



**MHRA**  
**Blanche Lane, South Mimms EN6 3QG**  
**Proposed 219.12kWp Solar Carports**  
**Design & Access Statement**

MHRA – D01

September 2023

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## 1.0 Introduction

- 1.1 This Design and Access Statement supports the proposal for a 219.12kWp capacity solar PV generator that will be mounted on a series of ground anchored canopy structures above existing car parking bays in the staff car park at the Medicines and Healthcare products Regulatory Authority (MHRA) at Blanche Lane, South Mimms EN6 3QG.
- 1.2 The purpose of this document is to provide the Local Planning Authority – Hertsmere Borough Council – with information about the proposed development.
- 1.3 This document is submitted with accompanying drawings relevant to a development proposal of this nature and appropriate to the scale of the project, which is very modest in size.
- 1.4 In 2018, the International Panel on Climate Change (IPCC) special report on ‘Global Warming of 1.5°C’, concluded that just 12 years remained for the world to make the changes required in order to limit global emissions to 1.5°C – but that, to do so, ambitions and targets needed to be significantly scaled up.
- 1.5 In May 2019, the UK became the first national government to declare an Environment and Climate Emergency. A month later, following the Climate Change Committee’s report, ‘Net Zero – The UK’s contribution to stopping global warming’, the Government amended the 2008 Climate Change Act to go beyond the original target of an 80% reduction in UK emissions by 2050 (measured against a 1990 baseline), with a new focus on achieving Net Zero Carbon by 2050.
- 1.6 Hertsmere Borough Council declared a Climate Emergency in September 2019. The Council is committed to achieving carbon neutrality as soon as possible and no later than 2050.
- 1.7 In light of the urgency regarding the climate agenda, HBC published a position statement in November 2020 to provide clarifications on existing sustainability and climate change policies until the new Local Plan (2018- 36) and any supplementary documentation is fully adopted.
- 1.8 Given the urgent need to ensure the introduction of measures to meet both government and local Climate Change commitments, the Council considered it both prudent and necessary to publish this position statement which clarifies how Hertsmere as the Local Planning Authority (LPA) will interpret its existing development plan policies in the context of updated material considerations and circumstances until the new Local Plan is published and subsequently adopted.
- 1.9 The position statement sets out the requirements which Hertsmere as LPA will seek on relevant applications for planning permission in order to deliver on the requirements set out in the adopted Core Strategy (2013) and the Site Allocations and Development Management Policies (SADMP) (2016), the National Planning

Policy Framework (NPPF), Climate Change and Sustainability Strategy (Hertsmere Borough Council) and the Government's commitments and emerging priorities on climate change.

