ENGINEERING SERVICE AGREEMENT

BETWEEN

KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY (KITECH)

AND

GOLDEN HORN TECHNOLOGY LTD.

This ENGINEERING SERVICE AGREEMENT (hereinafter referred to as this “Agreement” is made and entered into by and between the Korea Institute of Industrial Technology, having a place of business at 89 Yangdaegiro-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnam-do, 31056, Republic of Korea (hereinafter referred to as “KITECH”), and Golden Horn Technology Ltd. with a primary address of 43 MIRPUR ROAD, NEW MARKET, DHAKA, Bangladesh (hereinafter referred to as “GH”).

WITNESSETH:

WHEREAS, the Korea Institute of Industrial Technology (KITECH) is conducting a technical assistance project titled *"Feasibility research of Solar Electric-Based Cold Warehouse equipped with Low-temperature Latent Heat Material for Fruit Storage in Bangladesh Climate Conditions"* supported by the United Nations Climate Technology Centre & Networl (CTCN); and

WHEREAS, KITECH has approved Golden Horn Technology Ltd. (GH) as the engineering service provider for the "Installation of 29 kW Solar PV System for the Cold Storage Facility" (hereinafter referred to as the “Engineering Service”); and

KITECH and GH may be referred to as a “Party” individually and the “Parties” collectively.
NOW THEREFORE, in consideration of the premises and mutual covenants set forth herein, the Parties agree as follows:

Article 1 (Scope of Engineering Service)

GH agrees to use reasonable efforts to carry out the construction and performance evaluation of a 29 kW solar PV system for the cold storage facility in Bangladesh.

Article 2 (Term)

This Agreement shall commence on August 14, 2025, and shall remain in effect until October 17, 2025, unless earlier terminated or extended by mutual written consent of the Parties in accordance with the provisions set forth in this Agreement.

Article 3 (Payment of Engineering Service Expenses)

a) In consideration of engeering services to be performed pursuant to this Agreement, KITECH shall make a fixed payment in the total amount of US Dollars $31,000 (grant amount including tax) (Payment will be in US Dollars, 70% payment after contract completion, 30% payment after completion of inspection). The invoice (electronic version for the payment shall be sent from GH to KITECH (refer to the financial contact point in Exhibit A) for the remittance process within thirty (30) days after the execution of this Agreement. The invoice shall include the information on the “Payment Information” in Exhibit A.

b) The invoice (electronic version) for the payments stated on a) shall be sent from GH to KITECH (refer to the financial contact point in Exhibit A) for the remittance process. The invoice shall include the information on the “Payment Information” in Exhibit A.

c) All payments will be made in US Dollars and KITECH shall be responsible for all wire transfer fees.

Article 4 (Interpretation of Contract and Objections)

The contracting party shall supply all goods and services specified in the contract. For any matters not stipulated in this specification, or for any ambiguous or unclear provisions, the interpretation and opinion of the Korea Institute of Industrial Technology shall prevail.

Article 5 (Responsibilities of the Contracting Party)

The Contracting Party shall be responsible for the overall production, inspection, transportation, installation, and trial operation of the goods (equipment). All components shall maintain sufficient strength and performance and shall not be damaged or deformed under normal operating conditions.

The Contracting Party shall obtain prior approval from the Korea Institute of Industrial Technology for the production drawings before commencing the manufacture of the test equipment.

In the event that any components or parts required under the contract are omitted or missing at the time of delivery, the Contracting Party shall deem them included in the scope of the contract and shall deliver them accordingly without additional cost.

The Contracting Party shall be liable for any issues, including defects, that arise in the delivered goods (equipment) after the execution of the contract.

The Contracting Party shall ensure that no infringement of third-party intellectual property rights arises in connection with the design, production, testing, delivery, or maintenance of the goods (equipment). In the event of such an infringement, the Contracting Party shall bear full responsibility.

Article 6 (Packaging and Transportation)

The equipment and parts shall be securely packaged to prevent any damage during transportation or storage. The packaging shall take into account the humidity, climate conditions, and other environmental factors at the transportation and installation sites. Each item shall be clearly marked on the exterior with its quantity, name, and other relevant information using appropriate colors and symbols for easy identification.

