Technical Report.

2 X ADDITONAL UNITS FOR TENNIS COURTS

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TENNIS COURT FLOODLIGHTING
LOW LIGHT POLLUTION INSTALLATION

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University College London and Direct Sports Lighting are proposing the installation of 2 x additional LED units on current purpose-built tarmac tennis courts. There are currently 3 x court, 2 of the courts have full lighting to all the courts areas, 1 x courts has only half the court lit, we propose to light the other half using low glare LED units to meet the current requirements, in designing a suitable lightng solution for the tennis court,the key specification issues had to be considered. These included the illuminance level required, the environmental zone category for the site, the minimum mast height & the number type of floodlights. Details of how these issues were resolved are as follows: -

1. To ascertain the illuminance level required we referred to a Type 4 MUGA maintained average illuminance of 200 lux.

2. For the relevant environmental zone reference was made The Institution of Lighting Engineers: *Guidance Notes for The Reduction of Light Pollution, 2000*. (as attached). This document categorises the environment into four zones ranging from National Parks to City Centres. The site would fall into Zone E4 High district brightness.

3. The mast height was calculated using the method detailed in the CIBSE guide LG4 “Sports Lighting”. This uses angles projected from the centre of the pitch & the touch line to produce a head frame location zone. When applied to this project the optimum mast height ranged from 8m to 10m for the Pitch. A 8m mounting height was chosen as it would allow the floodlights to be mounted horizontally. This will result in low vertical overspill & good uniformity on the playing surface, without compromising cost. The 8m mast will offer a slimline profile which will minimise daytime impact, and also the mast locations allow us to keep the elevations to a minimum causing less overspill on the surrounding areas.

4. In order to meet the requirements of The Institution of Lighting Engineers: Guidance Notes for The Reduction of Light Pollution, 2000, the FL_13 floodlight, using **Flat Glass Technology** was chosen as being suitable.

5. DSL have taken every care and consideration into the floodlighting design, this includes installing rear floodlight shields, front cowls and positioning of the masts to reduce the impact of floodlights on the local properties. DSL appreciate that the floodlights and masts are going to be noticeable, however everything has been undertaken and designed to ensure that this provides minimal impact on the neighbours.

