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# LIGHTING



**Cranham Golf Course, St Marys Lane, Cranham**  
Lighting Impact Assessment  
July 2025

**Report Ref: 29846-LIGH-0401**

# Cranham Golf Course, St Marys Lane, Cranham

## Lighting Impact Assessment

### July 2025

REPORT REF: 29846-LIGH-0401

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#### REGISTRATION OF AMENDMENTS

| Date      | Rev | Comment     | Prepared By                                                          | Checked By                                                   | Approved By                                                  |
|-----------|-----|-------------|----------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
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- A. PROPOSED SITE LAYOUT
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## 1.0 INTRODUCTION

### General

- 1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Cranham Golf Course Ltd to undertake a Lighting Impact Assessment for proposed padel courts at Cranham Golf Course, St Mary's Lane, Cranham. A site location plan is provided in Figure 2.1 and in **Appendix A**.
- 1.2 This report assesses, in terms of artificial lighting, the likely effects of the proposed development. The lighting assessment includes information on the baseline lighting conditions within the area, quantitatively assesses the potential effects of the proposed lighting on surrounding sensitive receptors and if required considers possible mitigation measures to reduce potential light spill into neighbouring properties and ecological receptors, upward light (which can create sky glow) and visual source intensity (glare). Indicative illuminance lux plot for exterior areas of the proposed development is included in **Appendix B**.

### Disclaimer

- 1.3 MEC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.
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## 2.0 SITE DESCRIPTION

