

KNELLER HALL
EXTERNAL LIGHTING STRATEGY REPORT

P05

7th SEPTEMBER 2022

INTRODUCTION

This report has been prepared for Kneller Hall to outline the initial proposed external lighting strategy for the landscape development. The report provides the baseline assessment of the site along with a number of key design strategies for the development of areas throughout the site. The principles are to enhance the landscape and public realm design and provide safety lighting for visitors/pedestrians whilst protecting the night sky and ecology to the surrounding areas.

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DOCUMENT CONTROL


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1.0 INTRODUCTION

1.1 PUBLIC REALM AND LANDSCAPE LIGHTING DESIGN

A landscape lighting design is required for the Kneller Hall school site within the London borough of Richmond upon Thames. The scheme consists of a new teaching wing, pavilion and additional sports pitches.

The external lighting design will follow and complement the architects and landscape architects designs whilst actively reducing light pollution from the site to benefit dark skies and local ecology. We have engaged closely with the appointed ecology consultant (RPS) on the proposals and their advice has led to changes to the lighting strategy.

An initial Lighting Strategy report was prepared to accompany a pre-application submission in June 2022. The Lighting Strategy report has been updated to address planning officer's feedback, to further justify the proposed strategy and to reflect the final proposed scheme that a planning application is being submitted for.

The proposed site will be retaining the majority of existing trees along the boundary lines and within the site itself and also introducing additional tree planting across the site.

1.2 SCOPE OF WORKS

A lighting assessment has been undertaken by Cundall Light4 as part of the planning application for the proposed Kneller Hall expansion.

This report is intended to support the planning application for the proposed development. The objective of the study is to provide an assessment of the impact that the new lighting design might have on the existing site and surrounding sensitive receptors, including neighbouring residential units and ecological areas.



Image 2 – Proposed masterplan

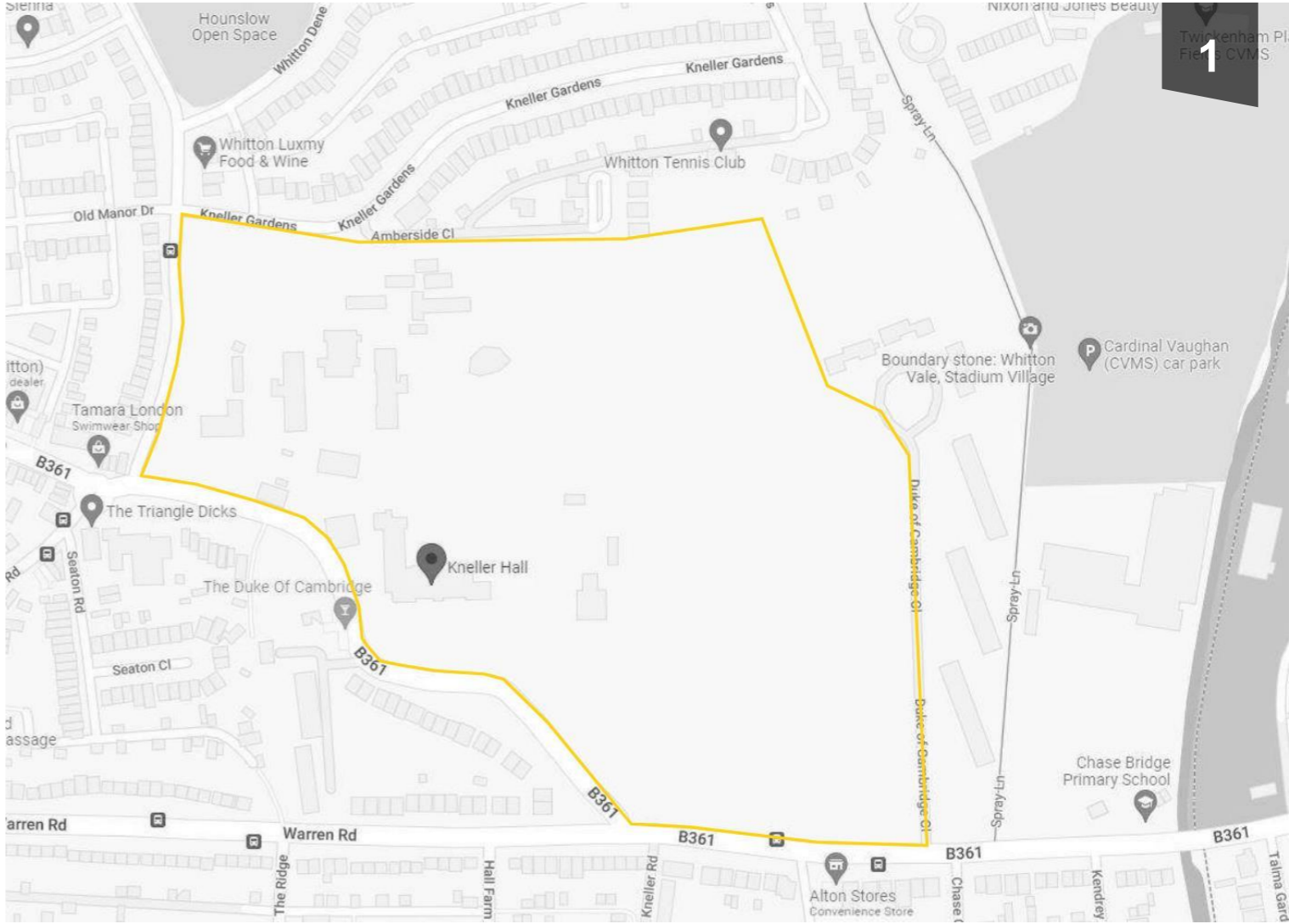


Image 1 – Map showing site boundary

1.0 INTRODUCTION

1.3 BASELINE LIGHTING CONDITION

A site survey, which took place on the 22nd February 2022, was carried out to determine the existing luminaires located on and around the Kneller Hall site. Lux level measurements were also taken to determine the amount of light currently emitted around the site.

The key receptors were identified during the site survey and can be categorised into two groups; Sports Field Receptors and Proposed Building Receptors:

Sports Field Receptors

A – Duke of Cambridge Close

B – Amberside Close

C – B361/Kneller Road

Proposed Building Receptors

D – Kneller Gardens

E - Whitton Dene

F – B361

The impact of the proposed external lighting on the above key receptors will form the basis of our assessment. – See appendix for further details.

