gia EQUATION

3074 | GUILD LIVING EPSOM | Lighting Strategy | 20 December 2019

CONTENTS

INTRODUCTION

Purpose of this Report

This Exterior Lighting Strategy has been prepared by GIA Equation to accompany an application being submitted to Epsom and Ewell Borough Council by the Applicants, Guild Living and Legal & General.

The proposal is to create an Assisted Living development of 344 residences and extra-care units within two new buildings operating within a C2 Use Class.

The proposed development will benefit from a range of amenities and facilities such as Physiotherapy, Gym, Hydrotherapy Pool, Spa and other Wellness facilities and retail tenants in fit-out areas such as the Restaurant, Cafe and Bar.

The intention is to provide fully open landscaped gardens surrounding the two buildings, accessible by residents and visitors alike, with access to the public controlled.

The scope of the Exterior Lighting Strategy includes all external parts of the application site including all public spaces, vehicle routes, walkways, gardens and building facades within the site boundary.

Existing Site

The site totals 1.13 hectares in size and is located to the South of Epsom town centre.

The site is delimited, to the South-East, by Woodcote Green Road, characterised by historic built fabric.

To the North and West, the neighbouring development is predominantly two-storey, semi-detached and terraced housing that typifies the more recent expansion of Epsom. The Western boundary is defined by mature trees which separate the hospital grounds from the adjacent back gardens of the adjacent residential dwellings.

To the South of Woodcote Green Road, Woodcoote Millennium Green provide a vast open area in direct link with the site.

The site is currently occupied by redundant health care buildings and associated infrastructure. These include existing low-grade administrative space, temporary structures, boiler house and the four storey Rowan House, which together form a pedestrian barrier to the south of the site and are surplus to hospital requirements.

Access into the site is directly from Woodcote Green Road or from Dorking Road to the North of the hospital, passing through the wider hospital complex.

Proposed Development

The proposed development will provide a series of high-quality, interconnected landscaped spaces throughout the site including the Central Plaza, the Hospital Entrance, Woodcote Green entrance and the key worker communal gardens.

The landscape master plan developed by Andy Sturgeon Design has identified a number of distinct character spaces. Sympathetic lighting typologies are proposed for each area which are in keeping with the proposed uses of each space. The intention is to create visual amenity in order to extend the recreational uses of the site until late into the evening for both residents and visitors alike. The existing ecological constraints have also been taken into account whilst developing this lighting strategy. Existing dark corridors will be maintained at the perimeter of the site to connect existing bat foraging and commuting routes with Millennium Green to the south.

The lighting strategy for the proposed development creates a framework and set of principles for the future detailed design of the exterior lighting which take into account the local context and the sensitive ecological constraints of the application site.

This report identifies the proposed uses and various typologies within the planning application boundary which are relevant to the proposed night time uses. The lighting strategy considers the potential environmental impact of electric light on the site surroundings and describes how best practice guidelines should be implemented during the design stages of the project.

It should be noted that the precedent project images, types and locations of the luminaires shown in this report do not represent the final material specification proposed for each area and are intended to illustrate the overall exterior lighting strategy only.

EXISTING EPSOM GENERAL HOSPITAL GROUNDS - AERIAL VIEW

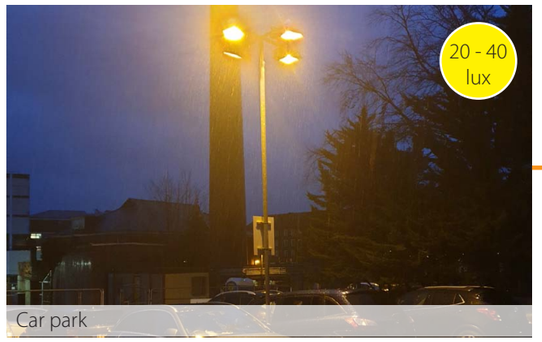
Boundary Line - Scope of Works

SITE CONTEXT & ANALYSIS

SURVEY - EXISTING ILLUMINANCE LEVELS

A lighting survey of the existing site, located within the Epsom General Hospital complex, was carried out using a calibrated digital lux meter with illuminance measurements taken at ground level at various key points on site and in the surrounding area.
Photos of the site were taken both during the afternoon and after dark, in order to document the existing lighting conditions.
The survey was carried out on 12th December 2019 from 3:30 pm to 5:30 pm. The sky was overcast and there was intermittent rain.

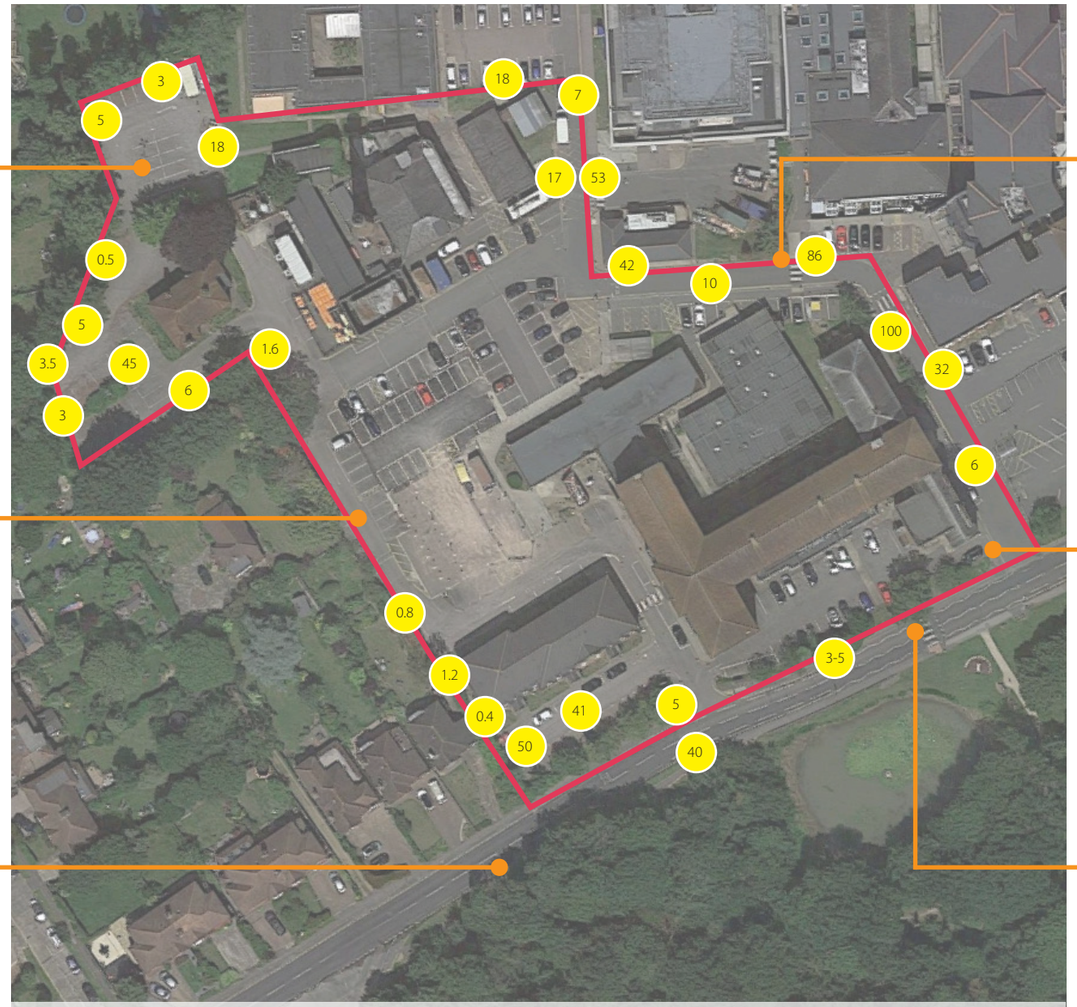
Care was taken to leave the light meter photocell unobstructed from the observer's own shadow and from passing traffic whilst taking measurements. The sample illuminance measurements shown below illustrate the extent to which horizontal illuminance values vary across the existing site and in the immediate vicinity.
Existing exterior lighting within the proposed development site comprises a series of ad hoc installations of various luminaire types, mainly mounted onto lighting columns or directly onto building facades. The documented readings vary from > 50lux (on the NHS vehicular route and eastern boundary) to 0.5lux (on vehicular route in the car park and western boundary). Uniformity along all pedestrian and vehicular circulation routes is low and there is inconsistency in illumination levels across the existing site. The area is navigable, however the lack of vertical illumination which supports good facial recognition does not promote a sense of security and perceived wellbeing for staff and visitors to the site after dark.



