“CAESAREA” SUBSTATION
BATTERY ENERGY STORAGE SYSTEM

PREFabricated EQUIPMENT Container

SPECIFICATION

ATTACHMENT TO ANNEXURE "B"

This document shall be revised in its entirety only. All sheets of this document are the same revision.

REV. DATE DRAWER DESIGNER APPROVER DESCRIPTION

Released : REV.STATUS

For Bid : DEST.

XX - GENERAL P.S.  XX - GENERAL P.S.

CONCEPTUAL DESIGN - ELECTRICAL
BATTERY ENERGY STORAGE SYSTEM
PREFabricated EQUIPMENT Container
DATA SHEET

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
<th>SIGN.</th>
<th>SCALE</th>
<th>SIZE</th>
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<td>DRAWER</td>
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SERIAL NO. DRAWING NO.
3135 3135

XX0/00-E00-N00026-XX  00
1. **General**

Prefabricated equipment container (PEC) means mobile and modular construction for outdoor installation with all equipment mounted inside. It may be single container or consist of several construction parts. The equipment should be preferably factory mounted. Part of equipment may be erected on site after mobile structure transportation and installation. Prefabricated equipment container includes power and control equipment, lighting, HVAC, smoke exhaust and Fire protection systems with complete internal cabling. Transportation of PEC and it's erection on the foundation is included in the scope of work.

2. **PEC content**

<table>
<thead>
<tr>
<th>No.</th>
<th>Content</th>
<th>Document No.</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Energy storage battery pack</td>
<td>XX0/00-E00-N00021-XX</td>
</tr>
<tr>
<td>2</td>
<td>Power conversion system (PCS)</td>
<td>XX0/00-E00-N00022-XX</td>
</tr>
<tr>
<td>3</td>
<td>Power transformer</td>
<td>XX0/00-E00-N00023-XX</td>
</tr>
<tr>
<td>4</td>
<td>Medium voltage switchgear</td>
<td>XX0/00-E00-N00024-XX</td>
</tr>
<tr>
<td>5</td>
<td>Control and monitoring system</td>
<td>XX0/00-E00-N00025-XX</td>
</tr>
<tr>
<td>6</td>
<td>Lighting &amp; Power system</td>
<td>According to par. 5 of this document</td>
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<tr>
<td>7</td>
<td>Uninterruptible Power Supply (UPS) system</td>
<td>According to par. 6 of this document</td>
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<td>8</td>
<td>HVAC and smoke exhaust system</td>
<td>According to par. 7 of this document</td>
</tr>
<tr>
<td>9</td>
<td>Fire protection system</td>
<td>According to par. 8 of this document</td>
</tr>
</tbody>
</table>

3. **PEC installation**

3.1. PEC will be installed on raised on concrete foundation (columns), according to static calculations. Column Height is approximately 1m.

3.2. The foundation will be supplied by others.

3.3. The space under the PEC will be used for cables installation.

3.4. Contractor shall provide static calculations for the containers foundation and provide the signature of an engineer with an Israel license, with a building permit.

4. **PEC structure**

4.1. PEC shall be light industrial steel construction with thermal insulation.
The PEC shall be modular and include the following modules (sections):

- Energy Storage
- Power conversion system (PCS)
- Power transformer
- Medium voltage switchgear
- Control room
- Communication room

For PEC schematic view see supplement 5.3.1 (ELECTRICAL & CONTROL BLOCK DIAGRAM XX0/00-I00-N00001-XX)

4.2. Each section must be provided with separate access and be able to maintain the module without disassembling the other sections.

4.3. Control room area should take into consideration 6 m² areas for Purchaser equipment, for details see supplement 5.3.6 (XX0/00-E00-N00025-XX).

4.4. PEC area should take into consideration space for communication room (at least 6m² for 19" cabinet installation).

4.5. PEC construction fire resistance:
   - Floor, walls, ceiling - 2 hour
   - Doors - 0.5 Hour

4.6. Corrosion protection of PEC shall be according to ISO 12944, for C5M corrosion category.

4.7. Openings shall be provided suitable for cables entries.

5. **PEC Lighting & Power system**

5.1. Contractor shall design, procure, build, supply, install, wire and operate all necessary electrical distribution, lighting fixtures, sockets and electrical installation to make a complete lighting & power system for The PEC.

5.2. Lighting & power cabinet should be designed & constructed according to SI 61439-1,2.

   Lighting level inside the PEC is 300 Lux minimum and according to standard SI/CIE/ISO/DIS – 8995.

   Emergency Lighting will be designed according to EN/ SI 1838. Emergency lighting fixtures will be approved according to SI 20 part 2.22.

   All 230VAC sockets will be according to SI 32.

5.3. PEC lighting & power system include:

   5.3.1. Lighting & Power distribution cabinet 400VAC 3 phase, 50Hz, 10kA short circuit current, protection level- IP32, wall mounting.

   5.3.1.1. Contractor shall indicate the calculated current of the main circuit breaker and of every circuit. There will be at least 30% spare space in the cabinet.