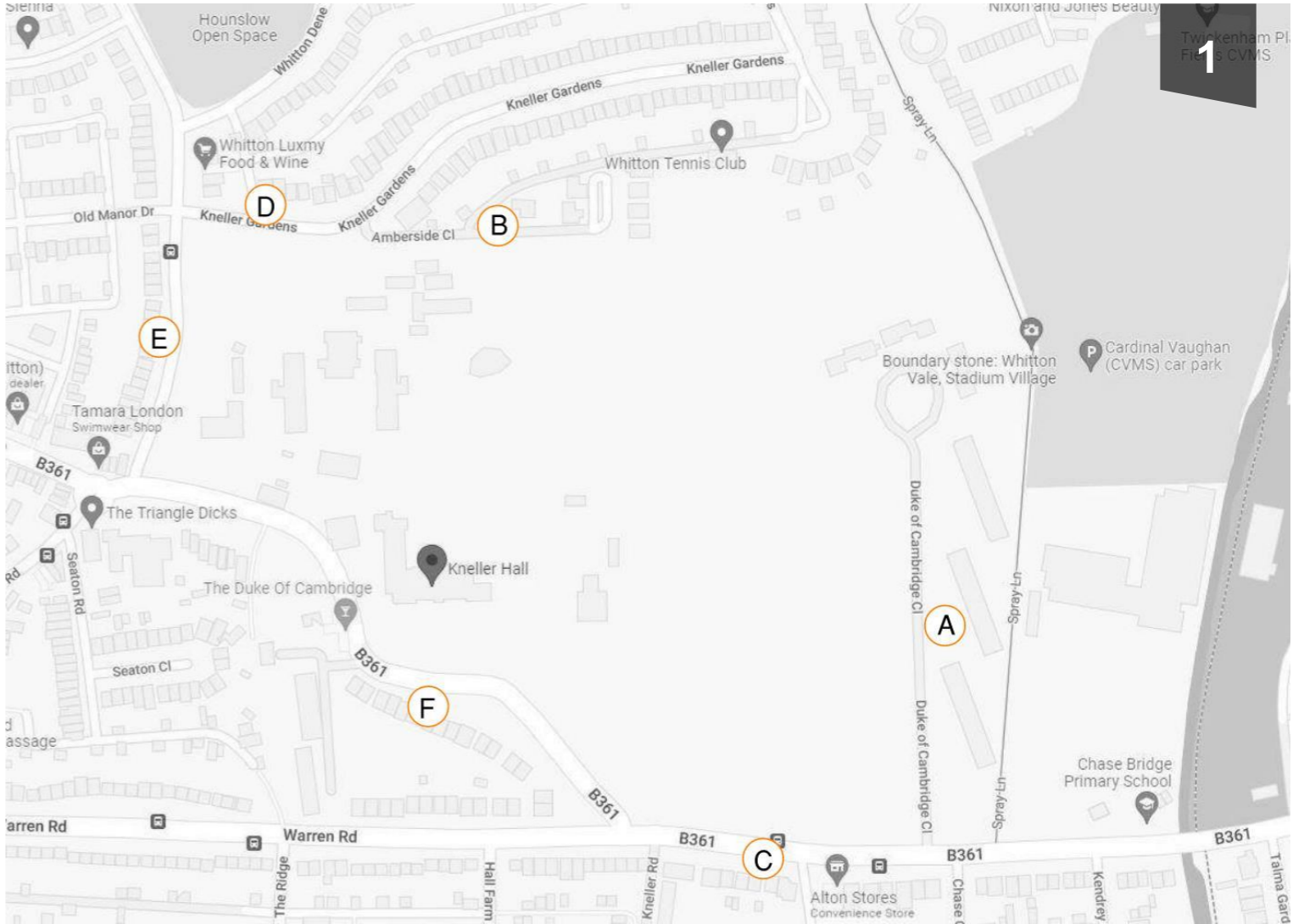


Image 1 – Map showing receptor locations

1.0 INTRODUCTION

1.4 LUX LEVEL ASSESSMENT

Where existing lighting was identified, a lux level measurement was taken. Image 1 shows each measurement point location and is identifiable by a number reference.

The 28No measurements are identified below.

LUX LEVEL READINGS

- 1 - 0.03lux - Horizontal 0m
- 2 - 0.6lux - Horizontal 0m
- 3 - 4lux - Horizontal 0m / 0.5lux Vertical 1.2m (next to street lamp)
- 4 - 3lux - Vertical 1.2m (in front of street lamp)
- 5 - 0.01lux - Horizontal 0m / 0.03lux - Vertical 1.2m (on fence line)
- 6 - 7lux - Horizontal 0m (behind street lamp)
- 7 - 0.2lux - Horizontal 0m (between street lamps)
- 8 - 1lux - Horizontal 0m / 0lux - Vertical 1.2m
- 9 - 2lux - Horizontal 0m
- 10 - 1lux Horizontal 0m / 2lux Vertical 1.2m
- 11 - 1lux Horizontal 0m
- 12 - 0.5lux Horizontal 0m / 0lux Vertical 1.2m
- 13 - 0lux Horizontal 0m
- 14 - 1lux Horizontal 0m / 0.4lux Vertical 1.2m (between street lamps)
- 15 - 5lux Horizontal 0m (in front of street lamp)
- 16 - 13lux Horizontal 0m / 4lux Vertical 0.2m
- 17 - 5lux Horizontal 0m
- 18 - 3lux Horizontal 0m / 1.4lux Vertical 1.2m
- 19 - 2lux Horizontal 0m
- 20 - 21lux Horizontal 0m
- 21 - 5 lux Horizontal 0m (car park)
- 22 - 25lux Horizontal
- 23 - 2lux Vertical 1.2m (on fence line)
- 24 - 20lux Vertical 1.2m (on fence line, in front of street lamp)
- 25 - 7lux Vertical 1.2m (on fence line)
- 26 - 0lux Horizontal 0m (on fence line, between street lamps)
- 27 - 3lux Vertical 1.2m (on fence line)
- 28 - 18lux Horizontal 0m (in front of street lamp)

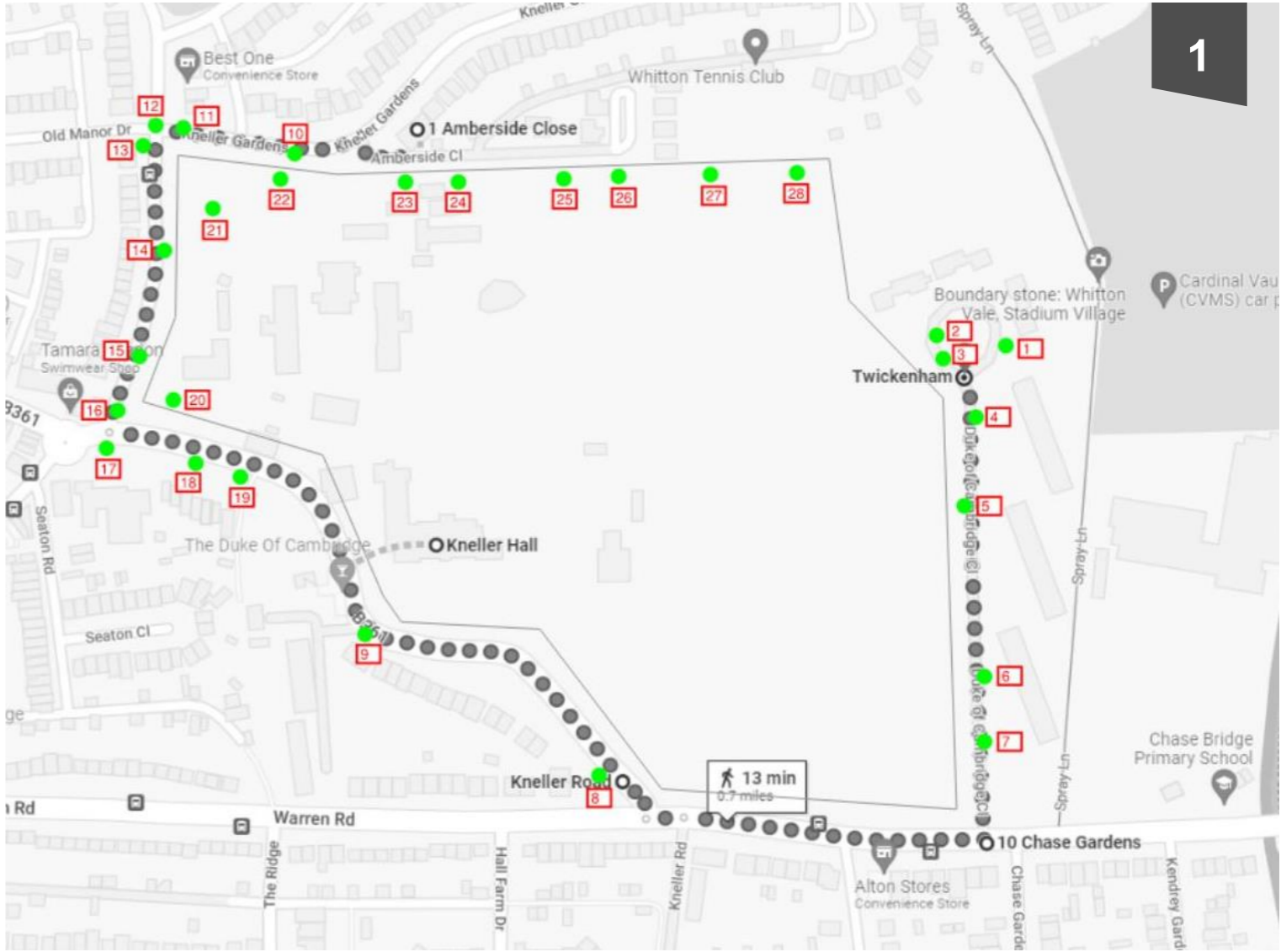


Image 1 – Map showing lux level reading locations

1.0 INTRODUCTION

1.5 EXISTING LIGHTING EAST

The existing lighting to Duke of Cambridge Close consists of a combination of 5m high round headed streetlamps (image 2) and 6m high flat headed streetlamps (image 1), spaced along both sides of the private road.

At the end of the close, the cluster of houses have a circular safety light (image 3) on the front of each. There is no other external lighting on the houses and the mini roundabout on the close is not lit.

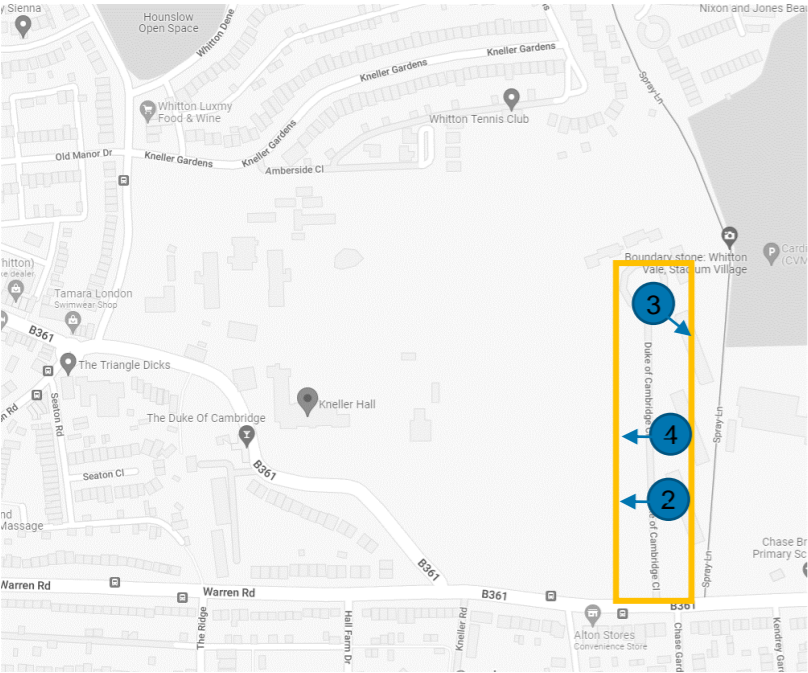
From the site visit, it was witnessed that the round headed luminaires contributed to spill light across the boundary of the proposed site.

