



GLASDIR DEVELOPMENT

DENBIGHSHIRE COUNTY COUNCIL

Dextra
LIGHTING

ABOUT THE CLIENT

As part of the Welsh Government's 21st Century Schools programme, the largest investment in the region's schools since the 1960s, Denbighshire County Council received a substantial capital grant to rebuild Glasdir's shared school site in Ruthin.

The £10.5m redevelopment will accommodate 315 pupils from Ysgol Pen Barras and 210 from Rhos Street School, separating the previously shared facilities into two independent buildings.

Ysgol Pen Barras and Rhos Street School are but two of the 150 schools and colleges targeted by the first wave of the £1.4b programme. Its aim is to create sustainable and inspiring learning environments that meet the needs of the community. In addition to providing schools with state-of-the-art facilities to support the delivery of a new curriculum, the prioritised schools would need to meet the UK government's target of achieving BIM maturity level 2 (BIM2), which now applies to all public assets. More specifically, new build projects are required to achieve BREEAM "Excellent" status, whilst "Very Good" is expected for refurbishments.

The first investment phase continuing until March 2019 will focus on:

- Reduction of poor condition school buildings
- Reduction of running costs so as to maximise resources available to target improvements to learner outcomes
- Promoting sustainability through reducing recurrent costs, energy consumption and carbon emissions

Sensor-controlled LED lighting is a single and immediate contributor to these targets, helping new and refurbished schools to achieve zero carbon status and keep their overheads low, so money can be channelled towards other curricular resources or facilities.

Over the years, Dextra Lighting has developed an extensive range of LED products purpose-built for the educational sector. These products offer low energy and maintenance costs with quick paybacks at affordable prices. Dextra Group's vast

manufacturing and assembling facilities, experience in-house designers, and dedicated transport have long served educational establishments across the UK, ensuring each project is delivered within schedule and budget.

With lighting usually accounting for up to 30% of a school's energy bills, rising energy prices, cuts to funding and stringent environmental targets to worry about, Dextra Lighting's solutions have made a notable impact on the sustainability of schools, colleges and universities across the UK. In addition to reduced running costs, the initial capital costs of installing a new system, which may seem daunting to many administrators, is made more affordable, as Dextra's LED luminaires and control gear appear on the government's ETL (Energy Technology List), offering ECA (Enhanced Capital Allowance) compliance for a 100% tax levy over the first year of purchase, as well as offering access to a list of energy-efficiency schemes such as Salix and the Carbon Trust's Energy-Efficiency Financing scheme.

Overall, LED lighting has been widely recognised as a sound investment in the future of educational buildings, which also helps improve the schools' reputation and image, as well as raising awareness of climate change amongst the community.

Dextra Lighting partnered with Wynne Construction and architects, Lovelock Mitchell Associates to ensure Denbighshire Council's ambitious vision for the Glasdir schools was fulfilled in the minute details.



THE BRIEF

A well-lit space is essential for an effective teaching and learning environment. Dextra Lighting were required to provide a complete lighting solution for both schools following BREEAM assessment criteria for lighting design. These guidelines are not only related to energy-efficiency but include elements of light quality as indicated the "Hea 1 Visual Comfort" section – taking into account user well-being, comfort and safety. To achieve as many BREEAM credits as possible, the lighting installation for the Glasdir development was to follow Lighting Guide LG9 CIBSE guidelines, incorporating L2 calculations to ensure the lighting would:

- Minimise glare
- Provide task appropriate illumination
- Integrate with architecture and daylighting design
- Uniformity / Eliminate unwanted shadowing
- Sensor controls to maximise efficiency
- Abide to statutory safety regulations (BS 5266)

In addition to ongoing energy and maintenance savings, the new system was to generate capital savings from the moment of purchase through simplified installation and high-quality, yet affordable, ECA compliant products.

Beyond practicality, the luminaries selected would need to conform to the development's modern aesthetic; helping to make the school an appealing and inviting environment for pupils and teachers to enjoy.



THE PRODUCTS

Classrooms / Library / Staff Offices – Graduate LED & Graduate Recessed

Over the years, the Graduate family of LED luminaires has become a mainstay for schools, colleges and universities nationwide due to its versatility, premium performance and energy-efficiency.

In its linear format, the Graduate LED was customised using a wide range of output packages of up to 11,734lm and three luminaire lengths. A surface-mounted version was provided as well as luminaires with 4-point adjustable suspension cables to suit the ceiling type of each classroom. 1500mm versions of the luminaire were installed in 3052, 3924 and 4800lm outputs, depending on the room size and ceiling height, to achieve the recommended 300lux for classroom activities. The chosen luminaires were compliant to the BSEN 12464 3000 candela glare limit and UGR (Unified Glare Rating) 19, allowing them to support the use computers and other monitors whilst providing added visual comfort.

Main Halls (Gym) – Prosport LED

In each school, the main halls were illuminated by the Prosport LED: a high-performance solution offering excellent light quality at minimal maintenance and energy costs.

As the multi-purpose halls are intended to be used for everything from school assemblies to indoor sports, the luminaire was provided in a 15079lm from a range of outputs, with a symmetrical optic designed to provide the CIBSE recommended 500 to 750lux and a versatile light distribution which would comply to the correct uniformity ratios and glare control requirements.

The Prosport LED offers flexibility at the point of installation, offering suitability for trunking, surface-mounting and suspension to adapt to a wide range of building requirements. Certain luminaires were rigidly suspended from the halls' tall ceilings, positioned at the desired height for greater coverage.

The Prosport was installed with DALI (Digital Addressable Lighting Interface) dimming controls, giving staff the flexibility to switch light levels for different activities and events and can be connected to selected sensors for further energy savings.

