

LAND AT

# GILLINGHAM

DORSET

NEWHOUSE FARM AND HAM FARM



Light Assessment  
December 2017



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# GILLINGHAM

DORSET



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# Ham Farm and Newhouse Farm, Gillingham

## Lighting Assessment



### 1.0 Introduction

WYG Environment Planning Transport has been commissioned by Welbeck Land to undertake a Lighting Assessment in support of the outline planning application for a mixed use development on land at Ham Farm and Newhouse Farm, Gillingham, North Dorset.

#### 1.1 Site Context

The development site currently consists of farmland, the approximate national grid reference of which is 382349:125603.

The proposed site is bounded by:

- Cole Street Lane and agricultural land to the south
- Kingsmead Business Park and Park Farm to the east beyond which is agricultural land
- The B3092 to the west
- Residential properties associated with Ham Common to the north

Reference should be made to Figure 1 for a visual representation of the application site and surrounding area.

The proposed development will require the installation of a number of luminaires that have the potential to increase existing light levels at sensitive locations within the vicinity of the site. As the development is indicative, the lighting strategy considers the potential impact of light pollution from the development on nearby light sensitive receptors such as residents and ecology. The strategy provides design guidance and identifies potential constraints and set parameters for all future lighting designs to consider during the reserved matters stage of the application.



## **2.0 Policy, Legislation and Relevant Agencies**

### **2.1 Documents Consulted**

The following documents were consulted during the undertaking of this assessment:

- Guidance Notes for the Reduction of Obtrusive Light, The Institution of Lighting Professionals, 2011;
- National Planning Policy Framework, Department for Communities and Local Government, 2012;
- Planning Practice Guidance on Light Pollution, Department for Communities and Local Government, 6<sup>th</sup> March 2013, ID 31-007-20140306;
- Environmental Protection Act, 1990;
- Statutory Nuisance from Insects and Artificial Light, Guidance on Sections 101 to 103 of the Clean Neighbourhoods and Environment Act 2005, DEFRA 2006;
- Artificial Lighting and Wildlife Interim Guidance: Recommendations to Help Minimise the Impact of Artificial Lighting, Bat Conservation Trust, 2014;
- BS EN 12464-2: Lighting of Work Places - Outdoor Work Places, British Standards Institute, 2007;
- BS EN 13201-4: Road Lighting – Methods of Measuring Lighting Performance, 2003;
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, British Standards Institute, 2013;
- PLG 04- Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, 2013;
- North Dorset District Council Local Plan, January 2016



## **2.2 Planning Policy and Guidance**

### **2.2.1 National Policy**

The National Planning Policy Framework (NPPF) principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF broadly retains the principles of PPS 23: Planning and Pollution Control and with regard to light pollution, states that:

*'By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. It states that "for maximum benefit, the best use of artificial light is about getting the right light, in the right place and providing light at the right time". In light of this guidance, the assessment has considered the following implications of the proposed lighting design:

- *Does a new development proposal, or a major change to an existing one, materially alter light levels outside the development and/or have the potential to adversely affect the use or enjoyment of nearby buildings or open spaces?*
- *Does an existing lighting installation make the proposed location for a development unsuitable? For example, this might be because:*
  - *the artificial light has a significant effect on the locality;*
  - *users of the proposed development (e.g. a hospital) may be particularly sensitive to light intrusion from the existing light source.*
- *Does a proposal have a significant impact on a protected site or species e.g. located on, or adjacent to, a designated European site or where there are designated European protected species that may be affected?*
- *Is the development in a protected area of dark sky or an intrinsically dark landscape where it may be desirable to minimise new light sources?*

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- *Are forms of artificial light with a potentially high impact on wildlife (e.g. white or ultraviolet light) being proposed close to sensitive wildlife receptors or areas, including where the light shines on water?*
- *Does the proposed development include smooth, reflective building materials, including large horizontal expanses of glass, particularly near water bodies (because it may change natural light, creating polarised light pollution that can affect wildlife behaviour)?*

If the answer to any of the above questions is 'yes', consideration should be made for:

- where the light shines;
- when the light shines;
- how much light shines; and
- possible ecological impact.