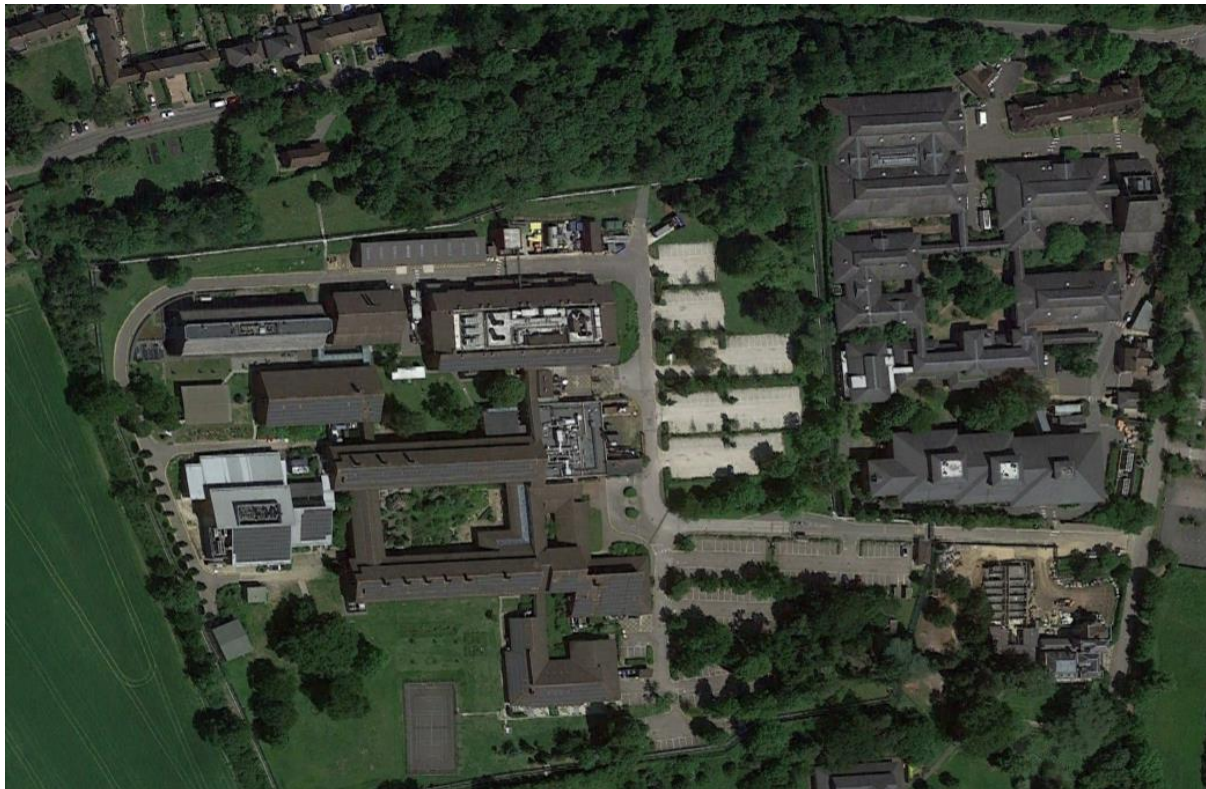
- 1.10 It contents will be kept under review with any necessary amendments and clarifications made after the new Local Plan is published (originally scheduled for Spring 2021 but still only in draft plan form with no current timetable).
- 1.11 With regard to the existing Local Plan policy CS16 which concerns the environmental impact of development, the position paper, planning applicants are requested to go further than not to create an 'unacceptable level' of risk – but to make a positive contribution towards the area, its biodiversity alongside climate change adaptation and mitigation.
- 1.12 The justification is the HBC 'Climate Change and Sustainability Strategy' and in relation to the proposed development this states 'In order to achieve net-zero carbon emissions, the following principles will be embedded in all aspects of the functioning and development of the borough: reducing consumption, minimising waste, **switching to renewable forms of energy.....**'
- 1.13 Local Plan policy CS17 'Energy and CO2 Reductions' states:
- "The Council will further encourage all new development or major refurbishment to incorporate energy from decentralised and renewable or low carbon sources. All large scale development will be required to incorporate on-site renewable energy generation, unless it is not feasible or viable or alternative decentralised and renewable, low carbon sources can be identified."*
- 1.14 Policy CS17 adds:
- The Council will also permit new development of sources of renewable energy generation subject to:*
- *local designated environmental assets and constraints, important landscape features and significant local biodiversity;*
  - *minimising any detriment to the amenity of neighbouring residents and land uses;*
- and*
- *meeting high standards of sustainable design and construction*
- 1.15 The Position Statement emphasises HBC support for renewable energy development with the following policy application statement:
- "The Council will encourage new development of sources of renewable or sustainable energy generation subject to existing policy caveats."*
- 1.16 A justification for this is para 148 of the NPPF which states the planning system should '....support renewable and low carbon energy and associated infrastructure'.

