



# BIHAR INDUSTRIAL AREA DEVELOPMENT AUTHORITY

1st Floor, Udyog Bhawan, East Gandhi Maidan, Patna-04

Website: [www.biadabihar.in](http://www.biadabihar.in) Email: [biada-bih@gov.in](mailto:biada-bih@gov.in) ☎-0612-2675998 & 2675991

## Short Notice Inviting Quotation No.- 15/BIADA/2024-25

Quotation for the rate finalisation is invited for the work of Design, Supply, Installation, Testing, Commissioning of various Plant & Machineries for the BIADA Mega Food Park, Motipur, Muzaffarpur from the Original Equipment Manufacturer (OEM)/Authorised Dealer/Supplier till 21/01/2025, 5:00 PM

Quotations for Supply and Installation of following machines shall be submitted in a sealed envelope to: DGM- Technical, 3<sup>rd</sup> Floor, Udyog Bhawan, East Gandhi Maidan, Patna- 800004

Sl. No.	Description	Unit	Quoted Rate per Unit in Figure.	Quoted Rate per Unit in Words.
1	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Mezzanine floor for Stacking Arrangements for Potato Cold Storage-5000 MT.	01		
2	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Mezzanine floor for Stacking Arrangements for Onion Cold Storage- 5000 MT.	01		
3	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for Banana Ripening Chamber- 80 MT	01		
4	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for Litchi Packhouse- 6 MT/Batch	01		
5	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries for the IQF with Pre-processing line- 2MT/Hr.	01		
6	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for the Frozen Storage - 4000 MT.	01		
7	Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Stacking Arrangements for Potato Cold Storage-3000 MT and the packhouse for potato capacity 2MT/Hr.	01		

Note: Detail breakup of all above items & the machineries including specification details for above mentioned components is available on the BIADA website: <http://biada1.bihar.gov.in>

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**Rules:**

- This notice has been invited for the finalization of rates only.
- The rate quoted shall be inclusive of all charges, taxes and freight.
- The quotation shall be submitted along with GST Certificate.

For further details or information regarding above subject, interested one may contact on [dgmnorth.tech@bihar.gov.in](mailto:dgmnorth.tech@bihar.gov.in)

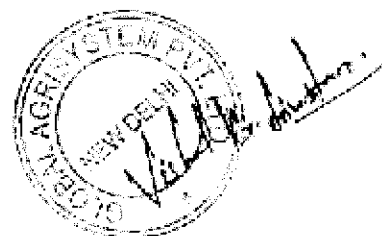
Memo No. 54/Tech

Date 08/01/24

  
DGM-Technical

**(5000 MT Potato Cold Store)**

**Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including  
Puff Panel works and Mezzanine floor for Stacking Arrangements for Potato Cold  
Storage-5000 MT.**



**BASIS OF DESIGN**

**1. Cold Store 1 - 4**

Product	:	Potato
Storage Capacity	:	1250 MT
Daily Loading	:	62.5 Ton/Day/Chamber
No. of Rooms	:	04
Room Dimension	:	20 x 18 x 12 m H
Product Inlet Temp.	:	25°C
Room Temperature	:	2°C
Relative Humidity	:	85 - 90%
Cooling Load	:	22 TR Each

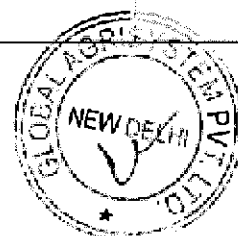
**SECTION A**

**TECHNICAL SPECIFICATIONS FOR REFRIGERATION SYSTEM**

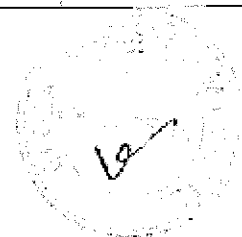
Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Mezzanine floor for Stacking Arrangements for Potato Cold Storage-5000 MT.

S. No.	Description	Unit	Qty	Unit Rate	Amount	Remarks										
<u>1</u>	<div>High Stage Compressor For Cold Store</div> <div>high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches &amp; foundation bolts &amp; gauge cum control panel and capacity control arrangement, ammonia head &amp; oil cooling and skid mounting.</div> <table><tr><td>Intermediate Temp.</td><td>: (-) 5°C</td></tr><tr><td>Condensing Temp.</td><td>: 38°C</td></tr><tr><td>Capacity</td><td>: 93.6 TR</td></tr><tr><td>Power Consumed</td><td>: 108.5 BHP</td></tr><tr><td>Rpm</td><td>: 1100</td></tr></table>	Intermediate Temp.	: (-) 5°C	Condensing Temp.	: 38°C	Capacity	: 93.6 TR	Power Consumed	: 108.5 BHP	Rpm	: 1100	Nos.	1			COMPAK SRC 92 N 05, Single Stage Reciprocating Compressor Package for Potato rooms, capacity 93 TR @ -5 deg C SST / 38 deg C SDT, complete with 90 kW 4-pole belt-driven IE2 motor, oil separators, Kirloskar KCX4/equivalent, [1 working]
Intermediate Temp.	: (-) 5°C															
Condensing Temp.	: 38°C															
Capacity	: 93.6 TR															
Power Consumed	: 108.5 BHP															
Rpm	: 1100															
<u>2</u>	cyclone type oil separator flanged connections with companion flanges and oil drain valve.	Nos.	1													

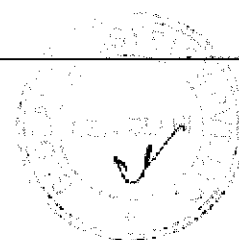
3	ABB/ Siemens make 120 HP, 4-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor	Nos.	1													
4	L&T/ Equiv make star delta starter for the above motors.	Nos.	1													
5	High Stage Compressor for Cold Store  high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches & foundation bolts & gauge cum control panel and capacity control arrangement, ammonia head & oil cooling and skid mounting. <table><tr><td>Intermediate Temp.</td><td>: (-) 5°C</td></tr><tr><td>Condensing Temp.</td><td>: 38°C</td></tr><tr><td>Capacity</td><td>: 56.7 TR</td></tr><tr><td>Power Consumed</td><td>: 67.1 BHP</td></tr><tr><td>Rpm</td><td>: 1000</td></tr></table>	Intermediate Temp.	: (-) 5°C	Condensing Temp.	: 38°C	Capacity	: 56.7 TR	Power Consumed	: 67.1 BHP	Rpm	: 1000	02 Nos. (1W+1S)	2			COMPAK SRC 58 N 05, Single Stage Reciprocating Compressor Package for Potato Rooms, capacity 57 TR @-5 deg C SST / 38 deg C SDT, complete with 55 kW 4-pole belt-driven IE2 motor, oil separators, Kirloskar KCX3/equivalent, [1W+1S]
Intermediate Temp.	: (-) 5°C															
Condensing Temp.	: 38°C															
Capacity	: 56.7 TR															
Power Consumed	: 67.1 BHP															
Rpm	: 1000															
6	Cyclone type oil separator flanged connections with companion flanges and oil drain valve.	2 Nos. (1W+1S)	2													
7	ABB/ Siemens make 75 HP, 4-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor.	02 Nos. (1W+1S)	2													
8	L&T/ Equiv make star delta starter for the above motors.	02 Nos. (1W+1S)	2													
9	LP Receiver For Cold Store  ammonia low pressure receiver 42" dia x 12' Long constructed with liquid inlet & outlet valves, safety valve, gauge glass with valves, pressure gauge with valve saddle supports, and pump out connection with valve. Also incorporating all the nozzles and valves for easy connection with ACU's and suction -discharged lines.	01 No	1			Low Pressure Liquid Receiver Package @ -5 deg C, with vessel suitable for 150 TR, Rinac make, with Ammonia Pumps [1 working + 1 standby]										



<b>10</b>	Hermetically sealed liquid ammonia pump for ammonia recirculation with motor and accessories comprising of suction strainer, suction and discharge valves, check valve.	02 Nos. (1W+1S)	2			
<b>11</b>	Set of Danfoss /Manik make controls for liquid re-circulation system comprising of:  Electronic Float switch : 03 Nos. Pressure Differential Controller : 02 Nos. Differential Pressure Regulating Valve : 01 No. Liquid line solenoid valve : 01 No.Frost-free gauge glass : 01	Set	1			
<b>12</b>	Wall mounted / ceiling suspended frigid coil air Cooling unit complete with SS Tubes & AL finned cooling coil. Total GI enclosure, drain pan, axial flow fan with motor, water defrost arrangement etc. Cold store 1-4 Capacity: 6.2 TR @5 deg C	Nos.	20			Ammonia Pumped type Evaporator for Freezer rooms with GI Casing, SS Tubes & Al Fins – 6.2 TR
<b>13</b>	Set of Danfoss /Manik make Controls for Coil:  Liquid line solenoid valve, Digital Temp. Indicator cum controller	Set	4			Ammonia Valves & Controls, Danfoss/equivalent
<b>14</b>	evaporative ammonia condenser complete with hot dip galvanized condensing coil, GP casing &water sum tank, fan section with fans, motor, eliminators and water circulation pump with PVC fittings. Capacity: 229 TR Condensing Temp : 38 °C Wet Blub Temp. : 27.8 °C	Nos.	1			Evaporative type condenser of capacity 270 TR
<b>15</b>	Ammonia receiver of size 24" Dia. x 20' Long constructed with Liquid inlet And outlet valves, safety valve, charging valve, drain valve, Purge valve, pressure gauge and gauge glass with valves.	Nos.	1			High Pressure Liquid Receiver, horizontal straight through type, suitable for 150 TR capacity, with necessary valves & controls, Rinac make
<b>16</b>	MS 'C' class refrigerant pipes, pipe fittings and ammonia valves to interconnect above equipment in the system comprising of suction,	Lot.	1			15mm dia : 60 Rmt 25mm dia : 55 Rmt 32mm dia : 12 Rmt



	discharge, liquid and oil lines as per PID and based on compact plant layout.					40mm dia : 129 Rmt 50mm dia : 24 Rmt 65 mm dia : 61 Rmt 80mm dia : 6 Rmt 100mm dia : 72 Rmt 125mm dia : 18 Rmt 150mm dia : 55 Rmt
<b>17</b>	G.I 'B' class pipes, pipefitting and valves for condenser make up water, cylinder head cooling defrost and drain line piping as per PID and based on assumption that condenser shall be placed at a distance have not more than 10 m from the plant room.	Lot.	1			
<b>18</b>	PUF insulation for accumulators/vessel, suction line, liquid lines and wet return lines with fixing material bitumen/ CPRX compound and aluminum cladding of 26G with in battery limit.	Lot.	1			
<b>19</b>	Structural Material for pipe installation and plat form Piping support to be fabricated and installed at site with steel channel and steel angle distance between the supports to be Approx. 5 meters, with variance depend on the building condition	Lot.	1			
<b>20</b>	MCC panel will be cubical type switchboard with bus bar, Incoming ACB, indicating lamps, push buttons, switches, fuses, voltmeters, Voltmeter switch, ammeters, ammeters switch and starter for	Lot	1			
	a) compressors motor,					
	b) condenser fan motor & pump,					
	c) Cooling coil fan motor,					
<b>21</b>	Power & Control cabling with cable tray for complete refrigeration plant.	Lot	1			Electrical Cables & Related Accessories, Polycab Cables/equivalent
<b>22</b>	manual gas purger with safety valve for purging non- condensable Gases from the system.	Nos.	1			
<b>23</b>	First charge of ammonia gas and lubricant compressor oil.	Lot.	1			First Charge of Ammonia & Oil for Commissioning & Startup Activities



