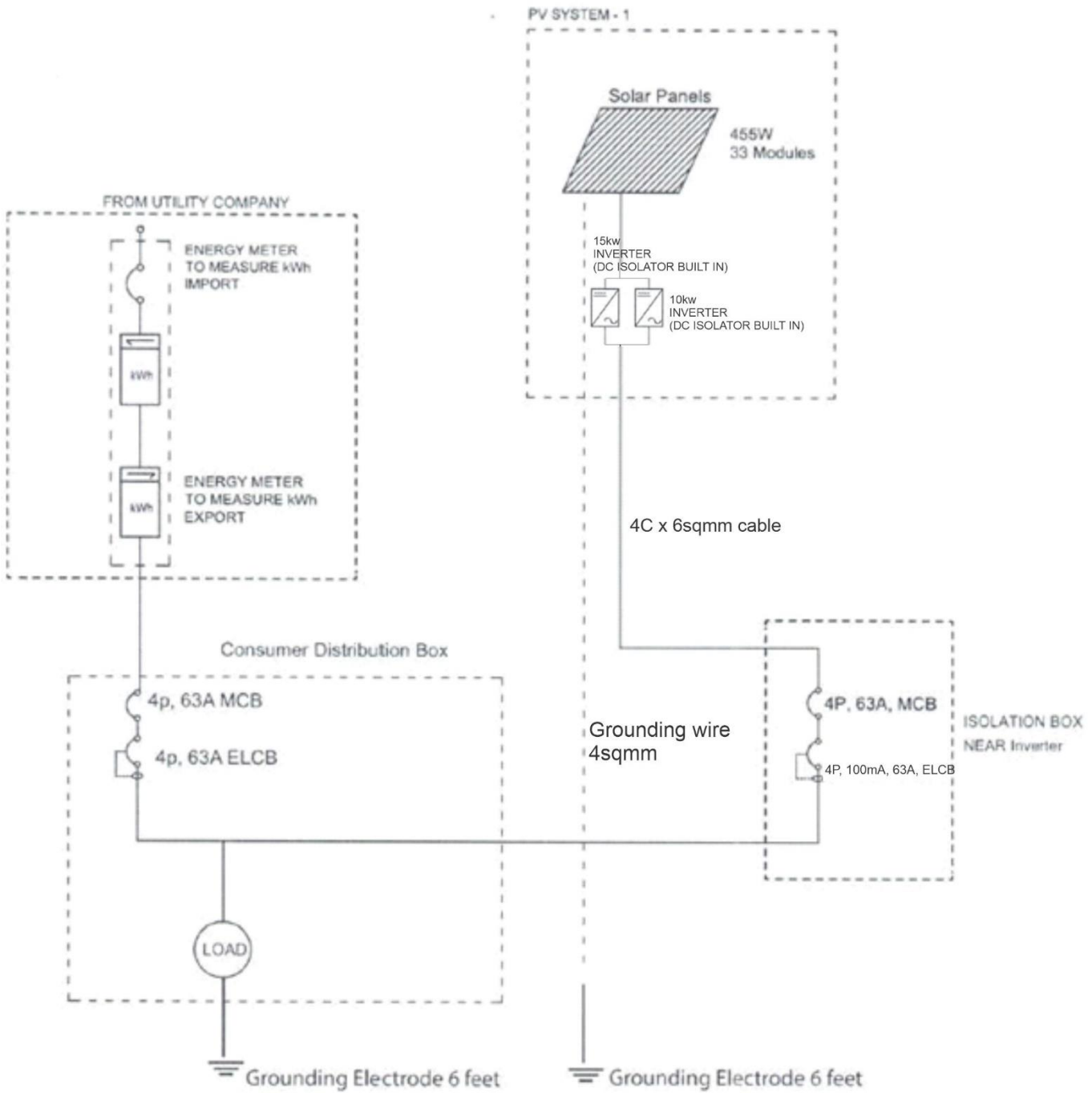
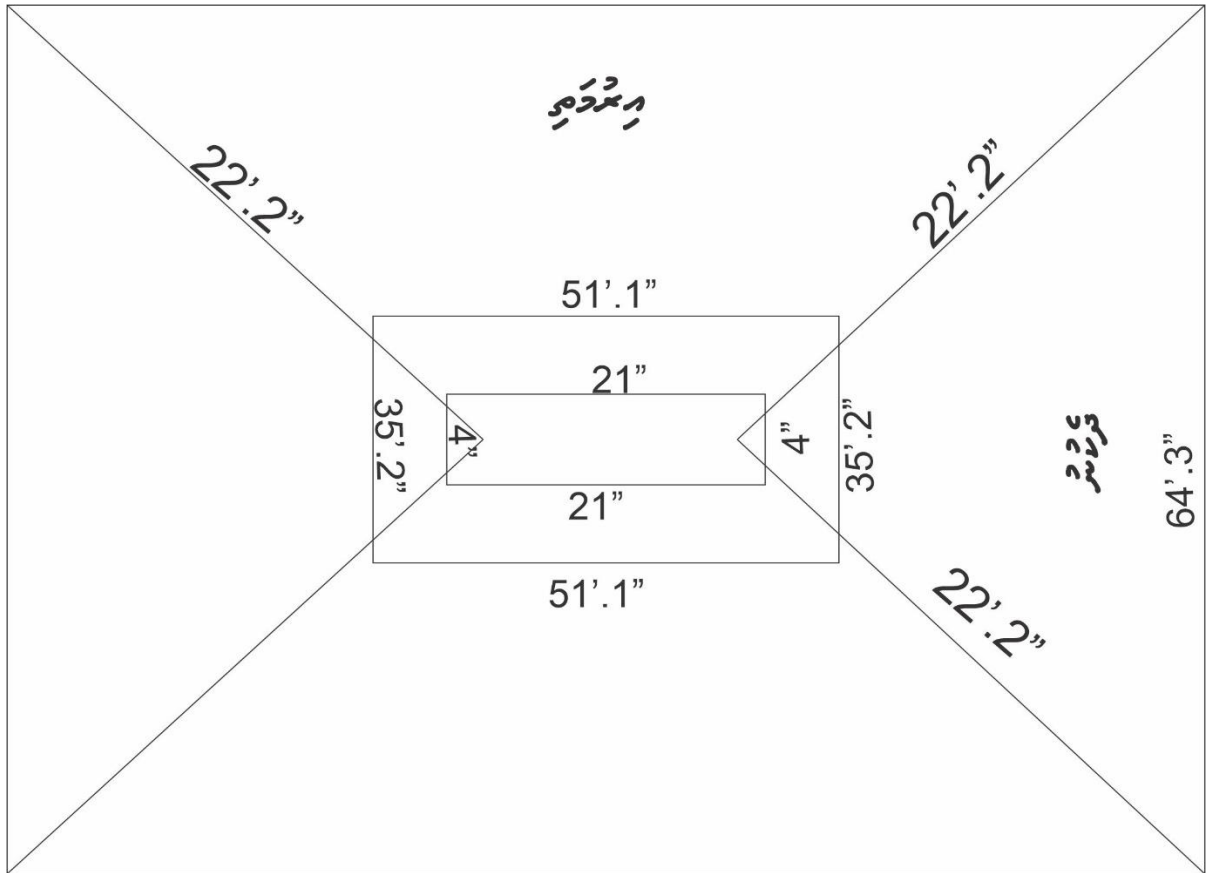
