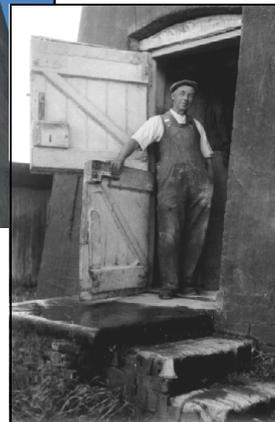


# BURWELL WINDMILL & MUSEUM PROJECT



The repair of an historic windmill  
as part of  
a regional educational resource



# Burwell Windmill Project

## PROJECT TIMELINE & BUDGET COSTS



### Budget cost breakdown - Burwell Windmill Project

The total cost of the project will be around **£350,000**. A substantial part of this sum (approximately **£200,000 - £220,000**) will be needed to carry out repairs to the structure and working parts of the windmill.

**£15,000** will fund bursaries for work placements. These people will gain first-hand experience of the techniques of mill repair by working closely alongside the professional millwrights, and will experience all aspects of working in a museum and on a project.

**£15,000** will provide Freelance Learning Support to develop educational resources for the museum and windmill.

**£50,000** will fund the activities of a Museum Co-ordinator who will be responsible for designing new learning resources linking the windmill and museum and delivering the museum's educational programme to visitors and school groups over a period of 30 months.

**£60,000** will generate new learning resources, facilities and interactive displays that will enhance the impact of the museum's existing collections and improve their accessibility, integrating the windmill into the museum's displays.

### Project timeline

The project will take place over a period of 30 months in the following sequence:

- |                     |  |
|---------------------|--|
| <b>Months 1-6</b>   | Volunteer co-ordinator employed<br>Volunteer recruitment and training begins<br>Work placement bursaries advertised<br>Stage 1 of repairs to windmill begins                                     |
| <b>Months 7-12</b>  | First work placement commences<br>Stage 2 of repairs to windmill begins<br>Museum interpretation development commences<br>First of three on-site training days takes place                       |
| <b>Months 13-18</b> | Stage 3 of repairs to windmill commences<br>First work placement completed and second placement begins<br>Museum resources development work commences<br>Second on-site training day takes place |
| <b>Months 19-24</b> | Second work placement completed<br>Stage 3 of repairs to windmill completed<br>Museum interpretation work completed<br>Third on-site training day takes place                                    |
| <b>Months 25-30</b> | New museum interpretation evaluated<br>Educational resources piloted with school groups and evaluated<br>New ongoing activity programme launched<br>Final project report published               |



# Burwell Windmill Project

## EXECUTIVE SUMMARY



**Burwell windmill** is an **intact Grade II\* listed tower mill** of four storeys, preserved in a condition close to its last working state and a representative example of its type.

The mill is one of the two principal landmarks on the village's horizon, and one of the most significant and tangible links to the industrial past of this East Cambridgeshire fen-edge village.

**Burwell Museum** was developed on a site directly adjacent to the mill during the 1980s, and the mill is now cared for and managed as part of the museum by the Burwell Museum Trust.

The windmill and adjacent museum have proved a popular and valued attraction to visitors from the local area and further afield. They have been demonstrated to be an **important educational resource**, specifically for primary schools and visiting groups.

**The Burwell Windmill Project** sets out to fully repair the windmill to an authentic standard using traditional materials and techniques. At present, the mill is vulnerable to degradation by the elements. The mill features on the current **Buildings at Risk Register** (July 2010).

At the climax of the project, the mill will be returned to a condition where its milling machinery can be safely demonstrated to the visiting public and disabled access to the ground floor can be gained. The local population will benefit from the restored condition of the windmill and tourism for the region will be boosted by the mill's greater accessibility to the public.

**The project will deliver opportunities for learning and the development of new skills.**

During the course of the project, a group of apprentice millwrights and historic building conservators will have the opportunity to train in **traditional craft skills** by working alongside the professionals involved with the repair work to the windmill.

Local **volunteers** will receive training and will be encouraged to participate in the museum's activities, helping to deliver its learning aims and to build up the museum's key audiences.