<b>24</b>	<p>Installation, Testing &amp; Commissioning of the complete refrigeration plant and putting in operation. Our scope is as follows:</p> <p>- Erection of the equipment as per our layout with proper operation and alignment</p> <p>- Connecting various equipment's with pipelines, fittings, controls and instruments</p> <p>- Painting of Equipment &amp; Piping</p> <p>- Pressure testing, charging of gas and commissioning of the plant.</p>	Lot.	1			
<b>25</b>	ALL ELECTRICAL FIXTURES INCLUDE ALL SWITCHES AND lighting AS REQUIRED -Complete Facility	Lot	1			
<b>26</b>	Dock leveller of platform with hinged lip made of profile and anti-slip steel. Pairs of super bumpers with heavy steel support. Hydraulic power pack suitable for p load of 40 tones as defined by EN 1398.	Nos.	1			
<b>27</b>	Stacking Arrangement					
<b>A</b>	Lot of MS Material for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material	Kg (approx)	400000.00			
<b>B</b>	Lot of Labor Job for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material which is fabricated at site will all consumables like Electric Rod and Gas with labor job for painting. All MS material, Redoxide and Color which is required will be supplied by Vendor	Kg (approx)	400000.00			
<b>C</b>	Wooden batten required for Wooden Flooring with accessories like strip and nails including installation.	Nos (Approx)	180000.00			
<b>D</b>	Wooden Planks required for staircase inside the cold room with fixing material	Nos	125			
<b>E</b>	COLOR AND PRIMER MATERIAL FOR STEEL STRUCTURE	LOT	1			



28	PUF Panel & Doors				
A					
1	Supply of PUF Insulated Composite wall and ceiling panels.				
1.1	100 mm Thick PUF Panel for wall and ceiling in Cold Store	Sq.m	5106		
2	Hinged Door of Size 1200 mm x 2100 mm x 80 mm thick	Nos.	5		
3	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tarfelt, bitumen and Polythene Sheets				
3.1	100 mm thick	Sq.m	1660		
4	Panel Fixing Accessories comprising:				
4.1	Sealant, pop rivets and flashings, PUF Chemicals,	Sq.m	5106		
	Alumnum tee only.	RMT	1360		
4.2	PVC Strip Curtains for Doors	Nos.	5		
5	Installation				
5.1	Installation of Panels	Sq.m.	5106		
5.2	Installation of Floor Insulation	Sq.m.	1660		
5.3	Installation of Hinged Door	Nos.	5		
29	Freight	Nos.	1		
30	Civil work for Machinerries foundation and other misc. works		LS	1	
	Total			₹	
	GST@18%			₹	
	Grand Total			₹	
				-	

#### Technical Specification

##### PUF Panel

PUF insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. The PUF density to be  $40 \pm 2$  Kg /m<sup>3</sup>. The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints

The thermal conductivity of PUF to be  $(0.023 \pm 5\%) \text{ w/m}^2\text{K}$ . For PUF Insulated panel thickness.

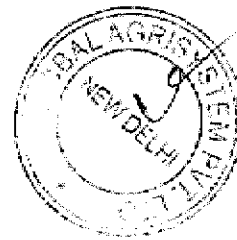
Panel Fixing Accessories

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspension system for ceiling panel support

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Floor Insulation with PUF Sheets

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer.



The density of PUF Sheet to be  $40 \pm 2 \text{ Kg /m}^3$ . The supply includes sufficient quantity of vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

#### **Hinged door**

Hinged Doors comprising Door Shutter clad on both sides with 0.5mm thick (tct) plain pre-painted GI sheet in Off-white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable.

#### **Motorized / Manual Horizontal Sliding Doors**

Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter clad on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced doorframe and be fitted with EPDM gasket suitable sliding arrangement.

#### **PVC STRIP CURTAINS**

PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

#### **Pressure relief Valve**

The walls and ceilings of cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves make it possible to balance internal and external pressure, through venting.

**PRICE SCHEDULE: Include (Design, Supply, Installation, commissioning, Trial run)**

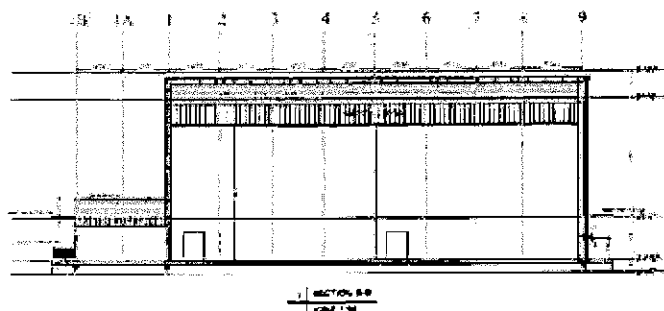
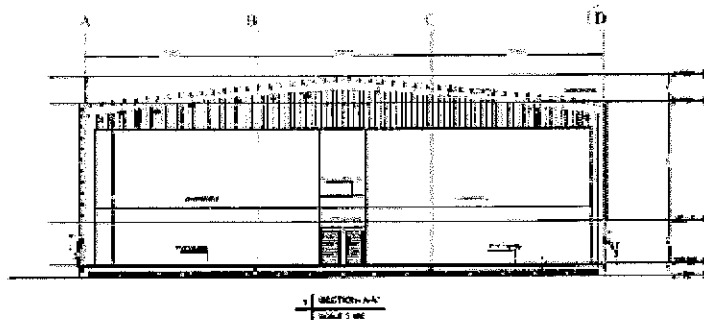
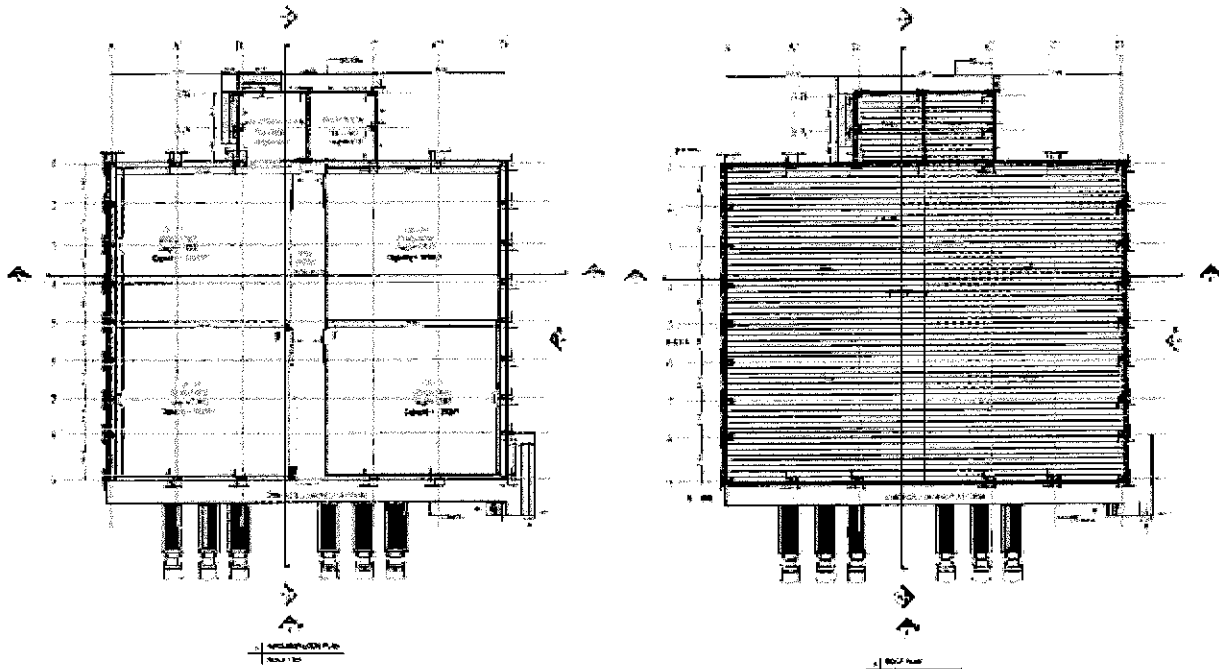
#### **INCLUSIONS**

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation.



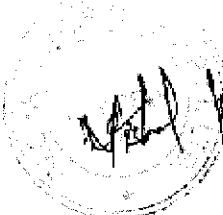
## Layouts

### Potato Cold store



**Note: LOT Details-** This is the estimated quantity and the bidders are requested to visit the site and check the drawings before submission.