In the event that any damage affecting the function or performance of the equipment occurs during transportation, the Contracting Party shall be fully responsible for all necessary corrective actions and for restoring the equipment to its original condition at its own expense.

Article 7 (Installation)

Prior to installation, the Contracting Party shall verify the basic conditions of the designated installation site. All costs associated with the installation, including equipment, labor, electricity, and other resources, shall be borne entirely by the Contracting Party.

Following the execution of the contract, the Contracting Party shall provide all necessary technical support required to ensure the normal operation of the product during delivery, installation, and trial operation.

Article 8 (Safety Measures and Responsibilities)

The Contracting Party shall bear full responsibility—both civil and criminal—for any safety accidents involving its personnel during the performance of the contract, including all related administrative and technical costs and the resolution of resulting issues.

The Contracting Party shall establish and implement internal regulations to prevent safety accidents during the work of its personnel.

The Contracting Party shall prepare a safety management plan covering the delivery and installation process and shall be fully liable for any issues arising from negligence related to the plan.

The Contracting Party shall fulfill all employer responsibilities and obligations under applicable laws and regulations, including but not limited to the Labor Standards Act, the Industrial Safety and Health Act, the Industrial Accident Compensation Insurance Act, and the Occupational Safety Act, with respect to personnel performing the contract.

Article 9 (Testing & Commissioning)

The Contracting Party shall conduct a test drive of the equipment in the presence of KITECH's members in accordance with the test plan and approved test inspection procedures.

Upon completion of the test, the results shall be recorded in the Inspection Certificate (Exhibit C), which shall be signed by authorized representatives of both Parties.

In the event the test drive fails, the Contracting Party shall immediately correct any defective parts and conduct a re-test at no additional cost. The re-test results shall also be documented in the Inspection Certificate (Exhibit C).

Final acceptance of the equipment shall be deemed to occur only upon mutual signing of the Inspection Certificate by both Parties.

Article 10 (Warranty)

The warranty period for all delivered equipment shall be twelve (12) months from the date of delivery or the date of inspection completion, whichever is applicable under the terms of the contract.

If, during the warranty period, any defects or failures occur due to issues related to design, manufacturing, installation, or previously repaired parts, the Contracting Party shall promptly repair or replace the affected components free of charge within the period specified by the Korea Institute of Industrial Technology.

Even after the expiration of the warranty period, the Contracting Party shall cooperate with the Korea Institute of Industrial Technology to provide necessary support for replacement parts, consumables, auxiliary equipment, and other maintenance services required for continued operation.

Article 11 (Operation Support)

The Contracting Party shall establish and maintain a support system to provide prompt and comprehensive after-sales service for the equipment it manufactures and supplies.

Article 12 (Notice)

a) Any notices or requests one Party is required to make to the other under this Agreement shall be in writing delivered by certified or registered mail, postage prepaid, commercial overnight delivery or first-class mail (air mail if not domestic) or official e-mail with filling out the items addressed in Exhibit A, incorporated as part of this Agreement.
b) The Parties may use any method to communicate on matters that are not subject to a requirement of written notice.
c) Notices and requests shall be deemed given as of the date received.

Article 13 (Dispute Resolution)

a) Any matters not provided for herein or any disputes arising in connection with the performance hereof shall be determined through a mutual good faith consultation between both Parties.

Article 14 (Amendments)

This Agreement, including the Exhibits, may be modified upon mutual written consent of both Parties. No verbal agreement may be binding on both Parties for this purpose.

Article 15 (Final Provisions)

a) This Agreement consists of this document and the following Exhibits:

Exhibit A. Contract Contact Information

Exhibit B. Engineering Service Proposal

Exhibit C. Inspection Certificate

b) In the event of any conflict between Exhibits and any other provisions of this Agreement, the latter shall take precedence.

This Agreement, and Exhibits A through C, constitute the entire agreement and understanding between the parties and supersede all previous agreements and understandings on the subject matter of this Agreement, if any.

