

TECHNICAL SPECIFICATION OF SOLAR POLYCARBONATE DRYER

1. Background and Justification

Maramche is located in a high-humidity, high-rainfall micro-climatic zone where open-air sun drying of agricultural produce and seeds is severely constrained. During peak harvesting seasons, the community experiences surplus leafy vegetable (Saag) production intended for Gundruk processing, alongside routine seed drying requirements for the local Community Seed Bank (CSB). To mitigate post-harvest losses, maintain seed germination viability, and ensure food quality standards, a structured Polycarbonate Solar Dryer is required.

2. Structural Design & Layout Overview

The proposed solar dryer is a tunnel/arch type polycarbonate greenhouse structure built on a concrete foundation. It features two double-tier drying racks inside, designed to maximize effective drying surface area while retaining an ergonomic central walkway.

General Structural Parameters

Parameter	Specification	Remarks
Footprint Area	3.0 m (Width) × 5.0 m (Length) = 15.0 m ²	Ground base area
Concrete Base Height (PCC)	0.2 m (20 cm)	Plinth height above ground level
Side Wall Height	1.7 m	Vertical frame clearance
Arch Curve Height	0.5 m	Semi-circular roof curve
Total Height (Apex)	2.4 m	Base to highest apex point
Covering Material	1.8 mm UV-Stabilized Polycarbonate Sheet	High heat retention & durability

3. Internal Layout & Drying Capacity

Drying Rack Specifications

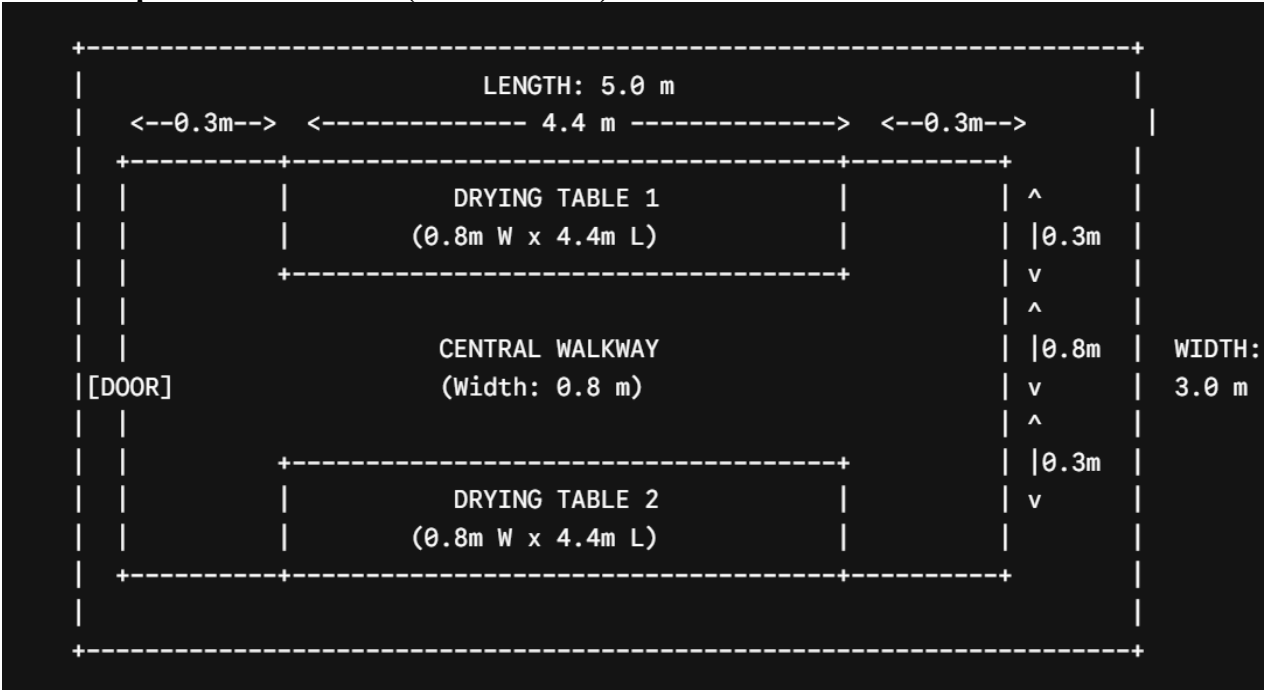
- **Number of Tables:** 2 parallel table structures running along the 5.0 m length.
- **Table Dimensions:** 0.8 m (Width) × 4.4 m (Length).
- **Levels / Tiers per Table:** 2 Levels (Double-tier structure).
- **Level 1 Height:** 0.8 m from ground – *Waist-level for zero bending strain.*
- **Level 2 Height:** 1.25 m from ground – *Chest-level for easy tray handling without reaching/straining.*
- **Vertical Gap Between Tiers:** 0.45 m – *Provides ample space, light, and airflow for Level 1 trays.*
- **Clearance above Level 2:** ~0.45 m-0.50 m gap to the start of the roof arch curve.
- **Total Effective Drying Area:** 2 tables × 2 tiers × (0.8 m × 4.4 m) = **14.08 m².**