- 1.17 HBC have made the position statement a material planning consideration – to be taken into account when determining planning applications (and appeals) until the new Local Plan is published under Regulation 19. It sets out how the Council as local planning authority is seeking to interpret adopted planning policy in light of material planning changes as outlined in the statement, and the very pressing nature of climate change.
- 1.18 The proposed development does not create floor-space so there is no requirement to submit a Climate Change and Energy Statement with the planning application. This document will however provide sufficient information about how the proposed development will contribute in these areas.
- 1.19 The HBC position statement provides the updated context and other information to applicants, and in particular how adopted policy should be interpreted in relation to climate change matters following updates to the National Planning Policy Framework and both national and local commitments relating to climate change. As such, it should be given significant weight in reaching planning decisions.
- 1.20 The MHRA (formerly known as the National Institute for Biological Standards and Control (NIBSC)) was originally built in 1985 on part of the former Clare Hall Hospital Site.
- 1.21 The facility lies on the south side of Crossoaks Lane at the eastern end of Ridge Village with its main vehicular access on Blanche Lane. The topography of the land which falls away southwards from Crossoaks Lane and screening vegetation along Crossoaks Lane means that the bulk of the MHRA buildings are effectively separated visually from the Ridge Village.
- 1.22 To the west and south of the site is the open pastureland sloping southwards from Ridge Village. To the north of the site is a playground and a number of modern dwellings. Part of the site is within the Ridge Conservation Area.
- 1.23 The proposed development site is part of an existing staff car park located on the east side of the complex, to the north of the Blanche Lane entrance.
- 1.24 The car park is heavily screened along its northern boundary by a dense and broad band of woodland formed of mature trees with significant undergrowth providing continuous vegetation along the Crossoaks Lane frontage.
- 1.25 The woodland continues south of the secure fence which surrounds what is a high security establishment and thins to a line of mature trees that flank the eastern side of the car park, and which provide partial screening of and from the adjacent Cancer Research UK (CRUK) premises.
- 1.26 There are no views into the car park from the public highway and nor can the car park be seen from any nearby residential dwellings.

- 1.27 The nature of the work carried out at the MHRA is predominantly laboratory based testing and quality control to ensure the quality of existing biological medicines and facilitating the safe development of new biological medicines for the treatment of diseases. It performs a critical public health support function both in the UK and internationally.
- 1.28 Science laboratories typically have very heavy energy use with the need to precisely control temperature, and power significant amounts of refrigeration and other process equipment.
- 1.29 In 2014 planning consent was granted for the installation of solar panels totalling 378.25kWp on 9 separate roofs. Although this PV system has contributed a significant quantity of renewable energy generation since its installation, the MHRA was still using around 6,643 MWh a year in 2020.
- 1.30 Under permitted development an additional 611.31kWp of roof mounted solar PV has now been added that will displace an additional 7.6% of the imported grid energy demand with zero carbon renewable energy, but this latest investment has now covered all the practical and available building roofs that were not already supporting solar panels.
- 1.31 The proposed 219.12kWp solar carport development will generate a further 3% of the annual power demand, taking the overall proportion of on-site generated zero carbon energy to over 15% of the annual electricity usage.
- 1.32 This Design & Access Statement covers the following matters: -
- Use
  - Amount
  - Layout
  - Scale
  - Landscaping
  - Appearance
  - Access
- 1.33 This document should be read in conjunction with the following accompanying drawings that make up the planning application: -
- |                |                                   |
|----------------|-----------------------------------|
| MHRA / 01      | Site Location Plan                |
| MHRA / 04 REVB | Solar Carport Plan and Elevations |
| MHRA / 05      | Existing Site Plan                |
| MHRA / 12      | Proposed Site Plan                |

## 2.0 Site Description & Context

- 2.1 The proposed site for the development is the northern staff car park on the east side of the MHRA premises, close to the main entrance.



