Guidance Note 10/19

Night-time photography

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Introduction

This Guidance Note has been developed to provide advice for those taking night-time photographs of exterior lighting installations be they for presentations, formal reports, assessments, competition entries or any other purpose.

Professional photographers will produce high-quality images using a high-specification digital camera and lens. Whilst the lighting professional may not be able to match the standard of these professionally produced images, careful attention to detail and the right equipment can still produce good results.

Equipment

Whilst the majority of modern mobile phones have good cameras built into them and come with a professional mode and produce good images in very low light, they can be problematic when trying to obtain the right night-time photographs – ensuring the required focal length, focus and depth of field for the desired images.

It is therefore recommended that a high-quality digital SLR camera from one of the major brands be used.

The camera should preferably be fitted with a fixed-focus high-quality lens providing a 50mm focal length when the camera has a full-frame sensor, and a 35mm focal length for a DX format camera (with a smaller sensor), and as large an aperture setting as possible. If a zoom lens is fitted it should be fixed at the aperture matching the sensor when taking the image. This provides a similar magnification and angle of sight to that of the human eye, especially important if taking images for evidence purposes.

The following additional equipment and features should also be considered:

- Tripod: a sturdy tripod with panning head and suitable levelling indicator; for the long exposures required the camera must be held steady and the sturdier the tripod the less it will be affected in windy conditions.
- Remote shutter release: you may use the camera's in-built self-timer but pressing the button can cause some camera shake so a good remote shutter release compatible with the camera will be a good investment. Many of the more modern digital SLRs also permit remote operation through an app on a tablet, smart phone or similar; this can bring other benefits, as discussed later, in considering the images as they are taken.

Camera set-up

Firstly, be familiar with your camera and equipment. Night-time photography is a slow process and by its very nature you are in an environment where there are many things to consider, and the last thing

Typical digital SLR and associated equipment

you need is to have to spend time finding buttons, display settings and the like.

Except for more decorative or effect images, the majority of images of night-time lighting installations are intended to show what users experience. For this reason, a lens with a focal length of 50mm or 35mm, as explained previously, is of importance as is the height at which the image is taken.

It is recommended that the same lens/lens setting is used consistently for all comparable photographs, particularly where day and night comparisons are required.

For normal representation images should be taken at a height of 1.7m, the height of the eyes of an average adult. In practice, the additional height between the lens axis and camera eyepiece makes this impracticable for all but tall people unless the camera has 'live-view'. Unless the subject being recorded is very close, the difference in vertical viewing angle will be very small and setting the camera at 1.5m above ground is likely to be more practical.

The camera should be taken out of auto mode and set to manual and the flash should be disabled.

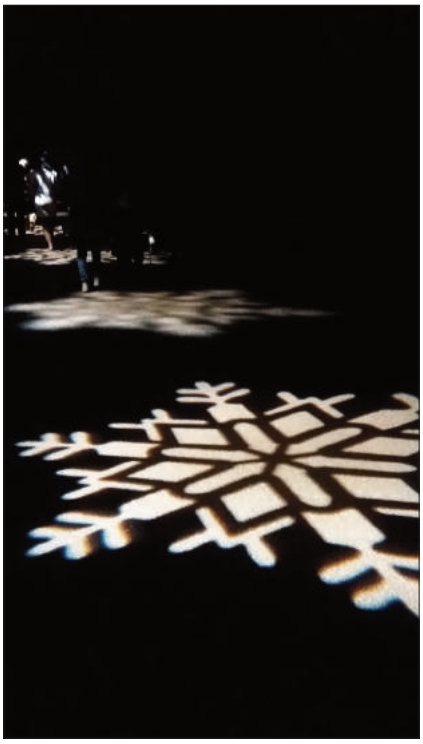
Focus

Autofocus can struggle especially at night, and therefore it is best to use manual focusing. Also at times, depending upon the subject being photographed, there may be a lack of target to adequately focus on, so the scale of the lens may have to be referenced and the lens set accordingly.

Lens aperture-setting effects

The normal approach is to open the aperture as wide possible in order to allow as much light a possible to enter the camera and this may be suitable for some purposes. The disadvantage of this approach is that the image will lack any depth of field making it unsuitable when photographing buildings, highways and most tasks.

The required depth of field must be a consideration, and this will require the larger 'f' stop (smaller aperture) perhaps down to f/11 or even f/16. This of course



Images showing poor depth of field

Images showing good depth of field

reduces the amount of light into the camera and has to be compensated for with regard to shutter speed and to some extent the camera's ISO setting.

