

PLANNING STATEMENT

Ground mounted Solar PV Array at
HMP Ford, West Sussex

On behalf of Ministry of Justice

September 2021



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Version	Prepared by	Approved by	Date
Supporting Statement	Katrina Crisp MTCP MRTPI	Andrew Teage MRTPI	September 2021

1. Introduction

- 1.1 Cushman & Wakefield (C&W) has been instructed by the Ministry of Justice (MoJ) to prepare and submit a full planning application for the proposed installation of a 239.2MWh ground mounted Solar Photovoltaic (PV) generation system at HMP Ford. This is further to pre-application dialogue with Arun Council, who advised that it was anticipated that the proposal would find officer support should it be submitted as a planning application.
- 1.2 This Supporting Statement sets out the proposed development and is structured as follows:
- Site Description – Section 2;
 - Proposed Development – Section 3;
 - Planning Policy – Section 4;
 - Planning Analysis – Section 5
 - Conclusion – Section 6.
- 1.3 The following plans and information are also submitted in support of the application:
- Application Forms and Certificates
 - Site Location Plan (ref: DR-A-1300 Rev.6)
 - Site Plan General Arrangement (ref: DR-A-1301 Rev.5)
 - Concept Landscape Proposals Plan (ref: LUC-11357-LD-PLN-106 Issue C)
 - Pre-application response from Arun Council (appended to this statement)
 - Ground Mounted PV Short Form Specification (appended to this statement)
 - Extended Phase 1 Habitat Survey Memo
 - Landscape Opinion
 - Historic Environment Opinion

2. Site and Surroundings

Site Location and Description

- 2.1 The application site is located on Crown operational land located in the south west corner of the HMP Ford prison complex. HMP Ford is a Category D men's open prison situated to the east and west of Ford Road. The site lies in the western half of the site; often referred to as the 'industries site'.
- 2.2 HMP Ford is located close to the village of Ford in West Sussex. HMP Ford is defined as being within the built-up area of Yapton (in the Arun Local Plan). To the east of the main prison complex is the River Arun and to the west is farmland. To the north is farmland and a housing development (which runs parallel to Ford Road on the east side). To the south west is the Rudfield Industrial Estate and to the south east St Mary's Church (Grade I listed).
- 2.3 The area of land proposed for the new Solar Array is situated on the west side of Ford Road, within the main prison boundary. The land is currently hard standing understood to be used by the Prisons Garden Centre. The parcel of land that is the subject of this application is identified on the accompanying Site Location Plan drawing DR-A-1300 Rev.6 Site Location Plan.
- 2.4 The application site is 0.35 hectares (0.86 acres) in size and is adjacent to the main prison complex within the wider HMP Ford Estate that extends to circa 26 hectares (64 acres).
- 2.5 The boundaries of the application site are defined by the main prison boundary to the west and the existing internal access road to the north.
- 2.6 The topography of the site is relatively flat land and is also located within flood zone 1, at the lowest risk of flooding with no identified surface water issues on the site.

Pre-application Response

- 2.7 Pre-application advice was sought on 26 March 2021, to request the Council's assistance in delivering this project against challenging implementation programme. The pre-application request sought confirmation whether the application could benefit from permitted development rights under Class A / Class C of Part 19 of Schedule 2 of the Town and Country Planning General Permitted Development Order 2015 (as amended).
- 2.8 A response was received from Karl Roberts (Head of Planning) on 26 March 2021 which anticipated that the proposal would find officer support if submitted as a planning application.
- 2.9 The Council also advised that if it was MoJ's preference for a Certificate, they would expect any application to set out clearly through plans what is proposed and secondly, a statement outlining why MoJ believe the proposal is Permitted Development.

3. Proposed Development

- 3.1 The accompanying drawing Site Plan General Arrangement (ref: DR-A-1301 Rev.5) illustrates the proposed layout of the Solar PV arrays and associated infrastructure. The main features of the proposed development are:
- the Solar PV Arrays;
 - Connection Route;
 - Switch-gear units and cabling; and
 - Security high weld mesh fencing.
- 3.2 The installation proposes 5 panels, comprising a total of 124 modules. The panels will be mounted in a portrait configuration, with 4 modules on top of each other in a horizontal arrangement. The panels will be south facing and inclined to between 20 to 35 degrees to capture the most sunlight.
- 3.3 The panels will be laid in rows with a minimum separation distance of 4 metres to prevent any overshadowing. The panels will be no higher off the ground than 3 meters and will be installed on a continuous framing system mounted on piles. These will have a minimum impact on the ground and thus will allow the site to be returned to its current state at the end of the installation's lifespan.
- 3.4 The panels will be accompanied by 3no. inverters and 400v 3 WAY TP + N Panel Board which connects the solar panels to the main switchboard which is located within one of the prison administrative buildings located to the east of the installation. The inverters will be 0.10, 0.16 and 0.2 cubic metres in size and will be installed on profile rails within proximity of the solar panels. Array switchgear shall be located next to the inverters which will allow for AC SWA cables to run from the PV array switchgear to the sites main point of connection. AC cables shall run from the PV generation distribution board to the site's main switchboard underground within a trench following the existing access roads within the Prison estate.
- 3.5 The site will be secured by a 1.8m high wire mesh deer fence. The fence will be painted green. It will form a complete enclosure of the site. A gate will be installed in the south west corner providing access to the compound.
- 3.6 The proposal includes 3no. bat boxes, 3no bird boxes, 1no. invertebrate habitat and 1no. hibernacula. Additional species rich grassland is also proposed to be planted. This will result in a habitat and hedgerow net gain of +13.63% and +100% respectively.
- 3.7 A vehicular access for servicing the PV array is proposed to be taken from an existing internal access road at the south west corner of the application site. Once operational, only maintenance visits to the solar arrays will be required. The designated contractor will install, operate and maintain the panels throughout their operational life.

Energy Generation

- 3.8 The proposed panels will provide energy solely for the operational prison with the objective of reducing mains energy usage and offsetting carbon emissions. This is a significant driver for the MoJ as the second largest Central Government estate, accounting for more than 20% of Central Government's total greenhouse gas emissions, which must be reduced to assist the UK Government to meet its net zero carbon target.

- 3.9 The MoJ has therefore been awarded funding to invest in low carbon technologies on its estate and the proposed development is one of the prison sites that will benefit from this important initiative.
- 3.10 The proposed development will produce solar energy to generate electricity to power the operational prison complex. The proposed solar arrays are predicted to generate 239.2MWh. This is expected to contribute to 19.55% of the total prison yearly energy demands.

4. Planning Policy

Overview

- 4.1 The Development Plan for Arun District Council comprises the Arun Local Plan 2011-2031 (July 2018) and Ford Neighbourhood Plan (made on 9 January 2019). The National Planning Policy Framework (the Framework) and any relevant Supplementary Planning Documents ('SPDs') are material considerations in the determination of planning applications.
- 4.2 Paragraph 47 of the Framework notes planning law requires that applications for planning permission be determined in accordance with the Development Plan, unless material considerations indicate otherwise. Neighbourhood Plans form part of the Development Plan once adopted or 'made'.