The development of an improved **educational programme**, making the most of the museum's collections, will allow increased access to the museum and windmill, giving local children the chance to understand the heritage of their area and an opportunity to compare life in the past with how we live now.

A programme of **presentations to local and national groups**, supported by **online resources** developed during the project, will ensure that the mill's significance can be transmitted to out-of-area groups and individuals who may be unable to visit the site.

# The Windmill:

## A BRIEF HISTORY

The mill is thought to have been built circa 1820 for Oliver Carter, possibly on the site of an earlier post mill. It remained in the Carter Family until 1884 when it was purchased by its tenant, George Mason. From the 1920s until the 1950s it was owned and worked by Alfred and Warren Stevens, becoming known as Stevens' Mill. Warren Stevens retired in 1955 and the mill ceased work. Remarkably, the mill became a **listed building** on 1<sup>st</sup> December 1951, when it was still in regular use.

In the 1960s, the areas to the north, west and south of the mill, together with the mill itself, were sold off to housing developers. The sheds and buildings to the east and south of the mill were demolished, leaving the mill isolated.

Demolition of the mill was prevented by its listing, and it was purchased from the developers for preservation by Burwell Windmill Trust in 1969.



Working under steam power, c1910



With outbuildings, 1935

The mill was integrated with the museum in the mid-1990s and is one of its main attractions.

During the 1970s and 1980s, the initial phases of the mill's restoration attracted some grant aid from English Heritage, but recent phases of repair and maintenance have been funded solely by the museum's activities.

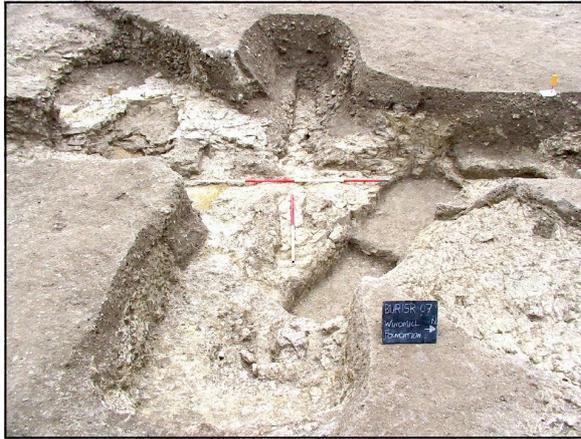
Completion of the restoration of the windmill is considered an essential element of the museum's future development.



## The Windmill:

# THE SIGNIFICANCE OF THE MILL

The key elements that contribute to the significance of the mill are its **completeness** and its **accessibility to visitors**, making the preservation of the mill a worthwhile aim and fully justifying the expenditure of public funds.



The present mill's location, at the centre of the village, reflects Burwell's former significance as a hub of regional windmilling activity for more than 800 years. The use of wind power for corn milling in the parish can be traced back to the 13<sup>th</sup> century using archaeological evidence recently discovered at Isaacson Road (above).

At the turn of the 20<sup>th</sup> century there were three mills in the village. North Street Mill, often known as the 'Busy Bee' (above), has completely disappeared. Only the brick stump of another windmill, Big Mill, can still be seen. **Stevens' Mill** is the sole survivor of many windmills that stood in and around the village.

Today, the Grade II\*-listed status of the mill recognises its **exceptional national value** as one of the very few well-preserved, complete, representative examples of its type.

The mill is of **local importance**, displaying many identifiable features that exemplify the traditional millwrighting practice of the locality. Its identity and characteristics will be repaired and reinstated during the proposed scheme of repair work.

The mill is of **regional significance** as one of only three tower mills in the county that are opened to the public on a regular basis. It is the only example that is accessible to visitors to an existing, integrated attraction.