An aerial view of the site

- 2.2 From the aerial image above, it can be seen that the staff car park north of the main MHRA entrance road is very heavily screened from public view, with the only visibility of the proposed solar carports possible from the adjacent Cancer UK HQ.
- 2.3 This parking area was constructed in 2010 to cope with the rapid expansion of the NIBSC and increased the previous on site parking by an additional 69 spaces.
- 2.4 The car park slopes gently north to south with each parking aisle terraced into the slope.
- 2.5 The car park aisles generally level but laid to slight crossfalls to allow surface water to be collected by road gullies that are connected to the surface water drainage system serving the site as a whole.
- 2.6 Car parks are developed land that generally have a single use to park cars and other road vehicles. Installing solar carports allows a secondary use of this developed space in order to generate zero carbon renewable energy. Solar carports also provide shade in sunny weather that reduces heat gain in cars parked beneath them.



A view towards the top of the proposed site



A view looking down the slope towards the proposed site

- 2.7 Solar carports are the most expensive way to install solar PV, so it has taken time for them to appear in the UK. The impending decarbonisation of transport and the need



for EV charging infrastructure to be rolled out across the UK; coupled with the rise in the electricity price and need for businesses to make progress reducing their carbon footprint has now resulted in a growing demand for solar carports.

- 2.8 There is only very partial data for the surface area in the UK set aside for car parking, but a recent study found that public surface car parks in the West London area alone occupied nearly 3.9 square kilometres. Clearly there is nothing attractive about large expanses of parked cars and adding solar carports does not change this fact, but does at least make a virtue out of a necessity.
- 2.9 The proposed area of solar carport roof canopy cover in this application is 1,065m<sup>2</sup>. The surface of the north staff car park is approximately 2,745m<sup>2</sup>, therefore 38.8% of the car park will be utilised for renewable energy generation.



A view towards the proposed locations of solar carports 5 and 6

## 3.0 Design

- 3.1 Solar carports are canopy structures usually supported on steel or sometimes aluminium frames and covering single or back to back car parking bays. They can vary from single bay width designs typically aimed at a domestic market to 2 bay, 3 bay or even wider span examples.
- 3.2 Supports can be single post columns with cantilevered rafters or multi-strut designs. Foundations are generally above ground concrete or steel bases that are anchored using steel rods or screw piles as these are the easiest systems to accommodate in existing car parks and avoid excavation for large in-situ cast concrete pad foundations.
- 3.3 Carport roof structures are generally standard type steel purlins typically used in steel framed buildings although timber solar carport structures have also been designed and installed, and hybrid designs are also available.



Examples of solar carports





Some early Solarsense solar carport installations using imported systems



- 3.4 Solarsense have developed a new series of steel framed solar carport designs with cantilevered rafters meaning that support columns can be positioned at the rear of

