Stowe Nine Churches Parish Council – External Lighting Guide

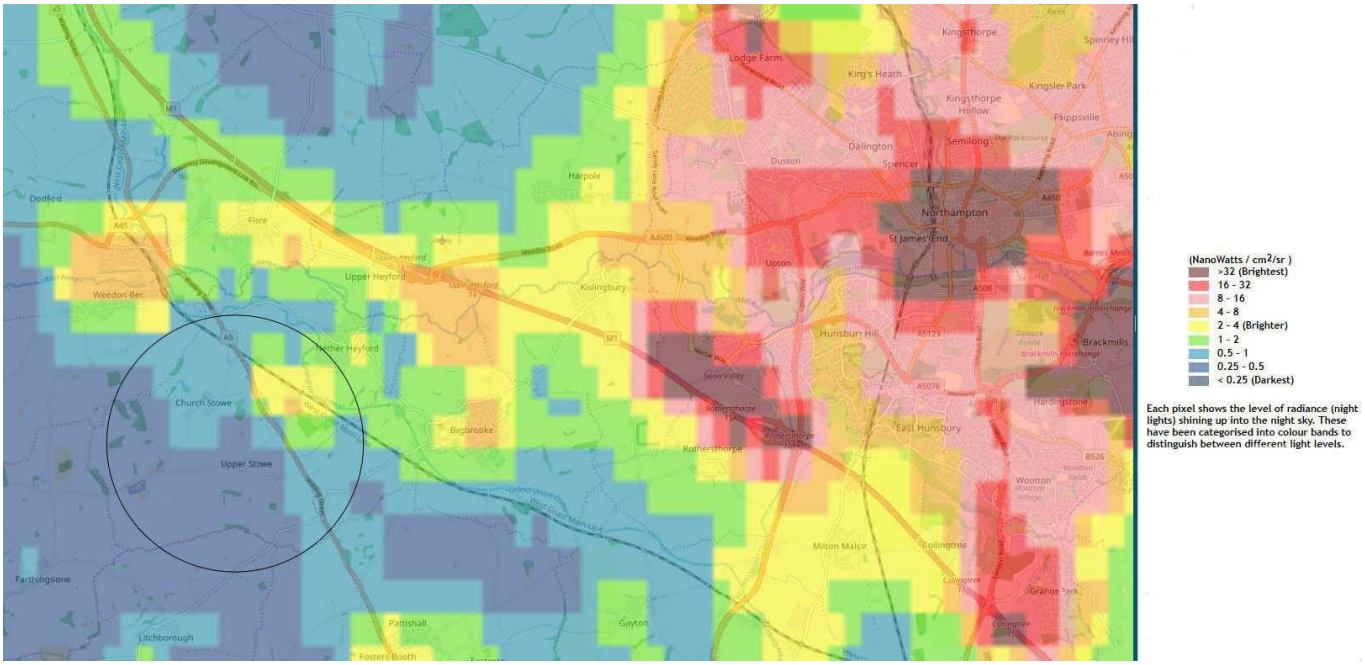
The Parish of Stowe Nine Churches in Northamptonshire encompasses the settlements of Church Stowe and Upper Stowe, together with outlying rural properties. The two settlements are each built on a plateau of Northamptonshire sand and are surrounded by farmland and wooded areas in rolling countryside.

It is an old and traditional village, with the church tower dating back to Anglo Saxon times.

An excerpt from John Moreton's The Natural History of Northamptonshire, 1712 says: "And no County in England affording a greater Variety of Quarry-Stone than this, or exceeding this in its goodness and Plenty of it, upon that account it deserves a more particular consideration"

Northamptonshire is known for its many varieties of warm sandstone buildings, the variety we have in Church Stowe has a high iron content, it has a deeper hue and burnt richness that enhances and is more satisfying than sandstone alone. It can look outstanding, particularly if lit well. One only has to view these buildings close to sunset, with the sun exhibiting its warmest colour to get an appreciation of how beautiful it can look. This is clearly a characteristic of the village we want to preserve; it shows the village in a traditional, calm and inviting way.

Another characteristic of the village which is becoming more unusual and certainly more desirable in the UK is its comparatively dark skies, the ability to observe and enjoy the stars and objects of the night sky.



From the above dark sky map, it can be seen that Upper Stowe and S, SE parts of Church Stowe have excellent viewing conditions with the night sky having radiance levels of only 10% of most of the surrounding villages and 2% of parts of Northampton. The outskirts of the village in the direction of Farthingstone giving the best conditions. A significant reason for this is that the parish has no streetlights.

