

5.0 The Proposal for Podium & EGA PV Panels

- 5.0.1 Mitie Energy have reviewed all aspects of the proposed solar PV project, from suitability, through to capacity and proposed location of the arrays. Throughout the study, recommendations for products have been detailed.
- 5.02 The energy study has looked at the building, specifically the roof type, the possible system options, such as types of panels, inverters, roof mounting options and electrical considerations. The final design will be developed to deliver the best overall solution for carbon reduction, energy saving and safety, given the constraints of the building.
- 5.03 It is proposed to install a solar PV system on 2 roof spaces of the UCLH campus buildings. This includes the podium roof and the Elizabeth Garrett Anderson (EGA) wing, shown on the following page.
- 5.04 All roof spaces are of a concrete construction capped with paving slabs. The podium and EGA wing roofs are approximately 5 storeys high or around 20 metres tall. The areas suitable for electrical connection of the proposed solar PV system would be the plant rooms directly below the roof areas.
- 5.0.5 The annual consumption for UCLH 3 buildings, the tower, podium and EGA wing equates to approximately 20,700,000 kWh with annual electricity costs of approximately £3.11 million (based on 15p/kWh). This will now more than double due to an increase in energy prices.
- 5.06 The proposed system layout is illustrated on the following pages. This layout has been identified as the best solution for the available and useful roof space. All roof spaces are of concrete construction. MITIE has recommended the proposed solar PV arrays are to be installed using a Van der Valk ValkPro+ flat roof mounting system with a south facing orientation.
- 5.07 The mounting will be at a pitch of 10° which, increases the capacity (physical number of solar panels) with minimal impact to the annual efficiency, thus increasing the annual yield of the system.
- 5.08 Based on the recommended solar panel, with a 30-year warranty on both performance and product, the useful life of the proposed initial installation is expected to be over 30 years. To ensure this, regular maintenance and cleaning will be required alongside periodic inverter replacements, likely after 15 years.
- 5.09 The Solar Report highlights that based on 2 options for the panels will achieve between 163 - 170 Kwh in electricity per year, with a carbon saving of 34,600 - 35,500 kg CO₂e per year. This will now be slightly reduced due to the removal of the solar panels from the tower location. Alternatively, it maybe possible to incorporate the additional panels on the lower 2 buildings.
- 5.10 The **Total CO2** offset in the first year is estimated at approximately **34.2 Tonnes** and an estimated total of **949 Tonnes over the 30 year** projected life of the recommended system based on the current grid carbon factor.
- 5.11 The solar photovoltaic panels form the bedrock of the full install system providing the DC power directly from the available sun light. SOLARWATT has been identified as the foremost manufacturer and supplier due to high-performance modules, proven build qualities and industry leading warranties. Please find attached data sheets submitted with this application.
- 5.12 The mounting system is an important and integral component of the installation. A correctly designed system will consider loadings from the base system weight, wind and snow. Location and building dimensions will be considered with adequate edge zones being specified.
- 5.13 An European manufacturer Van der Valk or K2, both of which have UK support and stocks. Typically, mounting components will have a 12-year warranty.
- 5.14 The Solar PV panels are recommended to be mounted to a concrete roof at a south facing orientation using a Van der Valk ValkPro+ 10o system, which has been selected to minimise ballast requirements and maximise the number of panels for the available space. These differ depending on roof material, with the 10o mounting system, suitable for the hospitals concrete roof as shown in the previous pages. Sections and details have been shown for the proposed system.
- 5.15 The Fronius Smart Meter along with Fronius inverters with built in monitoring capability have been chosen to provide monitoring of solar production along with building import / export values.
- 5.16 All electricity produced will be consumed on site, resulting in no export and negating the need for a battery storage system.
- 5.17 Cleaning, maintenance and monitoring throughout the lifetime of the installation are integral elements of a solar PV project. Regular cleaning is the most basic element but perhaps the most important. Cleaning solar panels regularly ensures the maximum yield throughout the lifetime of the system and helps reduce the risks of hot spots and panel failures. All of the panel locations will be fully accessible allowing for cleaning and maintenance when required.