Arun District Council Local Plan (2018)

- 4.3 The following policies are considered of relevance to this application. Policy SD SP1 states when considering development proposals, the Council will take a positive approach when considering development proposals, which reflects the presumption in favour of sustainable development identified in national planning policy.
- 4.4 Policy SD SP2 states that development will be focused in built up areas and will be permitted subject to compliance with other policies in the plan. The Arun Local Plan Proposals Maps shows that the site is within the built-up area boundary of Yapton. The built-up area shown on the map defines the 'urban area'. This is reinforced within the Neighbourhood Plan Decision Statement, which makes it clear that the built-up area boundary is the boundary that is shown on the Arun Local Plan Proposals Map.
- 4.5 Policy ECC SP1 supports development which is located and appropriately designed to adapt to impacts arising from climate change.
- 4.6 Policy ECC DM1 supports renewable energy development subject to the criteria in this Policy. Schemes will be expected to contribute to the social, economic and environmental development and overall regeneration of the District. The Council will support proposals for appropriately located renewable energy development, and their ancillary development where they meet the following criteria:
- a. The proposal is located and designed to minimise adverse impacts to landscape habitats, the historic environment and residential amenity including visual, noise and odour impacts;
 - b. The location and design of proposals will need to take account of the Council's landscape assessment and landscape sensitivity studies (or successor documents) and proposals for large scale renewable energy projects will need to be supported by a zone of theoretical visibility and viewpoint assessment;
 - c. Priority should be given to proposals that integrate with existing or new development where appropriate to do so having regard to (a); and
 - d. All proposals will need to demonstrate a suitable connection to the electricity distribution network, or appropriate energy storage facility, and provide evidence to demonstrate that the connection will not result in unacceptable impacts upon the landscape, natural and historic environment or visual and residential amenity.

- 4.7 Local Plan policies HER SP1 The Historic Environment, HER DM1 Listed Buildings and HER DM6 Sites of Archaeological Interest seek to protect, preserve, and enhance the historic environment.
- 4.8 Policy ENV SP1 supports development which promotes the preservation, restoration and enhancement of biodiversity and the natural environment.
- 4.9 Policy ENV DM3 states that developments should be designed in order to minimise disturbance to ecological habitats.
- 4.10 Policy ENV DM5 seeks to achieve a net gain in biodiversity and protect existing habitats on site.

Ford Neighbourhood Plan (2019)

- 4.11 Policy BUA1 defines the boundary of the Built-Up Area. Outside of which development will not be acceptable. The prison estate falls within the Built-Up Area.
- 4.12 Policy EH2 supports energy generating infrastructure using renewable or low carbon energy sources to serve individual properties or groups of properties will be supported that:
 - a. The energy generating infrastructure is located as close as practicable and is in proportion to the scale of the existing buildings or proposed development it is intended to serve
 - b. The siting, scale, design and impact on heritage assets, landscape, views and wildlife of the energy generating infrastructure is minimised and does not compromise public safety and allows continued safe use of public rights of way
 - c. Adjoining uses are not adversely impacted in terms of noise, vibration or electromagnetic interference
 - d. Where appropriate, the energy generating infrastructure and its installation complies with the Micro-generation Certificate Scheme or equivalent standard.
 - e. Energy generating infrastructure is not located on Grade 1 or 2 agricultural land.

The National Planning Policy Framework (2021)

- 4.13 The National Planning Policy Framework sets out the government planning policies for England and how these are expected to be applied in plan making and decision taking. The Development Plan remains the starting point for decision making; however, where the existing plan is absent, silent or relevant policies are out of date then decisions should be taken after an assessment against the policies in the Framework taken as a whole.
- 4.14 The Framework sets out the purpose of the planning system is to contribute to the achievement of sustainable development (paragraph 7). Paragraph 8 sets out achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):
 - a) **An economic objective** – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right

time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

- b) **A social objective** – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
 - c) **An environmental objective** – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.
- 4.15 So that sustainable development is pursued in a positive way, at the heart of the Framework is a **presumption in favour of sustainable development (paragraph 11)** (*paragraph 10*).
- 4.16 Chapter 14 sets out the approach to meeting the challenge of climate change, flooding and coastal change. Paragraph 158 requires Local Planning Authorities to consider the following when determining planning applications for renewable and low carbon development:
- a) Not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and
 - b) Approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.

Climate Change Emergency

- 4.17 Arun District Council declared a climate emergency on 15th January 2020, and as a Council, pledged to be carbon neutral by 2030.

5. Planning Analysis

Introduction

- 5.1 In March 2020 the Chancellor announced a package of financial support to kick start economic growth impacted by Covid-19, by injecting investment and creating jobs in across the UK. As a result, the Ministry of Justice (MoJ) has been awarded funding to invest in low carbon technologies on its estate to help enable post Covid-19 recovery, reduce its carbon emissions, and maximise the social and economic benefits for the UK when transitioning to net zero by 2050.
- 5.2 As the second largest central Government estate, accounting for more than 20% of total Greenhouse gas emissions, MoJ is very clear on the important role it must play in meeting the net zero target, including working with Local Authorities to collaborate on priority Climate Emergency and Corporate Environmental initiatives.
- 5.3 This planning application is therefore critical to the MoJ achieving these important climate change objectives and targets, and is the result of the MOJ focusing a proportion of their low carbon technologies funding on the installation of ground mounted Solar Photovoltaic (PV) panels on MoJ owned land across their Prison estate, which will expedite the process of meeting these objectives and targets.

Principle of Development

- 5.4 First and foremost, the location of the application site is contained within the built-up area boundary of Yapton where Policy SD SP2 states that development should be focused and permitted subject to consideration against other policies of the Local Plan. Secondly, Policy ECC DM1 supports proposals for appropriately located renewable energy development and their ancillary development (subject to meeting certain site specific criteria addressed later in this section).
- 5.5 The location and principle of a ground mounted PV installation array and associated infrastructure is therefore accepted in adopted planning policy, subject to consideration against other relevant policies of the Local Plan.
- 5.6 The remainder of the planning analysis will consider these other relevant policy considerations in more detail to provide a comprehensive justification for the proposed development.

Renewable Energy Policies

- 5.7 Policy ECC DM1 Renewable Energy states that the Council will support proposals for appropriately located renewable energy development, and their ancillary development where they meet four criteria, which can be summarised as follows:
- a) located and designed to minimise adverse impacts to landscape, habitats, the historic environment and residential amenity including visual, noise and odour impacts;
 - b) the location and design to take account of the Council's landscape assessment and landscape sensitivity studies;
 - c) in relation to a. they should also be integrated well with existing development; and

- d) demonstrate a suitable connection to the electricity distribution network, or appropriate energy storage facility, and provide evidence to demonstrate that the connection will not result in unacceptable impacts upon the landscape, natural and historic environment or visual and residential amenity.

