NOISE BULLETIN
June 2007 Issue 13

PLANNING

All change for planning

The widely anticipated shake up of the planning system is outlined in a new White Paper.

Planning for a sustainable future sets out a number of key reforms – most notably a series of overarching policies will set out the need for projects of national importance allowing individual planning inquiries to focus on local issues. There are four key themes:

- Streamlining planning for major infrastructure projects;
- A new national policy framework setting out key infrastructure needs;
- A new inquiry system led by an independent commission consisting of leading experts from key sectors – including planners, lawyers, environmentalists and community experts;
- A new legal requirement on developers to consult with the public and key parties such as environmental groups and heritage experts.

Additionally there will be cuts in red tape for the use of microgeneration such as wind turbines (see also feature, page 4). The White Paper says that national policy statements will "indicate any circumstances where it was particularly important to address adverse impacts of development, for example to mitigate detrimental impacts such as the effect of additional noise and poor air quality".

PPS23 vulnerable?

Rumours have been circulating that planning policy statements and guidance on specific issues (such as PPG24 on noise and PPS23 on air quality) will be axed in favour of more overarching policy statements contained in an expanded *PPS1 Delivering sustainable development*.

The White Paper states: "There should be a substantial streamlining of national policy, we should publish proposals by Summer 2007. This should include consideration of the potential to remove some of the current range of planning policy guidance, and where necessary replace through an expanded PPS1. A desirable goal would be to reduce over 800 pages of policy to less than 200 pages."

- *Planning for a sustainable future* www.communities.gov.uk/embedded_object.asp?id=1510669

AVIATION

BAA lets Londoners track loud planes

BAA has launched a new website that will enable local residents around its Heathrow, Gatwick and Stansted airports to track planes and find out which ones are making excess noise. The software is similar to that used at other airports (such as East Midlands).

The system is part of a £1.8m investment to upgrade BAA's noise and track keeping and complaints handling systems at its London airports. Webtrak allows internet users to track aircraft arriving and departing from the airport, and displays their height, allowing them to make more detailed enquiries about aircraft noise.

BAA said: "This significant investment demonstrates how fully committed we are to providing the best possible service to members of the public about noise and aircraft track keeping."

Campaign group Hacan for once found itself congratulating BAA. It welcomed the "dramatic new system that will bring transparency to what is going on in the skies". "The visual images are dramatic. They show planes criss-crossing the skies of London and the Home Counties. They illustrate that aircraft noise is no longer a just a problem for areas close to Heathrow."

HACAN chair John Stewart added: "For years we have been campaigning for this system to be introduced. It will enable people to see for themselves exactly what is going above their heads. Webtrak will bring renewed pressure to admit that aircraft noise is now a major problem in areas many miles from Heathrow."

- BAA's noise and web tracking can be seen at: www.heathrowairport.com/noise www.stanstedairport.com/noise www.gatwickairport.com/noise

HIGHLIGHTS INSIDE...

IN BRIEF

House closures

Councils are to be given powers to close houses due to excess noise. The powers will be like those given to the police to close crack dens.

The Home Office said: "The police and, for the first time, local authorities will be given new powers to temporarily close and seal the houses of persistent nuisance neighbours. The powers, which will be introduced in the forthcoming Criminal Justice Bill, are based on existing crack house closure rules.

"Similar powers already exist in Scotland where they have been used 21 times. For the first time local authorities as well as the police will be able to seek notice to close and seal a property and, once approved by the court, prevent anybody using it for up to 12 weeks." This will apply to owner occupiers and tenants of domestic and commercial properties.

"By extending this power, we can tackle other forms of extreme and persistent anti-social behaviour, such as excessive noise, rowdy behaviour, frequent drunken parties and anti-social residents intimidating and threatening their neighbours."

English and Welsh councils can use the powers as they do Asbos and injunctions.

- http://press.homeoffice.gov.uk/press-releases/new-house-closure-powers-asb?version=1

Smoke shelter refused

Noise and nuisance fears have scuppered plans to erect a smoking shelter at an Asda store in Ellesmere Port.

Asda sought planning permission for the shelter in readiness for the forthcoming smoking ban in England. The local authority refused permission "by virtue of its potential to constitute a bad neighbour development which would adversely affect current levels of amenity for nearby residents".

Asda appealed the decision, but lost, again on noise and nuisance grounds.

IN BRIEF

Port loses appeal

A scrap metal exporter operating from Brightlingsea Harbour in Essex has lost its appeal for extended operating hours.

Easco (Wheelers) recently came under IPPC regulation by the Environment Agency. The business wanted to extend ship loading operations as the port is tidal.

Appealing to the Planning Inspectorate for longer operating hours, the inspector noted the Environment Agency's condition on working hours "is aimed at preventing nuisance in the evenings and at night, and at the weekends and bank holidays, which are all times when people are entitled to peace and quiet in their own homes and gardens or in the local area in pursuit of their leisure activities."

The Agency says that scrap metal operations at the site have been the subject of many noise complaints from local people due to the close proximity of the port to residential areas.

Grants restart

Grants for people who want to install micro-wind turbines on their homes have been made available again – albeit with tighter conditions.