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*[Signature]*  
Mr. [Name]

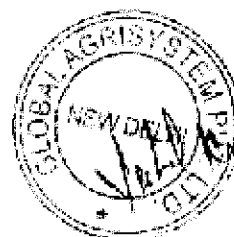
**(5000 MT Onion Cold Store)**

**Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Mezzanine floor for Stacking Arrangements for Onion Cold Storage-5000 MT.**

**BASIS OF DESIGN**

**1. Cold Store 1 - 4**

Product	:	Onion
Storage Capacity	:	1250 MT
Daily Loading	:	62.5 Ton/Day/Chamber
No. of Rooms	:	04
Room Dimension	:	20 x 18 x 12 m H
Product Inlet Temp.	:	25°C
Room Temperature	:	0°C
Relative Humidity	:	65 - 70%
Cooling Load	:	23.7 TR Each

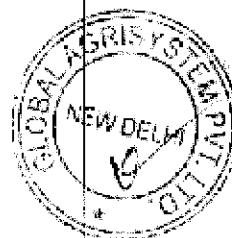


**SECTION A**

**TECHNICAL SPECIFICATIONS/BOQ FOR REFRIGERATION SYSTEM**

**Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Mezzanine floor for Stacking Arrangements for Onion Cold Storage-5000 MT.**

S. No.	Description	Unit	Qty.	Unit Rate	Amount	Remarks
<u>1</u>	High speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches & foundation bolts & gauge cum control panel and capacity control arrangement, ammonia head & oil cooling and skid mounting. Intermediate Temp. : (-) 15°C Condensing Temp. : 38°C Capacity : 62.9 TR Power Consumed : 97.53 BHP Rpm : 1200	Nos.	2.00			COMPAK SRC 65 N 15, Single Stage Reciprocating Compressor Package for Onion Rooms, capacity 65TR @ -15 deg C SST / 38 deg C SDT, complete with 110 kW 4-pole belt-driven IE2 motor, oil separator, Kirloskar KCX6/equivalent, [1W+1S]
<u>2</u>	cyclone type oil separator flanged connections with companion flanges and oil drain valve.	Nos.	2.00			
<u>3</u>	ABB/ Siemens make 120 HP, 4-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor	Nos.	2.00			
<u>4</u>	L&T/ Equiv make star delta starter for the above motors.	Nos.	2.00			
<u>5</u>	High Stage Compressor for Cold Store high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools,	Nos.	1.00			COMPAK SRC 42 N 15, Single Stage Reciprocating Compressor Package for Onion rooms, capacity 42TR @ -15 deg C SST / 38 deg C

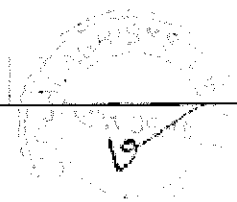


	wrenches & foundation bolts & gauge cum control panel and capacity control arrangement, ammonia head & oil cooling and skid mounting.				SDT, complete with 75 kW 4-pole belt-driven IE2 motor, oil separators, Kirloskar KCX3/equivalent, [1 working]
	Intermediate Temp.	: (-) 15°C			
	Condensing Temp.	: 38°C			
	Capacity	: 41.95 TR			
	Power Consumed	: 66.37 BHP			
	Rpm	: 1200			
6	coalescer type oil separator flanged connections with companion flanges and oil drain valve	Nos.	1.00		
7	ABB/ Siemens make 75 HP, 4-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage Induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor	Nos.	1.00		
8	L&T/ Equiv make star delta starter for the above motors.	Nos.	1.00		
9	Evaporative ammonia condenser complete with hot dip galvanized condensing coil, GP casing & water sum tank, fan section with fans, motor, eliminators and water circulation pump with PVC fittings Heat Rejection Capacity: 229 TR Condensing Temp: 38 °C Wet Blub Temp.: 27.8 °C	Nos.	1.00		Evaporative type condenser of capacity 270 TR
10	Ammonia receiver of size 24" Dia. x 20' Long constructed with Liquid inlet and outlet valves, safety valve, charging valve, drain valve, Purge valve, pressure gauge and gauge glass with valves	Nos.	1.00		High Pressure Liquid Receiver, horizontal straight through type, suitable for 108 TR capacity, with necessary valves & controls
11	LP Receiver For Cold Store	Nos.	1.00		Low Pressure Liquid

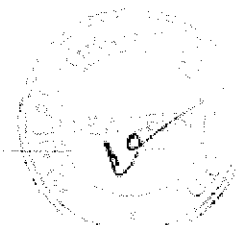
	ammonia low pressure receiver 42" dia x 12' Long constructed with liquid inlet & outlet valves, safety valve, gauge glass with valves, pressure gauge with valve saddle supports, and pump out connection with valve. Also incorporating all the nozzles and valves for easy connection with ACU's and suction - discharged lines.					Receiver Package @ - 15 deg C, with vessel suitable for 108 TR, Rinac make, with Ammonia Pumps [1 working + 1 standby]
12	Hermetically sealed liquid ammonia pump for ammonia recirculation with motor and accessories comprising of suction strainer, suction and discharge valves, check valve.	Nos.	2.00			
13	Set of Danfoss /Manik make controls for liquid re-circulation system comprising of: Electronic Float switch : 03 Nos. Pressure Differential Controller :02 Nos. Differential Pressure Regulating Valve : 01 No. Liquid line solenoid valve :01 No. Frost-free gauge glass : 01 No.	Set	1.00			
14	wall mounted / ceiling suspended frigid coil air Cooling unit complete with SS Tubes & AL finned cooling coil. Total GI enclosure, drain pan, axial flow fan with motor, water defrost arrangement etc. Cold Store 1 – 4 Capacity : 8.77 TR @7°C Coils will have additional 2 rows for hot gas arrangement for producing low RH.	Nos.	12.00			Ammonia Pumped type Evaporator for Cold rooms with GI Casing, SS Tubes & Al Fins – 8.7 TR + Recirculatory Fans
	Set of Danfoss /Manik make Controls for Coil:	Set	4.00			
15	Liquid line solenoid valve					
	Digital Temp. Indicator cum controller					



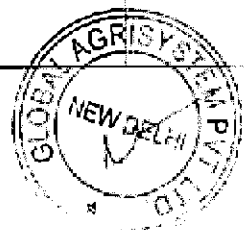
<b>16</b>	MS 'C' class refrigerant pipes, pipe fittings and ammonia valves to interconnect above equipment in the system comprising of suction, discharge, liquid and oil lines as per PID and based on compact plant layout.	Lot.	1.00			15mm dia : 36 Rmt 20mm dia : 55 Rmt 32mm dia : 12 Rmt 40mm dia : 175 Rmt 50mm dia : 63 Rmt 65 mm dia : 6 Rmt 80mm dia : 99 Rmt 100mm dia : 102 Rmt 125mm dia : 90Rm
<b>17</b>	G.I 'B' class pipes, pipefitting and valves for condenser make up water, cylinder head cooling defrost and drain line piping as per PID and based on assumption that condenser shall be placed at a distance have not more than 10 m from the plant room.	Lot.	1.00			
<b>18</b>	PUF insulation for accumulators/vessel, suction line, liquid lines and wet return lines with fixing material bitumen/ CPRX compound and aluminum cladding of 26G with In battery limit.	Lot.	1.00			
<b>19</b>	Structural Material for pipe installation and plat form Piping support to be fabricated and installed at site with steel channel and steel angle distance between the supports to be Approx. 5 meters, with variance depend on the building condition.	Lot.	1.00			
<b>20</b>	MCC panel will be cubical type switchboard with bus bar, Incoming ACB, indicating lamps, push buttons, switches, fuses, voltmeters, Voltmeter switch, ammeters, ammeters switch and starter for  a) compressors motor,  b) condenser fan motor & pump,  c) Cooling coil fan motor,	Lot	1.00			Electrical Control Panel and Distribution Panels,
<b>21</b>	Power & Control cabling with cable tray for complete refrigeration plant	Lot	1.00			Electrical Cables & Related Accessories, Polycab Cables/equivalent
<b>22</b>	Manual gas purger with safety valve for purging non- condensable Gases from the system	Nos.	1.00			



<b>23</b>	First charge of ammonia gas and lubricant compressor oil.	Lot.	1.00			
<b>24</b>	Installation, Testing & Commissioning of the complete refrigeration plant and putting in operation. Our scope is as follows:	Lot.	1.00			
	- Erection of the equipment as per our layout with proper operation and alignment					
	- Connecting various equipment's with pipelines, fittings, controls and instruments					
	- Painting of Equipment & Piping					
	- Pressure testing, charging of gas and commissioning of the plant.					
<b>25</b>	ALL ELECTRICAL FIXTURES INCLUDE ALL SWITCHES AS REQUIRED -Complete Facility	Lot	1.00			
<b>26</b>	Dock leveller of platform with hinged lip made of profile and anti-slip steel. Pairs of super bumpers with heavy steel support. Hydraulic power pack suitable for load of 40 tons as defined by EN 1398.	Nos.	1.00			
<b>27</b>	Ammonia Hot Gas Defrost Valve Assembly	Lot	1.00			It's required for Low RH Rooms
<b>28</b>	Stacking Arrangement					
<b>A</b>	Lot of MS Material for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material	Kg (Approx)	400000.00			
<b>B</b>	Lot of Labor Job for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material which is fabricated at site will all consumables like Electric Rod and Gas with labor job for painting. All MS material, Redoxide and Color which is required will be supplied by Vendor (G+3-1650 sqm each floor).	kg (Approx)	400000.00			
<b>C</b>	Wooden batten required for Wooden Flooring with accessories like strip and nails including installation.	Nos (Approx)	180000.00			



D	Wooden Planks required for staircase inside the cold room with fixing material	Nos.	125.00		
E	COLOR AND PRIMER MATERIAL FOR STEEL STRUCTURE	LOT	1.00		
29	PUF Panel & Doors				
A	Supply of Items:				
1	Supply of PUF insulated Composite wall and ceiling panels.				
1.1	100 mm Thick PUF Panel for wall and ceiling in Cold Store	Sq.m	5106		
2	Hinged Door of Size 1200 mm x 2100 mm x 80 mm thick	Nos.	5		
3	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tarfelt, bitumen and Polythene Sheets				
3.1	100 mm thick	Sq.m	1660		
4	Panel Fixing Accessories comprising:				
4.1	Sealent, pop rivets and flashings, PUF Chemicals,	Sq.m	5106		
	Alumnum tee only.	RMT	160		
4.2	PVC Strip Curtains for Doors	Nos.	5		
5	Installation				
5.1	Installation of Panels	Sq.m.	5106		
5.2	Installation of Floor Insulation	Sq.m.	1660		
5.3	Installation of Hinged Door	Nos.	5		
30	Freight	Nos.	1		
31	Civil work for Machineris Foundation and Other misc. works	LS			
	Total			₹	
	GST@18%			₹	
	Grand Total			₹	



## **Technical Specification**

### **PUF Panel**

PUF insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. The PUF density to be  $40 \pm 2$  Kg /m<sup>3</sup>. The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints. The thermal conductivity of PUF to be  $(0.023 \pm 5\%)$  w/m<sup>2</sup>°k. For PUF Insulated panel thickness.

### **Panel Fixing Accessories**

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspension system for ceiling panel support

### **Floor Insulation with PUF Sheets**

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer. The density of PUF Sheet to be  $40 \pm 2$  Kg /m<sup>3</sup>. The supply includes sufficient quantity of vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

### **Hinged door**

Hinged Doors comprising Door Shutter cladded on both sides with 0.5mm thick (tct) plain pre - painted GI sheet in Off- white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable.

### **Motorized / Manual Horizontal Sliding Doors**

Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter cladded on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced doorframe and be fitted with EPDM gasket suitable sliding arrangement.

