LIGHTING IMPACT ASSESSMENT

PROJECT: Batley Bulldogs RLFC

LIGHTING FOR PROPOSED PADEL COURTS

PREPARED FOR: Padel & Co Club Ltd

April 2025

Contents

1. Introduction

1.1 General

1.1.1 Batley Bulldogs RLFC is an existing stadium and associated sports facilities requiring additional artificial lighting for two new proposed padel tennis courts. The Stadium has a system of flood lighting installed for its existing courts. The introduction of Padel courts mean that lighting will be required to enable the safe use of the proposed courts during the hours of darkness.

1.1.2 This document shall outline the impact of the lighting from the proposed lighting design and is accompanied by lighting design calculation reports which illustrates the indicative lighting layout and calculated light spill towards sensitive receptors.

1.1.3 The lighting design shall be sensitive to the surrounding environment and residential receptors through the use of optically efficient luminaires, which control the light distribution to minimise light spill.

1.1.4 A site visit was undertaken to identify potential receptors and record the baseline conditions onsite including the measurement of existing light levels adjacent.

2. Legislative and Policy Framework

2.1 Introduction

2.1.1 This lighting design has been prepared with consideration towards the following legislation, policy and guidance:

2.2 National Policy and Legislation

- Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005
- National Planning Policy Framework: 2024

2.3 Relevant Lighting Standards

2.3.1 The most applicable Lighting Standards that relate to padel tennis courts are:

- Lawn Tennis Association (LTA) Padel Court Data Sheet.

Minimum Lighting performance standards for padel courts are defined as follows: -
Outdoor courts: - Minimum illumination at ground level (Z=0)

National and International Competition	500 lux (E av) with 0.7 uniformity
Regional competition, school & recreational use	**300 lux (E av) with 0.5 uniformity**

- BS EN 12193:2018 (Light and Lighting- Sports Lighting)

This standard proposes lighting levels according to the class of activity. Class II is defined as follows:

Lighting Class II: Mid-level competition such as regional or local club competition which generally involve medium size spectator capacities with medium viewing distances. High level training can also be included in this class.

Outdoor			Reference area		Number of grid points	
			Length m	Width m	Length	Width
Tennis	PA		30	15	13	7
	TA		36	18	15	7
Padel [a]	PA		20	10	13	7
Class	Horizontal illuminance		Horizontal illuminance TA		R_G	R_a
	$E_{hor\ Ave}$ lx	$U2_{hor}$	$E_{hor\ Ave}$ lx	$U2_{hor}$		
I	500	0,70	75 % PA	75 % PA	50	70
III	200	0,60	75 % PA	75 % PA	55	60
[a] A safety zone around both entrances of width 2 m, height 4 m and extending 4m from the centre to both sides is to be kept clear of any obstacles.						

Table 1 BS EN 12193:2018 Outdoor Tennis Lighting Standards

2.4 Relevant Guidance from the Institution of Lighting Professionals (ILP)

GN01: 2020 Guidance Notes for the Reduction of Obtrusive Light; 2020- ILP

2.4.1 GN01:2020 – *Guidance Notes for the Reduction of Obtrusive Light* – This document provides detailed information regarding types of obtrusive light and the mitigation that can be implemented to help prevent obtrusive light occurring.

2.4.2 Obtrusive Light (or sometimes referred to as Light Pollution) refers to any light emitted in a direction in which it is not required or wanted and as such is detrimental to other users. This can be limited by reducing the inclination of the luminaire to ensure as much light as possible is focussed onto the task area.

2.4.3 The lighting design has been undertaken in accordance with the published guidance documents from the ILP.

2.4.4 The quantitative limits are the same for both guidance documents. They quantify the levels of Direct Upward Light, Light Intrusion and Viewed Source Intensity (Glare) regarded as acceptable for varying environmental zones.