Shutter speed

Night-time images require a long shutter speed (long exposure time) which is also related to the aperture setting, ie the smaller the aperture the longer the shutter speed required. It also depends if any effects of movement within the image are required – such as light trails from vehicles which may require a shutter speed approaching 30 seconds.

Many DSLRs have shutter speeds up to 30 seconds and if a longer exposure is need then the B setting ('bulb') can be used which will keep the shutter open as long as the shutter button is pressed. A shutter release is essential for this and one that incorporates a lock, so you do not have to actually hold the button the entire time, will be of use.

With long shutter speed the camera will take time to render the final image, so it may not be available for viewing quite as quickly as normal.

Aperture and shutter speed

It is best to experiment with aperture and speed settings perhaps using the camera set on AV (aperture) or TV (shutter priority) modes or fully manual to determine what best works for the scene being photographed.

ISO setting

ISO is a standardised industry scale for measuring how sensitive the camera sensor is to light; the higher the number

Human movement

Light trails

the more sensitive it is. Changing the ISO setting adjusts the sensitivity of the camera, and whist many cameras now go up to very high ISO settings the temptation to use them should be avoided. ISO should be kept as low as possible in order to avoid any digital noise created because the higher the ISO the more noise encountered.

White balance

White balance relates to the way digital cameras can change/interpret the colour cast of the image. The white balance can generally be set to a number of presets – tungsten, fluorescent, daylight, shade, cloudy, a colour temperature range – or can be set to an automatic mode.

Lit nightscapes can contain a wide range of colour temperatures as well as light sources and the photographer will have to consider what white balance is best for each shot. This can be a matter of personal preference and often auto white balance on most cameras performs extremely well in selecting the right white balance

Shooting/file format

Most people are familiar with the JPEG format but the option of shooting in RAW might be a consideration. When shooting in JPEG the camera does a certain amount of processing and the recorded image is compressed. However the RAW format captures all image data when the photo is taken. Using software, you are then able to process the images to obtain higher-quality images as well as correct aspects such as over- or under-exposed images which you cannot do with JPEG.

RAW files tend to be two to three times larger than JPEG and will therefore take up more space on the memory card. The images will also take longer to write to the memory card, so they will fill up the camera buffer more quickly.

Image enhanced by the blue-sky effect

When?

The so called 'magic hour' is generally the hour or so after sunset and is the time of day when the light hasn't quite disappeared and the sky takes on a whole array of indigo hues. A similar effect can be seen in the morning an hour or so prior to sunrise.

Photographing exterior scenes during this time benefits the image in terms of the sky with rich dark blues rather than the full blackness of a night sky.

Checking the image

It is important that the image taken matches the scene being considered. With digital cameras checking is fairly easy as the image taken can be shown on the display screen and immediately compared with the visual scene in front of the camera. The aperture and shutter speed settings can then be adjusted until the desired image is obtained.

The camera display itself may be too small or lack the quality to undertake this fully and many modern cameras will now link to a tablet, smart phone or similar, so the image can be viewed in greater detail at the time of taking.

Other considerations

Image stabilisation technology

This is a feature of many modern cameras. However, it does not work over extended exposure times. It is normal for this to be switched off for long exposures.

Lens inter-reflections

Modern lenses have coatings on the glass to help reduce reflections between the various elements, which would otherwise reduce contrast and result in 'ghost' images. The presence of bright light sources does accentuate the problem, particularly when the rest of the scene is relatively dark.

Use of a lens hood to restrict light hitting the lens at oblique angles may assist if there are many sources in the wider scene.

Skylight and UV filters, often used to protect the front surface of the lens, may also add to problems of inter-reflection. Removing them may help but leaves the front lens element more vulnerable. It may not be possible to eliminate all multiple images caused by sources in view, so if they do appear, it is necessary to add explanatory comments with the affected images.

Image manipulation ('Photoshopping')

It is possible to remove some of the problem effects listed above by post-processing of the image using Adobe Photoshop or similar programmes. However, this could lead to suggestions of other manipulation of the apparent effects and it is recommended that post-processing of this type is not done, with any unusual effects being explained in the accompanying text.

If post-processing is done, it must be clearly acknowledged and described, with full details of the manipulations used. The reasons for undertaking it should also be given.

Further reading

There are many good books and YouTube videos that provide good background through to more detailed instruction in the art and practice of photography. Many of these specifically consider specialised practices such as night-time photography. It is perhaps best to watch a video that is specific to the camera model you use.

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Images kindly provided by Elisabeth Howard, Westminster City Council, and WSP.