5.1 Proposed Podium Roof Plan with PV Panels

5.1 Location 2. The Podium Roof Level - Proposed

5.1.1 Please refer to the submitted drawings for the proposed podium floor plan and sections.

UCLHPV-LDW-XX-ZZ-DR-A-30-2004 - Podium Proposed Roof Plan

UCLHPV-LDW-XX-ZZ-DR-A-00-1003 - Podium Section

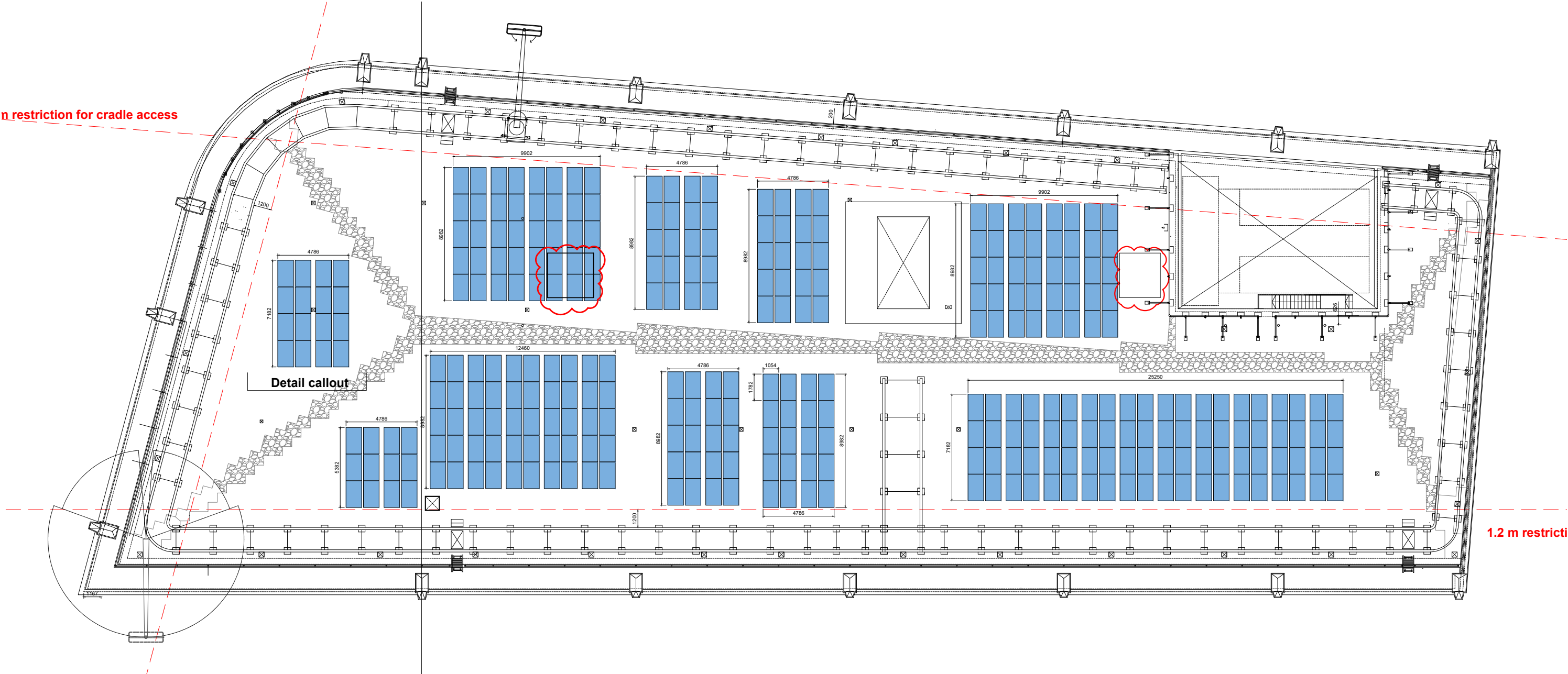
5.1.2 It is proposed to install 10 separate banks of PV panels to maintain access to the cleaning cradle and associated existing small plant located on the podium roof.