### **PVC STRIP CURTAINS**

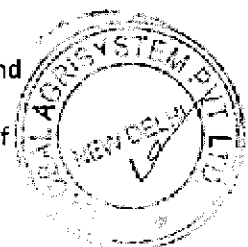
PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

### **Pressure relief Valve**

The walls and ceilings of cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves make it possible to balance internal and external pressure, through venting.

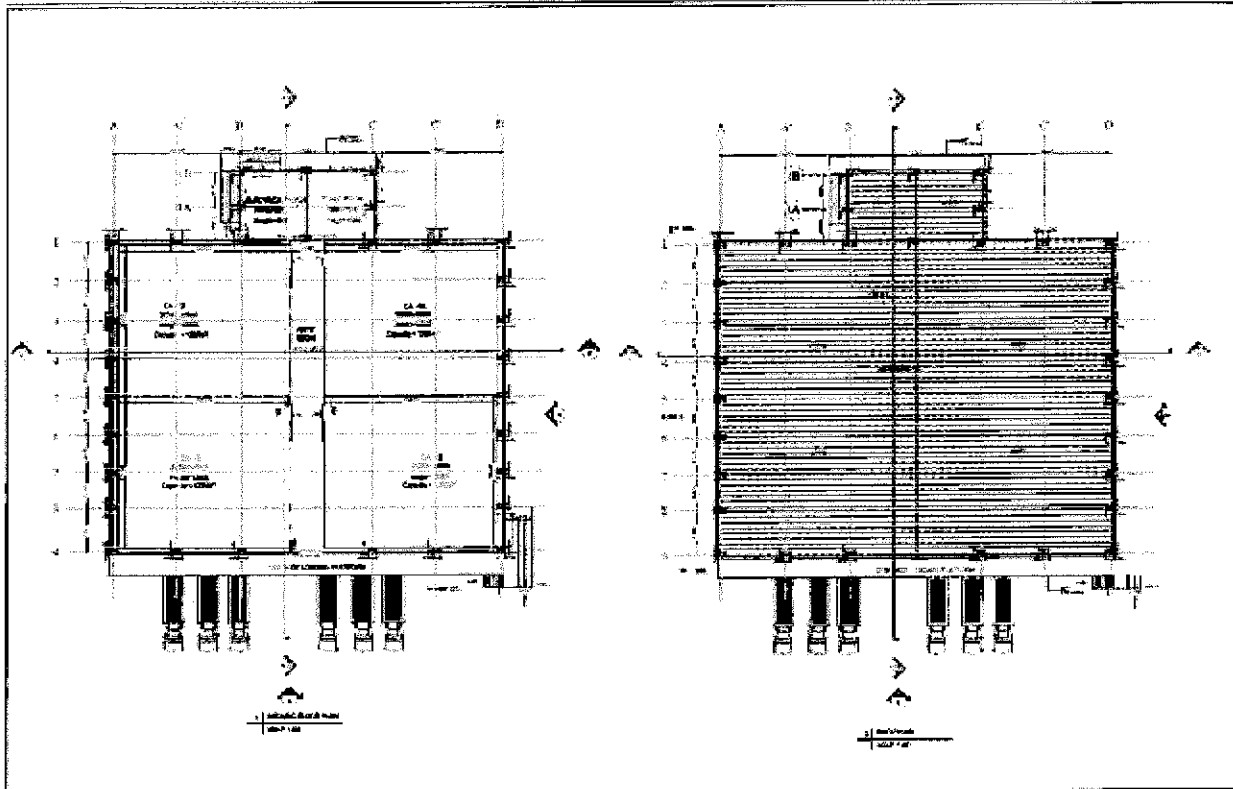
## **INCLUSIONS**

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of

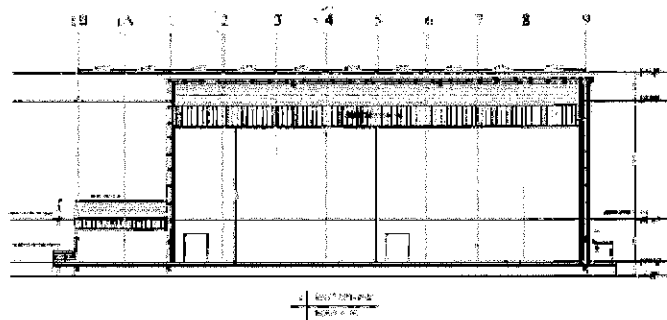
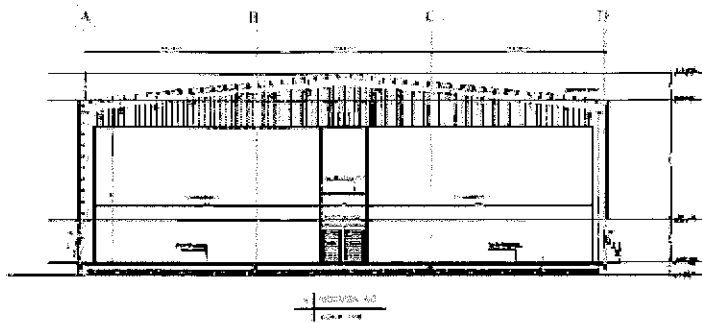


- holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation.

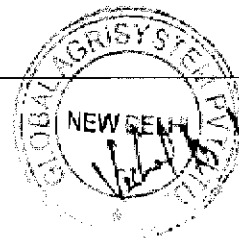
### Onion Cold Store



10



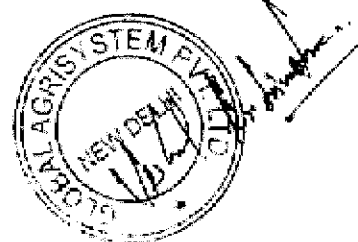
**Note: LOT Details-** This is the estimated quantity and the bidders are requested to visit the site and check the drawings before submission.



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**(Banana Ripening 20 MT x 04 Nos.)**

**Design, Supply, Installation, Testing, Commissioning of Plant & Machineries  
including Puff Panel works for Banana Ripening Chamber- 80 MT**



## BASIS OF DESIGN

### 1. Banana Ripening

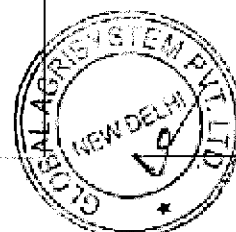
Product	:	Banana
Storage Capacity	:	20
MT No. of Rooms	:	4
Room Dimension	:	5.5 X 7.2 X 3.5 m
HProduct Inlet Temp.	:	25°C
Room Temperature	:	15°C -
18°C Cooling Load	:	7 TR Each

### Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for Banana Ripening Chamber- 80 MT

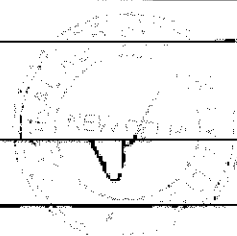
S. No.	Description	Unit	Qty	Unit Rate	Amount	Remarks
1	high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches & foundation bolts & gauge cum control panel and capacity control arrangement, ammonia head & oil cooling and skid mounting. Suction Temp. : 10°C Condensing Temp. : 40°C Capacity : 39 TR Power Consumed : 29.4 BHP Rpm : 750	Nos.	2.00			COMPAK SRC 40 P 6, Single Stage Reciprocating Compressor Package for Ripening chamber, capacity 40TR @6 deg C SST / 40 deg C SDT, complete with 37 kW 4-pole belt-driven IE2 motor, oil separator, Kirloskar PC2/equivalent, [1W+1S]
2	cyclone type oil separator flanged connections with companion flanges and oil drain valve.	Nos.	2.00			
3	ABB/ C.G/ Siemens make 40 HP, 4-pole, IE2, IP 55, Class F Insulation, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor	Nos.	2.00			
4	Reputed make star delta starter for the above motors.	Nos.	2.00			



5	<p>evaporative ammonia condenser complete with hot dip galvanized condensing coil, galvanized water sum tank, galvanized casing, fan section with fans, motor, eliminators and water circulation pump with PVC fittings</p> <p><b>Heat Rejection Capacity: 79 TR</b> <b>Condensing Temp: 38°C</b> <b>Wet Bulb Temp. 27.8 °C</b></p>	Nos.	1.00			Evaporative type condenser of capacity 79 TR
6	Ammonia receiver size 20" dia x 12' long Liquid inlet And outlet valves, safety valve, charging valve, drain valve, Purge valve, pressure gauge and gauge glass with valves.	Nos.	1.00			High Pressure Liquid Receiver, horizontal straight through type, suitable for 41 TR capacity, with necessary valves & controls, Rinac make
7	<p>wall mounted / ceiling suspended frigid coil air Cooling unit complete with AL Tubes &amp; AL finned cooling coil. Total GI enclosure and drain pan axial flow fan with motor with water defrost arrangement etc.</p> <p>Banana Ripening 1 - 4</p>	Set	4.00			Ammonia Flooded type Evaporator for Cold rooms with GI Casing, SS Tubes & Al Fins & Accumulator— 7 TR
8	<p>Controls for Coil:</p> <p>Liquid line solenoid valve : 01 No.</p> <p>Digital Temp. Indicator : 01 No.</p> <p>Electronic Float Switch : 01 No.</p> <p>Expansion Valve : 01 No</p>	Nos.	2.00			
9	Ethylene Generator portable type with power cord	Nos.	2.00			Supply and installation of Ripening rooms with Humidifier, CO2 Extraction system, controller, Sensor, Ethylene generator & Light fittings
10	MS 'C' class pipes, pipe fittings and ammonia valves to interconnect above equipment based on compact plant layout. Also pipe, pipefitting and ammonia valves to inter connect compressors	Lot.	1.00			<p>15mm dia : 16 Rmt</p> <p>20mm dia : 35 Rmt</p> <p>25mm dia : 24 Rmt</p> <p>32mm dia : 16 Rmt</p> <p>40mm dia : 56 Rmt</p> <p>50mm dia : 86 Rmt</p>
11	G.I 'B' class pipes, pipefitting and valves for condenser water circulation with defrost drain pipe, oil-cooler piping and based on assumption that condenser shall be placed at a distance have not more than 7m from the plant room.	Lot.	1.00			