Car park

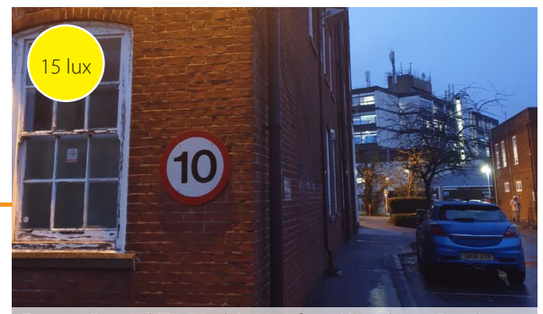
Car park boundary

Woodcote Green Road (West side)



EXISTING GUILD LIVING EPSOM GROUNDS

NHS vehicular route - North-West Boundary



Epsom General Hospital Access from Woodcote Road

Woodcote Green Road - East side

SITE CONTEXT & ANALYSIS

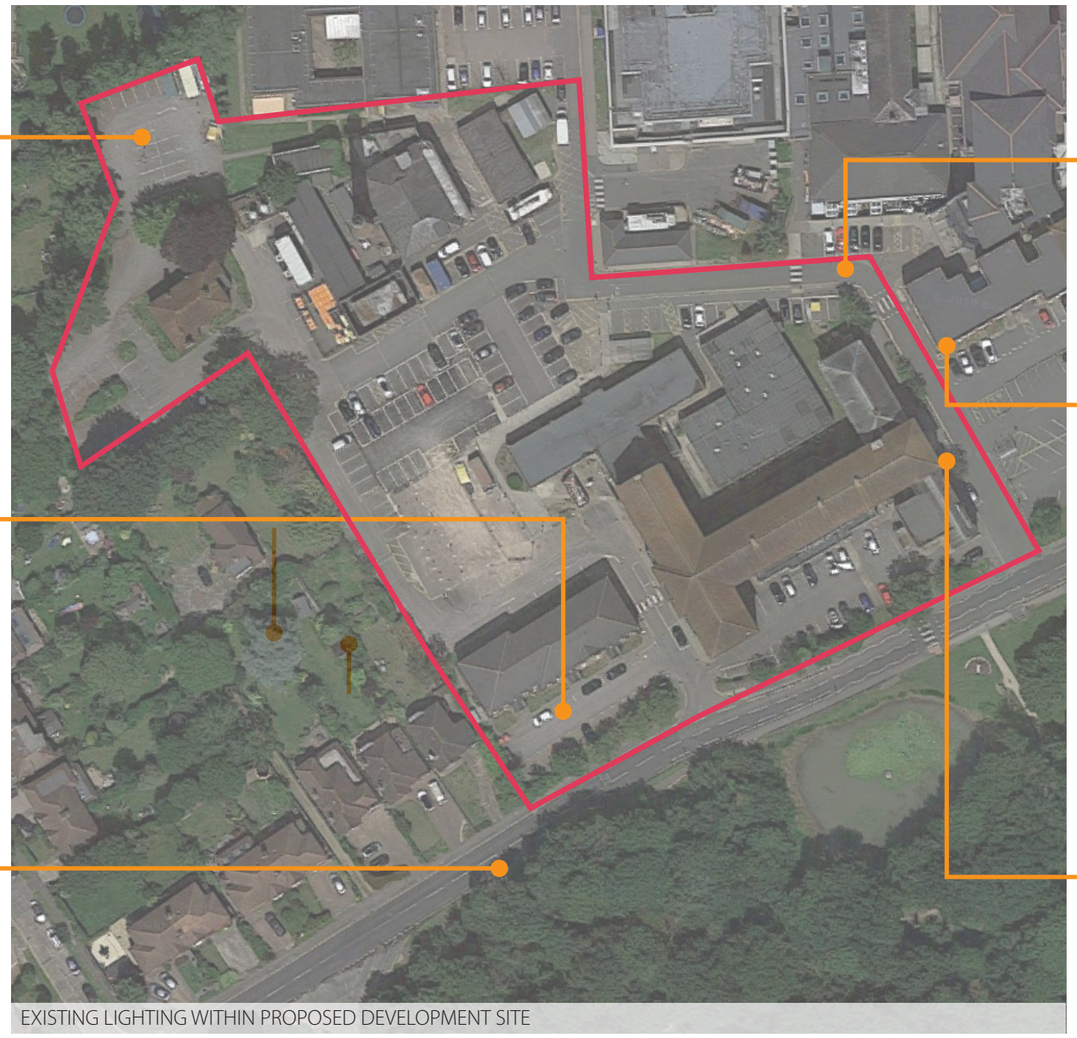
SURVEY - EXISTING LUMINAIRE TYPOLOGIES

There is a considerable variation in luminaire types and the levels of illuminance within the site and in the immediate surrounds.
Woodcote Green Road is illuminated with 6m high light columns installed every 15 - 20m apart. Levels of illuminance vary on both road and pavement. Approximately 50 Lux was measured on the pavement directly beneath the light columns, whilst 5-10 Lux was measured on the pavement directly opposite the luminaires.
To the East, the access road within the site is illuminated by wall mounted floodlights (on the East wing of Rowan House) which cast considerably more light onto the adjacent building facades and onto the pavement than the carriageway below. To the North, a variety of 4-5 m tall lighting columns provide lighting to the vehicular routes within the site and the parking spaces along the carriageway. Illuminance levels of between 30 and 40 Lux were measured on the pavement during the survey, with as little as 5 Lux measured at intermediate points on the carriageway and footpaths.
The two parking areas to the North-West boundary are illuminated by two 8 m multi-head lighting columns each utilising 4 no. downward facing asymmetric floodlights. An average illuminance of 30-40 Lux was measured in the central area of the parking space, with approximately 3-5 Lux measured at the perimeter. The central parking area within the site is illuminated by wall mounted floodlights installed on the West facade of Rowan House. To the West of the site, the access road and footpath are relatively dark with illuminance readings varying from 0.5 to 1.2 Lux.


8m high multi-head column lighting


6m high column lighting


6m high column lighting


EXISTING LIGHTING WITHIN PROPOSED DEVELOPMENT SITE


4m high column lighting


Wall mounted luminaire with downward lighting emission


Wall mounted adjustable floodlight

LIGHTING DESIGN CRITERIA
PLANNING POLICY & LEGISLATION / PROJECT DESIGN PRINCIPLES

Relevant legislation, key guidance documents and design standards that have informed the exterior lighting report and which will form the basis of the detailed lighting design for the application site are summarised below:

NATIONAL LEGISLATION

Environmental Protection Act 1990
An amendment contained within the Clean Neighbourhoods and Environment Act, 2005 to Section 79 of the Environmental Protection Act, 1990 states:
"Artificial light emitted from premises so as to be prejudicial to health and nuisance constitutes a 'Statutory Nuisance' and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under Section 80 and, where a complaint of a statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint".

NATIONAL PLANNING POLICY

National Planning Policy Framework 2019 (NPPF)
The NPPF was adopted on March 2019, it states that:
"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 sire or the wider area, to impacts that could arise from the development ..."

In addition, the NPPF states:
"Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity…"

Planning Practice Guidance (PPG) 2014
The PPG was launched in 2014, creating an online resource for planning practitioners. The guidance does not provide any further detail in terms of amenity beyond that stated in the NPPF.
The Government's National Planning Practice Guidance states that: "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" (Paragraph: 001 Reference ID: 31-001-20140306).

REGIONAL PLANNING POLICY

The Epsom & Ewell Borough Council Core Strategy, 2007
Sustainability in New Developments - Policy CS 6 states:

"Proposals for development should result in a sustainable environment and reduce, or have a newutral impact upon, pollution and climate change.
The council will ensure that new development minimises the emission of pollutants, including noise, water and light pollution."

The Epsom & Ewell Borough Council Development Management_ Policies Document, September 2015
Policy DM 10 Design Requirement for New Developments states:

"Development proposals should incorporate the principles of safe design to reduce the risk and fear of crime, e.g. natural surveillance, appropriate levels of lighting"

Policy DM 16 Backland Development states:

"The privacy of existing homes and gardens must be maintained and unacceptable light spillage avoided"

The Epsom & Ewell Borough Council Revised Sustainable Design Supplementary Planning Document, February 2016
Section 2.8, matrix of sustainability statement requirements estates:

"The sustainability statement should identify potential air quality, noise and light pollution issues related to the proposal and set out how they are to be addressed"

"A report setting out lighting isochrome details specifically mapping lighting contours and lux levels emanating from source "

PROJECT DESIGN PRINCIPLES

Guild Living Relevant Brand Standards
A set of guidelines aimed at providing benchmark parameters for designing Guild Living developments has been considered as a departing point for the lighting strategy.

Details referring to car park, cycle storage, playground, porte cochere and landscape lighting will be incorporated as appropriate in keeping with the brand's principles and design philosophy.

Marchese Partners Aging Design Principles
Aligning all aspects of the design and life cycle of the project with the design principles outlined in Marchese Partners' strategy is an equally important consideration for the development of the lighting strategy.

A thorough explanation of these principles facilitate the incorporation into the lighting strategy and ensure the architectural aims are closely followed and therefore enhanced by it.

The terms of these principles include essential concepts of familiarity, legibility, distinctiveness, accessibility, connectivity, safety and individual choice. All of which will find a correlation within the lighting principles established and further developed through this report.

Andy Sturgeon Design Guidelines
Landscape and exterior space planning has a crucial role in ensuring the scheme is successful in providing attractive and an adequate environment for Senior activities as well as family and visitors. It is also an essential buffer between the new development and the existing infrastructure, enhancing the local community and protecting the ecological existing conditions.

The landscape architect has distilled the rationale behind this design as in dynamic terms that translate clearly into actions that help define spaces, they look to provide integration, relaxation, movement, flexibility and engagement.

The lighting strategy will evolve around these and previous cornerstones to resolve spaces in practical but attractive ways.

LIGHTING DESIGN CRITERIA

RELEVANT LIGHTING DESIGN STANDARDS & GUIDELINES

Relevant key guidance documents and design standards that will inform the detailed lighting design for the proposed Guild Living development site are as follows:

ILP Guidance Notes for the Reduction of Obtrusive Light GN01:2011
The Institution of Lighting Professionals (ILP) publication Guidance Notes for the Reduction of Obtrusive Light (GN01:2011) makes recommendations aimed particularly at avoiding nuisance from obtrusive external lighting installations. The guidance advises that this can be achieved by good lighting design through careful selection of light sources, luminaires, and, the method of installation and these recommendations will be considered in the context of the proposed development's lighting design to limit the need for any further mitigation measures.