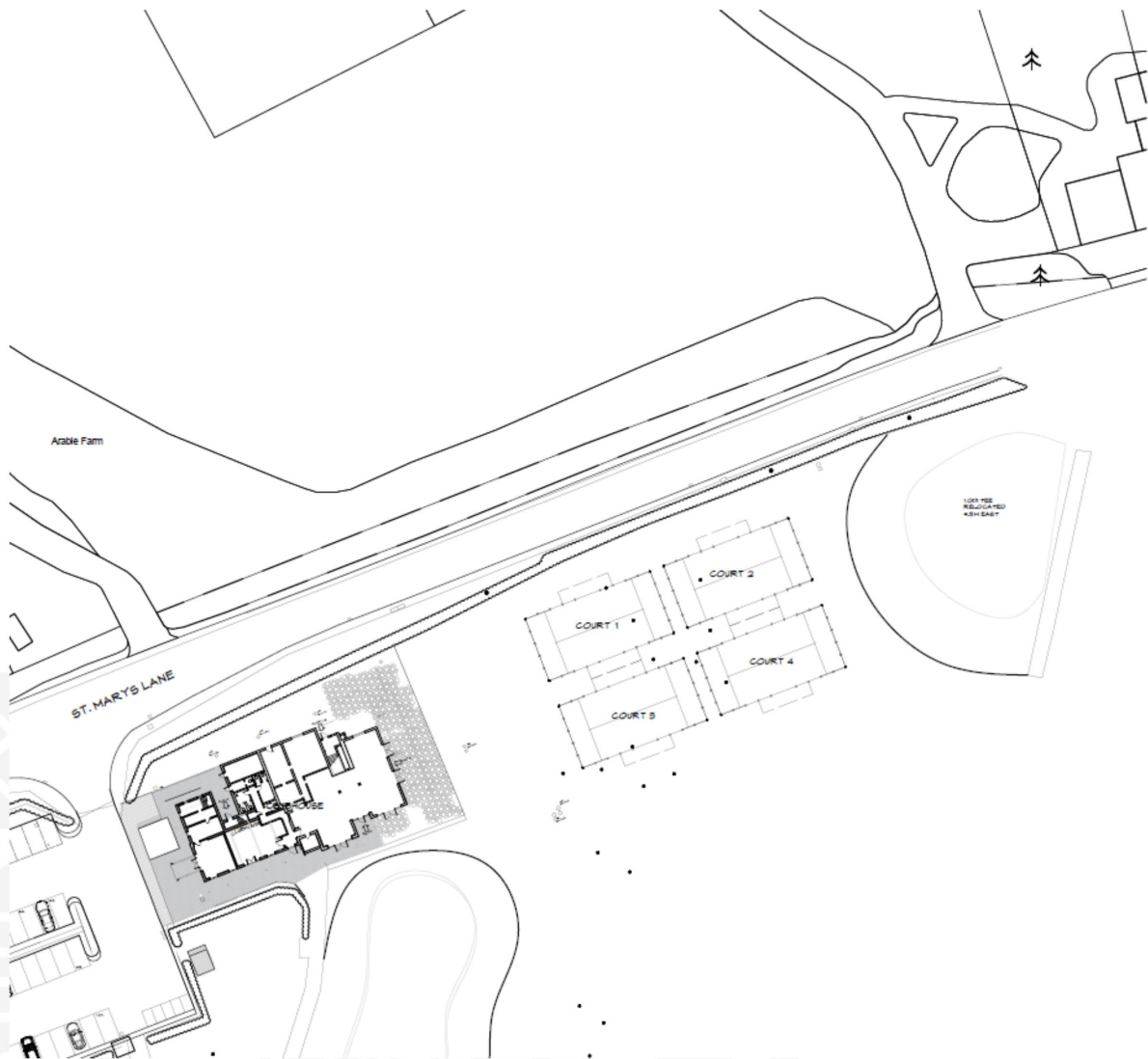
### Existing Site

2.1 The proposed site is currently comprised of grassland on the existing Cranham Golf Course. The site is bound by:

- St Mary's Lane to the north, with no major sources of light,
- Granham Golf Course to the east and south, with no main sources of light, and;
- Jaxon's Eating House to the west with the main source of light from security lights.

2.2 A site layout plan is provided in Figure 2.1 below.

**Figure 2.1: Site Layout Plan**



### 3.0 POLICY AND GUIDANCE

#### **Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005**

- 3.1 Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (the 'EPA', 1990), which states: "artificial light emitted from premises so as to be prejudicial to health or nuisance."

#### **National Planning Policy Framework**

- 3.2 The National Planning Policy Framework (NPPF), published in December 2024, sets out the governments planning policies for England and how they are expected to be applied and provides a framework for local plans. With regards to lighting, the following is stated;

*198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*C) Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

#### **National Planning Practice Guidance November 2019 Lighting**

- 3.3 This report also has taken into account the relevant questions the PPG advises on how to consider light within the planning system detailed below;

- What light pollution considerations does planning need to address?
- What factors can be considered when assessing whether a development proposal might have implications for light pollution?
- What factors are relevant when considering where light shines?
- What factors are relevant when considering when light shines?
- What factors are relevant when considering how much the light shines?
- What factors are relevant when considering possible ecological impacts of lighting?
- What other information is available that could inform approaches to lighting and help reduce light pollution?

#### **Relevant British Standards and Design Mitigation**

- 3.4 The most applicable British Standards for lighting that relates to the proposed development are:
- BS EN 12464-2 Lighting of Work Places – Outdoor Work Places, 2014
  - BS 5489-1:2020 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas

## **Institute of Lighting Professional Documents**

3.5 The following Institute of Lighting Professional (ILP) guidance documents have been consulted with regard to lighting from the proposed development;

- PLG 04- Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, 2013;
- Guidance Note 08/23 Bats and artificial lighting in the UK ILP, 2023
- Guidance Notes for the Reduction of Obtrusive Light, ILP, 2021;

## 4.0 ASSESSMENT METHODOLOGY

4.1 Guidance notes produced by the Institution of Lighting Professionals are among the most commonly referenced guidance notes for good practice within the lighting design industry.

4.2 The methodology of this report is as follows:

- Identify the environmental zone of the site and surrounding sensitive receptors in accordance with ILP GN01/21 and PLG 04;
- Produce a detailed 3D model using industry-standard light modelling software and quantitatively assess the following parameters; light intrusion, source intensity and upward light spill/sky glow; and
- If required, consider possible mitigation measures to reduce potential light intrusion into neighbouring properties and ecological receptors, upward light (which can create sky glow) and visual source intensity (glare).

4.3 In accordance with Guidance Notes for the Reduction of Obtrusive Light, the following definitions are used to describe lighting effects in this assessment:

- Light intrusion – light intrusion into windows (the spilling of light beyond the boundary of a property which may cause a nuisance to others).
- Source intensity – how bright the source appears to an observer (uncomfortable brightness of the light source against a dark background which results in dazzling the observer, which may cause a nuisance to residents and a hazard to road users).
- Skyglow – a combination of direct upward light and indirect upward light, (the upward spill of light into the sky which can cause a glowing effect and is often seen above cities when viewed from a dark area).

