

TECHNICAL NOTE

Project name **Wrexham AFC - KOP Development**
Description: **Response to Flood Light Planning Queries**
Project no. **1620012485**
Client **Wrexham Association Football Club**

Prepared by **Mostafa Moradalizadeh**
Checked by **Carla Bartholomew**
Approved by **Martin Willis/Adam Selvey**

1 Introduction

Date 20/07/2022

This technical note has been prepared in response to queries raised by the Planning Officer regarding the Flood Light Report, submitted as part of the planning application for the new flood lights. The purpose of the note is to formally capture the design team's response.

2 Spill Diagram

Planning officer's comment:

"The light spill diagrams in the appendices should be overlaid over a map of nearby buildings that will be impacted by the proposals to show the light level they will be exposed to."

Design Team's Response:

Refer to Appendix 1. The local map has been overlaid to better illustrate the impact of flood lights.

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3 Impact

Planning Officer's comment:

"There has been no discussion as to what the impact will be on affected properties. The report suggests that the light spill on the vertical plane will be a significant increase, this should be discussed in the report."

Design Team's Response:

To assess the impact of the proposed flood lights on the nearby properties, we tested the light spill from the existing flood lights. The test locations included the residential buildings along Mold Road, Glyndwr University student residential building and Campus. The vertical illuminance was measured at 1.5m above ground level, as per BS EN 12193 methodology for vertical illuminance. At the time of testing 56 out of 116 lights were operational, producing an average of 500lux on the field of play. The results have been extrapolated to estimate the spillage when all lamps are operational, with an average of 1000 lux on the field of play. It should be noted the new flood lights will provide an average of 1600

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lux on the field of play, therefore a like for like comparison is not possible. Refer to Appendix 2 for the test results overlayed on the vertical lux spillage drawing. Table below outlines a summary:

	Existing Flood Lights Vertical Minimum Lux - <u>extrapolated up to</u> <u>1000 lux</u> average field of play	Proposed Flood Lights Vertical Lux - 1600 lux average field of play	Percentage reduction
Mold Road Resi 1	116	11	91%
Mold Road Resi 2	62	7	89%
Mold Road Resi 3	104	31	70%
Glyndwr Student Resi	50	50	0%
Glyndwr Campus 1	42	32	24%
Glyndwr Campus 2	28	19	32%
Glyndwr Campus 3	92	50	46%
Glyndwr Campus 4	26.6	6	77%

In conclusion, the proposed flood lights will cause less spillage to the neighbouring environment despite higher average lux levels on the field of play. Whilst extrapolating the test results to be twice as much is a reasonable assumption as it is the minimum potential light spillage, however there is no guarantee to the aiming of the luminaires that are inoperable are consistent with the luminaires operational at the time of survey. This could potentially lead to higher than double spillage in certain locations.

4 Mitigation

Planning Officer's comment:

"There has been no discussion in the report on mitigation from light spill."

Design Team's Response:

TLC 1500 LED Luminaire photo (Appendix 3) which showcases the full cut-off visor has been utilised for this design. The visor has varying lengths to allow adjustments at point of commissioning to further reduce the spill and improve glare control.

ULR Drawings (Appendix 4) indicate that with the use of the visored TLC 1500 luminaire there will be 0.0% skyglow or upward light resulting directly from the flood lights. This will be a key point for the planners, as the current lights have very little upward light control, so they throw significant light into the night sky.

The existing flood lights are discharged luminaires and require the lamps to be replaced at regular intervals. During the maintenance procedure, there is a potential for the luminaire aiming angle to be altered, as there may be difficulty to install back into exact position and angle. The new flood lights will be manufactured with predetermined, customised, and fixed aiming angles prior to being installed. Therefore, luminaires will not lose their aiming angle during maintenance being carried out at high level.

In addition, discharge type luminaires are turned on for a long period of time prior to a match to allow for full output. However, as the new flood lights are LED, the period of time required for full brightness is drastically reduced, resulting in the total "on-time" much less than the discharge type. Subsequently this will result in spillage being observed for a much shorter time.

