



YGSOL GLANCEGIN

DEXTRA LIGHTING'S LED SOLUTION
HELPS BANGOR SCHOOL ACHIEVE
BREEAM "EXCELLENT" STANDARD

Dextra
LIGHTING

ABOUT THE CLIENT

Gwynedd council appointed Dextra Lighting to design, manufacture and deliver a future-proof LED lighting solution as part of its goal to achieve BREEAM "Excellent" for the newly-built Ygsol Glancegin school in Maesgeirchen, Bangor.

The £5.1m project, funded by the council and the Welsh Government's "21st Century Schools" programme, began in 2016, with Wynne Construction and Lovelock Mitchell Architects at the helm.

Under the Welsh Government's guidelines on the sustainable development of public buildings, the project was to ensure "children have access to the best possible educational resources" and was to be constructed in accordance with BREEAM "Excellent" criteria.

BREEAM sets the European standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

Now at the end of its first academic year since reopening, the school has reaped the benefits of the sensor-controlled LED system in the form of significant energy savings*, 100% tax reduction as part of the ECA scheme for the first year of purchase, financial benefits of improving its performance on the Carbon Reduction Commitment league table and no maintenance costs incurred.

With lighting amounting to roughly 40% of an average school's utility bill and energy prices on the rise, the future-proof system will continue to generate revenue for the school by minimising energy and maintenance costs in the long-term, which will free up capital for other improvements to facilities or services.

* Approximately 50% less energy consumed than conventional fluorescent or 70% HID alternatives and an additional 30% average in energy savings gained by incorporating intelligent sensor controls.



THE BRIEF

To score highly in a BREEAM assessment the lighting design needed to perform well in a number of criteria relating not only to energy-efficiency but in safety, comfort and overall effectiveness. Sustainability, functionality and flexibility, therefore, were to go hand in hand to create a modern, stimulating teaching environment for staff and students alike.

Credits would be awarded for factors which are outlined in different sections of the official BREEAM guide. The main sections relevant to lighting are:

- Sustainable Procurement
- Visual Comfort
- Reduction of Emissions
- Energy Monitoring
- External Lighting
- Reduction of Light Pollution

As one of the UK's leading manufacturers of energy-efficient lighting, sustainability runs at the core of Dextra Group's operations. Gwynedd council were reassured not only by the extensive range of efficient LED products available but by the fact that Dextra's efficient transport fleet operates strategically to minimise its carbon miles and that Dextra, Dextra's AATF registered luminaire recycling subsidiary, would promptly recycle all the old fittings and other electrical waste in accordance with WEEE regulations following the demolition of the old building.

With low-carbon methodologies as its backbone, the design approach would refer to guidelines and standards provided by CIBSE (Part L2A for the Conservation of fuel and power for non-domestic buildings), SLL Code for Lighting, British Standards and all relevant safety regulations, to ensure full compliance is achieved. The key elements in lighting design to observe included:

- Glare control
- Daylight design
- Task appropriate illumination levels (Lux and uniformity)
- Zoning and occupant control
- Accessibility of controls

The council would also be required to produce all documentation to prove the design criteria and compliance were met alongside continuous monitoring of the performance of the system over time. With Dextra Group's experienced design team and LED products using the latest LM 80-verified sources, and luminaires offering both L2 and ECA compliance – this process was made easier for the local authority.

Emergency Lighting with standalone central battery was required with performance and testing functions compliant to BS 5266 standards.



THE SOLUTION

Classrooms – Runway Surface / Suspended & PIR sensor

For projects that require both an architectural and practical approach, the Runway LED's slimline anodised aluminium housing offers a contemporary minimalist form, backed by the premium performance and light quality offered by the latest Lumileds LED source and highly efficient optics. The combination of high-quality components and efficient design allows the luminaire to operate at an impressive efficiency of up to 118 llm/w.

The Runway LED is designed with versatility in mind. With output packages ranging from 871 llm to 4244 llm across two body sizes, a choice of a BSEN 12464 compliant microprism insert or a brighter opal diffuser, and black or white finishes to match the interior, the luminaire can be surface-mounted or suspended in a range of ceiling types to suit most architectural, practical or decorative approaches.

To achieve the recommended 300 lux and uniformity levels for reading, writing and the use of teaching aids, a 1500mm, suspended version with opal diffuser was provided, which uses a bi-directional optic to distribute 75% of its total 3331 llm output downward on to the study area and 25% onto the ceiling.

The result is that with a relatively high output, the bi-directional distribution dissipates the overall light intensity to prevent harsh glare from forming. Luminaires above the whiteboard were also installed with their own separate manual controls so that they could be switched on or off accordingly to avoid glare and unwanted reflectances during certain times of the day.

A C84 (4000k) cool-white LED source was used to provide a stimulating and comfortable light temperature.

