TENDER FOR CIVIL FOUNDATION, PUF INSULATED FLOORING, PUF SANDWICH PANEL INSULATION FOR WALL & ROOF, TRUSS STRUCTURE, REFRIGERATION & ELECTRICAL WORKS AT LAND CUSTOM STATION AT FULBARI, SILIGURI

PROJECT - LAND CUSTOM STATION AT FULBARI, SILIGURI

SH SUPPLY, ERECTION, TESTING AND COMMISSIONING OF PUF BLOCK (FLOOR), PUF INSULATED SANDWICH PANEL (WALL & ROOF), DOORS (SLIDING), REFRIGERATION SYSTEM, LIGHTING INCLUSIVE OF CIVIL FOUNDATION AND TRUSS STRUCTURE ETC.

BY - SILIGURI JALPAIGURI DEVELOPMENT AUTHORITY
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THE FOLLOWING GUIDELINES SHOULD BE NOTED DURING FILLING OF THE MODIFIED TENDER DOCUMENTS

- **ALL COMPLETED DOCUMENTS ADDRESSED TO:**

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- THIS TENDER DOCUMENTS MUST BE COMPLETED AND RETURNED TO ABOVE ADDRESS SIGNED IN EVERY PAGE WITH COMPANY SEAL
- PERSONS SIGNING THE DOCUMENTS MUST ATTACHED POWER OF ATTORNEY / AUTHORIZATION OF THE COMPANY
- WITH THE TENDER DOCUMENTS MUST ADD REFERENCE LIST OF SIMILAR TYPE PROJECTS EXECUTED IN INDIA WITHIN LAST THREE YEARS.
- THE BIDDER SHALL QUOTE THE PRICE RATES IN ENGLISH LANGUAGE
- ALL ENTRIES IN THE TENDER SHALL PREFERABLY BE TYPED OR CLEARLY HAND WRITTEN
- ALL DESIGNS, MATERIALS, MANUFACTURING TECHNIQUES AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH HIGHEST ACCEPTED STANDARDS

- EACH OFFER SHALL BE SUPPORTED BY ADEQUATE TECHNICAL DOCUMENTATION, EQUIPMENT LISTS, DATA SHEETS, PERFORMANCE SHEETS, ILLUSTRATIONS, BLOCK DIAGRAMS, LAYOUT DRAWINGS ETC., TO FACILITATE A FULL AND COMPLETE APPRECIATION OF THE EQUIPMENTS
- SUCCESSFUL BIDDER HAS TO SUPPLY DRAWINGS FOR APPROVAL FROM ENGG. –I CHARGE / CONSULTANT BEFORE EXECUTI0ON OF WORK.
- SUCCESSFUL BIDDER HAS TO APPROVE THE SUPPLIED MATERIALS BEFORE EXECUTION.
- OFFER SHALL BE ATTACHED WITH TIME SCHEDULE BY BAR DIAGRAM
- CANVASSING IN ANY FORM IN CONNECTION WITH THE TENDERS IS STRICTLY PROHIBITED
- SILIGURI JALPAIGURI DEVELOPMENT AUTHORITY RESERVES THE RIGHT TO REJECT FULL OR PART TENDER WITHOUT ASSIGNING ANY REASON

GENERAL DESCRIPTION

Scope of Work

The scope of work covers supply (inclusive of all taxes, VAT, loading, unloading charges etc), installation, testing and commissioning of

- PUF insulated sandwich panel (80 mm thick) at entire top roof of the cool ware house, as per specification mentioned.
- PUF insulated sandwich panel (60 mm thick) at all walls of the cool ware house, as per specification mentioned.
- PUF block (60 mm thick) insulation at entire cool ware house floor.
- Four numbers PUF insulated sliding door (40 mm thick) with electrical air curtain.
- Out door and Indoor Refrigeration system (air cooled type) for cool ware house inclusive of platforms and its covering by net / grill.
- Complete control and monitoring system for refrigeration units inclusive of required power cable.
- Temperature and humidity indicator (installed side of door).
- Emergency signal light.
- Lighting arrangement (CFL), eco friendly, 150 Lux per M^2 for entire cool ware house inclusive of suitable cable.
- All civil foundation works required for cool pack house as per specification and approved drawing.
- Brick works, sand filling, flooring, truss structure with joist and pre coated sheeting.
- Required plinth protection, drainage of rain water etc.
- Lighting arrangement (CFL), eco friendly, 200 Lux per M^2 for pack house inclusive of suitable cable.