The previous grant regime was too popular and the new system has a £3,500 cap and is dependent on having planning permission granted. Domestic wind turbines currently require planning permission, although a consultation is considering removing the need (*Noise Bulletin April p1*).

The Low Carbon Buildings Programme (LCBP) has already allocated £6.8m, now a further £6m is available. 242 turbines have been funded to date.

- More details on www.lowcarbonbuildings.org.uk

For the record…

Environment minister Ben Bradshaw has told Parliament that he will issue a combined national noise strategy, covering both environmental and neighbourhood noise, "by the end of 2007".

AVIATION

Ecolabels for planes

Budget airline Flybe has launched an ecolabel for its flights.

The label, mirroring the style of fridge, freezer and car ecolabels, shows noise and air quality emissions of Flybe's plane fleet. The aim is to allow consumers to gauge their environmental impact when booking flights, and encourage operators to use quiet, low emission planes.

Flybe is in a good position to push such a scheme as its fleet is relatively modern and consists of smaller, quieter aircraft as it is a regional rather than global operator. However it is the first airline to explicitly spell out to consumers the noise impact of its operations on those living near airports.

Under the scheme, which was subject to an assurance process by Deloitte, Flybe passengers will be provided at the time of booking via the internet with a detailed but user-friendly breakdown of the fuel consumption, carbon emissions and noise patterns of the aircraft type to be used on their journey.

Each aircraft's eco-label includes:

- Local environment which assesses the aircraft's noise rating on an A (low) to F (high) rating; and the levels of CO_2 and NO_x emissions on a landing and take-off cycle basis
- Journey environment which grades fuel consumption and CO_2 emissions (kg/seat) on a range of typical European sector basis (500, 1000 and 1500 KM) and also on an A (low) to F (high) grading

The Bombardier Q400, a 78-seat, twin-turboprop aircraft has an A rating for its noise footprint while the Embraer 195, a 118-seat, twin-jet engine aircraft which Flybe uses for its short-haul EU market and dense domestic trunk routes, scores scores a B for its noise footprint.

- Flybe's ecolabels can be seen on www.flybe.com/environment/eco-labels.htm

Flybe Bombardier Q400 — flybe.

Local Environment		
Noise Rating (Less A B C D E F More)		A
Take off & Landing CO_2 Emissions		A (817kg)
Take off & Landing CO_2 Emissions (per seat)		10.5kg
Take off & Landing Local Air Quality[1]		2kg
Journey Environment		
Total Aircraft Fuel Consumption By Journey Length	Domestic (500km)	A (1044kg)
	Near EU (1000km)	A (1896kg)
	Short Haul (1500km)	A (2760kg)
CO_2 Emissions Per Seat By Journey Length	Domestic (500km)	B (42kg)
	Near EU (1000km)	B (77kg)
	Short Haul (1500km)	B (111kg)
Passenger Environment		
	Minimum Leg Room	30"
	Number Of Seats	78

[1] Emissions of Nitrogen Oxides as an indicator of the effects on local air quality

RAILWAY NOISE

Trains: plans to make them quieter

The European Commission is consulting on the need to reduce noise from trains.

Recognising that railway noise is constraining the growth of railways, it is seeking opinions on how noise from existing rolling stock can be implemented: "Given that the lack of appropriate mitigating measures may be a serious threat to the development of rail traffic, in 2007 the European Commission intends to adopt a Communication on rail noise which will cover abatement measures for the existing fleet."

The Commission says that measures to tackled existing stock are necessary as wagons have a very long life. It suggests switching emphasis from the building of trackside noise barriers to adapting rolling stock, for instance by fitting low noise brake blocks. Such work could be encouraged by subsidies or differentiated track access charges. It could be mandated by noise emission ceilings, operating restrictions on noise sensitive lines or tradable permits.

- http://ec.europa.eu/dgs/energy_transport/home/consultation/transport_en.htm

NUISANCE

Annoyance due to anxiety, not noise

Annoyance may be more related to anxiety traits rather than noise or air quality, Danish researchers suggest.

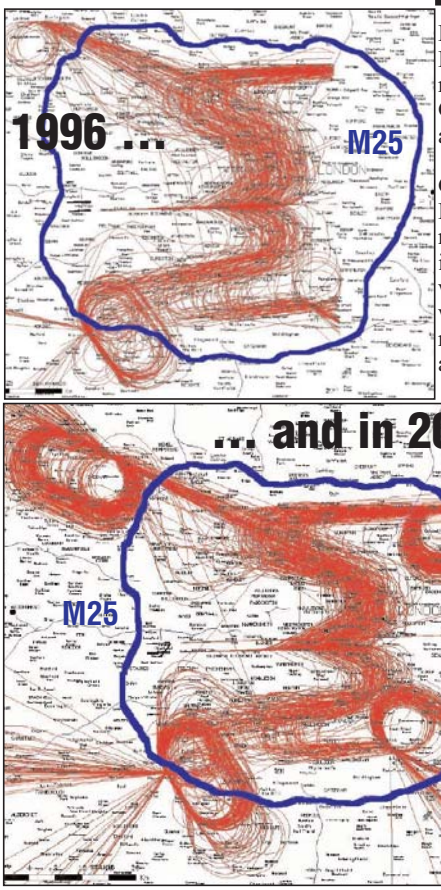
The researchers carried out a cross sectional study of nearly 3,000 respondents who were marked against a 'trait anxiety scale'. Their noise and air quality exposure was calculated, and they were asked about their annoyance to ten specific factors in the residential environment, mainly focusing on source-specific noise and air pollution.