[Signature Page Follows]

[Exhibit A] Contract contact Information

Client Contacts	Engineering Service Provider Contacts
KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY(KITECH) Business Contact: Name: SANGMOK LEE Title: President Address: 89 Yangdaegiro-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnamdo 31056, Republic of Korea Sign Date 13.08.2025 Telephone: +82-41-589-8101 Fax: +82-41-589-8330 Email: smlee@kitech.re.kr	**Golden Horn Technology Ltd.** Business Contact: Name: Arshad Mahmud Title: Director of Admin Address: 43 MIRPUR ROAD, NEW MARKET DHAKA, Bangladesh Sign Date 13.08.2025 Telephone: +8801712827292 Fax: - Email: goldenhorntechnoloy@gmail.com
Technical Contact: Name: Jeong-Yeol KIM Title: Principal Researcher Address: 89 Yangdaegiro-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnamdo 31056, Republic of Korea Sign Date 13.08.2025 Telephone: +82-41-589-8339 Fax: +82-41-589-8330 Email: esperant@kitech.re.kr	Technical Contact: Name: Heaml Hussain Title: Manager, Technical Address: 43 MIRPUR ROAD, NEW MARKET DHAKA, Bangladesh Sign Date 13.08.2025. Telephone: +8801712827292 Fax: - Email: goldenhorntechnoloy@gmail.com
Financial / Accounts Payable Contact: Name: Yucheong RA Title: Officer Address: 89 Yangdaegiro-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnamdo 31056, Republic of Korea Telephone: +82-41-589-8604	Financial Contact: Name: Sadat Ahmed Title: Manager Operation Address: 43 MIRPUR ROAD, NEW MARKET DHAKA, Bangladesh Telephone: +8801711057737

Fax: +82-41-589-8480 Email: ryc@kitech.re.kr	Fax: Email: goldenhorntechnoloy@gmail.com
	Payment Information: Beneficiary: GOLDEN HORN TECHNOLOGY LTD. ABA No. (if applicable): Swift Code: IBBLBDDH205 Bank Address: ISLAMI BANK BANGLADESH PLC, DHANMONDI BRANCH, DHAKA Account Number: 20502050100339009

Installation of 29 kW Solar PV System for the Cold Storage Facility

Proposal to the Korea Institute of Industrial Technology (KITECH)

Golden Horn Technology Ltd..

43 MIRPUR ROAD, NEW MARKET, DHAKA, Bangladesh

Period: August 10, 2025 – October 30, 2025

August 5, 2025

1. Purpose of Engineering Service

1.1 Background

□ Overview and Necessity

- Bangladesh faces severe post-harvest losses due to its tropical monsoon climate, characterized by consistently high temperatures and humidity. In rural and semi-rural areas, the absence of reliable cold storage infrastructure contributes to rapid spoilage of agricultural produce, resulting in financial losses for farmers and worsening food insecurity.
- Many regions of the country suffer from unstable electricity supply and limited access to grid infrastructure. These conditions make it difficult to operate conventional refrigeration systems, underscoring the need for reliable, independent energy solutions for agricultural storage.
- Solar-powered, off-grid cold storage systems have emerged as practical and sustainable alternatives that do not rely on the national power grid. Bangladesh's high solar irradiance during daylight hours makes it an ideal environment for solar energy applications, particularly in rural settings.
- In response to this need, the Korea Institute of Industrial Technology (KITECH), with support from the United Nations Climate Technology Centre & Network (CTCN), is implementing a technical assistance project. The initiative focuses on assessing the technical feasibility, performance, and local applicability of a solar-powered cold storage system utilizing low-temperature latent heat materials, specifically tailored to Bangladesh's agro-climatic conditions.

