Terms of Reference (ToR) for implementation of Passive and Active Cooling Strategies for a warehouse

Title	Implementation of Passive and Active Cooling Strategies for an Agri warehouse
Timeline	3 weeks
Expected area of expertise	• Project management with a minimum of 3 years' experience. • Experience in designing and retrofitting storage, retail, and office spaces. • Knowledge of ventilation aspects for a large storage facility. • Knowledge of sustainable and energy-efficient design principles and practices.
Apply Link	https://forms.gle/98gdJsMrdgdbXHGd8 (Contact Procurement for Form Link)

About SELCO Foundation

SELCO Foundation's mission is to create a platform of solutions that uses sustainable energy as a catalyst to bridge environmental sustainability and poverty alleviation. With holistic development as the primary focus, the organization strives to create equitable societies, where services are accessed by all communities. The interventions of SELCO lead to a sustainable delivery model of essential services like livelihoods, education, and health till the last mile. (Read more about SELCO here: http://www.selcofoundation.org/)

About Built Environment

The aim of the built environment program is to democratize access to design of livable habitats to address poverty and climate challenges in a climate-stressed world by integrating energy optimization through an ecosystem approach. Underserved communities are usually at the receiving end of the worst impacts of climate change coupled with improper ventilation, natural lighting and thermal conditions; the cost of building resilience and comfort is generally high. The overall energy performance of built environments is influenced by people, units and climate. Hence, innovations need to integrate energy optimization in the application of technologies and the environment of built spaces.

1. Background

The warehouse located near Agara lake, Siddanapalya, Bangalore, facilitates the collection, grading, packaging, and branding of a variety of products, including grains, pulses, fruits, and vegetables. The warehouse, constructed as a portal frame structure, spans 200 feet in length, 100 feet in width, and has a height of approximately 30 feet. It is divided into three functional sections:

- Storage for dry commodities
- Branding and packing of dry commodities
- Packing and branding of fruits and vegetables

Each section includes dedicated office spaces for billing and warehouse management activities.


2. Problem Statement

The warehouse experiences excessive heat stress and limited ventilation, leading to the following challenges:

- Workers experience significant thermal discomfort, particularly during summer and monsoon seasons.
- The warehouse environment is stuffy and lacks adequate airflow.
- Commodities lose moisture, reducing their weight and potentially degrading their quality.

3. Observations

- The warehouse consists of a 10 ft high dado wall, with the remaining structure made of Pre-Painted Galvanized Iron (PPGI) sheets.
- The roofing material is white-colored PPGI, integrated with skylights and 16 turbo ventilators.
- The PPGI sheet walls are dark in color, which contributes to increased internal temperatures.
- The industrial High Volume Low Speed (HVLS) fan is installed too high, pushing hot air downward rather than improving circulation.
- Turbo ventilators are insufficient to extract the trapped hot air due to the warehouse's large size.
- Windows are installed at a height of 3 ft with a height of 4 ft, but no additional openings exist above the window level, restricting cross-ventilation.

4. Scope of Work

The consultancy shall be responsible for the supply, installation, and implementation of passive and active cooling strategies, including:

- **Installation of Exhaust Fans:** Supply and installation of ten (10) exhaust fans with a capacity of 150 AF / 3000 CFM.
- **Fabrication and Base Frame Support:** Construction of a base frame support for exhaust fans, including wall cladding sheet modifications and a suitable protective box around each fan.
- **Louver Installation:** Supply and installation of standard louvers without mosquito mesh using 0.55 mm thick PPGL sheet.
- **Electrical Wiring:** Complete electrical wiring to support the new exhaust fans and ventilation improvements.
- **Application of Heat Reflective Paint:** Coating of the warehouse metal walls (200 ft x 100 ft) with heat reflective paint to reduce internal temperatures.
  Note: Roof is made of white PPGI sheets.
- Painting of Polycarbonate sheets (20No.s) with Half white color (Waterproof paint)

5. Deliverables

The consultancy shall deliver the following:

- Fully installed and operational exhaust fans and louvers as per specifications.
- Properly fabricated and installed base frame supports for the exhaust fans.
- Fully connected and functional electrical wiring for the installed fans.
- Applied heat reflective paint on the warehouse roof.

6. Reporting and Supervision

The consultancy shall work under the supervision of the warehouse management team, providing regular progress updates and ensuring quality implementation of the proposed cooling strategies.

Note:

- Orientation and discussion sessions to be held with the Built Environment team of SELCO Foundation at every stage of the process.

7. Timelines:

3 weeks for stakeholder meeting, site visit, understand the scope of work, producing drawings/ details as required, Procuring necessary material and implementation

8. Eligibility Criteria:

- Individual or agency that has experience in designing and implementing storage/warehouse facilities, commercial spaces and offices.
- Individual or agency that has overall 3 years of experience in designing and implementation.
- Individual or agency that has worked on context suitable and cost-effective designs.
- Individual or agency should have construction network in the given geography.

9. Selection Criteria:

The proposal will be evaluated based on the following general areas:

- Agency will be evaluated based on prior work experience/ portfolio.
- Agency to understand the core value and mission of the organization, SELCO Foundation.
- Agency to have a qualified team with relevant experience.
- The financial proposal will be evaluated based on approach & work plan, prior work experience, expertise, cost, and proposed payment terms.

