Phasing

Lighting

Lighting will play a key role in the success of the Green Heart redevelopment. The various public spaces will be used in general, after dark, and in particular during the busy winter months. It is therefore critical that the area is well illuminated in relation to its context, not only to meet the requirements of safety and security of the students, staff and visitors, but also to provide a character that is appropriate to the landscape. This section of the Design and Access Statement aims to briefly summarise the lighting intent.
The strategic design for the lighting of the site is based on three key themes:

**Safety & Security**

The primary role of the lighting is to keep people safe and secure. Lighting standards have been selected to harmonise with the University’s requirements and to provide both horizontal and vertical illuminance that is appropriate to a landscaped area with busy footfall. Warm white light sources with a broad spectrum will be used to ensure good recognition and the accurate rendering of colours. The lighting has been designed in both support areas of the overall landscape concept in supporting movement and promoting interaction between people using the site. This is to be achieved by clearly illuminating the routes to respect their hierarchy and then highlighting key junctions and meeting spaces. The lighting has also been designed to meet the general requirements for accessibility for all.

**Movement & Encounter**

The lighting has been designed to both support areas of the overall landscape concept in supporting movement and promoting interaction between people using the site. Warm white light sources with a broad spectrum will be used to ensure good recognition and the accurate rendering of colours. The lighting has also been designed to meet the general requirements for accessibility for all.

**Sustainability & Flexibility**

The need for light for both safety and security and social interaction needs to be balanced against potential adverse environmental impacts including energy use, light pollution and damage to local ecologies. The lighting design has taken a progressive approach by avoiding over-lighting and retaining natural darkness in areas where appropriate. The use of low energy light sources (LEDs) and area control (dimming) will assist in managing energy. Flexibility is required to support a programme of events after dark.
12.2 Quality of Light

The quality of light has been carefully selected to facilitate:

Intensity
The intensity of the lighting has been carefully selected to evoke an atmosphere that will not cause glare with the provision of the lighting equipment. It has been adjusted to create an overall atmosphere. The use of broad spectrum white light will allow plants to be presented properly. Colour and texture within the landscape design will contribute to the perception of safety and aid legibility. It will also encourage such spaces to be continued to be used after dark.

The key elements of the lighting to this area are:

• 4m high post-top mounted lanterns using warm white LED (3000K) to provide general area lighting to the footpath.
• Adjustable in-ground luminaires using cool white LED (4000K) to uplight trees to provide natural colour and texture.
• Surface mounted linear luminaires using warm white light (3000K) to be concealed to underside of curved benches to wash floor.
• 12m high quad arm lanterns using warm white light (3000K) to provide general area lighting to the primary pedestrian route.

Quality
The colour temperature of the light will be warm for the primary pedestrian routes, meeting class P4 as defined by BSEN13201/BS5489. The secondary routes are to be lit to provide an average illuminance of 4 lux with a uniformity of 0.25 to meet class P2 as defined by BSEN13201/BS5489.

Texture
The lighting will highlight the natural colour and texture of the landscape design and implementation. The key views and vistas are retained after dark, allowing the central area to be lit to a lower level such that the area are lit more brightly and with higher light columns to create a human scale to the area after dark. The edges of the secondary routes to the perimeter of the space from post-top mounted lanterns providing a human scale. These will provide safe and secure lighting with good vertical illuminance to aid legibility.

Uniformity
The intensity of the lighting has been graded to reduce strong contrasts that will create problems with the perception of the lit environment. Brightly lit areas can create dark adjacencies. The use of broad spectrum white light will allow plants to be presented properly.

12.3 Areas

University Square
As per Chancellor’s Court this area provides for a simple landscape lighting approach within the tradition of the University landscape design. Illumination is provided to the secondary routes to the perimeter of the space from post-top mounted lanterns providing a human scale. These will provide safe and secure lighting with good vertical illuminance to aid legibility. It will also encourage such spaces to be continued to be used after dark.