5.1.3 working from left to right the following size and quantum of PV Panels will be installed.

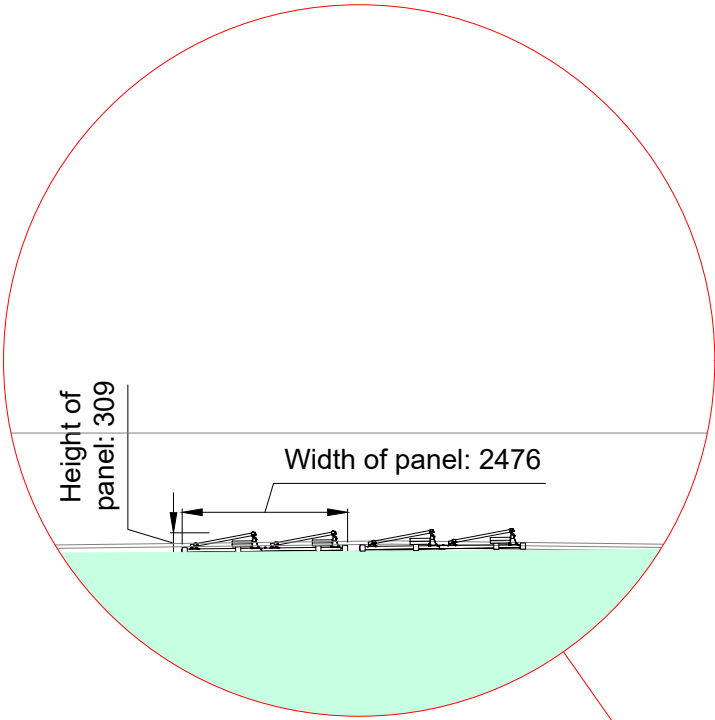
Bank 1	7182 x 4789 = 34.4m ²	16 panels
Bank 2	5382 x 4786 = 25.8m ²	12 panels
Bank 3	8982 x 9902 = 88.9m ²	40 panels
Bank 4	8982 x 12460 = 111.9m ²	50 panels
Bank 5	8982 x 4786 = 42.9m ²	20 panels
Bank 6	8982 x 4786 = 42.9m ²	20 panels
Bank 7	8982 x 4786 = 42.9m ²	20 panels
Bank 8	8982 x 4786 = 42.9m ²	20 panels
Bank 9	8982 x 9902 = 88.9m ²	40 panels
Bank 10	7182 x 25,250 = 181.40m ²	80 panels