Tender Rate

The quoted rate shall be deemed to include for all materials, equipments, accessories, transportation, insurance and all connected works required for successful erection, testing and commissioning of said equipments / systems inclusive of necessary civil work.

Location of Ware House

The mentioned cool ware house is located at Fulbari zero point, Fulbari, Siliguri.

Ambient Condition

- Summer - Average ambient temperature of that area is 34^{o}C with a peak of 42^{o}C.
- Winter – Minimum temperature is 4^{o}C at night and 12^{o}C at day time.

Standard and Specification

All the supplied materials strictly as per BIS specification and using with latest technology with upto date amendments.

Approval of Working Drawings

Successful bidder has to be supplied 3 copies of working drawings within 15 days from date of work order. The drawings need to approve by concerned Engineer-in-charge/ Consultant of the project prior to supply of materials.

Dimension, Capacity, Product to be load

Dimension (30 Mt X 20 Mt X 4 Mt), and product to be load (mainly Fruit Juice) etc .

Workmanship

The work shall be carried out in conformity with the followings

- Indian Standard code of practice
- Relevant specifications for all equipments

Testing and Installation

On completion of the installation following test shall be performed to the full satisfaction of Engineer-in-charge / Consultant of the project

- Earth resistance of the installation
- Insulation resistance test
- Interlocking of PUF panel
- Functional and interlocking of all motors and its control panel
- Refrigeration load and its control
- Any other test as desired by Engineer-in-charge / Consultant

Final Painting / Cleaning of Site

On completion of installation, testing, commissioning the final painting and cleaning of floor, site etc. will be performed by contractor.

Completion Drawings

Two sets of as built drawings shall be submitted to the Engineer-in-charge along with all relevant documents by the contractor within 15 days after completion of job.

Warranty

The materials to be supplied by the contractor shall be guaranteed for satisfactory operation for a period of 18 months from the date of completion of the whole contact job. If during the above period, any of the installation found defective in materials or workmanship, the same shall be rectified or replaced by the contractor at site within reasonable time without affecting day to day job. After completion the warranty / guarantee / defects liability period will be as follows

- For PUF block insulation / PUF insulated panel / Insulated doors : 18 months from the date of completion.
- Refrigeration system (inclusive of everything) : 12 months from the date of completion.
- All electrical equipments (except light) 12 months from date of completion

TECHNICAL SPECIFICATION

Properties of PUF

The properties of the poly urethane foam (Sandwich PUF panel / block) should confirm to best International / Indian Standards.

Density	:	**40 ± 2 Kg / M^3 (PU)**
Closed cell content	:	**90 – 95%**
Temperature range	:	**- 100^o to + 90^{o}C**
Water Absorption	:	**< 1%**
'K' factor	:	**0.22**
'U' factor	:	**0.019 – 0.022**
Self Extinguishing	:	**As per ASTM D 1692**

- The material, both PUF block and Panel should be fire resistant and should have excellent self-extinguishing characteristics. The successful bidder has to submit the fire resistant characteristics of the material.
- Both side of panel elements are made up of 0.5 mm thick hot deep galvanized and pre-painted steel sheets. The color coating should be of approved color at least 25 micron polyester on 150 gms / m^2 of Zinc coating. The steel sheets should have formed grooves to provide extra strength as well as to enhance the appearance of cladding.
- The ceiling panel should be manufactured by pressure injection of CFC free Poly urethane foam at 40 ± 2 Kg/m^3 density, in between the outer and inner steel sheet surfaces. The panels either be complete with tongue and groove joint together or Cam Lock joint with flushing. The Cam Locks should be of G.I /PVC material and minimum of 0.7 mm thick.
- The Ceiling panel should be longed from the truss with proper fixing rod. The rod / joints must be insulated with liquid PUF / silicon fixer / armaflex.
- The PUF block (1 mt x 0.5 mt) must be well finished and best in quality.
- The bidder should provide the manufacturing certificate conforming to CFC free method of Panel manufacturing and paint & zinc coating thickness.

