



**Project: PEACOCKE STRUCTURE PLAN AREA CHANGE**

**LDP Ref: 21-0018-001A**

**Subject: BAT SENSITIVE LIGHTING RULES**

**Organisation HAMILTON CITY COUNCIL**

**Attention:** Jamie Sirl

**Date:** 07/07/2021

**Email:** Jamie.Sirl@hcc.govt.nz

**From:** John Mckensey

**Signed:**



---

This technical memo has been prepared at the request of Hamilton City Council (**HCC**), in conjunction with a long-tailed bat report (**4Sight Report**) prepared by 4Sight Consulting (**4Sight**), to inform bat sensitive lighting rules for a proposed plan change to the Peacocke Structure Plan Area (**PSPA**).

### 1.0 INTRODUCTION

The PSPA is known to contain habitat used by the national critically endangered New Zealand long-tailed bat (**LTB**). While there is a lack of literature available regarding lighting effects on the LTB, 4Sight are of the opinion that a conservative approach is warranted and that the LTB should be assumed to be light sensitive.

Hence, HCC consider it would be appropriate to establish a set of bat sensitive lighting rules for the PSPA.

### 2.0 PROPOSED METHODOLOGY

In the absence of useful research regarding lighting effects for the LTB, we have agreed with 4Sight that the most appropriate guide currently available would be the publication jointly produced in 2018 by the (UK based) Bat Conservation Trust (**BCT**) and the (UK based) Institution of Lighting Professionals (**ILP**) – "Guidance Note 08/18: Bats and artificial lighting in the UK" (**GN 08/18**).

---

INDEPENDENT ELECTRICAL & ILLUMINATION ENGINEERS

---

This document and any attachments hereto contain confidential and/or privileged information. This information is intended solely for the individual or entity named above. If the reader of this document is not the intended recipient, you are hereby notified that any use, disclosure, storage, dissemination, or duplication of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately at the address above or by return fax, and destroy this document.

GN 08/18 recommends various physical mitigation measures in relation to separation and screening. Matters such as these have been addressed in the 4Sight Report.

In terms of lighting, GN 08/18 recommends consideration of the following potential measures to mitigate effects;

- Avoid lighting key habitats
- Set acceptable lux limits with ecologist guidance
  - Complete darkness could be considered as 0.2 lux horizontal or 0.4 lux vertical  
*NOTE: In our opinion, a practical interpretation would be "a limit of 0.3 lux in the vertical plane at 1m above ground"*
  - Relevant luminaire features;
    - Use warm white LED luminaires, aimed down and emit zero direct upward light
    - Use a warm colour temperature – preferably no more than 2700K
    - The LED spectral peak should be higher than 550nm and lack UV  
*NOTE: White LED sources do not emit any significant amount of UV. Also, LED sources with a colour temperature of 3000K or less invariably have a spectral peak higher than 550nm. Therefore, a warm white LED with a colour temperature no higher than 3000K will usually automatically address both the UV and spectral peak recommendations*
    - Minimise luminaire mounting height to minimise visibility and light spill
    - External security lighting on motion sensors with a short duration (1 minute)
    - Consider the type and location of interior lighting to minimise spill light and glare, where adjacent glazing faces directly toward bat habitat – refer to GN 08/18 for further guidance
  - Consider dimming or part night switching

*NOTE: Provided the lux limit and luminaire features described above are achieved, there would be no additional benefit in these measures and they could potentially give rise to unwanted effects such as increased crime. Hence, while such measures may be considered if believed to provide sufficient net benefit, we do not recommend mandating such measures. Further guidance is given in GN 08/18.*

- Demonstrate compliance with lux limits

The BCT website advises that they are looking to update GN 08/18 and anticipated doing so by the end of 2020. However, that does not appear to have occurred as yet, so GN 08/18 is currently considered best practice.

In addition, as discovered during the recent Amberfield (Weston Lea) Environment Court hearing, while 2700K luminaires are obtainable for commercial luminaires (e.g. roadway lights), residential outdoor luminaires are invariably available with a minimum of 3000K colour temperature. We believe that the rationale for 2700K emanates from a desire to minimise the 'blue' content and there are only a few percentage points difference in that regard between 2700K and 3000K. Therefore, we propose that the 'permitted activity' for residential lots mandate 3000K, but include a preference for 2700K in the Guidance notes.