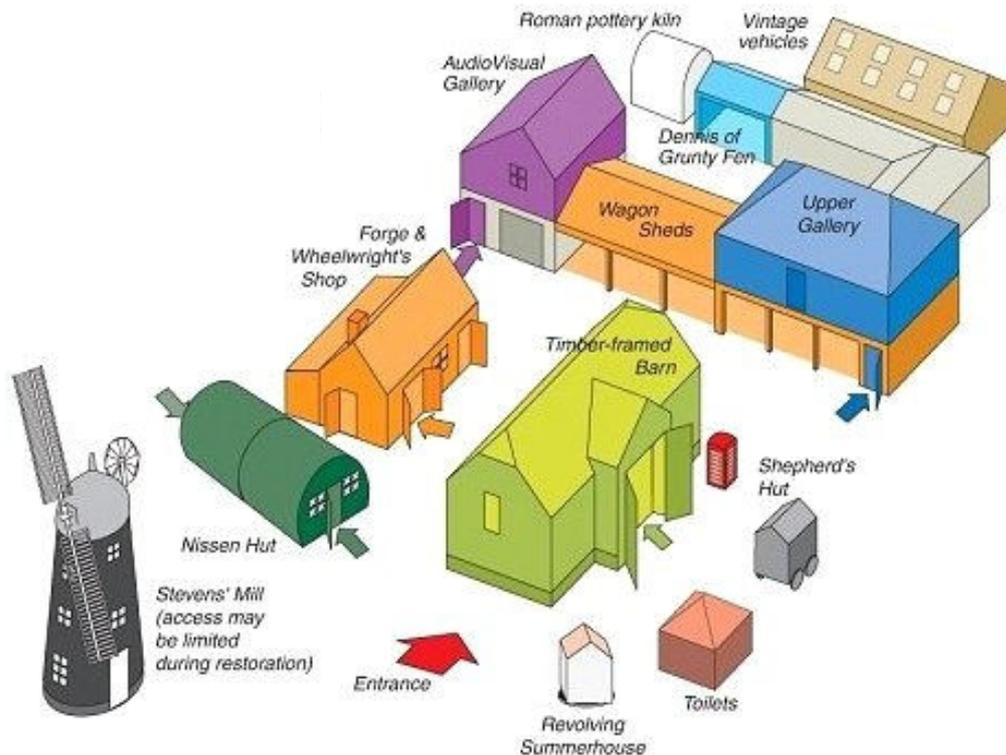
Unlike privately-owned mills, the ownership of Burwell windmill by a Charitable Trust is ideal because it allows wide accessibility to the public, not least due to the number of volunteers on hand at all times, both during the week and at weekends.

The mill's function as a main attraction of a well-established MLA-accredited museum, described as "*unique and engaging*" by Stuart Davies Associates, means that it is able to fulfil its potential to demonstrate the principles of corn milling by wind power to the visiting public and to inspire further teaching and learning about the subject.

# The Museum:

## ALREADY A UNIQUE RESOURCE

### The Museum site



**Burwell Museum Trust** was established in 1982 by a group of local volunteers, with the aim of providing visitors with a glimpse of what life was like in the past in a fen-edge village. The museum site to the east of the mill has been developed on part of the land previously used for village allotments. The mill now stands in the centre of a small grassed area approximately 25m square, outside the entrance to the museum.

### Accessibility

Unlike other examples of windmills that are open to the public, Burwell Mill is not required to perform work in order to help offset its maintenance costs. Its working parts can therefore be demonstrated to visitors at close quarters without the inherent restrictions of a working mill, and all floors of the mill are able to be made accessible when the mill is open to the public.

### Scope of the site

The flexibility of use of the other buildings of the museum for visual displays, local history research, presentations and hands-on demonstrations gives the mill a wider scope than other local examples and, consequently, a significant educational value.

### Visitor facilities

The existing infrastructure of the adjacent museum means that the level of provision of on-site facilities for visitors to the mill, such as refreshment and exhibition areas, as well as toilets, is excellent.



## The Windmill:

# ITS ROLE IN THE MUSEUM

### Funding awards

The museum, managed and staffed by volunteers, has been successful in obtaining funding support for the improvement and maintenance of its exhibits, and for the construction of new buildings on the site incorporating display areas.