4.4 The ILP Guidance Notes for the Reduction of Obtrusive Light: GN01/21 define environmental zones appropriate to the location of the proposed development shown in Table 4.1:

**Table 4.1: Environmental Zones**

| Zone | Surrounding | Lighting Environment                    | Examples                                                                                                       |
|------|-------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------|
| E0   | Protected   | Dark (SQM 20.5+)                        | Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places                             |
| E1   | Natural     | Dark (SQM 20 to 20.5)                   | Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc. |
| E2   | Rural       | Low district brightness (SQM ~15 to 20) | Sparsely inhabited rural areas, villages 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                                                      |

- 4.5 The environmental zone appropriate for the proposed development is considered to be Zone E2. The obtrusive light limits defined in ILP GN01/21 are summarised in Tables 4.2 to 4.4.

**Table 4.2: Maximum values of vertical illuminance on properties**

| Application conditions                                                                | Environmental Zone |          |     |      |      |
|---------------------------------------------------------------------------------------|--------------------|----------|-----|------|------|
|                                                                                       | E0                 | E1       | E2  | E3   | E4   |
| Pre-curfew (07:00-23:00)                                                              | n/a                | 2lx      | 5lx | 10lx | 25lx |
| Post-Curfew (23:00-07:00)                                                             | n/a                | <0.1 lx* | 1lx | 2lx  | 5lx  |
| *Note: If the installation is for public (road) lighting then this may be up to 1 lx. |                    |          |     |      |      |

- 4.6 The limits for the luminous intensity of bright luminaires are dependent on the viewing distance  $d$ , (between the observer and the bright luminaire(s)) and the projected area  $A_p$ , of the bright part of the luminaire in the direction of the observer. Table 4.3 shows the maximum values for the luminous intensity of luminaires in designated directions where views of bright surfaces of luminaires are likely to be a nuisance to occupants of premises or from positions where such views are likely to be maintained, that is, not momentary or short-term.

**Table 4.3: Maximum values of vertical illuminance on properties**

| Application Conditions                            | Luminaire Group (Projected area $A_p$ in $m^2$ ) |                         |                        |                        |                        |             |
|---------------------------------------------------|--------------------------------------------------|-------------------------|------------------------|------------------------|------------------------|-------------|
|                                                   | $0 < A_p \leq 0.002$                             | $0.002 < A_p \leq 0.01$ | $0.01 < A_p \leq 0.03$ | $0.03 < A_p \leq 0.13$ | $0.13 < A_p \leq 0.50$ | $A_p > 0.5$ |
| 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                   | 10,000      |
| 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 in 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:**

d is the distance between the observer and the glare source in metres;

A luminous intensity of 0 cd can only be realised by a luminaire with a complete cutoff in the designated directions;

Ap is the apparent surface of the light source seen from the observer position

For further information refer to Annex C of CIE 150

Upper limits for each zone shall be taken as those with column  $Ap > 0.5$

- 4.7 Skyglow is the brightening of the night sky caused by artificial lighting resulting from the reflection of radiation (visible and non-visible); ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky. The ILP limits for ULR are shown in Table 4.4 below

**Table 4.4: Maximum values of upward light ratio (ULR) of luminaries**

| Application conditions     | Environmental Zone |    |     |    |    |
|----------------------------|--------------------|----|-----|----|----|
|                            | E0                 | E1 | E2  | E3 | E4 |
| Upward Light ratio (ULR)/% | 0                  | 0  | 2.5 | 5  | 15 |

## 5.0 BASELINE CONDITION

- 5.1 A site visit has not been undertaken however it has been assumed for the basis of this report that lighting levels along the boundary of the site from the existing site conditions will be 0.0lux.



## 6.0 RECEPTORS

6.1 Following a desktop survey of the site and having liaised with the project team the following light-sensitive residential and ecological receptors have been identified;

**Figure 6.1: Ecological and Residential Receptor Locations**



(Green = Ecology, Yellow = Residential)

### Residential receptors

6.2 The following residential properties surrounding the site have been identified and assessed based on their proximity to the site and the potential impact of the proposed lighting on them. Each receptor has been modelled at 4.0m to represent a first-floor bedroom. The locations of these receptors are visually presented in Figure 6.1 below as well as in Table 6.1.