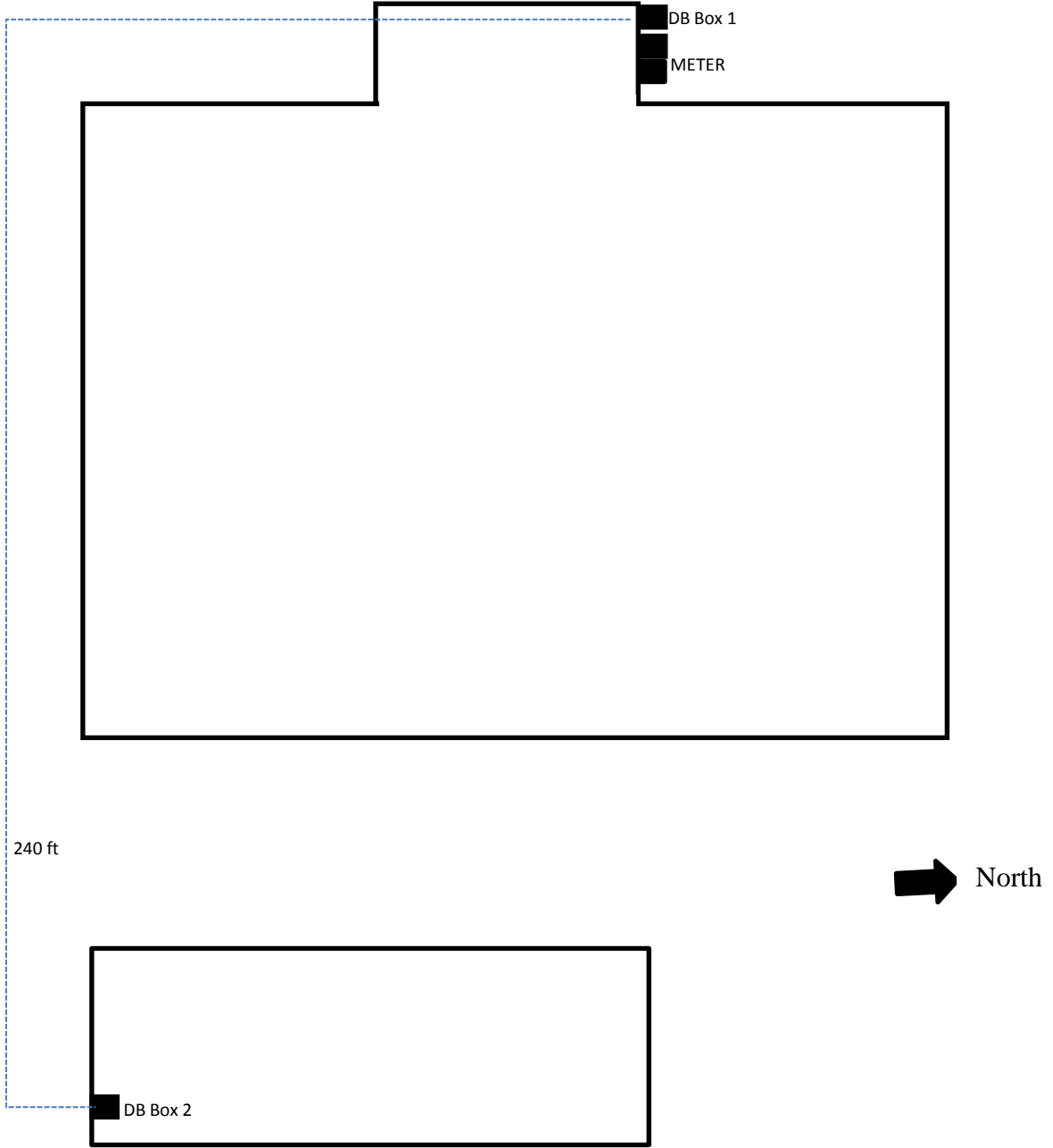