2.4.5 Light Intrusion refers to the spilling of light beyond the boundary of the area to be lit. This includes the intrusion of light into bedroom windows. Sky Glow refers to the brightening of the sky above towns cause by direct or reflected upward light.

2.4.6 Glare refers to the uncomfortable brightness of a light source when viewed against a dark background. **Figure 1** illustrates the different types of obtrusive light.

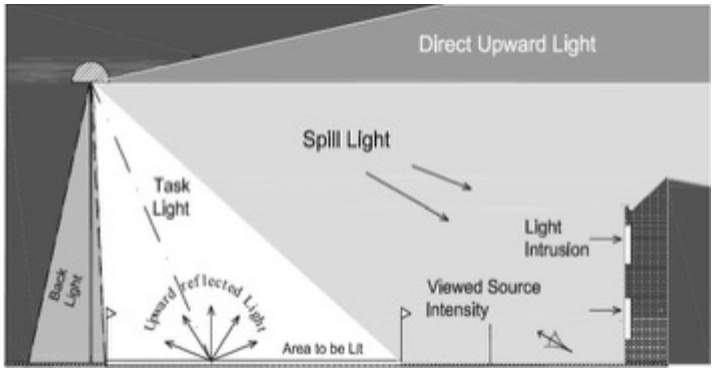

Figure 1- Obtrusive light diagram

2.5 Environmental limits

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Intrinsically dark	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Table 2 Obtrusive light limitations

Environmental Zones	Sky Glow ULR (Max %)	Light Trespass (into Windows) E_v (lux)	
		Pre- Curfew	Post-Curfew
E0	0	0	0
E1	0	2	0 (1*)
E2	2.5	5	1
E3	5	10	2
E4	15	25	5

Table 3- Maximum obtrusive light permitted for exterior lighting installations

2.5.1 The environmental class is assessed as **E3** as the application site is located in an area of medium district brightness, which resembles that of a suburban area. The existing public lighting, sports lighting and the luminance of the surrounding environment contributes towards the level of medium district brightness within the surrounding environment.

Curfew: the time after which stricter requirements (for the control of obtrusive light) will apply

Light technical parameter	Application conditions	Luminaire group (projected area A_p in m^2)					
		$0<A_p \leq 0.002$	$0.002<A_p \leq 0.01$	$0.01<A_p \leq 0.03$	$0.03<A_p \leq 0.13$	$0.13<A_p \leq 0.50$	$A_p>0.5$
Maximum luminous intensity emitted by luminaire (I in cd)	E0						
	Pre-curfew	0	0	0	0	0	0
	Post-curfew	0	0	0	0	0	0
	E1						
	Pre-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	2,500
	Post-curfew	0	0	0	0	0	0
	E2						
	Pre-curfew	0.57 d	1.3 d	2.5 d	5.0 d	10 d	7,500
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	500
	E3						
	Pre-curfew	0.86 d	1.9 d	3.8 d	7.5 d	15 d	
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	1,000
	E4						
	Pre-curfew	1.4 d	3.1 d	6.3 d	13 d	26 d	25,000
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	2,500
Aid to gauging A_p		2 to 5cm	5 to 10cm	10 to 20cm	20 to 40cm	40 to 80cm	>80cm
Geometric mean of diameter (cm)		3.2	7.1	14.1	26.3	56.6	>80
Corresponding A_p representative area (m^2)		0.0008	0.004	0.016	0.063	0.251	>0.5

Notes:

1. d is the distance between the observer and the glare source in metres;
2. A luminous intensity of 0 cd can only be realised by a luminaire with a complete cut-off in the designated directions;
3. A_p is the apparent surface of the light source seen from the observer position
4. For further information refer to Annex C of CIE 150
5. Upper limits for each zone shall be taken as those with column $A_p>0.5$

Table 4 Light Source Intensity limits

3. Baseline Conditions

3.1 Application Site

3.1.1 The Batley Bulldogs RLFC is set within a residential area approximately 1 mile South of the Batley Centre. It is bounded on the East and West by housing, mostly terraced with small gardens, to the South by Hyrstmount Junior School.

