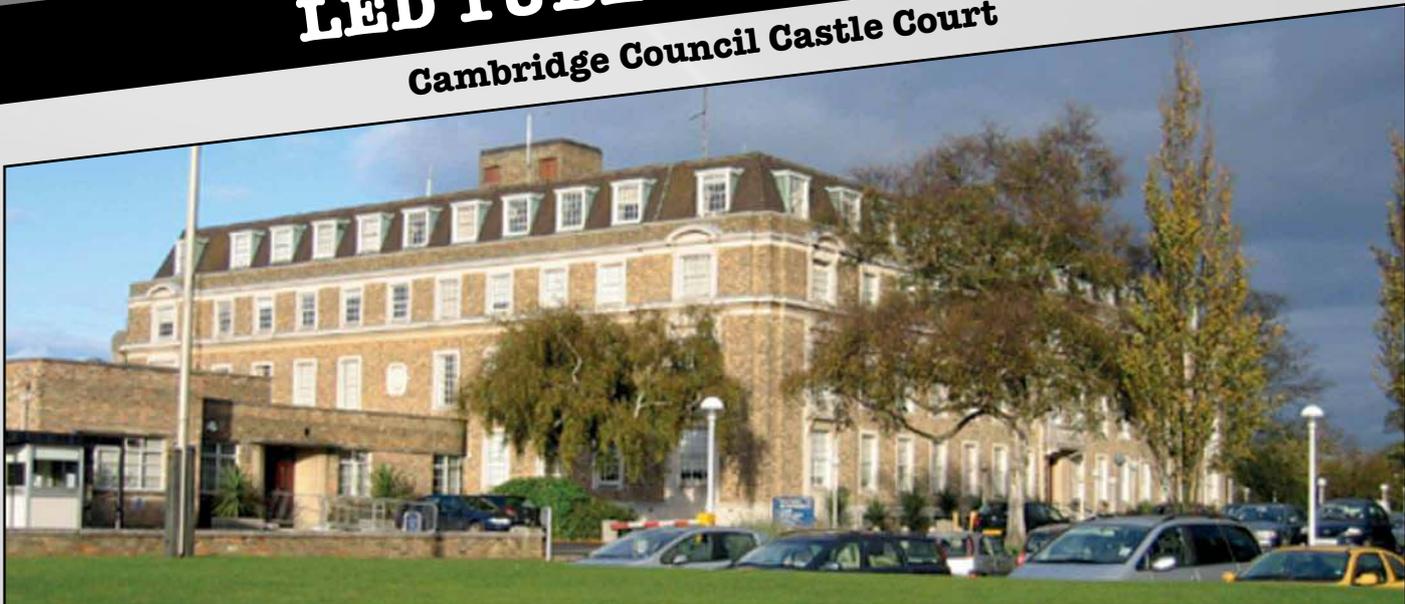


LED TUBE CASE STUDY

Cambridge Council Castle Court



The Overview:

Cambridge City Council were looking for a 5 year maintenance free lighting system for their 4 storey Castle Court office block, including walkways and meeting rooms, staffed throughout a 12 hour day.

The lighting system already in place used inefficient twin T8 58W 5ft tubes, in need of frequent maintenance. The UV produced by these tubes had discoloured the luminaires diffusers, considerably reducing lux levels at desk height.

The Requirement:

The client was adamant LED was the future but had not been satisfied with results from previous samples tried in both reducing their energy consumption and obtaining adequate lux levels.

The replacement lamps needed to offer the same light output as the fluorescent lamps, give a good return on investment, reduce maintenance costs, have a high power factor, a low energy usage and have minimal recycling costs.

The Solution:

After a site evaluation, the Prolite technical team offered to replace existing lamps on trial with a 5ft high powered LED Tube, a product designed to meet the required lux levels to comply with CIBSE Guidelines. These tubes have an additional benefit of not requiring any control gear giving even greater energy savings.