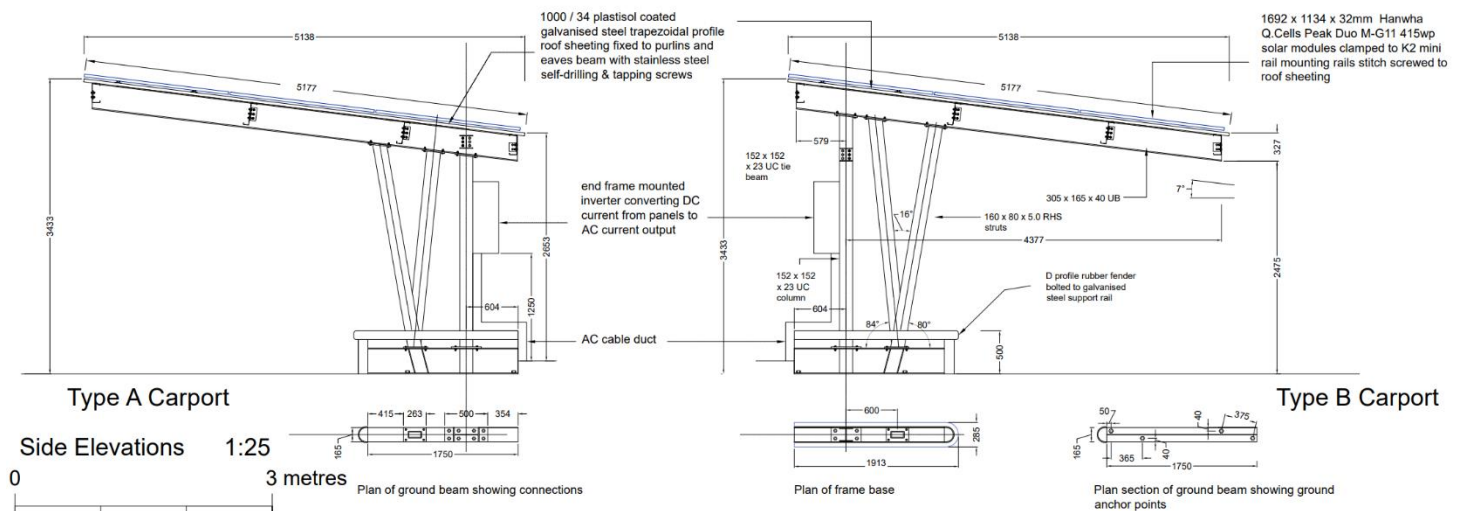
parking bays or between back to back parking bays. This allows the support structures to be less intrusive and avoid collisions with driver or passenger doors.



Dual bay monopitch Solarsense carport installed at Bicester Leisure Centre for Cherwell District Council



Solarsense solar carports currently under construction at a factory premises in Gloucestershire



Side elevations of the Type A and Type B monopitch single parking bay depth carports proposed

- 3.5 The two types of solar carport will be bolted down to Spirafix helical ground screw anchors with 4 anchors per frame.



- 3.6 The steel ground beam base will be clad with a heavy duty two part rubber casing which will act both as an aesthetic and a protective cladding.
- 3.7 The steel support structures will be spaced generally at 7.5 metre centres which equates to the width of three car parking bays. In order to avoid buried services and also to fit Blue Badge parking bays a number of frames will be installed at different spacings.
- 3.8 In order to allow flexibility in the ultimate choice of solar panel – as these come in varying sizes depending on power rating, solar cell configuration and manufacturer, the solar carport frames support trapezoidal profile colourcoated steel roof sheeting

fixed to steel C section roof purlins. The sheeting has a light grey colour finish.



Recently completed gull wing type solar carports in Gloucestershire showing colour finishes

- 3.9 The proposed design consists of 9No. solar carports of varying length supporting a total of 528No. 415 watt peak monocrystalline solar panels to give a total installed capacity of 219.12kWp.
- 3.10 This underlying roof sheet construction allows surface water draining from panel edges to be collected and drained to the eaves where it is allowed to simply drip to ground. This is known as an eaves drip system and is approved by Building Control where the ground incorporates surface water drainage systems.
- 3.11 The quantity of surface water is discharged to the drainage system is no greater than it receives without the proposed carports, and the runoff rate will be no different to the existing surface.
- 3.12 DC string cables will connect the solar panels in series in a number of 'strings' and these string cables will run to the west end of each carport where they will be brought through the roof sheeting in cable containment and connected to string inverters mounted on the end structural frame.
- 3.13 The inverters convert DC current to 3 phase 400V AC current which will be fed

through steel wire armoured ducted cables underground to run to an AC combiner cabinet located close to the point of electrical connection in the nearest of the 11kV transformer switch rooms.



A string inverter with integrated DC cut off switch

- 3.14 The AC combiner cabinet will be similar in appearance to the dark green utility cabinets used everywhere in different sizes to house electrical switchgear or other utility services. The cabinet will house an electrical distribution board that will allow the 9 separate AC cables from the inverters to be joined into a single AC power cable that will be routed to a nearby electrical services inspection chamber and then via existing underground ducts to the electrical plant room serving the main boiler house.

