

# LIGHTING JOURNAL

Professional best practice from the Institution of Lighting Professionals November/December 2019

## TIME TO SHINE

How lighting has restored New Zealand's earthquake-damaged 'Timeball' Station

## PRISON SELL

LED is providing solutions to the challenging environment of prison lighting

## CHRISTMAS POUNDS

Ensuring lighting columns are safe to carry the load of festive lighting



The publication for all lighting professionals

# PRISON SELL

*Prisons can be challenging environments from a lighting perspective, as luminaires need to be robust, reliable, impact-, tamper- and attack-resistant, prevent inmates from self-harming and be easy to maintain. With our prison estate expanding, it is perhaps unsurprising that LED solutions are becoming increasingly attractive*

By Steve Tilling

**W**hether you're lighting a 19th century building or a new 'super prison', safety is the key consideration when it comes to custodial luminaires and lightingschemes.

Ensuring the wellbeing of prisoners and operational personnel is also of the utmost importance. A custodial luminaire must pass stringent Ministry of Justice (MoJ) standards. This includes real-world destruction tests that use implements that could be available to a prisoner, such as chair legs and pool cues.

Impact resistance is governed by the European Standard EN 60068-2-75, which tests the joules of energy a luminaire can resist. A compliant luminaire is given an IK rating.

The highest IK rating, IK10, is equal to an impact of 20 joules of energy. However, in custodial environments this level of impact resistance is simply not adequate. At Designplan, for example, we have built a drop-test rig that can create impacts up to 250 joules of energy, or 12.5 times more than an IK10 rated fitting, to ensure our luminaires are fit for purpose.

Preventing self-harming is another key safety concern in custodial applications. MoJ standards state that in 'safer cell' applications, 'the luminaires must be designed so as to reduce the potential for a prisoner to attach a ligature in order to attempt suicide'.

This is achieved by minimising the aperture between the luminaire's diffuser and body, incorporating anti-pick mastic around the base plate of the fitting and utilising tamper-proof screws.

To resist extended periods of naked flame attack, specially designed diffusers are incorporated into custodial light fittings to stop holes being created that could be used to attach ligatures or store contraband. In addition, a wire mesh can be incorporated into a luminaire as another way to help prevent a fitting from being breached.

## EMERGENCY LIGHTING

Emergency lighting is very important in the context of custodial lighting. Many general custodial areas can be lit to BS5266-1:2016. However, the MoJ has a very stringent set of specific emergency lighting standards.

These require enhanced lighting levels, which go over and above normal emergency lighting levels, for high risk areas, secured doors or gatelines and defined escape routes.

Cost of ownership and ease of maintenance have become increasingly important in custodial applications.

To that end, LED light engines have been the most significant product innovation in the lighting industry in the past 20 years. LED ensures a higher level of illumination, longer running times and significantly reduced energy use.

For example, when compared to traditional fluorescent luminaires, LED light fittings can use up to 65% less energy. The MoJ is the second largest government department in terms of size and estate running costs. This equated to more than £500m in 2017/18 [1].

Therefore, the opportunity of utilising LED technology when upgrading or replacing existing antiquated lighting in the MoJ estate is significant. This energy reduction also counts towards the overall zero carbon target the government has committed to by 2050.

The cost of replacing old fluorescent lighting with LED can be significant, however. Luminaires with removable gear trays enable custodial facilities to easily adopt the latest technology upgrades quickly and cost effectively.

## RETROFITTING QUESTIONS

However, retrofitting into an existing fluorescent fitting constitutes a fundamental alteration to the product. When retrofitting, operators of custodial applications must be aware of the golden rule: CE + CE doesn't equal CE.

Recertification, testing and re-CE marking as a new product is mandatory. Providing energy savings in custodial applications is obvious. However, this should only be introduced in accordance with the compliance laid out by the MoJ – and without ignoring basic safety measures in this specialised sector.

The logistics of moving prisoners from block to block to carry out maintenance is a major consideration in custodial

applications, especially in large prisons. In this context, luminaires that incorporate removable gear trays not only save energy but ensure quick and easy upgrades, resulting in less disruption to prisoners and staff.

The Prison Estates Transformation Programme (PETP) has committed to providing an additional 10,000 new prison places by 2020 [2].

Whilst this will be a challenge to deliver, there is an opportunity within this to incorporate innovation in lighting with the construction of new-build prisons.