Floor Insulation by PUF Block (60 mm) size

Insulation work of the ground floor of cold rooms and ground floor of ante room should be carried out as bellow:

- Clean the floor surface to remove dust, oil, grease etc.
- Apply a layer of bituminous primer and fix a layer of aluminum foil as vapor barrier.
- Apply molten bitumen of suitable grade @ 1.5 Kg / M^2 on the entire floor.
- Apply one layer of bituminous tar felt. The tar felt should be applied with molten Bitumen while sticking. The joints of the tar felt should overlap by 40mm. The joints should be sealed with molten Bitumen. The tar felt should overlap the insulation by at least 0.3M on all sides.
- Apply Bitumen over tar felt @ 1 Kg / M^2.

- Fix PUF slabs (Block size 1.00 mt X 0.50 mt) of 40 mm thick in one layer. The joints should be sealed perfectly.
- Fix second layer of PUF block (same size) of 40 mm thick as brick joint nature . The joints should be sealed perfectly.
- Apply the second layer of tar felt over the PUF (40 mm + 40 mm) slabs. The tar felt should be applied with a layer of Molten Bitumen while sticking to PUF. The joints of tar felt should overlap by at least 40 mm. The overhang of the tar felt of first layer should be folded up and sealed with the second layer of tar felt.
- Apply Molten Bitumen @ 1.5 Kg / M^2 on the entire area of insulation over the tarfelt and fix a layer of aluminum foil.
- Apply a layer of sand cement screed on top of aluminum foil.
- Concrete slab (PCC 1:3:6) has to be cast over the screed. Slab thickness will be 100 mm.

PUF Panel (80 mm) Installation on Top Roof of Ware House

Only the top ceilings are to be fabricated by sandwich panels. The panels should be installed by skilled work men. Care should be exercised to seal the joints adequately using the best sealant.

Following points are the guide lines for a successful work.

- The Contractor to submit 3 copies of the panel design and method of installation for approval. Only the final approved drawings with the seal and sign of concerned Engineer, and consultant should be referred for the installation plan.
- The ceiling panels should be suspended from the roof truss with proper arrangements.
- Use proper clamping device of adequate strength. Use minimum 12mm dia galvanized and threaded steel down rods. Use a turn buckle between two rods for aligning the panels. Use galvanized steel washers and nuts for fixing the panels to the down rods. The down rods must be insulated upto minimum of 1M length from the panel surface by using 15mm thk. "Arma flex" insulation or similar material. The ends of the insulation material should be sealed using Silicon sealant.
- The projection of down rods and nuts should be covered neatly using plastic caps of matching color.
- At the panel joints in ceiling panels, it is preferable to use HAT channels to support the panel lengths. The HAT channels should be formed from pre-painted GI sheet metal. The panel should be fixed to the HAT channel by Aluminum pop rivets of at least 4mm dia. The HAT channels should be suspended from roof using at least 12mm dia threaded and galvanized steel down rods. A turn buckle should be incorporated in the suspension system.
- Care should be taken to avoid scratches to the panels. The holes for the joints should be plugged using plastic caps. The holes made in the panels for passing electric cables, instrumentation cables, refrigeration piping etc. should be sealed using foamed PU and silicon sealant. Circular flashing should cover the larger holes from inside and outside. Contractor should also protect the panels from accumulation of dirt and dust during the installation.

Insulation of PUF Panel at Wall (60 mm) of Ware House

Only the top ceilings are to be fabricated by sandwich panels. The panels should be installed by skilled work men. Care should be exercised to seal the joints adequately using the best sealant.

Following points are the guide lines for a successful work.