The foregoing measures are given as a range of possible measures to consider. They are not necessarily all required. We are of the opinion that it would be practical to achieve sufficient control with a limited portion of these measures set as compliance standards. An additional set of guidance notes could be provided to assist in achieving best practice outcomes.

### **3.0 RECOMMENDED RULES**

Based on the foregoing, we recommend the following rules;

#### ***PSPA BAT SENSITIVE LIGHTING – STANDARDS***

*The Peacocke Structure Plan Area contains habitat used by the New Zealand long-tailed bat which is a national critically endangered species and believed to be light sensitive. The following standards and guidance notes are intended to minimise potential loss of habitat.*

*Where the term "land adjoining" is used, it includes all land uses, including but not limited to, building lots, public roads, private roads, access ways and reserves.*

*The terms "artificial outdoor lighting" and "fixed lighting source" include all static lighting fixed to a permanent structure (e.g. building, lighting column, fence). They exclude mobile vehicle or mobile machinery mounted lighting (e.g. headlights, navigation lights, hazard warning lights, working lights).*

### **Permitted Activities**

*Artificial outdoor lighting on land adjoining bat habitat, which satisfies the following requirements, will be a Permitted Activity;*

- 1. Added illuminance must be no greater than 0.3 lux in the vertical plane at 1m above ground at the bat habitat boundary.*
- 2. Luminaires using warm white LED, emitting zero direct upward light. Luminaires must be installed with the light emitting surface facing directly down and be mounted as low as practical.*
- 3. A maximum of 3000K colour temperature, for land with a residential use and 2700K for all other uses (e.g. all roads, access ways, commercial lots, reserves, etc), and*
- 4. Exterior security lighting controlled by a motion sensor with a short duration timer (1 minute)*

### **Restricted Discretionary Activities**

*The following are restricted discretionary activities;*

- 1. Artificial exterior lighting within a bat habitat for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical.*

### **Non-complying Activities**

*The following are non-complying activities;*

- 1. Exterior lighting for a multi-storey building, on an elevated balcony, elevated open walkway, stairwell or other building feature with external openings positioned on a building face adjacent to a bat habitat*

**Prohibited Activities**

*The following are prohibited activities;*

- 1. Artificial exterior lighting within a bat habitat, other than emergency lighting for an essential public service, and*
- 2. Any lighting adjoining bat habitat that does not satisfy the Permitted Activity requirements.*

**4.0 RECOMMENDED GUIDANCE NOTES**

In addition to the above rules, we recommend the following guidance notes;

**PSPA BAT SENSITIVE LIGHTING – GUIDANCE NOTES**

*To assist in minimising potential adverse lighting effects to the New Zealand long-tailed bat, the following publication provides further guidance that may prove helpful;*

- Guidance Note 08/18: Bats and artificial lighting in the UK*  
*(<https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>)*

*In addition the following notes may be helpful;*

- 1. The UK document recommends no more than 2700K adjacent bat habitat, so that is the preferred upper limit. The permitted activity rules for residential use require a maximum of 3000K as that is typically the lowest available for residential grade lights. If 2700K or lower can be obtained, it would be preferable.*
- 2. The use of a maximum of 3000K with zero direct upward light is encouraged for locations beyond those adjoining the bat habitat as bats in flight will see a vista greater than just the immediate area.*

3. *Limiting the height of luminaires can be helpful. The New Zealand long-tailed bat has a tendency to fly near the top of trees and the upper outer tree canopy edges. Hence, any lighting more than a few metres high may become directly visible to the bat in flight.*
4. *Bats tend to fly near tree tops and near the outer edges of foliage canopies. Where a multi-storey building is proposed adjacent to a bat habitat, features such as an elevated open walkway or open stairwell requiring exterior lighting should be placed on a face of the building other than the building face adjacent to the bat protected area. Since some such features may require lighting, where this is the case they should be located in a part of the building which does not face the bat habitat.*
5. *In the case of a building lot immediately adjacent a bat habitat, a minimum building setback of 5m with a solid 1.5m high boundary fence (i.e. impervious to light passing through), together with sensible lighting design, is capable of achieving compliance.*