Single Line Drawing



پہلو 1 و 02 سے باقی: دوسرے قریبی دروازے کی اونچائی، دروازے کی چوڑائی





Requirements for major equipment

1- Photovoltaic (PV) module

- The PV module must qualify the latest edition of any of the following IEC PV module qualification OR equivalent to BS standards.
- The PV modules must qualify to IEC 61730-1 (photovoltaic (PV) module safety qualification – Part1: Requirements for construction) and IEC 61730-2 (photovoltaic (PV) module safety qualification – Part 2: Requirements for testing).
- PV modules must be suitable to be used in highly corrosive atmosphere throughout their lifetime and must qualify to IEC 61701 (Photovoltaic (PV) modules – Salt mist corrosion testing).
- The total power shall be obtained by strings of PV modules.
- PV modules shall be either monocrystalline OR polycrystalline.
- PV modules shall be in 1/3-cut cell layout Mono PERC technology.
- PV modules shall be PID resistant.
- PV modules shall be aluminum framed with hard face covers.
- PV module selection shall be made from state of the art of the PV technology with the best relationspace/production as possible.
- PV module brand/s should be declared with datasheet and justified.
- Stream voltages should be average voltage to avoid losses on low voltage transfer which increases the length of wiring and not too high to avoid magnetic field production with relevant thunder shot possibility.
- PV modules shall come to site properly tested and in good packaged to avoid any damage.
- PV modules shall be guarantee 20 years power performance with not more than 2% power degradation in first year and 0.55% annual power attenuation.
- PV modules shall be guarantee 10 years against any kind of production defect.

2- On -Grid Inverter

- The contractor shall supply all necessary on-grid inverters for the correct operation of the system and which allow for future expansion of the PV power plant in phases.
- The council expects the contractor to propose robust, reliable and low failure rate proven inverters which can work efficiently for more than 10 years without any major failure in hot and humid environments.
- The contractor shall provide details of the following characteristics for each inverter
 - i) Max input power
 - ii) Max output power
 - iii) Efficiency rating
 - iv) Protection features
 - v) Voltage and power ratings
 - vi) Communication capabilities
 - vii) Operating parameters
 - viii) Controls and displays
 - ix) Standards and certifications
- The inverters shall have an efficiency of 97% and above.
- The inverters shall have an inbuilt DC isolation switch.
- The inverters shall have surge protection.
- The inverter must have capability to monitor data.
- The inverters brands must be from one of the brands.
 - i) ABB
 - ii) Enphase Energy
 - iii) Huawei
 - iv) Fronius International GmbH
 - v) Ginlong Solis
 - vi) SMA Solar Technology AG



Warranty

- PV modules used must be warranted by the manufacturer for output wattage, which should not be less than 90% within the first 10 years and 80% at the end of 20 years.
- Inverter must be 5 years manufacture backed warranty.
- Contractor must be responsible for service warranty at least 2 years from the date of PV panel commissioning date.

