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| <div>CLIENT:</div> <div></div> <div>شرکت کهر انرژی سرجهان<br/>Gohar Energy Sirjan Co.,</div> | 60 MW Gohar Energy Sirjan Solar Power Plant |                 |          | <div>CONSULTAN:</div> <div></div> <div>شرکت مهندسی قدس نیرو<br/>GHODS NIROO ENGINEERING CO.</div> |
|                                                                                                                                                                               | SOLAR STRUCTURE TECHNICAL SPECIFICATION     |                 |          |                                                                                                                                                                                      |
|                                                                                                                                                                               | Project Code                                | DOCUMENT No     | Revision | Page 1 of 6                                                                                                                                                                          |
|                                                                                                                                                                               |                                             | 9108-ST-SPC-001 | 01       |                                                                                                                                                                                      |

# SOLAR STRUCTURE TECHNICAL SPECIFICATION

|      |               |                  |          |         |          |
|------|---------------|------------------|----------|---------|----------|
|      |               |                  |          |         |          |
| 01   | 2025.07.07    | IFA              |          |         |          |
| 00   | 2025.11.15    | IFA              |          |         |          |
| Rev. | Date Of Issue | Purpose Of Issue | Prepared | Checked | Approved |



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## 1. GENERAL

Solar Structure of site should be in compliance with two different technical specifications (Plot Plan and PV Module Datasheet). All of the power plant should utilize a fixed structure. The solar structures should be positioned so that the power plant site faces south, ensuring that the structures cover the entire width of the land. The design of the solar structures should comply with the standards mentioned in the design requirements section.

The solar structure must meet the standards for the region's weather conditions, including wind and snow loads. ASCE 7-22 standard for solar design based on the wind speed mentioned in the table below. If dimensions of solar panels do not meet geometrical limitation provided in section 29.4.5.1 of ASCE7-22, wind force shall be calculated from figure 27.3.4 for open building.

Wind load parameters for this project are determined in accordance with the 'Addendum to ASCE 7-16 According to Local Environmental Conditions in Iranian Building Codes. Specifically, the design wind speeds are extracted from Table A-26 of the mentioned addendum, considering a 300-year return period and Risk Category I.

Table A.26 continued –basic wind speed

| Location | Mean Hourly. (wind speed/50y)<br>m/s | 3s wind<br>Speed/300 y.r.p (m/s) |
|----------|--------------------------------------|----------------------------------|
| Sirjan   | 33.4                                 | 57.5                             |

All equipment related to the solar structure must comply with the solar panel manufacturer's instructions. If there are discrepancies, the manufacturer's instructions will prevail.

The distance from the lowest point of the panel to the ground should be at least 100 cm.

## 2. SOLAR STRUCTURE TECHNICAL SPECIFICATIONS

Proposed Solar Structure system of site should be in any case compatible to the Solar Panels and compatibility of the exact solar panel model should be approved on a written notice by vendor. The letter should accompany the technical and financial proposal of contractor. Other technical specifications should be as follows:

|   | Item                                 | Description                      |
|---|--------------------------------------|----------------------------------|
| 1 | Type of Structure system             | Bifacial Fixed Tilt              |
| 2 | Number of Poles                      | Two Pole                         |
| 3 | Max Pole Span (m)                    | To be calculated based on design |
| 4 | Panel Orientation                    | Portrait                         |
| 5 | Number of Panels on each table (Max) | Portrait: 2 x 27                 |

|                                                                                                                                                                             |                                             |                 |          |                                                                                                                                                                                     |
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|    |                                     |                                                                                                                               |
|----|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 6  | Length of Table                     | Two strings in case of portrait                                                                                               |
| 7  | Ground Clearance of Panels          | 100 Cm                                                                                                                        |
| 8  | Maximum height of panel             | To be calculated based on design                                                                                              |
| 10 | Related Standards                   | ASCE 7-22                                                                                                                     |
| 11 | angle                               | 26 Degree                                                                                                                     |
| 12 | Pitch (m)                           | 11m                                                                                                                           |
| 13 | Pile Profile                        | IPE,IPB,UNP -Cframe                                                                                                           |
| 14 | Pile Material                       | ST52 Steel                                                                                                                    |
| 15 | Ramming Depth                       | To be calculated based on design                                                                                              |
| 16 | Clamp/Bracket Material              | Aluminum (based on panel supplier endorsement)                                                                                |
| 17 | Bolt/Not material                   | At least Grade 8.8 (DIN 933/ AST325)                                                                                          |
| 18 | Type of Coating for Pile            | At least Hot Deep Galvanized (ATSM 123/ISO 1461) and See Note(the minimum coating thickness for pile must exceed 120 microns) |
| 19 | Type of Coating for bolt            | Zinc Flake (ISO 10683/EN 13858)                                                                                               |
| 20 | Type of Coating for other equipment | At least minimum coating thickness must exceed 80 microns                                                                     |
| 21 | Welding of Any Type                 | Not allowed                                                                                                                   |
| 22 | Structure Warranty                  | At least 10 years from COD                                                                                                    |
| 23 | Module Attachment                   | Direct mount to Panel Rail                                                                                                    |
| 24 | Type of Foundation                  | Pile                                                                                                                          |

NOTE: The galvanized coating thickness shall be calculated based on the chemical properties of the soil to ensure adequate corrosion protection. In any case, the minimum coating thickness for pile must exceed 120 microns and the minimum coating thickness for other equipment must exceed 80 microns.

- The structural design documentation must include the following items for review and approval:
  - Computational Files: Submission of the original structural analysis and design software files (SAP2000).
  - Design Calculation Report: A comprehensive report covering the structural analysis and design.
  - Connection Calculation Booklet: Detailed technical calculations and design specifications for all connections.
  - Structural Member Specifications: Documentation justifying the selection of wall thickness and corrosion protection type (Hot-Dip Galvanization) for the support posts.
  - Engineering Drawings: Submission of all structural and execution drawings in DWG format.
  - The solar structure design shall be specifically developed and approved for bifacial PV modules. Crossing purlins shall only be permitted in the central section of the panel corresponding to the location of the junction box.
  - All connections, bolts, nuts, washers, and associated hardware shall be delivered in clearly labeled, separable packaging approved. Bulk or loose shipment of these items is strictly prohibited.

|                                                                                                                                                         |                                                                                                          |                 |          |                                                                                                                                                                 |
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- The structure components shall be packaged at the manufacturing facility in a manner that prevents any damage during transportation and allows for straightforward unloading, storage, and handling at the project site.
- The structure shall be designed to incorporate dedicated cable ducts or conduits for solar cables associated with both the upper and lower strings of each table.