

The smock windmill, Mill Hill, Swaffham Prior, Cambridgeshire, CB25 0JZ

DESIGN STATEMENT V3

November 2023

Overview

The aim of this planning proposal is to convert the current garage 'pod' into habitable space that is to be used as a self-contained annex. The annex is to be used by visiting family members and guests only.

The application seeks to make changes to the garage 'pod' and Link Roofs **ONLY** with no changes being made to any other 'pod' or the mill itself.

Details of the Listed Windmill on site are below,

Swaffham Prior is one of only a handful of places in England where a pair of windmills can be seen together. It will be the only location where visitors can view a pair of working windmills.

It is the intention of the owner to open the smock windmill to the public on scheduled days during the year once the restoration of the cap and sails is complete.



Figure 1: Swaffham Prior windmills circa 1920. Foster's tower mill is in the background. The smock mill is in the foreground. It has reached the end of its working life and has already lost two of its sails.

Design background

The smock windmill was built in 1875 in a characteristic local style on high ground to the north east of Swaffham Prior village. It accompanied an existing windmill on the opposite side of the road, Fosters Mill, a brick tower mill, built in 1860. Fosters Mill is preserved in full working order and continues to earn a living by producing flour using wind power.



Figure 2: The smock mill as converted, showing its non-working 'dummy' sails (October 2019).

When originally constructed there would have been few other buildings in the area surrounding the windmill. This is confirmed in historic photographs taken in the early 20th century. The sails of the windmill would therefore have been able to derive the maximum amount of power available from the wind, with few obstructions in the path of its sails.

The timber-framed 'smock tower' of the mill contains three floors and stands on a single-storey octagonal brick base. Both the brick base and the smock tower were originally tarred black, following local practice.

The smock tower is clad in a double skin of weatherboards, the external layer laid vertically. This characteristic feature of the local area can also be seen at Wicken smock mill. The preserved Northfield Mill at Soham formerly had this feature but now carries horizontal boarding.

Compared to other local windmills, such as Downfield Mill at Soham, the windmill's tower is short in stature. This reflects its geographical location on a hill and the rural nature of its historic setting, free of neighbouring houses, trees and other structures that have the effect of obstructing and reducing the mill's wind resource.

The cap roof

Above the smock tower, the mill is fitted with a domed, aluminium-clad wooden cap roof to which the sails and fantail are attached. The present cap is fixed with the sails facing south west.

The original cap roof was designed to rotate through 360 degrees so that the sails could face the wind from whichever direction it is blowing. The original cap comprised a stout base frame of oak with lightweight curved rafters above. The rafters were clad with a double layer of white-painted softwood weatherboarding laid vertically.

The form of the present 'dummy' cap is a fair approximation of the original but some key design details are missing. Early photographs show a small rear dormer giving access to the fantail

stage at the rear of the cap. The design of the external framework supporting the fantail was slightly different to the current arrangement. The fantail itself had eight fully boarded blades in place of the existing example which has eight 'skeleton' blades to reduce wind resistance.



Figures 3a and 3b: The original (left) and present cap roof and fantail compared.

The sails

The mill is currently fitted with four dummy sail frames without shutters. These broadly follow the form of the mill's last working sails but, as a non-operational aesthetic feature, they lack the shutters and metal operating rods that allowed the speed of the original sails to be controlled.

Historic photographs show that the mill was fitted with four clockwise-rotating sails which followed Cubitt's 'patent' design of 1807. These ingenious self-regulating sails were fitted with two rows of adjustable shutters which could be opened or closed remotely to catch or to spill the wind, enabling the speed of rotation to be controlled.

This type of sail was widely used throughout eastern and southern Britain. East Cambridgeshire patent sails had their own particular design quirks, principally their impressively large width and steep twist or 'angle of weather'.