From the above it can be seen our Parish has an outstanding heritage and rare features that we wish to preserve, the External Lighting Guide is designed to preserve and enhance this.

The guidance is designed to achieve 3 objectives, well designed external lighting can achieve all these generally without compromise.

- Accentuate the Aesthetic Features of the Village
    - As shown the village's ironstone buildings that can look outstanding when lit correctly, emulating the natural colour of the sun at sunset, being the objective here.
- Dark Sky Policy
    - Through the good fortune of our location in relation to major towns and industrial complexes and our current policy of no streetlights, we do have very good conditions which we want to preserve, through new technology there are also opportunities to improve and enjoy better conditions.
- Minimise energy consumption and CO^2 emissions
    - There is now a major global initiative to reduce our carbon footprint as quickly as possible, LED lighting has now almost completely replaced tungsten and fluorescent lamps. There are still many of these old lamps which can be replaced with considerable CO^2 saving in the order of 20 to 80%, with this comes the same percentage saving in energy bills too. These savings can also be increased with the use of automatic on/off and dimming controls which ensure lights are only on when they are needed.

Considerations in the design of external lighting

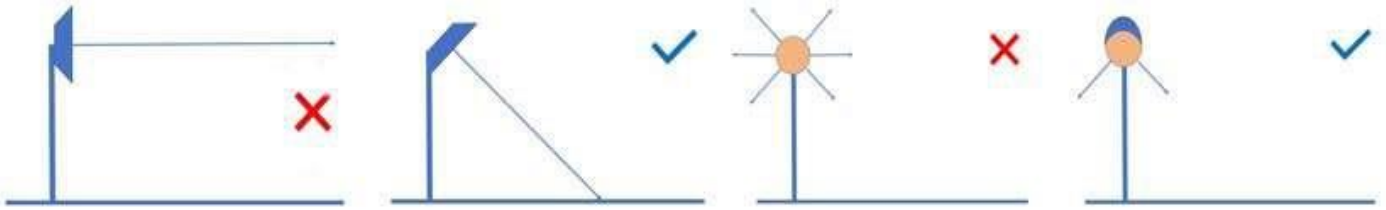
Generally, in rural communities, much less light is needed than is often used. If we go out on a night with a clear sky and a full moon, most of us would agree that this gives a perfectly acceptable amount of light for most non task related activities - we would have an illumination level of 0.25 lux. Most rural villages with street lighting are lit to 2 lux and towns as high as 10/20 lux. This clearly indicates why Stowe Nine Churches has such good night viewing conditions.

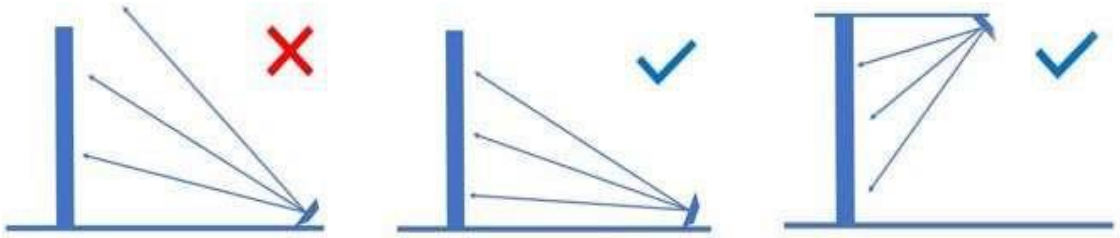
When considering lighting for your premises it is important to consider the following –