CIE Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations CIE 150:2003
The purpose of the International Commission on Illumination (CIE) publication Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations (CIE 150:2003) is to help formulate guidelines for assessing the environmental impacts of outdoor lighting and to give recommended limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. The guidance given is primarily applicable to new installations; however, some advice is also provided on remedial measures which may be taken for existing installations.

CIE Guidelines for Minimising Sky Glow CIE 126-1997
The International Commission on Illumination (CIE) publication Guidelines for Minimising Sky Glow (CIE 126-1997) gives general guidance for lighting designers and policy makers on the reduction of the sky glow. The report discusses briefly the theoretical aspects of sky glow and it gives recommendations about maximum permissible values for lighting installations in relation to the needs of astronomical observations - casual sky viewing included.

CIBSE Guide to Limiting Obtrusive Light
The Chartered Institution of Building Services Engineers Guide to Limiting Obtrusive Light (November 2012) outlines the causes and consequences of obtrusive light, and what can be done to minimise obtrusive light generally and in some commonly occurring applications.

Code of Practice for Road Lighting
British Standards Institution, BS 5489-1:2013
"Code of practice for the design of road lighting. Lighting of roads and public amenity areas"
British Standards Institution, BS EN 13201-2:2015
"Road Lighting Part 2: Performance requirements"

Good Practice Design Guidelines
Society of Light & Lighting (formerly CIBSE) Lighting Guides:
LG6 **"The Outdoor Environment"** - 2016
LG9 **"Lighting for Communal Residential Buildings"** - 2013
Fact File No. 8 **"Lighting For People Who Are Visually Impaired"** – July 2012
Fact File No. 10 **"Providing Visibility for an Ageing Workforce"** – Sept 2006

Thomas Pocklington Trust - Lighting Guide
Thomas Pocklington Trust has produced a third iteration of its lighting guide based on research carried out within the Trust for best practice lighting conditions for dwellings inhabited by persons affected by age-related sight loss.

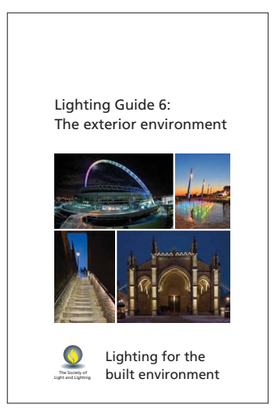
Recommendations relevant to the scope of this report are:

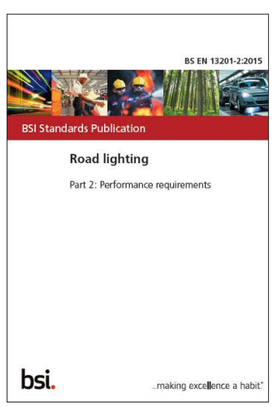
<u>Entrances and External Lighting.</u>

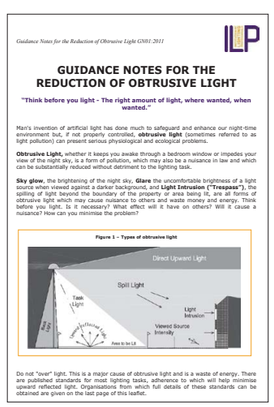
Lighting at entrances needs to provide safe and navigable access when leaving and returning, often high level and external lighting is necessary when approaching the building to satisfy the following points:

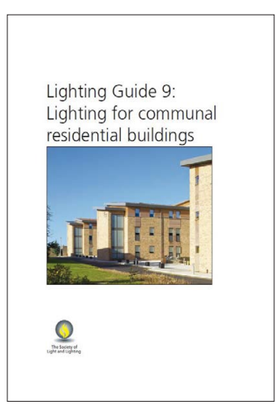
- Identifying the front door from a distance
- Safe transit from road to the door
- Finding the lock and inserting the key. Increasing contrast between door and keyhole.
- Slower eye adaptation from exterior to interior lighting considered.
- Lighting over the door, pathways or external steps are important at night.
- Presence and daylight sensors can be helpful by automatically illuminating doorways or entrances and adding security at night.

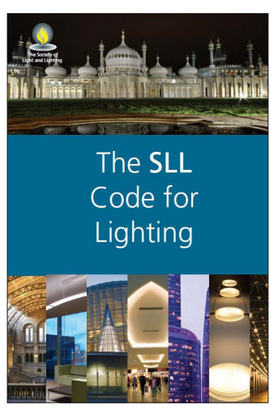
Glare is an important consideration when installing exterior lighting, the angle at which these light fittings are set to provide illumination must be such that people walking towards the house are not blinded by it.

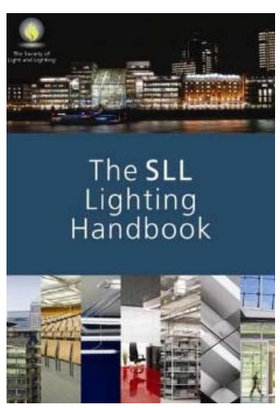












LIGHTING DESIGN CRITERIA

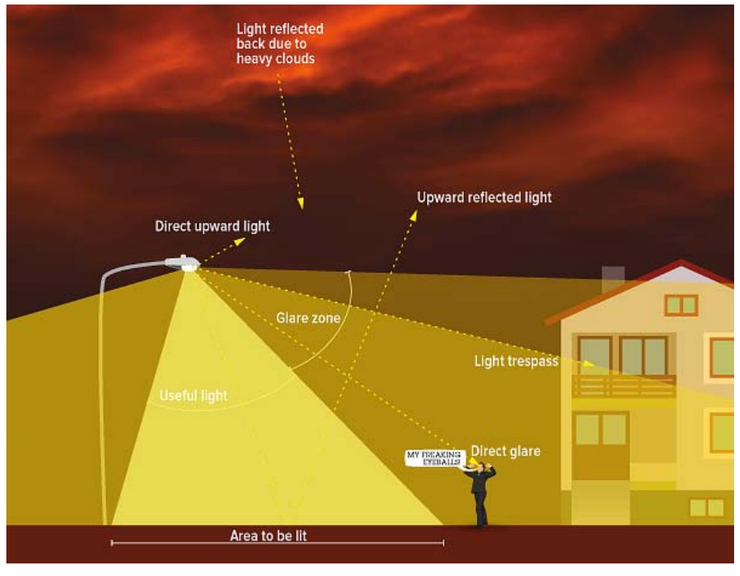
GENERAL APPROACH

The lighting for the exterior areas of the proposed Guild Living development will be designed to be sympathetic to the surroundings and enhance specific landscape features at night. The overall lit appearance will reflect the aspiration to create a high quality contemporary development. Lighting to the landscape should promote a sense of security and enhance the appearance of the site by night, taking into account current design guidelines and best practice lighting recommendations.

Light Distribution

The exterior lighting for the proposed development should be designed in accordance with current good practice Society of Light and Lighting (SLL) guidelines and in compliance with 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 adopted at the detailed design stage of the project:

- Luminaires with accurate optics will be specified - directional and with tight light beam angles whenever appropriate.
- Lighting at the perimeter of the site will be specified with cowls or light shield where necessary to avoid light spill.
- Lighting will be operated by time-based controls to limit post-curfew light spill.



IMPACT OF STREET LIGHTING TO ENVIRONMENT AND NEIGHBOURING PLOTS

Energy Considerations & Lighting Control Strategy:

The external lighting in all public areas of the Guild Living site will be designed to use high output, energy efficient LED light sources in accordance with current good lighting practice. As part of the overall energy saving strategy for the development, it is proposed to introduce a networked lighting control system. The control system will incorporate astronomical time clock and dimming controls.

Controlling exterior lighting elements in groups will enable specific circuits, such as non-essential feature lighting to be dimmed or switched off late at night when not needed. Functional lighting will also be dimmed after an agreed curfew time in the evening to minimise potential adverse impacts on the surrounding area without negatively affecting pedestrian safety and security after dark. This strategy will minimise potential adverse impacts and reduce overall energy use whilst maintaining safe minimum levels of illuminance.

Maintenance Considerations:

Ease of maintenance of the lighting scheme is important not only to reduce costs, but also to ensure the integrity of the lighting design is maintained over its service life. As part of the design process, ease of access for maintenance will be considered. All luminaires will be either accessible from ground level or by Mobile Elevating Work Platform (MEWP). To ensure the longevity of the scheme and extend maintenance intervals, long-life LED light sources will be specified throughout.

Environmental Zone:

The site is in an urban environment with high levels of night-time activity.

Table 1: Environmental Zone Classification

Category	Description	Examples
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 Centres or urban locations**
E4	High district brightness area	Town/city centres with high levels of night-time activity

ENVIRONMENTAL ZONE CLASSIFICATION

The proposed 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 to the left.

Perceived Safety & Security:

In exterior and urban environments, ensuring good facial recognition plays a key role to the perceived safety and psychological wellbeing after dark. This will be a key consideration for the exterior lighting.

Lighting for The Elderly:

People will experience a number of significant changes to visual performance with increased age.