Corridors & Circulation Areas – Runway LED Surface / Suspended

The Runway LED combines aesthetic appeal and practicality with its slimline anodised aluminium housing offering a contemporary minimalist form backed by the premium performance and longevity of the latest Lumileds LED source and highly efficient optics. By combining high-quality components and efficient design, the luminaire offers superb light quality whilst operating at an impressive efficiency of up to 118 llm/w.

The corridors featured a parapet ceiling that allowed natural light to pool during the daytime. To adapt to this, Dextra Lighting supplied wall-mounting brackets to install 1500mm long, 2221lm versions of the luminaire illuminating the path at an average of 150lux for occupants at ground level. The integration of natural and artificial lighting in the corridors earned the schools extra BREEAM credits for daylighting design. A C84 (4000k) cool-white LED source was also used to provide a stimulating and comfortable light temperature. The overall result combined visual clarity with a fresh and inviting ambiance – ensuring safe passage throughout the day whilst minimising electrical consumption.



THE PRODUCTS

Kitchen – IMPR LED

The IP65-rated IMPR LED recessed luminaire is designed for arduous applications that require extra protection from dirt, dust, water and other substances. The panel luminaire was therefore ideal for the schools' kitchen areas, as its steel housing, injection moulded ABS frame and liquid poured polyurethane gasket offer a flush-fitting, hygienically sealed solution which will not harbour dust or bacteria. Paired with its durable LM80-verified Lumileds source, this sturdy construction makes the IMPR LED a fit-and-forget solution which is cost-effective to run and will not cause frequent disruptions to food service for routine maintenance.

WC Facilities – Protec LED

To ensure optimal light quality and coverage in the bathroom and changing facilities, Protec LED luminaires were supplied with specular reflectors, with a narrow light distribution. Grey bezels were provided to match the colour scheme and decor.

As required in most bathroom facilities, IP44 covers were utilised, which were silicone sealed on location to an IP65 rating to protect the luminaires from exposure to water, dirt and light impact. Luminaires were fitted quickly and cost-effectively thanks to their four point self-clamping spring brackets which offer the flexibility for installation into plasterboard, mineral fibre and metal tile ceilings of thicknesses between 3mm and 42mm.

Stores/Stock rooms – Amenity Plus & EPK LED

Manufactured in robust polycarbonate, a circular 1252lm version of the IP65-rated Amenity Plus LED was installed in the storage areas requiring added protection to dirt, dust and water ingress. Integral sensors were also provided for further energy savings. This luminaire is available in either circular or square body types in various sizes, in either black or white to suit the practical and aesthetic purposes of the design.

The Ecopack LED batten luminaire was also installed in selected stock rooms. The robust and highly efficient luminaire is usually specified to meet the high-performance criteria of the industrial sector and maximises return on investment through excellent energy-efficiency, simple installation and integral sensor-control.



THE PRODUCTS

Lighting Controls – Dexsor’s Reacta Range

All the luminaires featured in this project are compatible with a comprehensive range of digital or analogue dimming options and integral or standalone sensors. These can be incorporated into the design to reduce energy usage and carbon emissions by an average of 30%.

The schools’ bespoke control system included a number of sensors handpicked from Dexsor’s wide range of products. In the classrooms, sets of Reacta 3 mid-range microwave sensors were controlled by centralised Lighting Control Modules (LCMs) offering absence detection and bright-out function. This type of sensor detects daylight and occupancy levels in each room, switching the lights off when daylight reaches a prescribed level. Throughout the school day, the installation will now maintain the required task illumination levels as well as switching off when the classrooms are vacated.

In all the other areas of the schools, recessed and flush-mounted versions of the Reacta 7 passive infrared sensor were installed offering bright-out function and daylight sensing via photocell. Sensors functions can now be easily adjusted using the REA-DPA programmer. The user-friendly controls will allow staff to take full ownership of the new systems without incurring the extra cost of calling out technicians.

In accordance with BREEAM calculations, sensors were positioned strategically at a specified distance from the floor surface and from each other to deliver the most efficient results.

Emergency

The schools opted for a standalone emergency lighting solution using an array of luminaires best suited for each area and for different purposes.

The LED4 was chosen to provide emergency lighting to complement the main lighting. The LED4 is the first emergency luminaire in Dextra Lighting’s range to incorporate a Lithium Iron Phosphate battery, giving greatly extended lifetime over traditional Nickel Cadmium and Nickel Metal Hydride products.

Designed to complement mains operated luminaires, the LED4 is a standalone non-maintained emergency luminaire and is available in standard, self test and autotest emergency variants.

For the halls’ higher ceiling, the 500 lumen HighSpot high level emergency LED was supplied with an Open Area lens to provide the best coverage and light level for the area. The IP65-rated luminaire will also offer added protection to light impact and ball strikes. The 2.5w, IP65-rated AME LED emergency bulkhead was used in lower level areas in conjunction with the LED4 module, offering a 150 lumen output with a wide light distribution. The highly efficient and low-maintenance EXI LED and Hanging Blade LED provided clear emergency signage for all the exits and safety routes across the building.

The efficient and low-maintenance 4w LED self-contained surface HBE Hanging Blade and EXI LED, provided clear emergency exit signage where required. The luminaire is manufactured in high-quality aluminium with screen-printed legends on flame retardant acrylic panels.



FEATURED PRODUCTS



AMENITY PLUS



EPK LED



GRADUATE LED



IMPR LED



PROSPORT LED



PROTEC LED



RUNWAY
SURFACE/SUSPENDED