**Table 6.1: Residential Receptor Locations**

| Receptor | Location Description                    | Height (m) | Environmental Zone (ILP) |
|----------|-----------------------------------------|------------|--------------------------|
| R1       | 1A St Marys Lane                        | 4          | E2                       |
| R2       | 1 St Marys Lane                         | 4          | E2                       |
| R3       | 2 St Marys Lane                         | 4          | E2                       |
| R4       | 3 St Marys Lane                         | 4          | E2                       |
| R5       | Residential properties above Club House | 4          | E2                       |

**Ecological receptors**

- 6.3 The ILP Guidance Note 08/23 specifies that when a planning application includes additional artificial lighting, developers should ensure that a lighting assessment is done alongside an ecological assessment. Lighting can impact light-sensitive species such as bats by impacting roosting, commuting and foraging behaviour.
- 6.4 There is potential that a number of bat species are anticipated to use the hedgerow along St Mary's Lane north of the site. Therefore, ecology receptors have been located along the hedgerow at a height of 3m. The locations of these receptors are visually presented in Figure 6.1, as well as in Table 6.2 below.

**Table 6.2: Ecological Receptor Locations**

| Receptor | Location Description             | Height (m) |
|----------|----------------------------------|------------|
| Eco 1    | Hedgerow north of St Mary's Lane | 3          |
| Eco 2    | Hedgerow north of St Mary's Lane | 3          |
| Eco 3    | Hedgerow north of St Mary's Lane | 3          |
| Eco 4    | Hedgerow north of St Mary's Lane | 3          |

## 7.0 LIGHTING ASSESSMENT

- 7.1 A site plan (**Appendix A**) was provided by the project architect for this development and the lighting criteria has been discussed with the project team. A 3D model has been produced using a range of industry-standard light modelling software including Lighting Reality and Dialux, the model only considers the effect of solid structures so natural structures such as trees will be assessed qualitatively outside the model calculations.
- 7.2 The padel courts will be lit to 350 lux and due to the rural nature of the site and nearby residents the lights will have 0° tilt and back shields fitted.
- 7.3 The assessment currently considers 24 hours operation of the light fittings as a worst-case scenario.

### Light Intrusion Residential Receptors

- 7.4 Table 7.1 compares the modelled light intrusion at the surrounding residential properties with the relevant ILP environmental zone criteria as specified in Tables 4.1 and 4.2. For this assessment based upon the site location and survey results, this will be Environmental Zone E2 – Rural Area of Low-level brightness with the criteria being 5 lux pre curfew and 1 lux post curfew.

**Table 7.1: Residential Receptor Results**

| Receptor | Predicted model vertical illuminance | ILP Pre-curfew criteria (Lx) | ILP Post Curfew Criteria (Lx) |
|----------|--------------------------------------|------------------------------|-------------------------------|
| R1       | 0.12                                 | 5                            | 1                             |
| R2       | 0.11                                 | 5                            | 1                             |
| R3       | 0.07                                 | 5                            | 1                             |
| R4       | 0.05                                 | 5                            | 1                             |
| R5       | 0.98                                 | 5                            | 1                             |

- 7.5 The results in the table above show that with the proposed development in place, lighting from the site will not exceed the recommended ILP pre- and post-curfew criteria.

### Ecology Receptors

- 7.6 The ILP Guidance Note 08/23 specifies that acceptable lux limits should be used to assess the impact of lighting upon ecological species including bats. Therefore, impacts will be considered significant where predicted vertical illuminance levels exceed 1 lux vertically. The results of this assessment can be found in Table 7.2 below.

**Table 7.2: Ecology Receptor Results**

| Receptor | Predicted model vertical illuminance |
|----------|--------------------------------------|
| Eco 1    | 0.40                                 |
| Eco 2    | 0.63                                 |

| Receptor | Predicted model vertical illuminance |
|----------|--------------------------------------|
| Eco 3    | 0.58                                 |
| Eco 4    | 0.36                                 |

- 7.7 The results show that lux levels along the woodland surrounding the development will be below 1 lux therefore lighting is not anticipated to have a significant impact on any light-sensitive species using this space.

#### Source Intensity

- 7.8 Based on the size of the luminaire and distance to the receptor (Table 4.3) the maximum luminous intensity criteria have been calculated for each of the residential receptors. Table 7.3 below shows the maximum calculated intensity for each receptor and the largest modelled intensity calculation from the modelling software.