As well as donations from individuals, financial support has been received from English Heritage, East Cambridgeshire District Council, Cambridgeshire County Council, WREN (Waste Recycling Environmental Ltd) and the National Lottery's Heritage Lottery Fund and Awards For All scheme.

### Improving visitor access and addressing key audiences

A detailed description of the educational resources of the museum's collections and the key facilities currently provided for visitors to the museum is given in Section 2 of the *Audience Development and Access Plan* produced by Stuart Davies Associates in October, 2008.

### Results of the audience survey

Several key issues raised by the report concern the windmill. Access to the mill by disabled people was highlighted, as was the limited amount of interpretative and display material currently available.

In a visitor survey of more than 200 individuals, 67% of respondents wished to see the mill in a working condition in the future, identifying this as the top priority of several proposed initiatives.



A school party at the Museum

More than half of the respondents to the questionnaire had been attracted to the museum by a special event it had held, or by its collections of artefacts, rather than by the historic buildings. This statistic indicates that, unlike at other mill sites, Burwell Museum will continue to attract members of the public who may not otherwise have been encouraged to visit a windmill.

### The value of the mill to museum visitors

The number of visitors to the site showed a steady increase between 2005 and 2007, reaching just short of 3,750 in 2007. Throughout this period, the sails of the windmill have been unable to turn so the museum has lacked a substantial 'draw'. The windmill stands approximately 80ft (24m) tall to the tip of its top sail, and when its sails are turning they command a powerful advert to potential visitors.

The repair and conservation works to the mill that are now required will provide an opportunity for the public to inspect usually inaccessible parts of the mill, such as the sails, at close quarters when they are lowered to ground level for repair.

The results of the survey clearly demonstrate the extent to which the mill is valued by the visiting public, both on its own merits and as one of the main elements of a successful visitor attraction.

# The Windmill:

## DESIGN AND FUNCTION IN CONTEXT

Burwell windmill, known as “**Stevens’ Mill**” to distinguish it from other windmills in the parish, milled locally-grown cereals into flour for human consumption and, later in its life, for animal feeds. Its miller purchased the grain directly from local farmers and sold the milled flour he produced to his customers.

All the **machinery** inside the mill derives power from the wind.

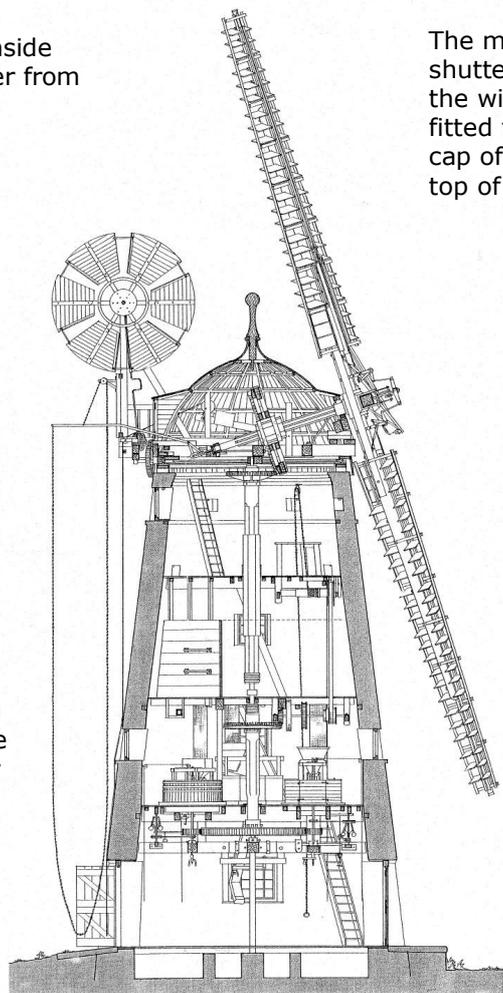
The mill is fitted with four shuttered **sails** that harness the wind’s energy. These are fitted to the rotating wooden cap of the mill which rests on top of the clunch-built tower.

The **cap** is steered towards the oncoming wind automatically by the **fantail**, a set of six small blades positioned at the rear of the cap.