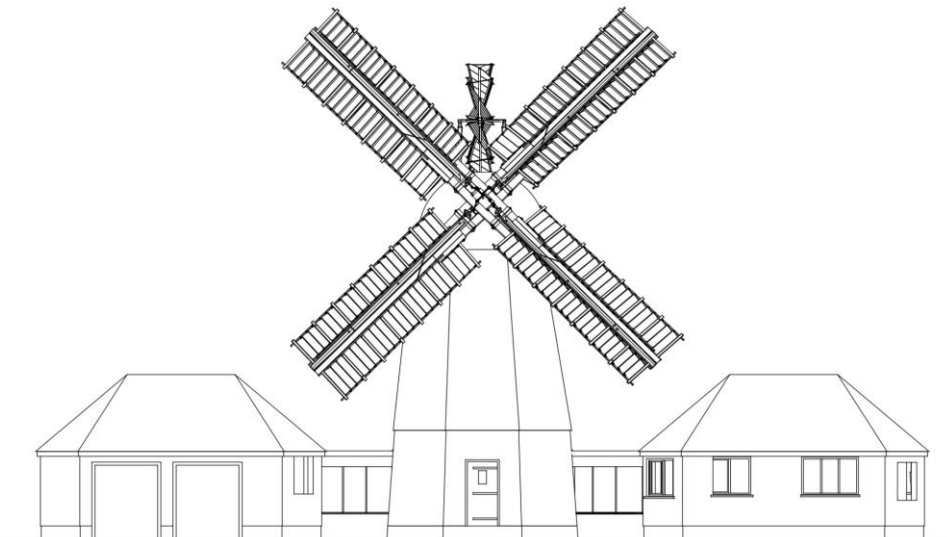
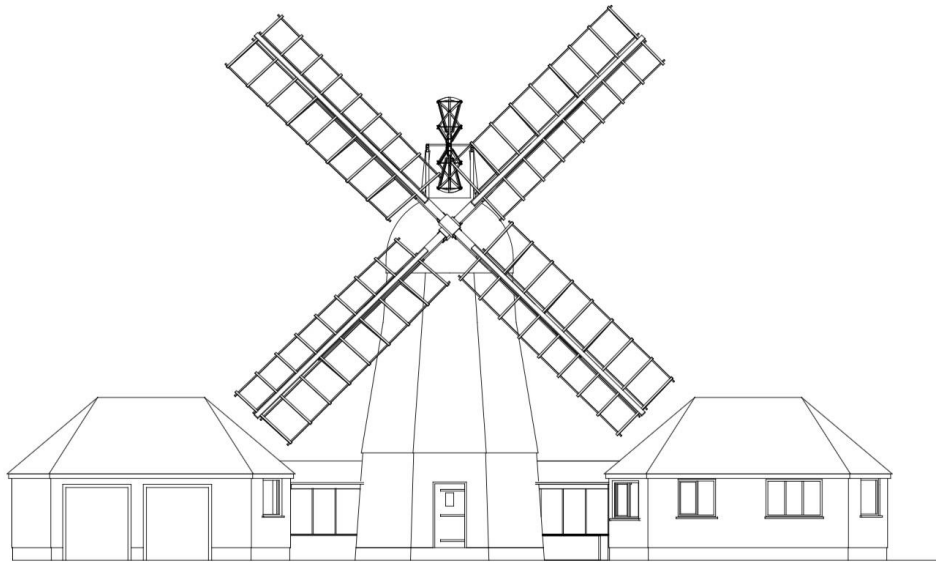
With no buildings attached to the base of the tower, the mill's last working sails were free to swing close to the ground with an approximate overall diameter of 18.75m.

The existing set of dummy sails broadly reflect the width and length of the last working set, with a diameter of 18.75m and a width of 2.55m.

If the mill is to carry working sails in the future, these must be designed to clear the buildings adjoining three sides of the brick base.

A design has therefore been developed which is based on the last working set of sails but is proportionally shorter and narrower so that the ends of the sails do not foul the roofs of the glazed link buildings.

The proposed new sails will have a maximum overall diameter of 15.6m. The width of the shutter bays on each side of the sails will be slightly reduced from the present dimensions to an overall width of 2.2m. This will ensure the correct visual proportions of the windmill are maintained. In spite of this reduction in sail area, the new sails will work very efficiently and will be powerful in use.



Figures 4a and 4b: The smock mill as existing and as proposed (south west elevation). Note the shutters in the sails and the reduced height of the glazed links joining the mill tower to the side wings.

The internal machinery

With the exception of the cast iron windshaft inside the cap, all of the mill's internal milling machinery has disappeared.

The existing cast iron windshaft that carries the sails will be re-used. A large gear wheel, known as the 'brake wheel', will be fitted to the windshaft inside the cap. This will be traditionally constructed of oak and elm with a separate segmental ring of metal gear teeth.