Researchers said: "The two most prevalent complaints were annoyance to traffic noise and sounds from neighbours, which was reported by about 8% of the participants. Modelled noise and NO_x exposure were positively related with annoyance to traffic noise and exhaust fumes. This suggests caution when using annoyance reports either as a surrogate measure for environmental exposure on the individual level in epidemiology studies or when studying the moderating effects of annoyance on health outcomes."

Trait anxiety and modelled exposure as determinants of self-reported annoyance to sound, air pollution and other environmental factors in the home.Persson R et al, *Int Arch Occup Environ Health*. 2007 Jun 1.

AVIATION

Heathrow footprint spreads



Flight numbers at Heathrow are likely to rise to 800,000 a year, the Government has admitted.

Aviation Minister Gillian Merron told Parliament that this number could be reached if both a third runway went ahead and more use was made of the existing runways through the abolition of runway alternation.

It would almost double the number of flights using the airport. Last year flight numbers reached 473,000, close to the current cap of 480,000.

Later this year the Government will consult on proposals to build a third runway and end runway alternation which gives residents respite from noise for half the day.

Aviation experts are assuming mixed mode will go ahead. They point to the CAA's decision to downgrade plans to test technology to allow closer separation distances. The thinking is that there is no point in testing this technology on an operations mode that will be changed.

Meanwhile Hacan Clearskies is releasing analysis prepared by consultant Bureau Veritas with BAA's help showing how the increase in number of flights over a ten year period has spread noise across London.

It has plotted flight paths for a representative ten hour period in 1996 and compared to them to the same period in 2006 (see maps). There is a dramatic increase in flight numbers – and the increase in numbers has led to an increase in the amount of stacking and traversing of planes across London at lower altitudes than before.

● www.hacan.org.uk

PUBLIC OPINION

Operation Torque tackles noisy bikes

Noise Action Week saw hundreds of UK authorities carrying out innovative events.

NSCA coordinates the week which was this year supported by the Noise Abatement Society. Defra has sponsored the event in previous years.

South Gloucestershire Council set up *Operation Torque* with local police, the fire service and Vehicle Operator Service Agency (VOSA) to raise awareness of the impact of noise from mopeds and scooters. It aimed to crack down on people riding unlawful, disorderly, dangerous and noisy mopeds and scooters.

The operation took place during Noise Action Week and targeted mainly young riders in Yate who were stopped and required to have their vehicles examined at the fire station. The examination included noise checks by South Gloucestershire environmental health officers.

Shaun Fudge told *NB*: "Enforcement action was taken regarding bikes that breached the legal noise limits usually as a result of being de-restricted or having a custom exhaust fitted. These machines are often associated with reports of anti-social behaviour, riding around too fast or being too noisy. Using Noise Action Week to highlight this problem was very helpful".

Meanwhile a survey carried out for the NSCA to mark the week suggests that a million people may have moved due to noisy neighbours.

NSCA got MORI to poll over 2,000 people on noise issues. They found 2% of people have moved house to escape noisy neighbours, and that one in five are bothered by noise from cars and motorbikes and 70% are bothered by noise in their neighbourhood.

NSCA notes that the survey shows that noise from pubs, clubs and entertainment venues is a source of increasing bother, particularly for those living in Scotland, with increasing outdoor revelry since the indoor smoking ban which is now in place in Wales, and due in England next month.

● www.nsca.org.uk

South Glos EHO's test noise from illegal exhausts

IN BRIEF

Stansted inquiry opens

Noise arguments will be aired as the inquiry opens into plans to expand Stansted airport.

BAA wants an extra 75,000 flights a year and the complete removal of the annual 25m limit on the number of passengers.

Stop Stansted Expansion (SSE) is spearheading opposition. Over the course of the next five months, SSE will be presenting evidence to the inquiry "to demonstrate that BAA has systematically understated the local environmental impacts of its application in almost all the key areas such as additional aircraft noise, local air quality, landscape and visual impacts, light pollution, road traffic and community health.

Rehis seeks feedback

The Royal Environmental Health Institute of Scotland is urging councils to respond to a Scottish Executive consultation on environmental health.

● Consultation on *Environment and health Strategic Framework*, can be viewed on www.rehis.org

Mosquito backlash

MPs have asked Home Office ministers whether there are any environmental impacts or health and safety implications from the increasing use of the Mosquito ultrasonic youth deterrent device.

Ministers say that there "do not appear to be significant and relevant health effects that may harm children/youths exposed to vhf/ultrasound in the long-term". The Health and Safety Executive also considered issues in terms of the Control of Noise at Work Regulations 2005 including possible implications for persons working in proximity to the units, and added: "While there is the possibility of some short-term subjective effects if the duration of exposure is prolonged, there would appear to be little likelihood of persons exposed to vhf/ultrasound from this device suffering long-term ill health."

What to do about wind turbines?