A **chain hoist** is provided to lift heavy sacks of grain from the ground floor of the mill to the top, ready for milling.

The mill was fitted with **grain-cleaning** machinery to prepare the raw materials for milling and **flour-dressing** equipment to separate the milled products into different grades.

The windmill is equipped with three pairs of **millstones**, of two different types, which performed its principal function.



SECTION THROUGH THE MILL— Chris Brook

The flat countryside of the Fenland and the need to drain the marshes for agricultural use gave rise to the wind-powered drainage pumps which had become numerous throughout this part of the world by the seventeenth century. The technological development of the drainage mills had a demonstrably strong influence of the location and design of their corn-milling counterparts. Consequently, during its working days, Burwell windmill was similar to many other windmills making use of the Fenland winds in this part of the county. Most of these mills have been lost forever.

# The Windmill:

## DESIGN & FUNCTION IN CONTEXT

### Regional characteristics

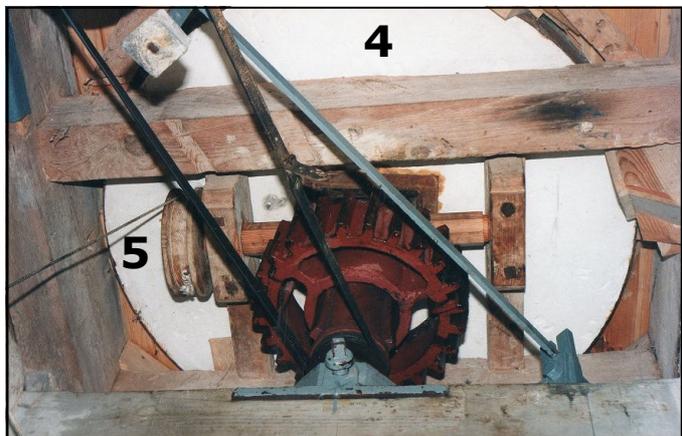
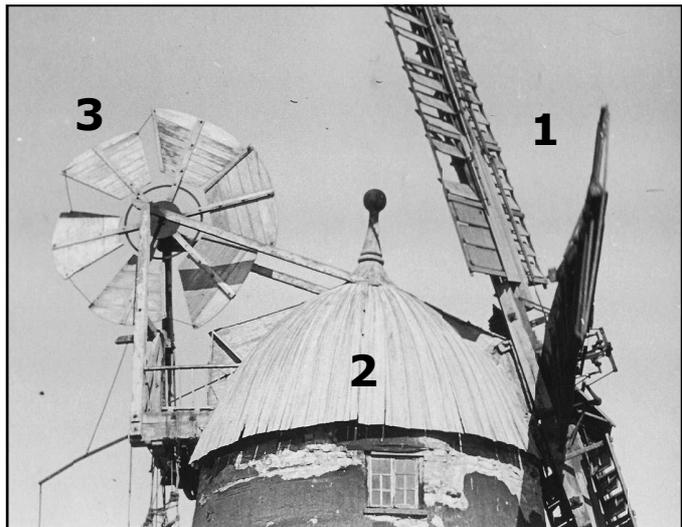
In spite of the fact that every windmill is unique, several factors conspired to produce groups of mills that shared similar characteristics. Factors influencing the design of windmills in a given area are likely to have included:

- The types and availability of local materials
- The geography of the site on which the mill was to be built
- The needs and requirements of the person commissioning the mill
- The amount of money available for the construction of the mill
- The knowledge, skills and design preferences of the millwright building the mill

Burwell is located close to Soham, a local millwrighting centre in the past and probably a melting pot of millwrighting skills and techniques. Two well known firms, Fyson's and Hunt's, continued in operating well into the 20<sup>th</sup> century - Hunt's as late as the 1940s - and are known to have designed, built and maintained windmills in and around the Burwell area.