3.1.2 The proposal is to convert a derelict bowling green into 2 No. Padel Courts. Floodlighting to each Padel Court will be provided by 4 No 6m high columns each fitted with 2 No. LED floodlights.

3.1.3 These courts are immediately to the South of Batley Bulldogs Stadium that has stadium lighting. When in use the stadium lights are a major light source and drown all the adjacent lighting.

3.2 Site Survey

3.2.1 A site survey was undertaken on Thursday 3rd April from 17:00pm – 20:00pm to assess the existing baseline lighting levels and review the sensitive receptors. The weather was slightly overcast.

Figure 2 Application site - Indicative view

3.3 Sensitive Receptors

3.3.1 The primary purpose of the survey was to assess the potential for nearby residential properties to be affected by obtrusive light, resulting from the introduction of artificial lighting. To begin assessing this potential, it is necessary to measure the existing light levels on the site.

3.3.2 Upon visiting the application site, a small number of residential properties were identified as potential receptors to obtrusive light. These are indicated on the image below:

Figure 3 Indicative view of potentially sensitive residential receptors

3.3.3 The sensitive receptors are identified as:

- Residential properties on Purlwell Hall Road located to the East of the Application Site. These properties are set back due to the Batley Cricket Green, also hedges and established foliage between the houses and the Application Site. There is an 3·7 m change in ground level putting these properties higher than the site.
- Hyrstmount Junior School and to the South of the Application site. It is screened by a dense mass of trees and bushes
- Mount Terrace are residential properties to the West of the Application Site. It is screened by a dense mass of trees and bushes.

3.3.4 Vertical illuminance measurements were taken at the boundaries of the existing tennis courts on the location of the proposed padel tennis courts, using a calibrated illuminance meter. Measurements were taken at a height of 1.5m above ground level and in the 4 cardinal directions facing North, East, South and West. (North is looking towards the tennis dome, East towards Purlwell Hall Road, South towards Hyrstmount Junior School and West towards Mount Terrace.

3.3.5 All the existing street lighting was on and operating at the highest normal level to obtain a worst-case scenario.

4. Lighting Design

4.1 Introduction

4.1.1 This section outlines how the lighting design will be suitably implemented to ensure that the lighting performance is fit for purpose, whilst ensuring the effects on the surrounding environment and residual receptors are minimised.

4.1.2 Luminaires will be focussed directly onto the task area and away from the overlooking properties within a configuration that matches the layout provided.

4.2 Specification

Equipment details:

- Lamp Package: LED- Cold White- 16,000 lumens /
- Column height: 6 metres.
- Inclination: Not to exceed 2.5°
- Illustration: See **Figure 4**.

Installation details:

4.2.1 Lighting would be switched off when the padel club is closed at 22:00pm, thus allowing compliance with the post curfew obtrusive light limits for E3 Environmental Zones.

Figure 4- LED Floodlight

4.3 Lighting Performance

4.3.1 The luminaires shall be arranged as shown in **Figure** 5 i.e. 2 luminaires per lighting column and 4 lighting columns per court. The lighting columns are located 4m from the rear of each court towards the centre line:

