

Balfour Beatty  
**Reading Green Park Station**  
Station Building - Lighting  
Statement for Planning

158989-ARP-RG-BD-RP-Z-000002

P01 | 16 April 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 260708-00

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# Document Verification

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## Appendices

# **1 Introduction**

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## **1.1 Scheme Context**

The proposed development of Green Park Railway Station, together with a transport interchange, multi-storey car park, surface car park and access road was granted full planning permission by Reading Borough Council (Ref. 141944) and West Berkshire Council (Ref. 14/03289/COMIND) in spring 2015.

A subsequent planning permission was applied for to relocate the proposed station further South from the position shown in the documents noted above. This revised planning application was granted by Reading Borough Council (Ref. 181195), West Berkshire Council (Ref. 18/01451/COMIND) and Wokingham Borough Council (Ref. 181514). This revised application does not include the proposed station building, which was a later addition to the scheme.

This planning application is concerned with the proposed station building which will house ticketing facilities, staff accommodation, retail offering and toilet facilities.

## **1.2 Site Location and Description**

The application site is located adjacent to the BKE railway line running from Southcote Junction in the North to Basingstoke in the South. The building will be situated between the rear of the proposed East platform and the proposed interchange development.

## **1.3 Report Scope**

This report will outline the lighting assumptions and proposals for the platform and station building. This report provides a high-level view of the following:

- Maintenance factors;
- Environmental Considerations;
- Proposed light fittings;
- Proposed lighting levels; and
- The current lighting control scheme.

Any information provided in this report is subject to change due to development related to the GRIP 5 design.

## 2 Design Criteria and Assumptions

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### 2.1 Introduction

The following section outlines the maintenance factor calculation and environmental considerations that will be used during the GRIP 5 lighting design.

The maintenance factor is a value applied to a light fitting that allows the design to provide the required lux levels up to the end of the fitting's design life.

The environmental considerations are applied to ensure the building and platform lighting design does not negatively impact the surrounding areas.

### 2.2 Maintenance Factor

Maintenance factors have been derived from CIBSE-SLL. Typical maintenance factors have been assessed based upon the following criteria:

- Cleaning interval 18 months with IP6X minimum luminaire rating and medium pollution (factor = 0.8 and factor = 0.88 for internal spaces);
- Spot replacement (factor = 1);
- Lamp lumen maintenance factor at 10,000 hours (0.9)

**Maintenance factor applied for external areas = 0.72**

**Maintenance factor applied for internal areas = 0.80**

### 2.3 Environmental Considerations

Guidance Notes for the reduction of Obtrusive Light GN01:2005 defines Lux level limits to the surrounding areas for certain categories.

Based upon an Environmental Zone of E2 Low district brightness area Rural, small village, or relatively dark urban locations - Table 1 provides criteria as follows:

- Sky Glow 2.5%;
- Light trespass into windows – Pre-curfew - 5 Lux;
- Light trespass into windows – Post -curfew - 1 Lux;
- Source Intensity – Pre-curfew 7.5(kcd);
- Source intensity – Post-curfew 0.5(kcd); and
- Building Luminance – N/A to platform.

*Note: curfew timetable to be confirmed by Network Rail during next design stage.*

Remedial measures considered for compliance are as follows:

- Sky Glow – Flat glass diffuser will give 0% upward light.

- Lamp Source intensity – Source intensity should be measured in the obtrusive direction of lamps.

## 3 Proposed Lighting Design

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### 3.1 Introduction

This section will provide a high-level overview of the luminaires that will be used during the GRIP 5 detailed design in addition to the proposed lighting levels that will be required in each area.

### 3.2 Luminaire Descriptions

LED luminaires have been proposed for all spaces that will reduce the electricity consumption, decrease the maintenance frequency's and improve the overall quality of the light.

Station Building Areas:

- The M&E plantroom and storeroom for the retail will be fitted with LED luminaires suspended at 2.4m above finished floor level (AFFL).
- The retail unit will include LED downlights recessed in the suspended ceiling at 3.6m AFFL.
- The station ticket hall will include recessed linear LED luminaires installed integral to the suspended raft ceiling. These luminaires will be spaced to align with the grid system of the concourse raft at 3.6m AFFL.
- The external entrance canopy will be fitted with recessed sealed IP65 LED downlight luminaires.
- The external Out-of-Hours side entrance will be illuminated using the entrance canopy lighting along with a single lighting column<sup>1</sup> and wall mounted IP65 LED linear luminaires as required.
- The external mechanical plant area adjacent to the Station Building will wall mounted circular IP65 luminaires complete with eye-lid cover to prevent upward light pollution.
- Lighting to external signage and advertising boards have not been confirmed and will be developed during the next design stage.

Platform and Footbridge Areas:

- The open platforms will be illuminated by LED luminaires mounted on flange plate mounted 5m columns.
- The platform canopy luminaires will consist of vandal resistant linear LED luminaire installations mounted onto the Cable Management System to provide illumination of the canopy area and platform edge.

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<sup>1</sup> As per Form 004 – Architectural and Layout Acceptance – 158989-ARP-RG-ST-RP-A-000001

- The footbridge lighting will consist of vandal resistant linear LED lighting system mounted to the roof above the footbridge stairs and footbridge deck, as well as specific luminaires mounted above each lift entrance.
- Local lighting will be provided within the proposed lift motor rooms and plantrooms below the new footbridge stairs by linear LED luminaires.