- The Contractor to submit 3 copies of the panel design and method of installation for approval. Only the final approved drawings with the seal and sign of concerned Engineer, and consultant should be referred for the installation.
- Both side of panel elements are made up of 0.5 mm thick hot deep galvanized and pre-painted steel sheets. The colour coating should be of approved colour at least 25 micron polyester on 150 gms / m^2 of Zinc coating. The steel sheets should have formed grooves to provide extra strength as well as to enhance the appearance of cladding.
- The panel should be manufactured by pressure injection of CFC free Poly urethrene foam at 40 $\pm$ 2 Kg/m^3 density, in between the outer and inner steel sheet surfaces. The wall panels either be complete with tongue and groove joint together or Cam Lock joint with flushing. The Cam Locks should be of G.I/PVC material and minimum of 0.7 mm thick. The Cam Lock should provide a tight joint and should be easy to operate.
- The bidder should provide the manufacturing certificate conforming to CFC free method of Panel manufacturing and paint & zinc coating thickness.
- The Contractor should mark the outline on the ground, measure the diagonals, mark the portion of doors etc. and these markings are to be approved by SJDA before installation.
- 'C' channels should be fixed to the ground and leveled for installing wall and partition panels. Install the panels in the groove of the channel and assemble together. The gaps between channel and ground, channel and PU Panel should be plugged with suitable compounds. The joints between the panels should be sealed using Silicon compound. The Silicon compound should be injected into the gap and finished neatly. The wall panels have to be fixed to structure as mentioned in point above. The vertical panels should be assembled in perfect plumb level.
- Use proper clamping device (PVC CAM Lock) of adequate strength. Use galvanized steel washers and nuts for fixing the panels to the down rods. The ends of the insulation material should be sealed using Silicon sealant

Specification of Sliding Door (Four Nos.)

- Door Clear Opening (1500 x 2200 mm)
- All Doors to be RH (opening from left to right)
- Material of Construction :Steel/Polyurethane/Steel sandwich type, With suitable polyester finish.
- Temperature at which it operates :Ambient temperature.
- Method of operation : Manual
- Electrical Air Curtain : To be provided with each door.
- Viewing Glass Window : One Nos. 8" x 6" glazed window at 1.5 mt level

- 10 x 40 x 150 x 40 x 10 mm x 1.2 mm GI Powder coated Frame for vertical and horizontal support of the door.(3 nos. of vertical legs & 1 no horizontal leg)
- Sliding rail made of galvanized MS for a length of 3350 mm
- Nylon sliding wheels mounted on SS304 shaft with bearings.
- GI powder coated Rail cover.
- Main handle pushing bracket made of SS 304
- Inside handle pushing bracket made of SS 304
- Proper wheel stopper.
- Nylon taper piece set.
- Wheel bracket SS for mounting the wheels - 2 nos.
- Wheel bracket drop - 2 nos.
- Main handle made of SS rod and grip cover
- Main handle mounting box of SS powder coated.
- Inside handle made of SS
- Star knob for lock safety release made of HD plastic fitted SS rod
- Pipe brackets fixed inside the door panel
- Nylon Pushing rod.
- Nylon locking rod with brass knuckle.
- Aluminum face washer.
- SS bottom cross piece with SS box.
- 3 mm thick SS bottom blade
- Nylon bottom guide
- EPDM bulb type beading with Al carrier
- EPDM flat beading with Al carrier
- Door Panel with 1.2 mm thick GI powder coated 'C' capping.

Specification of PVC and Electrical Air curtain

- PVC Strip curtain shall be provided at all doors. It shall be fixed with S.S hook and cover the full span of open area.
- The air curtain (1.50 mt length) should cover the doorway completely and their should not be any air gap. It should create an effective air seal across the opening to separate two environments and prevent flying insects from entering the establishment. Non re-circulating air curtains are to be used for these applications. A limit switch at the door should automatically operate when the entrance is open eliminating any ingress of external air & shut it off when the door is closed. Color shall be used either entirely or with individual panels in contrasting colors with the approval of Engineer in charge, SJDA. Adjustable louvers are to be provided to obtain optimum operating efficiency.