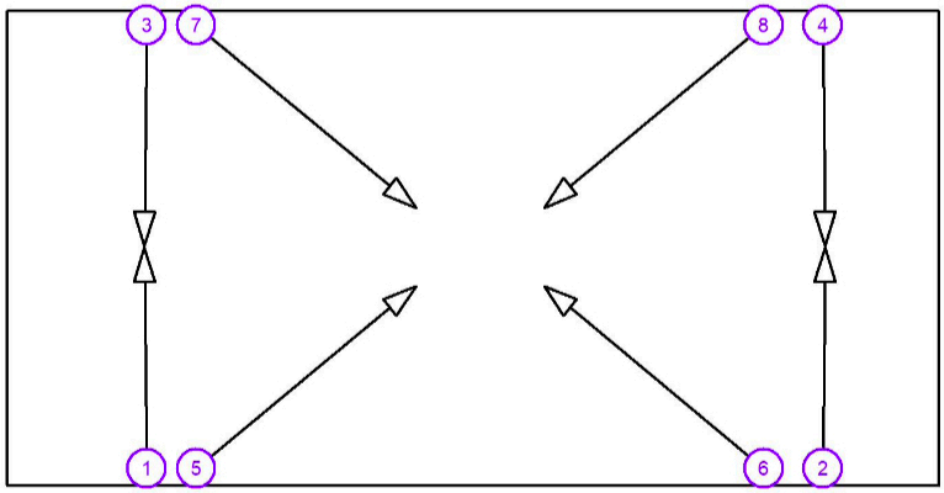

Figure 5- Luminaire layout

4.3.2 With the lighting arrangement in **Figure 5** above, the calculated lighting performance achieves both the recommended lighting performance as outlined by the LTA for padel court lighting, along with the Guidance Notes for the Reduction of Obtrusive light detailed in **Section 2**.

4.3.3 For lighting to comply with guidance outlined by the LTA, it is recommended that the principle play area (PPA) of each tennis court to be individually illuminated to an average of 300 Lux.

4.3.4 For the purpose of assessing the potential for obtrusive light resulting from additional floodlighting of the proposed courts, the obtrusive light calculations assume both of the proposed courts are to be illuminated. Therefore, the maximum adverse scenario is presented in **Section 5**.

