RMR, Saltbox, Bognor Regis

External Lighting Report

Richmond Motor Group

Saltbox, Bognor Regis

External Lighting Report

Issue: P02

ARUN DISTRICT COUNCIL BE/20/22/DOC

Document Sign Off

RMG Saltbox

External Lighting Report

CURRENT ISSUE					
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Contents

Contents

1 INTRODUCTION 4

2 SITE LOCATION 5

3 OBJECTIVES 6

4 ASSESSMENT METHODOLOGY 8

5 DESIGN CRITERIA AND APPROACH 9

6 PROPOSED LUMINAIRES 11

7 CONCLUSION 12

8 APPENDICIES 13

1 INTRODUCTION

The following design statement is provided for planning purposes to describe proposals for the new external lighting scheme for the proposed New Multi Car Dealership Showroom and Service Centre on the Saltbox Development in Bognor Regis for The Richmond Motor Group. The report detail the specific intention of expressing methods for the reduction of obtrusive light.

The proposal is to provide an external lighting scheme which is as unobtrusive as possible, which complies with guidelines for the reduction of light pollution and to satisfy the local planners and the local community, whilst meeting RMG's operational requirements. The external lighting scheme will be designed to create a safe external environment by providing artificial lighting in the hours of darkness, whilst ensuring the lighting does not affect neighbouring areas. This report and associated drawing focuses on lighting to the car forecourt, building perimeter, service parking and customer/staff parking areas.

The external lighting scheme in this report is to be viewed as a lighting design strategy rather than a detailed design solution. The external lighting strategy has been developed to assess the impact the lighting will have on the surrounding area and surrounding properties and assesses whether the proposed scheme is suitable for the intended use and also whether all applicable regulatory requirements are met. To reduce the backward lightspill from the external lighting scheme 'back light baffles' shall be installed on all perimeter lighting. The external lighting shall be design to minimise the adverse impact on ecology.

The proposed external lighting strategy has been designed in compliance with the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011 and complies with all relevant British Standards, lighting guidelines and guidance provided by the Society of Light and Lighting.

It is proposed that the majority of external lighting shall be switched off out of hours with minimal being provided for out of hours security and minimal site movement.
The proposed hours of operation are detailed below:

Workshop		**Sales**	
Mon-Fri	07:30-18:00	Mon – Fri	08.30 – 19.00
Sat	08:30-13:00	Sat	08.30 – 18.00
Sun	Closed	Sun	10.00 – 16.00

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2 SITE LOCATION

The proposed site for the new car dealership is located off Shipney Road on the new Saltbox Industrial Development near Bognor Regis.

The site is close to the A29 with industrial/commercial buildings to the North and East of the site. A small caravan site is located towards the south of the site, the site light spill shall be kept to a minimum with the intention to avoid light pollution to neighbouring properties.

The proposed site is located on an industrial estate adjacent the A29 with this road and the industrial estates stree lighting lit 24 hours for safety and security. With the surrounding roads and sites being lit for a significant number of hours each day consideration of the operational hours for the proposed sites external lighting should be given to ensure these align with the surrounding area.

Although the site is located within a commercial area due to its surrounding environment (and major roads) being in close proximity with long durations and high levels of artificial light. The local planning authority have confirmed that the site is within a Category E2 Environmental Zone. A Category E2 Environmental Zone is defined in the ILE guides as ‘An area of low ambient brightness or outer urban or rural residential area’.

The external lighting proposed has been designed to comply with the requirements of a Category E2 Environmental Zone as stated above.

It has been proposed that currently no modifications are to be made to the existing access roads existing lighting.

ARUN DISTRICT COUNCIL BE/20/22/DOC

3 OBJECTIVES

The general objective of this report is to assess the impact of a suitable lighting scheme for the proposed new development on the surrounding area and environment.

Specific objectives of the proposed lighting scheme include:

- To limit light pollution and sky glow.
- To limit obtrusive light, spill light / trespass light and glare to neighbouring land and properties.
- To provide an external lighting strategy and level of illuminance that addresses site security
- Provide a scheme that meets RMG's operational and commercial requirements.

Relevant Standard & Guidance

The following standards and guidance have been consulted in preparing the lighting design:

- CIBSE Lighting Guide 6 – The Outdoor Environment
- Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011
- SLL Code of Lighting 2006
- Society of Light & Lighting Handbook – 2009
- Guidance Notes for the Reduction of Obtrusive Light – ILE, 2005
- CIE Technical Report, CIE 150:2003 – Guide to the Limitation of the Effects of Obtrusive Light from Outdoor Installations
- BS EN 12464-2:2007 lighting of work places. Part 2: Outdoor work places.
- (ILE) Guidance Note 1 for the reduction of obtrusive light 2021

All standards consulted are nationally recognised documents, (some internationally, also) which deal with all design issues associated with external lighting. There are also a number of other factors which influence the appropriate design of a lighting scheme, based upon the Environmental Class. These factors are explained in more detail below.