The close as a whole is visibly darker than the adjacent main road (B361). The streetlamps have a warm colour temperature (CCT) and do not give off much light.

SITE VISIBILITY

The views from the properties on the close are onto the Kneller Hall playing field. The hall building is visible in the distance. The boundary line has a few existing trees and a wire metal fence around the edge of the field however this is easy to see through and does not obstruct views.

The views onto the field from the cluster of houses and the flat buildings are generally dark, but there are column lamps / some floodlights at the back of the playing field which are very visible. Kneller Hall is not illuminated from this view and is in darkness. (image 4)



Context plan showing view point locations



1.0 INTRODUCTION

1.6 EXISTING LIGHTING SOUTH

The existing lighting to B361 Kneller Road consists of a number of tall LED flat glass streetlamps spaced along both sides of the main road approximately 10m high (See Image 1)

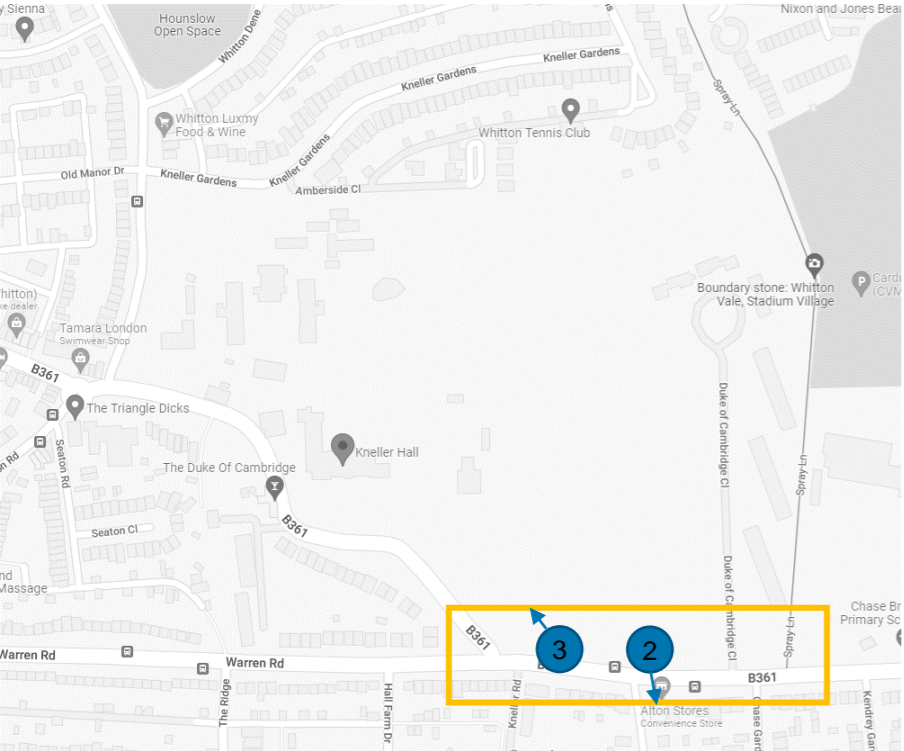
There is a 'corner shop' half-way up the road which incorporates illuminated signage on the façade (See Image 2).

Refer to lux level readings provided on page 6 for lighting levels.

SITE VISIBILITY

Along this road, much of the field has an iron fence with slats that can be seen through. (See image 3)

The views across the playing field from the houses are generally dark with some of the column lamps / floodlights at the back of the field visible in the distance. In some positions, the field lights are blocked by the existing trees at the edge of the field.



Context plan showing view point locations



1.0 INTRODUCTION

1.7 EXISTING LIGHTING SOUTH WEST

Continuing along Kneller road towards the Hall, the existing lighting to B361 Kneller Road/Main Entrance Approach follows the same approach; There are a number of tall LED flat glass streetlamps spaced along both sides of the main road approximately 10m high (See Image 1)

Further up the road, there is a pub opposite the hall entrance which has some feature lanterns / fairy lighting outside.

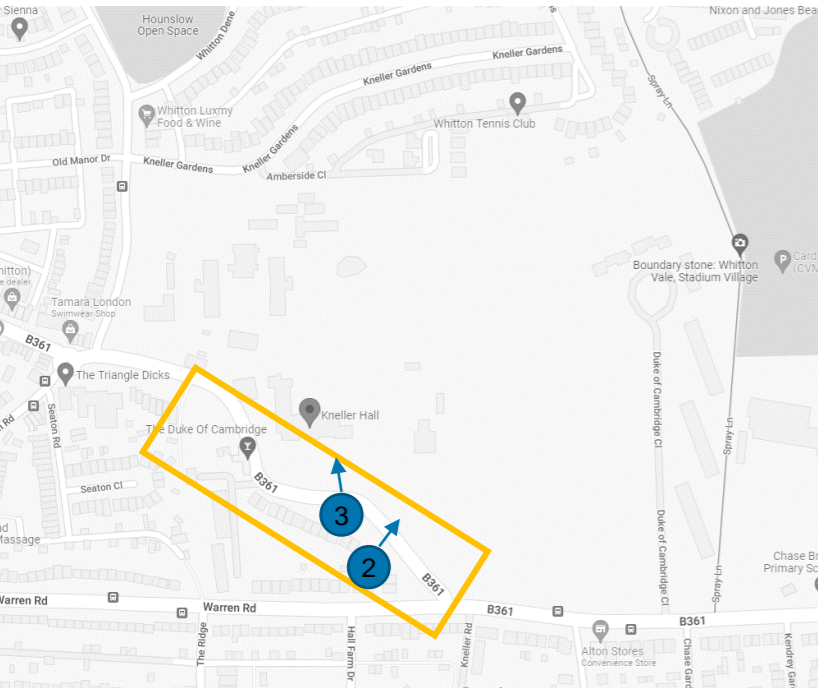
Refer to lux level readings provided on page 6 for lighting levels.

SITE VISIBILITY

Along this road, there is a solid brick wall with metal barbed wire along the top of the 2m high wall. The wall blocks the views of the playing field and the Hall building from site (see image 3) however views of Twickenham stadium are visible in the distance above the wall.

The houses are set-back from the road and in some positions, the field lights are blocked by the existing trees at the edge of the field.

Further along the road the fence changes to iron with slats that can be seen through (See image 2. Kneller Hall and the courtyard are visible to the houses positioned directly opposite the entrance however there is no façade lighting on the building that faces the entrance.



Context plan showing view point locations



1.0 INTRODUCTION

1.8 KNELLER HALL GROUNDS (BUILDINGS)

A number of different lighting types are present around the Kneller Hall site. The observations below are taken from the locations shown in image 6:

Location 1

At either end of the existing accommodation buildings, there are round safety lights mounted above each door on the staircase landings (Image 1). Behind the accommodation buildings, there are a handful of inverted cone 5m high column lamps (image 2).

Location 2

In the grass corner of the site there are 2no. 4.5m high column lamps within the existing carpark. (image 3) The column lamps continue along the edge of the site.

Location 3

On the side of the building there are 2no. LED floodlights mounted at 4m high (image 4).