5.1.4 The proposed PV Solar installation will provide approximately 703m² of Solar Panels incorporating 318 panels.

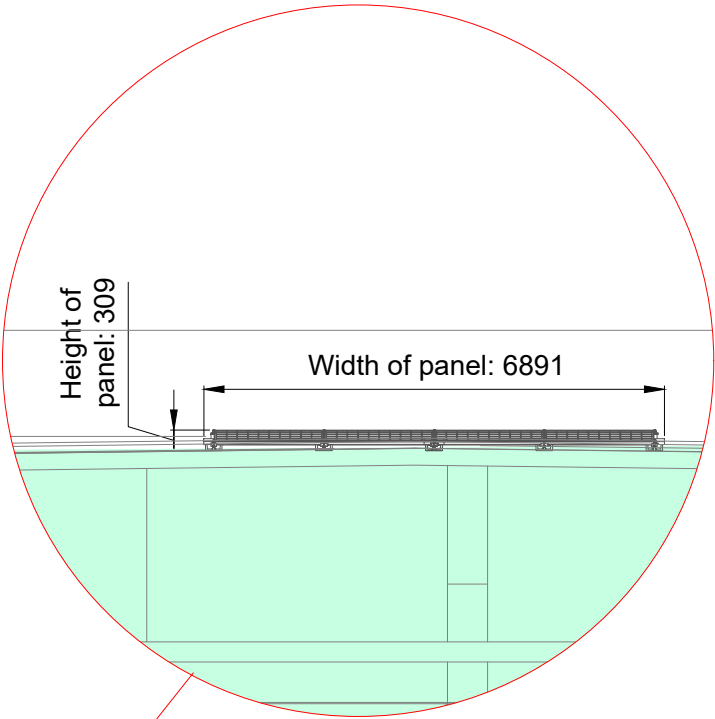
Total 702.90m² / 318 panels



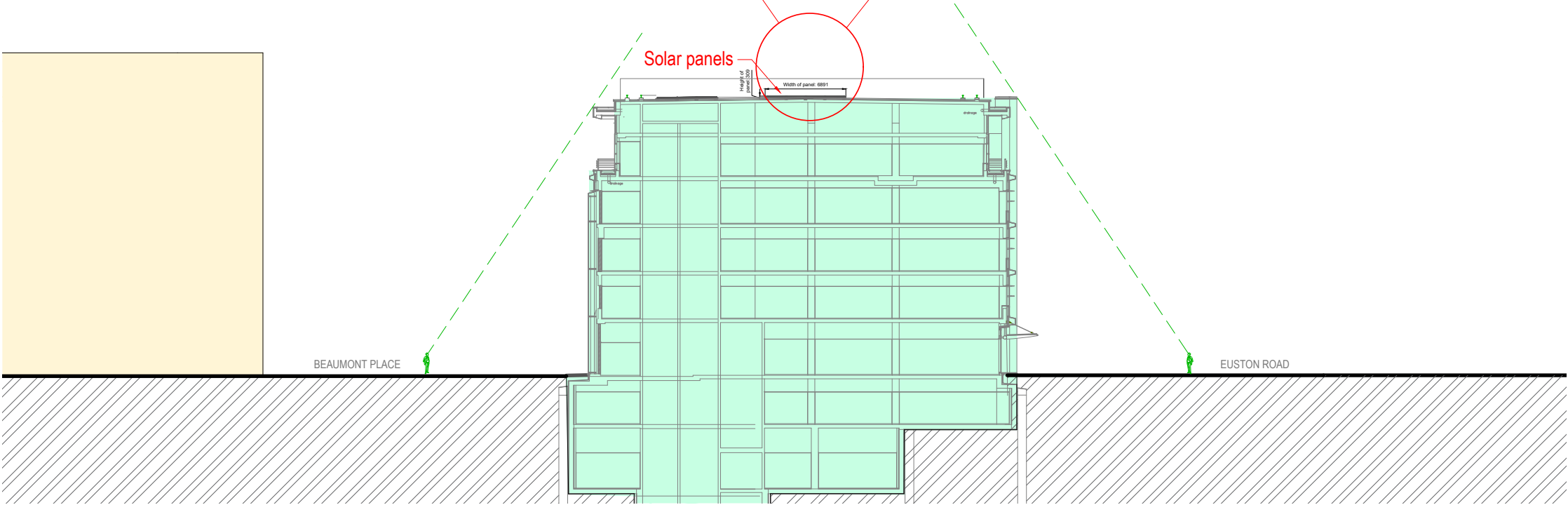
5.1 Proposed Podium Section & detail



1:50 Detail Callout B of Solar Panel (East to West)



1:50 Detail Callout A of Solar Panel



- 5.1.5 The following page shows a cross section from South to North of the 5 storey podium building.
- 5.1.6 The adjoining detail shows that the proposed installed PV panels will sit approximately 310mm above the existing roof level.
- 5.1.7 The solar panels set back from the boundary edge varies to allow access for the cleaning cradle. The proposed panels will not be visible from street level. The majority of neighboring buildings do not overlook the podium roofspace and the panels will not be visible.
- 5.1.8 The proposed impact on neighboring buildings will be negligible.
- 5.1.9 No new plant is required for the PV panels.
- 5.1.10 No noise or air pollution will be created by the proposed installed PV panels.