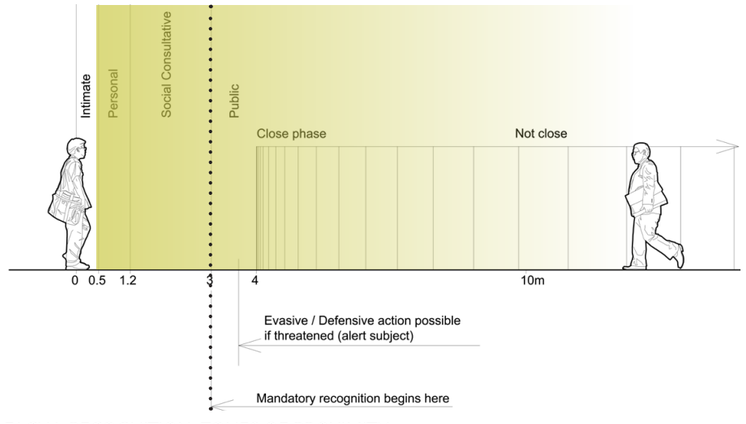
"….Old age is characterised by reduced absolute sensitivity to light, reduced visual acuity, reduced contrast sensitivity, reduced colour discrimination, smaller visual fields and greater sensitivity to glare"

Source: Peter Boyce, Human Factors in Lighting

The exterior lighting for the proposed development will be designed to mitigate these adverse effects by ensuring that both disability and discomfort glare are carefully controlled and veiling reflections are minimised.

Quality of Light:

Good colour rendering high efficiency LED light sources will be specified in all external areas of the development. The luminaires specified shall have a minimum Ra_{14} value of 75.



FACIAL RECOGNITION: ZONES OF PROXIMITY

LIGHTING DESIGN CRITERIA
ENVIRONMENTAL CONSIDERATIONS

Recent surveys carried out by the project ecologist Arup have indicated the presence of common and soprano pipistrelle, Daubenton's bat, noctule, serotine and brown long-eared bat within 2 km of the site.

The site is situated adjacent to private gardens to the West and to the pond and plantation woodland to the South, which increase the potential value of these areas for bats. Especially the row of trees along the western boundary could provide roosting, foraging and commuting habitat for bats.

The Bat Conservation Trust has published guidance for mitigating the effects of artificial lighting on bats in its publication Landscape and Urban Design for Bats & Biodiversity. Additional guidance has been previously published in the ILP/Bat Conservation Trust document entitled **"Bats and Lighting in the UK".** The guide makes the following recommendations:

- No bat roost (including access points) should be directly illuminated;
- The type of lamp (light source) specified can have an adverse impact on bats foraging and commuting;
- Lighting should be directed to where it is needed and light spill avoided;
- The height of lighting columns in general should be as short as is possible;
- The light should be as low as guidelines permit. If lighting is not needed, don't light;
- The times during which the lighting is operational should be limited to provide some dark periods;
- Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies.

The annotated plan to the right illustrates the existing bat commuting and foraging corridor to the North-West side of the development site (highlighted in pink), with a series of proposed artificial bat roots (highlighted in blue).

Lighting in proximity to the artificial bat roosts should be avoided to reduce disturbance to bats roosts. Lighting in vicinity of the commuting corridor should ideally be avoided, but if necessary, it should be designed to minimised spillage onto trees.
it is recommended that this be in the form of 'warm' LED lighting with a low UV content in order to minimise the impact of this lighting on bats. New lighting should also be fitted with louvres, cowls or other beam shaping devices to limit the angle of light to 70 degrees or below.

A COMMON PIPISTRELLE BAT IN FLIGHT

SKETCH CROSS SECTION OF PRIMARY ROUTE AND BAT ACTIVITY

ANNOTATED LANDSCAPE PLAN ILLUSTRATED BAT ROOSTING, FORAGING AND COMMUTING ROUTES (Received from Arup on16/12/19)

LIGHTING DESIGN CRITERIA
RESIDENTIAL INTERFACE

An initial assessment of the baseline lighting condition has been carried out which has recorded existing electric lighting installations in the local area and has identified potential receptors which may be impacted by the proposed development.

Existing Neighbouring Properties

Neighbouring sensitive residential receptors have been identified along Woodcote Green Road (particularly on the western side of the site) and Digdens Rise, including their associated rear gardens. Secondary residential receptors which may potentially be affected by increased sky glow from the proposed development include residential dwellings to the south on Woodcote Hurst and Hyland's Road and dwellings on the Woodcote Green Road on the eastern side of the development.

The existing western boundary of the site is bordered by the back gardens of the residential dwellings in Digden's Rise. The boundary to the proposed development site contains many mature trees and is effectively a dark landscape.

This lighting strategy has considered the potential light pollution and light trespass from the proposed development and its potential to cause a statutory nuisance.

Potential significant effects on the identified receptors are light spill, glare and increased increased sky glow from lighting installations within the proposed development, both during construction and in the operational phase. This will include amenity lighting for access roads, footpaths and car parking areas. Potential light spill from the interior of the proposed development has also been considered.

During the design stages of the project, luminaires with a shielded downward light distribution focused onto identified task areas will be specified. Light spill and light trespass beyond the site boundary will be avoided.

The potentially adverse effects of lighting installations on the application site can be mitigated by the application of good design principles and by implementing guidelines for best lighting practice. With appropriate mitigation measures in place it is considered that there will be no adverse impacts or residual effects.

EXAMPLE: VISIBLE GLARE

EXAMPLE: LIGHT TRESPASS

EXAMPLE: SKY GLOW CREATED BY URBAN LIGHTING

SITE BOUNDARY - RESIDENTIAL INTERFACE

SITE CONTEXT & ANALYSIS
VEHICULAR & PEDESTRIAN ROUTES

The proposed Guild Living development sits alongside the existing Epsom and St. Helier University Hospitals. The site is extremely permeable, which is a key aspect of the development intended to encourage direct access to and from the surrounding area.

The principal pedestrian routes enables residents and visitors to proceed directly from the hospital site in the north to Woodcote Green Road in the south and provides access the shared amenities on the site.

The Central Plaza at the heart of the development creates a focal point for the development creating a new public space with a large central lawn.

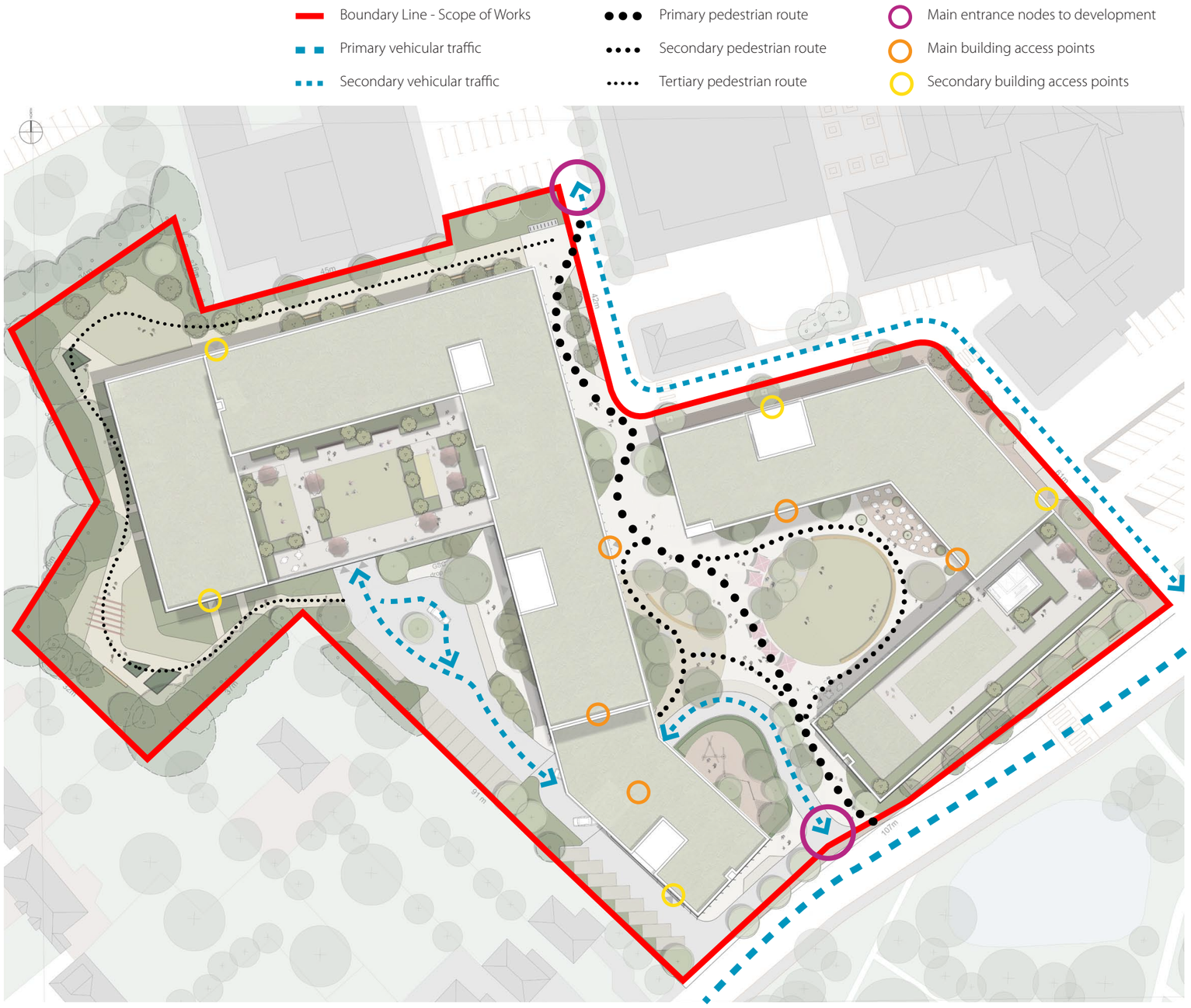
The entrance from Woodcote Green Road is animated by the cafe on the corner and the children's play space.