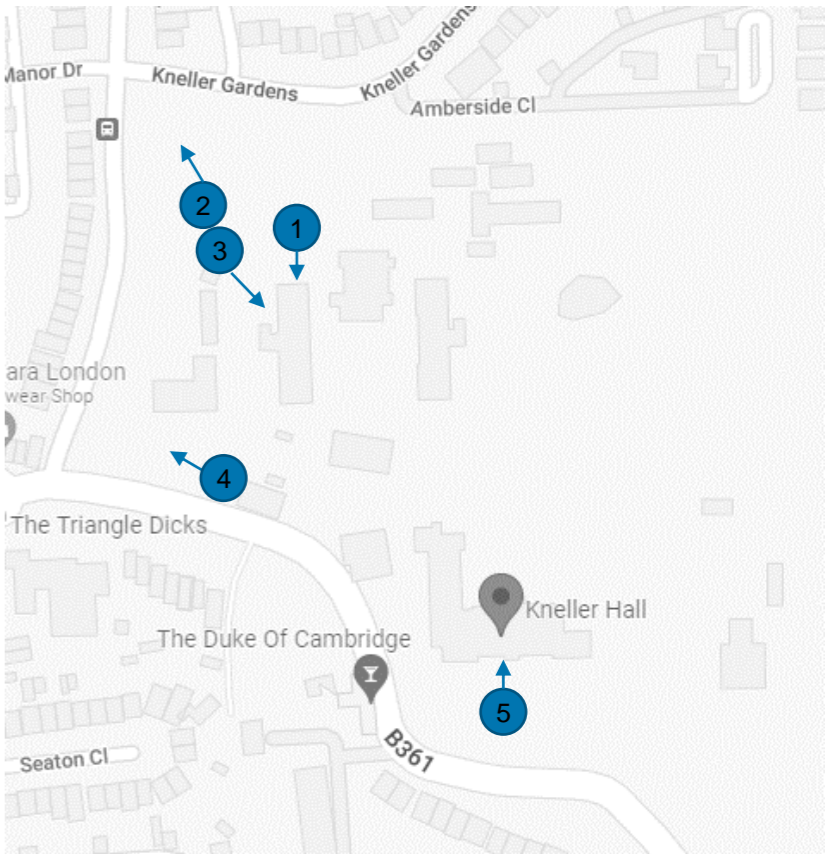
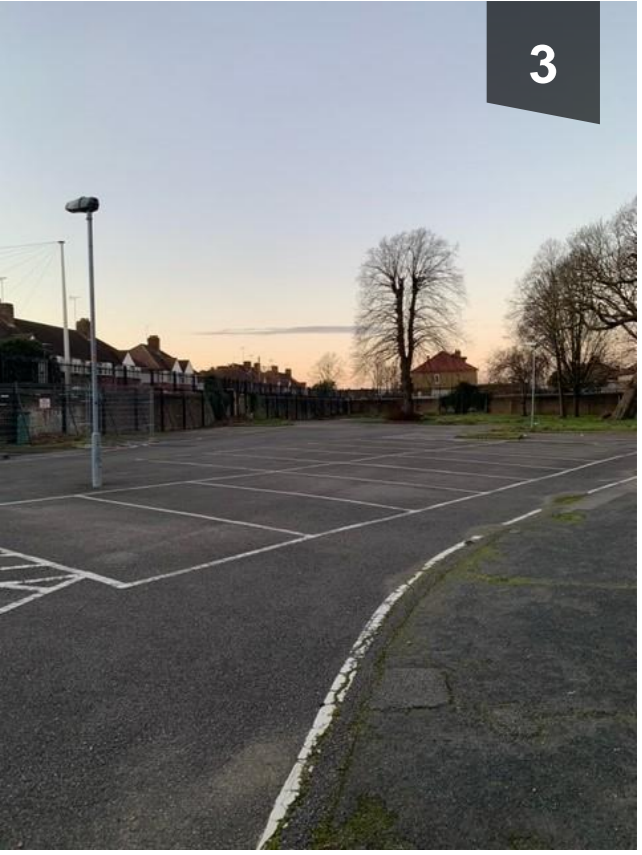
Location 4

In the grass corner of the site, there are a handful of 4.5m high column lamps (See Image 5)

Location 5

There is no façade lighting on the building that faces the entrance.

Continued page 11...



1.0 INTRODUCTION

1.8 KNELLER HALL GROUNDS (BUILDINGS)

The following observations are general across the Kneller hall site. These consist of façade lighting to existing buildings, lighting close to the boundary and common site lighting:

Existing Buildings

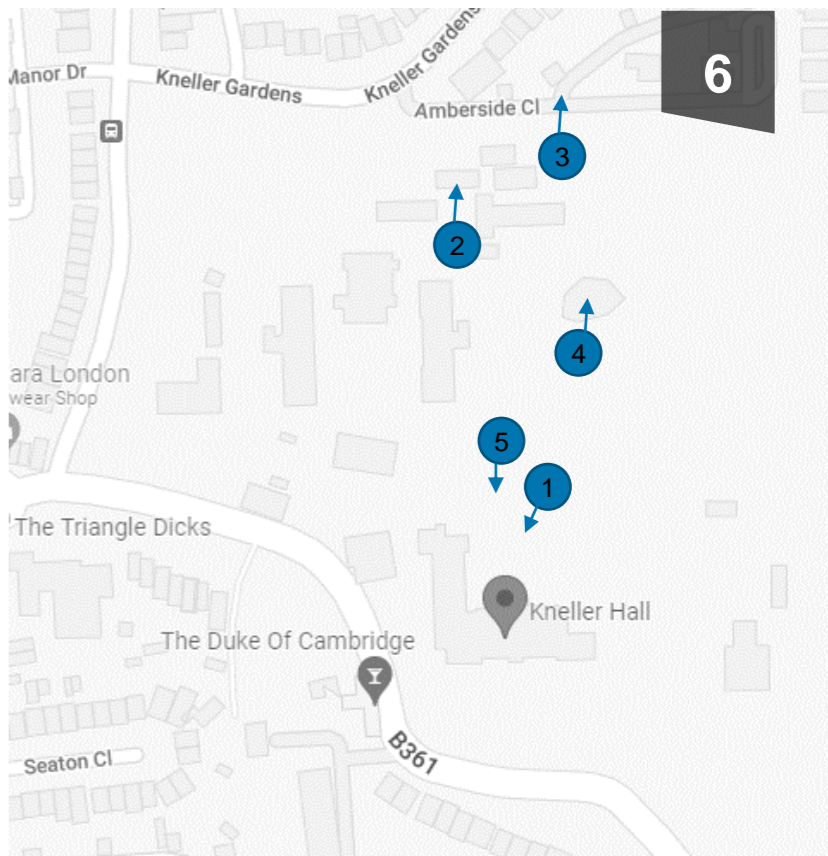
There is no façade lighting to the rear façade of the Hall building (Image 1). At the front of the building, there are 2no, decorative lanterns at either side of the doorway; but these were not illuminated at the time of the visit. There are 4m high column lights with a warm colour temperature (CCT) on the grass at the back of the hall (image 5). These columns continue along the path that follows the southern edge of the site; however, most were not illuminated / were damaged.

On the garages, there are bulkhead luminaires (Image 2)– mostly facing inwards towards the site (illuminated). The luminaires which were facing outwards towards Amberside Close were not illuminated at the time of the visit.

The houses on Amberside Close are in close proximity to some of the existing buildings along the northern edge of the site. The rear windows of the houses look onto the field / buildings; however, the site is only visible through a ~30m section of the fence where there is no hedge. Most of this perimeter edge has dense hedging which blocks views of the site (image 3).

The amphitheatre at the centre of the site has a handful of LED bulkhead luminaires to the stairs and some LED floodlights mounted around the edge (See image 4), but these were not illuminated at the time of the visit. It is also rigged-up with steel poles and LED stage luminaires, presumably for event purposes - but these were also not illuminated.

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1.0 INTRODUCTION

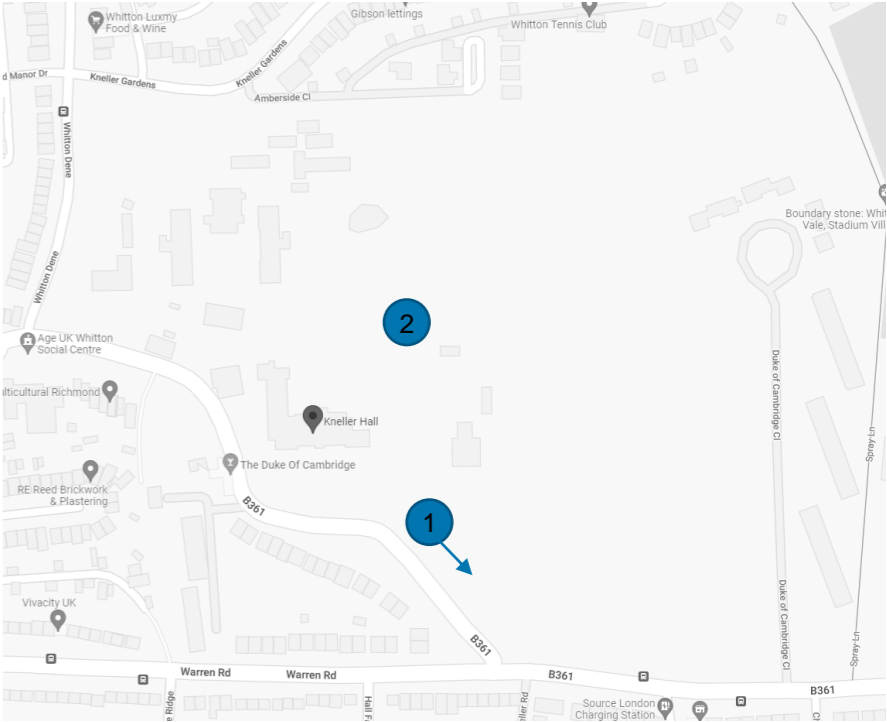
1.8 KNELLER HALL GROUNDS (BUILDINGS)

Existing Driveway

The entrance driveway is illuminated by a number of approximately 4m high lampposts with 360 degree illumination. The lighting flashes the existing trees whilst also providing some illumination onto the road (see image 1).