#### 2.2.2 Local Policy

The primary policies of relevance to the proposed development are those contained within the North Dorset District Council Local Plan Jan 2016, policy 25: AMENITY states:

*Where external lighting is proposed, development will be permitted provided that:*

*a the scheme is the minimum necessary to achieve its purpose; and*

*b light scatter, spillage and glare are minimised through the control of light direction and intensity; and*

*c the quality and intensity of the light and the daytime appearance of any light fittings and cables would not have a detrimental impact on local amenity or the character of the surrounding area.*

*In the case of other development, no light pollution should occur by virtue of lighting schemes incorporated into the development.*



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### 3.0 Baseline

This section provides a review of the baseline lighting levels at the nearest residential properties along Station Road, in order to provide a benchmark against which to assess potential impacts associated with the development.

The Institute of Lighting Professionals (ILP) has developed an Environmental Zone classification system for the categorisation of sensitive receptor locations based on typical levels of baseline obtrusive light. This is summarised in Table 1.

**Table 1. Environmental Zone Classification**

| Category | Description                    | Examples  |
|----------|--------------------------------|---|
| E0       | Dark landscapes                | UNESCO Starlight Reserves, IDA Dark Sky Parks             |
| E1       | Intrinsically dark landscapes  | National Parks, Areas of Outstanding National Beauty, etc |
| E2       | Low district brightness areas  | Village or relatively dark outer suburban urban locations |
| E3       | Medium district brightness     | Small town centres or suburban locations                  |
| E4       | High district brightness areas | Town/city centres with high levels of night-time activity |

For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in Table 2.

**Table 2. Obtrusive Light Limitations for Exterior Lighting Installations**

| Environmental Zone | Max Sky Glow ULR <sup>(a)</sup> (%) | Light Trespass (into Windows) Ev (lx) <sup>(b)</sup> |                            | Source Intensity I (kcd)  |                            | Building Luminance Pre-curfew Average L <sup>(c)</sup> (Cd.m <sup>-2</sup> ) |
|--------------------|-------------------------------------|--|----------------------------|---------------------------|----------------------------|--|
|                    |                                     | Pre-curfew <sup>(d)</sup>                            | Post-curfew <sup>(e)</sup> | Pre-curfew <sup>(d)</sup> | Post-curfew <sup>(e)</sup> |  |
| E0                 | 0                                   | 0  | 0                          | 0                         | 0                          | 0  |
| E1                 | 0                                   | 2  | 1 <sup>(*)</sup>           | 2.5                       | 0                          | 0  |
| E2                 | 2.5                                 | 5  | 1                          | 7.5                       | 0.5                        | 5  |
| E3                 | 5.0                                 | 10   | 2                          | 10                        | 1.0                        | 10   |
| E4                 | 15.0                                | 25   | 5                          | 25                        | 2.5                        | 25   |

- NOTE:**
- (a) Upward light ratio of the installation - maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.
  - (b) Vertical Illuminance measured flat at the glazing at the centre of the window.
  - (c) Luminance.
  - (d) Typically considered to be between 07:00 and 23:00
  - (e) Typically considered to be between 23:00 and 07:00
  - (\*) Permitted only from public road light installations



### **3.1 Baseline Survey**

#### **3.1.1 Survey Conditions**

A baseline lighting survey was undertaken on the 30<sup>th</sup> November 2016. An initial survey was undertaken between 19:30 hours and 22:30 hours to establish the existing pre-curfew lighting conditions and a further survey was undertaken after 23:00 to determine existing post curfew conditions. It should be noted that conditions were not noted to change between the pre-curfew and post-curfew periods.

The survey was conducted using a Digital Lux Meter which meets CIE photopic spectral response, with a maximum resolution of 0.01 lux. The survey was undertaken with a meter resolution of 0.01 lux.

#### **3.1.2 Survey Locations**

Light monitoring was undertaken at a number of survey locations to determine variations in baseline light levels within the vicinity of the site. Where possible, monitoring at the boundary of the receptor locations was undertaken to provide the best possible representation of existing light obtrusion. Where this was not possible, monitoring was undertaken at the most appropriate representative location. Reference should be made to Figure 2 for an illustrative site map of the monitoring locations.