Internal Walkway and Clearances

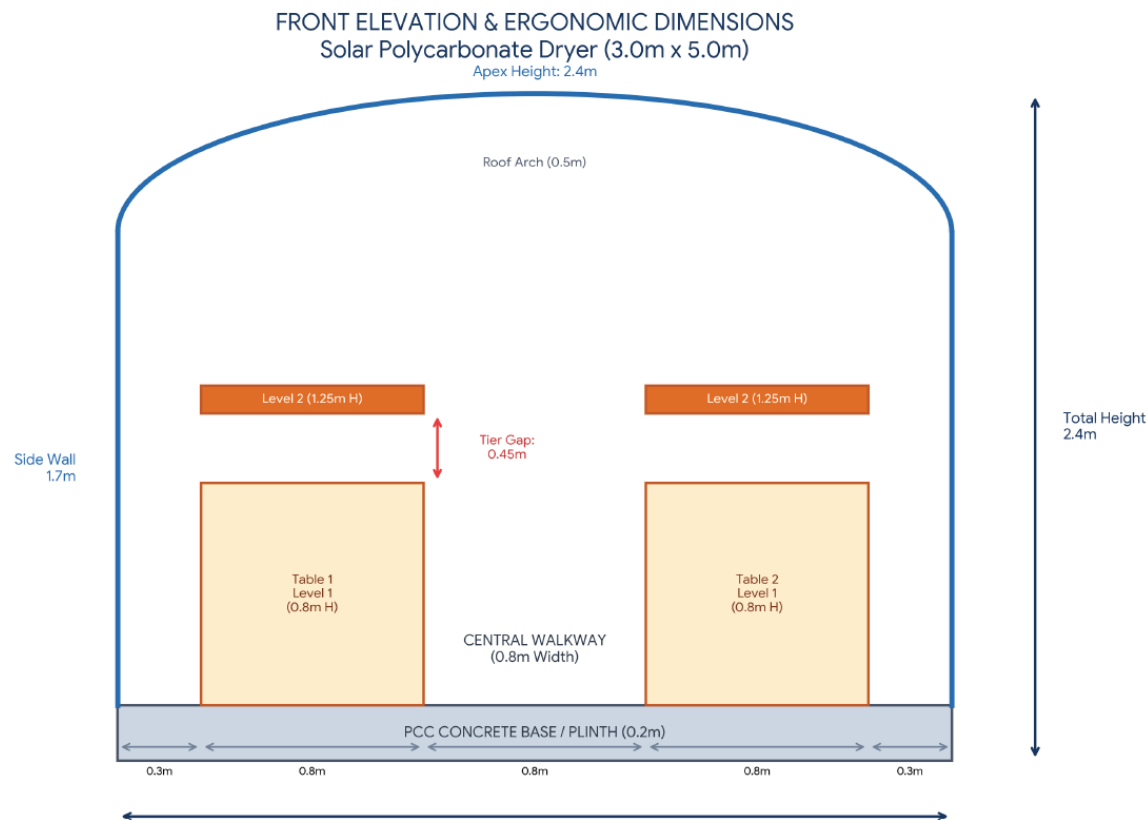
- **Central Walkway Width:** 0.8 m (For comfortable passage with crates and trays).
- **Side Clearance (Wall to Table):** 0.3 m gap on both outer edges and ends for airflow and maintenance access.
- **Door Placement & Size:** 0.9 m width entry door located at the front end facing the central walkway.

4. Schematic Layout Diagrams

A. Top-Down Floor Plan (3.0 m × 5.0 m)



B. Front Cross-Section Elevation View



5. Bill of Quantities (BoQ Estimate)

S.N.	Item Description	Specification/Unit	Estimated Qty
1	Site Clearance & Foundation Base	Job (Site Prep + PCC Concrete base 0.2 m)	1 Job
2	MS Pipe 2" (Main Frame Columns)	Heavy Duty Structural Columns	~38 kg
3	MS Pipe 1.5" (Truss, Purlins & Door)	Arch Frame & Cross Structural Support	~75 kg
4	Polycarbonate Sheet (1.8 mm)	UV Stabilized Transparent Sheet	~260 sq. ft
5	Polycarbonate Fitting Accessories	Aluminum profiles, Rubber Gaskets, Screws	1 LS
6	MS Angle Frame 1" (For Tables)	Double-tier Drying Table Framework	~60 kg
7	Wire Mesh (Jali / Food-grade)	For Drying Trays / Surfaces	2 LS
8	Exhaust Ventilation Provision	12-inch Exhaust Fans (DC Solar or AC)	2 Units

6. Mandatory Quality & Functional Requirements

- **Moisture Management:** Due to Maramche's humid climate, the structure must include 2 exhaust fan cut-outs/provisions near the top gable to extract humid air continuously.
- **Drying Tray Mesh:** Drying surfaces must use non-corrosive, food-grade wire mesh suitable for direct contact with leafy green vegetables and agricultural seeds.
- **Structural Anchorage:** Main columns must be embedded into the PCC foundation to withstand high wind pressure in mountainous terrain.