



ARVALEE SCHOOL

INVESTS IN SUSTAINABLE FUTURE
WITH LED AND INTELLIGENT LIGHTING
CONTROLS

Dextra
LIGHTING

ABOUT THE CLIENT

Dextra Lighting's recent design for the Arvalee School phase of the brand-new Shared Campus Facility in Omagh demonstrates why LED and advanced sensor controls are regarded as the number one energy-efficiency recommendation for the education sector.



In 2012, Northern Ireland's Department of Environment approved plans to build a state-of-the-art Shared Education Campus facility in Lisanelly, catering for six schools and 3,700 pupils. With a total budget of £120m, the project is the region's largest single investment in education.

Construction began in October 2013 at the town's army base in Omagh and this phase is due for completion in September 2016. In its final phases of development, Dextra Lighting were approved by the appointed building consultants, Caldwell Consulting Engineers Ltd, as the exclusive lighting suppliers for the project and were given responsibility along with GR White & Son Ltd to design and deliver a sensor-controlled LED solution offering future-proof levels of energy-efficiency and functionality.

Dextra Group collaborated with local electrical contractors GR White and Son Ltd to install the new system and was supplied through our Northern Ireland Partner/Distributor, AJ Hurst Ltd.

Arvalee School for children with learning disabilities will be one of six partner schools to move into the new premises. Pupils have been attending lessons in temporary classrooms since the school's previous building suffered major fire damage in 2012, so the move has been eagerly anticipated.



THE BRIEF

The lighting for the multi-purpose building was scheduled to be delivered incrementally, with the first phase covering Arvalee School classrooms and labs, shared sports facilities, administrative offices, and external areas including dedicated car park.

Alongside the premium performance, increased energy-efficiency and low-maintenance benefits expected from LED lighting, the new system was designed to be integrated with the building's modern architecture and visual appearance, whilst improving ROIs by minimising the number of luminaires used and incorporate easy-install features wherever possible.

"This was our first association with Dextra on such a large scale project and we were very pleased with their service from design through to completion. Dextra provided comprehensive calculations in accordance with the design specification provided and we found that the products put forward for approval were both highly efficient and highly suited to the environment to be installed. Dextra also supplied the lighting controls for this project which greatly assisted the contractor with site co-ordination and deliveries."

Padraic Quinn – Caldwell Consulting Engineers Ltd

"Dextra and AJ Hurst really delivered for us on this job. Fittings were supplied in full on the dates that we requested them, and we found them easy to install. Dextra were easy to work with and very helpful when information was requested."

Allen McComb – GR White & Son Ltd



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THE PRODUCTS

The majority of LED products featured in this project are manufactured using the latest LM80-verified Lumileds 3535 LED chips offering 90% lumen maintenance for the first 60,000 operating hours. By simply opting to install high-quality LED systems, schools and universities are reducing their energy costs by approximately 60% compared to fluorescent or HID lighting, whilst benefiting from the reliability and low-maintenance of the LED source for added returns on investment. The savings generated help schools become greener and receive financial gains from government-sponsored environmental schemes (e.g. CRC), allowing the money saved to be redistributed into other areas of service.

Intelligent Lighting Controls – Reacta 7 Master & Slave Sensors

Staff at Arvalee were extremely pleased by the bespoke Master and Slave sensor network designed by Dextra's in-house design team to improve the energy-efficiency and functionality of the new lighting system. With lighting amounting to almost a third of a school's total energy consumption, any cuts in this area of spending can lead to significant long-term savings. That is why, in addition to opting for LED, many schools are incorporating intelligent controls to their lighting design, as it can reduce the system's energy consumption by up to an additional 30%. The main advantages and features of the Reacta 7 Master & Slave sensor network include:



Improved intelligence - Detection data picked up by sensors is shared amongst other sensors. Applications of this include "corridor linking" which ensures users always walk into an appropriately lit corridor.

Optimum Detection Footprint – Tilting sensor lenses allow the detection area to be fine-tuned to precise requirements.
Lowest levels of quiescent power consumption – Sensors deliver industry leading levels of energy-efficiency during periods of inactivity to maximise savings.

QuickAnalytics monitoring software – Precise and user-friendly monitoring of energy-savings and the performance of entire network using Dextra's advanced REA-DPA digital LCD programming tool.