Vehicles entering the development will pass through an undercroft between the amenity buildings where cars are then taken to the robotic parking facility at the rear of the site. A limited amount of temporary parking spaces at grade level are also provided.

A secluded communal garden for key workers is provided at the north western corner of the proposed development site, which will maintain the existing dark corridor in this location.

In addition, roof gardens are provided for residents of the two principal buildings.

The lighting strategy for the proposed development will employ a tiered approach in which the external lighting conditions will relate directly to anticipated levels of vehicular and pedestrian flow and the identified uses of each space. The lighting design will also seek to reveal and enhance the architecture of the buildings and the external landscape without causing light trespass, light pollution or glare to adjacent properties and the surrounding environment.



VEHICULAR AND PEDESTRIAN ROUTES - BASED ON 191203 ROOF GARDEN + MASTERPLAN PREPARED BY ANDY STURGEON (12/12/19)

DESIGN CRITERIA
ILLUMINANCE LEVELS

Illuminance Levels

Proposed illuminance levels for all external areas of the proposed development have been determined with reference to BS 5489-1:2013 **"Code of practice for the design of road lighting"**, CIBSE SLL Guide LG6 **"The Exterior Environment"** 2016, BS 12464-2 **"Lighting of work places - part 2: Outdoor work places"** 2007, the CIBSE SLL **"Code for Lighting"** 2012

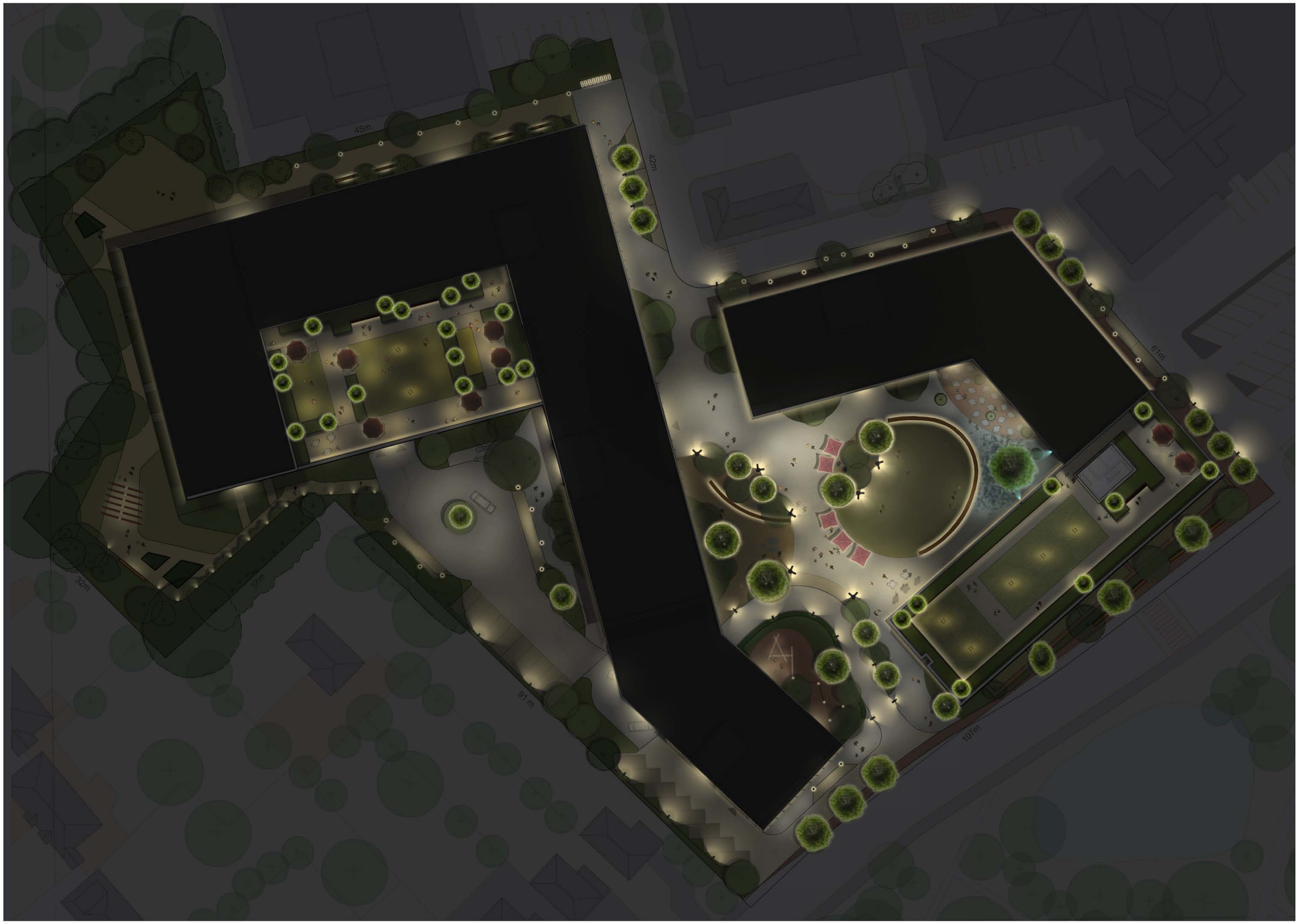
Table 3: Benchmark light levels as per guidelines			
Area	BS 5489-1 Table B.4, B.5 Lighting class	Eav (average maintained illumi-nance)	Emin (minimum maintained illuminance)
Primary roadways (high traffic E3 high crime, high pedestrian/cyclist use)	CE2	20 lux, U_o: 0.4	n/a
Main thoroughfares & public spaces (mixed vehicle / pedestrian / cyclist on separate surface E3)	CE2	20 lux, U_o: 0.4	n/a
Secondary roadways (normal traffic E3, moderate crime)	CE3	15 lux, U_o: 0.4	n/a
Tertiary & Residential roadways (normal traffic E3, moderate crime)	CE3	15 lux, U_o: 0.4	n/a
Public footpaths (pedestrian only E3)	S3	5 lux	1.5 lux
Outdoor park areas (light traffic, shops, apartments, cycle parks)	n/a	5 lux, U_o: 0.25	n/a
Open public spaces (courtyards, square)	S2	10-15 lux	3 lux
Footbridges (open)	n/a	30 lux	15 lux
Subways (enclosed)	n/a	100 lux	50 lux

Table 4: Benchmark light levels as per guidelines BS 12464-2 - Parking Areas		
Type of area	Eav (average maintained illuminance)	Emin (minimum maintained illuminance)
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5 lux, U_o: 0.25	n/a
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipur-pose building complexes	10 lux, U_o: 0.25	n/a
Heavy traffic, e.g. parking areas of schools, churches, major shopping centres, major sports and multipurpose building complexes	20 lux, U_o: 0.25	n/a

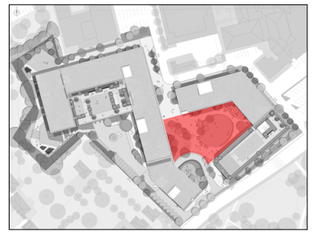
TARGET ILLUMANCE LEVELS - BASED ON 191203 ROOF GARDEN + MASTERPLAN PREPARED BY ANDY STURGEON (12/12/19)

LIGHTING STRATEGY

GLOW PLAN



LIGHTING STRATEGY
CENTRAL PLAZA

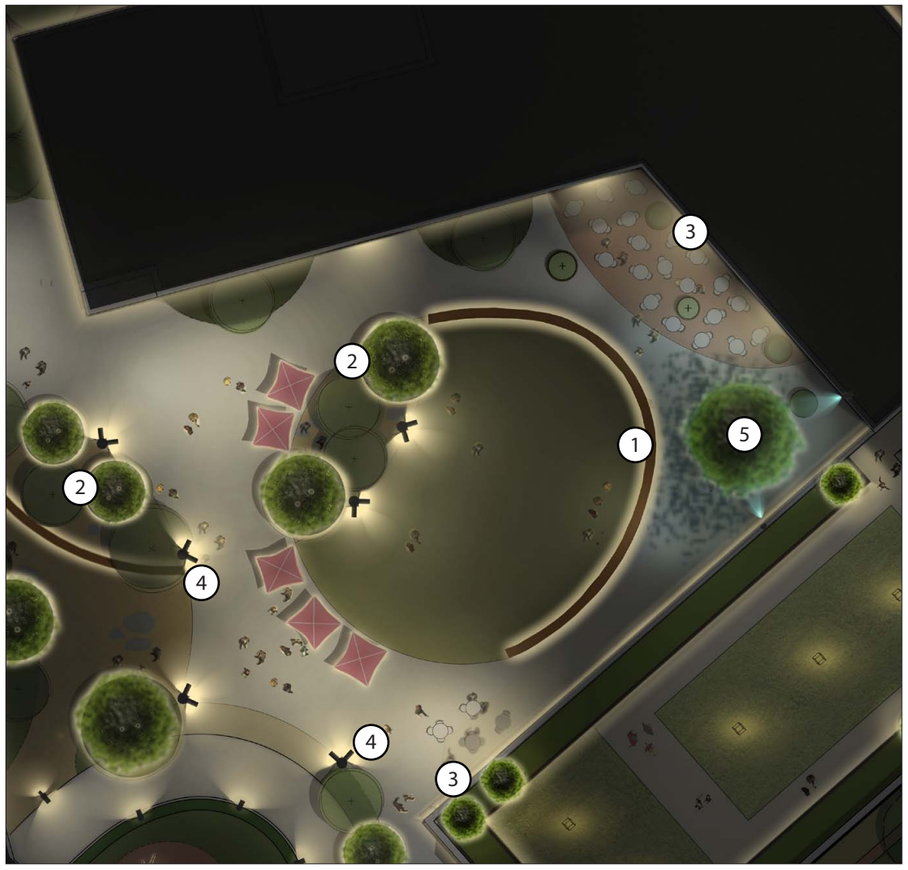

KEY PLAN

The Central Plaza lies at the heart of the new development, encompassing the philosophy of the site as a whole, the offer to new residents as well as its contribution to the local community.

