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| **TSC - TECHNICAL SPECIFICATIONS FOR THE INSTALLATION & COMMISSIONING OF THE SOLAR PV SYSTEM UPGRADE 30kWp AT THE ADMIN BUILDING**  |

# **1. TECHNICAL SPECIFICATIONS**

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| **Item** | **Description of item** | **Specification compliance: Yes/No****(Indicate ‘Yes’ or ‘No’; describe deviation from requested spec)** | **Unit Price** | **Total Price** |
| **1.1** | The construction must include delivery, installation, certification and commissioning: |  |  |  |
|  | Installation of roof-top Solar **30kWp** PV System upgrade to the existing system at the admin building complying with the following specifications:* Solar modules 20 x 550Wp
* 10 kWp 3phase PV inverter
* 30 kWh battery storage
* 30kVA inverter (3 x 10kVA)
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| **1.2** | **AC Distribution** * Upgrade of electrical circuits, where necessary.
* Solar power to supply the main distribution board (DB) from the inverter room.
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| **1.3** | Any downtime when connecting new solar power to existing grid should be done after normal working hours (08:00 – 16:30), Monday to Friday) to avoid disruptions to activities on the campus. |  |  |  |

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| **1.4** | Installation of PV panels to be in most cost/energy efficient location:  |
| **1.5** | **PV system type** * Roof mount: Perform structural analysis on the roof to ensure the roof structure is fit for installation and to ensure the structural integrity of the building is not compromised.
* Roof type: IBR roof sheeting.
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| **1.6** | **Type of solar panels*** **Install** Mono-Crystalline PV modules, each solar module should have a maximum power output (Pmax) of 595 W. The selected Mono-Crystalline PV should be finalized in consultations with ARC-TSC personnel who supervise the construction.
* Solar PV panels should be installed on the roof with PV mounting structures facing northward and not exposed to shading.
* The solar panels placement must comply with building codes.
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| **1.7** | **Battery bank*** Install lithium-ion battery bank for a backup power of 2.5 hours (amount of backup 75 kWh: 2.5hrs x 30kWp = 75kWh).
* 30 kWh battery storage.
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| **1.8**  | **Electrical loads*** All lights and other critical loads (refrigeration, ice machines etc). Load isolation is critical. The electrical loads powered must be well balanced according to the expected solar output (30kWp).
* Loads will be split into 2 i.e., essential and non-essential loads.
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| **1.9**  | **System architecture*** The system should allow for seamless integration for future expansion of the PV and battery bank.
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| **1.10** | **Standby generator & UPS*** The system should allow for seamless integration with the existing standby generator and the UPS.
* During power outage, the generator will automatically replace the grid supply.
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| **1.11** | **Commissioning*** The PV system to be signed off by Professional Engineer (Pr. Eng.) or Professional Technologist (Pr. Tech.)
* PV solar system design must be approved by Pr. Eng. or Pr. Tech
* Letter of installation and commissioning approval from Eskom or municipality.
* Installation must have been performed under the supervision of a qualified electrician according to the approved design
* Electrician has to sign a certificate of compliance (CoC) for the installation
* Pr. Eng. signs off an as-built drawing, after system works as specified
* Installer or supplier provides any additional documents and reports for commissioning the PV system to client (ARC)
* All compliance certificates/electrical audit/municipality registration/permission and requirements according to current government regulations at time of commissioning.
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| **1.12** | **Miscellaneous** * All preliminary work, including draft technical drawings must be discussed with ARC personnel before construction begins.
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