The Runway LED is compatible with all mainstream analogue and digital dimming types (White Tuneable now also available) which can be used with a wide choice of integral and standalone sensors from Dextor's Reacta range to maximise energy savings and flexibility in control.

In each classroom, fixed output luminaires are now controlled by a single lighting control module (LCM) connected to a flush-mounted Reacta 7 passive infrared sensor offering daylight regulation and absence control. The installation, therefore, will harvest daylight entering the windows whilst ensuring the correct lux levels are maintained throughout the day. When classrooms are vacated, the luminaires will also automatically switch off.

By keeping the number of sensors and control units as low as possible without compromising the precision of the sensor's detection area and functionality, installation times were kept low, keeping the project well within schedule and budget.



THE PRODUCTS

Circulation & WC facilities – Protec LED

With a wide range of customisable options including a number of lumen outputs, reflectors (specular and semi-specular), colour attachments and custom bezels, the Protec LED gives designers the flexibility to tailor each installation to suit a variety of applications.

Its interchangeable reflectors and colour attachments make the luminaire adaptable to future changes in décor and layout, whilst a range of colour temperatures and CRI (colour rendering) options ensure that optimal light quality is achieved with each installation.

This versatility allowed the recessed downlighter to satisfy the requirements of both the circulation areas and bathrooms. Luminaires with a 2000lm output were used in varying quantities to provide the recommended 100 Lux and UGR 25 for the circulation areas and the 150 Lux for the WC facilities. Thanks to its high-performance Lumileds LED source and efficient specular reflector, optimal light levels and uniform coverage were achieved whilst operating at a low circuit wattage of 14.7w.

For the WC facilities a IP44 cover was supplied which was silicone in-situ to provide full IP65 protection to dirt, dust and water ingress.

In addition to its versatility and attractive contemporary design, the luminaire owes its popularity to its premium performance, combining high-efficiency anodised aluminium reflectors and the latest Lumileds LEDs and Philips or Tridonic drivers to offer a light output ratio in excess of 90% whilst consuming up to 70% less energy than fluorescent or HID equivalents for shorter payback periods and reduced carbon emissions.

The Protec LED offers flexible and cost-effective installation, with a four-point, self-clamping bracket, making installation less time consuming and is suitable for a range of ceiling types and surfaces including plaster and mineral fibre in thicknesses ranging between 3mm and 30mm.

The luminaire offers compatibility with DALI, Touch Dim dimming functions alongside standalone sensors and a range of remote or manual switch controls. The Protec LED luminaires were connected to a Reacta 3 microwave sensor in each zone, which are controlled by their respective LCM to offer daylight control in the form of a bright-out function and occupancy detection for when corridors are vacated.



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THE SOLUTION

Multi-purpose Hall – Prosport LED

The Prosport LED utilises LED technology to optimise lighting conditions for a range of indoor sports whilst reducing energy and maintenance costs.

The versatile luminaire is available in various distributions and output packages of up to 30,601 luminaire lumens, ensuring the correct lux levels, uniformity ratio and glare control are achieved for each sporting activity. These factors will ensure maximum visibility of fast moving objects in the field of play to increase safety, especially for younger students.

Although the multi-purpose room did not need to fulfil stringent Sports England criteria, the 15,079lm version installed comfortably fulfilled the 500 to 750Lux suitable for most recreational or school sports environments. A versatile symmetrical optic was selected to support a broader range of sports, activities and events. An asymmetrical bracket is also available, offering an angled distribution ideal for badminton or tennis applications.

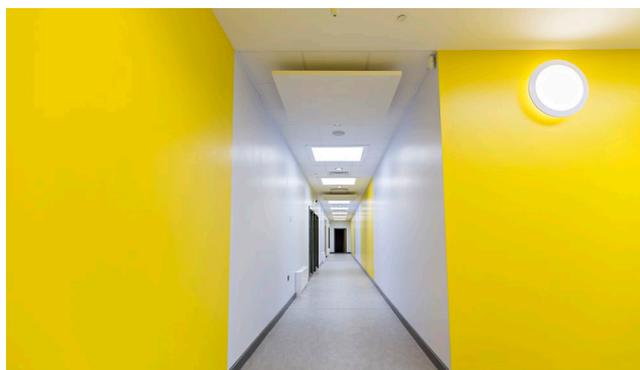
As ball games were expected to be played in the hall, the Prosport's robust IK10-rated steel housing and polycarbonate ends caps offer suitable protection from ball strikes, and unlike fluorescent or HID luminaires, its LED source eliminates the risk of shattered lamps. This durable construction combined with the long life and low-maintenance benefits of its reliable Lumileds LED source, make the Prosport LED a fit-and-forget and sustainable solution.

Luminaires were positioned with careful consideration of the direction of daylight entering the room as well as wall and ceiling reflectances, to provide optimum light levels throughout the day and avoid discomfort and disability glare.