### 3.3 Lighting Illumination Levels

Normal illumination levels shall be based on Network Rail South-East Territory Lighting Installations Guidance Note; Issue 2, Design Standards for Accessible Railway Stations Version 04, Rail Industry Standard for Lighting at Stations and BS EN 12464-1:2011.

The illumination levels and uniformity shall for the Platforms, Footbridge and Station Building will be:

| Station Building Areas                 | Average Illumination Levels | Uniformity           |
|----------------------------------------|-----------------------------|----------------------|
| Ticket Hall                            | 200 lux at floor level      | 0.4                  |
| Ticket Barrier                         | 350 lux at floor level      | 0.4                  |
| Retail Unit                            | 500 lux at floor level      | 0.6                  |
| Retail Store                           | 200 lux at floor level      | 0.4                  |
| Cleaner Room                           | 200 lux at floor level      | 0.4                  |
| M&E Plantroom                          | 200 lux at floor level      | 0.4                  |
| GWR Staff Restroom                     | 200 lux at task level       | 0.4                  |
| Toilets & baby change facilities       | 200 lux at floor level      | 0.4                  |
| GWR Secure Office                      | 350 lux at task level       | 0.4                  |
| GWR Open Ticket and Enquiry Desk       | 500 lux at task level       | 0.4                  |
| Entrance Canopy                        | 100 lux at floor level      | 0.4                  |
| Out-of-Hours Entrance                  | 100 lux at floor level      | 0.4                  |
| External condenser compound            | 10 lux at floor level       | 0.4                  |
|                                        |                             |                      |
| Platforms and Footbridge               | Average Illumination Levels | Uniformity           |
| Open Platforms                         | 50-80 lux at floor level    | 0.4                  |
| Platform Edge (Open Platforms)         | 10 lux                      | 0.4 / 0.1 diversity  |
| Covered Platforms (Category D Station) | 100-130 lux at floor level  | 0.4 / 0.25 diversity |
| Platform Edge (Covered Platform Edge)  | 10 lux                      | 0.5 / 0.1 diversity  |
| Footbridge                             | 150 lux at floor level      | 0.4                  |
| Footbridge Stairs                      | 150 lux at tread level      | 0.4                  |
| Lift Motor Room                        | 200 lux at floor level      | 0.4                  |
| Plantrooms                             | 200 lux at floor level      | 0.4                  |

### 3.4 Emergency Lighting Illumination Levels

Emergency illumination levels have been based on the following requirements and shall align with Group Standard Document – Rail Industry Standard for Lighting at Stations RIS-7702-INS and BS 5266.

- The minimum maintained horizontal illuminance of emergency lighting on an escape route will be a minimum 2 lux measured at the walkway surface, with a diversity not exceeding 40:1 or 0.025.

Based on the above information the emergency lighting levels have been calculated to provide:

- Reading Green Park station building: > average 2 lux and > diversity 0.025.

### 3.5 Emergency Lighting Types and Power Supplies

Emergency exit signs will include pictogram formats in compliance with BS5499 and in accordance with the Fire Strategy requirements.

Selected luminaires will generally be provided with integral 3-hour maintained inverter/battery packs to internal areas and external canopy of the Station Building.

The Platform and Footbridge emergency lighting will be provided within selected luminaires complete with integral maintained inverter/battery packs capable of providing sufficient emergency lighting levels for a period of at least 3 hours.

The current Fire Strategy requires an emergency escape route behind Platform 2 that includes egress from the south end of the Platform to the public road overbridge and will require an emergency lighting system to be incorporated – a central battery system is currently being considered for this application. A central battery system will require additional space housed within a 120min fire resistant enclosure/room and circuits wired in fire resistant cabling plus separate cable containment system. Details of these emergency lighting systems i.e. central battery system and/or luminaires with self-contained batteries will be concluded during the next design stage.

Emergency test key switches will be provided integral to a multi-gang switch arrangement located adjacent to the electrical distribution board associated with the space being served.

## **4            Lighting Control**

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### **4.1           Introduction**

The following section will detail the current lighting control scheme.

### **4.2           LiGO Lighting Control System**

A lighting control scheme for Reading Green Park Station will be based on Open Technology's 'LiGO' lighting control system.

The Station Building consists of a combination of manual switching, presence and absence detection as the most cost-effective solution to minimise electricity consumption. The Station Building LiGO lighting control panel and equipment will be installed in a suitable enclosure within the M&E Plantroom.

The Station Building lighting systems shall be controlled via the pre-set LiGO system which shall include integrated time control. Based upon agreed pre-set timings, the lights will turn on and turn off thirty minutes prior to the Reading Green Park Station opening times and one hour after closure. The systems will also include a manual override switch forming part of the LiGO system.

The external out of hours entrance route lighting will also include a photocell to illuminate these areas during low light conditions.

The LiGO system will include the facility to remotely monitor and control the station lighting systems over the internet. This facility will allow NR/GWR staff to provide lighting levels to match train timetables, passenger presence and daylight levels.

The LiGO lighting control system will be developed to integrate the Station Building and Platform & Footbridge during the next design stage. The LiGO system will interface the Station Building with the Platform and Footbridge lighting scheme, however these two areas will generally operate as two independent systems in terms of lighting control applications.