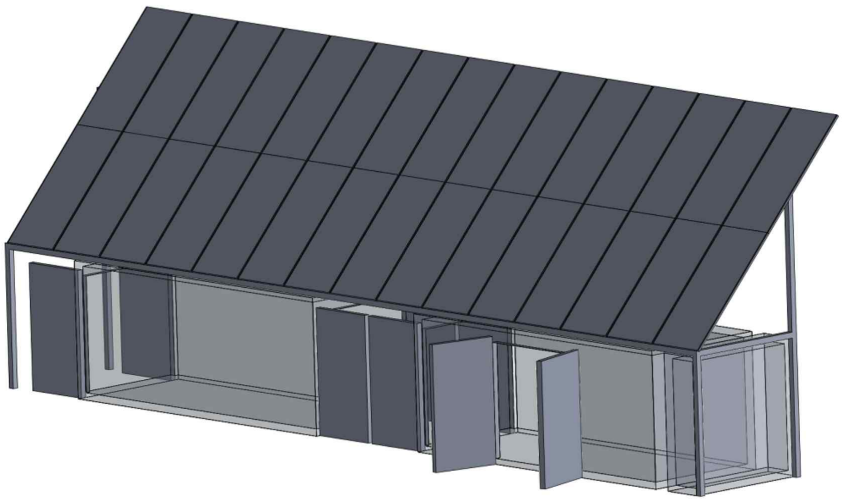
1.2 Purpose of Engineering Service

□ Installation of 29 kW Solar PV System for the Cold Storage Facility

1.3 Engineering Service Details

□ Design and Planning

- Site assessment, including solar irradiation analysis, roof/ground suitability, and shading analysis
- System layout design (module configuration, string sizing, and inverter selection)
- Electrical design including wiring diagrams, grounding, and protection systems
- Structural design and mounting system selection based on site conditions The Contractor shall complete on-site installation of Solar PV System for Cold Storage



[Figure] Estimated Layout of 29 kW Solar PV System for Cold Storage

□ Procurement and Delivery

- Procurement of PV modules, inverters, mounting structures, charge controllers (if applicable), wiring, and protection devices
- Logistics and safe delivery of all system components to the installation site

□ Installation and Commissioning

- Mechanical installation of PV modules, mounting systems, and cabling
- Electrical installation including inverter integration, grid/off-grid connection (as applicable), and safety compliance
- System testing, performance verification, and functional commissioning
- Complete on-site installation of 29 kW Solar PV System for the cold storage facility of delivery location within the agreed delivery period
- Undergo and complete the inspection process in accordance with the Client's procedures upon delivery

1.4 Specification Overview

□ Scope of Work

- Installation of 29 kW Solar PV System for the cold storage facility

□ Quantity

- 1 set

□ Purpose of Use

- To conduct a feasibility study on building and evaluating a solar-based cold storage facility in Bangladesh

□ Technical Requirement

- Solar PV System (29kW) for Cold Storage to supply electricity for the operation of the refrigeration system

□ Main Functions

[Solar PV Module]
- Total Solar PV Capacity: 29 kW
- Solar PV Module Capacity: 710Wp
- Cell Materials: Mono Crystalline

[Grid Tie Inverter]
- Solar PV Inverter: 10 kW 3Phase
- Capacity: 15 kW
- Quantity: 2 set

[Transportation & Installation]
- Transportation for local part & Loading/Unloading
- Installed Solar PV System for Cold Storage

[Testing & Commissioning]
- Testing & Commissioning of the installed Solar PV System for Cold Storage

□ Included Components / Accessories

[Monitoring and Communication]
- Dongle

[DC Cable]
- PV graded & UV protective
- Voltage Rating: 1500V DC
- Size: 6 sqmm

[DC Connectors]
- MC4 (Male & Female Pair)

[Accessories of Inverter]
- Mounting Kit and other accessories

[Module mounting structures with Accessories (RCC)]
- MS Angel, Base Plate, C Channel with Accessories

[DC/AC Earthing]
- 12.7 mm solid copper (1,650 ft)
- Busber & insulator

[AC Cable (Inverter-Combiner)]
- NYY-0.6/1KV - 4*1c*16rm

[AC Cable (Combiner-LV/MDB)]
- NYY-0.6/1KV - 4*1c*25rm

[Earthing / Grounding Cable]
- Module to Module Earthing , Structure Earthing, LT Earthing, Inverter Body
- Earthing BYA1*4 mm2
- AC cable BYA-1*25mm2