The Prosport's zintec spine simplified mounting at the inconveniently high ceilings and was prewired to the required specifications to reduce the time and costs of installation.

From a range of dimming options, the luminaire was customised with DALI dimming, offering the flexibility to switch between scene plates. The scenes can be programmed and commissioned via the user-friendly REA DPA Advanced LCD digital Programmer to create preset light levels to suit different sports or activities. Luminaires were connected to a LCM providing centralised sensor control to automatically adapt the lighting to daylight levels and occupancy patterns.

After Dextra Lighting's technical team provided the initial commissioning and basic training, the staff will be able to operate the system independently without incurring further call-out charges.



THE PRODUCTS

Corridors – Capo LED

The Capo LED pendant luminaire brought an energy-efficiency and a decorative touch to the building. The attractive luminaire was suspended from the higher ceilings of certain corridors combining the modern functionality of LED technology with a classic pendant design.

The luminaire's anodised spun rear housing, coloured translucent collar (different colours provided upon request) and opal refractors, combine efficiency with form and can be customised to suit a variety of decors and themes.

For corridors with higher ceilings, a 2992lm version of the luminaire was suspended at a level that would provide the recommended 100 lux at floor level without wasting energy into lighting the entire vertical space.

The Capo LED was supplied with a highly efficient LED chip-on-board source providing similar lumens to 70w HID sources at half the power load whilst eliminating the need to replace lamps at impractical ceiling heights.

To complete this range's up-to-date functionality, DSI, Switch Dimming and Analogue Dimming control gear are also available, accompanied by compatibility to a wide choice of sensors for maximum energy savings.



Offices, Staff Room & Classrooms – Graduate LED Recessed

For the teacher's offices, staff room and remaining classrooms with suspended ceiling grid systems, a 2861lm version of the Graduate Recessed LED was installed offering BSEN 12464 compliant glare control for maximum visual comfort for staff using computers and other VDUs. This output offers a triple compliance package by not only meeting the 3000 candela glare limit but by comfortably exceeding the 82lm/w required by L2 standards and fulfils all ETL (Energy Technology List) efficiency criteria for compliance to the ECA scheme.

The Graduate LED Recessed has been the luminaire of choice for educational establishments around the UK who are particularly observant of their energy management, budgets and environmental impact but are equally committed to providing the best quality facilities for their pupils.

Energy-efficiency meets high performance with the luminaire's aluminium gull-wing reflectors and prismatic opal extruded diffuser, making the most of its HE 3535 Lumileds LED source. Available in a wide range of output packages, sizes and installation formats (lay-in or pull-up), the luminaire can be customised to suit specific requirements of each application. A practical 25 litre-per-second air-handling option is also available with this product, allowing for installations to integrate lighting and ventilation systems with minimal modifications to the ceiling.

Luminaires were connected to strategically positioned Reacta 7 PIR sensors to offer occupancy detection and a bright-out function for when daylight levels exceed the required 300 Lux for classroom use.



THE PRODUCTS

External Lighting

The Avalon Wallpack floodlight, was mounted directly onto the building's external walls, providing pedestrians with safe and clear perimeter lighting. The luminaires illuminated all entrances whilst providing a pleasant evening ambiance. The durable luminaire is manufactured in high-quality die-cast aluminium and uses the latest Lumileds LEDs to offer increased efficiency and requires minimal maintenance to run. Supplied in a 2547lm output, the luminaire achieved the required lux levels for the building exterior with its external reeded curved diffuser and internal optic creating a comfortable and even light coverage.

Other products used in this project include:

The sturdy and efficient IP65-rated Hydra LED in the plant room, offering a hassle-free, low-maintenance solution offering added protection to dirt, dust and water ingress as well as resistance to higher temperatures. The efficient and attractive Discalo LED bulkhead on the other hand, was wall-mounted in the building's stairwells.

Emergency

The LED3 Emergency Module was installed to provide three-hour non-maintained emergency lighting in optimal positions throughout the premises. The durable IP-rated and efficient 2.5w AME LED emergency bulkhead was installed to increase emergency lighting coverage in the building. The self-contained HBE "Hanging-Blade" and EXI LED emergency exit luminaires provided clear, energy-efficient and low-maintenance emergency signage in compliance with BS 5266 regulations.

All emergency luminaires were part of a relay system connected to a maintained central battery supply specifically requested for the project, which economises the ongoing maintenance of the entire emergency system by restricting servicing and testing to a single CB230 battery.



FEATURED PRODUCTS



ECA

RUNWAY
SURFACE/SUSPENDED



ECA

PROTEC LED



ECA

PROSPORT LED



ECA

CAPO LED



ECA

GRADUATE LED
RECESSED



ECA

AVALON WALLPACK LED



ECA

HYDRA LED



LED3



AME LED



NEW

HBE2 LED



EXI LED