Sky glow must be restricted, by restricting the upward light ratio of all light fittings. Table 2, from CIE guidance states the requirements that must be met.

Environmental Zone	Maximum upward light ratio ULOR (%)
E1	0
E2	5
E3	15
E4	25

Table 2 – CIE Recommendations for the limitation of Sky-glow

All luminaires for this scheme will emit less than 5% upward light, and will therefore meet this objective.

The intensity of all light sources must also be controlled such that there are no lamps visible from the site boundary exceeding the values in table 4.

Given that all specified luminaires will have clear and defined cut-off angles, and be angled down with the lamp concealed by the luminaire body, there is no possibility of direct glare being experienced by nearby residents.

Light Technical Parameter	Application conditions	Environmental Zones			
		E1	E2	E3	E4
Luminous Intensity emitted by luminaires	Pre-curfew	2500 cd	7500 cd	10000 cd	25000 cd
	Post-curfew	0 cd	500 cd	1000 cd	2500 cd

Table 4 – CIE Maximum Values of Intensity of luminaires in designated directions

Safety in all areas of the site is the primary reason for the lighting provision. The standards and guidance listed above not only stipulate the necessary requirements to reduce and/or eliminate light pollution, they also specifically detail the minimum illumination levels that should be achieved within the development.

4 ASSESSMENT METHODOLOGY

An appropriate lighting scheme for the site has been assessed using standard industry software Dialux. The lighting outputs have been calculated with all the luminaries switched on. During out of hours (including out of hours deliveries) a part lighting strategy will be used throughout the site, as outlined in the report, to further reduce light levels during the night.

From these calculations, drawings illustrating the horizontal illuminance levels throughout the site and at the boundary have been produced so that the lightings scheme's impact can be assessed.

The calculation model (isolux levels on drawing) do not include the proposed planting / hedgerows / trees, however this is accounted for when assessing and making conclusions about the light spill.

Light trespass has been assessed and the line of sight from neighbouring residential properties has also been considered. The sky glow impact from the site has been calculated for the 'worst case scenario', with all the luminaries switched on.

5 DESIGN CRITERIA AND APPROACH

The lighting scheme outlined in this report is to be viewed as a lighting design strategy rather than a detailed design solution but will provide a robust basis for the future detailed design.

Recommended Lighting values lighting levels have been designed in accordance with the CIBSE Lighting Guides requirements and to mitigate the sites impact on wildlife. Consideration has been given to SLL Code for Lighting 2006 – Obtrusive Light Guide, Guidance Notes on Reduction of Light Pollution, and BS 5489.

Recommended Levels

The recommended levels according to SLL Code for Lighting – Obtrusive Light Guide and General Areas in Outdoor Work Places are as follows:

- Walkways exclusively for pedestrians are 5 Lux Maintained Average (horizontal).
- Traffic areas for slowly moving vehicles (max 10 km/h) e.g. bicycles, trucks and excavators is 10 Lux Maintained Average (horizontal).
- Pedestrian passages, vehicle turning, loading and unloading points are 30 Lux Maintained Average (horizontal).
- Lighting requirements for safety in medium risk areas is 20 Lux.
- Lighting requirements for safety in high risk areas is 50 Lux. The recommended lighting levels according to BS EN 12464-2:2007 Lighting of work places – Part 2: Outdoor work places, are as follows:
- Staff welfare area to be lit to 10 Lux maintained average. This area is to be lit between the hours of 7am till dawn and dusk till 7pm.
- Car parks to be lit to a luminance of 20 lux minimum with a 0.25 uniformity, with light level enhanced in and around designated disabled parking spaces.
- Main building perimeter to be lit to an average luminance of 20 lux minimum with 0.45 uniformity and with an enhanced light level around the perimeter of the building.

Strategy for minimising obtrusive light, mitigating the effect on wildlife and reducing the visual impact of the lighting scheme.

Careful consideration has been given to reducing obtrusive light during the hours when the site is lit and the visual impact of the lighting scheme during the day, whilst maintaining an adequate level of illuminance for its application on the site. Particular attention has been paid to minimising the presence of the scheme and any intrusion, glare or sky glow produced by the scheme.

A majority of the luminaires are building mounted luminaires while the luminaires in the car park are to be column mounted, some columns will be base-hinged to allow for maintenance in areas where access may be difficult. The building mounted luminaires are generally, mounted at 3.5m high while columns luminaire are be mounted between 6-8m high.