5.8 Each of the above criteria will be addressed in turn.

5.9 In relation to criteria a., a Landscape Opinion report and associated Concept Landscape Proposals, Preliminary Ecological Appraisal, and Heritage Opinion report have been produced to support the planning application, all of which demonstrate that the location and design of the proposed installation have no significant impact to the local landscape, habitats, or the historic environment. In summary:

- a) The location of the proposed solar arrays is currently an area of hard standing of negligible ecological importance within the boundary of the prison estate. The site has been identified as the most appropriate within the site to accommodate the arrays on the basis that the site is not surrounded by buildings which would impact on the solar PV generation as a result of overshadowing. There are no buildings to the south of the site, with the majority of solar panels southwards facing for maximum solar net gain. The proposed solar panels are, furthermore, located as close as practicable to the development they are intended to serve.
- b) The submitted Landscape Opinion report considers the Council's landscape assessment and landscape sensitivity studies and concludes that the mature shelterbelt which surrounds the prison complex to the north, west and south, and the prison buildings to the east of the site, provide significant screening from the surrounding area. Any views of the proposed development will be heavily filtered by this vegetation and be seen in context with the prison buildings. The only receptors with potential views are motorists on Ford Road, 220m east of the site, albeit, any views will be fleeting and seen in the context of the surrounding prison complex leading to only minor change to the character of views from these receptors.
- c) The development site is of low ecological value, and the applicant proposes to introduce 3no. bat boxes, 3no. bird boxes, species rich grassland, 1no. invertebrate habitat and 1no. hibernacula which will result in a 13.63% net gain in habitats at the site. The development will also deliver a 100% net gain in hedgerow, thus providing a net gain in biodiversity.
- d) The submitted Historic Environment report identifies that the existing prison complex is constructed on part of the former Ford Airfield, which is a non-designated heritage asset. This is the only identified heritage asset where there is potential for harm in terms of archaeology and setting. On this point, the Historic Environment report concludes that the undesignated asset is unlikely to experience significant additional change to its significance, therefore, any harm would be less than substantial (NPPF paragraph 196) owing to its limited extent. The Historic Environment report also concludes that the other identified designated and non-designated assets are not likely to have their significance affected.

5.10 The installation is also not located adjacent or close to any existing homes and will therefore have no impact on residential amenity. It will also not provide any electricity back to the National Grid; all energy generated from the panels will be used by the prison directly. Drawing DR-A-1300 Rev.6 demonstrates the route of the electricity cable and its connection points into the prison's electricity infrastructure.

5.11 Policy EH2 Renewable Energy of the Ford Neighbourhood Plan is very similar in its objectives to Policy ECC DM1 of the Local Plan in that it supports proposals for energy generating infrastructure using renewable or low carbon energy sources subject to proposals meeting five specific criteria. These criteria are set out below with a corresponding assessment of the proposed installation.

- a) The energy generating infrastructure is located as close as practicable and is in proportion to the scale of the existing buildings or proposed development it is intended to serve.

Drawing DR-A-1300 Rev.6 demonstrates that the PV installation is located within the built up area of the main prison complex so that it is able to effectively produce electricity to power the main prison. This means that it will be experienced within the context of the much larger scale main prison buildings and will not therefore be out of proportion with the scale or extent of the existing built form.

- b) The siting, scale, design and impact on heritage assets, landscape, views and wildlife of the energy generating infrastructure is minimised and does not compromise public safety and allows continued safe use of public rights of way.

A Landscape Opinion report and associated Concept Landscape Proposals, Preliminary Ecological Appraisal, and Heritage Opinion report have been produced to support the planning application, all of which demonstrate that the location and design of the proposed installation have no significant impact to the local landscape, habitats, or the historic environment.

No public rights of way are available to or across the site. Furthermore, the site lies within a secure prison estate with no access by the public. The solar compound will be fenced off with access only required for maintenance purposes. The potential risk of accidents is minimal, and no public rights of way will not be affected as a result of the development.

- c) Adjoining uses are not adversely impacted in terms of noise, vibration, or electromagnetic interference.

There are no neighbouring uses near the proposed PV installation meaning that they will not therefore lead to noise, vibration or electromagnetic interference.

- d) Where appropriate, the energy generating infrastructure and its installation complies with the Micro-generation Certification Scheme or equivalent standard.

The proposed development does not fall within the Micro-generation Certification Scheme. The panels will comply with Energy Performance Certificate requirements and Building Control Regulations.

- e) Energy generating infrastructure is not located on Grade 1 or 2 agricultural land.

The PV installation is proposed to be located on previously developed land within the main prison complex, which is not Grade 1 or 2 agricultural land.

5.12 The assessment of the proposed PV installation against the adopted renewable energy policies demonstrate that any impacts are (or can be made) acceptable, which in accordance with NPPF paragraph 158 should lead to this application to produce renewable energy being approved.

5.13 Approving the application will allow MoJ as the second largest Central Government estate to reduce its total greenhouse gas emissions in line with national policy to reduce carbon and

transition to low carbon energy sources. It will also make a positive contribution to the Council meeting its Climate Emergency commitments.

Other Relevant Policies

- 5.14 The application site is of low ecological value and drawing LUC-11357-LD-PLN-106 Issue C illustrates that the proposal will introduce 3no. bat boxes, 3no. bird boxes, species rich grassland, 1no. invertebrate habitat and 1no. hibernacula, and a 100% net gain in hedgerow. This will result in a 13.63% net gain in habitats at the site. The proposed development therefore conforms with Local Plan policies ENV SP1, ENV DM3, and ENV DM5.
- 5.15 Local Plan policies HER SP1, HER DM1 and HER DM6 seek to protect, preserve, and enhance the historic environment. An Historic Environment report has been submitted in support of this application. It identifies that the existing prison complex is constructed on part of the former Ford Airfield, which is a non-designated heritage asset. This is the only identified heritage asset where there is potential for harm in terms of archaeology and setting. On this point, the Historic Environment report concludes that the undesignated asset is unlikely to experience significant additional change to its significance, therefore, any harm would be less than substantial (NPPF paragraph 196) owing to its limited extent. The Historic Environment report also concludes that the other identified designated and non-designated assets are not likely to have their significance affected.

