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Precautionary Approaches to Power lines and Residential Land

Introduction

We have been asked to provide advice regarding the 132kV overhead line which impacts upon the development at Cot Hill, Llanwern. Where overhead lines impede residential development professional advice on their removal or diversion should be sought. If removal or diversion is not feasible a “precautionary” offset should be applied to homes and schools and a “physical” clearance to other buildings:

Precautionary Offset for Dwellings and Schools

Voltage	Restriction
275,000 and 400,000 volts lines	60 metres
132,000, 110,000 and 66,000 volts lines	30 metres
33,000, 22,000, 11,000 and 6,600 volts lines	provisionally no restriction
400 volts lines	no restriction

Source: Stakeholder Advisory Group on ELF EMF's - First Interim Assessment 27 April 2007

These measurements are based on recommended guidelines for distances from overhead lines for the building of new homes and schools published by both the Stakeholder Advisory Group on ELF EMF¹ (SAGE) and the Cross Party Inquiry into Childhood Leukaemia in 2007. The Cross Party Inquiry also recommended that Government consider the case for extending these distances to 200 metres for the highest voltage lines and pro-rata for lower voltages. The Health Protection Agency's advice to Government in 2008 was that the attention of local authority planning departments and electricity companies be drawn to the evidence for a possible small increase in childhood leukaemia which may result from siting new buildings very close to power lines, or new power lines very close to existing buildings; and that homeowners be protected by having access to information on the proximity of a property to overhead lines or EMF levels within a property. The Government has yet to formally respond to any of these recommendations.

Physical Clearance for Other Buildings

Type of Line	Conductors to ground level	Clearance from any building
400,000 volts lines	7.6 metres	5.3 metres
275,000 volts lines	7.0 metres	4.6 metres
132,000 volts lines	6.7 metres	3.6 metres
66,000 volts lines	6.0 metres	3.2 metres
33,000 & 11000 volts lines	5.2 metres	3.0 metres

Source: ENA Technical Specification 43-8 Issue 3 March 2004

¹ Extremely Low Frequency Electric and Magnetic Fields

These clearances set the statutory safe working clearances in proximity to overhead lines. Site specific clearance drawings should be obtained from the electricity company before any work takes place.

Other Considerations

The application of these offset distances will have cost and compensation implications as well as implications for the scale and form of development. Utilising public open space requirements under overhead lines and adhering to design principles is recommended within National Grid's Document "A Sense of Place". National Grid actively encourages residential development not to be built beneath their lines; partly to minimise difficulties when the conductors require replacing.

Restricted Corridor Approach

HM Government have not supported the approach of setting corridors where dwellings should not be built each side of power lines. Evidence supports a threshold of 0.4 micro tesla where there is a statistical association between magnetic fields and childhood leukaemia which averages at a distance of 60 metres from 132kV overhead lines. We are aware that some local planning authorities have established stand-off distances to high voltage overhead lines where residential development should not take place in line with the Sage Report recommendations.

Residential Developer Attitude

As a typical example, Barratt David Wilson recently produced a company policy on detractors to residential dwellings which included overhead lines. A copy of their document is attached. This largely follows the advice included in the SAGE Report.

We are aware that Barratt David Wilson, and other residential developers, have not acquired land for development where overhead lines are present.

Llanwern site

Applying this data to the site crossed by the 132kV overhead line suggests the distance from the overhead line where work should not be undertaken without approval and close supervision from the electricity company is likely to average 15 metres from centre line. The SAGE Report guidelines suggest no dwellings within 30 metres and the statistical association averaging 60 metres away. The supporting towers should not have any construction carried out within 5 metres of the base of each tower, which are likely to measure 10 metres across, as this could impact on the ground support for the towers and impair their stability. For completeness we make reference to the accompanying plan, Ringway Allotment Site rev 1, illustrating the restrictions the overhead line has upon the site.

Also applicable to the Llanwern site is the restriction the overhead line has upon altering ground levels on site. Any work in proximity to the overhead line, such as increasing or decreasing ground levels, would need to comply with the Energy Network Association Standard 43-8 in maintaining 6.7 metres to ground level from the conductors when at maximum sag and swing.

Additionally HSE Guidance Note GS6 will need to be followed in avoiding danger near overhead lines when using plant and machinery to ensure a safe working clearance is maintained at all times.