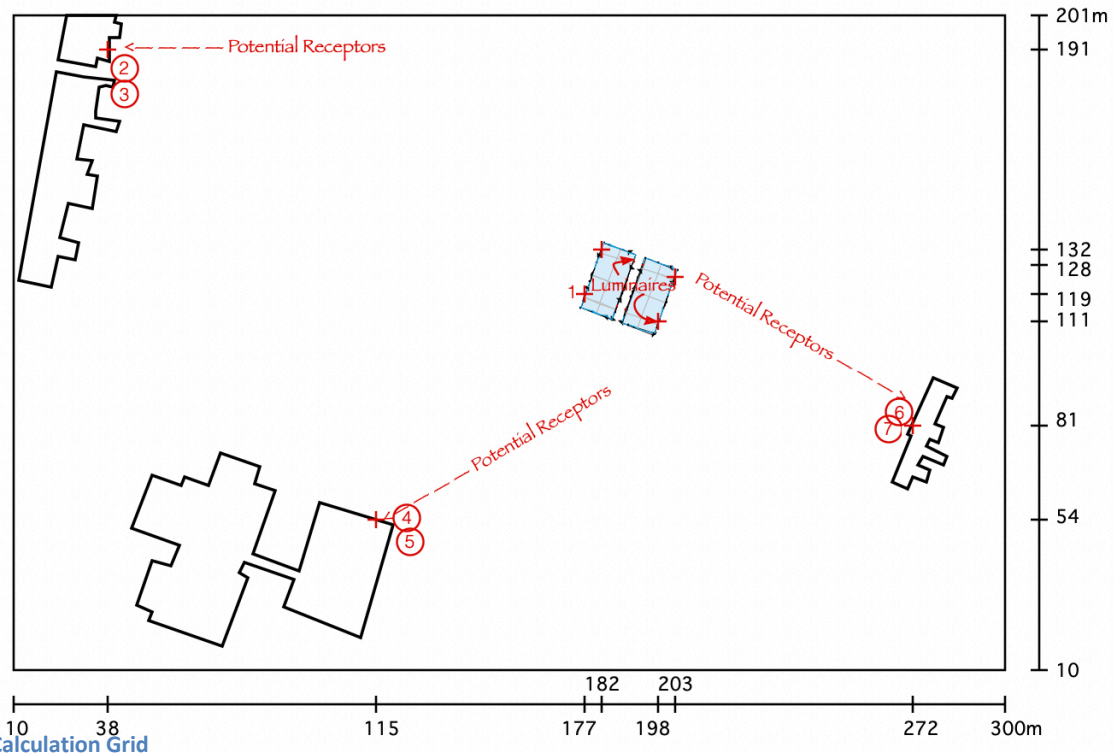

Figure 6- Calculation Grid

4.3 Lighting Performance

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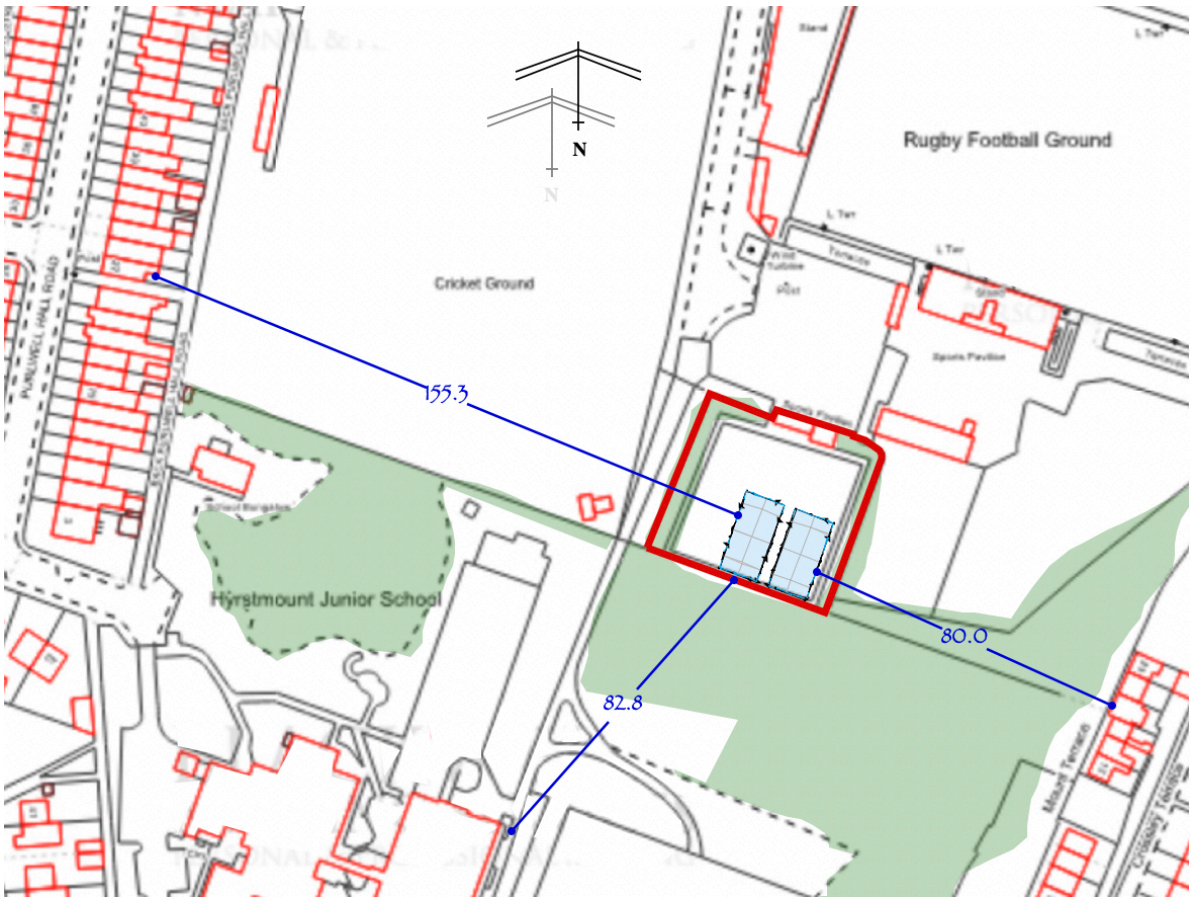

Figure 7- Luminaire layout

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4.3.3 For lighting to comply with guidance outlined by the LTA, it is recommended that the principle play area (PPA) of each tennis court to be individually illuminated to an average of 300 Lux.