The column mounted luminaires have been chosen to be as inconspicuous as possible. Arm brackets shall have 0º uplift. They will also be fitted with flat glass to reduce the visibility of the light source. Wherever possible luminaires are to be orientated towards the site, to make them less intrusive to neighbouring properties and wildlife. Luminaires have been chosen that have good light control and cut off angles to reduce light spillage.

The building mounted luminaries will be angled at a maximum of 0º above horizontal which will minimise sky glow whilst providing a wide light distribution at ground level reducing shadows produced from obstructions. The luminaires shall have 0% upward light ratio, and the beam spread is controlled to within 50º from the vertical when the glass is horizontal.

Strategy for Luminaire Types

LED luminaire shall be utilised around the perimeter of the building and car park area on the site. Using this type of LED lamp will provide an energy efficient solution which complies with building regulations Part L. These luminaries, or equal and approved, have been chosen as they have been designed to be anti light pollution (due to the shape of luminaires) and low glare with good levels of efficiency between 80-90% for the chosen lamp types and zero upward light output ratio. All the luminaries are IP65-IP66 rated and impact resistant.

Lighting Control

To minimise the light impact on surrounding areas as much as possible a part-lighting strategy will be adopted. A part-lighting strategy will ensure that where security lighting is not required luminaires shall switch off during hours where the site is not occupied. When out of hours deliveries occur these shall be carried out using the security lighting only with lighting local to the workshop to be manually operated for the duration of the delivery.

Photocells and timeclocks shall be used to control all external luminaires, this will ensure that luminaries are not on during daylight hours or when they are not required. In areas where there is intermittent pedestrian traffic external luminaires shall be controlled by local presence detection with integrated photocells.

6 PROPOSED LUMINAIRES

Building Mounted

All building mounted lighting shall consist of LED bulkhead luminaires with less than 2% upward light component and between 4000-6000k in colour temperature. The luminous efficacy of this fitting is 138 lm/W.

Car Parking

All car park lighting shall consist of column mounted LED luminaires with 0% upward light to ensure dark skies compliance and between 4000-6000k in colour temperature. The luminous efficacy of this fitting is 122 lm/W.

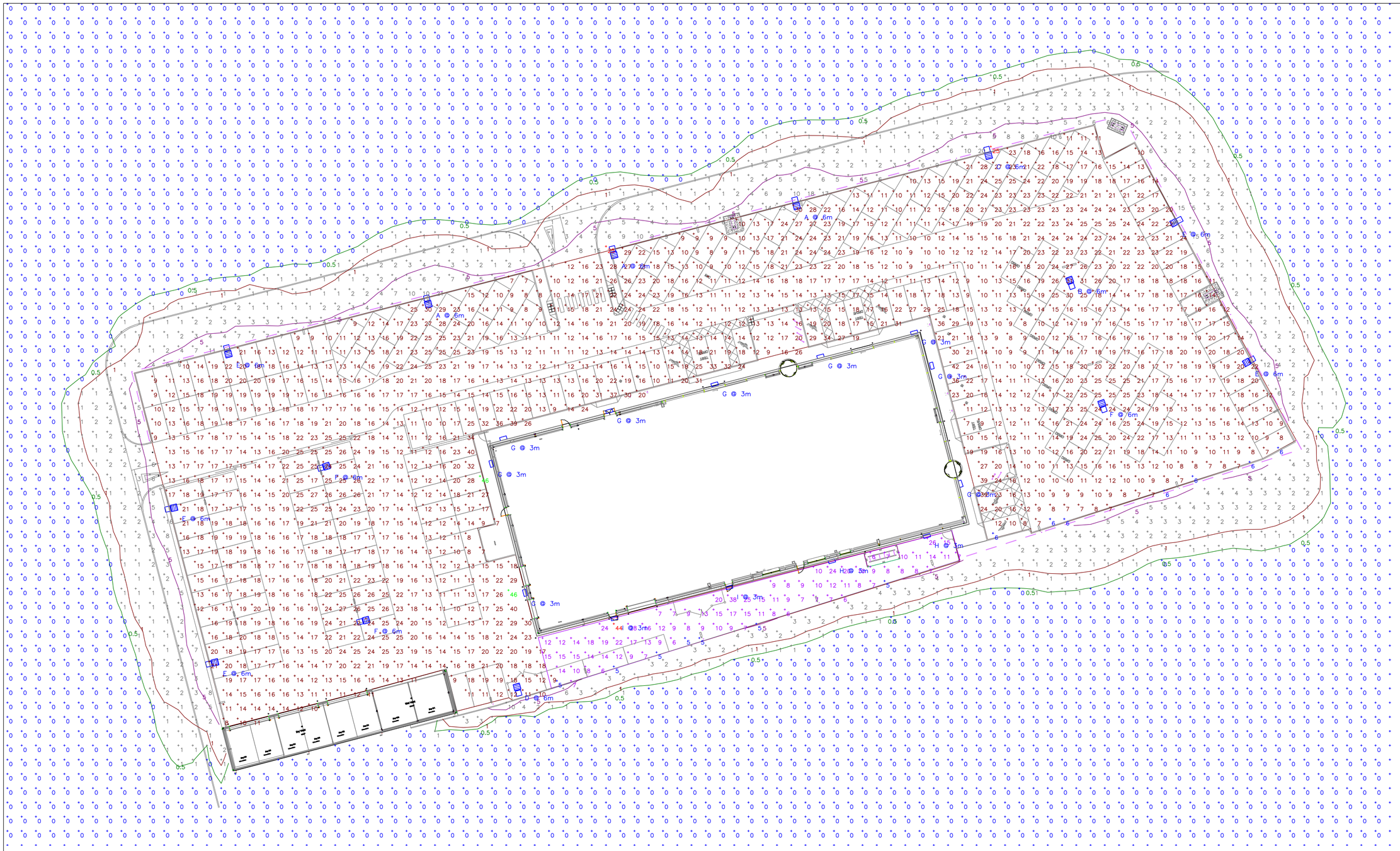
The luminaires installed shall have the same specification as above with the final aesthetic style of fitting subject to change.