5.2 Proposed EGA Roof Plan with PV Panels

5.2 Location 3. The EGA Roof Level - Proposed

5.2.1 Please refer to the submitted drawings for the proposed EGA floor plan and sections.

UCLHPV-LDW-XX-ZZ-DR-A-30-2002 - EGA
Proposed Roof Plan.pdf

UCLHPV-LDW-XX-ZZ-DR-A-00-1000 - EGA
Section AA

UCLHPV-LDW-XX-ZZ-DR-A-00-1001 - EGA
Section BB

5.2.2 It is proposed to install 4 separate banks of PV panels. Access to the cleaning cradle and associated existing small plant located on the EGA roof will be maintained

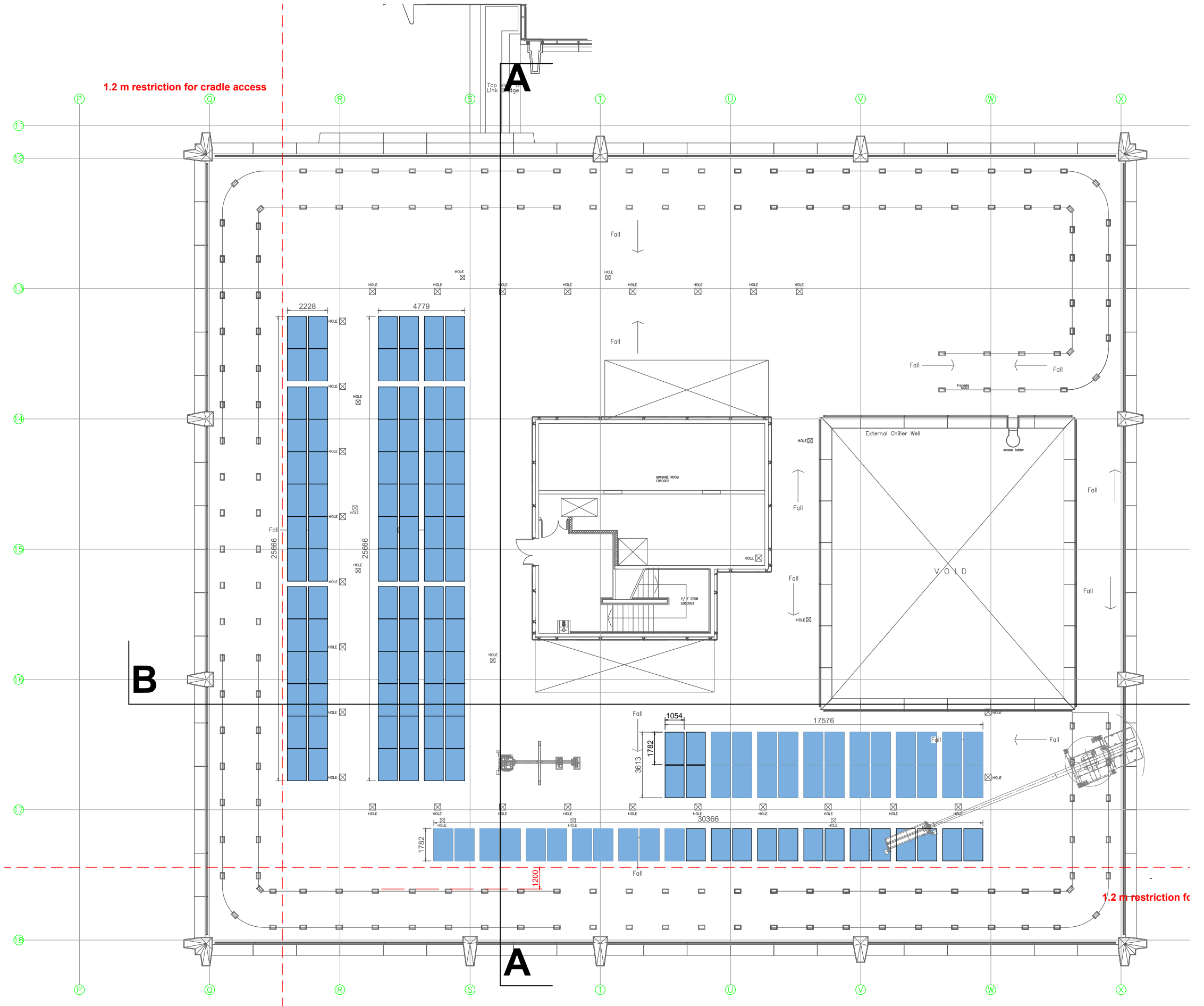
5.2.3 working from left to right the following size and quantum of PV Panels will be installed.