Characteristics of the mill's structure and machinery that are peculiar to this area of Cambridgeshire include:

1. Clockwise-rotating patent sails.
2. A vertically-boarded wooden-framed hemispherical cap of elegant flared design, surmounted by a finial.
3. A fantail carried on vertical posts which were braced to the top of the cap, rather than down to the sheers as is more usual.
4. 'Underdrift' millstones, located on the first floor rather than higher up the mill, as they are in other areas.
5. Individual belt pulleys, or 'riggers', for lifting the stone nuts out of mesh with the great spur wheel.



# The Windmill:

## THE NEED FOR REPAIRS

### Current problems

The windmill's present appearance is generally good, but closer examination reveals that repairs are needed.

The external rendering of the clunch tower and the metal cladding of the cap roof are both in a poor state and have allowed water to penetrate, causing decay to certain parts of the building.

The circular curb, on which the cap of the mill rotates, has been affected by decay in some areas and is no longer concentric or level. The cap has become seized, facing in one direction, and is immovable.

It has been necessary to remove the shutters from the mill's sails to prevent accidental damage from strong winds while the mill is out of action.

Full restoration of the mill, including the replacement of the two missing sails, was never completed due to lack of funds.



The mill was assessed as a Building at Risk by English Heritage Inspectors in July 2010, and **emergency repairs** were carried out to weatherproof the structure until comprehensive repairs can commence.

The photograph to the left shows the state of the mill's leaking tower before emergency repairs were effected.

Emergency works to temporarily seal the joints of the cap have given it an unsightly appearance (above).



# The Windmill:

## THE NEED FOR REPAIRS

### Planning the approach to repairs

Draft plans for the repair of the mill have been drawn up and divided into a series of stages which will take place over a period of 24 months (see page 2). Budget costings have been placed against each stage of the works, each of which is complete in its own right and provides a foundation for successive stages. The total estimated cost of the repair works to the windmill is £200,000 - £220.00.

Draft plans for the mechanical and structural repairs to the windmill have been produced by a millwrighting consultant and an accredited conservation architect, as a result of a series of consultations with independent subject specialists.

The plans have been developed in line with conservation guidelines provided by the relevant statutory bodies, eg. SPAB Mills Section's *Philosophy of Repair* (2009) and English Heritage's *Informed Conservation* (2007), and will be independently checked and further refined at the development stage of the project.

### Stages of repair

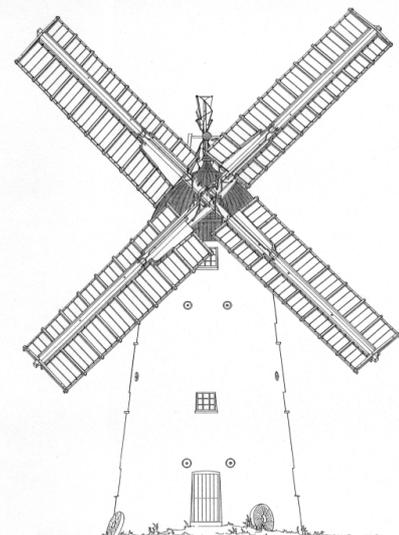
The care with which repairs have been undertaken in the past provides a solid base for the conservation and improvement works that are now required, which comprise five main elements:

1. **Structural repairs** and re-rendering of the clunch tower of the windmill, and repair of the curb ring at the top of the tower.
2. **Minor internal repairs** to woodwork of floors, windows and machinery supports.
3. **Removal, repair and reinstatement of the existing sails** and reconstruction of the two missing sails.
4. Lowering of the cap and fantail to ground level for structural repair, involving **re-cladding of the cap** to provide a more authentic appearance, and overhaul of the fantail gearing.
5. **Repair of the internal machinery**, including the reinstatement of items missing or currently in storage, leaving it in working condition.

### The end result

The **Burwell Windmill Project** will ensure that the windmill is restored using the highest standards of materials and craftsmanship, minimising its repair requirements for the future. All working parts of the mill will be left in an operational condition and suitable for demonstration.

Following the completion of the repairs, it will be possible to allow the sails of the mill to turn with the milling machinery disengaged and, therefore, without risk to visitors. Although the mill will not strictly be working when visitors are present, the revolving sails and principal gears will allow the milling process to be more readily understood by visitors than in its present, static, condition.