6. The floodlights requested would be used inline with the current planning passed for the current lighting.

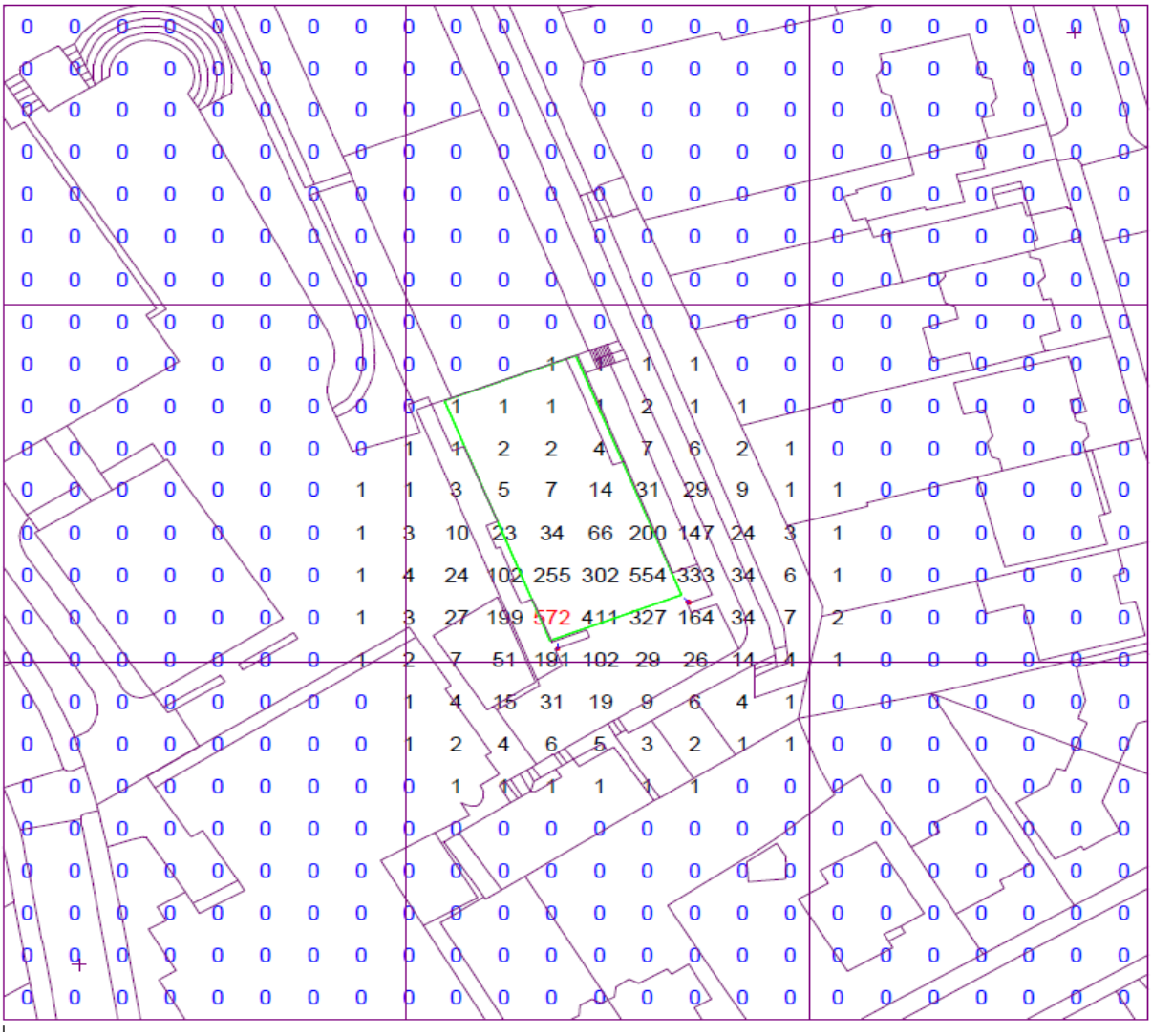
DSL Lighting Design

The Direct Sports Lighting proposals are detailed on the design, these show the mast locations, floodlight orientations, illuminance levels on the pitch & projected overspill values.

For the court the design achieves a maintained minimum illuminance value of just over 200 Lux with a uniformity in excess of 0.6 which meets the requirements. The maintained illuminance values are calculated using a maintenance factor of 0.80. This takes into account light losses due to dirt accumulation on the floodlight front glass & lamp lumen depreciation, ensuring that the minimum requirements for safe play are achieved.

The use of the Challenger 1 floodlight ensures that horizontal & vertical overspill containment is excellent. As less than 10 Lux vertical illuminance will be projected towards any residential property windows the system will exceed the requirements for an environmental zone E2 location. Upward waste light will also be minimised & at the floodlight elevations used 0% will be projected into the atmosphere. This will meet the recommendations of The Campaign for Dark Skies, an organisation who lobby for low light pollution systems & recommend the use of Abacus Challenger 1 systems.

All design calculations have been undertaken using an open, unobstructed site, the values of overspill will be further reduced any existing mature trees or natural screening.



Conclusion.

The proposed system would be suitable for installing in an environmental zone E4, meeting the most stringent of light control parameters whilst maintaining the specified illuminance levels for the sports pitch.

The impact on residents will be minimised as overspill values into gardens will be no more than moonlight & vertical illuminance into windows before curfew are below the values recommended by the ILE. Daytime visual impact will also be minimised by using slimline masts & light grey floodlights which do not stand out against the skyline.

For reference please see below a description of lighting levels.

Light Source	Horizontal Lux
Full Moon	0.3 to 0.5
Street Lights – Footpath	3 to 10
Street Lights – Residential Area	5 to 15
Typical City Centre Car Park (non-retail)	20 to 30
Office/Classroom	250 to 750
Professional Stadium	800 to 2500
Sunny Day	80,000 to 120,000

Once installed the FL-13 series light control system will provide the optimum sports lighting solution, ensuring that light reaches the sports surface & not into the sky or polluting the environment.

Direct Sports Lighting are world leaders in the design & manufacture of low pollution exterior lighting solutions. For further information regarding Direct Sports Lighting low light pollution products please contact our Head Office on 0845 643 0722 or visit our Web Site www.directsportslighting.co.uk