Lis Stedman listens in to Institute of Acoustics discussions intended to form a response to the recent consultation on domestic wind turbines

The political case for green credentials has brought micro wind turbines under an unprecedented spotlight as reaction to the DCLG consultation on deregulating them – allowing them to be added to dwellings under the permitted development rules – draws to a close (*NB April p1*).

Microturbines are not the only beneficiaries of the proposed relaxation of the planning rules, but in terms of noise they are potentially one of the most important, as recognised by the Institute of Acoustics workshop at the beginning of June, which was held to define the IoA's response to the consultation paper.

Some of the early comments reported in last month's *Noise Bulletin* suggested the event could be a lively one, and it was quickly clear that these mini wind turbines have indeed generated a great deal of heated debate, if not power.

Microgeneration is defined in the Energy Act 2004 as anything producing less than 50kW – most houses only need 20kW at most, so in theory (and it will become clear why this is important) this size of generator is plenty big enough. Indeed, talk around the conference revealed that some areas are already seeing a massive increase in applications for microturbines ahead of permission being relaxed – Milton Keynes, for instance, and breezy Brighton.

Gwyn Mapp of Bureau Veritas kicked off the proceedings, which were chaired by Nigel Cogger of the English Cogger Partnership. Mapp's backgrounder revealed the considerable influence that his own MSc thesis has had on the development of the vibration criteria within the consultation and also a possible very sticky fly in the ointment.

Windsave markets small turbines

He noted: "They have got to consider the impact on radar for aircraft – it could completely torpedo the proposal if the MoD came along with reservations." But this caveat aside, his talk made clear there is considerable impetus to the proposals – the government's keenness to push permitted development rights through is based on a number of background pressures – the need to meet Kyoto CO_2 reduction targets, reducing grid energy losses, increasing energy awareness and securing the power supply against such things as terrorist threats.

Some areas (including the London borough of Merton) have also been adding to the impetus by insisting that new developments over a certain size must generate 10% of their own energy on site. Mapp explained that the noise criteria for the proposed limits (based on an Entec project) were for sound power levels of 45dB at the building façade and added: "Having noise criteria like this scared the hell out of me. I have not found any sound power data for turbines yet. I am extremely concerned that this is over-simplistic."

Mapp underlined the amount of background reluctance to take this approach precipitately: "I felt Defra's position shouldn't be giving permitted development rights to microturbines as siting is more important than the turbine itself. You have to rely on statutory nuisance powers if you give carte blanche. People would be spending two to three thousand pounds on a turbine and then would be told to take them down. This would damage the industry. I felt the DCLG plans were not a good idea, but it was already committed."

Presented with a fait accompli, Defra chose to help. The physical proposals in the final consultation paper are straight from the Entec report, including the provisions for mast heights and the number of turbines on a property (one per house, four on multi-occupancy dwellings such as flats), and the ban on permissions in conservation areas, World Heritage sites.

Mapp added that DCLG had made it clear it wanted the noise levels to be as simple as possible. At his recommendation, Defra pressed for structure-borne noise to be included for dwellings other than the one hosting the microturbine (on the grounds that the owner has the ultimate sanction of removing the turbine if it offends). Levels were derived from WHO guidelines of 35dB(A), with 5dB(A) shaved off to account for possible cumulative impacts if a number of properties in close proximity were to erect such turbines.

A similar 5dB reduction was made for airborne noise (40dB) to account for cumulative effects, and this will also apply to an area of not less than 50% of a private outdoor space not solely associated with the host dwelling (a neighbour's garden or balcony, for instance).

The conservative vibration values (not over 0.5mm sec^{-1}) came from Mapp's research. Again, the DCLG requirement for simplicity means only vibration on the z axis is being considered, which the research found to be the dominant source. One side issue, he noted, is that Building Regulations bods are "incredibly interested" from a structural stability point of view. "It's not an easy topic," he warned. "Not as easy as wind farms, which are incredibly complex. It's a potential minefield."

Responses from the floor suggested a degree of incredulity that it would be possible to assess whether these devices are in breach of their limits until they are actually up and working. Mapp agreed, adding: "Each application is incredibly site-specific, which is why Defra had reservations." To much knowing laughter he added that planning departments would police the developments.

Mapp clarified one general question as to why the LA_{90} metric was used – at very high wind speeds an incremental increase in noise from a microturbine, it is reasoned, would be drowned out by the background wind noise – there have been anomalous cases of turbines being refused because in a force eight gale a neighbour might hear them (the inadequacies of this approach were explored in the May issue).

Alastair Mackinnon and Patrick Jones of TUV NEL then took the stand, providing insights from the institution's research capabilities. NEL has tested a range of free-field and 'as installed' turbines in wind tunnels and undertaken component tests. They pointed out that the small turbines typically produce 5kW or less (somewhat feeble in terms of the top household energy requirements outlined above).

Another siting issue emerged: wind speed varies exponentially with height, and wind tunnel tests showed a 10% difference in the amount of power produced between the tallest and shortest installations (the current proposals severely restrict turbine heights as noted last month).

There is also bad news for anyone that finds themselves with one of a group of turbines in close proximity, because the lead turbine (first facing the wind) has been found to significantly affect the power output and cut-in wind speeds of turbines behind it. More bad news came in the form

of estimates of noise levels, which from a 1kw machine at 10m could be "of the order of 45 to 55dB." Importantly, the character of the noise (tones and thumps, for instance) can add a 5dB penalty.