**Table 7.3: Source Intensity Results**

| Receptor | Luminaire Group Criteria (*distance) | Maximum Luminous Intensity Criteria Cd | Modelled Luminous Intensity cd | Meets the Criteria |
|----------|--------------------------------------|----------------------------------------|--------------------------------|--------------------|
| R1       | 5.0*65m                              | 325                                    | 44                             | Yes                |
| R2       | 5.0*68m                              | 340                                    | 40                             | Yes                |
| R3       | 5.0*80m                              | 400                                    | 33                             | Yes                |
| R4       | 5.0*95m                              | 475                                    | 30                             | Yes                |
| R5       | 5.0*29m                              | 145                                    | 44                             | Yes                |

- 7.9 The results show that with the proposed layout in place, no residential receptors surrounding the Site will exceed the luminous intensity criteria.

#### SkyGlow

- 7.10 The model has been used to calculate the predicted Upward Lighting Ratio (ULR) of the proposed external lighting scheme. Model outputs predict a sky glow figure (ULR) of 0.0%. As illustrated in Table 4.4, the ILP sky glow limitation for an area classified as Environmental Zone E2 is 2.5% ULR. As such the indicative lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in detrimental impacts on the dark sky landscape.

## 8.0 CONCLUSIONS

- 8.1 MEC has been commissioned by Cranham Golf Course Ltd to undertake a Lighting Impact Assessment for proposed padel courts at Cranham Golf Course, St Marys Lane, Cranham.
- 8.2 With the proposed development in place, lighting from the site will not exceed the recommended ILP pre- and post-curfew criteria.
- 8.3 Lux levels along the light sensitive ecological areas surrounding the development will be below 1 lux therefore lighting is not anticipated to have a significant impact on any light-sensitive species using this space.
- 8.4 The proposed lighting scheme will comply with all relevant British Standards and the Institution of Lighting Professionals lighting guidelines and will serve to ensure safety and security of all areas of the development can be effectively maintained.