10. Payment Terms:

Fixed as per the agreement between consultant and SELCO Foundation. Please provide your proposal and quotation for the above-mentioned program requirements. Capture Timelines and Split cost wherever possible.

1. Please provide a break-up of the costs as agreement quotation for the service provided on an official letterhead with signatures and stamps, wherever needed.
2. Kindly mention your name, address, contact information along with correct bank details and signature in the agreement quotation.
3. Please note that the prices quoted by the consultant are firm, final, and binding and not subject to variation on any account.
4. The quotation is inclusive of all necessary taxes and applicable costs.
5. Other than the proposed amount, no additional amounts will be paid for fuel, phone charges, etc.
6. Deliverables need to be submitted as per the given timeline or before the expected date.

Payment Timeline:

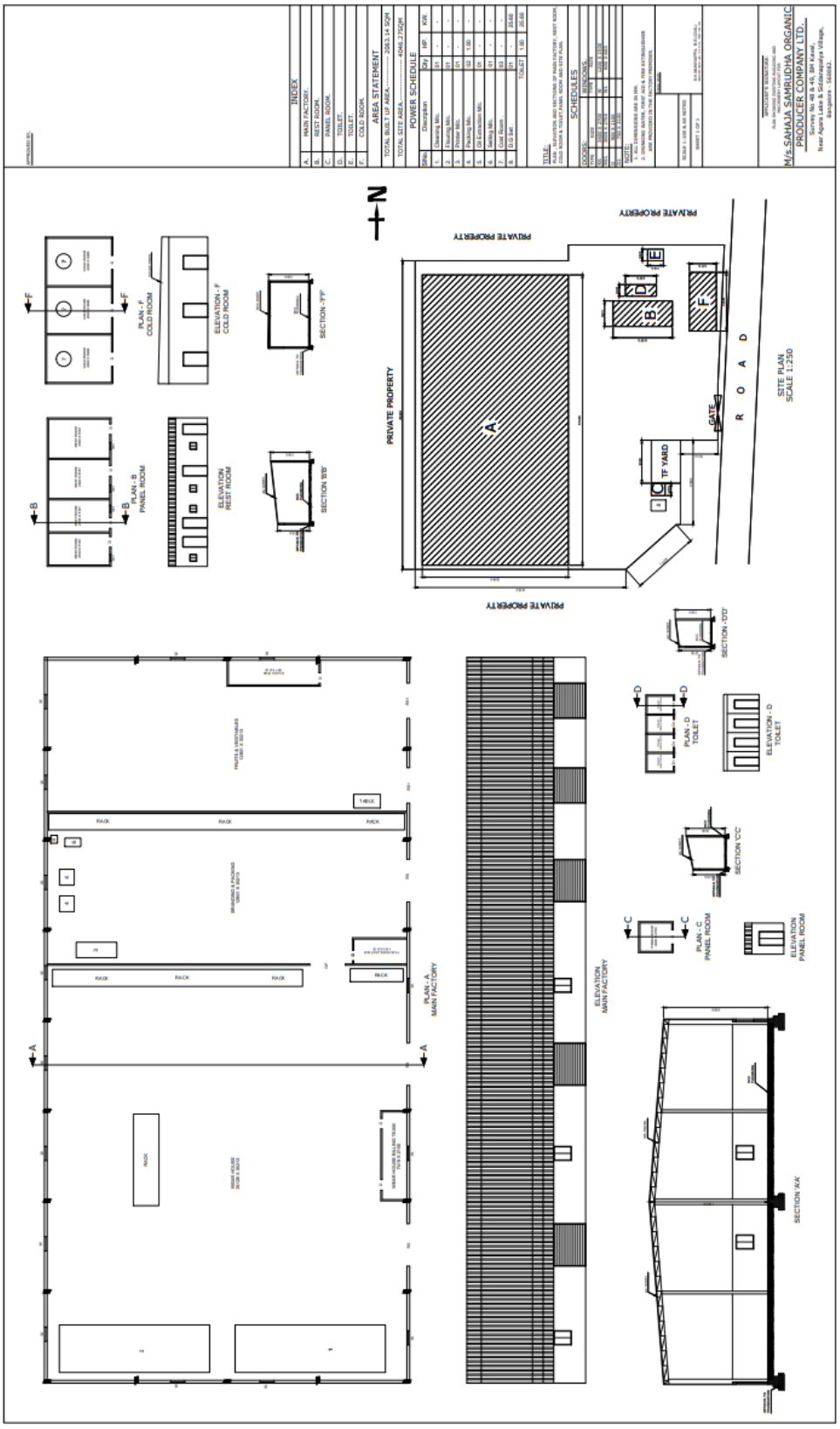
First payment instalment:	**40%** advance payment.
Second payment instalment:	**60%** upon submission of all deliverables

To apply

Interested consultants / organizations, with relevant experience (please include samples and/or references of the previous similar work as proof of experience) and based out of India are requested to reach out with a detailed proposal giving a brief on the methodology and the process they will uptake for this project, including design remuneration (per. Sq.ft), milestones and submit the same to google form https://forms.gle/wJwttLVweRAVbU8w6 on before **17th February 2025.**

Any further queries please write to **procurement@selcofoundation.org** with a subject line: **"Implementation of cooling strategies for Agri warehouse"** (Name of Project)

Annexure A: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