post Mills and again there are no visible remains of any of them. Unfortunately there is apparently very little photographic record of the post mills. Perhaps there is a research project there waiting for someone to look at.

## 2. TOWER MILLS

Tower mills differ from the earlier post mills by having a fixed tower generally constructed from stone or brick, depending on the availability of materials in the location of the mill.

On top of the tower was the cap, sails and fantail, all of which turned on a curb mounted on top of the tower. The fantail is an extremely important part of the mill and is used to automatically turn the cap to keep the sails facing into the wind. This was one of the many brilliant pieces of engineering in the development of windmill technology and made the life of the miller considerably less arduous. A small variation in the direction of the wind starts the fantail turning which in turn rotates the whole cap assembly by means of gearing to a pinion mounted in the cap. This pinion in turn rotated on a rack mounted on the top of the main tower and so kept the sails facing directly into the wind.

Power from the wind on the sails was transmitted to the grinding stones via the brake wheel, wallower, vertical shaft, spur wheel and stone nuts.

Callington was such a mill and was very much a 'State Of The Art' windmill at the time of its construction and compared very favourably with windmills constructed in Britain at the time of Callington's construction.

## 3. CALLINGTON MILL- ORIGINAL CONSTRUCTION (1)

### 3.1 GENERAL

The tower was constructed using sandstone quarried from the shores of the nearby Lake Dulverton and is of ashlar construction with the external face being of individually cut stones, each course being of different diameter and having a sloping upward face to suit the taper of the tower. The internal stones are much rougher and may have originally been rendered.

### 3.2 Tower

Height 50'6" (15.4m)  
External diameter at base 30'0" (9.1m)  
External diameter at curb 18'6" (5.0m)  
Wall thickness at base 2'6" (0.8m)  
Wall thickness at curb 2'0" (0.6m)  
Inclination of wall exterior 1 horiz. to 7 vert.

### 3.3 Windows

Twelve double-hung, Georgian sash windows each consisting of two six pane sashes 3'0" (0.9m) wide and 2' 6" (0.8m) high.

### 3.4 Floor

Butts of burnt out joists were still visible as were the pockets in which the massive floor beams were seated so a reasonable assessment of the construction of the floors was able to be made. However much conjecture followed particularly regarding the location of the stairs connecting the floors and the sack hoist. I believe we have located these reasonably correctly although future information may alter this slightly.

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### 3.5 Sails

Double shuttered 'patent sails 8'0"(2.4m) in breadth at the windshaft end and 32'0"(9.7m) in length. The windward shutters were 1'0"(0.3m) wide and 3'0"(0.9m) long. The leeward shutters were 1'0"(0.3m) by 4'0"(1.2m). The angle of weather was about 22 degrees at the axis and 5 degrees at the tip.

### 3.6 Sail Fixing

The sail stocks were fixed to the windshaft through a 'poll end' or canister. This is an unusual feature of Callington as most British mills constructed at that time were using cast iron crosses for fixing the sail stocks to the windshaft.

### 3.7 Windshaft

There is still no evidence of whether this was made of cast iron or timber or what its dimensions were. Windshafts in British mills were generally cast iron by this time although we are sure that Callington had a timber poll end which was not typical by 1837. The bearings on which the windshaft seated were almost certainly brass.

### 3.8 Brake Wheel

Again we still do not know of what material the brake wheel was constructed but it is reasonable to assume that it would have been of composite wood and steel construction with the cast iron rack being imported from Britain and the timber milled locally. The brake wheel was probably 8'0"(2.4m) in diameter.

### 3.9 Cap

Abbott's photo of 1860 (probably the best extant photo of the mill) clearly shows the ogee shape and this photo was used to determine the dimensions of the cap. Details of its construction were taken from various books and plans of a similar mill that was to be constructed on Norfolk Island in 1845.

This plan proved to be invaluable although it is fairly certain that the mill proposed for Norfolk Island was never constructed.

Detailed examination of a number of mills in England in 1990 showed that most of our guesses about the construction of the cap were reasonably correct although we were if anything a bit too fussy with workmanship as those visited were significantly rougher and were clad with lapped planks and painted with white lead.

Our reconstructed cap is clad with butted King Billy Pine boards, covered with fibreglass and painted with special acrylic paint.

I believe our decision to clad the cap with fibreglass was correct and the saving in maintenance costs will show this in the long term.

### 3.10 Ring gear

The only remaining piece of equipment at Callington at the time of our first involvement was the cast iron ring gear bolted to the top of the curb. This ring gear or rack is in almost as good condition today as it was when first installed in 1837 despite being exposed to the elements for nearly 100 years. Wouldn't it be wonderful if someone could locate the rest of the equipment that must have been in the mill!