7 CONCLUSION

The above methods of lighting and control are proven methods for reducing light spill over the site boundary onto neighbouring areas and also to reduce sky glow from upward light distribution. The purpose of the lighting scheme is ultimately to provide a safe and secure environment and also to minimise or eliminate any negative impact on the existing environment.

8 APPENDICIES

A – EXTERNAL LIGHTING – LIGHTSPILL DRAWING



Schedule						
Symbol	Label	Quantity	Catalog Number	Description	Lumens Per Lamp	Wattage
	A	3	DSX0.1.LA104.FW.BLS	D-Series 0 Area luminaire	7553	81
	B	1	DSX0.1.LA104.FW	D-Series 0 Area luminaire	9673	81
	C	1	DSX0.1.LA084.AY.BLS	D-Series 0 Area luminaire	6323	64
	D	1	DSX0.1.LA044.BLC	D-Series 0 Area luminaire	3287	29
	E	5	DSX0.1.LA064.AY.BLS	D-Series 0 Area luminaire	4719	45
	F	3	DSX1.2.LA114.SY	D-Series 1 Luminaire	13055	105
	G	9	DWL.1.LA044.FW.W025	Denver iD Wall	3823	25
	H	2	DWL.1.LA024.AY.W011	Denver iD Wall	1442	10.3
	I	2	DWL.1.LA034.AY.W018	Denver iD Wall	2384	18

Statistics				
Description	Symbol	Avg	Min	Min/Avg
Building Perimeter South	+	12 lux	5 lux	0.42
Car Parking	+	17 lux	6 lux	0.35
Spil Light	+	0 lux	0 lux	N/A

Revisions:

Revision	Date	Revision Notes	Drawn	Checked

Standard Notes
1. DO NOT SCALE THIS DRAWING, WORK TO DIMENSIONS GIVEN.
2. ALL DIMENSIONS TO BE VERIFIED FROM SITE MEASUREMENT.
3. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATION AND ALL OTHER LAYOUT DRAWINGS.

2. ALL SETTING OUT TO BE CONFIRMED BY THE ARCHITECT.

3. ELECTRICAL INSTALLATION SHALL COMPLY WITH THE CURRENT BS 7671 WIRING REGULATIONS.

4. DO NOT SCALE OFF THIS DRAWING, ALWAYS WORK TO NOTED DIMENSIONS.

5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND STRUCTURAL ENGINEERS DRAWINGS.

LUMINAIRE SCHEDULE

Z - FACTOR SMALL STREETLIGHT - SINGLE
(FTS.2.LA054.AY)

Y - FACTOR SMALL STREETLIGHT - TWIN
(FTS.2.LA054.AY)

X - FACTOR SMALL STREET LIGHT - BUILDING MOUNTED
(FTS.2.LA054.AY)

Project:

RMG, Saltbox
Bognor Regis

Confidentiality

This drawing is issued confidentially and must not be disclosed to any third parties without the prior written consent of Collina MEPI.

Drawing Title:

ELECTRICAL SERVICES
EXTERNAL LIGHTING LAYOUT

Status:

PLANNING

Drawn:	Checked:	First Issued:
K.H	T.H	15.02.22

Drawing Number:

2110-COL-XX-00-DR-E-901

Sheet Size:	Scale:	Revision:
A1	N.T.S	T01

COLLINA
MEP DESIGN