



LED Lighting Replacement Project at PPC Cement Dwaalboom, Beestekraal, Hercules & Jupiter Plants

CASE STUDY



Cementing sustainability, ALTSA helps PPC Cement build a brighter future.

Introduction

PPC Cement is a leading multinational producer of cement, aggregates, readymix concrete, premixes, fly ash and lime across sub-Saharan Africa. This iconic brand, founded more than 100 years ago, is well-known for its quality and reliability.

As part of their drive to minimize their environmental impact and lower their carbon footprint, PCC Cement partnered with ALTSA to upgrade the lighting at their plants in Beestekraal, Hercules, Jupiter and Dwaalboom..

Project Objectives

ALTSA was tasked with enhancing the quality of lighting across all areas in each plant to improve visual effectiveness for staff as well as to enhance visibility for operations.

The project aimed to improve overall sustainability of the plants by reducing energy consumption, decreasing operating costs and lowering the environmental impact. Critical to the success of the project was that new installations had to integrate seamlessly with the existing infrastructure and that there would be little or no disruption to production.

Challenges

Ensuring staff safety. All of the PPC Cement plants remain fully operational during the installation. Therefore, stringent safety measures had to be implemented to avoid any potential risks to staff. It was also necessary to ensure that there would be little or no disturbance to ongoing production.

<u>Complex lighting requirements.</u> PPC required specific lighting in various fields of operation - such as offices, plant interiors and exteriors, conveyor belts, high mast lights and lighting for perimeters. Selecting the right fixtures and design to ensure optimal lighting conditions while, at the same time, adhering to lighting regulations also posed a challenge.

<u>Multiple stakeholders.</u> PPC has many different facility services areas, each with its own lighting needs. Therefore, to ensure a smooth implementation, it was necessary to coordinate information between plant management, key stakeholders and staff to address concerns and manage expectations.

> "With the increase of lighting at night it increases the mood and positive attitude when moving through the plant."

> > Johan Saunders Technical Advisor Engineering PPC Cement SA (Pty) Ltd

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Planning Phase

Overcoming challenges and ensuring a smooth, professional implementation always requires careful planning.

ALTSA's planning included the following:

Assessment and audit. ALTSA began by conducting a comprehensive assessment of the existing lighting in each of the plants. This included an evaluation of the current fixtures, lighting levels, energy consumption and maintenance requirements. The assessment also provided insights into areas that needed improvement such as operational areas, offices, boardrooms, corridors, toilets and staff rooms - as well as exterior areas, conveyor belts, high mast lights and perimeter lighting. Once completed, this assessment served as a baseline for understanding the current situation and planning the solutions.

Stakeholder engagement. PPC Plant management and staff were consulted throughout the planning process. To ensure optimal lighting conditions, key stakeholders and staff were encouraged to share their perspectives and voice any concerns. These consultations resulted in a mutual understanding of the lighting required and garnered unilateral support for the project.

Budgeting and financing. A detailed budget was developed, which covered the costs of various LED fixtures, installation, infrastructure upgrades and the disposal of old fixtures. Potential financing options were included. The budget also covered available incentives, such as government grants. Energy-efficiency programs were explored to optimize the project's financial feasibility.

Implementation Phase

PROACH

<u>Fixture selection and design.</u> LED fixtures were carefully selected based on the lighting requirements specified by each of PPC's various plant facilities. The selection was based on energy efficiency, color rendering, and compatibility with lighting standards. Special consideration was given to specified areas within each plant, including offices, boardrooms, corridors, toilets and staff rooms as well as external areas, such as conveyor belts, high mast lights and perimeter lighting.

<u>Installation</u>. The project team collaborated with qualified and experienced electricians, contractors and lighting specialists to develop a comprehensive installation plan. The plan included timelines, phasing strategies, and contingency measures to ensure little or no disruption to operations at each of the plants. Once the plan was in action, ALTSA conducted regular oversight visits at every step of the installation process to ensure that the work was done correctly and according to specifications.

<u>Commissioning and testing</u>. After installation, rigorous testing and commissioning processes were performed to verify the functionality, lighting levels and color consistency of all fixtures. Checks were carried out to ensure that the entire installation complied with all safety regulations and standards.





Outcomes and Benefits

Enhanced lighting quality. The LED lighting replacement significantly improved lighting quality throughout each of the four plants. The LED replacement also created a better color rendering, reduced glare, and improved uniformity. This resulted in a considerable improvement in visibility. Both management and staff were very satisfied with the new lighting.

<u>Energy and cost savings.</u> The project achieved substantial energy savings, reducing PPC's electricity consumption and operational costs. LED fixtures have a longer lifespan. This results in considerably reduced maintenance, which leads to additional cost savings over time.