Bank 1	25666 x 2228 =	57.2m ²	28 panels
Bank 2	25666 x 4779 =	122.66m ²	56 panels
Bank 3	1782 x 30366 =	54.11m ²	24 panels
Bank 4	3613 x 17576=	63.50m ²	28 panels

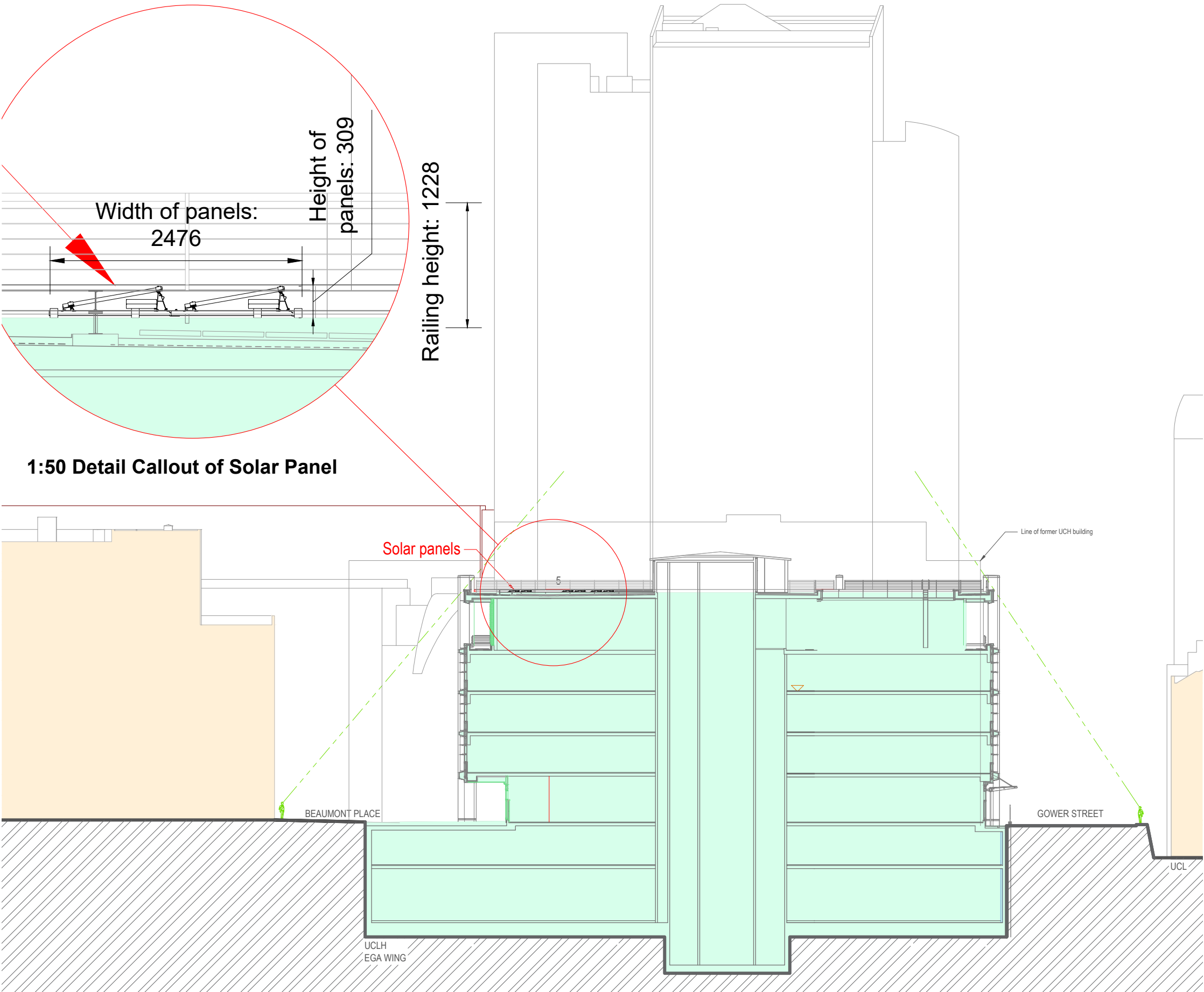
Total 297.47m² / 136 panels

5.2.4 The proposed PV Solar installation will provide approximately 297.5m² of Solar Panels incorporating 136 panels.

5.2.5 The Total Proposed PV installation for both buildings, the podium and EGA wing will provide 1000.37 m² / 454 solar panels.