The talk made clear the uncertainties: noise from small turbines in the built environment raises issues not encountered with large turbines, and performance will be influenced both by installation and proximity of other turbines. The research suggests that vibration (and particularly harmonics) could be an important issue, intimately connected with static and dynamic loads on the structures. The authors also pondered whether BS EN 61400 (which sets standards for large turbines) is the best approach for their smaller cousins.

The talk finished with a plea to "speak to the industry" to determine the best approach. The industry appears to have many doubts – one audience member commented that it would not be easy to measure vibration and noise in the field, adding: "it looks unenforceable".

Dr Andy Mackenzie of the Hayes Mackenzie Partnership delved further into BS EN 61400 – 11 and pointed out the host of acoustic differences between small and large turbines, particularly the increased speed of travel of the blades. Large turbines rotate at one rotation per second; small ones warm up at 500rpm.

He also pointed out that assessment of background noise is "fraught with difficulties", and that any tonal content would be a factor in whether microturbines are perceived as a nuisance – noise spectra and tonality are notable by their absence in the proposals. BS EN 61400 does, however, deal with 1/3 octave band spectra and analysis of tonal noise. Mackenzie recommended that measurements should be carried out to the standard's requirements.

The afternoon saw the audience divide into groups for a workshop to work out responses to the questions posed in the consultation. The relevant ones are:

- Do you agree with the principle of an impact approach for permitted development? One of the guiding principles is that where there is no impact, there is no need to go for a planning application;
- Do you agree that the impact of noise should be dealt with by specific noise restrictions based on decibel levels at/in neighbouring dwellings?
- If not, what alternative approach would address this issue?
- Do you agree that local planning authorities should be able to restrict permitted development rights for microgeneration where the benefit of the technology is outweighed by the impact?
- Do you agree with the recommendations for wind turbines?

Out of the deliberations came a number of valid points. There is a need to consider how to express impact, some noted. And should impact be governed by absolute criteria? How should combined impacts be expressed, and is it clear that microgeneration can be said to benefit anyone other than the individuals concerned?

There were a number of eyebrow-raising observations. A manufacturer (whose company does not yet make domestic turbines) emphasised that there is a tonal element to the noise from the devices, and environmental health officers confirmed from experience that vibration can be a problem, but that the whole issue is too immature to set meaningful thresholds.

There were calls for certified installers, and even a product approval system akin to Robust Details to ensure that (as far as possible) installations meet agreed standards. The issue of any numbers-based system having to be too complex to be enforceable was a widespread concern.

The fitful nature of operation of such turbines is also something potential users should be aware of – one environmental health officer noted that their council had received complaints about noise from a turbine, which it had never been able to substantiate as it had not been windy enough.

It also became clear that turbine manufacturers are somewhat behind the game – no publicly-available reports of noise levels have been produced, partly because there is no fixed idea of what format they should come in. One issue is that to get an accurate idea of noise levels a turbine really needs to be assessed on site, and the expense of a proper noise assessment on top of the price of a turbine would put many potential purchasers off.

There was a suggestion to base modelling on BS 61400 but change the averaging period from one minute to ten seconds because of the intermittent nature of the noise, and general agreement that the noise level criteria should cover the whole of neighbouring gardens as otherwise people could find their enjoyment of their plots restricted to less-popular areas, and those with large gardens could be discriminated against.

Modern housing developments with quirky layouts were also raised as a potential pitfall, as they bring into question the assumption of a linear layout where most dwellings would generally not be subject to noise from too many turbines. Using weightings for different types of area – tranquil and urban, for instance – was also suggested – in a very quiet area, someone noted, 35dB or 40dB might not be an appropriate limit. It was also suggested that 30dB might be 'not unreasonable' and one participant wondered if manufacturers would agree to an accreditation scheme.

Manufacturers seem keen on accreditation, and there is a scheme under development. This would certainly get round the awful possibility of an unregulated system where cheap and noisy might prevail.

A manufacturer suggested using a statistical measure rather than insisting a microturbine fall within any limit 100% of the time, which he noted any turbine was bound to exceed. "If they had to fall within limits 95% of the time then manufacturers' data could be correlated with the legislation," he explained.

The interesting issue of whether having figures would be a defence against a statutory nuisance complaint was mooted, and the need to have some sort of requirement for a maintenance programme so that old, worn turbines don't become an ear-sore.

There was a general consensus at the end of the meeting that the whole issue is "fraught" and that more research should be undertaken (something NEL was clearly keen on). There was a further suggestion that permitted development be adopted in a trial area to work out what the issues and challenges really are, neatly sidestepping some of the more weighted questions.

However, the benefit aspect may be the killer – one audience member commented that microturbines' output is "about enough in average conditions to power my TV on standby". "Is there a benefit, or is it something the government is promoting to prove it has a green outlook?" someone wondered.

Answers to that one on a postcard, but please note a manufacturer's response: "A turbine is a visible statement. Its contribution may be trivial, but it's a signal of what's going on. That's what's driving politicians. When people install one and see how little energy it produces, they modify their energy-using behaviour."