<u>Environmental impact.</u> The reduced energy consumption and dramatically lowered carbon footprint aligned with PPC's sustainability goals and environmental responsibilities.

<u>Compliance with standards.</u> The LED lighting systems met all lighting standards specific to the industry and PPC's needs. This helped ensure staff safety, as well as complying with all industrial regulations.

Improved staff experience. The upgraded lighting systems had a very positive impact on the overall staff experience. The improved visibility at the plants helped to create a safer working environment (especially where heavy equipment is used) and the enhanced lighting inside the buildings created a more comfortable working environment for office staff.

ALTSA LED **Lighting Solutions**

The following superior quality, energy efficient, LED Lighting Solutions were used to transform PPC Cement's manufacturing facilities.



16 045

LUMINAIRES

INSTALLED FROM OUR INDOOR AND OUTDOOR COMMERCIAL

2 368hrs

INSTALL HOURS

AN EFFICIENT PROJECT PLAN ENSURED OUR TEAMS INSTALLED ON SCHEDULE

Zero

DISRUPTION

TO PPC CEMENT PRODUCTION FACILITIES, STAFF MOVEMENT AND LOGISTICS

Lux Levels

Light levels were taken at various points within the main building, and the exterior

PRE-INSTALLATION	POST-INSTALLATION		
Beestekraal Plant			
Current average light level: 51.9 Lux	Improved average light level: 203.9 Lux		
Measurements taken by: David Arendse	Instrument: Mastech MS6612T		
Hercules Plant			
Current average light level: 358.2 Lux	Improved average light level: 572.5 Lux		
Measurements taken by: Daiyaan Warries	Instrument: Mastech MS6612		

1,251,596 Maximum Power Saving (W)

899,737 Monthly Energy Saving (kWh)

R 1,307,147 Monthly Electricity Saving

R 834,053 Annual Maintenance Saving

R 27.74 Costs per kW (average)

10,689 tonnes Annual Environmental Save CO²

R 19,353,529 Total Project Cost

ROI 10.42 Average Payback Period (mnths)



Individual Site Results

	Beestekraal	Hercules	Jupiter	Dwaalboom
Max Power Savings (kW)	625 520	302 389	254 904	68 983
Monthly Energy Savings (kWh)	478,273	213,994	168,948	38,522
Monthly Electricity Savings (ZAR)	705,453	306,011	241,596	55,087
Annual Maintenance Savings (ZAR)	284,559	257,049	221,425	71,200
Financial Cost per kW (ZAR)	20.34	31.49	25.82	33.32
Environmental Annual Savings CO ²	5 682 Tons	2 542 Tons	2007 Tons	458 Tons
Total Project Cost (ZAR)	12,276,626	3,601,344	2,663,375	812,184
Payback Period (Months)	ROI 7.2	ROI 11.0	ROI 10.2	ROI 13.3

AESTHETIC Lighting

Aesthetic Lighting

A great facelift with enormous productivity and safety improvements

Differential light levels to suite all different functional activities

Great esthetical facelift to old areas

Uniform, Crisp and Clear lighting

Entire plant looks brilliantly new at night



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DWAALBOOM

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Functional Lighting

No functional area is skipped

General productivity is increased

Luminaires are chosen strategically to the environment to have optimal function and sustainability



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FACILITY Lighting

Facility Enhancement Lighting

Bright, clear and uniform lighting in high production and storage areas

Lux levels tha exceed compliance regulations

Robust, durable design to withstand temperature extremes

Impact and shock resistant outer shell, with IP65 and IK08-ratings





Compliant Lighting

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Bright and uniform lighting over conveyors belts

No wasted light or light pollution - lighting is very focused with great general terrain lighting

Light levels compliant in all functional areas

All conveyors are uniformly lit well above compliant standard





Strategic Lighting

Zero wasted light or light pollution

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Lighting is very focussed with great general terrain coverage

No functional areas are overlooked



EFFICIENT Lighting

Efficient Lighting

PPC Cement Dwaalboom required additional ALTSA Solar LED Lights, to brighten up roads leading into the PPC facility, as well as the onsite accommodation village

Solar Driven lights are powerful and uniform

Lighting design are optimized and glare is minimized

Streetlight is solar driven, uniform and of height quality







Guarantee

We have the utmost confidence in our quality and expertise ensuring we deliver every time and our 5 Year Guarantee comes standard on:

- Our LED Lighting Solutions
- Compliant Lux Levels
- Our Installations



Contact us

We look forward to partnering with your business as we lead the way with LED.

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