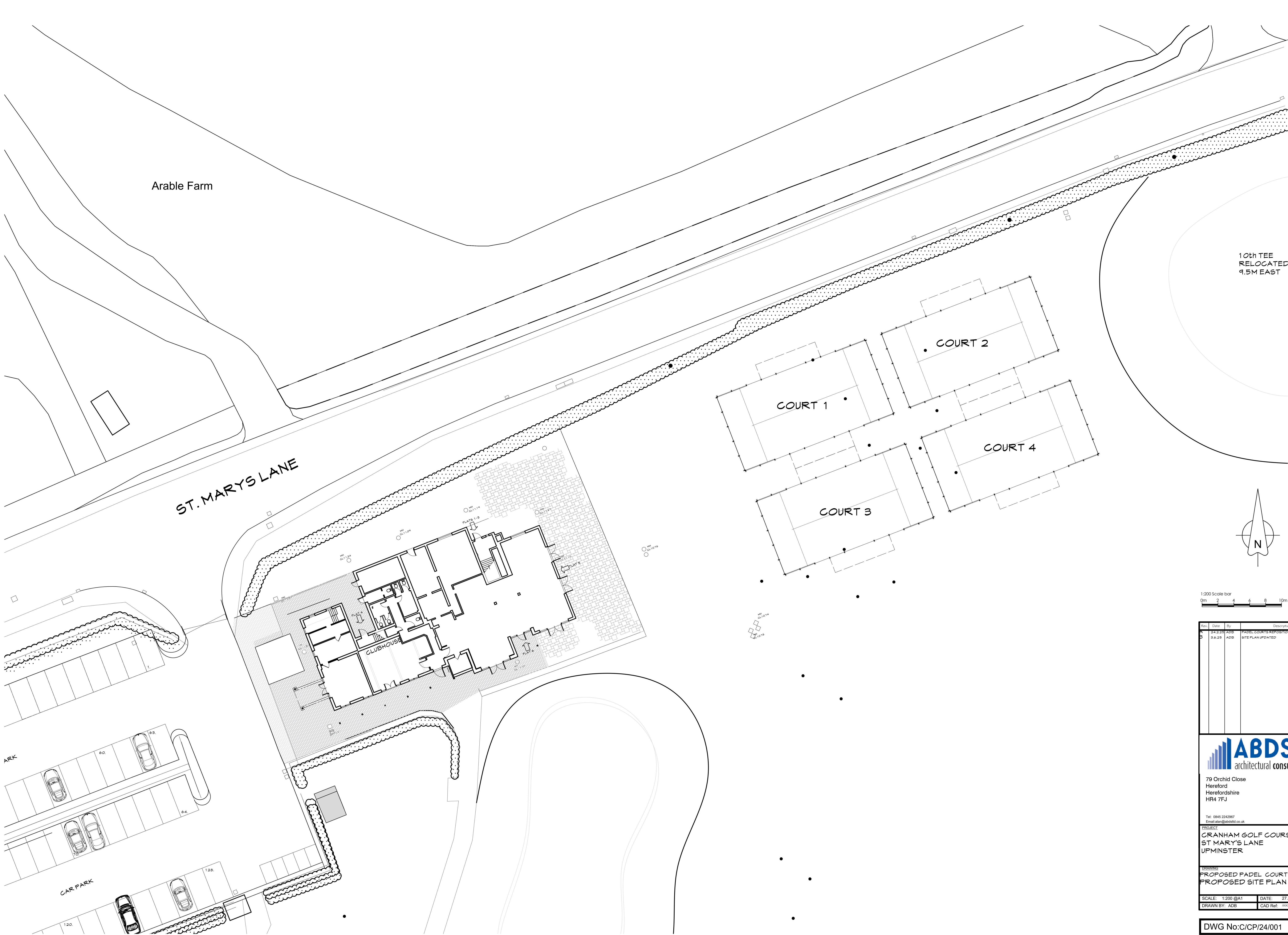


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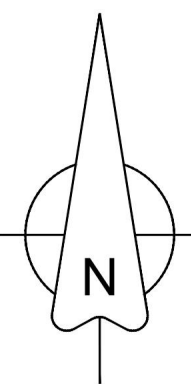
# APPENDICES



## APPENDIX A



10th TEE  
RELOCATED  
9.5M EAST



| Rev. | Date    | By  | Description               |
|------|---------|-----|---------------------------|
| 1    | 24.3.23 | ADB | PADEL COURTS REPOSITIONED |
| 2    | 9.6.25  | ADB | SITE PLAN UPDATED         |



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PROJECT:  
**CRANHAM GOLF COURSE  
ST MARYS LANE  
UPMINSTER**

DRAWINGS:  
**PROPOSED PADEL COURTS  
PROPOSED SITE PLAN**

|                  |                         |
|------------------|-------------------------|
| SCALE: 1:200 @A1 | DATE: 27.09.2024        |
| DRAWN BY: ADB    | CAD Ref: xxxxxxxxxxxxxx |



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# APPENDICES



## APPENDIX B



NOTES:

- DO NOT SCALE THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH REPORT 29486-LGH-0401.

LIGHTING KEY

QUANTITY

16

PROPOSED FLOODLIGHTING

COLUMN HEIGHT: 6m

PROJECTION: 0.3m POST TOP

LANTERN MANUFACTURER: AFP COURTS

LANTERN NAME: AFP320L

INCLINATION: 15°

LAMP TYPE: 5000K WHITE

WATTAGE: 320W

OPTIC: 46.09KLM

DIM TO: 55% (28.0KLM)

5.0

LUX ISO CONTOUR

2.0

LUX ISO CONTOUR

1.0

LUX ISO CONTOUR

|                                                                                         |                |                                                                                                                                                                                                                                             |     |     |          |
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| REV:                                                                                    | AMENDMENTS:    | DRN                                                                                                                                                                                                                                         | CHK | APP | DATE:    |
| PROJECT: CRANHAM GOLF COURSE                                                            |                |                                                                                                                                                                                                                                             |     |     |          |
| DRAWING TITLE: LIGHTING LAYOUT                                                          |                |                                                                                                                                                                                                                                             |     |     |          |
| CLIENT: CRANHAM GOLF COURSE                                                             |                |                                                                                                                                                                                                                                             |     |     |          |
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| STATUS: FOR INFORMATION / APPROVAL                                                      |                |                                                                                                                                                                                                                                             |     |     |          |
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CIVIL ENGINEERING



TRANSPORT



FLOOD RISK & DRAINAGE



STRUCTURES



GEO-ENVIRONMENTAL



ACOUSTIC AIR



UTILITIES



GEOMATICS



LIGHTING



EXPERT WITNESS



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