Simple lighting controls, daylight saving and using lighting systems to incorporate other services will all ensure PETP is delivered in the most energy efficient way, with the lighting element fit for purpose both now and in the future.

## CONCLUSION

To summarise, when specifying light fittings for custodial environments the safety of prisoners and staff is paramount. The construction of the product is very important, as is compliance to various standards.

Easy maintenance and reduced energy consumption are also key drivers as custodial applications look to retrofit existing luminaires to LED or build new facilities which maximise the use of the latest lighting technology.

*Steve Tilling is national sales manager for the custodial sector at Designplan Lighting*

## REFERENCES

[1] 'State of the Estate in 2017-2018', Cabinet Office, June 2019, <https://www.gov.uk/government/publications/state-of-the-estate-in-2017-2018>

[2] 'PM to create 10,000 new prison places and extend stop-and-search', BBC, August 2019, <https://www.bbc.co.uk/news/uk-49309112>



## Lighting for prisons



### CASE STUDY – ‘THE UK’S FIRST 100% LED PRISON’

HMP Berwyn in Wrexham was opened in 2017 and is a 21st century rehabilitative establishment accommodating 2,106 ‘category C’ men, writes Steve Tilling.

For those unfamiliar with prison categories, category C is inmates who are deemed not to be trusted in an open prison but who have been recognised as being unlikely to make any attempt at escape.

It is also the UK’s first 100% LED prison. We at Designplan supplied more than 6,000 luminaires to all areas of the facility, working from the initial design phase through to commissioning and ongoing facilities management maintenance.

With HMP Berwyn, the Ministry of Justice (MoJ) has adopted a progressive approach. However, it is still a prison where the men are locked in their rooms

for up to 12 hours a day.

Therefore, a robust approach to lighting is essential. Our ‘Abrams AL’ luminaire is installed in all 1,350 rooms and en suites.

The anti-ligature design is ‘safer cell’-approved, to prevent self-harming, and the IK16 rating ensures the fitting can withstand a force of 150 joules. This is 7.5 times more than the standard 20 joules.

Each room has its own control panel that allows light levels to be adjusted to low, medium, high and night-light.

The Abrams AL’s patented flame and puncture-resistant diffuser, secured with tamper-proof screws, prevents the luminaire from being breached and used as a weapon.

On the association and landing areas, our robust IK16-rated ‘Tuscan’ luminaire can resist extreme attack. The gradient top design also prevents the fitting from being used as a place to conceal restricted items.

Every prisoner works or is involved in voca-

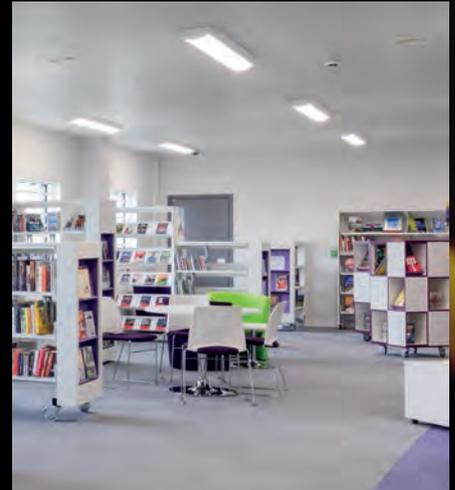
tional training, except those who are retired.

To that end, our ‘Curve VR’ luminaire is installed in all 34 classrooms and the library. These have reinforced ceiling mounted fittings, which provide a safe yet non-institutional feel to the development areas.

With a limited amount of time spent outside, natural light inside helps to support human health and aids mental and visual stimulation.

The education block is naturally bright, with daylight sensors used to control the level of artificial light. The luminaires remain unlit when natural light levels are adequate, also helping to reduce energy and running costs.

To conclude, Designplan delivered a lighting solution to illuminate all aspects of HMP Berwyn, creating an environment which upholds the progressive values of this pioneering prison.



Top left HMP Berwyn’s association and landing areas are illuminated by Designplan’s IK16 rated Tuscan luminaire

Top right Curve VR provides a safe yet non-institutional feel to the library and development areas.

Bottom left A typical HMP Berwyn house block.

Bottom right Abrams AL, a MoJ safer cells compliant luminaire, is installed in all 1,350 rooms and en suites.