The question is, would anyone want to make a trivial contribution to reducing global warming, or indeed their energy bill? If the likely IoA recommendation for a trial and more research is adopted, perhaps a modicum of sense and perspective can be injected into the fevered, green debate.

Devil in the details

Good sound insulation between new attached homes relies on getting everything right, from the type of blockwork to the fixing of ceiling systems. Lisa Russell hears some the findings – and lessons – from the first three years' use of robust details.

"Spilt blobs of mortar in wall cavities can cause headaches for inspectors checking on the installation of robust details. Such seemingly innocuous results of sloppy workmanship can instantly undo the effectiveness of the wall's design by providing an easy route for noise to travel to the adjoining homes. As acousticians we've learn't a lot in the last five years – probably more than the previous 15 put together. The effect of mortar on wall ties was unknown," chairman of the Robust Details Inspectorate Philip Dunbavin told delegates at seminars last month, which looked at the first three years of robust details and what is to come.

Fortunately, such construction errors are claimed to be rare: "We've got a large data set to prove we are getting better than 97% compliance after three years of operation," said Robust Details Ltd (RDL) chief executive officer Dave Baker. Some 97.5% of robust details that have undergone sound tests have passed the Building Regulation standards, in most cases by a comfortable margin, with a typical performance 7dB better than the minimum level.

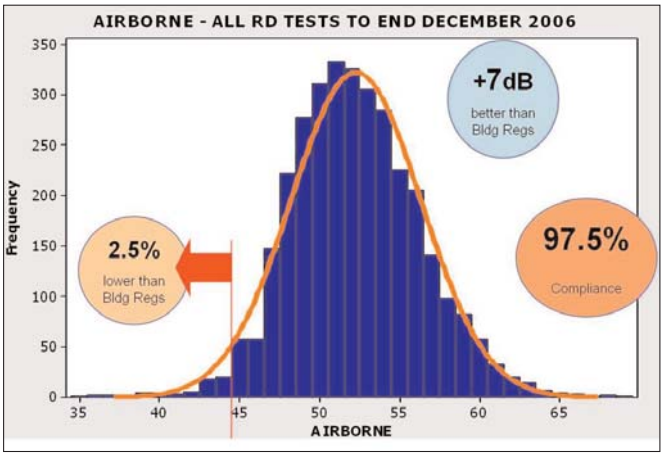
A Part E robust detail is a separating wall or floor design, assessed and approved by RDL. It has to be capable of consistently exceeding Approved Document E acoustic performance standards. Some robust details are generic, requiring no specific branded products such as blocks or boards. Others are developed by manufacturers.

Robust details were introduced in 2004 to provide a series of proven designs for walls and roofs between new, attached homes. The idea is that they should do exactly what the name says, with the design being robust enough to be constructed reliably on real-life sites. If they are too complicated – or the shopping list of parts is too long – then people will cut corners or improvise, with inevitable compromises to the design. One detail has been withdrawn and another is currently suspended following analysis of the reasons behind their high failure rates.

Use of robust details gives an alternative to pre-completion testing for demonstrating compliance with the acoustic performance standards of Part E. Deviations from the published details can result in the wall or floor failing acoustically, said Colin Potter of the technical team. Investigations on details that have failed performance monitoring tests have shown that they had been built incorrectly.

Most people building attached houses now use robust details – about 86% in 2006 – but usage in flats is, at 57%, less prevalent. A matrix is provided to show which walls and floors can be used together, for instance in apartments. Flats involve a lot more bespoke design with one-off construction that can make pattern book details less appropriate, pointed out Baker. "It is our ambition to try and address that to satisfy more builders who are building flats," said. "That said, we already have quite a significant market share."

There are a lot of new robust details in the pipeline, said Napier University depute director Dr Sean Smith, who is also senior acoustic consultant at Robin Mackenzie Partnership. "As more come in, so the matrix for building an apartment that uses separating walls and separating floors increases," he pointed out.



Statistics on the progress of robust details

Quarterly dwelling registrations have remained fairly constant since robust details' early days, with a slight increase year-on-year of about 10%. There were more than 27,000 registrations in the final quarter of 2006.

Not every builder gets it right and RDL's inspectors have to be on the lookout for sites where errors are being made.

RDL is about to undergo a three year review with government, which will examine the service provided as well as checking that the obligations for checking have been met.

"We are hoping the government will feel good about robust details." This will be important not only for the continuation of the scheme as it applies to Part E of the Building Regulations and sound insulation, but also with what happens next. Use of pattern books in Building Regulations is set to grow he believes. Many people believe that pattern books underperform once designs are adopted on site, but robust details are different, believes Baker. "We developed the pattern book with the industry. Our patterns are performing better in the field than they performed during the original project assessment phase."

In total, 1.7% of the 268,509 units registered between May 2004 and December 2006 were subject to visual inspection reports, exceeding the 1% target. Sound tests had been carried out on 3,553 dwellings by the end of December 2006, which represented some 2.2% of the plots completed under the registration scheme, beating the target figure of 2%.

Of the 4,000 or so dwellings sound-tested, about 91% have been found to meet or exceed the robust details standards and a further 6% satisfy Part E of the Building Regulations while not reaching the higher robust details criteria.