The key elements of the lighting to this area are:

• 4m high post-top mounted lanterns using warm white light (3000K) to provide general area lighting to the footpath.
• Adjustable in-ground luminaires using cool white LED (4000K) to uplight trees to provide natural colour and texture.
• Surface mounted linear luminaires using warm white light (3000K) to be concealed to underside of curved benches to wash floor.

The key elements of the lighting to this area are:

• At high position concealed luminaires using warm white light (3000K) to provide general area lighting to the footpath.
• Adjustable in-ground luminaires using cool white LED (4000K) to uplight trees to provide natural colour and texture.
• Surface mounted linear luminaires using warm white light (3000K) to be concealed to underside of curved benches to wash floor.

The key elements of the lighting to this area are:

• At high position concealed luminaires using warm white light (3000K) to provide general area lighting to the footpath.
• Adjustable in-ground luminaires using cool white LED (4000K) to uplight trees to provide natural colour and texture.
• Surface mounted linear luminaires using warm white light (3000K) to be concealed to underside of curved benches to wash floor.

The key elements of the lighting to this area are:

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The key elements of the lighting to this area are:

• At high position concealed luminaires using warm white light (3000K) to provide general area lighting to the footpath.
• Adjustable in-ground luminaires using cool white LED (4000K) to uplight trees to provide natural colour and texture.
• Surface mounted linear luminaires using warm white light (3000K) to be concealed to underside of curved benches to wash floor.
Library Square

The area is to be illuminated to provide a safe and inclusive hand to the campus whilst at the same time preserving the natural environment. The design aims to create a high-quality public realm with the preservation of the square as a central feature. The project needs to be innovative, sustainable and2 sustainable and environmentally friendly. The approach we have taken, where well-known and established techniques are used to create a space which is easy to navigate, has been to enhance the area while maintaining the form and identity of the space.

The key elements of the lighting scheme for this area are:

- Surface mounted wash lights using warm white LED (3000K) to provide general area lighting to the footpath.
- 4m high post-top mounted lanterns using warm white LED (3000K) to provide general area lighting to the hard landscaped route to the square.
- 10m high adjustable column mounted spotlights to provide natural colour and texture.
- 2m high adjustable column mounted spotlight using warm white LED (3000K) to uplight vertical surfaces either side of the vertical supporting glass fins to provide ambient and feature illumination.
- Recessed wash-light module using warm white LED (3000K) to be integrated into handrail.
- Raised Terrace

The key lighting element is as follows:

• Recessed washlight using warm white LED (3000K) to uplight main wall surface and other light walls.

Steps

All steps are to be simply illuminated from lighting up integrated into the handrail to support safety.

The key lighting element is as follows:

• Surface mounted luminaire using warm white LED (3000K) to be integrated into the handrail to support safety.

Archaeology Terrace

This area is illuminated from low level lighting to the perimeter of the terrace, to provide definition and highlight to the terrace.

The key lighting element is as follows:

• Surface mounted wash lights using warm white LED (3000K) to uplight main wall surface and other light walls.

Bridge

The illumination of the main bridge deck is to provide a safe environment for movement around the central lawn but also encourages interaction within the landscape that will promote interaction.

The key elements of the lighting scheme for this area are as follows:

- Recessed washlight using warm white LED (3000K) to uplight main wall surface.
- Recessed washlight using warm white LED (3000K) to be integrated into handrail to support safety.
- All steps are to be directly illuminated from lighting integrated into the handrail to support safety.

Handrail Service Yard

The steps are to be lit to provide an average maintained illuminance of 30 lux with a uniformity of 0.5 as defined by BSEN13201/BS5489.

The key lighting element is as follows:

• Adjustable in-ground luminaires using cool white LED (3000K) to illuminate flights to create a safe level of illumination.

Cafe

The key lighting element is as follows:

• LED (3000K) to be concealed to underside of bridge deck to provide safety.

To provide natural colour and texture.

The upper ramp is to be lit to provide an average maintained illuminance of 30 lux with a uniformity of 0.5 as defined by BSEN13201/BS5489.

The key lighting element is as follows:

• LED (3000K) to uplight main wall surface.

Library Square

The main ramp to the southern threshold of the bridge and central tree is to be illuminated to create a wash to the terrace.