4.3.4 For the purpose of assessing the potential for obtrusive light resulting from additional floodlighting of the proposed padel courts, the obtrusive light calculations assume both of the proposed courts are illuminated. Therefore, the maximum adverse scenario is presented in **Section 5**.

5. Obtrusive Light

5.1 Obtrusive Light Analysis

5.1.1 During the lighting design process, a series of calculations were made to ensure that the lighting design is compliant with obtrusive light guidance produced by the Institution of Lighting Professionals (ILP GN01:2020). The calculations show the highest possible level of light spill by discounting the predicted depreciation in luminaire light output.

5.1.2 An indicative lighting layout demonstrates the compliance of the lighting design. This is summarised in **Figures 6, 7 & 8**, provided for information detailing where the observer positions have been located, for the purpose of assessing obtrusive light.

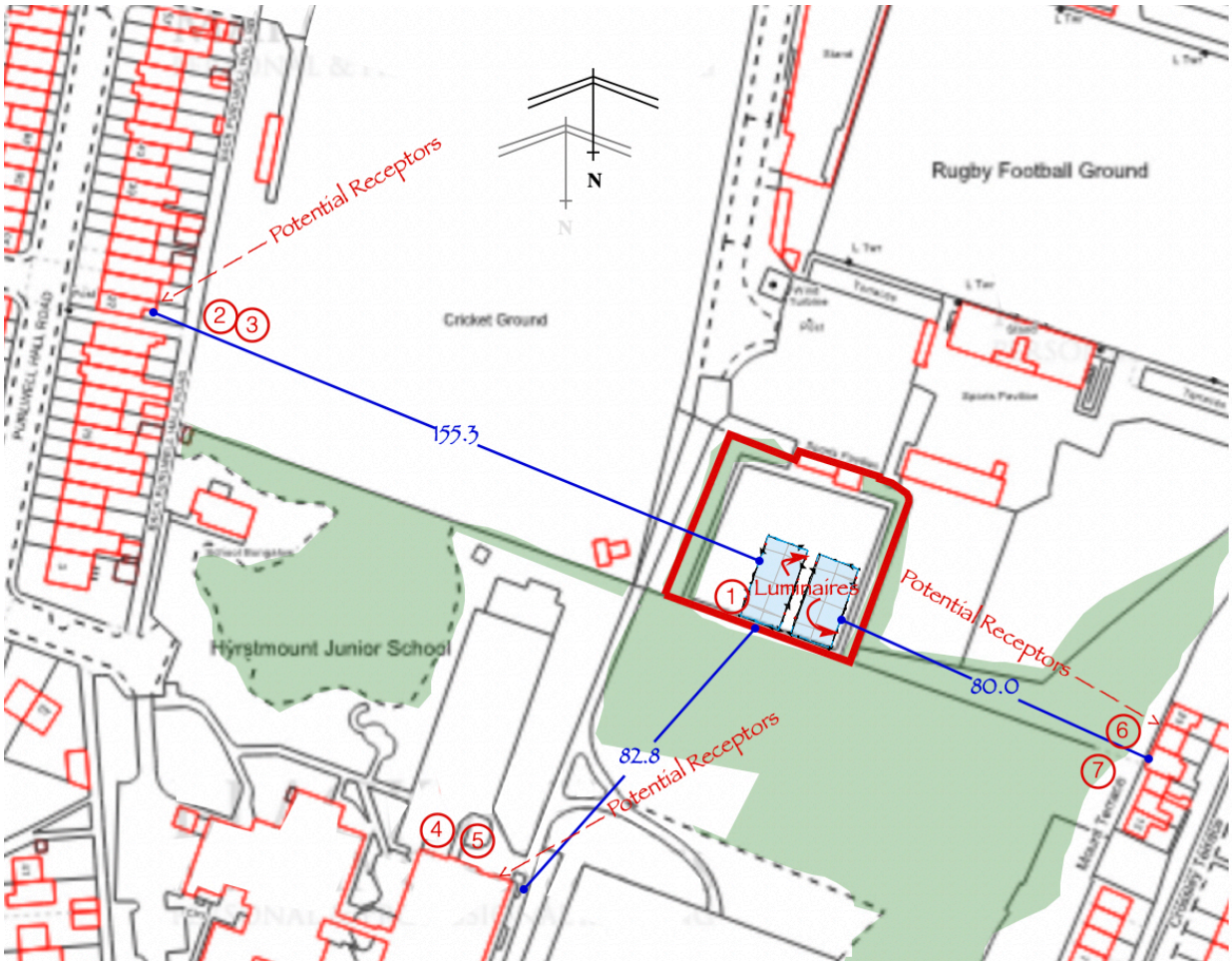

Figure 8- Glare assessment positions

		Permitted		Achieved	
Loc	Receptor Location	Light Intrusion (Lux)	Viewed Source Intensity (I_{cd})	Light Intrusion (Lux)	Viewed Source Intensity (I_{cd})
1	Padel Court Boundary	10.0	10,000	n/a	-
2	Purlwell Hall Road Ground	10.0	10,000	0.29	52
3	Purlwell Hall Road 1st Floor window	10.0	10,000	0.23	-
4	Hyrstmount Junior School Ground	10.0	10,000	0.41	85
5	Hyrstmount Junior School 1st Floor window	10.0	10,000	0.32	65
6	Mount Terrace Ground	10.0	10,000	0.21	-
7	Mount Terrace 1st Floor window	10.0	10,000	0.28	19

Table 5 Glare assessment results

5.1.3 **Table 5** indicates the light intrusion into windows of sensitive receptors and the viewed source illuminance (glare) does not exceed the permitted values when the proposed lighting is viewed through windows.