Conclusions about performance are therefore drawn from a large number of inspections, stressed Baker. An estimated 6.4% of all registered plots get some level of inspection and 25% of sites get a visit from one of the inspectors, he pointed out, which is far more than the 1% and 2% targets would imply.

Performance monitoring includes spot check visual inspections and sound tests. "We don't have any enforcement powers – if we find something seriously wrong we have to refer it to the building control body," says Dunbavin, who is also managing director of the PDA group of companies. A traffic light system is used for the visual inspections. 'Green' ones pass fully. For amber, the inspector has identified slight deviations that can easily be put right, which the builder agrees to do within 28 days. In these cases, the inspector has taken the view that the shortcomings would have no significant effect on the

sound insulation performance, though photographs may be required to prove the fault has been rectified.

But 'red' plots have been identified as having significant deviations from the detail, likely to lead to a significant reduction in performance. The word 'likely' is significant. Not all the 'reds' would fail a test – but one in five does. "Out of all the plots we have inspected, 72.3% have got a green. The build quality I see on sites now compared to five years ago is enormously improved." About 17.1% of visual inspections are rated amber. The result is that "89.4% of all robust details are being built absolutely on the money or so close that it's not going to make any difference," says Dunbavin.

Traffic light ratings are also used for the spot-check field tests. 'Green' results meet or exceed the requirements of the RD performance standards, ie 47dB $D_{nTw}+C_{tr}$ or greater for airborne, and/or 60dB L_{nTw} or lower for impact. 'Amber' means 45 or 46dB for airborne and/or 61 or 62dB for impact, which meets Part E's requirements, but fail the RD performance standards. Those classed as 'red' have failed to meet Part E's 44dB and/or 63dB values.

$D_{nTw}+C_{tr}$ is a single-number quantity which characterises the airborne sound insulation between rooms using a defined noise spectrum. The higher the number, the better. C_{tr} has been introduced as a correction to take account of specific sound spectra.

Smith showed results from three very different walls that had very different performances under the original method of measurement, but give identical results once C_{tr} is taken into account. What counts here is the performance at the lower frequencies. "I call it taming the tiger, because it is not as easy as we would like," says Smith (see box).

All 30 inspectors are acousticians, but acoustics knowledge is not enough, said Dunbavin: "They were recruited not just because they could go out and do the tests but also because they had a huge amount of experience in diagnostic work – in other words coming to your site, looking at a wall or floor that has failed and working out what has gone wrong without necessarily taking a sledgehammer to it."

The most popular robust wall detail, E-WM-4, uses blocks, render and gypsum-based board and wall ties. It is difficult to get it wrong, said Dunbavin – the mean result is 53dB for airborne and only 1.5% fail to meet the Building Regulations standards. Where it does fail, the most common cause is that people are not keeping the cavity and wall ties free from mortar droppings and debris. "It changes the stiffness characteristics of the wall tie, it couples the two leaves of the wall together, it increases the cross-sectional area for transmission," he says.

For floors, the best seller is E-FC-1, which uses specified precast concrete planks and screed with one of four ceiling systems below. Every example of the floor that has been tested has passed for impact noise. But about 2% fail on airborne noise and these have been examined. The most common mistake was that people were mixing the void from one ceiling system with the board from another.

A strength of the system is the extensive database and, in particular, the use made of it, believes Dunbavin. "We can pick out patterns and feed that back to the industry to help you avoid the same mistakes." Dunbavin is also tasked with advising the withdrawal of any robust detail that is not performing.

One wall detail, E-WM-7, is currently suspended. This uses a lightweight block, with thin joints, render and gypsum-based board. It is not very different from some other details – except that virtually all that were tested failed "and failed horribly". Where required, wall ties specific to thin joint construction were to be used, to the block manufacturers' guidance. It turned out that very stiff wall ties were being recommended, and these also had a large area that would catch mortar. Some 300 plots were affected. "We've stuck by every one of those builders and we've got every single plot through to a Building Regulations pass. It involved some creative thinking, including cutting wall ties, but we didn't leave the builders high and dry," said Dunbavin.

The one that was withdrawn is E-FC-3 – similar in many ways to another detail that performs very well. It has concrete planks, specified by thickness and density. They are grouted and topped with two resilient layers and a floating screed. About 2.7% of airborne samples failed – not enough to merit withdrawal, which is set at 5%. But more than 10% of the 193 failed the impact test – although the mean result was fine. "The problem with this system was that there was no single source for all the materials and so builders were missing bits out. When it's got everything in place, it works very well. We've learn't from this and fed this back into our assessment and approvals regime."

Weather also seems to play a part, with rain resulting in effects such as mortar slipping more easily off a trowel or board becoming warped. Field performance of a particular detail was logged for 127 uses across England and Wales. Typical performance was very good at 54dB, but in places it was rather "peaky-troughy" said Smith. Sure enough, heavy rainfall at installation tied up with low performance. "We can't ask the people who designed the code for weather-dependent robust details – much as we would like to – but it's an interesting feature that we are seeing," he observed.

Details important for sustainability

Robust details are recognised in the new code for sustainable homes (*NB issue May*). Buildings are allocated scores for a variety of factors, including sound insulation as it affects the health and well-being of occupants. The code offers 1, 3 or 4 points for exceeding the Building Regulations by 3, 5 or 8dB.