12	PUF insulation with 26 G aluminum cladding with fixing material bitumen/ CPRX compound for surge drum & suction line with in battery limit.	Lot.	1.00			
13	Structural Material for pipe installation and plat form Piping support to be fabricated and installed at site with steel channel and steel angle distance between the supports to be Approx. 5 meters, with variance depend on the building condition.	Lot.	1.00			
14	MCC panel will be cubical type switchboard with bus bar, Incoming ACB, indicating lamps, push buttons, switches, fuses, voltmeters, Voltmeter switch, ammeters, ammeters switch, and starter for fan motor, condenser pump, ammonia pumps, and feeder for compressors motor starter.	Lot.	1.00			
15	Power & Control cabling with cable tray for complete refrigeration plant and all electrical fixtures including lighting and power switch as required	Lot.	1.00			
16	manual gas purger with safety valve for purging non-condensable Gases from the system	Nos.	1.00			
17	First charge of ammonia gas and lubricant compressor oil	Lot.	1.00			
18	<p>Installation, Testing &amp; Commissioning of the complete refrigeration plant and putting in operation. Our scope is as follows:</p> <ul style="list-style-type: none"> <li>Erection of the equipment as per our layout with proper operation and alignment</li> <li>Connecting various equipment's with pipelines, fittings, controls and instruments</li> <li>Pressure testing, charging of gas and commissioning of the plant.</li> </ul>	Job.	1.00			
19	<b>PUF Panel &amp; Doors</b>					
A						
1	Supply of PUF insulated Composite wall and ceiling panels.					
1.1	80 mm Thick PUF Panel for wall and ceiling in	Sq.m	490			



	<b>Cold Store</b>				
2	Manual Sliding Door of Size 1200 mm x 2100 mm x 80 mm thick	Nos.	4		
3	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tarfelt, bitumen and Polythene Sheets				
3.1	60 mm thick	Sq.m	172		
4	Panel Fixing Accessories comprising:				
4.1	Sealant, pop rivets and flashings, PUF Chemicals, Alumnum tee only.	Sq.m	490		
4.2	PVC Strip Curtains for Doors	Nos.	4		
5	Installation				
5.1	Installation of Panels	Sq.m.	490		
5.2	Installation of Floor Insulation	Sq.m.	172		
5.3	Installation of Hinged Door	Nos.	4		
20	Freight	Nos.	1		
21	Civil work for Machineries foundation and other misc. works	LS	1		
	<b>Total</b>				
	<b><u>GST@18%</u></b>			₹	
	<b>Grand Total</b>			₹	



## **Technical Specification**

### **PUF Panel**

PUF Insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. The PUF density to be  $40 \pm 2$  Kg /m<sup>3</sup>. The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints. The thermal conductivity of PUF to be  $(0.023 \pm 5\%)$  w/m<sup>°k</sup>. For PUF Insulated panel thickness.

### **Panel Fixing Accessories**

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspension system for ceiling panel support

### **Floor Insulation with PUF Sheets**

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer. The density of PUF Sheet to be  $40 \pm 2$  Kg /m<sup>3</sup>. The supply includes sufficient quantity of vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

### **Hinged door**

Hinged Doors comprising Door Shutter cladded on both sides with 0.5mm thick (tct) plain pre - painted GI sheet in Off- white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable

### **Motorized / Manual Horizontal Sliding Doors**

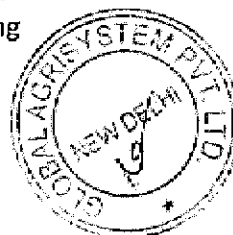
Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter cladded on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced doorframe and be fitted with EPDM gasket suitable sliding arrangement

### **PVC STRIP CURTAINS**

PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

### **Pressure relief Valve**

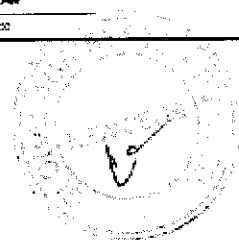
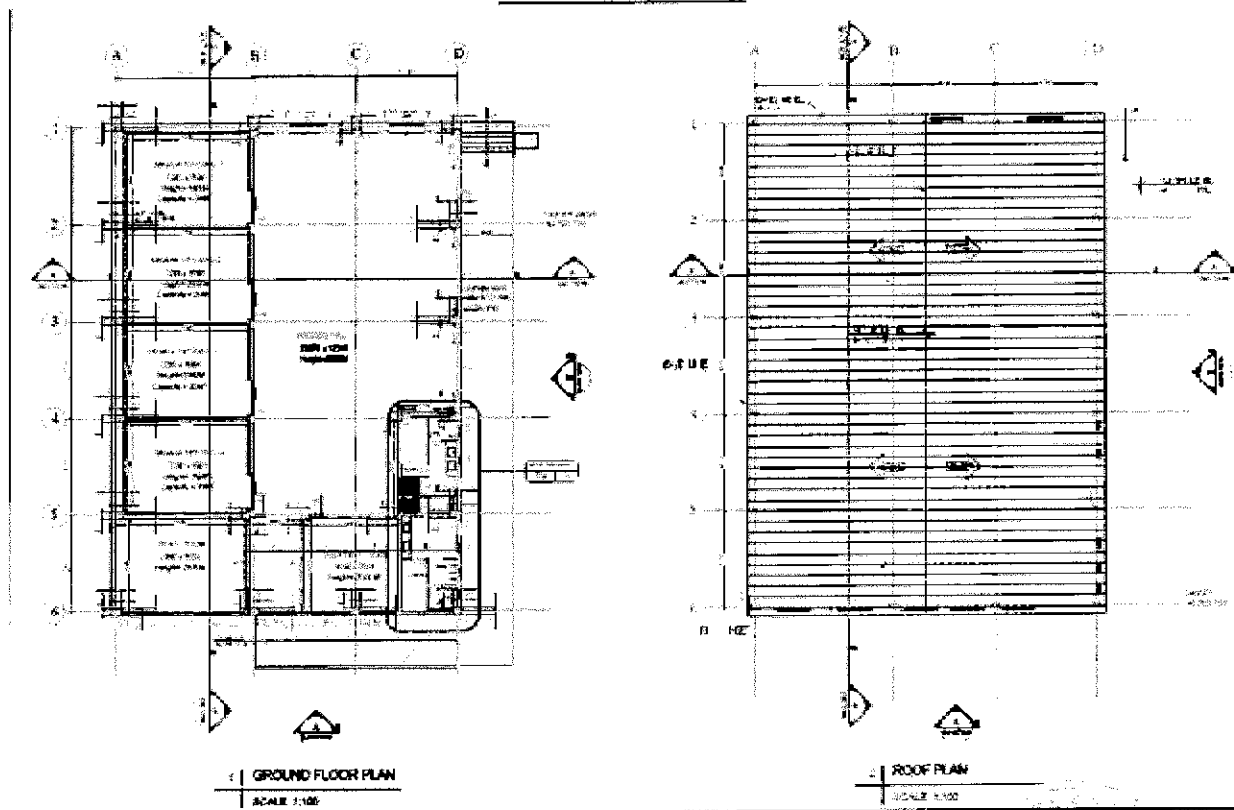
The walls and ceilings of a cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves makes it possible to balance internal and external pressure, through venting

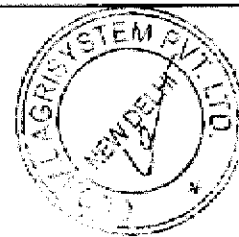


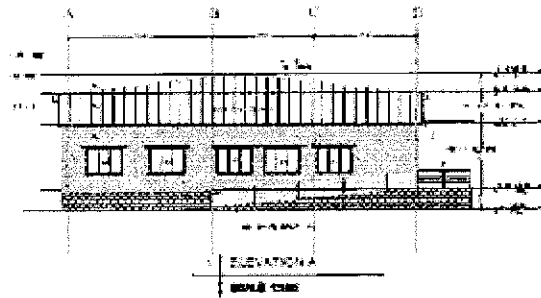
## INCLUSIONS

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation

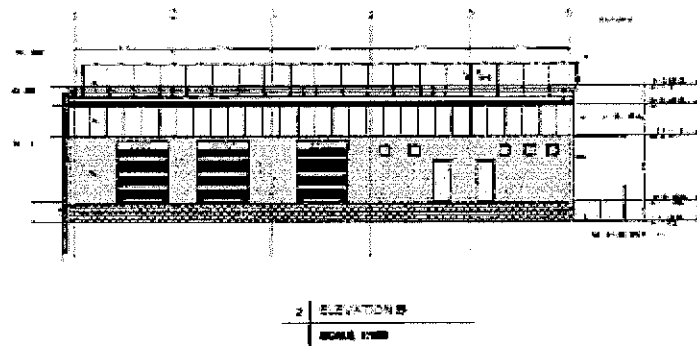
## Banana Ripening



SCALE 1, NEW



ITEM	DESCRIPTION	UNIT
1	FOUNDATION	SQ. FT.
2	WALLS	SQ. FT.



**Note: LOT Details-** This is the estimated quantity and the bidders are requested to visit the site and check the drawings before submission.

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(Litchi Packhouse)

**Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for Litchi Packhouse- 6 MT/Batch**



### BASIS OF DESIGN

#### 1. Litchi Pre Cooler 1 - 2

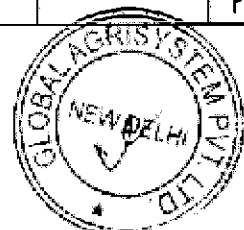
Product	:	Litchi
Storage Capacity	:	6 MT
Daily Loading	:	6 Ton/Day/Chamber
No. of Rooms	:	02
Room Dimension	:	5 x 5 x 3.5 m H
Product Inlet Temp.	:	25°C
Room Temperature	:	2°C
Cooling Load	:	10.5 TR Each

#### 2. Litchi Cold Store 1

Product	:	Litchi
Storage Capacity	:	50 MT
Daily Loading	:	12 Ton/Day/Chamber
No. of Rooms	:	01
Room Dimension	:	15 x 12 x 3.5 m H
Product Inlet Temp.	:	25°C
Room Temperature	:	2°C
Cooling Load	:	7.7 TR Each

### **Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works for Litchi Packhouse- 6 MT/Batch**

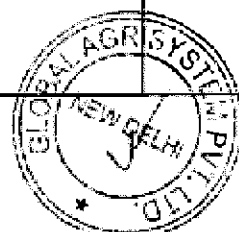
S. No	Description	Unit	Qty.	Unit Rate	Amount	Remarks
1	<p>high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches &amp; foundation bolts &amp; gauge cum control panel and capacity control arrangement, ammonia head &amp; oil cooling and skid mounting.</p> <p>Suction Temp. : (-) 5°C</p> <p>Condensing Temp. : 38°C</p> <p>Capacity : 35.03 TR</p>	Nos.	2.00			COMPAK SRC 36 N 5, Single Stage Reciprocating Compressor Package for Litchi Packhouse, capacity 36TR @ - 5 deg C SST / 38 deg C SDT, complete with 37 kW 4-pole belt-driven IE2 motor; oil separator, Kirloskar KC2/equivalent,