6. Conclusion

- 6.1 The Ministry of Justice (MoJ) is formally requesting planning permission from Arun District Council for a proposed ground mounted PV Solar Array installation and associated equipment that is required for operational purposes and is to be located on operational Crown Land within the boundary of the main HMP Ford prison complex.
- 6.2 This Planning Statement supported by the submitted drawings and accompanying documentation demonstrate the development can be supported and there are no technical reasons why the application cannot be approved. The site lies within the built-up area where development is supported in accordance with Local Plan Policy SP SD2 and Neighbourhood Plan Policy BAU1.
- 6.3 The development accords with the conditions of Local Plan Policy ECC DM1 and Neighbourhood Plan Policy EH2 in that the site is the most appropriate location for the proposed panels in close proximity to the prison estate on previously development land. The panels are located within the prison estate which it directly serves and located where it does not interfere with or impact on neighbouring uses. The panels are of a much lesser scale and extent than the existing prison complex and will therefore appear subservient and ancillary to this existing development.
- 6.4 This planning statement has demonstrated that any impact on landscape, views, heritage assets, and flora and fauna are (or can be made) acceptable in accordance with NPPF paragraph 158, and that the development does not compromise public safety and allows continued safe use of public rights of way. The development will not result in any pollution or nuisance impacts from noise, vibration or electromagnetic interference.
- 6.5 The development will also comply with building control regulations and energy certificate standards.
- 6.6 The proposed development will also deliver a +13.63% biodiversity net gain and +100% gain in hedgerows at the site.
- 6.7 The proposed panels will provide energy solely for the operational prison with the objective of reducing mains energy usage and offsetting carbon emissions. By investing in renewable energy, the MoJ can reduce their energy consumption at HMP Ford by up to 19.55% annually, thus contributing towards the national priority to move towards net zero carbon. The development supports the Council's Climate Change Emergency objectives and as such can look to be supported.
- 6.8 It is respectfully requested that planning permission is granted and issued as soon as possible to ensure this sustainable development can go ahead in line with the necessary project priorities and timescales.

Appendix 1 Arun Council Pre-application Response

Dear Ms Crisp,
Thank you for your email and enclosures. Based on the information provided I would anticipate that the proposal would find officer support if submitted as a planning application. However, I understand your preference is to submit an application for a Certificate of Proposed Lawful Use. On this basis we would expect any application to set out clearly through plans what is proposed and secondly, a statement outlining why you believe the proposal is Permitted Development.

Currently, we are experiencing a 25% uplift in the number of planning application received at the same time that we have lost personnel. Therefore, if you desire is to secure as speedy decision as possible then I would suggest that the MoJ enter into a Planning Performance Agreement with the Council to effectively pay an additional fee to allow us to hire in external resources to work on any application. This would be additional to the required application fee.

It is difficult to be precise about how much time would be required on a CLE application of this type (as opposed to a planning application) but I would suggest based on current rates for agency staff that a sum of £2000 would be sufficient. We are content to discuss this further if you require.

We have draft PPA templates to use to speed up the process.

Regards
Karl Roberts

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Appendix 2 Ground Mounted Photovoltaic Generation Short Form Specification

Ministry of Justice

Ground Mounted Photovoltaic Generation

XXXXXX-XXXX-MAC-MOJ-XX SP-SPEC-002

23/10/2020

(Short Form Specification - for planning application purposes)

MEP ENGINEERING

Revision	Issue	Originator	Approved	Date
01	Draft for Comment	AP	DSO	22 October 20
02	Final	PK		23 October 20

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1. Scope of works

1.1 General requirements

The project consists of a site survey assessment, full efficiency predictions, design, procurement, installation, testing, commissioning, certification, warranty and 1 year maintenance period of photovoltaic generation panels and associated infrastructure as described and specified hereafter.

The generated power has been specified to not exceed 75% of the minimum daytime load (defined as minimum power load between the hours of 10AM and 4PM). This is to ensure that all generated power will be utilised by the site to which the PV generation is connected, and no power is exported to the broader DNO network.

1.2 Proposed layout / connection to electrical infrastructure

The PV Generation System will be located as shown on the attached plan and shall be connected to the building's main switch board in the main Prison.

1.3 Photovoltaic Generation Hardware and Accessories

The data sheet for a typical panel that meets this specification is attached at Appendix 1.

The equipment shall meet the following minimum requirements:

- Panel efficiency minimum is to be 22%.
- Inverter with a manufacturer's warranty of not less than 10 years.
- A multifunction sub-meter to measure the output of the array shall be provided. The meter shall be digital with a readily available and easy to operate human interface. The meter shall provide an input into the Building Management System. Allow for the meter to be BACnet protocol compatible.
- A data logger with a GPRS modem for remote performance monitoring.
- Adequate on-site sensors or satellite-based data for irradiance and temperature.
- Maintain a measured annual Performance Ratio higher than 90% of the Predicted Performance Ratio.
- Meet all of the requirements set by the manufacturers of the Goods Warranted by a Manufacturer.
- The plant shall be designed and installed to minimise the cost of electricity generation over the plant lifetime, also commonly known as Levelised Cost Of Electricity (LCOE); compatibly with any relevant H&S, structural, planning constraints.
- PV electricity shall have priority over CHP electricity, where a CHP is installed.
- Individual string and inverter monitoring.
- GPRS to comply with Cellular Data Network Radio Equipment Directive.
- TCP/IP 2 way communication with secure central server. With network security to HTTPS, 128 bit encryption.

1.4 Mounting System

An example of a typical mounting system that meets this specification is attached at Appendix 2.

Mounts shall be specifically designed to support PV panels and have a guaranty equal or exceeding the PV panels guaranty itself.

Panel shall be oriented facing South or in Southward direction when South is not possible, and their pitch shall be selected to maximise power generation.

Spacing between rows of panels is to be allowed to minimise shading.

1.5 Meter Cabinet and Switchgear Enclosure

Cabinet and enclosure details to be confirmed.

1.6 Grid Connection

The Supplier shall be responsible for supplying and installing of all equipment required for connection of the PV generation to each site's electrical system and where necessary, any additional connection devices required by the Local Distribution Network Operator.

MoJ will initiate the grid connection application for the installation. Further liaison and approvals with the Local Distribution Network Operator shall be completed by the supplier and shall follow the approval route as detailed by the Local Distribution Network Operator. This shall include all application forms, design approvals and approvals for connection and commissioning.

Allow to provide synchronisation equipment within the PV system to synchronise with the mains, with any generator on site and with the combination of mains and generator.

1.7 Lightning Protection

The supplier shall produce a lightning protection risk assessment.

1.8 Surge Protection

The Supplier shall fit a Surge Protection Device to each string on the array side of the inverter. It is acceptable for this to be built into the inverter. Type of device shall be suitably selected for the risk associated.

The surge protection equipment shall conform to IEC61643-1, IEC61643-11 standard.

1.9 Security and perimeter fencing

Requirement for fencing to be determined by security risk assessment (health & safety and vandalism etc). If deemed necessary the PV panels area shall be made secure with the use of a fence. The meter cabinet and switch gear enclosure will be secured.

To be determined prior to application.

1.10 Signage and Labelling

The contractor shall install the required statutory signage. An information sign shall be installed, requirements to be agreed with MoJ.

As a minimum at the following locations in the installation:

- At the origin of the installation
- At the meter position, if remote from the origin
- At junction boxes
- At intervals along the cable route
- At the distribution board to which the generating set is connected
- At all points of isolation of both sources of supply

1.11 Fire Safety

Fire alarm audibility needs to be verified for the purpose of the construction phase (2-3 weeks on site, rather than short periodic maintenance access).