Easy-install – Traditional radial wiring techniques can be used to simplify installation and electrical circuit design. The network allows one "master" and up to three additional "slave" sensors to be connected via a simple two-wire, low voltage BUS connections.

THE PRODUCTS

Classrooms & Labs – MODLED Slim (Recessed & Suspended)

The MODLED Slim brought a combination of energy-efficiency, superb light quality and minimalist modern design to Arvalee's classrooms and laboratories. Using a highly efficient diffuser optic with up to 93% light transmission and market-leading Lumileds LEDs, the luminaire ensures visual comfort by concealing the point source to minimise glare, without compromising on light intensity.

With a range of customisable options, the MODLED Slim gives designers the freedom to tailor installations to specific architectural and performance requirements. In the classrooms, the luminaire was supplied in both 600mm x 600mm and 1200mm x 300mm sizes suitable for lay-in installation into the ceiling grid system. For sections where the ceiling slanted upwards, a version with catenary wire suspension was installed to match the height of the rest of the luminaires.

Using a 3532lm and a bespoke 4025lm output version, the design fulfilled the recommended 400 lux level and uniform coverage required to maximise visibility for classroom activities, whilst economising on the total amount of fittings used.

For further energy savings and flexibility of control, the luminaire is compatible with most mainstream dimming protocols and can be supplied with an integral R24 sensor for daytime regulation and presence detection, as well as a range of standalone sensors. With most of the classrooms and labs featuring coloured skylights to admit daylight, sensors were provided to maintain optimum light levels throughout the day and minimise energy consumption.

To significantly speed up the wiring process, and therefore improve returns on investment for the school, the luminaire was pre-wired and supplied with optional panel-mount GST connectors.



premium performance,
increased energy-efficiency
and low-maintenance benefits
expected from LED lighting"

Sports Hall & Fitness Centre – Prosport LED, Arcus LED & AMED65

Purpose-built for modern sports environments, the Prosport LED is a high-performance solution that 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 a range of distributions and lumen outputs as high as 30,601 luminaire lumens, ensuring the correct lux levels, uniformity ratio and glare control are achieved to fully support 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, and enhance player experience.

A 15,079lm version of the luminaire comfortably achieved lux levels within the 500 to 750 lux parameter recommended by Sport's England guidelines for recreational or school use. For this project a versatile symmetrical optic was selected to support a broader range of sports including football, basketball and netball. An asymmetrical bracket is also available, offering an angled distribution ideal for badminton or tennis applications.

With a choice of digital (DALI) or analogue (1 – 10v) dimming options, the luminaire can also be customised to offer flexibility to switch light levels to suit different sports and work in conjunction with a choice of sensors for further energy savings.

Its 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 hassle-free and sustainable solution for high-level sports applications.

To cut the costs of installation, the Prosport was provided with a zintec spine to simplify mounting at inconveniently high ceilings and was prewired to the required specifications.

The fitness centre required a visually attractive and comfortable lighting solution to help create an appealing exercise space. Luminaires were positioned with consideration of daylight levels and reflectances from mirrors, to provide optimum light levels throughout the day and avoid direct glare.

From a range of options, the Arcus LED was supplied in a 600mm x 600mm, 3696lm variant, with a twin diffuser to provide the 200 to 300 lux level and even illumination required. Using the latest Lumileds LEDs and efficient extruded polycarbonate diffusers, the luminaire offers LORs of 81% and excellent diffusion, creating a brightly lit workout environment whilst preventing direct harsh light from disturbing users.

The versatile luminaire is available in luminaire-lumen outputs of up to 6048lm in two different body sizes and diffuser options, making it adaptable to a diverse range of applications.

The luminaire was provided with DALI dimming functions from a wide range of control options, to allow staff to adjust the lighting to suit different fitness classes whilst working in conjunction with the standalone Reacta 7 sensors to adapt the lighting to changing daylight levels.

Beyond performance, the Arcus's attractive gull-wing design harmonised well with the centre's modern aesthetic.

