

Wind, Windmills and Neighbourhood Plans

Steve Temple

Jon Cook's mill at Swaffham Prior is under threat from a developer, and both I and millwright Dave Pearce have been helping Jon to mount a defence. All three of us have been addressing the problem of wind loss at mills since the planning inquiry in 2012 affecting Stanton Mill at Bury St Edmunds, which we lost resoundingly. Dave could not appear at that inquiry because of his employment in the Wind Industry, so I acted for SPAB with advice from Dave. Since then, all three of us have been threatened by developments, and Dave and I have both succeeded in modifying the plans in favour of our mills, though we did not succeed completely.

Faced with Jon's situation, I have written a report based upon the Molenbiotoop approach from the Netherlands (see below) to counter the Computational Fluid Dynamics (CFD) model commissioned by the developer.

Dave has assessed both models and written a report for the East Cambridgeshire District Council Planning Department, which recommends that measurements should be taken in order to resolve the large discrepancies between the two approaches. Our big concern is that, as at Stanton, the application may go to appeal against the opposition of the local authority, and the Planning Inspector may overturn the local decision as he did at Stanton. Our aim is to anticipate this by taking the measurements before such an appeal is launched and while there is still time to carry out sufficient measurements to be convincing.

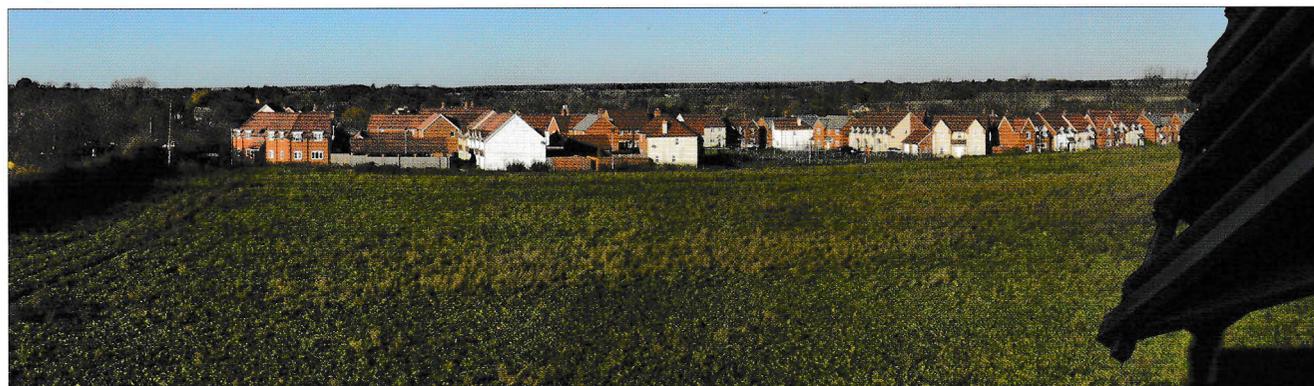
Significant Harm

The planning application for the houses near Stanton Mill was rejected by St Edmundsbury Borough Council, and the developers appealed. The inspector stated:

"I conclude on this issue that the mill is an important heritage asset, due both to its architecture, history and operability. I am satisfied that its operability will continue, but that its significant heritage value would remain even if it were not working. I consider that the proposal would have no material impact on either the mill's setting or operability and there would be no breach of policy CS3 in this regard. Moreover, even if there were any harm to it as a heritage asset, this would be less than substantial and would be outweighed by the various benefits of the development, so complying with the NPPF.



The picture above shows the view from the windshaft of Stanton Mill in 2012, facing NW and covering about 45°. The picture below shows the same view, at identically the same scale, in 2017. The new houses are about 120 metres from the mill.



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However, he did not allow the developer to claim costs, on the grounds that the defendants had made a significant case.

Power, Planning and Politics

Unlike watermills, windmills do not enjoy any form of protection of their energy supply - or do they?

The Government has empowered local authorities to prepare Neighbourhood Plans which will carry equal status with other planning policies. I would urge you as mill owners to take part in the preparation of such plans, and to press for special policies to be formulated for the protection of your mill.

In Holland, most planning authorities now recognise what is called the "Molenbiotoop" which provides in general for protection of the historic setting of windmills within a radius of 400 metres of the mill. The Molenbiotoop includes a calculation for determining how much reduction in wind speed is caused by the presence of an obstacle upwind of the mill and sets a limit upon what is allowable.

In England, the planning guidance in respect to Historic Assets comes from the relevant clauses in the National Planning Policy Framework or NPPF. These are in section 12 as a whole, with paragraphs 132-135 in particular. These refer to "significant harm" caused by a proposed development to the historic asset and its setting, but do not in any way define what constitutes significant harm, particularly not in respect to windmills. However, it seems clear that anything which prevents the working of a mill ought to be construed as harm, and the Molenbiotoop calculation defines the level of loss of wind which the Dutch deem to be "significant".