A suitable solution would consist of an audibility check and the installation of additional sounders prior to start of construction work.

Escape routes should be equipped re appropriate signage.

1.12 Sustainability, maintenance and spare parts

The general plant, equipment and materials shall be sourced from sustainable suppliers and manufacturers, without compromising quality, service or maintainability of the final installation.

All materials shall meet the relevant standards for each item as identified in the documentation and agreed with the Contracting Authority.

The Supplier shall ensure that all components can be easily accessed for maintenance activities and be able to be swapped out and replaced when and as necessary.

A minimum of a 10-year warranty is required on all major components along with details on the manufacturer of the panels and whether components are inter-changeable with other manufacturers should suppliers cease trading.

The Supplier shall provide one calendar year maintenance following practical completion. Extension to this initial one-year maintenance to be agreed with the MoJ.

1.13 Health and Safety

The Supplier and their supply chain shall always adopt working practices in accordance with the requirements of, but not limited to, the Health and Safety at Work Act 1974, CDM Regulations 2015, and the Electricity at Work Regulations 1989

Hazards associated with PV installation are outlined in the DTI's free manual, 'Photovoltaics in Buildings – Safety and the CDM Regulations'. The supplier shall provide full supporting Health and Safety Information with risk assessments and method statements with each proposed installation.

The Supplier shall provide a designer's risk assessment and installation method statements prior to commencement of works on site. The above documentation shall be submitted to the Contracting Authority for comments prior to commencement of the works.

The contractor shall provide a project specific Covid 19 Construction Management plan outlining their procedures and processes in that respect and in compliance with government guidelines and regulations.

1.14 Site compound

The Supplier's access, car parking, and compound requirements shall be agreed with the Contracting Authority before starting work.

The storage and site compound shall be maintained in clean & tidy order throughout the contract. Storage areas shall be reinstated to existing and good condition upon completion.

1.15 Deliveries

The Supplier shall include for the safe delivery to site of all materials and equipment for the installation of the complete System.

Where necessary this shall include for crane lifts, temporary material lifts, road closures and anything else to enable the works to be carried out including any local authority charges.

The Supplier shall provide within the method statement per each working location how the materials are to be delivered to site and any temporary storage facilities proposed.

At all times the Supplier shall understand, consider and respect the delivery constraints and timings for each individual site, location and Contracting Authority's requirements.

1.16 Builders and Civils Work

The Supplier shall be responsible for undertaking all builders and civils work in connection with the PV generation installation.

Holes through building structure for cabling shall be avoided where possible, however where this is impractical, prior to forming any holes, the Supplier shall consult with their appointed structural engineer then submit and agree with the Contracting Authority, the exact location of the penetration, including full weathering & fire stopping details.

Holes through walls and/or floors shall be filled, sealed and weatherproofed, with fire barriers added or reinstated. Filling of holes and decorations shall be made good to match existing.

Trenching and ground works shall be carried out in accordance with standards referenced in this document. Temporary supports and barriers for excavations are to be provided as required under the Construction Design and Management Regulations.

1.17 Reinstating Ground Works/ Haul Road

All trenching and any construction access reinstatement, supply of sand, ducts and installation of ducts shall be carried out by the Supplier and shall be to match existing and good standard or better upon completion.

If there is presence of water in the trenches, backfilling should not start until, and unless, the water has been taken out.

The backfilling shall be sufficiently compacted to ensure that the reinstated surface of the trenches will not collapse in future.

Surface finishing shall match, or better, the existing.

2. Performance Monitoring and Reporting

The Supplier will collect performance information of the Solar PV Installation on a daily basis through the transmission of data from the Meters, Inverters and Irradiance Sensors to the relevant online data monitoring system.

2.1 Energy Metering and Data Collection

The generation meter must be in accordance with the metering legislation as defined in the latest version of Ofgem's Guidance for Renewable Installations.

The supplier shall remotely monitor the plant for diagnostic and energy data collection via a data logger with GPRS communication. These will be within a tampered proof box with no signal of containing a GPRS device.

The supplier will need to react to any metering issues to rectify and ensure accuracy and quality of consumption data feeds are ongoing.

All metering consumption data must be made available for MoJ and GFSL for the duration of the Operation and Maintenance period. Data must be available on a "day+1" basis and with half-hourly granularity. Data must be made available as ".csv" file as a minimum, FTP data delivery is preferable. MoJ and GFSL can configure their system to accept different data layouts used in the .csv file itself.

2.2 Testing and Reporting

The following performance tests/reviews shall be carried out by the Supplier.

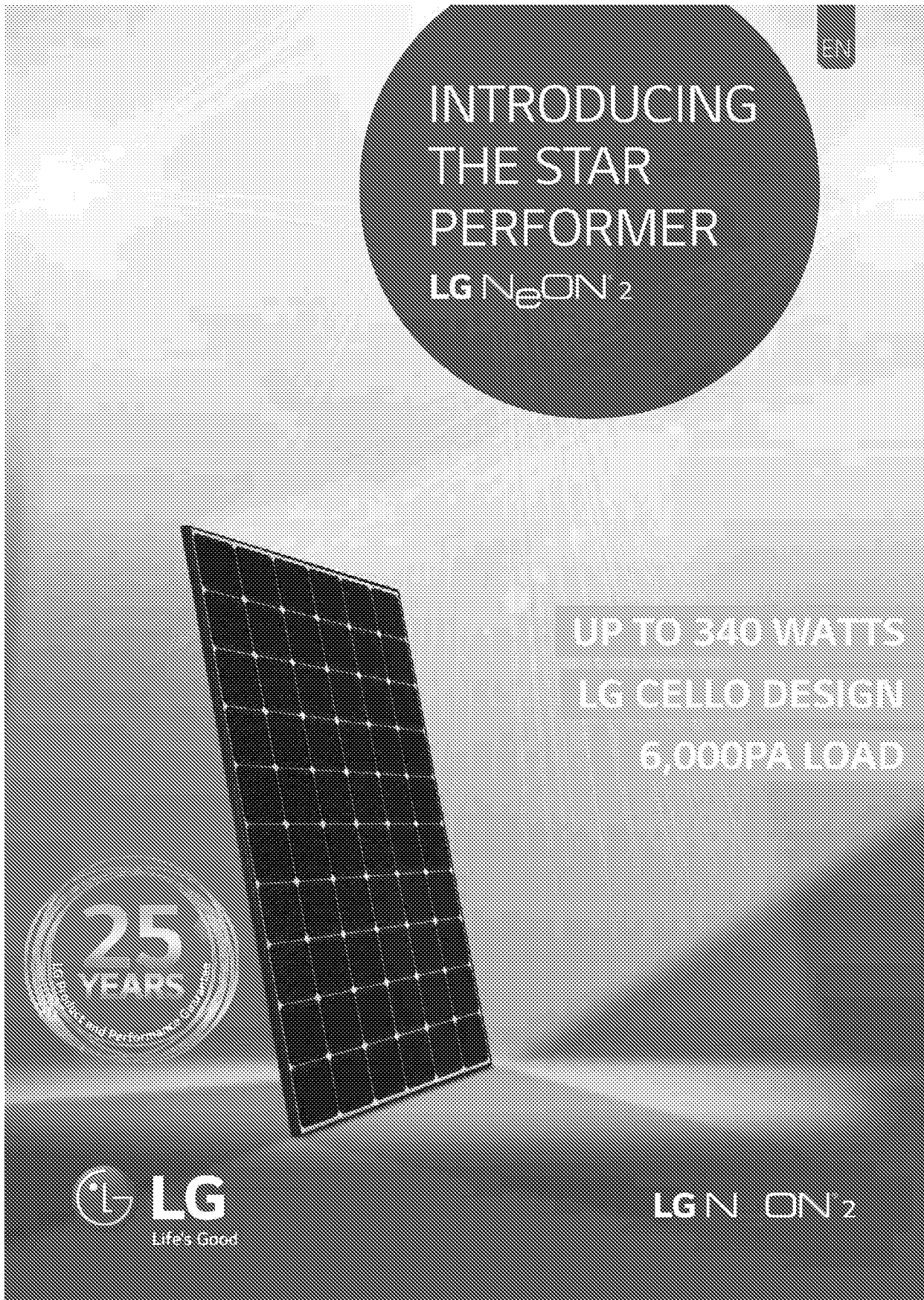
- Preliminary Acceptance Test (PAT)
- Monthly Performance Reviews (MPRs)
- Annual Performance Reviews (APRs)