Appendix 1

Wrexham FC
Wrexham, Wales

GRID SUMMARY	
Name:	5.1 Wrexham AFC - 200m Spill
Spacing:	10.0m x 10.0m
Height:	1.0m above grade

ILLUMINATION SUMMARY	
MAX VERTICAL LUX	
Scan Average:	Entire Grid 5.2152
Maximum:	224.05
Minimum:	0.00
CU:	0.01
No. of Points:	1838
LUMINAIRE INFORMATION	
Applied Circuits:	A, B
No. of Luminaires:	176
Total Load:	240.24 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume $\pm 3\%$ nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Appendix 2

Wrexham FC
Wrexham, Wales

GRID SUMMARY

Name:

5.1 Wrexham AFC - 200m Spill

Spacing:

10.0m x 10.0m

Height:

1.0m above grade

ILLUMINATION SUMMARY

MAX VERTICAL LUX

Scan Average:

Entire Grid

5.2152

Maximum:

224.05

Minimum:

0.00

CU:

0.01

No. of Points:

1838

LUMINAIRE INFORMATION

Applied Circuits:

A, B

No. of Luminaires:

176

Total Load:

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Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

SCALE 1 : 1250

0

13m

25m

Pole location(s) ⦿ dimensions are relative to 0,0 reference point(s) ⊗

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ENGINEERED DESIGN

By: Nick Rohrer · File #194992H · 14-Jul-22

ILLUMINATION SUMMARY

Appendix 3

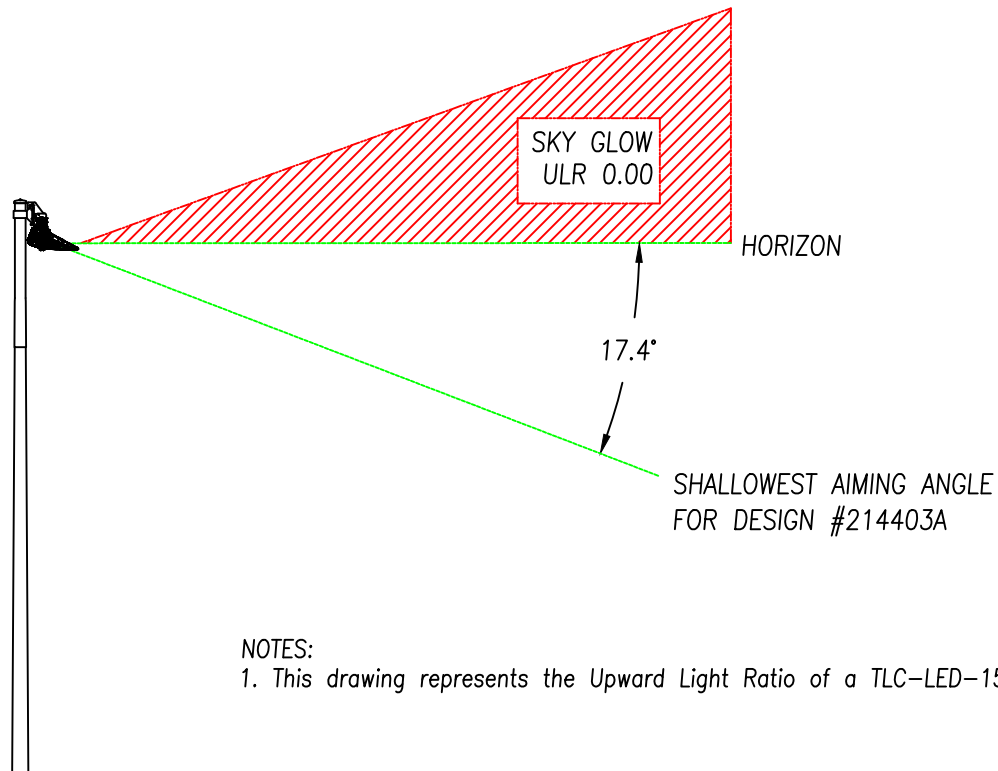
Total Light Control™ – TLC-LED-1500 Luminaire



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Appendix 4

Upward Light Ratio



NOTES:

1. This drawing represents the Upward Light Ratio of a TLC-LED-1500 3W luminaire with a 0.48m Visor.

DETAIL A

Wrexham FC
Musco LED
Upward Light Ratio

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