5.2 Proposed EGA Section A - A with PV Panels



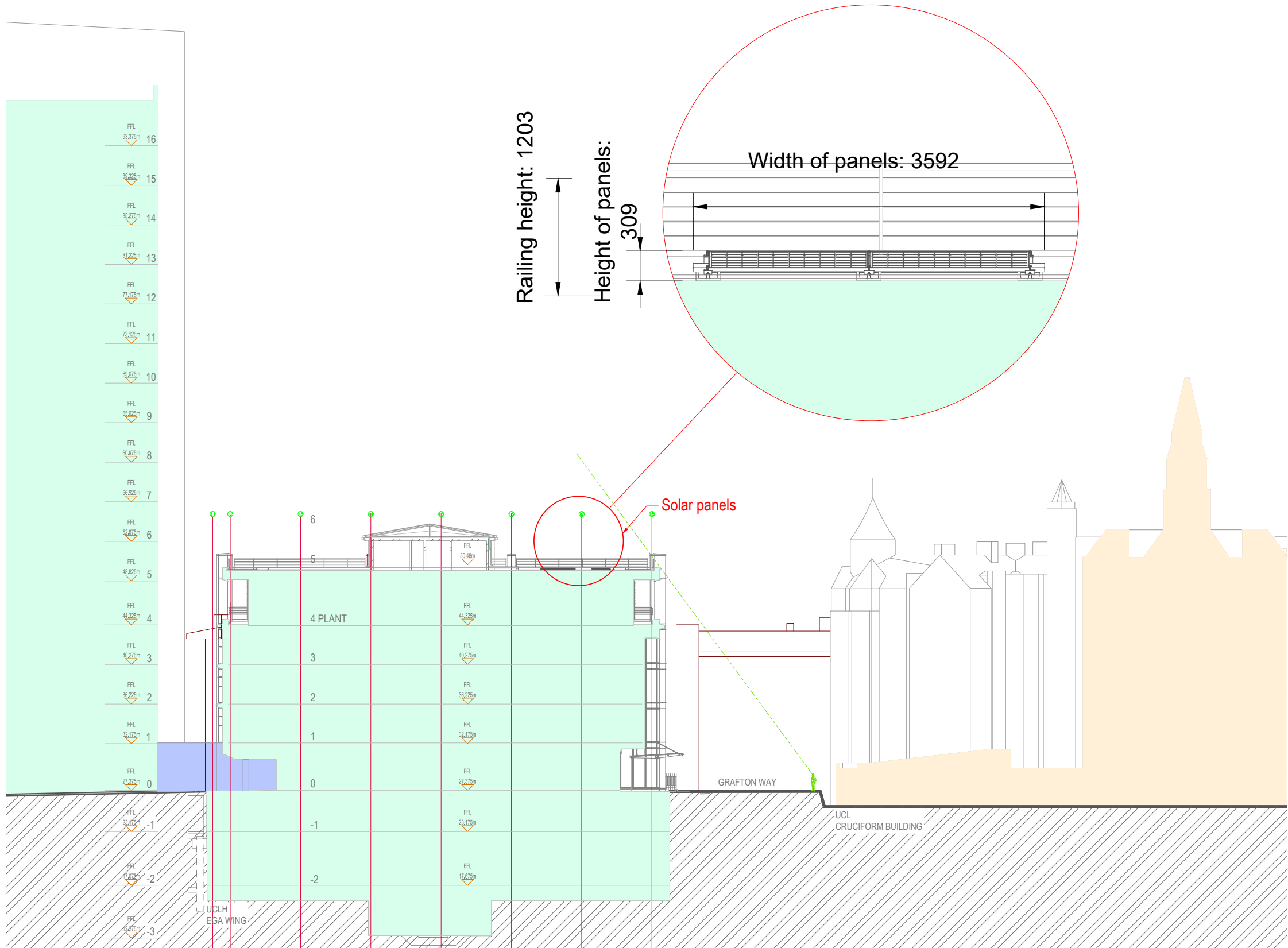
EGA Building Section AA

- 5.2.6 The following page shows a cross section from South to North of the 5 storey podium building.
- 5.2.7 The adjoining detail shows that the proposed installed PV panels will sit approximately 310mm above the existing roof level.
- 5.2.8 The solar panels set back from the boundary edge varies to allow access for the cleaning cradle. The proposed panels will not be visible from street level. The majority of neighboring buildings do not overlook the podium roofspace and the panels will not be visible.
- 5.2.9 The proposed impact on neighboring buildings will be negligible.
- 5.2.10 No new plant is required for the PV panels.
- 5.2.11 No noise or air pollution will be created by the proposed installed PV panels.

5.2 Proposed EGA Section B - B with PV Panels

EGA Building Section BB

- 5.2.12 The following page shows a cross section from North to South of the 5 storey EGA building.
- 5.2.13 The adjoining detail shows that the proposed installed PV panels will sit approximately 310mm above the existing roof level.
- 5.2.14 The solar panels are set back from the boundary edge to allow access for the cleaning cradle. The proposed PV panels will not be visible from street level. The majority of neighboring buildings do not overlook the EGA roofspace and the panels will not be visible.
- 5.2.15 The proposed impact on neighboring buildings will be negligible.
- 5.2.16 No new plant is required for the PV panels.
- 5.2.17 No noise or air pollution will be created by the proposed installed PV panels.



6.0 Conclusion