5.1.4 As Padel & Co Club Ltd will not operate outside of the curfew hours, the lighting shall not be required to comply with the 'post curfew' criteria as it shall be switched off.

5.2 Obtrusive light summary

E3 Environmental Zone Criteria						
Environmental Zone	Sky Glow ULR (Max %)	Light Trespass (into Windows) E_v (lux)		Source Intensity I (k_{cd})		Building Luminance Average, Pre-curfew
		Pre- Curfew	**Post-Curfew**	**Pre-Curfew**	**Post-Curfew**	**Average L (cd/m^2)**
E3	5	10	2	10000	1000	10
Maximum achieved	1	.41	0	85	0	N/A

Table 6 Obtrusive light compliance summary

5.2.1 **Table 6** demonstrates the maximum recorded obtrusive light values associated with the lighting of the proposed tennis courts does not exceed the criteria for an E3 environmental zone. Therefore, it is unlikely that neighbouring residential properties will be subjected to adverse levels of obtrusive light. As can be seen by the results outlined in **Table 5**, the achieved levels are significantly lower than the maximum permitted criteria for the environmental zone.

6. Mitigation

6.1 Introduction

6.1.1 Further to the light levels being within the limits prescribed by the guidance for minimising obtrusive light there are various mitigation actions available which will further limit the obtrusive light towards sensitive receptors.

6.2 Lighting Design

6.2.1 The lighting has been designed and luminaires orientated in order to both achieve sufficient lighting to the courts for safe playing and to minimise any light spill outside of the playing area, in particular onto adjacent properties. The lighting is orientated in a near horizontal aspect (2.5° max inclination) in order to minimise upward light and stray light onto adjacent properties.

6.2.2 The lighting system is one which has been specifically designed for Padel Court illumination and has been utilised on similar courts in the UK and Europe.