Typically, many windmills have already lost part of the available wind by virtue of housing developments and tree planting. In my own case at Impington, I estimate that I have lost 75% of the available wind because it is now surrounded by 7m high houses and by even higher trees - effectively burying the mill 7m into the ground. Clearly, the reduction in milling time caused by each new house is now much more significant than it would have been in the 1930s when the surrounding estate was first built in the then open fields. Planning officers are apt not to give due weight to this incremental effect, or indeed to understand that placing an obstacle in front of a windmill reduces its available wind and hence its viability as an historic asset.

One way to address this is to write a specific policy statement into your Neighbourhood Plan, for example, placing a specific height restriction on any new builds within the vicinity of your mill, or by restricting any form of building in certain directions (if you are lucky enough to have at least some unrestricted wind directions).

At Histon and Impington, we are putting the following special clauses into our Neighbourhood Plan:

HINPI The Windmill "Development proposals within the zone shown on map x will not be supported if they would cause further loss of wind to the Impington Mill at Cambridge Road. Determination will be by the Molenbiotoop method."

In addition, there will be a communication action:

"the parish council will work together with South Cambridgeshire District Council, landowners and other stakeholders to ensure that trees and other vegetation within the free zone do not cause loss of wind"

What happens next? The plan has to be ratified and authorised by means of a referendum. When that has been done, the Neighbourhood Plan will sit alongside other local plans, has equal weight and must receive due consideration in the determination of any planning application. You can then object to an application by referring to the specific clause in your Neighbourhood Plan as well as to any of the clauses referred to in the NPPF above.

Even before ratification, the activity of developing a Neighbourhood Plan gives additional weight to its proposals, as defined in the guidance notes.

Will this help? It remains to be seen, but not doing it might leave you even more vulnerable than at present because it is likely to be construed as meaning that the local community does not care about its mill.

Fluid Dynamics Without The Hot Air

Since the Stanton inquiry, I have been developing a simple method of evaluating wind loss at a mill. When developers propose to build a housing estate near to a windmill, they spend quite large sums of money with consultants, usually from the field of Wind Farm development, who build a Computational Fluid Dynamics (CFD) model to demonstrate how little the mill will be affected by the development. There are three flaws with this process - the first being that CFD consistently underestimates the loss of wind due to an obstacle, the second being that the cost of the CFD model is such that they never take a full 360° view of the mill and its environs and the third being that they do not take trees into account, not least because their geometry is too difficult to define.

The end result is that the actual loss of wind is seriously underestimated, and this is what the planning authorities want to hear because the presumption is always in favour of development in order to provide more housing.

The Molenbiotoop referred to above provides an alternative to the CFD approach, in which the detailed fluid dynamics is replaced by a simple relationship between the height and distance of the obstacle, the height and sail diameter of the mill and the consequential loss of wind speed at the mill. This relationship can be handled by an ordinary spreadsheet and applied to an all round view of

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the mill in which the various heights and distances of the obstacles are plotted, and the loss of wind speed calculated for all wind directions. This model can then be coupled with a “Windrose” giving the average wind speed from each direction at the mill to give estimates of total milling time available with and without the development. This is what my method does. It is much more thorough than the usual CFD model, handling all the local obstacles and allowing for both summer and winter foliage on trees, and does not depend upon very careful, and unverified, setting of the calculation parameters.

However, it does depend upon having verified the Molenbiotoop approximations. It is presumed that this was done early in the life of the Molenbiotoop in the 1940s - but no records seem to exist of this process. I am planning to carry out a reasonable sample of tests using local mills to provide the samples of differing obstacles. We will measure wind speeds at the mills by mounting a data-logging anemometer on a pole protruding from the windshaft, far enough out to avoid interference from the mill itself. We will then record the measured wind speeds and compare them to those given simultaneously by local Met stations. This will give us the losses caused by the obstacles, and these can be compared to the Molenbiotoop predictions. In the worst case, we might

need to modify the Molenbiotoop calculation to conform with the measurements, but the expectation is that we will obtain a good match, confirming the Dutch belief in the validity of the Molenbiotoop.

How could we use this to help other windmills threatened by a new development? Well, it's not difficult to plot the obstacles round a mill: this can be done by a combination of local observation and Google Earth (to provide the distances and directions accurately). It is likely that we would then need to make some measurements with the anemometer at the mill in order to determine how the local wind speeds compare with those of the nearest Met station. Once all this has been done, we can then calculate how much milling time is currently available to the mill, and of that time, how much would be lost if the new development were to go ahead. This is a direct calculation of the “harm” that would be done.

Steve Temple is Chairman of the East Anglia Mills Society.

In the next issue of Mill News we will feature an article by Colin Thompson, retired Planning Inspector, looking in greater detail at what planning policy has to say on the subject of heritage assets such as mills, and how to frame responses to development proposals in relevant terms.