Existing Car Park (North East of Kneller Hall)

Within the existing car park there are a number of lighting columns illuminating the car park spaced approximately 15m apart (see location 2 on the map)

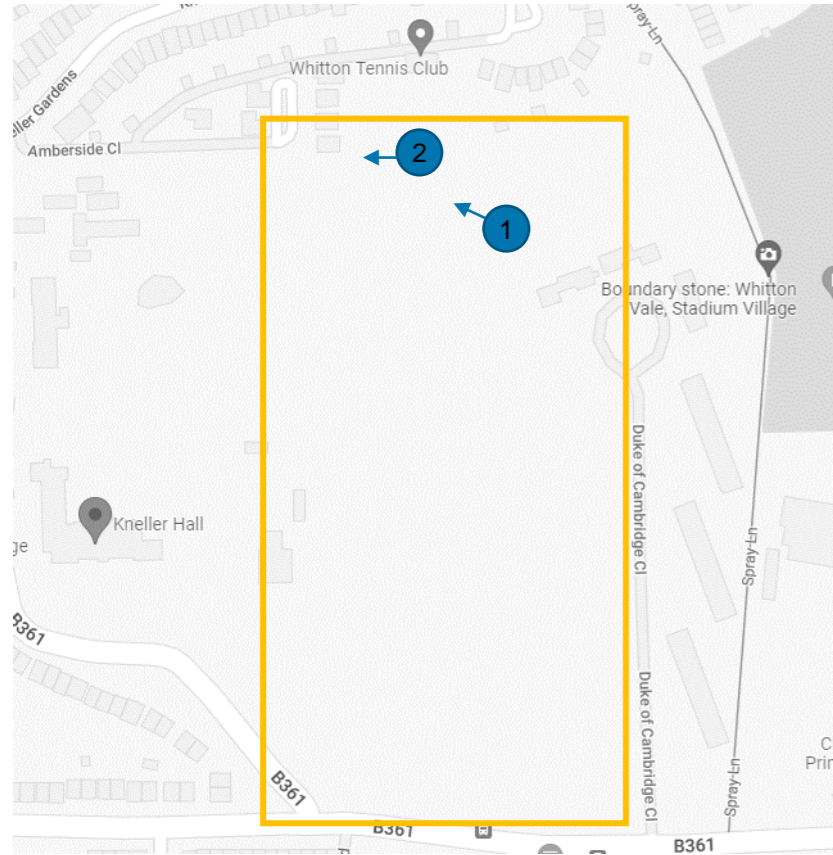


1.0 INTRODUCTION

1.9 KNELLER HALL GROUNDS (PLAYING FIELDS)

The views across the playing fields are generally dark but the column lamps / floodlights at the back of the field are very visible (image 1).

The northern edge of the field, nearest Whitton Tennis Club, has several column lights which are bright and illuminate the ground and perimeter wall. In some positions, the light from these lamps' spills over the back gardens of the adjacent houses on Ambleside close.



1.0 INTRODUCTION

1.10 EXISTING LIGHTING NORTH/WEST

The existing lighting to Kneller Gardens (located to the north of the site) consist of a number of tall LED flat glass streetlamps spaced along both sides of the main road approximately 6m high (Image 1)

The existing lighting to Whitton Dene (located to the west of the site) are a number of tall LED flat glass streetlamps spaced along both sides of the road approximately 7-8m high (Image 1)

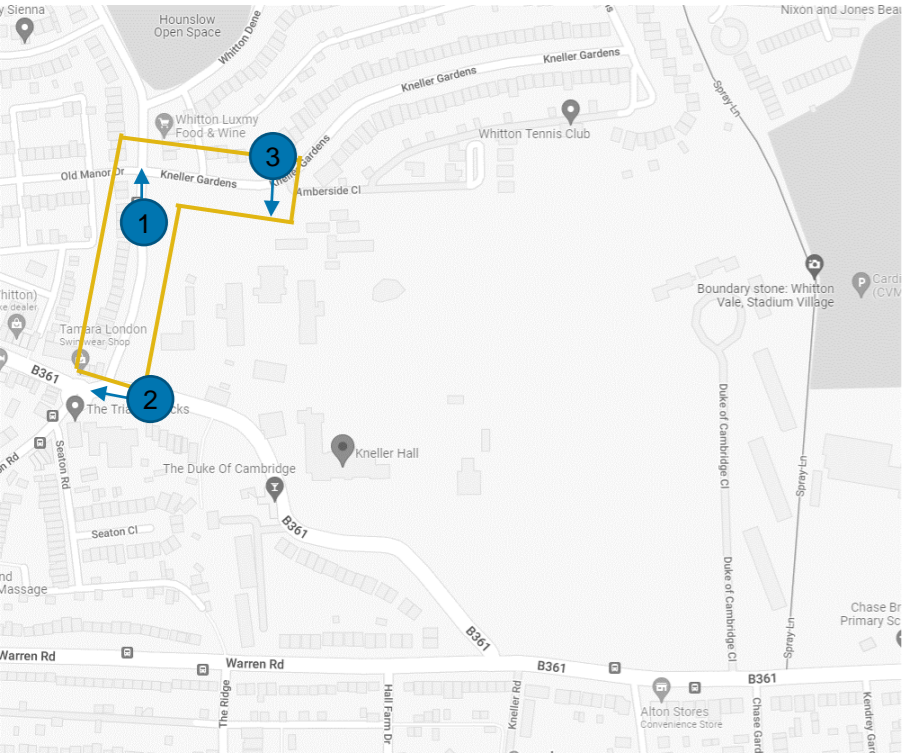
Refer to lux level readings provided on page 6 for lighting levels.

SITE VISIBILITY

The column lights positioned along the northern edge of the site are very visible from the road, and the warm CCT light from them comes through the fence to light the pavement and spills onto the driveways of the houses opposite (image 3)

At the corner of the road where the 'Best One' corner shop is, there is no visible spill light from the Kneller site.

The lamps on the Kneller Hall playing field are visible in certain positions along Whitton Dene road. Generally, the views of the hall and other site building are dark, other than that of the internal lighting coming through the windows of occupied rooms on the site.



1.0 INTRODUCTION

1.11 EXISTING LIGHTING WEST

The existing lighting to B361 consist of a number of tall LED flat glass streetlamps spaced primarily along one side of the road approximately 10m high. The luminaires face towards the windows of the flat building on the road and not towards the proposed site. (Image 2)

Refer to lux level readings provided on page 6 for lighting levels.

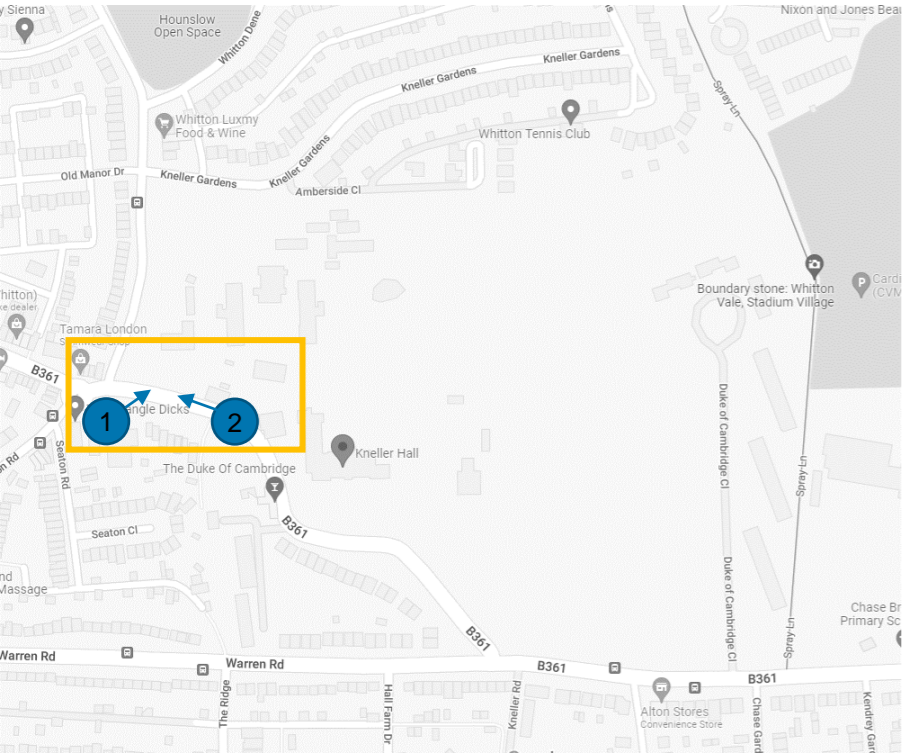
SITE VISIBILITY

Some of the column lights on the Kneller site are visible from the B361 road. They illuminate the existing trees along the edge of the wall within the site boundary (See image 1).

1.12 SUMMARY

The immediate area around the proposed development site has high levels of night time pollution and the street/flood lighting contributes to the overall brightness of the night-time environment.