Cambridge City Council's energy manager told Energy Matters (The newsletter for Eastern Shires Purchasing Organisation's energy customers):

"We considered replacing the old lighting with new T5 tubes fitted with end adaptors but decided to explore newer technologies to stimulate more reaction and interest from the building's occupants."

"A trial of ten LED tubes in an open plan office during July resulted in favourable feedback from staff and our health and safety team. After further evaluation of LED tubes from numerous suppliers, we settled on Prolite, available through the ESPO contract."

The Council now has 120 LED tubes installed and a further 500 on order. When this project is completed next spring, the lighting load will be down to 104,000KWh a year – a reduction of 230,000KWh and a massive £18,000+ per year (based on current prices).

Carbon emissions should also fall, by just over 123 tonnes a year. As Cambridgeshire CC will be participating in the government's Carbon Reduction Commitment, this will save a further £1,480 per annum (during the first three years when the price is fixed at £12 per tonne).

"We've already lined up another installation of 747 LED tubes and are considering a trial at one of our schools."

In total, 500 units were installed across Castle Court, upgrading luminaries with minimal inconvenience to the office's working day. The life expectancy of the new lighting system will vastly reduce maintenance costs for the Castle Court as replacement will not be required for approximately 10 years.

With unmatched solid state technology from Prolite, the revolutionary tube design has reduced wastage, maintenance, disposal costs and originally was able to increase the lux level at desk height by 80%.

After further testing, the Energy Manager concluded that CIBSE Guidelines on lux levels could still be exceeded if only one tube rather than two tubes were installed per fitting, reducing energy costs even further.

As you can see from the following cost savings table, the Castle Court will now have a return on investment for this project at the end of year 2.

Lamp usage information

Current Lamps	<input type="text" value="Fluorescent"/>		
Replacement Lamps	<input type="text" value="LED"/>		
Hourly Usage Per Day	Weekdays	<input type="text" value="12"/>	Weekends
			<input type="text" value="0"/>
Hours/Week	<input type="text" value="60"/>		Total Hours/Year <input type="text" value="3120"/>
Active Weeks/Year	<input type="text" value="52"/>		Number of Lamps <input type="text" value="500"/> (Max 1000)
Cost of Electricity pence/kwh	<input type="text" value="9"/> e.g. 8.5 = £0.085		

Running costs	Fluorescent	LED
Replacement Lamp Cost	<input type="text" value="£10.00"/>	<input type="text" value="£45.00"/>
Initial Cost of Lamps	<input type="text" value="£5,000.00"/>	<input type="text" value="£22,500.00"/>
Power Consumption	<input type="text" value="140"/> (w)	<input type="text" value="24"/> (w)
Annual Energy Cost	<input type="text" value="£19,656.00"/>	<input type="text" value="£3,369.60"/>
Lamp Life	<input type="text" value="15000"/> Hrs	<input type="text" value="50000"/> Hrs
Lamp Replacement At	<input type="text" value="4.81"/> Years	<input type="text" value="16.03"/> Years

Savings calculations

Year	Cost of energy		Lamps replaced		Cost of lamps		Cost savings
	Fluorescent	LED	Fluorescent	LED	Fluorescent	LED	
1	£19,656.00	£3,369.60	0	0	£0.00	£0.00	-£1,213.60
2	£39,312.00	£6,739.20	0	0	£0.00	£0.00	£15,072.80
3	£58,968.00	£10,108.80	0	0	£0.00	£0.00	£31,359.20
4	£78,624.00	£13,478.40	0	0	£0.00	£0.00	£47,645.60
5	£98,280.00	£16,848.00	500	0	£5,000.00	£0.00	£68,932.00
6	£117,936.00	£20,217.60	500	0	£5,000.00	£0.00	£102,718.40
7	£137,592.00	£23,587.20	500	0	£5,000.00	£0.00	£119,120.80
8	£157,248.00	£26,956.80	500	0	£5,000.00	£0.00	£135,291.20
9	£176,904.00	£30,326.40	500	0	£5,000.00	£0.00	£167,864.00