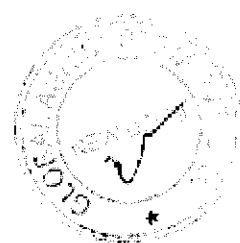
	Power Consumed : 40.99 BHP Rpm : 1200					[1W+1S]
2	Cyclone type oil separator flanged connections with companion flanges and oil drain valve.	Nos.	2.00			
3	ABB/ C.G/ Siemens make 50 HP, 4-pole, IE2, IP 55, Class F Insulation, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor	Nos.	2.00			
4	Reputed make star delta starter for the above motors	Nos.	2.00			
5	India make evaporative ammonia condenser complete with hot dip galvanized condensing coil, galvanized water sum tank, galvanized casing, fan section with fans, motor, eliminators and water circulation pump with PVC fittings Heat Rejection Capacity: 79 TR Condensing Temp : 38 °C Wet Bulb Temp. : 27.8 °C	Nos.	1.00			Evaporative type condenser of capacity 79 TR
6	Ammonia receiver size 20" dia x 12' long Liquid inlet And outlet valves, safety valve, charging valve, drain valve, Purge valve, pressure gauge and gauge glass with valves.	Nos.	1.00			
7	make wall mounted / ceiling suspended frigid coil air Cooling unit complete with AL Tubes & AL finned cooling coil. Total GI enclosure and drain pan axial flow fan with motor with water defrost arrangement etc. Pre Cooler 1 - 2 Capacity: 10.7 TR . Pre Cooler 1 - 2 Capacity: 6.2 TR	Nos.	2.00 2.00			Ammonia Flooded type Evaporator for Cold rooms with GI Casing, SS Tubes & Al Fins – 10.7 TR Ammonia Flooded type Evaporator for Cold rooms with GI Casing, SS Tubes & Al Fins – 6.2 TR



8	G.I 'B' class pipes, pipefitting and valves for condenser water circulation with defrost drain pipe, oil-cooler piping and based on assumption that condenser shall be placed at a distance have not more than 7m from the plant room.	Lot.	1.00			15mm dia : 8 Rmt 20mm dia : 40 Rmt 25mm dia : 24 Rmt 32mm dia : 58 Rmt 40mm dia : 32 Rmt 50mm dia : 50 Rmt 65 mm dia : 24 Rmt 80mm dia : 50 Rmt
9	PUF insulation with 26 G aluminum cladding with fixing material bitumen/ CPRX compound for surge drum & suction line with in battery limit	Lot.	1.00			
10	Structural Material for pipe installation and plat form Piping support to be fabricated and installed at site with steel channel and steel angle distance between the supports to be Approx. 5 meters, with variance depend on the building condition.	Lot.	1.00			
11	MCC panel will be cubical type switchboard with bus bar, Incoming ACB, indicating lamps, push buttons, switches, fuses, voltmeters, Voltmeter switch, ammeters, ammeters switch, and starter for fan motor, condenser pump, ammonia pumps, and feeder for compressors motor starter.	Lot.	1.00			
12	Power & Control cabling with cable tray for complete refrigeration plant	Lot.	1.00			
13	manual gas purger with safety valve for purging non-condensable Gases from the system.	01 No.	1.00			
14	First charge of ammonia gas and lubricant compressor oil.	Lot.	1.00			
15	<p>Installation, Testing &amp; Commissioning of the complete refrigeration plant and putting in operation. Our scope is as follows:</p> <ul style="list-style-type: none"> <li>Erection of the equipment as per our layout with proper operation and alignment</li> <li>Connecting various equipment's with pipelines, fittings, controls and instruments</li> <li>Pressure testing, charging of gas and commissioning of the plant.</li> </ul>	Job.	1.00			



16	ALL ELECTRICAL FIXTURES INCLUDE ALL SWITCHES and Lighting AS REQUIRED -Complete Facility	Job.	1.00			
17	Dock leveller of platform with hinged lip made of profile and anti-slip steel. Pairs of super bumpers with heavy steel support. Hydraulic power pack suitable for load of 12.5 tones as defined by EN 1398.	Nos.	1.00			
18	<b>PUF Panel &amp; Doors</b>					
1	Supply of PUF insulated Composite wall and ceiling panels.					
1.1	100 mm Thick PUF Panel for wall and ceiling in Cold Store	Sq.m	670.00			
2	Manual Sliding Door of Size 1200 mm x 2100 mm x 80 mm thick	Nos.	4.00			
3	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tarfelt, bitumen and Polythene Sheets					
3.1	100 mm thick	Sq.m	275.00			
4	Panel Fixing Accessories comprising:					
4.1	Sealent, pop rivets and flashings, PUF Chemicals, Aluminum tee only.	Sq.m	670.00			
4.2	PVC Strip Curtains for Doors	Nos.	4.00			
5	Installation					
5.1	Installation of Panels	Sq.m.	670.00			
5.2	Installation of Floor Insulation	Sq.m.	275.00			
5.3	Installation of Hinged Door	Nos.	4.00			
19	<b>Freight</b>	Nos.	1.00			
20	<b>Civil work for Machinerries foundation and other misc. works</b>	LS	1.00			
	<b>Total</b>				₹	
					-	
	<b>GST@18%</b>				₹	
					-	
	<b>Grand Total</b>				₹	
					-	



## **Technical Specification**

### **PUF Panel**

PUF insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. The PUF density to be  $40 \pm 2$  Kg /m<sup>3</sup>. The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints. The thermal conductivity of PUF to be  $(0.023 \pm 5\%)$  w/m<sup>2</sup>k. For PUF Insulated panel thickness.

### **Panel Fixing Accessories**

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspension system for ceiling panel support

### **Floor Insulation with PUF Sheets**

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer. The density of PUF Sheet to be  $40 \pm 2$  Kg /m<sup>3</sup>. The supply includes sufficient quantity of vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

### **Hinged door**

Hinged Doors comprising Door Shutter cladded on both sides with 0.5mm thick (tct) plain pre - painted GI sheet in Off- white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable.

### **Motorized / Manual Horizontal Sliding Doors**

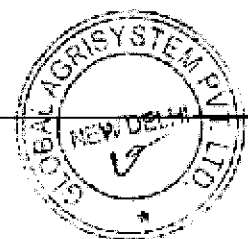
Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter cladded on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced door-frame and be fitted with EPDM gasket suitable sliding arrangement

### **PVC STRIP CURTAINS**

PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

### **Pressure relief Valve**

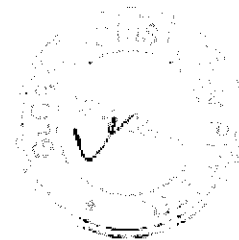
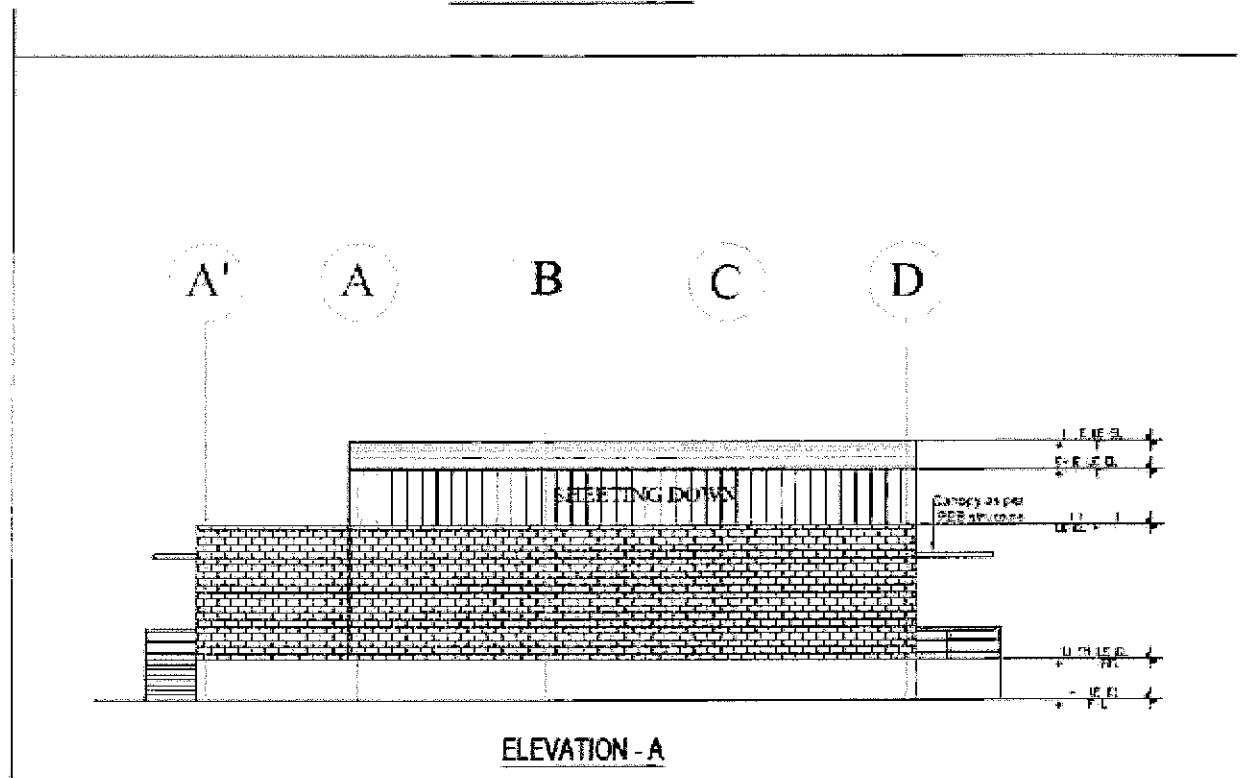
The walls and ceilings of cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves makes it possible to balance internal and external pressure, through venting.