The proposed site has existing lighting on the site with luminaire types that contribute to light pollution and the overall brightness of the area.



2.0 DESIGN CRITERIA

2.1 ENVIRONMENTAL ZONE

The proposed Kneller Hall site is located within the London borough of Richmond upon Thames and is bound to the south by the B361 road, to the west by Whitton Dene, to the north by Kneller Gardens and to the west by Duke of Cambridge Close. The development has been assessed as an “E3 Environmental zone” as defined in the Institution of Lighting Professionals publication ‘Guidance Notes for Reduction of Light Pollution’ - see Table 1 below.

Category	Description	Examples
E0	Protected	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Intrinsically dark landscapes	National parks, areas of outstanding natural beauty etc.
E2	Low district brightness area	Rural, small village or relatively dark
E3	Medium district brightness area	Small town centers or urban locations
E4	High district brightness area	Town/city centers with high levels of night-time activity

Table 1 – Environmental Zones

Environmental zone	Light on properties (vertical) E _v (lux)		Luminaire intensity I (cd)		Upward light ULR (%)	Luminance (cd/m ²)	
	Pre-curfew	Post-curfew	Pre-curfew	Post-curfew		Building facade L _b	Signs L _s
	E0	n/a	n/a	0		0	0
E1	2	<0.1	2,500	0	0	<0.1	50
E2	5	1	7,500	500	2.5	5	400
E3	10	2	10,000	1,000	5	10	800
E4	25	5	25,000	2,500	15	25	1,000

Table 2 – Environmental Zone Requirements

The exterior lighting shall be designed in accordance with current good practice Society of Lighting and Lighting (SLL) guidelines and the Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light.

To minimize the potential adverse effects of light pollution the following design principles will be applied during further design stages:

- Specification of luminaires with directional precision optics and with narrow light beam angles where appropriate to ensure light is focused only where illumination is required.
- Specification of optional accessories (cowls / baffles/ louvres) where necessary to prevent unwanted light spill.
- Specification of time-based lighting control to limit post-curfew light spill.

Institute of Lighting Professionals (ILP formally the ILE), Lighting Against Crime, A Guide for Crime Reduction Professionals (January 2011)

Secured by Design and the ILP produced a paper in 2011 conversing an understanding of external lighting and the recommended levels of illumination used to combat crime, the fear of crime and antisocial behaviour. Secured by Design is a police initiative to encourage the building industry to adopt crime prevention measures in the design of developments to assist in reducing the opportunity for crime and the fear of crime, creating a safer and more secure environment.

Institute of Lighting Professionals (ILP formally the ILE), PLG08 - Guidance on the Application of Adaptive Lighting within the Public Realm

PLG08 looks at approaches to consider when applying adaptive lighting levels to lit highways and public/private areas based upon the use of the area under consideration. This includes options such as:

- Trimming, turning the lighting on and off to suit local ambient lighting levels and performance requirements.
- Variable lighting levels where the task lighting is adjusted to suit the use of the area.
- Part night lighting where the lighting is turned off during defined hours.

2.0 DESIGN CRITERIA

2.2 ENVIRONMENTAL ZONE

CIBSE The Society of Light and Lighting (SLL), Lighting Guide 6: The exterior environment (January 2016)

LG6: The exterior environment; provides a holistic approach to the design of the exterior environment with respect to lighting. It sets out guidance for the application of lighting to all manner of external spaces including (but not limited to) landscapes, facades, amenities, together with information on luminaires and light sources.

CIBSE The Society of Light and Lighting (SLL), Lighting Guide 4: Sports Lighting (July 2013)

LG4: Sports Lighting; outlines example and opportunities for the lighting of Rugby, Hockey and Tennis Courts. The levels outlined are for county level play and lie within class II.

Sports England: Artificial Sports Lighting (2012)

The document gives recommendations and guidance on the lighting of Rugby, Hockey, Tennis Courts to community standard. This level of play lies within the class III category.

Following initial analysis undertaken by Cundall and engagement with the project Ecologist it has been confirmed that the rugby, football, hockey and cricket pitches are to be unlit. The tennis courts will be illuminated and therefore the relevant guidance has been provided, see below:

Sport	Class	Horizontal illuminance		Vertical illuminance		Ra	Reference / Sport England updates
		Eave (lux)	Emin/Eave	Eave (lux)	Emin/Eave		
Tennis							Table A.16 BS EN 12193:2007 LTA recommend maintained average illuminance of 500 lux on the PPA and 400 lux on the TPA LTA specify minimum maintained average illuminance of 400 lux on the PPA and 300 lux on the TPA To maintain safety margins and to ensure that there are no luminaires in an unacceptable location, there must be no lighting columns within the TPA
	I	500	0.7			60	
	II	300	0.7			60	
	III	200	0.6			20	LTA does not fund recreational level lighting

Table 3 - Outdoor Sports - Summary of the recommendations of BS EN 12193 with additional notes on key design issues

2.0 DESIGN CRITERIA

2.2 ENVIRONMENTAL ZONE

BSI Standards Publication – BS EN 12464-2:2014. Light and lighting - lighting of work places. Outdoor work places

Ref. no	Type of area, task or activity	Em lx	Uo	R GL	Ra	Specific requirements
5.1.1	Walkways exclusively for pedestrians	5	0.25	50	20	
5.1.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	0.40	50	20	
5.1.3	Regular vehicle traffic (max. 40 km/h)	20	0.40	45	20	At shipyards and in docks, RGL may be 50
5.1.4	Pedestrian passages, vehicle turning, loading and unloading points	50	0.40	50	20	
5.1.5	Cleaning and servicing	50	0.25	50	20	All relevant surfaces

Table 5.1 — General requirements for areas and for cleaning at outdoor work places

The following table gives reference to the parking areas around the site.

Ref. no	Type of area, task or activity	Em lx	Uo	R GL	Ra	Specific requirements
5.9.1	Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25	55	20	
5.9.2	Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25	50	20	
5.9.3	Heavy traffic, e.g. parking areas of major shopping centres, major sports and multipurpose building complexes	20	0.25	50	20	

Table 5.9 – Parking Areas

2.0 DESIGN CRITERIA

2.3 DARK SKIES

Artificial light at night has revolutionized the way we live and work outdoors, but it has come at a price. When used incorrectly, outdoor lighting can disrupt wildlife, impact human health, waste money and energy, contribute to climate change, and block our view of the universe. Light pollution is increasing worldwide at twice the rate of global population growth and virtually every species studied is impacted in some way by light pollution.

Access to darkness is important both visually and emotionally. However true darkness is hard to come by in a town or city. The towns and cities around the world have lost their stars and this in itself is wrong. We will be taking our responsibility for caring for the planet one step further and will be adopting the following the principles as determined by the International Dark Sky Association.

- 1 – Ensuring that every light serves a clear and necessary purpose.
- 2 – Ensuring that light only falls where it is intended/ needed.
- 3 – Ensuring that the amount of light is appropriate for the task.
- 4 – Providing connected active controls.
- 5 – Providing light sources that are warm in colour.

The surface finishes of the architectural and landscape architectural designs will be considered as this has the potential to affect light pollution. We will work with the architect and landscape architect for this approach to ensure we achieve the required criteria.

Our commitment to light pollution means this project will be designed with Dark Skies in mind and light pollution will be heavily assessed in terms of all decisions to be made.



2.0 DESIGN CRITERIA

2.4 LEGISLATION & LOCAL PLANNING

The Planning (Clean Neighbourhoods and Environment) Act 2005

• The legislation governing light pollution is the Planning (Clean Neighbourhoods and Environment) Act 2005. It applies to “artificial light emitted from premises so as to be prejudicial to health or a nuisance”. The relevant section is 102..

•Section 102 defines the premises to which the act applies. Shopping centres, residential properties and offices are not exempt.

National Planning Policy Framework (March, 2012)

Section 15 of the NPPF is titled “Conserving and enhancing the natural environment” and paragraph 180 discusses the approach to minimising the impact of light pollution.

“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:

a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.”

Planning Practice Guidance – Light Pollution (March 2014)

This Guidance sets out how the Government defines the link between lighting and planning:

“Artificial light provides valuable benefits to society, including through extending opportunities for sport and recreation, and can be essential to a new development. Equally, artificial light is not always necessary, has the potential to become what is termed ‘light pollution’ or ‘obtrusive light’ and not all modern lighting is suitable in all locations. It can be a source of annoyance to people, harmful to wildlife, undermine enjoyment of the countryside or detract from enjoyment of the night sky. 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.

Lighting schemes can be costly and difficult to change, so getting the design right and setting appropriate conditions at the planning stage is important. In particular, some types of premises (including prisons, airports and transport depots where high levels of light may be required for safety and security reasons) are exempt from the statutory nuisance regime for artificial light, so it is even more important to get the lighting design for these premises right at the outset.”