[AC Combiner Box with Energy Meter]
- AC Combiner: MCCB-32A TP 2Nos, MCCB-80A TP 1Nos , SPD
- Secure Energy Meter 1Nos

- Electric Panel Box 16 & 18 gage sheet powder coated

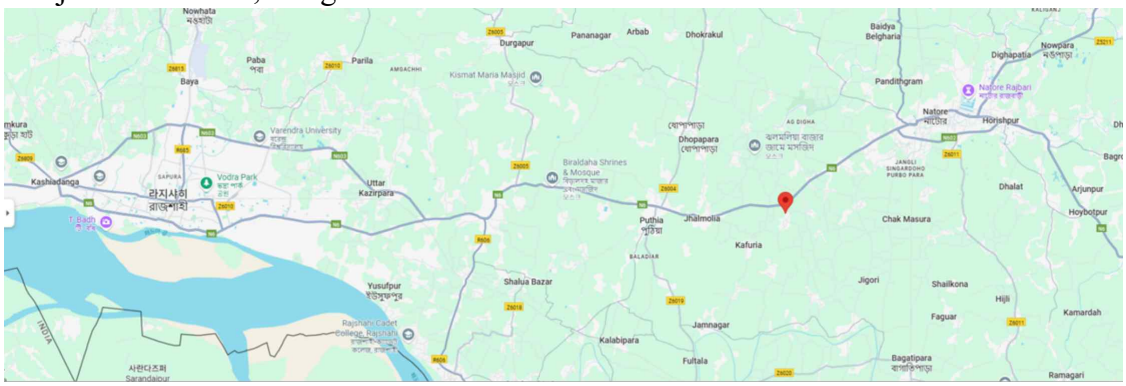
[Upvc Pipe for DC cable]

[Electrical Accessories]

- CAT Cable, Heat Shrink Tube, RJ45 Connector, PIV Tape, Cable Lug, Cable Marking, Cable Tie

□ Installation Location

- Rajshahi Division, Bangladesh



Google map plus code* : 9W92+PW8 Gowpara, Bangladesh

*Google Plus Codes are a digital location identifier made up of a simple combination of letters and numbers that serve as an alternative to complex street addresses. This open-source system, based on latitude and longitude, can precisely pinpoint a specific location even in areas without a formal address or where addresses are inaccurate. The codes can be used just like a street address, making them suitable for use in various official documents or systems where accurate location information is required, such as for navigation, mail delivery, or emergency services.

2. Installation Plan & Method

This installation plan outlines the step-by-step process required for the successful deployment of a 29 kW grid-tied solar PV system for a cold storage facility. The solar

system is intended to power cold storage operations, reduce electricity expenses, and contribute to sustainable and clean energy utilization.

2.1 Scope of Work

□ Supply, delivery, and installation of 41 mono-crystalline solar PV modules (710 Wp each).
□ Installation of two 15 kW 3-phase grid-tied inverters (total inverter capacity: 30 kW).
□ Setup of mounting structures, electrical cabling, safety components, and system synchronization with the utility grid.
□ Testing, commissioning, and handover.

2.2 Installation Timeline

SL	Activity	Duration	Responsible Team
1	Site Assessment	1 day	Engineering & Survey Team
2	Delivery of Equipment	1 day	Logistics Team
3	Mounting structure installation	2 day	Mechanical Installation Team
4	PV module installation	2 day	Solar PV Technicians
5	Inverter installation & Electrical wiring (DC & AC)	1 day	Solar PV Technicians & Electrical Team
6	Earthing and protection systems	1 day	Electrical Team
7	Testing & commissioning	2 day	Solar PV Technicians & Electrical Team
8	Hand over the system to the Operator	1	Solar PV Technicians

Estimated Total Duration: 10– 12 days

2.3 Equipment & Materials

□ Main Components

- Solar PV Modules: 710 Wp Mono Crystalline x 41 units
- Grid-Tied Inverters: 15 kW 3-Phase x 2 units
- Mounting Structure: Aluminum alloy frames
- DC Cables: UV-resistant solar cables
- AC Cables: Insulated copper cables

- Combiner Boxes: With fuses and SPD
- Earthing Materials: Copper rods, GI strips, and earth pits
- Safety Devices: MCBs, MCCBs, SPD, surge protectors, isolators
- Monitoring System: Optional online energy monitoring portal

2.4 Installation Steps

□ Step 1: Site Preparation

- Conduct roof strength analysis, sun path assessment, and load calculations.
- Clear the site and designate material storage zones.