### Landscaping

- 3.15 There are 21 small saplings in the grassed verges separating the parking aisles that will be cut back using a technique known as pollarding which should simply encourage these young trees to sprout new growth from the base of the cut back trunks. These pollarded trees will then be maintained at a height below the carport eaves level. The result is usually more of a bush or shrub but avoids removing the tree.
- 3.16 Should any of the pollarded saplings fail they will be replaced with suitable lower height shrubs.
- 3.17 The existing mature trees will not be affected but will of course be maintained as usual to ensure any dead or storm damaged branches are removed.

## 4.0 Access

- 4.1 The proposed site is a car park with direct vehicular access from the main MHRA entrance on Blanche Lane. The location is close to both the M25 London Orbital Motorway and the A1 with the most likely vehicle access by means of the B556 to South Mimms from junction 22 of the M25 (St Albans).
- 4.2 The steel frames will be delivered in sections on flatbed lorries equipped with HIAB cranes and a combination of these lifting devices and a telescopic front loader will position the steel sections allowing the bolted connections to be made.
- 4.3 Solar panels will be delivered by fixed bed curtain sided 27 tonne lorry in a single delivery or in two deliveries using smaller vehicles.
- 4.4 Other materials and equipment will be delivered in small vans.
- 4.5 The construction will be managed in phases to allow partial use of the car park to be maintained during the installation. It is anticipated that construction will take between 8 and 12 weeks.

## 5.0 Sustainability

- 5.1 In co-operation with the majority of countries worldwide the UK has signed up to international treaties and committed to ambitious targets to reduce greenhouse gas emissions of which CO<sub>2</sub> from the combustion of fossil fuels for power generation, space and industrial process heating, and for transportation is a major contributory factor in global warming and climate change.
- 5.2 As a result of Carbon Emissions reduction policies already in place in the UK and improvements in the electrical efficiency of modern household appliances and that of commercial and industrial equipment; the phasing out of tungsten filament based lighting, and the widescale replacement of other lamp types with LED lighting, the UK annual electricity demand has fallen compared to 2008.
- 5.3 Phasing out of coal and oil fired centralized power stations; inter-country HVDC connectors such as the ones linking Norway and France and the UK; and the significant addition of renewable energy generation in the form of onshore and offshore wind generators; biomass; anaerobic gas generation and of course solar PV that has resulted from the Renewables Obligation and FITS subsidy schemes; has collectively already had a considerable impact in decarbonizing electricity generation.
- 5.4 The latest (2022) UK electricity generation conversion factor to be used in Company reporting of carbon emissions due to power use and consequently also providing the carbon emission value of renewable energy displacing grid imported electricity is



0.21107 kg CO<sub>2</sub>e / kWh. Grid power generation carbon emissions have more than halved in the last decade.

- 5.5 We can't know what level this factor will fall to as the UK transitions fully away from fossil fuel based power generation and the rise of EVs as transport is decarbonised and the use of renewable energy to directly charge these vehicles uses a different conversion factor and different accounting approach.
- 5.6 The proposed 219.12kWp solar carport mounted solar PV system will generate a simulated 187,468 kWh or 187.5 MWh of zero carbon renewable energy per annum.
- 5.7 In present terms the projected first year renewable energy generation from the proposed development represents a carbon emissions saving compared to grid supplied electricity of 39.568 tonnes of CO<sub>2</sub>e.

#### **The Lifetime of Solar Panels**

- 5.8 How long do solar panels last? According to studies, the life expectancy of solar panels is about 30 years before decommissioning.
- 5.9 During the operational life of photovoltaic panels, a gradual decrease in power generation efficiency compared to the rated power occurs. A decade ago solar panel manufacturers guaranteed power output in stages at 90% of original output at 10 or 12 years; falling to 80% output at 25 years.
- 5.10 Subsequent technology improvements and better manufacturing quality control plus empirical field based operational data have shown that, in reality, the efficiency drops on average by merely 6 to 8 per cent after 25 years. The lifespan of solar panels may ultimately depend more on outside factors than their ultimate failure. The lifespan of high quality PV panels may well reach 30 to 40 years, and be still functional afterwards, though with decreasing efficacy.