Specification of Refrigeration System for Cool Ware House

The suggested air conditioning capacity is 80.00 TR. The location of cooling coils should be at individual cold room chambers on the basis of atmospheric condition at site.

- The refrigeration system shall be suitable for operation on 415 V,3 phase- 4wire, 50 Hz. AC supply.
- The compressor should be high ambient air cooled type and Semi-hermetic type.
- The refrigerant should be environment friendly.
- Air cooled condenser / compressor to be installed in both side of cold store on suitable platform. (Construction of Platform and its protection by suitable Netting etc in your scope).
- The casing of indoor & outdoor unit shall be made from corrosion resistant steel sheet with painted/powder quoted.
- The package unit shall be accompanied with separate microprocessor based control panel along with necessary switch, starter, fuse, HP/LP cutout switch, liquid line valve etc.
- Air-cooled split type condensing unit shall be provided with 25% stand-by capacity.
- The blower fan shall be selected for quite operation.
- The evaporator unit should have low height (i.e less than 700 mm) and enclosed in pre-painted galvanized corrosion resistant casing and drip pan. The condensate would be required to be taken out through a drain pipe leading on to rear and main drain line. The drain pans should be suitably insulated to eliminate drip page and condensation. The fan motors should be rated for operation at low temperature. The fan blades should be non-corrosive, preferably of Aluminum or S.S.
- The indoor unit should be ceiling mounted for cool chambers and ante room suspended from trust by suitable insulated hanging system.
- The indoor unit shall have adequate size copper tube.
- The surface area of the cooling coil shall be adequate to give required refrigeration capacity. Cooling coil should have with about 4 to 5 fins per cm. Test pressure should be 20 Kg / Sq. m.
- The condensing units should be stand alone and equipped with all electrical cables and switch gears for direct operation. The safeties for HP, LP and oil failure should be incorporated into the control.
- The condensing unit should be able to perform steadily at ambient temperature between 20°C and 45°C and RH up to 95%.
- In the evaporative should have high, long cased axial flow fan (33600 M^3) & air throw should be 30 mts. The grills should be S.S. make. The unit should have integrated water pump, valves and fittings and dual circuit refrigeration coil.
- Maintaining RH is very important to prevent condensation of moisture into consignments. The Indoor Unit complete with cooling coils shall be placed below the roof panel. The temperature control probes would be connected to the to the local control panel for monitoring & adjustment/ setting and computer for monitoring and data logging.

- For cold room and different storage and ante room the acceptable tolerance on temperature shall be ± 1°C. Temperature exceeding the higher side tolerance limit is not acceptable.
- It should be noted that all the cold rooms should be provided with hooter / alarms and light signals for use in the event of any person being trapped inside of chamber.
- All condensing units should be fitted with individual controls for independent operation and should be amenable to remote start / stop from control room at pack house. The temperature and relative humidity should be fully monitored from control room. Vendor will perform suitable cable connection.
- Condensate flow must be 68 M^3 /Hr. Suction, Discharge pipe diameter should be 80 mm.
- Shaft should be by Carbon steel and shaft sleeve should be by bronze.
- Suggestive make of Expansion valve : Bitzer / Dafoss / Rinac.
- Suggestive make of compressor : Emerson / Bitzer / Copeland / Bock
- Suggestive make of Evaporator : Zanotti / Bluestar / Star coolers / Rinac

Specification of Fixed Weighing Scale (`1 No.)