The purpose of the survey is fourfold:

- The survey enables quantified light levels at (or as near as possible to) local sensitive receptor locations to be measured;
- The site survey also provides an understanding of any significant landforms and vegetation that can potentially provide a pathway screen between light sources and receptors;
- The survey enables the ILP environmental zone to be determined based on sound, quantified evidence; and,
- The survey enables existing significant sources of artificial light and natural screens to be accounted for.

The survey therefore provides a robust understanding of the current artificial lighting illuminance levels currently experienced around the development site. The locations of all the light monitoring locations are summarised in Table 3 below and the results from the survey are contained in Table 4.

A series of measurements were taken at key points; a horizontal ground level measurement and four vertical measurements at 1.5m facing north east, south and west in general accordance with the recommended monitoring method in the statutory guidance issued by the ILP. Illuminance levels at a

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resolution of 0.1 lux can vary quite significantly over relatively small distances and even with slight changes in the plane of the lens. Therefore, the range of measurements taken over a monitoring length was recorded, in order to determine minimum and maximum illuminance at receptor façades.

**Table 3 Baseline Light Monitoring Locations**

| Reference | Monitoring Location                                      | Purpose of Survey                                       | Key Local Sources of Light          |
|-----------|--|---|-------------------------------------|
| L1        | South of Old Farm Cottage, on unnamed road west of B3092 | Representative of baseline at Old Farm Cottage          | Residential lighting                |
| L2        | North of Newhouse Farm, Cole Street Lane                 | Representative of baseline at Newhouse Farm             | Residential lighting                |
| L3        | South of Brickfields Business Park                       | Representative of baseline at Brickfields Business Park | No street lighting or other sources |
| L4        | Brickfields Business Park/B3092 junction                 | Representative of baseline at Brickfields Business Park | Regular street lighting             |
| L5        | The Meadows  | Representative of baseline at the Meadows               | No street lighting or other sources |
| L6        | South of Newhouse Farm Dairy, Cole Street Lane           | Representative of baseline on Cole Street Lane          | Residential lighting                |
| L7        | West of Orchard Park                                     | Representative of baseline on Orchard Park              | Regular street lighting             |
| L8        | Kingsmead Business Park entrance                         | Representative of baseline at Kingsmead Business Park   | Regular street lighting             |
| L9        | South of St. Mary the Virgin School                      | Representative of baseline around the School            | Regular street lighting             |
| L10       | Rookery Close  | Representative of baseline on Rookery Close             | Regular street lighting             |
| L11       | Kingscourt Road/Shafesbury Rd                            | Representative of baseline on Rookery Close             | Regular street lighting             |
| L12       | Railway crossing to east of Gillingham                   | Representative of baseline at the railway               | No street lighting or other sources |

### 3.1.3 Survey Results

The results of the monitoring are displayed in Table 4.

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**Table 4 Survey Results**

| Reference | Recorded Illuminance (Lux) |             |              |             |
|-----------|----------------------------|-------------|--------------|-------------|
|           | Facing North               | Facing East | Facing South | Facing West |
| L1        | 0.02                       | 0.02        | 0.02         | 0.02        |
| L2        | 0.02                       | 0.15        | 0.15         | 0.07        |
| L3        | 0.02                       | 0.02        | 0.02         | 0.02        |
| L4        | 5.00                       | 5.00        | 5.00         | 5.00        |
| L5        | 12.56                      | 9.86        | 7.82         | 10.74       |
| L6        | 0.02                       | 0.02        | 0.02         | 0.02        |
| L7        | 4.33                       | 4.24        | 4.27         | 4.75        |
| L8        | 5.60                       | 4.52        | 4.83         | 4.68        |
| L9        | 1.27                       | 0.98        | 0.54         | 0.98        |
| L10       | 1.30                       | 0.35        | 0.71         | 1.76        |
| L11       | 25.20                      | 22.78       | 24.65        | 26.70       |
| L12       | 0.00                       | 0.00        | 0.00         | 0.00        |

Following the environmental lighting survey, it was concluded that the proposed development site and the surrounding area should be classified as 'Environmental Zone E2 – Low district brightness', in accordance with the ILP guidance limits outlined within Table 2, is typically representative of small villages or rural locations.