#### **Disposal of Solar Panels**

- 5.11 From a regulatory aspect, PV panel waste still falls under the general waste classification. A sole exception exists at EU-level, where PV panels are defined as e-waste in the Waste Electrical and Electronic Equipment (WEEE) Directive. The PV panel waste management is thus regulated by this directive, additionally to other legal frameworks.
- 5.12 The solar panel manufacturers are bound by law to fulfil specific legal requirements and recycling standards in order to make sure that solar panels do not become a burden to the environment. All major (Tier 1) PV manufacturers have signed up to PV Cycle – a recycling scheme for end of life solar panels.

#### **Silicon Based Solar Panel Recycling**

- 5.13 The recycling process of silicon-based PV panels starts with disassembling the actual product to separate aluminium and glass parts. Almost all (95%) of the glass can be reused, while all external metal parts are used for re-molding cell frames.

- 5.14 The remainder materials are treated at 500°C in a thermal processing unit in order to ease up the binding between the cell elements. Due to the extreme heat, the encapsulating plastic evaporates, leaving the silicon cells ready to be further processed. The supporting technology ensures that not even this plastic is wasted; it is reused as a heat source for further thermal processing.
- 5.15 After the thermal treatment, the green hardware is physically separated. 80% of these can readily be reused, while the remainder is further refined. Silicon particles—called wafers—are etched away using acid. Broken wafers are melted to be used again for manufacturing new silicon modules, resulting in 85% recycling rate of the silicon material.
- 5.16 Once generating solar PV generators use only light as a fuel and there are no emissions or waste byproducts that need disposal, unlike traditional fossil fuel or nuclear power stations. The proposed solar generator is very nearly 100% recyclable at end of operational life and can also be re-located / dismantled very easily with minimal site reparation required.
- 5.17 Solar cell and solar panel manufacturers are continually seeking to reduce their manufacturing environmental impact and are utilizing the very technology they manufacture to reduce the amount of non-renewable energy they consume.
- 5.18 It is estimated that at the moment the embedded carbon in the latest generation of solar panels is repaid in under the first 10 to 18 months of generation (depending on system location, orientation etc). While this does not account for the carbon used in transporting the solar panels and balance of system components to site nor the carbon emissions associated with the construction phase, it is clear that solar renewable energy does pay back many times over the carbon emissions embedded in constructing solar generators during its operational lifetime.