The lighting strategy responds to this philosophy by incorporating the previously outlined design principles from all main parties involved in the design, from the client to the landscape architect. It considers landscape typologies, programmed outdoor activities and ecological constrains.

As such the lighting design evolves from a few anchor points from where it will enhance and integrate with the proposed architecture as follows:

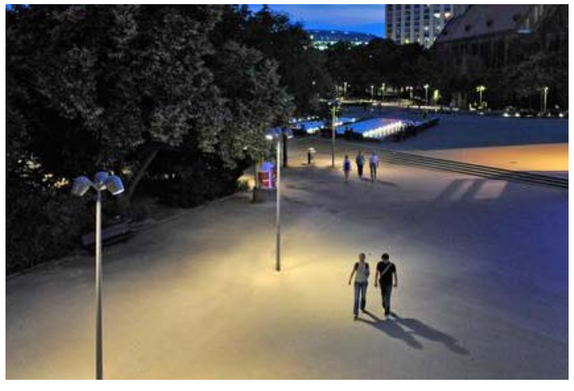
- Offer flexible public amenity space
- Create a safe and familiar destination
- Enhance active frontages (restaurant, shops, cafes, etc)
- Adapt to seasonal events (outdoor markets, shows, etc)
- Minimise visual clutter (utilise multihead pole lights etc)
- Focal areas highlighted (optical precision luminaires)
- Provide good vertical illuminance (reflect lighting off vertical surfaces to bring light back into the space, etc)
- Multilayered lighting solution (integrated lighting into landscape furniture, trees and feature planters, etc)



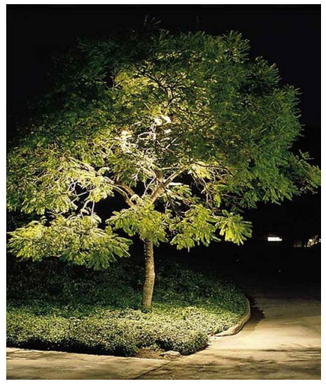
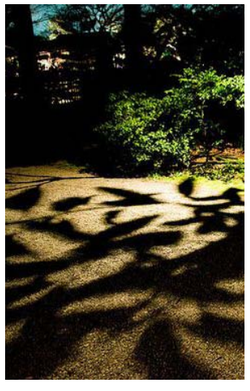

1. Integrated Lighting within Feature Bench


2. Tree uplight

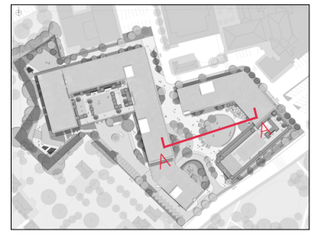

3. Light spill from glazed lobby entrances



4. Multi-head column to provide amenity lighting whilst minimising visual clutter



5. Moonlight effect to Specimen Trees

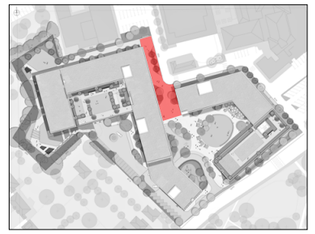
LIGHTING STRATEGY
CENTRAL PLAZA



KEY PLAN


Central Plaza - Elevation A-A

LIGHTING STRATEGY
PEDESTRIAN LINK


KEY PLAN

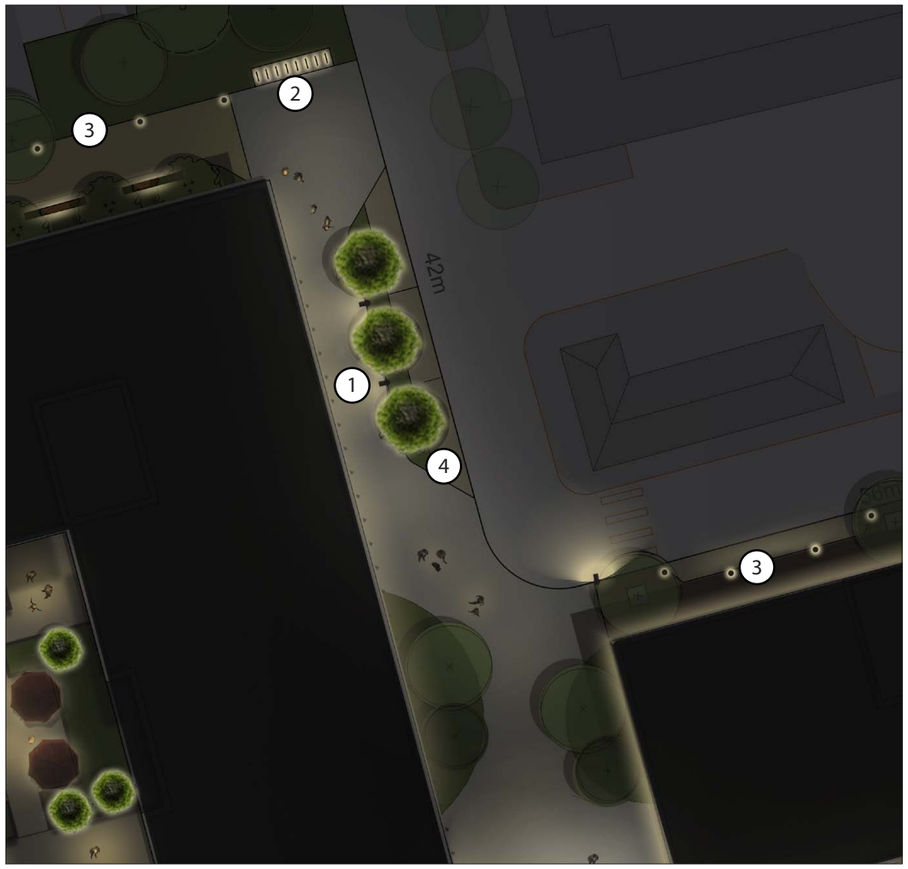
The pedestrian link is the principal connection between the retained hospital to the north and the proposed new later living development.

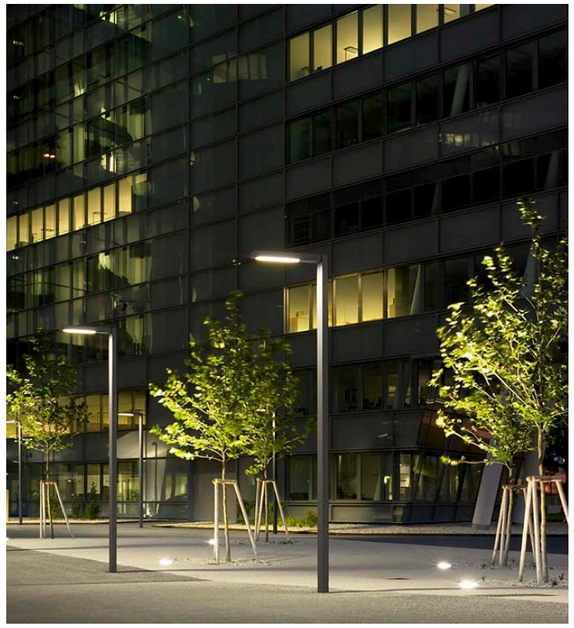
This will perhaps be one of the busiest corridors of the new development as it acts as a threshold for people visiting and working in the hospital that would like to use the new facilities within the Central Plaza.

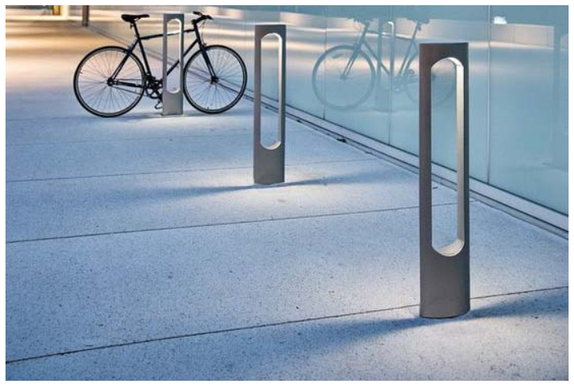
Clear pathways and boundaries along with well signposted entrances and routes are the main driver for the lighting strategy that will look at ways to enhance that element of wayfinding for both, residents and external visitors.