If the Performance Ratio ('PR') -calculated in the PAT, MPR or APR- is equal to or higher than 90% of the Predicted PR then the performance of the Plant is deemed to be 'Acceptable'.

If the Performance Ratio -calculated for the PAT, MPR or APR- is lower than 90% of the Predicted PR then the performance of the Plant is deemed to be 'Insufficient'.

The Predicted PR is the predicted Performance Ratio. It is site/plant specific, it is based on design stage data and its value relative to a full year is stated in the Investment Grade Proposal (and the Power Purchase Agreement, where applicable).

Appendix 1 – Typical PV Panels Details



INTRODUCING
THE STAR
PERFORMER
LG NeON²

UP TO 340 WATTS
LG CELLO DESIGN
6,000PA LOAD

25 YEARS
LG Product and Performance Guarantee

LG Life's Good

LG NeON²

The advertisement features a large, dark circular graphic at the top center containing the text 'INTRODUCING THE STAR PERFORMER LG NeON²'. Below this, a solar panel is shown at an angle, with a '25 YEARS LG Product and Performance Guarantee' seal to its left. To the right of the panel, text lists 'UP TO 340 WATTS', 'LG CELLO DESIGN', and '6,000PA LOAD'. The LG logo and 'Life's Good' tagline are at the bottom left, and 'LG NeON²' is at the bottom right. A small 'EN' logo is in the top right corner of the ad.

LG NeON[®] 2

LG NeON[®] 2 – BETTER. MORE EFFICIENT. GUARANTEED.

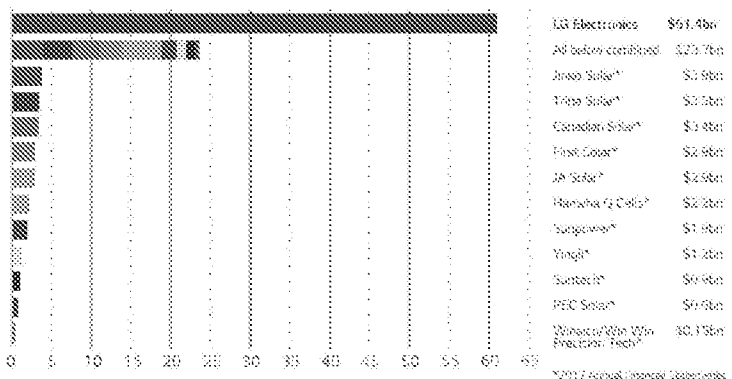
LG's NeON[®] 2 solar module now offers even more performance. Featuring a classy new design and with a total of 60 cells, it can withstand a load of 6,000Pa. LG is extending its product warranty from 15 to 25 years and improving its linear performance guarantee to at least 89.6% of nominal output after 25 years.

LOCAL GUARANTOR, GLOBAL SECURITY

LG Solar is part of LG Electronics, a global and financially strong company, with over 50 years of experience.

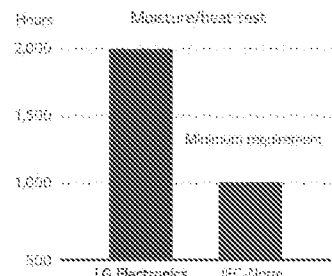
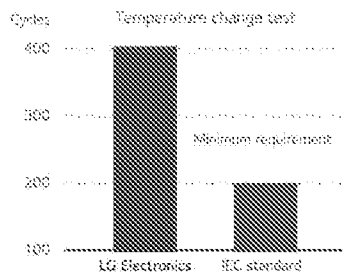
Good to know: LG Electronics is the warrantor for your solar modules. LG Electronics has been present in Europe with many local subsidiaries for decades.

The Warrantor's 2017 Global Sales in Billions of US Dollars



EXCELLENT QUALITY, INDEPENDENTLY TESTED

You can rely on LG. We test our products with double the intensity specified in the IEC standard. This quality is valued by installers across Europe, which is why they have awarded our LG solar modules the "Top Brand PV" stamp of quality for the highest recommendation rates for the fourth time in a row.

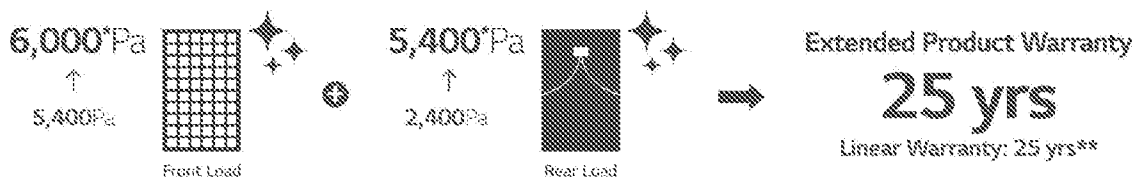


HIGHER OUTPUT, HIGHER YIELD

Semiconductor industry know-how is used to achieve a more even cell surface and thus increase efficiency up to over 21%. The module can evenly apply incident light from both the front and back of the cell, making LG NeON[®] 2 cells more efficient than conventional solar cells and producing a higher yield.

POWERFUL DESIGN, GUARANTEED ROBUST (LG STANDARD)*

With reinforced frame design, LG NeON[®] 2 can endure a front load up to 6,000Pa (represents snow height of normal snow of more than 1.8 meters) and a rear load up to 5,400Pa (represents wind speed of up to 93 m/s, compare max. wind speed of Hurricane Katrina 2005 of max. 75 m/s).