### 3.11 Fantail

Again the Abbott photo gave us the best information about the fantail which was 12'0"(3.7m) in diameter and had 7 blades- an unusual configuration as all mills studied in Britain had an even number of blades generally six or eight. The advantage of an even number is that if one blade is damaged the opposite blade can be removed and the fantail continue to operate.

As a general rule 1000 revolutions of the fantail generated one revolution of the cap.

### 3.12 Central Shaft & Wallower

Unfortunately no information is yet available on the size and material of the central shaft and wallower but again it is most likely that these were cast iron as most British mills were using cast iron.

### 3.13 Great Spur Wheel

We have no information on this either but have been fortunate enough to have purchased a wheel from a dismantled mill in Britain. This is a cast iron wheel some 7'0"(2.1m) in diameter and I believe is very similar to the wheel that would have been in Callington.

### 3.14 Internal Equipment

From sale advertisements for the mill in the 1800's we know that the mill was equipped with two 4'6"(1.4m) French burr millstones which would have been located on the first floor. These stones were overdriven (or driven from above) from stone nuts which could be engaged or disengaged from the spur wheel. The critical gap between the stones was controlled by a governor and tentering gear.

## 4 HISTORY

Based on the detailed Historic report researched and prepared by Mr Simon Harris, Historian in 1987 for The National Trust.

### 4.1 1836-1837

John Vincent acquired land on a hill in Oatlands in 1836 and constructed Callington windmill. The site was well selected as Oatlands is a particularly windy place and days on which the mill could not be operated would have been relatively rare.

It is still very much the subject of conjecture where the machinery for the mill came from. It has been suggested that the Hobart firm of Easby and Robertson imported and erected the machinery and it is fairly certain that the castings required were not being cast in Tasmania at that time and they were probably imported from Britain where many foundries were producing mill castings.

The only original casting that remains today is the horizontal rack or ring gear bolted to the top surface of the curb and which is in almost as perfect condition today as it was the day it was installed.

It is arguable that if Vincent went to the trouble of ordering this one casting - around the dimensions of which he had to build the whole mill - he most probably had all the precision machinery cast at the same time.

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**4.2 1837-1890**

The year after he built Callington, Vincent advertised the mill for lease in the 'Hobart Town Courier'.

A steam mill was added to the complex some time between 1845 and 1850 and the mills operated under various millers with differing degrees of success until somewhere around 1890.

As far as can be ascertained no milling took place after that time and deterioration of the mill began although it is difficult to tell just what condition the mill was end at the end of its working life.

**4.3 1890-1960's**

By no later than 1905, probably after the collapse of one or more of the sails, some anonymous person cut off the remaining sails. Photographs taken around 1905 show the mill with cap and sawn off sail stocks and poll end (Fig.1). These photographs belie the folklore that the sails were blown into Lake Dulverton after a severe storm.

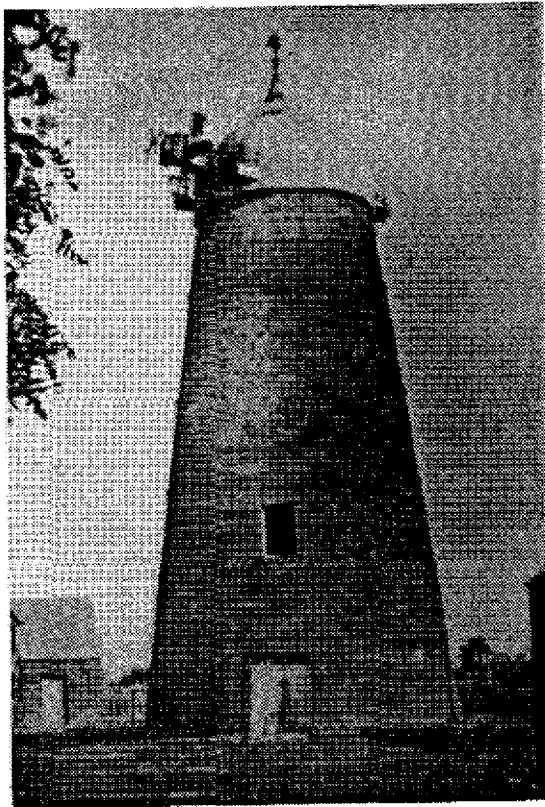


Figure 1 Callington Mill circa 1905

(Photographer unknown)

A blacksmith occupied the disused mill from about that time and it is likely that a spark from his forge set fire to the timbers within the mill which would have burnt with incredible ferocity, burning out completely all the timber beams, floors cap and sail stocks.

Presumably any castings that were still in the mill at that time would have crashed to the floor although there is no evidence as to how much of the running gear was manufactured from cast iron and how much was timber.

Mills constructed in England at that time Callington was constructed were using cast iron for most of their running gear and it is probable that the owners of Callington imported their gear from England.