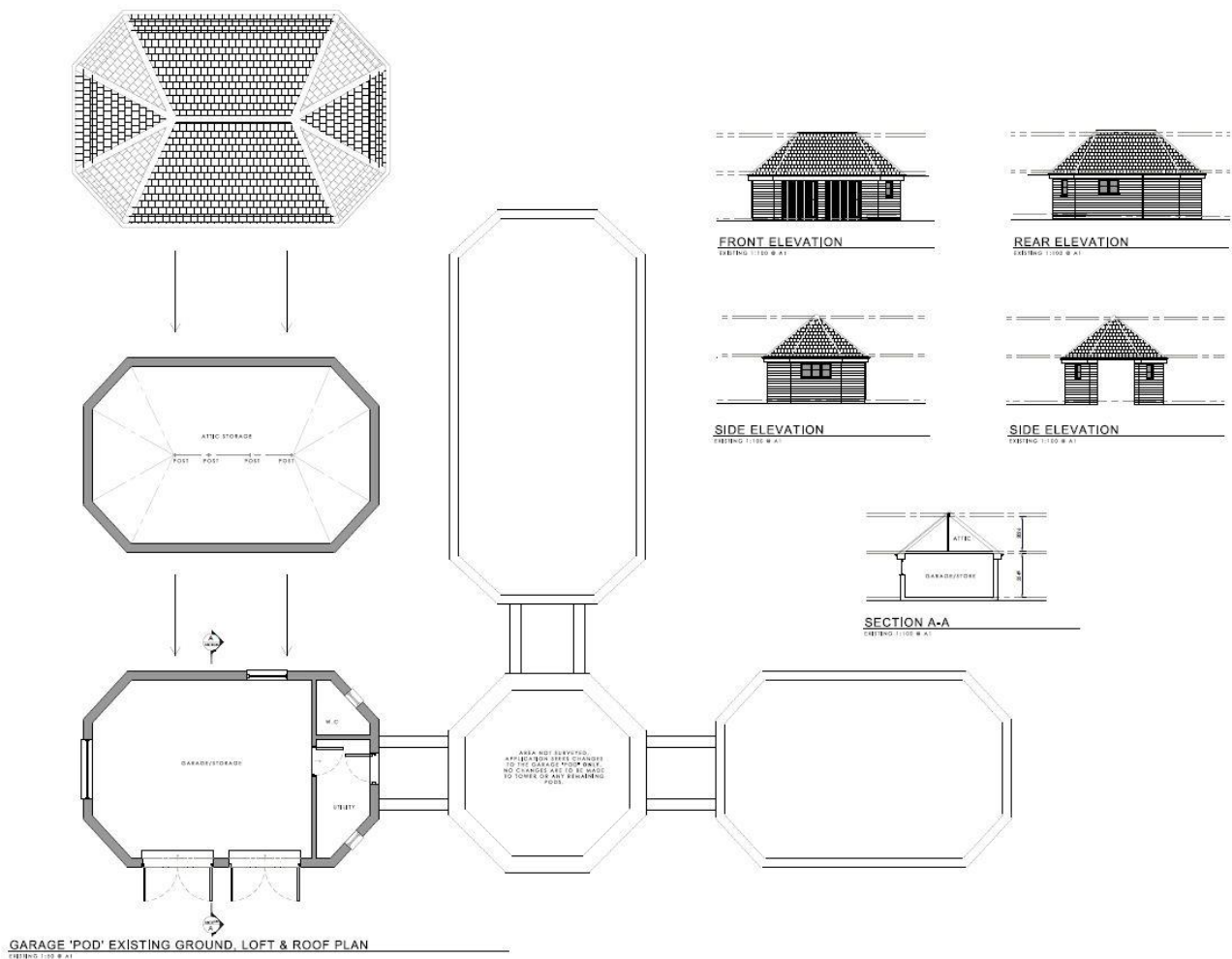
The brake wheel enables the sails of the windmill to be controlled and held stationary overnight or for longer periods. It takes its name from the brake shoe that encircles the rim of the wheel. This is controlled by a large lever positioned inside the cap on the left hand side.