- The capacity of the weighing platform shall be 2.0 metric Tones. With a platform size of 1520mm X 1520 mm.
- The weighing platform shall be flashed with floor.
- Adequate care shall be taken from ingress of dust/dirt and water.
- The mechanism should be Capable of withstanding all forces experienced for weighing the consignment with trolleys, without being adversely effected. Readout variations should not be produced by different positioning of load.
- Weighing system designed to run 24 Hrs a day.
- Fail safe operation should be ensured i.e. where load cell or other failure occur no read out is given.
- The display unit should read weight, tare weight and net weight.
- Other details :

Weighing Capacity	:	2000 kg
Smallest Division	:	5 kg
Load Cells	:	4 Nos. with IP67 protection.
Power Supply	:	220V ± 10%, 50 Hz ± 2%
Weighing Accuracy	:	0.05%
Printing arrangements	:	1 Desk Housing Printer

Specification of Cable Laying

- Cable shall be laid as per CPWD specifications.
- Identification tags shall be provided on either end of multi-core cables. Engraved tag plates or PVC ferrules shall be used for identification of cables.
- Cable shall be tested for insulation resistance by a calibration megger and checked for proper connections, results recorded and approved by Engineer-in-charge before installation.
- Where leads are connected to field instruments, a 300 mm coiled loop shall be provided. When connecting individual terminals on Panel / Junction box / instrument a coil should be made on each core of wire.
- All cables will be laid directly to the equipments without any joint unless otherwise specified.

Specification of Cable Trays

- These trays shall be fabricated out of 2.5 mm (12 B.G.) perforated G.I. (Hot dip).
- Supply of cable trays shall include supply of necessary coupling plates and hardware material such as GI bolts, Nuts, Washers etc. Reducer plate wherever required shall be supplied as part of the tray.
- The trays shall have suitable provision for clamping of cables at an interval of 500 mm.
- All finished cable trays and accessories shall be free from sharp edges and corners, burr and unevenness.
- Cable trays shall have to be supplied in standard length of 2.5 M except for smaller lengths at end of a straight run.
- Tray width as indicated are based on inside dimension.
- Size of Trays- As required.
- The trays shall be properly supported at regular intervals. Wherever insert plates are not available, supports on concrete structures or ceiling shall be fixed with minimum of 10 mm expansion bolts.
- All the G.I. perforated cable trays, if required, shall be cut with hacksaw only and then filed for smoothness. Gas cutting of G.I. Trays is not allowed.
- Cable trays shall be site fabricated out of steel (channel, angle, flats etc.), & shall be ladder type, duly epoxy painted & supported at every 2.5 meters maximum. Size / width of cable trays shall be as per approved drawings furnished to contractor during installation / as per detailed drawings prepared by him. These cables after laying, proper dressing & tagging, shall be terminated using industrial double compression glands, nickel-plated brass, & using heavy tinned copper lugs. These cables shall be checked using insulation resistance tester & then shall be energized. The IR value of each cable shall be recorded.

Specification of CFL Light Fittings

- The fitting should be Shock, dust and jet proof indoor type. Tube light fittings shall be made of high quality polycarbonate, (Make – Philips / Havels / Bajaj / Surya).
- It should be provided with stainless steel toggles.
- The lighting shall allow true color reading.
- All light fittings shall be provided cable entries suitable for 3 core 2.5 mm^2 PVC
- Insulated Cu cables. Degree of protection of light fittings shall be minimum IP 55.
- Contractor shall furnish catalogues of all light fittings along with all details.
- While designing the indoor lighting system, Contractor shall take note of reduced output of lighting fittings due to low operating temperature.
- The fitting should be Shock, dust and jet proof indoor type. CFL light fittings shall be made of high quality polycarbonate.
- All light fittings shall be provided cable entries suitable for 3 core 2.5 mm^2 PVC insulated Cu cables. Degree of protection of light fittings shall be minimum IP 55.
- Output of lighting fittings should operate at low temperature.