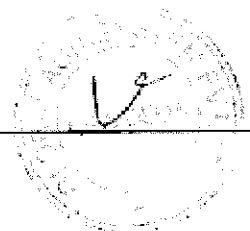
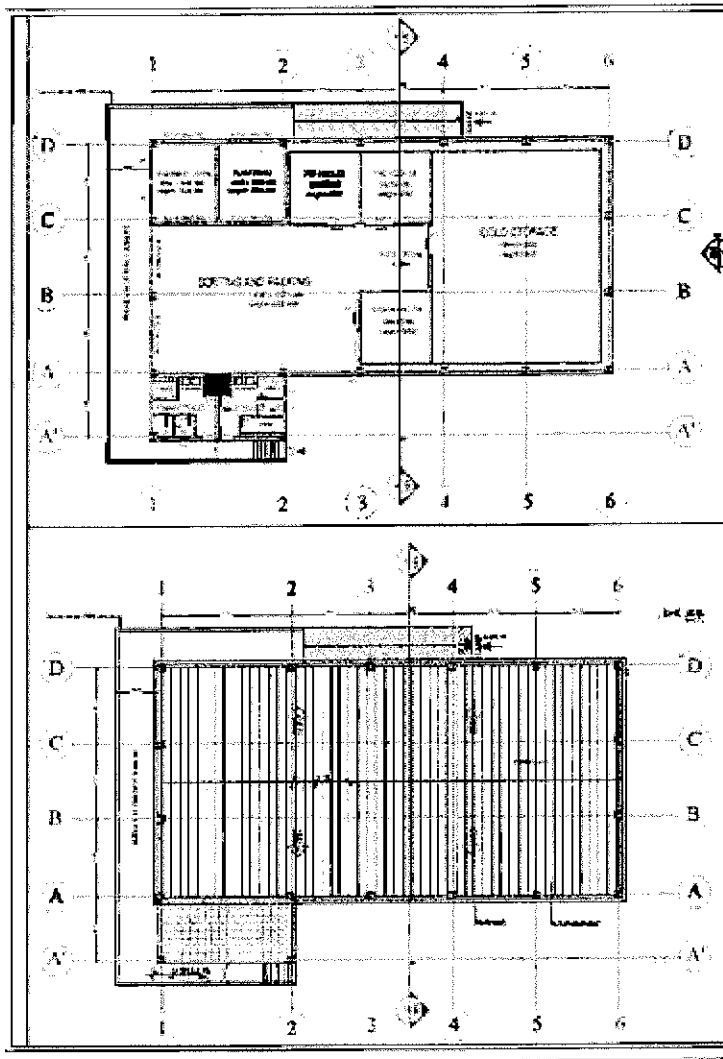


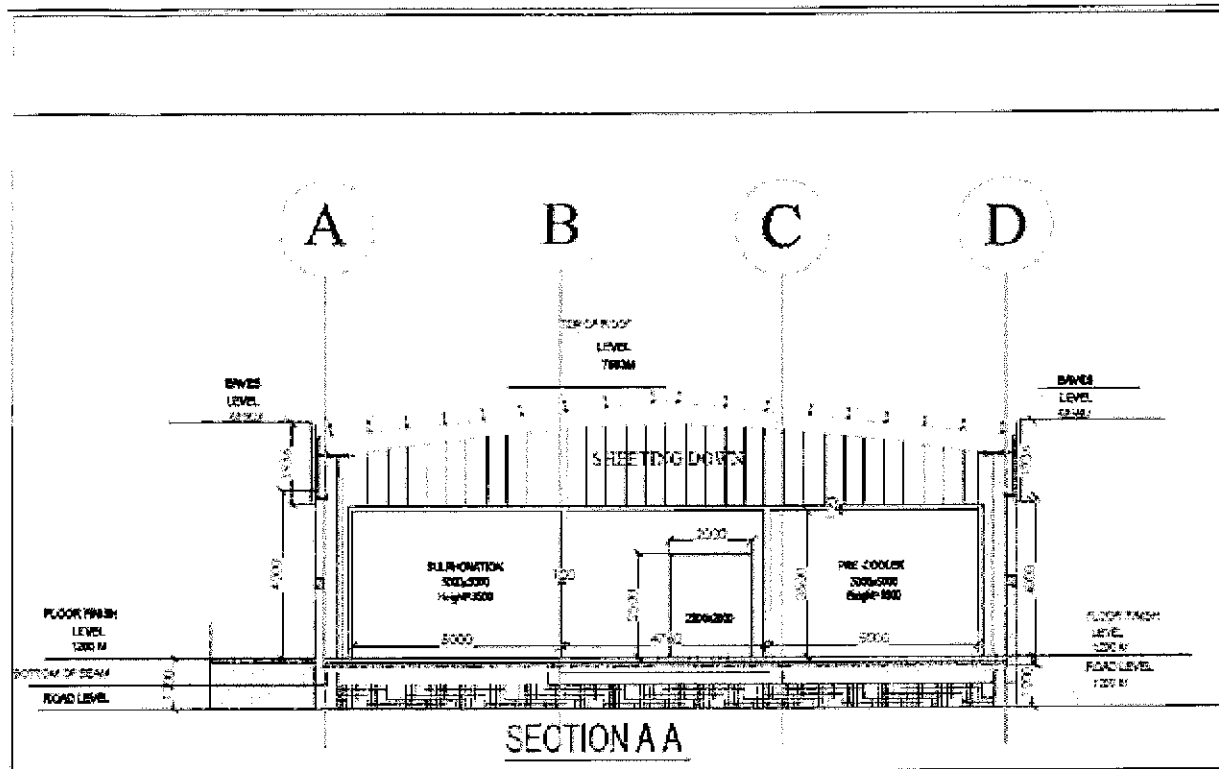
## INCLUSIONS

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping inside the packhouse and storage.
- Unloading, shifting of equipment at site and transportation.

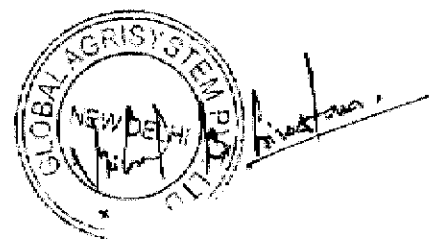
### Litchi Packhouse







**Note: LOT Details-** This is the estimated quantity and the bidders are requested to visit the site and check the drawings before submission.



**Design Supply installation, Testing,  
commissioning of Plant & Machineries for  
IQF-2MTPH and Frozen Storage-4000 MT**

(2 TPH IQF and Processing Line)

Section A

TECHNICAL SPECIFICATIONS FOR PROCESSING LINE

S.NO	EQUIPMENT DESCRIPTION	QTY.	Unit Rate	Amount
1.	<b>FEED ELEVATOR</b> Capacity - 2000 kg of pods/hr.(each)  Suitable for feeding peas to the depodder. The equipment consists of :- a) PVC flap type conveyor (imported) with height of Flap 100 mm, placed at a distance of 300 mm. b) S.S. 304 side guides & center guides for partition. c) S.S. feed hopper & discharge chute. d) Fixed speed drive with geared motor & sprockets. e) S.S. framework with S.S. supporting.	02 Nos.		
2.	<b>PEA DEPODDER</b> Capacity - 2000 kg of pods/hr.  Suitable for depodding of peas. The equipment consists of :- a) Wooden beaters mounted on S.S. beater drum with adjustment arrangement for flow of product. b) Riddle drum fabricated from S.S. 304 sq. pipes with S.S. wire mesh of size 14 mm X 14hmmX 2.5 mm thick. c) S.S. feed hopper & discharge chute. d) Apron conveyor (imported) with S.S framework, M.S driving & driven roller & arrangement for adjustment of apron conveyor. e) S.S framework for mounting of beater drum & riddle drum. f) Conveyor for carrying skins from apron conveyor to waste conveyor. g) Fixed speed drive with geared motor & sprockets.	02 Nos.		
3.	<b>WASTE COLLECTION CONVEYOR</b> Capacity - 4000 kg of waste/hr. Size - 800 mm x 6500 mm length Power - 1 HP  Suitable for collecting & carrying waste discharged from depodders. The equipment consists of :- a) PVC coated food grade endless belt (imported). b) Side guide, rollers, framework will be from S.S.304. c) Fixed speed drive with geared motor with S.S. base Plate & motor cover.	01 No.		

4.	<b>BUCKET ELEVATOR</b> Capacity - 4000 kg of waste/hr. Size - 600 mm x 3750 mm length Power - 1 HP Suitable for carrying the product to recovery drum. The equipment consists of: a) S.S. 304 framework with supporting b) Perforated buckets with side guards at both sides. c) Sprockets with S.S. shaft & bearings for driving buckets. d) Fixed speed drive with geared motor.	01 No.		
5.	<b>RECOVERY DRUM WITH GRAIN CONVEYOR</b> Capacity - 4000 kg Of waste/hr. Size - 1150 mm x 4700 mm length Power - 9 HP Suitable for separating pea grains waste. The equipment consists of:- a) S.S. perforated drum of perforation size 15 mm. Dia. b) Apron conveyor with S.S. framework & rollers for separating grains from skin pods. c) S.S. framework with supporting d) S.S. feed hopper & discharge chute. e) Fixed speed drive with geared motor. f) 5 h.p blower with ducting for continuous cleaning of holes.	01 No.		
6.	<b>WASTE DISCHARGE CONVEYOR/ELEVATOR</b> Capacity - 4000 kg of waste/hr. Size - 800 mm x 6000 mm length Power - 1 HP Suitable for carrying waste from recovery drum. The equipment consists of:- a) PVC conveyor b) S.S. 304 side guides & center guides for partition. c) S.S. feed hopper & discharge chute. d) Fixed speed drive with geared motor & sprockets. e) S.S. framework with S.S supporting.	01 No.		

7.	<b>CROSS COLLECTION CONVEYOR</b> Capacity - 2000 kg of waste/hr.  Suitable for collecting peas from depodders & carrying them to grain conveyor. The equipment consists of:- <ul style="list-style-type: none"> <li>a) PVC coated food grade endless belt (imported).</li> <li>b) Side guides, rollers, framework will be from S.S.</li> <li>c) Fixed speed drive with geared motor with S.S. base Plate &amp; motor cover.</li> </ul>	01 No.		
8.	<b>POD SORTER</b> Size - 1.25 mtr x 700 mm (top) & 500 mm bottom x 200 mm Power - 2 HP Hole size - 14 mm. round Suitable for separating pods from grain.	01 No.		
9.	<b>GRAIN CONVEYOR</b> Capacity - 2000 kg Of Kgs/hr. Suitable for collecting peas from pod sorter & carrying them to elevator. The equipment consists of :- <ul style="list-style-type: none"> <li>a) PVC coated food grade endless belt (imported).</li> <li>b) Side guides, rollers, framework will be from S.S.</li> <li>c) Fixed speed drive with geared motor with S.S. base Plate &amp; motor cover.</li> </ul>	01 No.		
10.	<b>BUCKET ELEVATOR</b> Capacity - 2000 kg of grains /hr.  Suitable for carrying the product to winower. The equipment consists of :- <ul style="list-style-type: none"> <li>a) S.S. framework with S.S. supporting.</li> <li>b) Perforated buckets with side guards at both sides.</li> <li>c) Fixed speed drive with geared motor &amp; sprockets.</li> </ul>	01 No.		
11.	<b>VIBRATORY WINOWER WITH POD STICK ELEMINATOR</b> Capacity - 2000 kg Of Kgs /hr. Suitable for removing pods, skin, floaters & warms from the product. The equipment consists of :- <ul style="list-style-type: none"> <li>a) S.S. slotted tray with S.S. side guides.</li> <li>b) S.S. supporting with S.S framework.</li> <li>c) Blower of suitable capacity.</li> <li>d) S.S. discharge chute with perforated base.</li> <li>e) Fixed speed drive for shaker &amp; blower with vibratory motors.</li> </ul>	01 set		