   5.3.1.2. The Lighting & Power distribution cabinet will be located in the control room.
5.3.2. Indoor regular & emergency (include "EXIT") LED lighting fixtures, Outdoor LED lighting fixtures & Lighting switches:

5.3.2.1. Outdoor lighting shall be automatically switching by photocell (will be supplied as well). There will be at least one (1) outdoor lighting fixture above every door and at least one (1) on every side of the PEC.

5.3.2.2. Emergency lighting fixtures shall have at least two (2) years warranty.

5.3.2.3. Regular lighting fixtures shall have at least five (5) years warranty.

5.3.3. Service sockets in every room (at least two (2) sockets on every wall). All service sockets circuits will be protected by Residual Current Device, 30 mA type A.

5.4. Electrical installation shall be complete include fire retardant halogen free cables, cable trays, PVC/rigid conduits, junction boxes, etc.

5.5. If there is an area the PEC which defined as a zone with explosive atmosphere, all the electrical equipment should be certified as explosion proof according to relevant standard (ATEX, etc.) suitable for this zone.

5.6. Contractor shall supply a power consumptions table of the all electrical equipment in the PEC.

5.7. The whole electrical system of the PEC will be designed, constructed and checked according the Israel Electricity Law.

6. Uninterruptible Power Supply (UPS) system

6.1. UPS system shall be provided for power supply of the control circuit of the BESS.

6.2. UPS 230 VAC specification:

<table>
<thead>
<tr>
<th>Capacity</th>
<th>BESS loads +1kVA (IEC loads)</th>
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</thead>
<tbody>
<tr>
<td>INPUT</td>
<td></td>
</tr>
<tr>
<td>Voltage Range</td>
<td>400VAC 3 PHASE</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 HZ</td>
</tr>
<tr>
<td>Power Factor</td>
<td>&gt;0.92</td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>230±1% VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 HZ</td>
</tr>
<tr>
<td>Work Time In Battery Mode</td>
<td>30 min</td>
</tr>
<tr>
<td>Standards</td>
<td>IEC 62040-1, IEC 62040-2</td>
</tr>
<tr>
<td>BATTERY</td>
<td></td>
</tr>
<tr>
<td>Battery type</td>
<td>Maintenance free lead acid batteries</td>
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</tbody>
</table>
6.3. UPS Distribution Cabinet 230 VAC specification:

<table>
<thead>
<tr>
<th>CIRCUIT BREAKERS (CB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main CB</td>
</tr>
<tr>
<td>Output CBs</td>
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</table>

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<thead>
<tr>
<th>ENCLOSURE</th>
</tr>
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<tbody>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Color</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
<tr>
<td>Ingress Protection (IP)</td>
</tr>
</tbody>
</table>

6.4. UPS system should take into consideration 1000 W additional power for Purchaser's control, monitoring and communication equipment.

7. PEC HVAC system

7.1. HVAC units shall be inverter type units with cooling gas R410A.
7.2. HVAC system shall be designed to ensure 2x50% redundancy for each container section.
7.3. Required temperature condition:
   - Energy storage battery pack: temperature condition shall be defined by Contractor to provide 5 years at least energy storage life cycle, but not more 30°C.
   - Power conversion system +5…30°C
   - Power transformer +5…30°C
   - Medium voltage switchgear +5…30°C
   - Control room +20…25°C
   - Communication room +20…25°C

8. PEC Fire Protection system

8.1. The fire protection system (fire detection and extinguishing) inside the prefabricated equipment container is a part of complete fire protection system of the power substation.
8.2. All fire extinguishing systems within the scope of supply shall be designed and installed according to FM, NFPA regulations, State Fire Marshal codes and Israel Local Standards (include Israel Standard 1220 Parts 1 to 10) and according to Risk assessment demand.
8.3. All basic equipment proposed and planned for use must be formally listed and/or approved by the LOCAL STANDARDS INSTITUTION and at least by one of the internationally recognized testing laboratories as follows for example:

8.3.1. USA - UNDERWRITERS LABORATORIES ........................................ UL
8.3.2. USA - FACTORY MUTUAL ............................................................ FM
8.3.3. WEST GERMANY - VERBAND DER SACCHVERISCHERE............. Vds
8.3.4. GREAT BRITAIN - FIRE OFFICES COMMITTEE ...................... F.O.C.
8.3.5. CANADA - UNDERWRITERS LABORATORIES ......................... ULC
8.3.6. UK - LOSS PREVENTION COUNCIL ....................................... LPC
8.3.7. OTHER RECOGNIZED LABORATORY in consultation with IEC

8.4. Principal and detailed design of all systems shall be checked and approved by Israel Certified Laboratory.

8.5. The NEW system (complete) shall be checked and approved by Israel Certified Laboratory. A document shall be provided by contractor.

9. **Grounding & Lightning protection**

9.1 The indoor grounding system includes all grounding measures inside PEC, which prevent dangerous potentials on touchable metallic surfaces.

9.2 Main grounding copper bar 50x5mm shall be provided in the PEC. All equipment grounding conductors shall be connected to the main grounding bar.

9.3 Provisions for external grounding connections shall be provided. Two (2) external connections copper cable 95 mm$^2$ will be provided by others.

9.4 The PEC shall be a completely shielded metal enclosure and shall be able to withstand direct lightning strikes. The enclosure will be connected (by others) to the external grounding system. At least two (2) grounding pads shall be provided.