Installation

- Miscellaneous consumables such as welding rods, anchor fastener, minor civil works etc. required for electrical installation are also included in contractor's scope of work. Minor civil work such as making chase / hole in floor / wall etc. required for electrical installation shall also be part of electrical installation. The installation shall be carried out as per layout drawings for power / control / lighting etc. issued to contractor.
- Structural steel such as channels, angles, plates, flats etc. shall ne new, conforming to Indian standards. Structural steel shall be painted with two coats of red oxide & two coats of epoxy paint, after cleaning of this steel installation.
- All cable glands provided shall be double compression, nickel plated brass & shall be suitable for termination of cables mentioned in SOQ.
- Cable lugs shall be Aluminum for Aluminum cable and tinned copper for other cable.
- All earthing material required shall be supplied by electrical contractor (must be hot dip galvanized).
- Contractor shall take due care for storage of all panels, doors, refrigeration units, electrical items supplied by him. Unloading, shifting of these items / equipments to site for installation is also included in contractor's scope. Until the time all equipments are installed, tested, commissioning & handed over to SJDA. contractor shall be responsible for proper care of all equipments.
- Conduit wiring, where require shall be carried out using M S heavy-duty conduits. Wires used for conduit wiring shall be PVC insulated, multi stranded copper conductor wires. Each point wiring shall consist of following :
    - ❖ Supply & installation of 1" M S conduits, multi stranded copper wires.

- ❖ Conduit accessories such as bends, tees, and junction boxes required with terminal block, suspension conduits etc. shall be threaded type and C.P.W.D approved.
- ❖ Fixing hardware (such as saddles, nuts, bolts, brackets etc.)
- ❖ 14 gauge bare copper wire for earthing
- ❖ Point wiring shall be measured as per CPWD specifications.

- Earthing & lighting protection shall be carried out as per CPWD specifications & other relevant Indian standards. Generally earthings system will comprise of GI pipe electrodes, MEL (main earth loop) of GI earthings strip of size 50 x 6 mm laid underground, above ground in cable trays, earth bus, test links etc. The method of installation for GI pipe earth electrodes shall be as per CPWD specifications.

Preventive Maintenance for Guaranteed Period

- All inclusive comprehensive maintenance inclusive of first year operation of the system for guaranteed period are being entrusted to the successful bidder, the firm shall depute qualified technical personnel for proper serviceability, maintenance and operation of the system for first year. The firm has to ensure that at no time the Refrigeration system are unserviceable more than 2 days; action shall be taken by authority to get the equipment attended at the risk and cost of the firm from special agencies.
- The firm shall carry out maintenance / repair, replacement of spare part, consumables etc. so that system is kept in full working conditions at all the times. Preventive maintenance schedule shall be submitted along with Technical bid.
- After completion of all the installation work and commissioning, the contractor shall provide necessary technical persons, skilled workers for operating and maintaining the entire installation during the guarantee period.
- The systems are to be operated & maintained for seven days in a week round the clock and the contractor has to deploy qualified personnel for this purpose.
- All spares / consumables required for proper maintenance are to be provided by the contractor during the period. This shall include refrigerant gas & other necessary material as and when required, all lubricating oils etc.
- The contractor / firm will be responsible for round the clock operation, day to day maintenance, all periodical maintenance, half yearly / annual overhauling etc. as per manufacturer's recommendation and service of the systems and equipments.
- For any maintenance work if shut down is necessary even for a short duration, the contractor will ensure proper co-ordination with Engineer-in-charge. The contractor will take all the necessary measures to ensure continued operational status of the entire equipment by prompt servicing and defects rectification action.
- All the tools necessary for successful operation and maintenance of the entire equipments and system shall be arranged by the contractor and must be available at all times at site.