6.3 Luminaire shields

6.3.1 Shields can be added to luminaires to shield stray light in the direction of the sensitive receptors. This could further reduce the stray light. This strategy is formulated from some of the existing arrangements and mitigation measures at the Batley Bulldogs Stadium.

6.4 Landscaping

6.4.1 Between the Padel Courts and the houses on Purlwell Hall Road to the East, there is an expanse of open ground between the courts and the houses also a raise in ground level. The distance will diminish the light into the houses from the Padel courts to a greater degree than the calculations show. The houses are far enough away from the courts such that light intrusion into first floor windows is very low. Furthermore, the receptors closest to the proposed lighting at Mount Terrace, are unlikely to be subject to non-compliant levels of light spill onto windows, as blocking effects from landscaping and topographical features are not considered during the calculation process.

6.4.2 The Junior School to the south of the Padel Courts, as a school, it is not operational during most of the lighting period, only during a few months of the year but still the levels are low.

6.4.3 There is a 56m of a tree and landscape margin between the padel courts and School which will mitigate the light into the existing windows at ground and first floor from the padel courts, a similar amount between the padel courts and Mount Terrace.

6.5 Curfew

6.5.1 It is proposed that a curfew of 10pm is enforced for the Padel Court Lighting, assuming this is will be imposed by a Planning Condition, will be adhered too by Padel & Co Club Ltd.

6.6 Custom & Practice

6.6.1 It has been observed that at around 6pm on the evening of the survey, windows to the ground and first floor rooms at the school were in darkness. It is assumed that this is a consequence of the end of the school day, this will also has the beneficial of significantly mitigating the effect of the padel court lighting.

6.7 Management Plan

6.7.1 A management Plan will be created to ensure that the lighting is not on for any period when the court is not operational. This will be developed to ensure that each court is switched separately and that only the operational courts will be lit at any time.

6.7.2 This will ensure that the minimum amount of lighting is working at any time, thus minimising the effect of the lighting on residents.

7. Conclusion

7.1.1 The outdoor padel lighting design contained within this document is designed to be fit for purpose without being detrimental to the surrounding environment.

7.1.2 The lighting design specifies that luminaires are installed with tilt angles not exceeding 2.5° above the horizontal to reduce the potential for light spill and light trespass, as well as mitigate direct upward light.

7.1.3 The luminaires that have been proposed so that focus the light onto the courts and emit minimal light towards adjacent properties.

7.1.4 Following the guidance for obtrusive light detailed in **Section 2** ensures that potential light spill is within guideline levels provided by the institution of lighting professionals.

7.1.5 In conclusion, potential effects of the proposed artificial lighting are likely to be of **low to negligible significance.**

8. Summary

8.1.1 Padel & Co Club Ltd are proposing the construction of two new padel courts replacing a redundant bowling green, which will require lighting to enable safety during play in the evening as the light fades to darkness. The lighting design aims to provide an adequate quantity of light for playing, whilst ensuring that the potential light spill is minimised.

8.1.2 Consideration has been made to nearby residents by ensuring the lighting of the courts complies with the lighting requirements for sports lighting. An assessment of the likelihood for light spill and glare to occur has been undertaken, this has indicated minimal potential for obtrusive light to affect the potentially sensitive residential receptors.

8.1.3 **Table 2** in this report details the maximum permissible light spill on a property (pre-curfew) to be 10 lux (E_v) for an **E3** zone, of which the area is categorised as falling under.

8.1.4 **Table 6** within this report details the results of lighting calculations that show the extents of spill light and viewed source intensity. None of the values in this table exceed the permitted values for obtrusive light. Therefore, the potential obtrusive light values are compliant with the limits set. The effects of the proposed lighting shall be **low to negligible.**

8.1.5 Alternative solutions will be acceptable providing they comply with the LTA guidance for court illuminance and have lower spill light and glare as assessed against the criteria for obtrusive light in **E3** environmental zones.