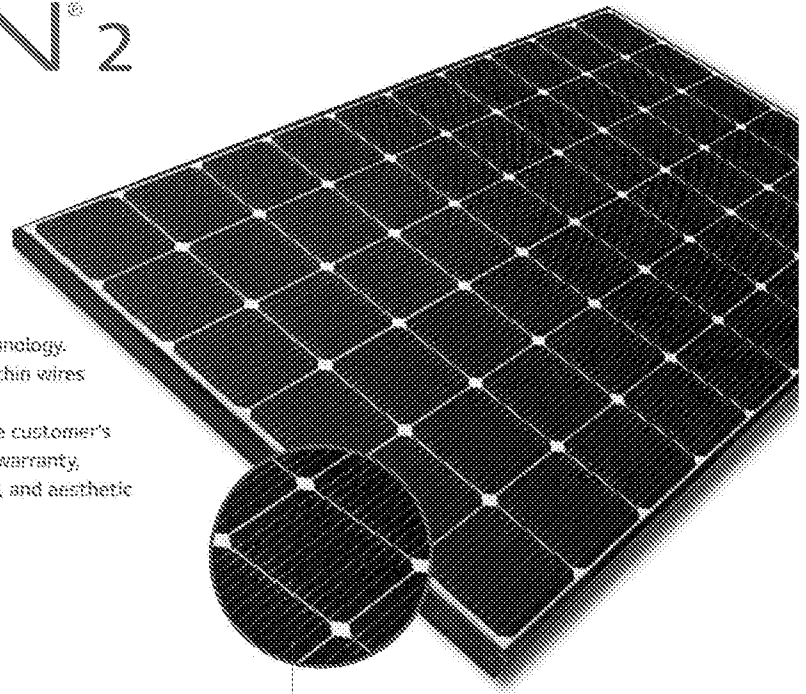
*Module fully complies with the new IEC 61215-2:2016 test procedures with confirmed 5,400 Pa front and 2,400 Pa rear side load. LG made internal tests to confirm 6,000 Pa front and 5,400 Pa rear side load also with new IEC 61215-2:2016 norms. Further tests are in going. Please, check restrictions on differently LG modules: 6,000 Pa / 5,400 Pa.
** 1) 1st year min. 88% 2) After 2nd year max. 0.30% annual degradation 3) Min. 89.6% for 25 years.

LG NeON²

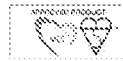
LG340N1C-V5
LG335N1C-V5

60 Cells

LG's new module, NeON², adopts CELLO technology. CELLO technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. NeON² demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



→ CELLO technology



KEY FEATURES



Enhanced Performance Warranty

LG NeON² has an enhanced performance warranty. The annual degradation has fallen from -0.5%/year to -0.35%/year.



Enhanced Product warranty

LG has extended the warranty of the LG NeON² to 25 years, which is among the top of industry standards.



Better Performance on a Sunny Day

LG NeON² now performs better on sunny days thanks to its improved temperature coefficient.



Double-Sided Cell Structure

The rear of the cell used in LG NeON² will contribute to generation, just like the front; the light beam reflected from the rear of the module is absorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global big player, committed to expanding its operation with the solar market. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first Mono² series in the market, which is now available in 22 countries. The LG NeON² (previous, Monix² NeON), NeON², NeON² B1 and NeON² B1 acid won the "Innovative AWARD" in 2013, 2015 and 2016, which demonstrates LG Solar's lead, innovation and commitment in the industry.

LG340N1C-VS LG335N1C-VS

LG NeON²

Mechanical Properties

Cells	6 x 70
Cell Vendor	LG
Cell Type	Monocrystalline/4-type
Cell Dimensions	161.7 x 161.7 mm
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	1,686 x 1,016 x 40 mm
Weight	17.1 kg
Connector Type	MC4/MC
Junction Box	IP68 with 3 bypass Diodes
Length of Cables	2 x 1,000 mm
Front cover	Tempered Glass with AR Coating
Frame	Anodized Aluminium

Certifications and Warranty

Certifications	IEC 61215-1/-2: 2016, IEC 61730-1/-2: 2016, PHCAS 18401, PV CYCLE, ISO 9001, ISO 14001, ISO 50001
Ammonia Corrosion Test	IEC 60719: 2013
Salt Mist Corrosion Test	IEC 61701: 2012 Severity G
Module Fire Performance	Class C, Fire Class 1 (Italy)
Product Warranty	25 years
Output Warranty of Peak (Measurement Tolerance $\pm 3\%$)	25 years linear warranty

* 1) 1st year min. 99%, 2) After 1st year max. 0.35% annual degradation
2) min. 89.1% for 25 years

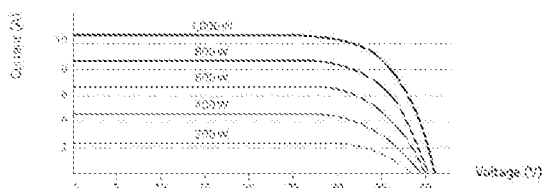
Temperature Coefficients

NOCT	42 $\pm$ 3 °C
Pmpp	-0.36 %/°C
Voc	-0.27 %/°C
Isc	0.03 %/°C

Electrical Properties (NMOT)

Model		LG340N1C-VS	LG335N1C-VS
Maximum Power Pmax	[W]	254	250
MPP Voltage Vmpp	[V]	32.3	31.9
MPP Current Impp	[A]	7.86	7.84
Open Circuit Voltage Voc	[V]	38.6	38.5
Short Circuit Current Isc	[A]	8.47	8.43

Characteristic Curves



Electrical Properties (STC*)

Model		LG340N1C-VS	LG335N1C-VS
Maximum Power Pmax	[W]	340	335
MPP Voltage Vmp	[V]	34.5	34.1
MPP Current Imp	[A]	9.86	9.83
Open Circuit Voltage Voc	[V]	41.1	41.0
Short Circuit Current Isc	[A]	10.63	10.49
Module Efficiency	[%]	19.2	19.6
Operating Temperature	[°C]	-40 ~ +90	
Maximum System Voltage	[V]	1,000	
Maximum Series Fuse Rating	[A]	20	
Power Tolerance	[%]	0 ~ +3	

* 1) STC (Standard Test Condition): Irradiance 1,000 W/m², Module Temperature 25 °C, AM 1.5.

