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To whom it may concern,

**Bats and Lighting: Lighting Assessment Methods and Design Principles.  
Boozey Fields, Griffiths Road, Gwersyllt.  
Planning Reference P/2015/0790.**

Following further comments from the Wrexham CBC regarding the potential impact of lighting on bats associated with the proposed development, lighting assessment methods and design principles to maintain existing dark corridors at the site's boundaries are provided.

It should be noted that following discussions with the council the layout of the site has been altered. Several houses that were previously proposed to be located adjacent to the northern boundary of the site have been moved approximately 3-4m further south, away from the boundary thereby reducing potential impacts on this feature.

**Lighting Assessment Methods and Design Principles**

*Overview*

The main aim of the final lighting design will be to retain dark corridors along the northern and southern boundaries of the site so that they might retain their ecological function as commuting routes and foraging habitat for bats.

A lighting designer will be appointed during the detailed design stage of the project. The lighting designer will consult the 'Bats and Lighting Research Project' (Stone 2013) which provides recommendations for limiting the negative effects of lighting on bats. In addition the lighting designer will include site specific recommendations and principles as described below in the final scheme lighting design.

Once the lighting scheme has been produced it will be modelled using a lighting design computer program to demonstrate that acceptable levels of darkness can be achieved for key areas. The lighting design would aim to ensure that increased light spill onto the boundary features is retained in the region of 1 Lux along at least 90% of the site's northern and southern boundary features.

### *Avoidance of Impacts*

Where possible the use of artificial lighting will be avoided. Street lighting will be limited at the site by restricting lighting to the central spine road where possible with no new lighting proposed along the side roads within 15m of the site boundary. The lighting within the central spine road and along the side roads will be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls. No new street lighting is proposed for Griffiths Road.

The cycle path that passes through this area of open space/ habitat creation at the western end of the site will remain unlit.

Housing along the northern boundary of the site largely faces away from the boundary itself therefore ambient light spill in this area is considered unlikely to be significant. Where possible windows facing onto the northern and southern boundaries of the site will be small in size to further limit ambient light spill.

### *Screening of Lighting*

Buffer areas have been identified between the proposed housing and Griffiths Road. These will be planted up with tree and scrub to shield the boundary from ambient light spill from the adjoining properties and to strengthen habitat features in this area providing further bat foraging opportunities. These areas lie outside of the ownership of the new home owners and so would be maintained by the new management company. A management plan would be produced to ensure that they are maintained principally to provide an ecological function.

Light trespass onto the surrounding boundary features can be controlled through directional lighting and the use of hoods and cowls. External lighting will be fitted to the exterior of the proposed housing by the developer. This will allow control of the lighting design.

### *Use of low Impact Lighting*

A footpath is proposed along the eastern half of the site where it adjoins Griffiths Road. This would be lit with low-level, screened LED lighting as described within 'Bats and Lighting Research Project'.

The front and rear gardens of properties located adjacent to the northern and southern boundaries of the site should be lit with low intensity porch lights as opposed to with security flood lights. The porch lights should be fitted with screens to limit further light spill onto the northern and southern boundary features.

Lighting sources should be 'bat friendly' using LEDs or low wattage lamps.

### **Lighting Assessment Method**

Once the lighting scheme has been produced by the appointed lighting designer, the lighting scheme will be modelled using a lighting design computer program to predict where light will fall. Such a computer program can be used to produce a lighting plot showing predicted light measurements across the site.

The lighting design will be an iterative process whereby the overall design will be adjusted until the lighting model demonstrates that acceptable levels of darkness can be achieved around the site boundaries and that the lighting management plan has been satisfied.

The final lighting design and full lighting plot would be issued to the council for approval at the reserved matters stage.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'R. Roe', with a stylized flourish extending to the right.

Richard Roe  
Principal Ecologist