6.01 University College London Hospital NHS Foundation Trust is seeking detailed planning permission for the installation of solar Photovoltaics on the roof at the podium & Elizabeth Garrett buildings formerly phase 1 & 2 for the new hospital on Euston Road.

6.02 The proposed system will provide an area of approximately 1000m² for 454 solar panels, incorporated into the 2 existing roof at podium level.

6.03 This secures a sustainable development and has been designed to respect the significance of the Parliament Hill viewing corridor & panorama setting. The neighboring listed buildings located within the northern boundary of the Bloomsbury Conservation Area.

6.04 The NPPF, The London Plan and Camden Local Plan supports the retrofitting and enhancing existing building incorporating renewable technology, undertaken in a sensitive and discreet manner.

6.05 This proposal will create new jobs providing monitoring and maintenance and reducing the hospital expenditure on electricity supply.

6.06 Due to the site location and exposure to daylight / sunlight allows for a predominately shadow free site which is ideal for solar panels. The hospital will use all energy generated on site approximately between 163 - 170 Kwh in electricity per year, with a carbon saving of 34,600 - 35,500 kg CO₂e per year.

6.07 The **Total CO₂** offset in the first year is estimated at approximately **34.2 Tonnes** and an estimated total of **949 Tonnes over the 30 year** projected life of the recommended system based on the current grid carbon factor.

6.08 In summary it is concluded that the proposals have been in compliance with planning policy and having regard to the building's sensitive site context.

6.09 In turn, this will provide medical care and support to the wider community of LB Camden.

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