Operating Conditions

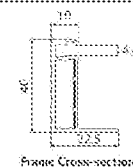
Operating Temperature	[°C]	-40 ~ +90
Maximum System Voltage	[V]	1,000 (IEC)
Maximum Series Fuse Rating	[A]	20
Mechanical Test Load* (Front)	[Pa / psf]	5400
Mechanical Test Load* (Rear)	[Pa / psf]	5400

* Manufacturer Declaration according to IEC 61215-1:2005 (Performance)
* Mechanical Test Loads: 5400 Pa / 4000 Pa based on IEC 61215-2:2016
(Test Load = Design Load + Safety Factor 1.55)

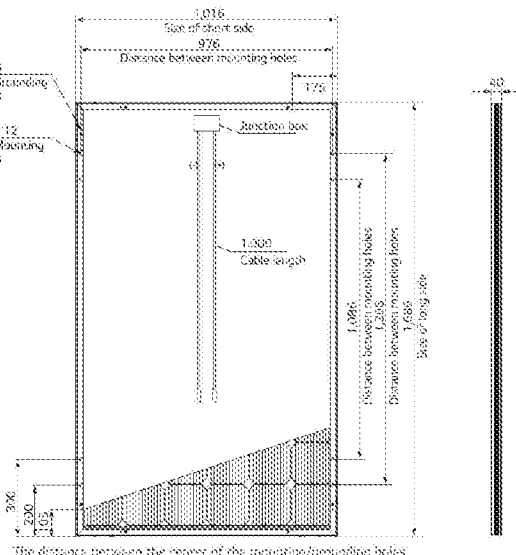
Packaging Configuration

Number of Modules per Pallet	[EA]	25
Number of Modules per 40ft HQ Container	[EA]	650
Packaging Box Dimensions (L x W x H)	[mm]	1,750 x 1,120 x 1,221
Packaging Box Gross Weight	[kg]	464

Dimensions (mm)



Front Cross-section



The distance between the centers of the mounting/grounding holes



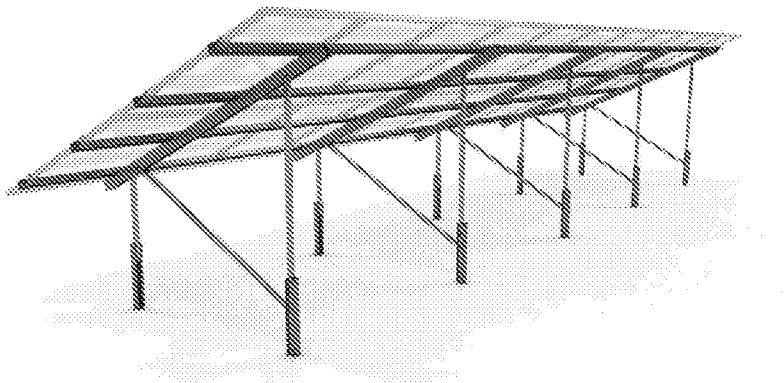
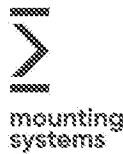
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All details in this data sheet comply with DIN EN 50339.
Subject to errors and alterations.
Date: 12/2018
Document: DS-N1C-VS-EN-201812

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Appendix 2 – Typical PV Panels Ground Mounting Details



2-Post Steel Precaster Datasheet

2-Post Steel

Flexible Standard

Tables can be designed differently through defined configurations, however by a flexible number of modules. The 2-Post Steel, combines the price of the steel outdoor system with material availability.

Proven New

The system is distinguished by an easy, functional design. The proven Clickstone-technology is used for the module fastening. Depending on the requirements, either posts or foot plates will be available.

Two Post

When it comes to the 2-Post Steel, a higher structural stability is ensured even when soil or load conditions are difficult. By means of foot plates and fixed anchors it is easy to can be mounted. Also lateral inclinations (in east-west direction) up to $\pm 10^\circ$ can be realized with 2 additional components.

High Availability

In order to implement small ground-mounting projects, we have a permanent stock of these components with a delivery time of a few days.

Maximum Service Life

Durability is a substantial feature for the 2-Post Steel. The selected materials provide effective and long-term protection. They guarantee high corrosion resistance for maximum service life.



Over Panel



Fixed Module



Optimized Panels



Optimized Panels

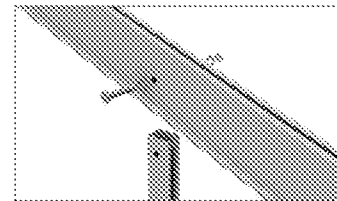


10
years
warranty

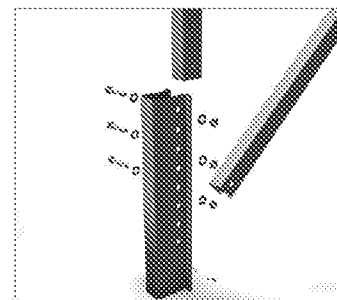
Operation Area	Ground mount		
PV-Modules	Framed		
Module Arrangement	Up to 20 m per rack unit		
Module Orientation ¹	Portrait, 2 modules on top of each other Landscape, 4 modules on top of each other		
Work Angle	20° or 25°		
Minimum Module Elevation to the ground	70-80 cm ²		
Max. ground inclination	Up to 10° in east-west direction		
Distance of the mounting in an east-west direction	After static calculation		
Standards	Eurocode 1 – Actions on structures Eurocode 2 – Design of aluminium structures		
Setting Options	Cap profile, Foot plates with fix anchors		
Frame Profiles	Stahl (S355, S350 (SD))		
Small Parts	Stahl galvanized, Stainless steel, Geomet-coated steel, Extruded aluminium (EN AW 2063 T66)		
Foundation	Low-resistance contact resistances between rack components without additional parts accessible		
Warranty	10 years ¹		

Configuration	Module	Foundation	Clamping	
2-Post STEEL 2 portrait			Clickstones	
2-Post STEEL 4 landscape				

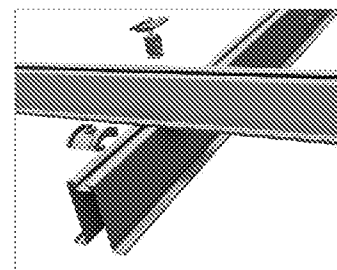
¹ Other arrangements available on request.

¹ Dependent on System, Inclination and Fixation to the Ground. For more details see technical system designs.
² Please find the exact terms in the Mounting Systems Strütt Warranty document.


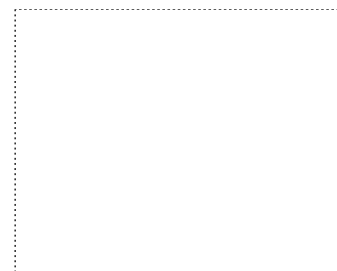
Connection detail support - rafter



Connection detail post



Connection detail module support



Whipstone

2-Post Steel 10-80-100

For further information: www.mounting-systems.com
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About Cushman & Wakefield

Cushman & Wakefield is a leading global real estate services firm that helps clients transform the way people work, shop and live. The firm's 45,000 employees in more than 60 countries provide deep local and global insights that create significant value for our clients. Cushman & Wakefield is among the largest commercial real estate services firms, with core services of agency leasing, asset services, capital markets, facility services, global occupier services, investment & asset management (DTZ Investors), project & development services, tenant representation and valuation & advisory.

To learn more, visit www.cushmanwakefield.com
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