Guide to Dark Sky Principles

Lacombe County's Guide to Applying Dark Sky Principles to Your Development

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LACOMBE COUNTY


LACOMBE
COUNTY

PREAMBLE

Lacombe County is proud of its rural landscape and rich natural environment. During the consultation process of the 2017 *Municipal Development Plan* (MDP) and *Land Use Bylaw* (LUB), County residents expressed their desire to ensure that the County's rural quality is protected from urbanization. Therefore a key objective for the County is to ensure that the integrity and character of the rural landscape is preserved by maintaining natural dark skies. While development is necessary and those developments should provide safe and secure environments, applying dark sky principles to your development can make a tremendous difference in preserving a natural nighttime environment.

The use of dark sky principles does not mean that light cannot be used, rather it means that the light used does not light the sky but instead lights the ground. It is based on minimizing the amount, direction, time and type of light that is used while ensuring the user(s) has adequate illumination.

Dark sky principles can be applied not only to industrial, commercial and residential multi-lot development but also to individual developments like homes, garages and farms. Many of the principles are simple design or lighting technology changes such as down facing lamps, timers and dimmer switches. These guidelines have been developed to assist developers and landowners in understanding dark sky principles, why they are beneficial and how they can be incorporated into homes, businesses and any other development projects.

Planning and Development staff are available to answer any questions that you may have concerning dark sky principles.

Dale Freitag, RPP, MCIP
Manager of Planning Services
Lacombe County

Introduction

Policy:

The County's *Municipal Development Plan* (MDP) encourages developers of both multi-lot and single developments to incorporate dark sky principles into the design of developments.

ENV&REC 4.4.12 Dark Sky Principles

Developments shall be required to design lighting that provides security and adds visual interest while minimizing light pollution through the application of dark sky lighting principles. Specific lighting requirements are outlined in Part 6 of the *Land Use Bylaw*.

Impact of Artificial Light

The International Dark Sky Association defines light pollution as the inappropriate or excessive use of artificial light which can have serious environmental consequences for humans, wildlife and our climate.

The following are a number of areas on which light pollution has a negative impact.

Human Health

Much like animals, humans also have a sleep wake cycle called our circadian rhythm and our bodies produce the hormone melatonin in response to that circadian rhythm. Melatonin is essential for human health including helping sleep, boosting the immune system and aiding in the functioning of the thyroid, pancreas, adrenal glands, etc.

Ecosystems

The natural rhythms of nocturnal and diurnal species are negatively impacted both in terms of their eating and sleeping cycles as prey use darkness for cover and use light to hunt. Insect populations are decreasing due to their attraction to artificial light, which in turn negatively impacts other species which depend

on them for food and pollination. Migrating birds also suffer from population loss as artificial light interferes with their instinct to migrate, causing migration to happen too early or late. Migrating birds instinct is to navigate by moonlight, which lead them off course to dangerous urban landscapes.

Energy Waste

The wasted energy from unnecessary lighting has a huge impact both economically and environmentally. It is estimated that 30% to 50% of the light produced is not used. This translates into easily avoidable cost, both monetary and in terms of carbon emissions. For example, Calgary Roads estimates that about $2 million of taxpayers money per year has been sent skyward due to over lighting or inefficient streetlights.

Heritage

The night sky untainted by artificial light is a natural resource, which has contributed to many human explorations around the world and into space, as well as many artistic masterpieces and the philosophies of great thinkers. Continued misuse of artificial light robs people of the unique enjoyment of the night sky.

What are the Benefits of Dark Sky Principles?

Applying dark sky principles mitigates the many negative impacts outlined in these guidelines, and provides numerous benefits to the developer, business owner, landowner and the general public. Some of these benefits include:

- Retaining the communities character and reduces sky glow;
- Providing monetary savings;
- Conserving natural resources;
- Reducing health risks;
- Promoting safety as correctly installed lighting reduces brightness and glare;
- Enhancing neighbourhood relations – excessive and misdirected lighting can intrude on others privacy or enjoyment of their property;
- Protecting flora and fauna.

Design Principles of Dark Sky Lighting: Minimize

There are four key principles to retaining natural dark skies, all of which can be accomplished through the following easy design and installation changes:

1 Minimize the amount of illumination:

- Reduce number of lighting fixtures to a level appropriate to do the task required; and
- Reduce the wattage of the bulb to the lowest level while still be able to accomplish the task.

2 Minimize the area of illumination:

- Ensure the light is only illuminating or shining on the area required;
- Aim fixtures downwards so no light is directed up or to the sides (to prevent glare);
- Reduce the number of lighting fixtures;
- Use lighting fixtures that are shielded;
- Ensure that little or no unwanted light falls directly onto adjacent properties; and
- Ensure that little/no light falls directly onto a lake or waterbody to ensure minimal impact on the aquatic environment.

3 Minimize the duration of illumination:

- Timers and motion sensors can be installed for lights in specific areas to ensure they are out when not being used; and
- Reduce the number of fixtures that are turned on to those needed for the required task.

4 Minimize the amount of 'cold' wavelength illumination in favour of those at the warmer end of the light spectrum:

- Use bulbs that are incandescent, compact fluorescent, or new generation LED with a warm colour for regular outdoor household fixtures; and
- Complete switch to high pressure sodium (HPS) bulbs for large fixtures such as, farm yard lights or parking lot illumination.

Reference Material

Lacombe County *Municipal Development Plan*

Lacombe County *Land Use Bylaw*

http://www.darksky.org

http://www.rasc.ca

http://www.beaverhills.ca/media/resources/DarkSkyHandbook.pdf

http://www.bpba.ca/images/Applying_Dark_Sky_Lighting_Principles.pdf

https://ambergriscaye.com/art/pdfs/LightingPlanGuidelines1.pdf