# Burwell Windmill Project

## KEEPING TRADITIONAL SKILLS ALIVE

### Vital expertise

Since the turn of the 20<sup>th</sup> century, the number of firms specialising in the repair of historic buildings has reduced dramatically, with the consequent loss of traditional craft skills and techniques.

The SPAB, English Heritage and other statutory bodies promote the retention and continuation of traditional craft skills through the provision of grants and the development of training programmes.

The Audience Development and Access Plan identifies that *"There is currently a significant lack of courses for rural and traditional skills within Burwell and Cambridgeshire as a whole"* and acknowledges that the Museum is *"well placed to fill this gap in the market..."* (Davies 2008: 3.6).

### Craft fellowships

The Burwell Windmill Project will provide opportunities, throughout the course of the repair works, for the **millwrighting work** and **building conservation work** to be studied at close quarters. This will allow skills to be passed on from the professionals involved with the works to future practitioners and presently unskilled volunteers.



Craftsmen making a windmill sail

For craftspeople, trainees or career-changers keen to develop skills in these areas, with the eventual aim of pursuing a career in the conservation of the historic environment, direct contact with the professional contractors involved with the repair of the windmill will be extremely beneficial.

Using a system of mentoring, trainees will have the opportunity to shadow and work with heritage professionals and to develop traditional craft skills by direct participation.

An example of an established scheme that will directly benefit from the project is the **William Morris Craft Fellowship**, operated by the SPAB. Each year, a small group of craft fellows attend work placements with subject specialists in order to learn the necessary techniques and to gain experience of a variety of building repair situations.

The museum features a working **blacksmith's forge** and **wheelwright's shop**, two traditional industries closely linked to the trade of millwrighting (the construction and maintenance of mills). It is likely that some of the metal parts required for the repair of the mill's cap will be made on site in the forge.

# Burwell Windmill Project

## KEEPING TRADITIONAL SKILLS ALIVE

### Demonstrations, displays and 'hands-on' learning

Demonstrations of traditional crafts, such as blacksmithing and brickmaking, will work alongside milling and millwrighting demonstrations to give an overall picture of fen-edge life.

A programme of craft workshops running alongside these demonstrations will allow visitors to try their hand at traditional crafts, increasing their understanding of this way of life and introducing techniques and skills to new generations.



Text panels and interactive models will explore the windmill's functions and its role in village life.

Relating these to the museum's collections will give a complete picture of food production from seed in the ground, through grain and milled flour, to bread.



The project will improve the consistency and clarity of the displays in the museum, providing a wealth of new information and increased interactivity.

The use of personal voices and oral history will bring the key objects alive for visitors, giving a better sense of the use and context of the collection. Improvements to the displays will also make the museum's narratives easier to understand. Significant and interesting facets of local history will be made more accessible to visitors.

# Burwell Windmill Project

## ACTIVE PARTICIPATION & LEARNING

The Audience Development and Access Plan highlighted the Museum's important contribution to the tourism potential of the region:

*"With its stunning architecture, rich history and natural beauty, Cambridgeshire is a popular destination for visitors from within the county and surrounding areas, as well as overseas tourists... Through heightened awareness of the Museum in the local area and the programmes it offers, together with a renewed events and exhibitions programme, the Museum could develop its contact with this audience."*

The museum runs a programme of regular events during the open season that cover a varied range of historical topics including **themed historical re-enactments**, showcasing local collectors and **hands-on activities for children**. Recent family events have included clay-brick making, bird box making and an array of paper craft activities.

The general response to hands-on activities, from children and adults alike, is very positive and the museum sees a surge in visitor numbers during every event. **Opportunities for participation and learning** are a key element of the museum's annual events programme.