□ Step 2: Mounting Structure Installation

- Install corrosion-resistant aluminum frames securely on the roof.
- Ensure optimal south-facing tilt angle (e.g., 20°–25° depending on latitude).

□ Step 3: PV Module Installation

- Fix the 710Wp panels onto the structure.
- Connect modules in appropriate series-parallel configuration to match inverter input voltage and current.

□ Step 4: Electrical Installation

- DC Cabling: Lay out and connect cables from PV modules to the DC combiner box and inverters.
- Inverter Setup: Install 2x15 kW grid-tied inverters in a cool, shaded, and ventilated room.
- AC Integration: Connect the inverter AC output to the main distribution board of the cold storage.

□ Step 5: Earthing and Surge Protection

- Install proper earthing systems for both AC and DC sides.
- Use SPD and MCBs at appropriate junctions.

□ Step 6: Testing & Commissioning

- Perform insulation resistance and continuity tests.
- Configure inverters and check MPPT tracking and grid compliance.

- Conduct trial run during peak sunlight to verify output.
- Verify inverter synchronization with the grid.

2.5. Safety Considerations

□ All work to be conducted following international and local electrical safety regulations.

□ Workers to wear PPE (helmets, gloves, boots, harnesses).

□ Lock-out/tag-out protocols to be followed during electrical connections.

□ Fire extinguishers and first aid kits available onsite.

2.6. Documentation & Handover

□ Upon successful commissioning:

- Handover complete as-built drawings and electrical schematics.
- Provide O&M manual and inverter datasheets.
- Train the facility operator in system monitoring and basic troubleshooting.

2.7 Post-Installation Support

□ Monitoring Period: 3 months of performance observation (optional).

□ Warranty & Support: Standard product and workmanship warranties apply.

□ Maintenance Services: Annual inspection and maintenance schedule to be proposed.

3. Promotional Schedule

2025														
		August				Semptember				October				Week
		1	2	3	4	1	2	3	4	1	2	3	4	
1	Design and Planning													2
2	Procurement and Delivery													2
3	Installation and Commissioning													5

[Exhibit C] Inspection Certificate

Inspection Certificate

Contract Title: Engineering Service Agreement – Installation of 29 kW Solar PV System for the Cold Storage Facility

Date of Inspection:
Inspection Location:

1. Parties
- Client: Korea Institute of Industrial Technology (KITECH)
- Contractor: Golden Horn Technology Ltd.

2. Scope of Inspection
- This inspection is conducted in accordance with the Engineering Service Agreement dated [Contract Date] for the purpose of verifying completion and compliance of the following scope:
- Installation of a 29 kW Solar PV System for the Cold Storage Facility, as per specifications in Exhibit C.

3. Inspection Items & Results

No.	Inspection Item	Specification Requirement	Result (Pass/Fail)	Remarks
1	PV Module Installation			
2	Inverter Installation			
3	Electrical System			
4	Structural Safety			
5	System Performance Test			

4. Conclusion

☐ All inspection items have been completed satisfactorily, and the system is accepted.

☐ The following issues were identified and must be corrected before final acceptance:

5. Signatures

For the Client	For the Contractor

(Korea Institute of Industial Technology):	(Golden Horn Technology Ltd.):
Name: _____	Name: _____
Title: _____	Title: _____
Signature: _____	Signature: _____
Date: _____	Date: _____

6. Notes

- This certificate serves as official confirmation of the inspection results for the installed 29 kW Solar PV System.