University of Glasgow - Exterior Lighting for the Visitors Centre, Hunter Memorial, and Quincentennial Gates.

Overview.

The area in question is perhaps at present poorly defined in intent, coping as it does with a collection of different buildings and spaces without a cohesive focus. The proposed landscaping works[1] for this precinct go a very long way towards rectifying this problem, giving the area a clear and solid framing from the Quincentennial Gates, onwards past the Hunter Memorial, and finishing at the Visitors Centre in the North Front. This could be sympathetically enhanced outside of daylight hours by a considered lighting design.

Quincentennial Gates.

Given that the night-time perspective of the precinct for many people will be from University Avenue, lighting of the Quincentennial Gates when closed is advisable, not only to bring some relief to the foreground, but also to mark the gates as a point of access to the University Main Building and the Hunterian Museum. Lit from below, the row of in-ground fibre-optic units envisaged would up-light the Gates whilst closed and present a lit entrance when the gates are open[2].

Lights to the walls left and right of the Gates would flank the image, and insertion of discreet fibre optic fittings in the top of the Gate Posts would light the lion escutcheons. Lights to the South of the Gate Posts inside the entrance forecourt would up-light the Gate Posts and the dates on them.

Hunter Memorial.

The main body of the memorial, the centre section with dedication and portraits, would be lit with in ground fibre-optic units.

The avenue of trees in the vicinity of the memorial would be lit in a similar arrangement to that which is proposed on the landscape drawing. Care would be taken to select appropriate light fittings that would not bring the trees to a higher level of illumination than the memorial itself. Correct optical specification in these units would keep glare to passers-by to a minimum.

Assuming that the flagpoles behind the memorial will carry flags, these could be lit from underneath, at either side of each flagpole.

Visitors Centre.

Lighting the Visitor Centre provides a striking focal point to the proposed scheme.

The Visitors Centre is at present lit with in-ground up-lights, and these would be augmented in this design by installing a second level of up-lights at the balcony level. At present the balcony itself prevents light from continuing from ground level on to the rest of the building. Installation of discreet architectural linear lighting, colour matched with the lights at ground level[3], would maintain the same lighting angle as if lit from the ground, and give the second level of the visitor centre the same “look” visually as the level

beneath[4].

Flood-lighting the building facade from a distance is not recommended, as it will come from a different angle and thus not balance visually with the in-ground lighting, and could be a cause of glare for people exiting the building, shining in to their eyes.

A third row of lighting at roof level would complete the image, using similar equipment to that used a balcony level, and making full visual use of the buildings increasing height and mass.

Entrances to East and West Undercrofts.

Both entrance archways would be lit with an in-ground Fibre Optic arrangement, ensuring that they are clearly defined as the point of access to the building, and complementary to the main bulk of the Visitors Centre.

Landscape Lighting.

The lighting scheme as described so far in this document could be considered formal in its approach, but is fitting given the style and history of the objects being lit. An exciting development to the lighting design proposed would be to incorporate more dynamic elements in the pathways and open areas of the new landscaping.

Beginning at the Quincentennial Gates, a splay of in-ground LED[5] luminaires embedded in the entrance forecourt would lead to the pathways either side.

Continuing along the East and West pathways, occasional square tile LED lights would continue this theme.

Arriving at the paved area directly in front of the Visitors Centre, a tangential arc of round in-ground LED units, converging in perspective, would draw the eye towards the East entrance. These units would be programmed to fade between one another along the length of the arc, giving the effect of movement towards the entrance as each unit dims whilst the next unit in the series becomes brighter, until the pattern repeats again.

Technical Issues.

Fibre Optic lighting technology has until recently been unsuitable for outdoor applications, mostly due to limitations in the brightness of older equipment, but can now be compared advantageously to other forms of lighting equipment.

Fibre Optic lighting systems are composed of three main components. Firstly, a light source (“generator”), secondly a collection of fibre optic cables to transmit the light (“harness”), and lastly a fibre optic cable termination (“projector”).

This lighting design would require six fibre optic generators to drive all forty-one projectors. The generators would be located remotely from the fibre optic projectors at a suitable site where they could not be seen. Each generator typically has a power requirement of only 140W, and a rated lamp-life of 8,000 hours, giving excellent maintenance efficiency and low energy consumption, an important factor over the design life of the installation.

Harnesses from the generators can be directed underground inside conduit until arriving at the target

projectors, leaving no exposed cables. It is also worth noting that as the cables are only transmitting light, there are no problems with either heat or live electric current in the cables or projectors, an added safety bonus. If water ingress does occur in the projectors, although unlikely as all parts are rated for outdoor use, it will not cause the projector to fail. Maintenance of the projectors is minimal, especially with in-ground types, which require only occasional external cleaning and to be kept free of obstruction. The in-ground projectors envisaged have a surface diameter of only ninety millimeters and are thus discreet.

LED (Light Emitting Diode) lighting technology has also recently progressed in to outdoor applications. The digital lighting units for this design are all controllable in both light intensity and light colour from a computer based control system. This gives the designer and client access to many theatrical lighting techniques, allowing the units to be programmed in co-ordinated displays to produce different "scenes". The LED units in the pathways could be programmed to change slowly and occasionally from colour to colour, whilst the units in the final approach to the entrance of the East Undercroft could have their own dynamic program as described earlier.

LED technology has huge cost benefits over the life of the installation. Lamp-life under continuous use is predicted at around eleven years, although none of this equipment has been in existence long enough yet to find if this extrapolation from initial testing is true. Power consumption per unit is given at 24W for the square units, and 9W for the round units, extremely power efficient to run. The size at surface of the in-ground LED units considered in this design are 200mm² for the square units, and 150mm diameter for the round units respectively, and would therefore fit comfortably with the pavings specified in the landscape design.

Optimal performance of this design would require a control centre to be housed indoors at a location appropriate to the University. This system could also control the day-to-day switching of all lights in the design, as well as running programs for the LED units.

Conclusion

The design as described should through an imaginative use of lighting techniques complement the proposed landscaping of the Hunter Memorial precinct, and elegantly bring to life the existing Visitors Centre, Hunter Memorial, and Quincentennial Gates. The use of dynamic elements in the design will also add points of interest to the overall presentation of the area at night.

1. Project CP98/217, Architect G.M. Thomson, 2000.

2. In-ground fibre optic units would be fitted flush to the surrounding surface, and thus present no hazard to pedestrians or wheelchairs, and are resistant to surface loads and vandalism.

3. Light from different sources (different light-bulbs) often has a different "colour" appearance to the human eye. For example, light from an ordinary domestic light bulb and light from a sodium street lamp has very different characteristics. Colour matching of mixed light sources requires specialist knowledge.

4. Units such as the Agabekov "Louvre" would be suitable as they are low profile and if carefully placed should not be visible from the ground, a pre-requisite for planning permission, and can be configured to fit the curvature of the building.

5. LED: Light Emitting Diode. Refer to the “Technical Issues” section of this document for more information.