### New initiatives resulting from the project

The project will create new opportunities for participation at the museum, with additional hands-on events and new learning programmes. Examples of new events include:

**"Milling days"** for children, based around the windmill:

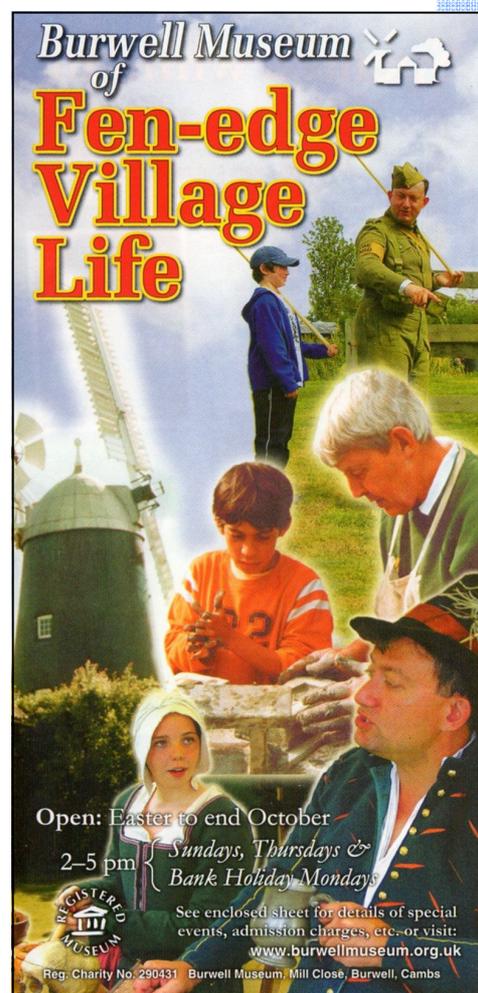
- threshing wheat to extract grain;
- milling grain using hand-operated quern stones;
- sieving grain to separate bran from white flour;
- learning how the windmill was operated

### Traditional craft workshops and demonstrations:

Providing hands-on experiences of millwrighting and blacksmithing for adults and older children; watching a craftsman at work and having a go at some new skills.

**Historical re-enactment days:** Drawing on particular periods in the history of Burwell, a chance to try food and dress up like the Victorians, the Romans or the Tudors, and to learn about life during the Second World War.

**"From Seed to Bread":** New interpretation and education provision at the museum will explore the farming cycle of seasons and follow the trail showing where our food comes from.



Current publicity leaflet



# Burwell Windmill Project

## BENEFITING REGIONAL TOURISM

The Project will establish “**Cambridgeshire’s Milling Trail**”, an exhibition of pictures, artefacts and oral testimony placing Burwell mill in its context. The museum will provide a focus for the trail, allowing visitors to first explore Burwell Mill before visiting other windmills in the locality.

Visitors’ understanding of the windmill will be enhanced by enabling them to identify the differences and similarities between local mills and the important role played by windmills in the industrial development of the area. It will also develop co-operation between the Burwell Museum Trust and other related organisations and groups in the region.

The progress of repairs to the windmill will be described and illustrated on a **newly-created weblog** linked to the museum’s website. This technique of providing regular updates to those interested, including the media, has been used successfully during recent mill repair projects in surrounding regions. For examples see:

[www.stansted.net/responsibilities/windmill](http://www.stansted.net/responsibilities/windmill) (Stansted Mill, Essex)

[www.buckscc.gov.uk/bcc/brill\\_windmill/brill\\_restoration.page](http://www.buckscc.gov.uk/bcc/brill_windmill/brill_restoration.page) (Brill Mill, Bucks)



**Clay-brick making on childrens’ activity day**

The Burwell Windmill Project will generate new information about the windmill and enable the existing visual displays and literature to be expanded and updated.

This material will be used by volunteers from the Friends of Burwell Museum to generate a series of **community outreach programmes**, including lectures, presentations and demonstrations to local interest groups within the region, as well as to national conferences. This initiative will raise the profile of the Museum both locally and nationally, generating discussion about the windmill and the Museum’s activities, and encouraging more people to visit the site and the region.

# Burwell Windmill Project



**Enabling active participation and learning**

**Conserving a significant heritage asset**



**Keeping traditional skills alive**



**Benefiting regional tourism and education**