Richmond’s Adopted Local Plan (July 2018)

Policy LP9 - Floodlighting, including alterations and extensions, of sports pitches, courts and historic and other architectural features will be permitted unless there is demonstrable harm to character, biodiversity or amenity and living conditions. The following criteria will be taken into account when assessing floodlighting:

1. The impacts on local character or historic integrity;
2. The impacts on amenity and living conditions;
3. The impacts on biodiversity and wildlife;
4. The benefits and impacts of the provision of floodlighting on the wider community; 5. the benefits and effects on the use and viability of the facility; 6. that it meets an identified need as set out within the council’s playing pitch strategy.

Floodlighting can enable the full use of outdoor sport and leisure facilities, but consideration must be given to any demonstrable harm to biodiversity, amenity and local character.

Site Designations

A large percentage of the site falls within the Metropolitan Open Land designation. This covers the eastern part of the site, including the playing fields.

Kneller Hall is Grade II Listed and the Band Practice Hall and Guard’s House are curtilage listed. Parts of the site boundary wall are also Grade II Listed.

The north eastern part of the site is designated as a Deciduous Woodland, identified as a Priority Habitat. There is extensive tree coverage across large parts of the site. Ecology and bat surveys are being undertaken at the site.

We have had regard to the site designations in preparing the lighting strategy. We have engaged with the project ecology consultant (RPS), to ensure that the proposals are appropriate and modified the strategy to respond to their advice and recommendations.

Further documents reviewed are listed below:

Light + Darkness in the City/ A Lighting Vision for the City of London/ Chapter 4

City of London Public Realm Technical Manual









2.0 DESIGN CRITERIA

2.5 ILLUMINANCE & UNIFORMITY

The exterior lighting shall be designed in accordance but not limited to the following guides and standards:

- BS EN 12464-2:2014 Light and lighting – Lighting Of Work Places Part 2: Outdoor Work Places
- CIBSE SLL Lighting Guide LG6 2016: Exterior environment
- CIBSE SLL Code for Lighting
- Secured by Design - Lighting against crime. A guide for crime reduction professionals 2011
- BSI Standards Publication – BS 5489-1:2020. Design of road lighting, Part 1: Lighting of roads and public amenity areas

The following lux levels will be provided to the highlighted areas;

-  Pedestrian Route / Building Perimeter – 5 lux
-  Vehicle Access Route / Cycle Parking – 10 lux
-  Parking – 5 lux
-  Entrance – 20 lux
-  Tennis Courts – 200 lux *
-  Ecology Corridor - <1lux - Areas within the ecology corridor that are to be lit are shown below:
-  Vehicle Entrance – Ecology Pinch Point – 5 lux (Luminaire under 1m high)
-  Unlit landscape areas



*level taken from Sports England: Artificial Sports Lighting 2012. The levels outlined are for club levels of play.

2.0 DESIGN CRITERIA

2.7 LIGHTING CONTROL PRINCIPLES

The external lighting shall be designed to use energy-efficient LED light sources in accordance with current good lighting practice.

As part of the overall energy saving strategy, it is proposed to introduce a lighting control system. The control system will incorporate astronomical time clock with photocell override and dimming controls. In accordance with the ILP Guidance Note 1 (The reduction of Obtrusive Light 2021) curfew times are to be discussed and agreed in order to minimise visual impact on the nearby residents.

Controlling exterior lighting elements in groups will enable specific circuits, such as non-essential lighting elements to be switched off late in the evening, to minimise energy use whilst maintaining safe levels of illuminance overnight.

Advanced lighting technology can provide dimming protocols and intelligent controls that can limit the operating hours of an installation to reduce running costs and potentially adverse environmental impact.

The landscape lighting must be regulated to create a comfortable ambience. Efforts should be put forward to reduce the intensity of vertical illumination during the hours of darkness and retain only minimal lighting for security and safe circulation during post-curfew hours by the entrances and circulations.



3.0 DESIGN STRATEGY

3.1 PEDESTRIAN WALKWAYS / LANDSCAPE LIGHTING

Wall mounted luminaires will be installed along building perimeters to provide a safe pedestrian walkway. The luminaires will be down only to minimise light spill. Where wall mounted luminaires are proposed on Kneller Hall and the curtilage listed buildings, regard will be had to the style of these fittings and the method of fixing these to the building, to ensure that they are sensitive to and preserve the building's heritage significance.

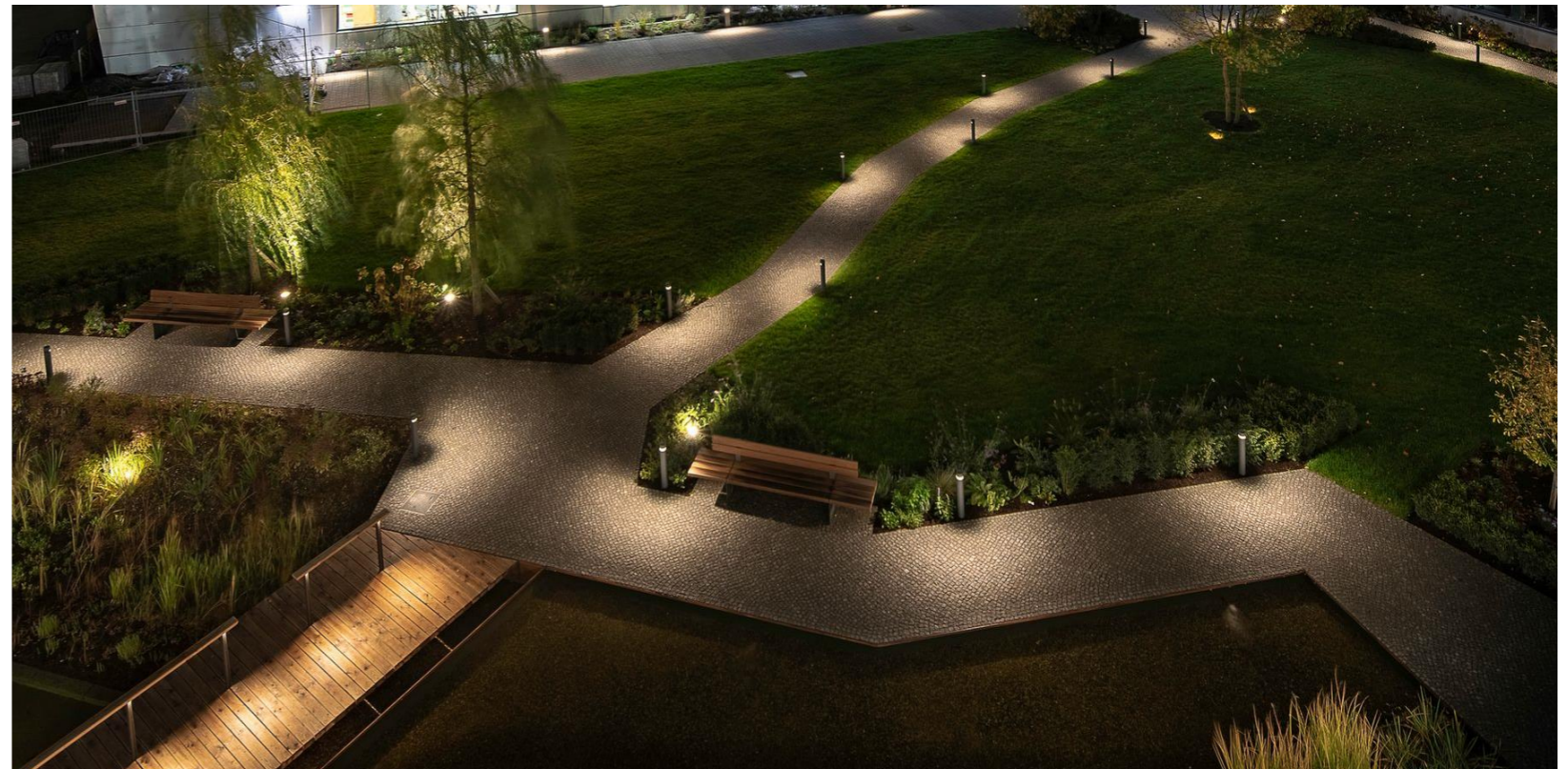
Where existing lighting is present on current buildings, these will be replaced with new luminaires that comply with the ILP guidance for obtrusive light and dark skies.

Where pathways are not surrounded by buildings, low level bollards will be provided to illuminate down onto the path. Asymmetric optics with additional back shield will focus the light where it is required minimising light spill to the surrounding ecology corridor.

Subsided lighting in the form of columns will be utilised only where necessary.



Building Mounted Luminaire – Illustrative Image



Low Level Bollards – Illustrative Image

3.0 DESIGN STRATEGY

3.2 PEDESTRIAN MAIN ENTRANCE

In order to define the pedestrian entrance, the entrance area will have elevated light levels in comparison to the pedestrian walkways. Several columns with symmetric optic will be positioned in and around the entrance area mounted at a 4m height. The style of these columns can be selected to ensure that they are appropriate for the setting, within the curtilage of the Grade II listed Kneller Hall. These could be heritage style columns.