After its use as a blacksmiths shop the door and lower windows were sealed off and the lower 10 ft(3.4m) of the tower and floor sealed with cement render and used as a water reservoir (this act appears to have had no detrimental effect on the tower).

The mill then remained in a state of deteriorating disuse until the 1960's when members of the Tasmanian Historical Research Association through Mr Michael Sharland and the Scenery and Preservation Board's Mr Jack Thwaites showed significant interest and had measurements taken of the mill (Fig.2). Plans for a possible reconstruction were drawn up by millwrights, Thompson and Sons of Alford, Lincolnshire.

Funds were not available for restoration at that time and no works were proceeded with.

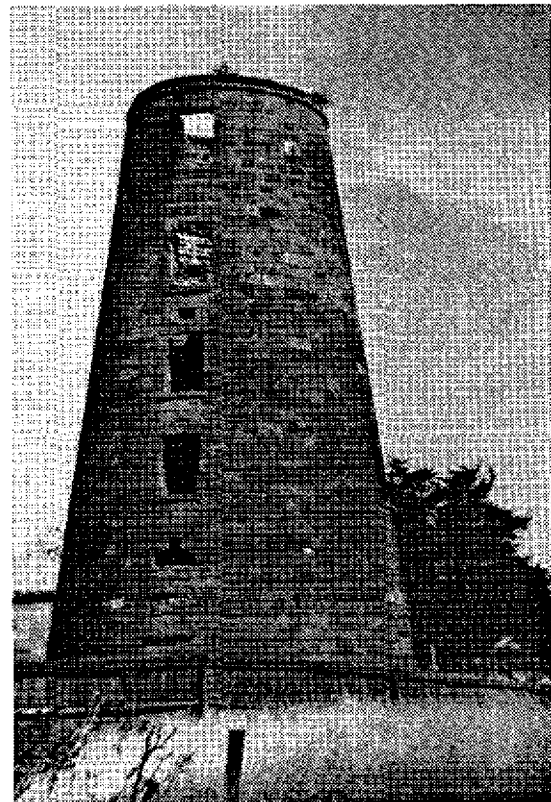


Figure 2 Callington Mill 1964 (J.Thwaites)

**4.4 1976**

In 1976 some preservation works were carried out by Rizollo Stone masons under the direction of Mr Peter Spratt.

These works included the installation of precast concrete lintels to all windows, repointing of the external stone ashlar facing and the construction of a temporary galvanized iron roof with downpipes.

This work was done to prevent further deterioration of the tower (as it was at that time) and was well worthwhile as no further funds were available for restoration until 1988

## 5 THE BICENTENNIAL PROJECT

### 5.1 REPORT & PLANS

Simon Harris, Historian was employed by The National Trust to prepare a Historical Report on Callington in early 1987 and this report, sponsored by AMATIL, as part of that company's "Gift To The Nation" programme together with measurements and uncovering work by ourselves allowed the restoration programme to begin.

Based on Simon's report plans for the first stage were prepared by England Newton Spratt & Murphy Pty Ltd for The National Trust.

These plans included the following works:

Supply and installation of the floor beams, floor joists and flooring for the ground, first, second, third, fourth and possibly fifth floor.

Construction of stairways from the ground to the top of the tower. This work involved considerable speculation as there was no photographic or other evidence as to the location of the stairs apart for a few minor indentations in the internal stonework.

Construction of the magnificent ogee shaped cap together with the massive framework required to allow for future installation of the Brake wheel and other running gear.

### 5.2 TIMBERS

Dean Brothers through their recently constructed sawmill at Baden felled the bluegums on the nearby 'Hermitage' property and supplied the 12in.(0.3m) by 12in.(0.3m) beams and 6in.(0.15m) by 3in.(0.075m) floor joists for the project. These were delivered to Oatlands and seasoned using sprinklers for a six month period. (we understand that at the time the mill was constructed timber was seasoned by letting it lie in running creeks for as long as possible).

### 5.3 CONTRACT

Selected Tenders were called for this work and I believe fortunately for us a contract was let to Andrew artha Bros. to complete the works as specified. The final contract amount for this stage of restoration was approximately \$120,000.00 and the works were completed in the anticipated time.

All up expenditure on the mill at that time totalled some \$145,000.00.

The massive timber beams and posts were cut to length to suit the original beam pockets still in the walls. They were then lifted into the tower by crane and manoeuvred into place which was an extremely difficult and exacting task but all went well due to the well organised team lead by Tom Andrewartha and the co-operation of Hazell's crane operators.

Once all beams were adequately located and fixed in position the floor joists and timber floors were laid.

Much conjecture again took place as to the original locations of the stairs and sack hoist. We believe the locations finally chosen are close to the original and are certainly consistent with the mills visited in the UK.

