

Appendix to CMA – **FP/811/04/17**

LED Street Lighting Phase 3 - Lessons Learnt - LED Replacement Phase Two

March 2017

1.0 Executive Summary

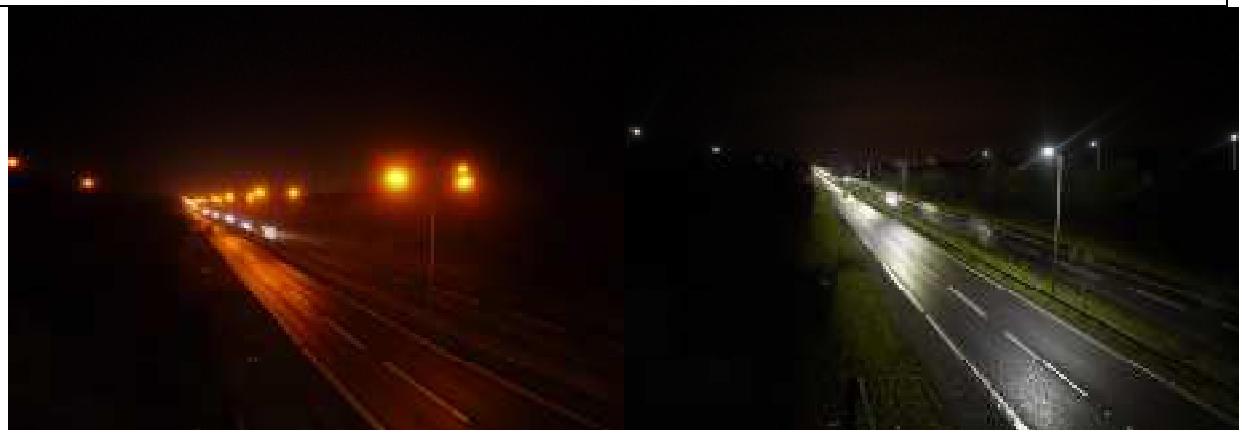
We are now in Phase 2 year 1 of the programme and have achieved the year end of target of installing 9500 LED units by end of March 2017. The programme started 3 months late due to delays with Project approvals and supplier issues which have now been resolved.

The programme is now back on track and has started year 2 LED installations to ensure we meet the Year 2 in year benefit profile.

Following a review of the Installation process for Year 1 we have made improvements to the Implementation process and will carry these lessons on to the proposed Phase 3 LED installations.

Some before and after pictures are below to show improvements:

A127 from Grass Verge – Before and After



A127 Central Reservation – Before and After



2.0 Lessons Learnt

2.1 Programme Start point

To ensure the successful delivery of the LED replacement program, effective planning is of key importance. The working assumption is for Phase 3 of the programme to commence in July 2017, subject to ECC Governance. Starting on this date will allow us to realise savings by using work teams already operating in the installation areas for Phase 2. This will mean we have less supervisory and operative costs and we can already utilise Traffic Work permits in operation. We plan to combine LED installations for Harlow, Brentwood and Epping. This will save ECC additional in year benefits, as outlined in the RJ commercial proposal -Essex Street Lighting CMS and LED Installation Phase 3, dated February 2017.

However, this date is indicative and could change in line with ECC approval of a budget to start the project. The schedule is intended to demonstrate key milestones and interdependencies, a final schedule would be approved subject to contract

2.2 Procurement

We already have a supplier for Phase 2 of the programme and work with Telensa (who supply all our telecells) and Philips (who supply the LED lanterns). Negotiations have been made with the manufacturer and the framework has been agreed with using the same pricing from Phase 3 of the programme. This pricing has been benchmarked across our contracts is in line, or below other manufacturers for a similar product. This is providing ECC with the best price

In addition, we have also been able to negotiate with Philips to supply the latest LED luminaire with "Smart Cities" technology, for the same unit price.

This smart LED will allow ECC to build technical capabilities and trial new applications based on this new innovative LED. This could lead to additional business cases and benefit streams for ECC, and is in line with technical objectives set for the Council.

There were delays, in the early part of the programme, due to late approvals to commence installations. This had a knock on effect with ordering equipment and compounded on lead times with ordering LED lanterns and Telecells.

We now have a well-developed close working relationship with Philips and Telensa to ensure that lead times are agreed, orders are placed to lead times, and delivery orders are tracked and managed to the delivery point.