Therefore, the permitted light trespass limit at an offsite receptor in the pre-curfew period (typically considered to be 07:00-23:00) is 5 lux and in the post curfew period (typically considered to be 23:00-07:00) is 1 lux.

## 4.0 Receptors & Constraints

### 4.1 Receptors

The term 'receptors' includes any persons, locations or systems that may be susceptible to changes in environmental factors as a consequence of the development.

#### 4.1.1 Residential Receptors

Any future lighting design should consider the key residential properties surrounding the site which have the potential to be impacted by obtrusive light from the proposed development including but not limited to those highlighted in Table 5.

**Table 5 Receptors**

| ID  | Description  | ILP Environmental Zone |
|-----|--|------------------------|
| R1  | Park Cottage, Shaftesbury  | E2                     |
| R2  | Foyers Lodge, Shaftesbury  | E2                     |
| R3  | Lockwood Farm, Shaftesbury   | E2                     |
| R4  | 4, Woodpecker Meadow   | E2                     |
| R5  | 6, Pheasant Way  | E2                     |
| R6  | 1, New House Farm Cottage  | E2                     |
| R7  | Dairy House, Cole Street Lane                                      | E2                     |
| R8  | New House Farm, Cole Street Lane                                   | E2                     |
| R9  | Orion Cottage at 3 Sette Brook, Cole Street Farm, Cole Street Lane | E2                     |
| R10 | Field View, Cole Street Lane                                       | E2                     |
| R11 | Meadow Brook Farm, Cole Street Lane                                | E2                     |
| R12 | Bramblestones, Cole Street Lane                                    | E2                     |

#### 4.1.2 Ecological Receptors

When producing a detailed lighting design on site, the likely impacts of lighting associated with the proposed development on sensitive ecological receptors should be considered. Impacts will be considered potentially significant where predicted illuminance exceeds 1 lux at ecological receptors along the site boundary to the north, west and south of the site.

The proposals include some new areas of planting within the site, which once mature, have the potential to become ecologically important, therefore where possible lighting of these areas should be kept to a minimum. Following consultation with WYG ecology several trees around the site particularly to the south of

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### **Lighting Assessment**



the site have potential for bat roosts therefore lighting in these southern areas of the site should be designed with these ecology receptors in mind, where appropriate using low lighting and baffle plates/hoods.

Section 5.0 below includes criteria and design guidance that should be followed to ensure that lighting levels along these boundaries do not exceed 1 lux.



## **5.0 Further Discussion and Mitigation**

Any future detailed lighting design should be undertaken in a manner such as to address two potentially conflicting needs; namely, on the one hand, to provide a safe environment for the movement of residents when the natural lighting levels fall and, on the other hand, to meet the light obtrusion limitations stated within the relevant standards and guidance in order to avoid any detriment to local amenity, and wildlife.

Future detailed lighting design on site should follow the national standards below;

### **5.1.1 National Standards**

- BS EN 12464-2: Lighting of Work Places - Outdoor Work Places, 2014;
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, 2013; and,
- BS EN 13201-2: Road Lighting - Performance Requirements, 2003.
- Sports England – Design Guidance Note for Artificial Sport Lighting 2012

### **5.1.2 Best Practice Design**

As well as meeting the statutory design standards outlined above, the future lighting design should seek to meet a number of criteria to ensure that the environmental effects of artificial lighting are managed to a high standard. These criteria are:

- In accordance with the ILP guidance, the area surrounding the proposed development site has been classified as an ILP E2 Environmental Zone and as such, the illuminance levels at the windows of residential properties should not exceed 5 lux in the pre-curfew period (typically considered to be 07:00 to 23:00) and 1 lux in the post-curfew period (typically considered to be 23:00 to 07:00);
- All external lighting schemes must not have an upward lighting ratio (ULR) of more than 1%;
- All new column luminaires should be fitted with flat glass where appropriate to aid 0% upward light discharge;
- Lighting should be controlled via light level sensors.
- Where appropriate, luminaires on the site boundary should be fitted with light baffles to prevent light spill;
- The use of directional LED lights within any future design is recommended as these can minimise light spillage beyond the boundaries of the site and can provide a more focused beam of light for areas which require lighting;
- The proposed schemes of lighting should include provisions for white light sources (4000k). The lighting assessment shows compliance with guidance by the Bat Conservation Trust which

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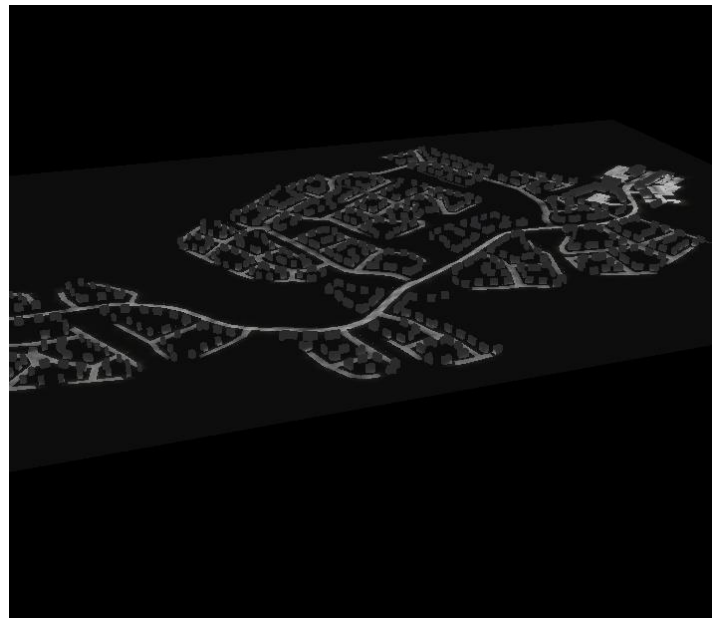
### Lighting Assessment



specifies lights to be < 4200 kelvin in colour to avoid white and blue wavelengths of the light spectrum which serves to reduce insect attraction.

- Lighting along the roads should be uniform and achieve the criteria set out in BS EN 13201-2: Road Lighting - Performance Requirements, 2003 for residential roads.
- Lighting of the employment area to the east of the site should be designed to avoid light spilling over Shaftesbury Road and nearby adjacent residential receptors.

An example of a 3D model of what the site may look like using an indicative lighting layout is below based upon the illustrative layout of the site.







## **6.0 Conclusions**

WYG Environment Planning Transport has been commissioned by Welbeck Land to undertake a Lighting Assessment in support of the outline planning application for a mixed use development on land at Ham Farm and Newhouse Farm, Gillingham, North Dorset.

A site survey was undertaken in order to quantify baseline lighting within the vicinity of the proposed development and to identify existing sensitive receptors.

Following the adoption of the proposed design standards and guidelines in this strategy the proposed development will not conflict with any national or local planning policies and not have a significant effect on surrounding light sensitive receptors such as local residents and ecological receptors along the boundary.