References

1. Stakeholder Advisory Group on ELF EMFs (SAGE) (2007). Precautionary Approaches to ELF EMFs. First Interim Assessment: Power Lines and Property, Wiring in Homes, and Electrical Equipment in Homes. RK Partnership Ltd, 27 April 2007.
www.rkpartnership.co.uk/sage/Public/SAGE%20first%20interim%20assessment.pdf
2. Parliamentary Cross-Party Inquiry into Childhood Leukaemia and Extremely Low Frequency Electric and Magnetic Fields ELF EMF. www.epolitix.com/forum/cpielfemf
3. Health Protection Agency Advice on the First Interim Assessment of SAGE
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1204276682532?p=1207897920036
4. Health & Safety Executive - Guidance Note GS6 (Third Edition) - Avoidance of Danger from Overhead Electric Power lines
5. Energy Networks Association - Technical Specification 43-8 Issue 3, 2004 - Overhead Line Clearance
6. NRPB (2004). Advice on Limiting Exposure to Electromagnetic Fields (0-300 GHz). [Documents of the NRPB, 15, No 2](#)

**AN ENVIRONMENTAL POLICY FOR:
DISTANCES FROM DETRACTORS TO DWELLINGS**

INTRODUCTION

- 1) In considering the potential development of a site, there is frequently a feature on or near the site that has a negative impact upon the site.
- 2) The Company does not have any specific policy for dealing with these impacts and the consequence can be a difficulty in achieving planning consent for at least part of the site or a sales resistance to part of the site as potential buyers are concerned about health risks (albeit these maybe unproven).
- 3) It is possible to seek to set a policy to cover all eventualities which would result in an extensive manual. However, that is considered impractical and so this document only seeks to cover:-
 - a) Overhead power lines and major electrical installations
 - b) Telecom masts
 - c) Sewage treatment works
- 4) All of these are not covered by any statutory minimum distances between the source and the nearest dwelling but often there are informal or “policy” requirements applied by local authorities.
- 5) Therefore, on observation of such features the advice is to seek the advice of the local authority or other appropriate body to ascertain the existence of any particular policy. Thereafter, the guidance in this document should be considered.

OVERHEAD POWER LINES

- 6) At the outset, it should be established if the power lines are terminable wayleaves (90% are terminable wayleaves) and so seek advice on removal or diversion. In the event that such lines cannot be removed or diverted feasibly then the following offset should be applied to dwellings:-

Voltage	Offset Distance
275kv to 400kv	60 metres
66kv to 132kv	30 metres
Below 33kv	No restriction

- 7) In the case of the lowest voltage lines it is the safe Health and Safety distances for construction purposes that will apply as a minimum.

- 8) Similar considerations should be made in relation to electricity substations with offset distances equivalent to the size of cable that it supplies. For a standard substation within a housing estate the main effect will be the noise generated. Therefore, the offset distance could be mitigated by surrounding walls. The key consideration is its perceived effect on sales of the adjacent dwellings and so it is essential that substations are marked on the sales plan.
- 9) It should be noted that the Stakeholder Advisory Group (SAGE) who were the originators of this standard are expected to publish further guidance on lower distribution lines and electricity substations shortly.

TELECOM MASTS

- 10) Initially, investigations should be made to ascertain the company that owns the mast. In the case of multiple ownerships each company should be contacted.
- 11) Once ownership is established the company should be written to in order to obtain the ICNIRP certificate. This provides the offset distances that were accepted for the mast to be erected. These distances should be used.
- 12) If it is not possible to obtain the necessary information then as a guideline a zone described at an angle of 45° degrees from the top of the mast should be avoided for building. Thus a mast 15 metres high would have its nearest building 15 metres away. However, at such a close distance bedroom windows facing a mast are unlikely to be a pleasant aspect and so commonsense related to the impact upon amenity should be applied.

SEWAGE TREATMENT WORKS

- 13) Much depends on the size of the works, processes carried out, anticipated extensions and local topography but offset distances of between 25 and 400 metres can be found in local policies to set a "Cordon Sanitaire" around a treatment works. Some local plans have specific policies.
- 14) The water companies and the local authority should be consulted in the first instances but in the absence of a policy a commonsense application of an offset of 25 metres from the smallest works to 400 metres from large urban facilities should be applied.

GENERAL

- 15) In taking into account there offsets, it should be remembered that it is the distances to buildings that is the offset distance and other non domestic uses (such as open space) can be accommodated in the intervening area.
- 16) However, it may not be possible to erect other buildings or plant trees within these set off distances. In the case of telecom masts there will be an offset distance for all types of building. In the case of electricity pylons the distances of the conductors to ground level will vary between 7.6 and 5.2 metres and then appropriate building clearance will need to be 5.3 to 3.0 metres accordingly underneath the lines.