The lighting strategy therefore will develop around the following principles:

- Clearly defined entrances
- Aid intuitive wayfinding
- Highlight and enhance thresholds
- Highlight landscape elements to create an inviting space
- Provide good vertical illuminance



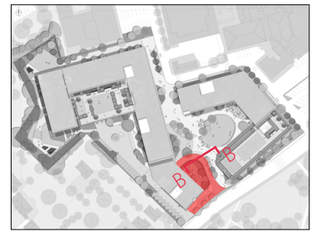

1. Pedestrian scale lighting columns


2. Integrated lighting within bike rack


3. Bollard lighting


4. Tree uplight

LIGHTING STRATEGY
WOODCOTE GREEN ROAD ENTRANCE

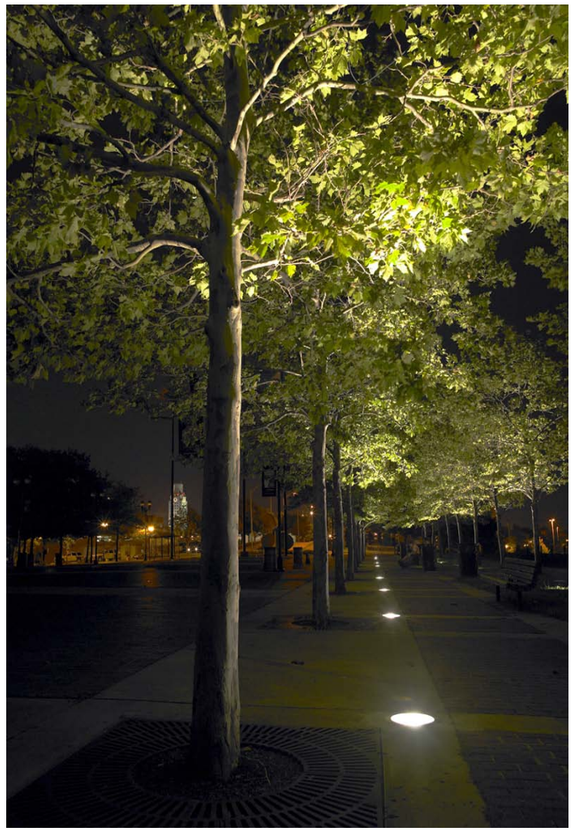

KEY PLAN

The south entrance to the site from the main road, Woodcote Green, it is envisioned as an animated area with the cafe and children's pay area welcoming visitors and residents alike.

This site boundary with the main road offers opportunities to enhance the landscape after dark by clearly signalling the entry to the new site in an inviting and distinct way from that of the hospital entrance, whilst keeping the ecological and privacy constrains from adjacent ecological corridor and existing dwellings to the East.

The lighting strategy will therefore follow:

- Clearly defined entrances
- Highlight and enhance thresholds
- Highlight landscape elements to create an inviting space
- Provide good vertical illuminance
- Playground space illuminated after dark


1. Specimen tree uplight

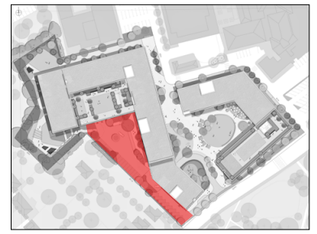

Woodcote Green Entrance - Elevation B-B


2. Integrated lighting to playground elements


3. Multihead light column


4. Light spill from cafe's interiors

LIGHTING STRATEGY
WOODCOTE GREEN ROAD ENTRANCE



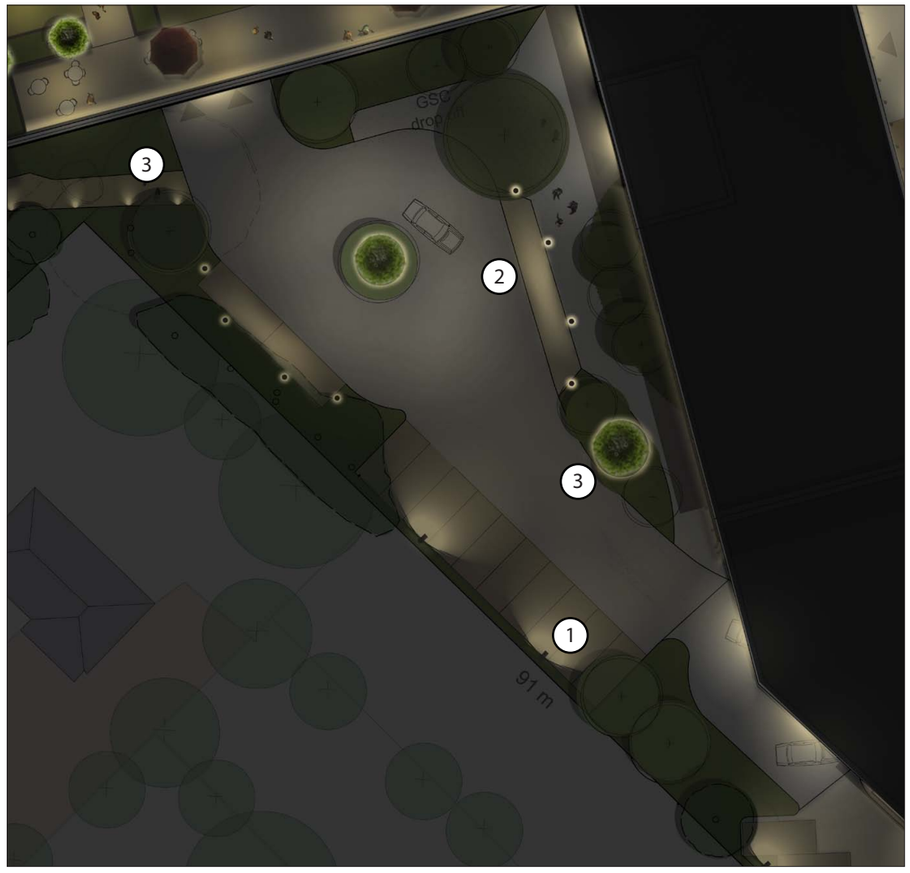
KEY PLAN

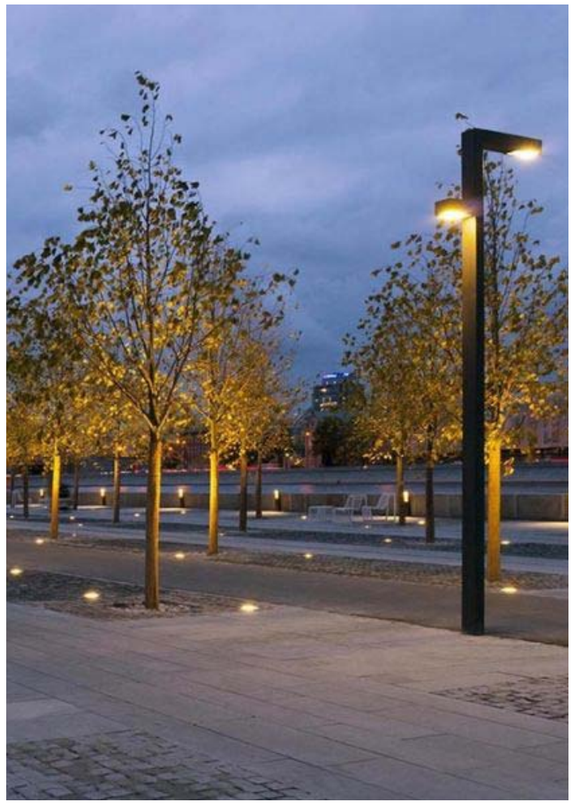
Following northwards from Woodcote Green entrance, the drop-off and parking areas are of particular importance and will present the new development to residents and visitors.

As such, the lighting strategy will look at enhancing the landscape by subtly highlighting feature elements, balancing the need for sufficient and uniform illumination at pathways, drop-off and entrances whilst keeping the ecological corridor out of the illuminated areas.

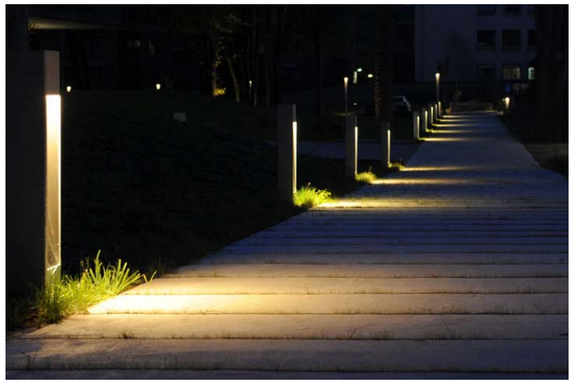
Optical precise luminaires, warm temperature lighting and low level path lighting are some considerations the lighting strategy will be developed around, as well as the following principles:

- Provide safe levels of illumination
- Clearly defined entrances
- Highlight and enhance thresholds
- Aid intuitive wayfinding
- Subtly highlight landscape elements to create an inviting space
- Maintain low illuminance level at perimeter (ecological corridor)





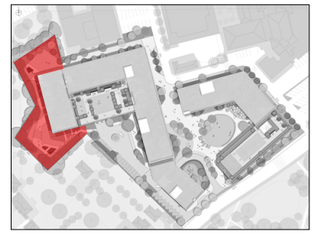
1. Double sided light column



2. Bollard Lighting

3. Subtle low level lighting to landscape

LIGHTING STRATEGY
KEY-WORKER COMMUNAL GARDENS


KEY PLAN

The key-worker communal outdoor gardens provide a secluded area for carers and staff to carry out relaxing activities.