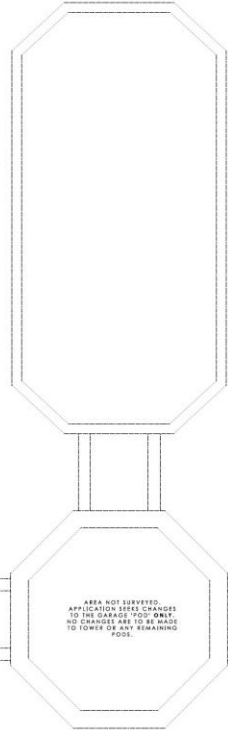
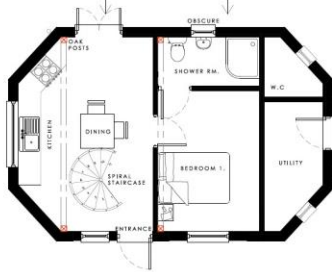
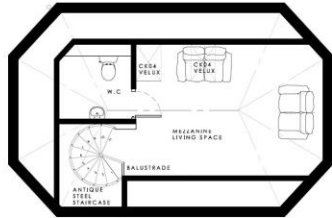
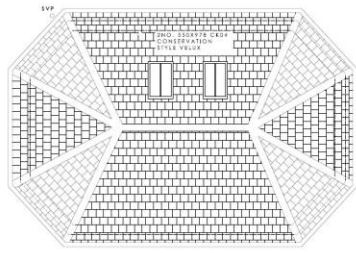
Control chains for the brake lever, and the adjustable shutters in the sails, will hang down from the rear of the cap in the traditional way.

The top floor of the mill will house the power generation gear. This will derive power from the brake wheel. The generating gear will comprise small, self-contained and easily removable pieces of equipment housed in metal containers for safety.

Proposed Garage Conversion

Please see Existing and Proposed plans, elevations, sections and photographs below of the current garage pod that is to be converted.

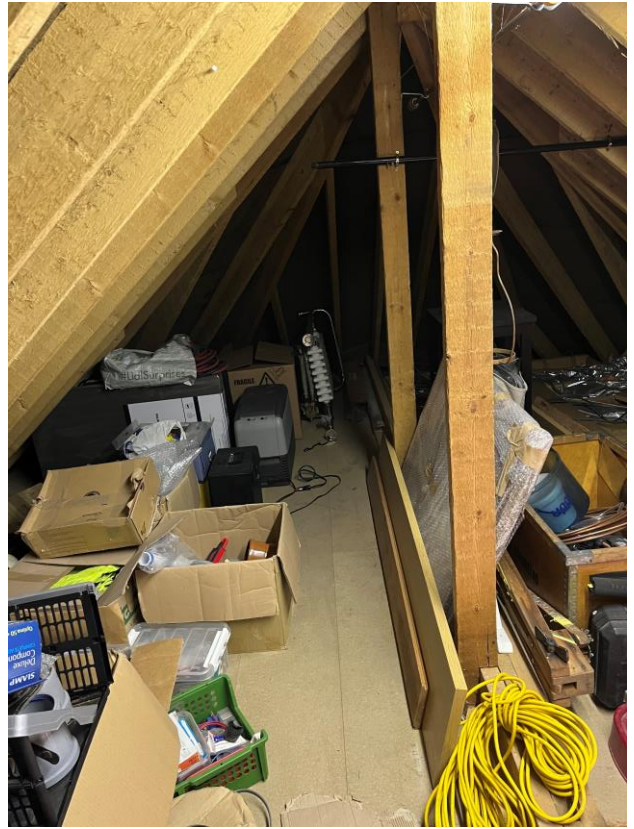




GARAGE 'POD' PROPOSED GROUND, LOFT & ROOF PLAN
PROPOSED 1:100 @ A1



Existing Garage 'Pod'



External and Internal Photographs of Existing Garage 'Pod'



Current images of Front Elevation of Annex (Timber yet to be painted black)



Current images of Rear Elevation of Annex



Raised Timber Decking to rear of Annex



Conclusion

As you will see from the proposed plans the internal layout of the approved annex has been tweaked. The changes that have been made to the approved plans are minimal and have caused no detrimental impact to the listed mill.

The conversion of the annex has been to the highest quality, using reclaimed materials where possible to ensure authenticity and has a positive impact on the existing mill.

The applicant was unaware they needed planning approval for the decking added to the rear of the annex but it has been included within this application which also covers the changes to the layout of the mill.

The applicant also seeks listed building consent and planning approval to remove the glass from the roof of the links to the mill. This is due to them leaking multiple times over the years since construction and they are now causing damage to the mill itself. The applicant wishes to simply replace the glass for a lead finish with vertical standing seams. The roof pitch etc will remain as existing and it will only be the material finish that will be different. Where the links abut the 'pods' there are already sections of lead roof finish, this is proposed to be continued until it reaches the mill. The standing seams will be placed at similar intervals to the window glazing currently on the roof.

This retrospective application covers the changes to the layout of the approved annex, Ref 22/00657/FUL and also the rear timber decking and changes to the link roofs, no other changes have been made to mill.