LESSON 1 – Build in to the Business Case scenario's to allow for a late start, due to Governance processes, and potential supplier issues. This will allow expectations to be set for in year benefits should we encounter the same issues for Phase 3.

LESSON 2 – Order equipment from Philips and Telensa to agreed lead delivery times and allow some float within the programme plan in case of delays to ensure that installation plan is not affected. Continue with tracking process for orders, and manage via bi-weekly project meetings.

LESSON 3 – Philips and Telensa continue to attend team meetings to discuss ordering, project plan, installation issues and overall progress. Continue key discussion and liaison points with key project personnel, these are; Richard Dimock and Trevor Rhodes -Essex Highways, Steve Forth Linc Procurement Management, Sara Lee Telensa Account Manager, Leigh Clarke Philips Key Account Manager, Paul Andrews, ELS Managing Director (Electrical Testing) and Ruta Eviltyte, Supply Chain Account Manager.

2.3 Design

Design is an important part of the project. Work in the design phase will ensure that the correct levels of lighting are achieved, but most importantly will ensure that the light levels are uniform so that there is not a 'Zebra Effect' (dark spots). RJ has a strong design capability and has the capacity to carry out 1250 unit designs per month. It is difficult to speed up this process up without increasing additional technical resource.

Phasing the designs will ensure that the lanterns can be ordered effectively and then construction can start whilst the design process is in place.

We have encountered a few issues where incorrect lantern spigots ordered, or the spigots ordered do not fit the brackets. This has now been corrected in the design process.

Some lanterns had different cable lengths and this was only discovered on inspection, prior to installation. This has now been corrected in the design process.

Our Mayrise data does contain a small number of inaccuracies. To ensure that we do not make mistakes for ordering equipment and affecting installations we have now added PCI capture prior to the design process.

LESSON 4 – Build into the project plan design points that meet the installation schedule. Where possible, ensure design resource is in place to design in advance, de-risking the installation schedule

LESSON 5 - Carry out design after the Pre-construction Information has been completed. This ensures that the correct lantern Spigot has been ordered. The PCI form has also been improved to provide further information, eliminating the issue

LESSON 6 – Lanterns with different cable lengths are now being flagged on the designs sheet to ensure that extra cable is requested when the lanterns are ordered.

LESSON 7 – Pre Construction Information will be captured before the designs, thus ensuring accurate information is supplied, as required under Construction, Design and Management regulations.

2.4 Installation

Using the current supply chain partners RJ will be able to install on average 1250 units per month. There will be challenges involved in this process, such as bracket replacement and reducing the size of the brackets. Also quality issues such as making sure the alignment is carried out properly; will need to be taken into account. However, in our experience installing at a pace of around 1250 units per month will ensure that the quality of the installation is maintained throughout the program.

Initially some traffic permits were refused for work orders for traffic sensitive routes. Training has been provided to the Supply Chain Partner and this has resolved the problems.

Some issues were encountered when ordering lanterns based on the numbers required in the districts we were installing in. This was compounded by delays in the delivery process by Philips. We have now revised this process based on the lesson learnt.

LESSON 8 – Ensure programme plan manages in peaks and troughs and that the installation rate does not regularly exceed highest numbers installed in Phase 2.

LESSON 9 – Ensure training requirements are identified for any new suppliers so that working practices do not cause delays in the installation process.

LESSON 10 –Lanterns will be ordered as a whole for each district and ordered in advance to known lead times. This allows the installation of each district to be completed rather than waiting for lanterns or moving out of installation areas to return once deliveries arrive.

2.5 Energy Savings

In the early installations we did not use an automated process to update CMS, thus some energy savings were not made due to missing the cut off for CMS updates. We have now implemented an automated PDA process so that engineers making the changes can update the lighting changes post installation. This will ensure that we meet the savings identified. We have also completed audit activity post installation and have noted that some dimming profiles have not been implemented post installation, this process has now been corrected.

There were some issues with Philips lights not being provided with the correct Elexon code, which affects the dimming profile not being implemented. Designers have now been made aware of this issue.

LESSON 11 – Ensure LED engineers are reminded to ensure that inventory data is updated the following day and that the data is correct.

LESSON 12 – Ensure LED engineers are reminded to ensure that dimming profiles have been implemented on CMS



LESSON 13 – Phillips lanterns did not have the correct Elexon code when they were initially provided. Designers need to ensure that the selected lanterns have valid Elexon codes