In the shower rooms, the AMED LED IP65 bulkhead offered sealed protection from water, dust and dirt ingress whilst adding an appealing decorative finish. The luminaire is available in a range of outputs to offer similar performance to fluorescent 28w 2D, 38W 2D or circular T5 fittings but with an average reduction in energy consumption of 60%. Its reliable LM80-tested Lumileds LEDs also minimise the costs and inconvenient disruptions of frequent lamp changes over time.



THE PRODUCTS

Reception & Corridors – CAPO LED pendant & Protec LED

The Capo LED pendant luminaire helped transform the central ceiling aperture above the reception area into a striking architectural feature. The attractive luminaire was suspended at approximately 2m from the ceiling; hung just below the upper mezzanine level.

The Capo LED'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.

Due to its position directly below a row of coloured skylights, the luminaire was connected to a DALI operated Reacta 7 Master / Slave sensor network to regulate its output to daylight and occupancy levels.

The highly versatile Protec LED downlight was installed in the corridors and other circulation areas, making full use of its wide range of customisable options including, interchangeable reflectors and colour attachments, IP-rated covers, and bespoke bezels.

To match the interior's colour scheme, grey bezels were provided, accompanied by white ring attachments. Opti-Spec Specular reflectors (Opti-Sat semi-specular option also available) allowed for a more controlled and uniform distribution ideal for narrower spaces such as corridors.

Available in a range of outputs the luminaire was supplied in a 2000lm output to achieve the 100 lux level requirement for corridors.

Since many of the circulation areas had minimal natural light, the Blade TC- L uplighter (T5 version also available) complete with semi-specular diffuser and glass cover, was installed to supplement the Protec LED and balance the overall light coverage by directing light onto the walls and ceiling surface and eliminating any unwanted shadows.

For the WC facilities, the Protec LED was supplied with IP44 covers which were silicone-sealed to a IP65 rating offering protection to water, dust and dirt ingress. BSEN 12464 compliant versions are also available for applications where glare reduction is needed to support the use of VDUs.

The Protec LED range owes much of its popularity to its excellent performance and energy saving capabilities, with its high-efficiency reflectors and Lumileds LEDs offering LORs in excess of 90% in luminaire-lumen outputs of up to 2850lm (depends on the attachment used) whilst operating at a fraction of fluorescent or HID equivalents.



Car Park & Building Perimeter – Dexeco Impervia LED Column & Avalon Wallpack

The versatile and ultra-efficient Dexeco Impervia LED Column was installed on a number of columns in the car park and main driveway to provide clear and safe illumination of all access routes for drivers and pedestrians.

Using a high-quality L3 LED Card, the Impervia LED Column offers excellent efficiency in a high band of outputs, with a constant lumen output function whereby the driver compensates for the lumen depreciation of the source over time by gradually increasing the power as required. In addition to the added long life benefits and reliability of the source itself, each LED present on the L3 Card features its own incorporated lens to offer maximum light control. Combined, these features give designers added flexibility to create highly efficient outdoor schemes whilst reducing the number of luminaires used.

To achieve the recommended 10 lux for external areas and a uniform distribution whilst adhering to optimal spacings, the luminaire was supplied in both a 4944lm version and a higher 10,959lm output, with asymmetrical reflectors to provide wide coverage whilst minimising glare and light pollution into unwanted areas. Symmetrical lenses are also available for a narrower distribution.

To boost the energy efficiency of the installation, the luminaire can be supplied with an integral R11 passive infrared sensor for presence detection dimming the lights to minimum, yet safe, output when the areas are vacated.

The Avalon Wallpack floodlight, on the other hand, was mounted directly onto the building's external walls, allowing pedestrians to circulate safely and illuminate all entrances and clearly whilst providing a pleasant 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 2802lm 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.

For further energy savings, the luminaire can be provided with an optional integral photocell to react to daylight and switch luminaires on only when pupils or staff approach the building.

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 also used to increase emergency lighting coverage in the building. The self-contained HBE "Hanging-Blade" and EXI LED emergency exits luminaires, provided energy-efficient and low-maintenance emergency signage in compliance with safety regulations.



FEATURED PRODUCTS



MODLED SLIM



PROSPORT LED



ARCUS



AMED LED IP65



CAPO LED



PROTEC LED



IMPERVIA LED COLUMN



AVALON WALLPACK LED



LED3