# Ham Farm and Newhouse Farm, Gillingham

## Lighting Assessment

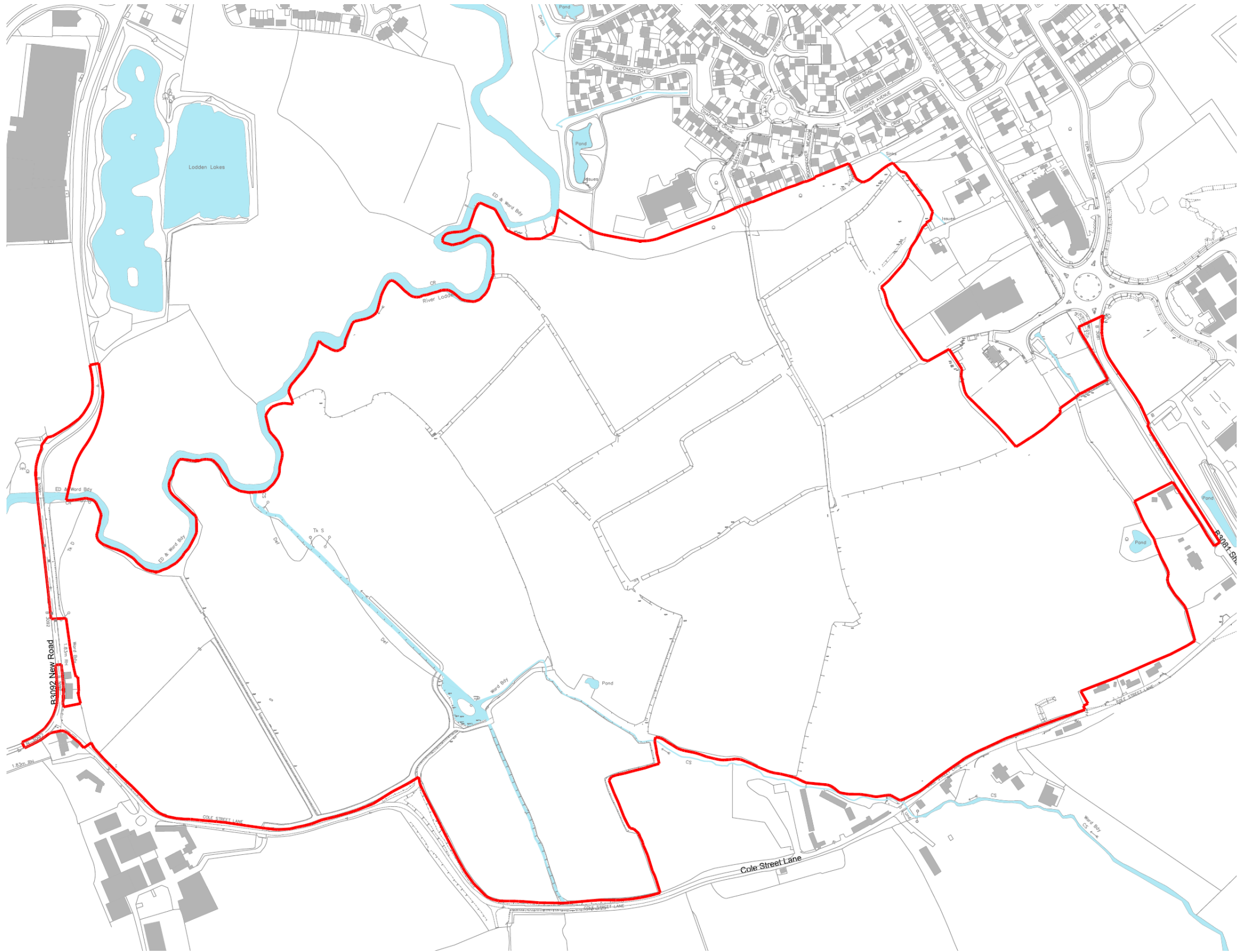


### Units and Abbreviations Used

|       |  |
|-------|--|
| CIBSE | Chartered Institute of Building Services Engineers |
| CIE   | Commission on Illumination                         |
| ILP   | Institute of Lighting Professionals                |
| LDF   | Local Development Framework                        |
| LP    | Local Plan   |
| CS    | Core Strategy                                      |
| DPD   | Adopted Development Plan Documents                 |
| SPD   | Adopted Supplementary Planning Documents           |
| SG    | Endorsed Supplementary Guidance Documents          |
| NGR   | National Grid Reference                            |
| PPS   | Planning Policy Statement                          |
| NPPF  | National Planning Policy Framework                 |
| Lx    | Lux  |
| ULR   | Upward Lighting Ratio                              |
| WYG   | WYG Planning and Environment                       |



## **Figures**



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Farm, Gillingham**  
  
Client:  
**Welbeck Land**

Drawing Title:  
**Figure 1: Site Boundary**

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Welbeck Land

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Figure 2: Light Monitoring  
Locations

creative minds safe hands

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