The frame for the cap was constructed on the ground adjacent to the mill and this again was built from 12in.(0.3m) by 12in.(0.3m) timbers cut and shaped to suit the design.

The shape of the cap was set out in Andrewartha's workshop in Hobart and the glue laminated ribs bent and glued to shape. The original ribs would probably have been roughly cut to shape from large sections of timber and in the UK they are still cut from large specially selected sections of oak.

A steamer was constructed on site and the horizontal battens steamed to shape and attached to the previously installed ribs.

King Billy pine planks some 4in.(0.1m) wide by 1in.(0.025m) thick were also bent to shape in the steamer and attached to the battens on the cap. These planks were butted together not lapped as they were in the original construction.

The cap was then clad with a fibreglass and resin finish and painted white.

Spars, rails and the frame for the future fantail were also constructed as part of the cap assembly and finally the whole cap assembly was craned into place.

This operation again went extremely smoothly thanks to the expertise and cooperation of all those involved.

Windows and the door built to match the originals were installed and painted in a colour we believe to be similar to the original (Fig 3).

Minor works as required to complete this first stage of restoration were then carried out.

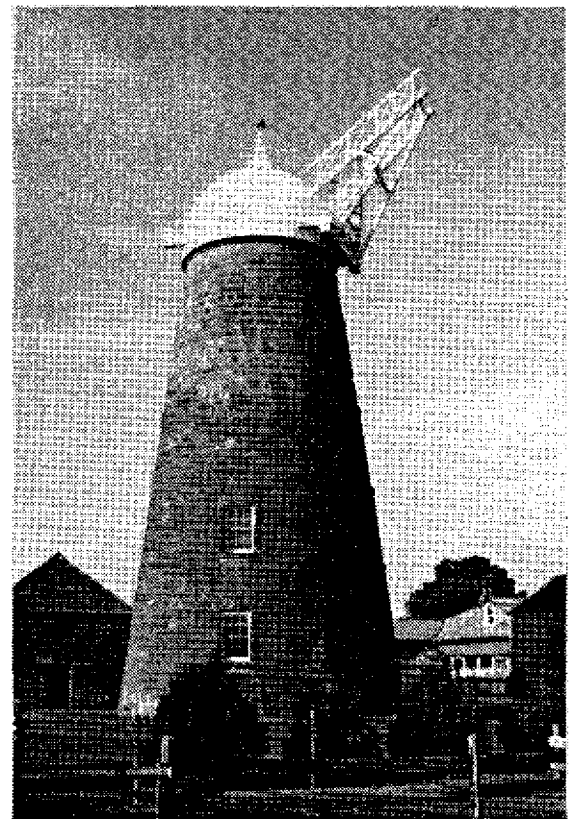


Figure 3 Callington Mill 1990

After the first stage of restoration (H.T.Murphy)

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### 6 The U K Trip

In May of 1990 I was fortunate enough, largely due to the efforts of Mr George Brown of The National Trust and the Callington Mill Restoration Committee of Oatlands, to obtain a Government Grant to visit the UK to study windmills as we needed far more information before we could commence work on the design of sails, fantail and the running gear.

16 mills were visited in the UK as detailed in my report of August 1990 and extremely important information gained on how windmills are constructed, maintained reconstructed and operated.

Considerable time was spent with Jim & Tom Davies, of R Thompson & Sons, millwrights of Alford who do more mill work than anyone else in the UK and were able to provide an incredible in site into the restoration of windmills.

I was also fortunate, through the much appreciated efforts of Mrs Catherine Wilson FMA, who was at the time Assistant Director of Museums, Lincolnshire County Council, to be able to spend a reasonable time with James Waterfield of Maud Foster mill, Boston. As far as I know this is the only commercially operated mill in the UK and is quite a remarkable piece of engineering heritage. The section of vertical shaft and spur wheel for our restoration project were purchased from Waterfields.

### 7. THE NEXT STAGE

It is hoped that after a time of apparent inactivity the next stage will be able to be started in the near future as funds become available.

This stage will include:

The importation of the spur wheel, vertical shaft and other minor parts from the UK.

The ordering of the Honduran Pitch Pine for the sails through Thompsons of Alford and the importation of that timber.

The construction of the sails and fantail and the erection of these items including installation of enough equipment to enable the cap to rotate to keep the sails facing into the wind. It is anticipated that the sails would be skeleton framework at this time as it is not practical to allow them to take the full load from the wind until most of the internal mechanisms are in place.

The long term aim of the project is to have the mill producing flour from wind power but this is a long way down the track and much more research has to be done and much more money required before this happens.

Callington windmill at Oatlands will one day be one of the major tourist attraction in the state and all of us who have been involved with her restoration look forward optimistically to that day.

### 8. REFERENCES

1. Harris, Simon "Callington Mill Research Project Stage One Historical Report", May 1987.