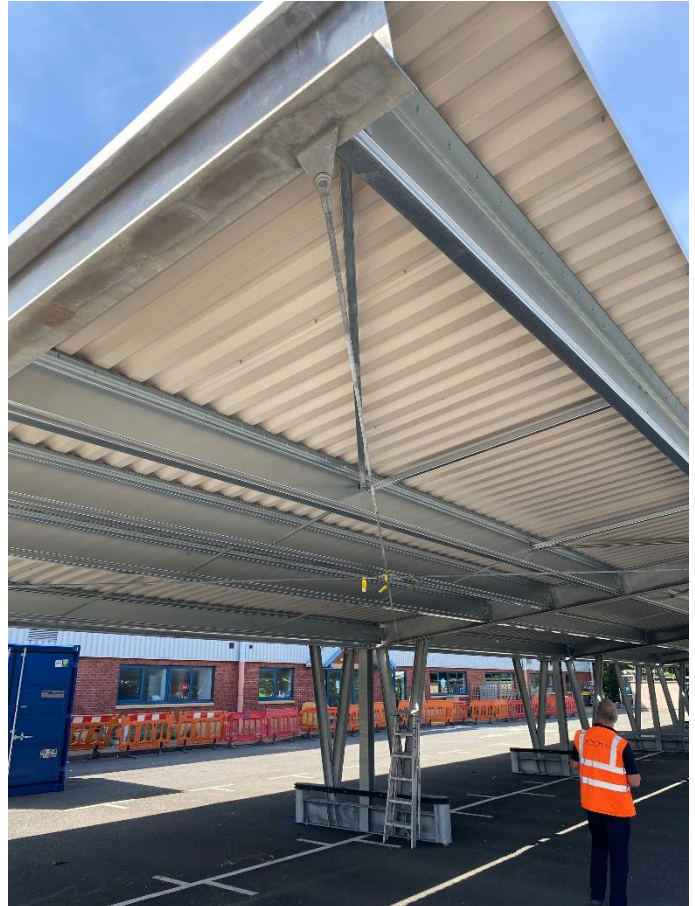
### **Solar Carport Structures**

- 5.19 The solar carport structures are predominantly made of steel and can be fully recycled at end of life. The ground screws can be reverse rotated and extracted from the ground and the surface easily made good.

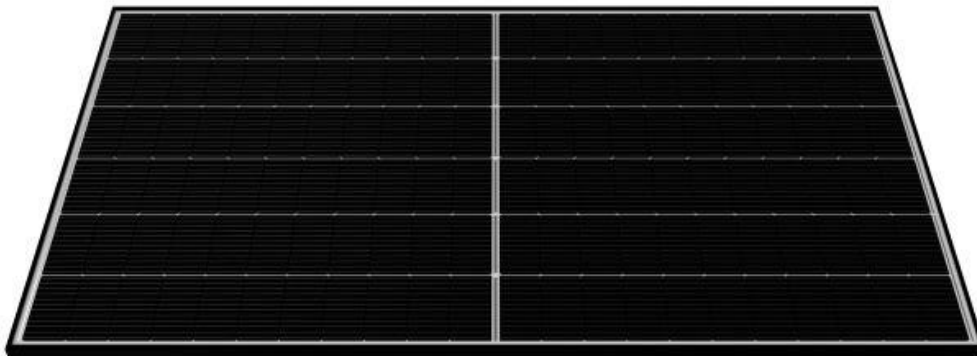
## 6.0 Appearance

- 6.1 Solar carports are a relatively new type of renewable energy generation system in the UK.
- 6.2 The proposed designs will consist of galvanised steel columns, diagonal struts and purlins, with trapezoidal profile colourcoated steel roof sheeting in RAL 9002 Grey White.

The image opposite shows our latest solar carport installation near completion with the colour finishes clearly visible.



- 6.3 Solar panels will be monocrystalline cell type with either black anodized or natural anodized aluminium frames.



## 7.0 Conclusions

- 7.1 Hertsmere Borough Council has recognised that we are facing a Climate Emergency and established ambitious targets for reducing carbon emissions across the HBC area.
- 7.2 In particular building owners are being encouraged to retrofit solar PV systems and new developments are expected to maximise on-site renewable energy generation.
- 7.3 The MHRA has already demonstrated strong sustainability leadership in installing nearly 1 Megawatt of roof mounted solar PV systems at the Blanche Lane site.
- 7.4 The proposed solar carport development makes more efficient use of land that is already developed but underused as an area to park cars. It will have no impact on the openness of the Green Belt.
- 7.5 The proposed additional solar PV generator will supply the MHRA with an additional 187.5MWh of zero carbon electricity which will mean that together with the roof mounted PV systems approximately 15% of the site annual electricity demand will be met by in-situ generated renewable energy.
- 7.6 The proposed development will not be visible from the public domain and as the site is restricted access, only staff and authorised visitors will be generally aware of the solar carports.
- 7.7 We consider that the proposed development is a positive example of an organisation helping to tackle the climate emergency and also that it shows an innovative use of otherwise inefficiently used land.
- 7.8 We trust that Hertsmere Borough Council will grant planning consent to this application.