Heritage style column – Illustrative Images



3.0 DESIGN STRATEGY

3.3 VEHICLE ACCESS

Areas such as vehicle routes will require additional illumination in order to enable the safe movement of vehicles and pedestrians.

The existing luminaires are spaced ~15m apart and are similarly mounted at a height of ~4m; however they are positioned along both sides of the driveway and their design is such that light is emitted in 360 degree directions making the control of illumination negligible.

The proposed luminaire specification features dedicated LED optics for effective distribution of light along the driveway. The proposed columns are spaced ~12-13m apart along one side of the driveway and are mounted at a height of 4m in order to minimise light spill.

Due to the vehicle access route being located adjacent to the ecology corridor, special street optics will be utilised to direct the light onto the road/ where it is required. A small element of back spill is likely to be emitted from the luminaires however the luminaires will be positioned as such so the spill light will illuminate the adjacent pedestrian path rather than the tree line. This therefore minimises the need for additional lighting along the pedestrian path.

The proposed lighting strategy seeks to minimise impact to the nearby ecology and residential receptors whilst illuminating the driveway for safety and navigation.



Proposed luminaire – Illustrative Images

3.0 DESIGN STRATEGY

3.4 ENTRANCE PINCH POINT

In order to maintain less than 1lux on the ecological habits, the entrance area has been defined as a pinch point whereby an alternative strategy to the road has been applied in order to lower light levels. 0.8m high bollards with an asymmetric beam and back shield so the light is focused only on the road will be positioned around the entrance area. The uniformity of light along the road will be slightly compromised however the design complies with the ILP guidance notes on the reduction of obtrusive light.

This entrance is used by both cars and pedestrians therefore lighting to this area is required for safe navigation.



Low Level Bollards – Illustrative Image



Low Level Bollard – Back Shield – Illustrative Image

3.0 DESIGN STRATEGY

3.5 PARKING

The proposed parking area sits in the same location as that of the existing car park and is within Metropolitan Open Land. The existing luminaires are distributed within the centre of the car park and are similarly mounted at a height of ~4m; their design is such that light is emitted in 360 degree directions making the control of illumination negligible.

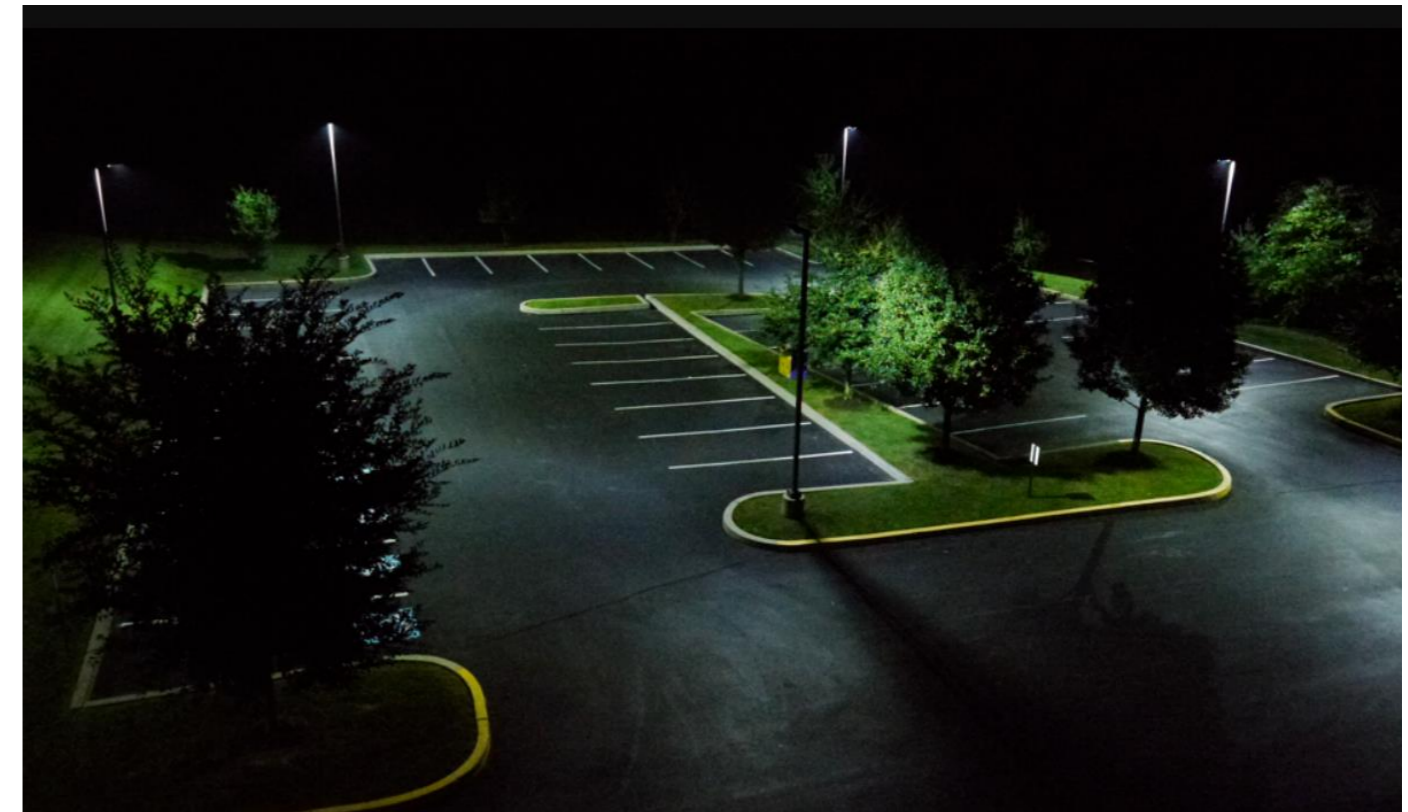
The proposed luminaire specification features dedicated LED optics for effective distribution within the car parking areas. A number of columns will be located at approximately 5-6m high to provide uniform light levels across the area.

The car park located on the west side close to the boundary will have luminaires mounted to 5m columns in order to minimise light spill outside of the site boundary.

A lower output will be used for the car parks in comparison to the vehicle routes to achieve the light levels set out in the design criteria.



Street Light - Illustrative Image



Illustrative Image

3.0 DESIGN STRATEGY

3.6 SPORTS LIGHTING

The tennis courts will require careful consideration of lighting placement and products to help minimise light pollution into the sky or surrounding areas.

In order to meet the Sports England Club level of play (Class I) the lighting to the sports pitches requires high uniformity alongside an average lux level requirement. The lighting strategy therefore will require high power LED flood lights mounted to approximately 7m high columns. The flood lights selected will utilise optics for control of obtrusive light for sports and area lighting applications.

In accordance with the ILP Guidance Note 1 (The reduction of Obtrusive Light 2021) curfew times are to be discussed and agreed in order to minimise visual impact on the nearby residents. For the Kneller Hall site, community uses would be during the hours of 18:00 – 21:00hrs therefore any lighting to sports pitches would be turned off after these hours.

Within the associated proposed lighting strategy, consideration has been given to minimising the lighting with respect to number of columns applied and mounting heights in order to mitigate the impact as far as possible. The style of luminaire utilises directional LED precision optics to ensure light is focused only where illumination is required – further ensuring that the impact on surrounding sensitive receptors is minimised.



Cowl Style Floodlight – Illustrative Image



Column mounted floodlights – Illustrative Image.

4.0 CONCLUSION

4.1 KEY POINTS

The lighting design discussion within this report refers to the site known as Kneller Hall.

If the lighting techniques highlighted in the ILP Guidance note on the reduction of obtrusive light, 2021 document are used, the site safety and security lighting located within the development area will not have an effect on the neighbouring adjacent residential properties.

The proposed lighting strategies have been designed such that light has been kept to a minimum and have only been applied to ensure safety / navigation is enabled. The strategies acknowledge the Metropolitan Open Land designation and ecology requirements for the site.

The Kneller Hall school buildings anticipated hours of operation are 07:00 – 20:00 weekdays. Lighting would only remain on later in the evening (22:00) if an event was to take place. Community uses would be during the hours of 18:00 – 21:00hrs therefore any lighting to sports pitches ,car park serving the community use and pedestrian/ vehicle access routes for the community users would be turned off after these hours. All lighting other than those required for security lighting will de-energise by 22:00hrs.

Consultation has been undertaken with the project Ecologist (RPS) to ensure that they are supportive of the proposed lighting strategy from an ecology perspective and mitigation put in place where required to minimise the impact to the local wildlife.

This document shows illustrative images of example lighting types that could be used. The final style of lighting to be used will need to be considered further by the project architect, having regard to the specification requirements set out in this report to ensure light spill is managed appropriately.

A maintenance factor of 1 is applied within the lighting calculations as per requirement of BS 2020 5489 and BCT,ILP 2018 and depict a day one of instalment/worst case scenario.

This report is to be read in conjunction with lighting Lux Plot drawing - KNH-CDL-ZZ-XX-SU-LG-63100 included in the appendix of this document.

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