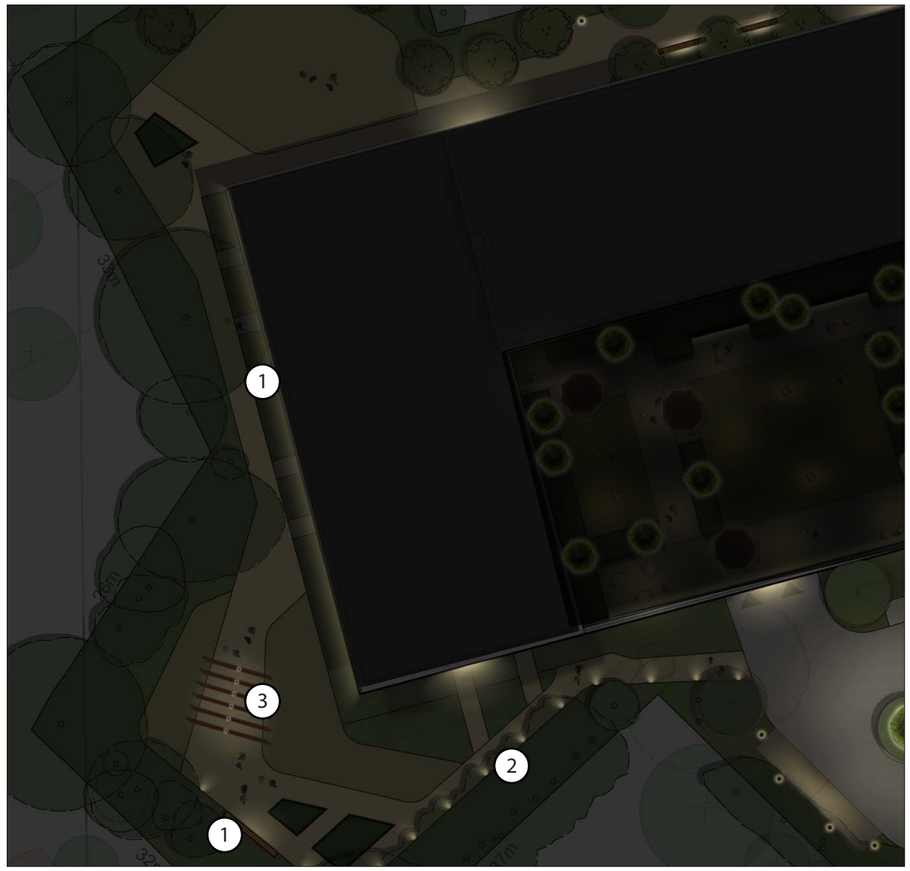
The proximity with the ecological corridor means this area of the development will maintained a very low illuminance level throughout.

The lighting strategy for this area, focuses on gently highlighting minimal landscape elements, utilising only luminaires with precise optics, putting light only where needed and avoiding unwanted light spillage.

It is also important the lighting scheme provides enough illumination after dark for the space to feel safe and secure particularly around entrances.

The following principles will be applied:

- Utilise low level, glare-free lighting for safe passage after dark
- Subtly highlight landscape elements
- Highlight entrance thresholds
- Maintain low illuminance level at perimeter (ecological corridor)

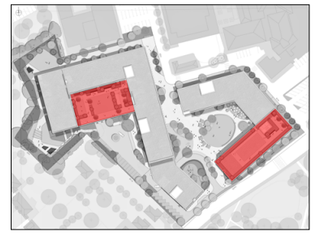



1. Low level lighting to footpath to enable wayfinding


2. Low level lighting to landscape


3. Subtle lighting to pergola

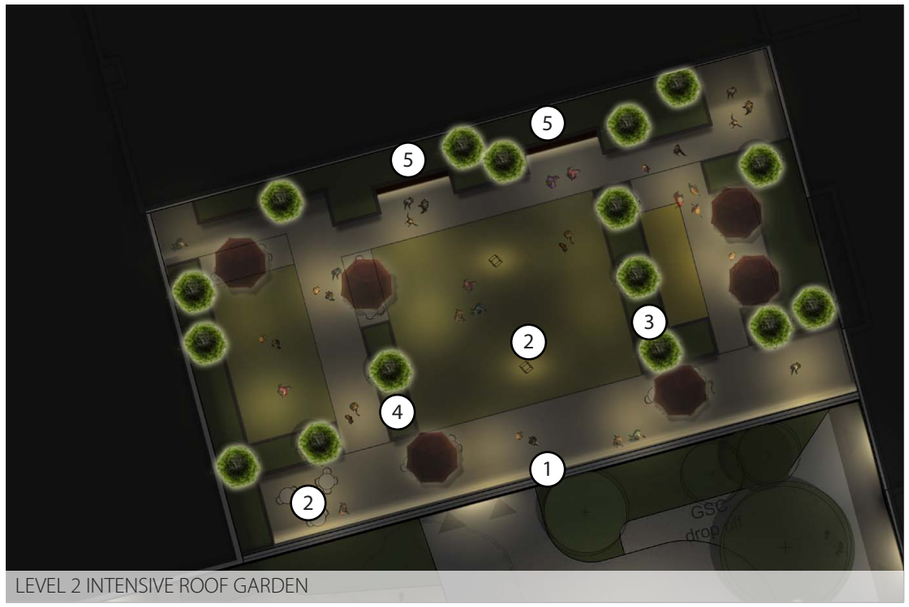
LIGHTING STRATEGY
ROOF GARDENS


KEY PLAN

As part of the roof gardens masterplan proposed by the landscape architect, there are two areas envisioned as roof gardens that, along with the biodiverse roof areas, embraces integration in the local ecosystem as well as provides areas of activity like gardening or areas of relaxation and calmness.

The lighting strategy will follow similar principles to those of communal gardens as follows:

- Utilise low level, glare-free lighting for safe passage after dark
- Subtly highlight landscape elements
- Highlight entrance thresholds



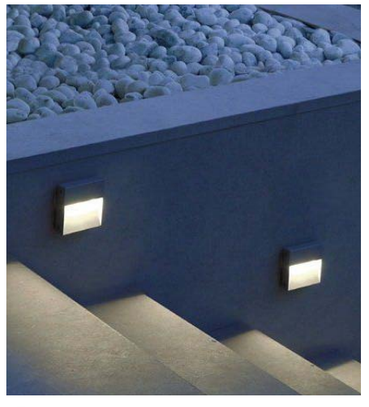
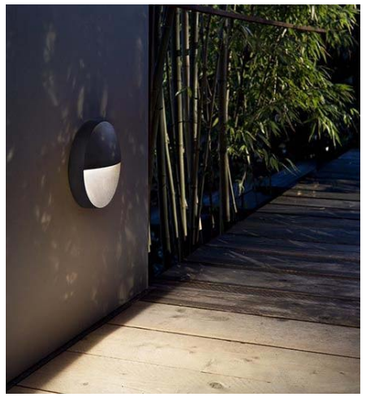
LEVEL 2 INTENSIVE ROOF GARDEN

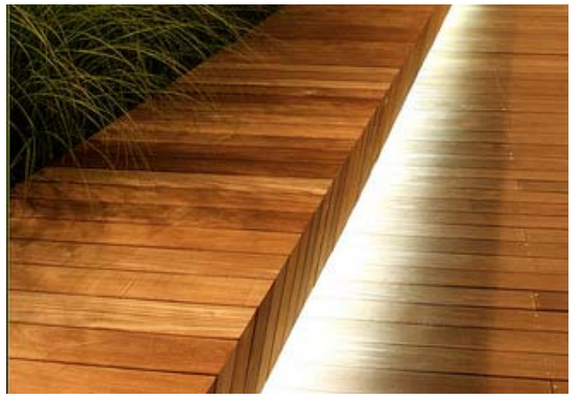

1. Wall grazer uplights to add visual interest


2. Battery powered exterior lantern

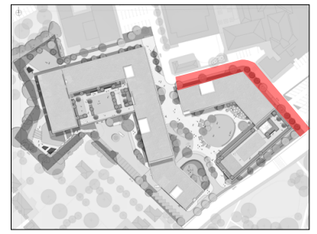
LEVEL 4 ACCESSIBLE ECOLOGICAL ROOF GARDEN


3. Tree uplight



4. Low level step lighting


5. Spike mounted uplights integrated into planters

LIGHTING STRATEGY
NORTH-EAST BOUNDARY


KEY PLAN

The new site will interface with the existing hospital buildings along the east boundary.

The lighting strategy will consider this interaction by looking at ways to enhance the architecture of the new site as well as the pedestrian and car routes that lay immediately beyond this boundary to create a transition that helps people clearly identify the hospital boundary whilst enhancing safety and wayfinding throughout the area.

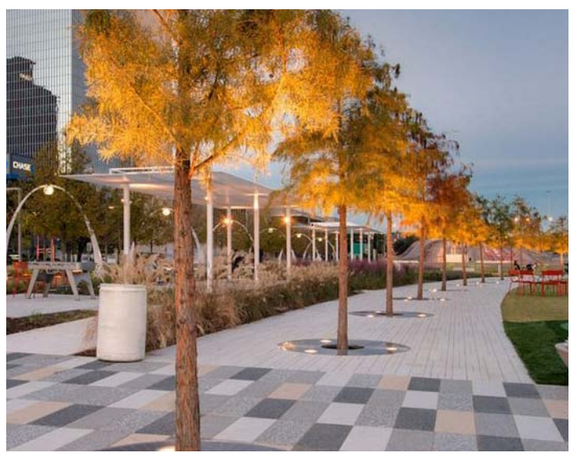
The following principles will be applied:

- Seamless interface with exisitng hospital car park area
- Utilise pedestrian-scale lighting columns
- Highlight landscape elements (specimen trees)
- Utilise low glare path lighting
- Highlight drop off areas


1. Pedestrian scale light column




2. Bollard lighting to footpath and drop off areas


3. Tree uplight

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QA SYSTEM

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Reason for Issue:	For Information
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Prepared By:	Beatrice Bertollini / Jorge Romero
Verification By:	Keith Miller
Project Coordinator:	Jorge Romero