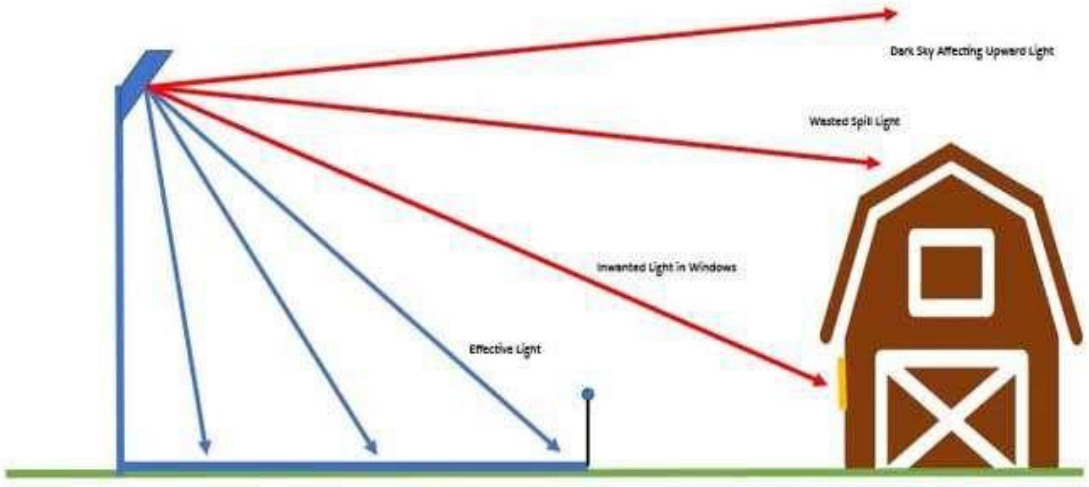
The only useful light is the light that falls on your own property, light going into the sky is wasted, generating additional CO^2, wasting money and deteriorating the night sky viewing conditions. Light falling outside of your property boundary is again wasted spill light and can cause annoyance, also if close to a road it can cause glare and "dazzle" drivers passing on the road.

The best quality and even exterior lighting are achieved by installing the light as high as possible, for lighting large areas such as gardens and yards this should be at eaves level. This reduces glare and wasted light, as the light has a more downward direction and does not spill outside the area you want to light.

Some simple design guides to assist in correctly positioning external lights.







External Tasks

There are always occasions when we need to work outside at night, there needs to be adequate light to do this safely. This can be achieved by positioning lighting close to the task at hand ensuring it covers the complete area that needs to be lit, preferably with as little spill outside of this area as possible. The above positioning diagrams will help here. Use switches and controls to switch off the lighting when the tasks are completed.

Security

Lighting plays an important part in security. Research in the past as shown that opportunist burglars are deterred by lit premises as against the unlit. This can be achieved by leaving one or two low wattage (2-5w) LED lamps on in the house, they will have virtually no external influence on the village and consume little energy.

“Many householders also install outdoor security lighting which may or may not be controlled by a presence detector, and may also operate in conjunction with security cameras; in these situations it is essential that the considerations listed above are adhered to during installation and operation, so as to avoid wasted energy and light pollution.”

Colour

The colour appearance of lamps is indicated by their colour temperature, a 100 watt light bulb being 2,700^{o} kelvin (This is best understood by considering it to be the colour of heated iron, it starts as a dull orange then as it continues to heat getting more blue).

In our world as the sun starts to rise it starts off at around 2,700^{o}K and rises as high as 15,000^{o}K in the North facing midday. This is because the sun has to shine a short distance through the atmosphere at midday but because of the angle, a long distance at sunrise/sunset. The atmosphere filtering out the blue light.

Also, other natural light sources such as candles and fires tend to be in the order of 1,500^{o}K to 1,800^{o}K. Naturally as the light level from the sun drops the colour becomes more orange/red. We therefore feel comfortable with lighting around 2,700^{o}K in the evening (the colour of the old 100 watt light bulbs.)

We discussed earlier that our village stone looks particularly good at sunset, when the orange/red light enhances the natural colour of the stone. Therefore, it makes sense that we choose lamps for our Exterior Lighting that emulate this. Lamps are readily available between 2,700^{o}K and 3,000^{o}K, these are not quite as common as the more blue 4,000^{o}K+ which are designed for commercial offices and industrial applications where the light is much brighter, therefore care should be taken to check when purchasing, it should be on the carton.

In addition, there is now much research that shows all light, but particularly blue light, has a negative impact on our Circadian Rhythm, the process in our body that regulates our sleep/wake cycle, making it more difficult to sleep, and thus more tired when we are awake. Modern Smartphones now allow their screen to filter out blue light at night for this reason. Care should be taken to ensure no light shines through your own, or your neighbour's, bedroom windows, and certainly no 4,000^{o}K or higher "blue" light.

Lamp Wattage

For good design, and to meet our Criteria, we should always choose the lowest wattage possible to achieve the light level we require. As stated earlier, external lighting needs far less light than internal lighting, if unsure and it is possible, starting off with a 2w lamp for mounting up to 3m or a 10w lamp for eaves level would be a good starting place for general outdoor premises lighting, increasing if it is not adequate. Task Lighting may require more, dependent upon the task.

Summary

- Position lighting carefully ensuring no upward light and no spill light outside your premises.
- Use the lowest wattage that is acceptable.
- Use 2,700^{o}K to 3,000^{o}K colour temperature.
- Switch off when not required.
- Survey your existing external lighting to see where you can save some energy and improve the villages appearance