Tests have been carried out on the robust details. If 90% of the most recent 100 test results achieve 53dB or better, the detail is valued at 4 points.

The key decider in assigning the points is how to deal with C_{tr}, the correction that takes account of specific sound spectra in airborne sound. The ultimate airborne sound performance will be dictated by the low frequency performances stressed Smith. For repeated achievement of +8dB, candidate robust detail proposers and their acoustic designers will have to focus heavily on the 100Hz, 125Hz and 160Hz frequencies. "This is where the points for the code will be decided. We need to tame this tiger of the low frequencies."

Sixteen frequencies are used for measurement of airborne sound insulation. Smith pointed to the results of a series of tests that were carried out, with changes made to each frequency for values ranging from -1dB to -10dB. A matrix was drawn up covering all 16 frequencies. "If I strip off 10dB at 500Hz just by putting a hole through the wall, I'll create a -10dB drop at that frequency, but it won't change the final value by more than 1dB. But if I change 100Hz by -10dB, the overall performance changes from 48dB to 42dB." This factor will prove crucial in the design of new structures and the examination of existing details to ensure high points, he said.

● www.robustdetails.com

SOUND BITES

Campaigners are quite used to finding the media trivialising the problem of noise.

Those campaigning for a quieter life are frequently confronted by accusations that they are spoilsports and party poopers, rather ignoring the fact that noise makers spoil far more fun and enjoyment than those that seek a bit of peace and quiet.

So it's a bit of surprise to find government ministers joining in with the trivialisation when faced with a serious question from Windsor MP Adam Afriyie: "The noise of a single aircraft wakes people up in the middle of the night causing stress and generally upsetting their quality of life. What plans are there to measure aircraft noise by the noise that is heard on the ground in the eardrums of sleeping individuals rather than by obscure and complicated noise quotients, quotas and averages which do not especially affect anyone?"

Transport minister Gillian Merron responded: "I presume that the hon. Gentleman is offering to be a volunteer to have the noise measured in his ear when asleep. I shall take that information back to the Department." Then she had the cheek to claim she was "sympathetic".

In a separate debate in the House of Commons, Merron was asked when results of the attitudes to noise from aircraft sources in England (Anase) study commissioned in November 2001 into attitudes to noise from civil aircraft sources in England will be published.

Merron "anticipates" that the results of this study will be available in the summer. We frequently take a pop at Defra for needlessly sitting on useful research results until they become out of date and useless, but six years is taking the mick.

And just for the record, lest Inverness Airport ever gets busy, we note local MP Danny Alexander telling Parliament: "My constituents in Inverness want to hear more, not less noise from aircraft." We think aircraft operators seeking to find new bases for their noisier planes banned elsewhere should get in touch.

We've featured the 'Mosquito' in this column in the past – a device aimed at cutting nuisance by deterring youths with ultrasonic noise.

Now 22-year-old Dundee University student Jennifer Kelloe has come up with a *Noisebomb* to let neighbours know their noise is disturbing. The *Noisebomb* is a small package with which sufferers can record a neighbour's excessive noise and post it back to them through their letterbox.

There are also standalone `Do Not Disturb' signs which `shout' at passers-by and give an indication of just how frustrating exposure to anti-social noise can be. "I posted a prototype of the signs in the corridor here in the art college and it wasn't long before people were complaining that they were really annoying, so I took that as a sign that it works!

"Noise is the biggest nuisance to a lot of people, so I thought I would develop a noise awareness package that is very different from traditional approaches to trying to get people to just turn it down. The *Noisebomb* is a way of telling your neighbours just how disruptive their noise is without having to get into a direct confrontation with them."

NOISE EVENTS 2007

June 25th-27th
AAAF/AIAA Aircraft Noise and Emissions Reduction Symposium
(ANERS 2007) to be held in La Baule, France
www.win.tue.nl/ceas-asc

July 11th
It's practically a quality measurement!
Are your acoustic measurements fit for purpose? Organised by the IOA's Measurement and Instrumentation Group contact Linda Canty, Institute of Acoustics, 01727 848195

August 28-31
Internoise 2007
The 2007 international congress and exposition on noise control engineering to be held in Istanbul, Turkey. E-mail: contact@internoise2007.org.tr or www.internoise2007.org.tr

September 20-22th
Wind turbine noise 2007
Second international Wind Turbine Noise conference organised by: INCE/Europe to be held in Lyon, France website: www.windturbinenoise2007.org/

July 11th
Perception, Consideration and Closure –
a better way of dealing with noise from aircraft to be held at the Arden Hotel, Birmingham. Organised by the IOA's Measurement and Instrumentation Group contact Linda Canty, Institute of Acoustics, 01727 848195

October 10th
Noise Update
NSCA's noise update conference to be held in Birmingham contact Lucy Salter 01273 878770

October 22-24
Noise-Con 07,
The 2007 National Conference on noise control engineering to be held in Nevada USA, www.inceusa.org

2008:

28 July – 1 August 2008
9th International Congress on noise as a public Health Problem
to be held in Mashentucket, Connecticut USA website www.icben.org

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