Format of Schedule of Quantity for Cooling Warehouse at LCS, Phulbari

SL.NO.	DESCRIPTION OF ITEM	QTY	RATE (Rs.)	UNIT	AMOUNT (Rs.)
1	Supply, installation, Testing, Commissioning of suitable capacity refrigeration unit comprising of low height, low noise level cooler and all weather proof remote condensing unit with hermetic compressor for maintaining following temperature and humidity and to be operated at 415 Volt, 3 phase, AC supply with R-22 Refrigerant enclosing oil separator, other accessories, and safety alarm, cabling connection & inter connection, earth connection, door control panel etc. i/c. 25% of standby condensing unit of equal capacity complete as specified inclusive of out door platform.	4		Set	
2	Supply, Fixing & commissioning of PUF insulated panel (80 mm thick) on roof of cool ware house inclusive of all accessories as specified	600		M^2	
3	Supply, Fixing & commissioning of PUF insulated panel (60 mm thick) for wall of cool ware house inclusive of all accessories as specified	400		M^2	
4	Supply & Fixing of PUF Block (60 mm thick) with vapor barrier as specified for floor insulation.	600		M^2	
5	Supply, Installation, testing & commissioning of sliding door with electrical air curtain as specified.	4		No	
6	Supply, installation, testing & commissioning of temperature and humidity indicator (Digital type).	4		No	
7	Supply, Installation, testing & commissioning of Fixed weighing Scale with in house printer as specified.	1		No	
8	Supply, installation, testing & commissioning of 1 x 18 Watt, bottom mounted light (CFL) fitting with a suitable cover ready to use with 230 V single phase 50 Hz AC supply, connection with 3 x 1.5 sq mm copper conductor cable etc. as reqd. in the	30		Set	

	cool ware house.				
9	Wiring for light point with 3 x 2.5 Sq mm single core stranded copper conductor cable in metal conduit including painting, including Control Switch with Box modular type as Control Group.	450		Mt.	
10	Design, supply, testing & fixing 5 Kg Fire extinguisher (ISI) with Dry Chemical Power & Fire Bucket,	4		Set	
11	Supply and fixing of Cable duct tray (ladder type) by M.S. (18 mm x 5.5 mm) as required	250		Set	
12	Construction of PCC (1:2:4) concrete 100 mm thick on top of Floor PUF panel it should be as per PWD Schedule.	45		M^3	
13	Earth work in excavation of foundation trenches as required complete	150		M^3	
14	Filling in foundation or plinth by silver sand in layers not exceeding 150 mm. as directed and consolidating same by thorough saturation with water ramming complete, including the cost of supply of sand	350		M^3	
15	Single brick flat soling of picked jhama bricks including ramming and dressing bed to proper level and filling joints with powdered earth	680		M^3	
16	Cement concrete with graded stone ballast (40 mm. size) excluding shuttering (1:3:6)	65		M^3	
17	Nominal Mix M - 20 Cement concrete with graded stone chips(20 mm size) excluding shuttering and reinforcement, if any, in ground floor	85		M^3	
18	Hire and labor charges for shuttering	490		M^2	
19	Reinforcement for reinforced concrete work	7.5		MT	
20	18 mm. to 20 mm. thick, kota stone slab set in 20mm thick cement mortar (4:1) in floor	640		M^2	
21	Brick work with 1st class bricks in cement mortar (6:1) 250mm thick in foundation	28		M^2	
22	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar, 20 mm thick.	260		M^2	

23	M.S. structural works in roof trusses with hollow sections (TATA make square or rectangular shape) conforming to IS: 806-1957 & IS: 1161-1958	15.4		MT	
24	Providing fixing of pre-coated GI profile sheet(size shape and pitch of corrugation as per direction E-in-C. 0.5 mm thick Zink coating 120gm/sqm as per IS 277 ,240 Mpa steel grade 5 to 7 micron epoxy primer on both side of the sheet and polyester top coat 15 to 18 micron	756		M^2	
25	Galvanized iron sheet eaves gutter fitted and fixed with necessary 50 mm. X 6 mm. M.S. flat bar clamps bent to design, bolts, nuts, washers etc. complete. Eaves gutter made of 0.63 mm. sheets	76		Mtr	
26	Applying exterior grade acrylic primer of approved quality and brand on plastered or concrete surface.	260		M^2	
27	Protective and decorative acrylic exterior emulsion Paint of approved quality, as per manufacturer's specification	260		M^2	
28	Priming one coat on steel or other metal surface with synthetic enamel/ oil bound primer of approved quality	220		M^2	
29	Painting with best quality synthetic enamel paint of approved make	220		M^2	
30	Supplying, fitting and fixing UPVC pipes A-type and fittings conforming to IS: 13592-1992 fitted with necessary clamps nails including making holes in walls, etc.	28		Mtr	
		TOTAL (Rs.) ----			