The key lighting element is as follows:

• Recessed washlight using warm white LED (3000K) to uplight vertical surfaces either side of the vertical supporting glass fins to provide ambient and feature illumination.

Important note: Whilst illuminated by spill and feature lighting the lower section of the ramp provides a secure but informal ambience.

The key lighting element is as follows:

• LED (3000K) to uplight main wall surface.

The key lighting elements are as follows:

- Recessed washlight using warm white LED (3000K) to uplight underside of bridge deck.
- LED (3000K) to uplight vertical surfaces either side of the vertical supporting glass fins to provide ambient and feature illumination.

The key elements of the lighting to this area are:

- **Primary pedestrian route column** (4000K) to provide general area lighting.
- **Secondary pedestrian route** fittings to provide general area lighting.
- **Surround mounted linear lighting** using cool white LED (3000K) to provide general area lighting.

The raised level lighting to the footpath will be designed to allow for a well-lit environment, addressing the need for safety and security.

**Secondary Routes**

The secondary routes in this area are to be well illuminated with warm white LED (3000K) to create a welcoming environment. This will help to support pedestrian movement across the main landscaped space and will assist with way-finding. The raised level lighting to the footpath will be designed to allow for a well-lit environment, addressing the need for safety and security.

The lighting control system will provide a minimum of five operational lighting scenarios, which will be addressed by lighting a number of general areas and creating a lit feature.

Secondary lighting scenarios will be provided by light sources via a number of inputs such as timer and motion sensor. The lighting equipment is designed to be low mounting heights to avoid the risk of damage to pedestrians, and to ensure that the scale of lighting equipment appears consistent across the project.

### Security Lighting

Security lighting will be provided by a number of inputs such as timer and motion sensor. The lighting equipment is designed to be low mounting heights to avoid the risk of damage to pedestrians, and to ensure that the scale of lighting equipment appears consistent across the project.

### Atmosphere

Lighting will be provided by a number of inputs such as timer and motion sensor. The lighting equipment is designed to be low mounting heights to avoid the risk of damage to pedestrians, and to ensure that the scale of lighting equipment appears consistent across the project.

### Design

The design of the lighting system is to be well illuminated with warm white LED (3000K) to create a welcoming environment. This will help to support pedestrian movement across the main landscaped space and will assist with way-finding. The raised level lighting to the footpath will be designed to allow for a well-lit environment, addressing the need for safety and security.
Infiltration is the primary means of surface water disposal throughout the Green Heart. Localised infiltration, or shedding runoff directly into adjacent landscaping, is used wherever possible with centralised storage and infiltration in larger paved areas. Overflow and the direct uptake in soak Wells are also included.

Chancellors Court
Channelling will continue to discharges to the existing gullies and surface water drains.

University Square
The main paths will be laid with surface falls toward 4 adjacent strips of planting and the soil level will be set 100mm below the adjoining path so that rain discharges under gravity into these beds.

New Library Square
Paving will be laid around generous rain garden beds. The soil level will be set 100mm below the adjoining path so that rain discharges under gravity into these beds. The soil profile within the bed will have a domed profile so that the effects of de-icing salt will be kept to a minimum.

Amphitheatre
The grass steps will be laid with a back fall to facilitate surface retention of rainwater.

North Gate
The central pear shaped lawn will be laid so that it is lower than the surrounding paving with falls toward the area of grass.

The site remains divided between north and south outfalls.

The existing subway and substation, and the east / west earthwork serve as a natural divide between extents of transformation, in that the bulk of site transformation occurs north of this barrier. However based on positions and levels of existing sewers, a portion of the northern catchment discharges to the southern outfall.

The statutory required climate change percentage to be considered in drainage design has increased in 2016 from 30% to 40% for the 1 in 100 year storm event. The storage volumes will not produce any discharge in the 1 in 1 year event, and the 1 in 100 year plus climate change event will be restricted to the 1 in 30 year greenfield runoff rate. With this approach the proposed discharge from the development area will not be higher than the greenfield runoff rate for any return period.

Figures A and B reflect the existing and proposed hydrologic catchment areas, including estimated discharge rates.