12.	<b>BUCKET ELEVATOR</b> Capacity - 2000 kg of grains /hr.  Suitable for lifting the product from winower to hydro flume hopper. The equipment consists of :- a) S.S. framework with S.S. supporting. b) Perforated buckets with side guards at both sides. c) 150 mm dia S.S pipeline for carrying the product to washer with pump & return line to hopper for recirculation d) Fixed speed drive with geared motor & sprockets.	01 set
13.	<b>FLOTATION WASHER</b> Capacity - 2000 Kgs /hr.  Suitable for washing of leafy & root vegetables & removing of floaters from the product. The equipment consists of :- a) S.S. balance tank with S.S. centrifugal pump for transfer of product. b) S.s wire mesh conveyor for de watering of product	01 set
14.	<b>S.S BELT WASHER</b> Capacity - 2000 Kgs /hr.  Suitable for washing OF leafy & root vegetables & removing of foreign particles from the product. The equipment consists of:- a) S.S. balance tank with S.S. centrifugal pump & turbine blower. b) S.S. flume suitable for washing of product & removal of stone & other solid particles. c) Arrangement for washing of product by fresh water& removing foreign material. d) Fixed speed drive with geared motor.	01 No.
15.	<b>S.S. BELT TYPE STEAM BLANCHER</b> Capacity - 2000 Kgs /hr.  Suitable for blanching of product. The equipment consists of: - a) S.S. outer shell with hinged top covers. b) PP Perforated belt (modular) to withstand 180°c temp. c) S.S. feed & discharge chute. d) VFD drive with geared motor.	01 No.

	<ul style="list-style-type: none"> <li>e) S.S pump with duplex filter system to spread water on the product.</li> <li>f) PLC Controlled Pneumatically operated solenoid valve assembly with temperature controller.</li> <li>g) Steam Spray Nozzle Assembly Placed Under the Belt.</li> <li>h) PLC with touch screen to control Speed of belt &amp; temperature.</li> </ul>		
16.	<p><b>BELT TYPE AFTER COOLER</b></p> <p>Capacity - 2000 Kgs /hr.</p> <p>Suitable for cooling of product up to 15 c provided feeded by water of temp. 7c.</p> <p>The equipment consists of :-</p> <ul style="list-style-type: none"> <li>a) Modular belt with counter flow arrangement</li> <li>b) S.S. centrifugal pump two nos. with two nos. S.S. balance tanks with filters.</li> <li>c) S.S. pipeline upto tanks.</li> <li>d) Level adjuster for water &amp; temperature gauges at two points.</li> <li>e) SS flume of suitable length for 1st stage cooling.</li> </ul>	01 No.	
17.	<p><b>DEWATERING CONVEYOR</b></p> <p>Capacity - 2000 Kgs /hr.</p> <p>Suitable for removing water from the surface of product. The equipment consists of :-</p> <ul style="list-style-type: none"> <li>a) S.S. frame with S.S. guides &amp; supports.</li> <li>b) S.S. Hooper for collecting &amp; drain water.</li> <li>c) S.S box frame for three no. fans mounted on conveyor.</li> <li>d) Fixed speed drive with geared motor.</li> </ul>	01 No.	
18.	<p><b>DEWATERING SHAKER</b></p> <p>Capacity - 2000 Kgs /hr.</p> <p>Suitable for removing water from the surface of product. The equipment consists of :-</p> <ul style="list-style-type: none"> <li>a) S.S slotted tray with S.S. guides &amp; supports.</li> <li>b) S.S hooper for collecting waste &amp; drain water.</li> <li>c) S.S framework with rosta springs.</li> <li>d) Fixed speed drive with vibratory motors.</li> </ul>	01 No.	

19.	<b>INSPECTION CONVEYOR</b> Capacity - 2000 Kgs /hr.  Suitable for manual inspection of product. The equipment consists of:- <ul style="list-style-type: none"> <li>a) PVC coated food grade endless belt (imported).</li> <li>b) Side guides, rollers, framework will be from S.S.</li> <li>c) Fixed speed drive with geared motor with S.S. plate &amp; motor cover.</li> </ul>	01 No.	
20.	<b>ELEVATOR FOR IQF</b> Capacity - 2000 Kgs Of grains /hr.  Suitable for carrying the product to IQF. The equipment consists of :- <ul style="list-style-type: none"> <li>a) S.S. 304 framework with support.</li> <li>b) Perforated buckets with side guards at both sides.</li> <li>c) Sprockets with S.S. shaft &amp; bearings for driving buckets.</li> <li>d) Fixed speed drive with geared motor.</li> </ul>	01 No.	
21.	Electrical Panel with Cabling, Internal Pipe Lining & All Electrical Fixtures which include all Lighting and Switches As Required.	01 No.	
22.	1 TPH BOILER	01 No.	

## **SECTION-B**

### **TECHNICAL SPECIFICATION FOR IQF**

Design Conditions:

1	Infeed Temperature	+15°C
2	Discharge Temperature	-18°C Equilibrated
3	Evaporating Temperature	-38°C
4	Electrical Characteristics	AC400V, 3ph, 50Hz

Performance:

<u>Products</u>	<u>Freezing Capacity</u>	<u>Refrigeration Requirement</u>
Peas*	2,000 kg/hr	320 KW

\*For other crops as well

### Freezer Technical Data:

1	Belt Type	C2060H SS304
2	Belt Width	1280 mm
3	Retention Time	Various mins.
4	Maximum Product Clearance	150 mm
5	Refrigerant/Feed	R717 Ammonia Pumped 4:1
6	MCC Power Required	60 kW
7	Coil Defrost Water	50 m <sup>3</sup> /h @ 2 bars & 25°C Shift Water Defrost
8	Belt Washer	25 m <sup>3</sup> /h @ 2 bars & 25°C Intermittent
9	Motor Horsepower	• Fan Motors: 4 x 11 kW
		• Belt Drives: 2x 1.1 kW
		• Vibrators: 5 x 1.1 kW
		• Belt Blower: 1 x 3 kW
		[7]

### SECTION - C (2 TPH IQF REFRIGERATION and 4000 MT Frozen Store)

#### BASIS OF DESIGN

##### **1. IQF**

Product	:	Green Peas
Capacity	:	2 MT/Hr.
Infeed Temp.	:	10°C
Discharge Temp.	:	(-) 18°C
Evap. Temp.	:	(-) 40°C
Cooling Load	:	91 TR

##### **2. Water Chiller**

Product	:	Green Peas
Water Flow Rate	:	6000 LPH
Water Inlet Temp.	:	30°C
Water Outlet Temp.	:	2°C
Cooling Load	:	56 TR

##### **3. Frozen Cold Store 1 - 8**

Product	:	Frozen Fruit & Veg
Storage Capacity	:	500 MT
Daily Loading	:	32 Ton/Day/Chamber
No. of Rooms	:	04
Room Dimension	:	21 x 12 x 8.5 m H
Product Inlet Temp.	:	(-) 15°C
Room Temperature	:	(-) 20°C
Cooling Load	:	12 TR Each

#### 4. Ante Rooms

No. of Ante Rooms	:	1
Room Dimension	:	48 x 4 x 8.5 m H
Room Temperature	:	0 - 5°C
Cooling Load	:	7.6 TR

#### TECHNICAL SPECIFICATIONS FOR REFRIGERATION SYSTEM

Sr. No.	Description	QTY
<b>SCREW COMPRESSOR PACKAGE FOR IQF</b>		
1.	Ammonia operated screw package unit incorporating compressor block coupled to an electric motor and mounted on a common steel base frame, piped, wired and factory tested.	01 No.
	Saturated suction temp.	: (-) 38°C
	Intermediate Temp.	: (-) 5°C
	Cooling capacity	: 96.81 TR
	Absorbed power	: 102.55 HP

The screw package shall comprise of the following: -

- Capacity control: 10-100% step less control with hydraulically controlled slide valve
- Lubrication System: Forced Lubrication
- Oil Separator: Three step oil separation with coalescer horizontal oil separator.
- Oil Cooler system: Thermosyphone oil cooler
- Oil filter: Double oil filter with cleanable stainless steel 300 mesh oil filter element
- Suction filter: Suction gas filter with stainless steel mesh gas filter element
- Safety Relief Valve: Dual
- Compressor Control Panel: India PLC Panel
- Suction and discharge Check valves

2. ABB/ Siemens make 120 HP, 2-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply.
- 
- |    |  |        |
|----|--|--------|
| 1. | Danfoss/ Schneider / Equiv. make VFD for the above motor | 01 No. |
| 2. | Priority Vessel with all necessary valve & fittings.     | 01 No. |

## **Technical Specification**

### **PUF Panel**

PUF insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. **The PUF density to be  $40 \pm 2 \text{ Kg /m}^3$ . The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints** The thermal conductivity of PUF to be  $(0.023 \pm 5\%) \text{ w/m}^2\text{K}$ . For PUF Insulated panel thickness.

### **Panel Fixing Accessories**

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspensionssystem for ceiling panel support

### **Floor Insulation with PUF Sheets**

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer. The density of PUF Sheet to be  $40 \pm 2 \text{ Kg /m}^3$ . The supply includes sufficient quantityof vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

### **Hinged door**

Hinged Doors comprising Door Shutter cladded on both sides with 0.5mm thick (tct) plain pre -painted GI sheet in Off- white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable

### **Motorized / Manual Horizontal Sliding Doors**

Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter clad on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced door-frame and be fitted with EPDM gasket suitable sliding arrangement

#### **PVC STRIP CURTAINS**

PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

#### **Pressure relief Valve**

The walls and ceilings of cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves makes it possible to balance internal and external pressure, through venting

#### **IQF – FROZEN STORE**

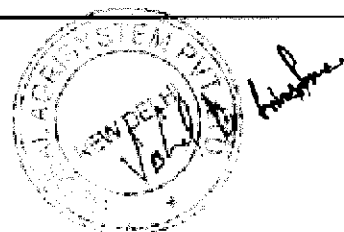
<b>A</b>	<b>Supply of Items:</b>	<b>Unit</b>	<b>Qty</b>	<b>Unit Rate</b>	<b>Amount</b>
<b>1.0</b>	<b>Supply of PUF insulated Composite wall and ceiling panels</b>				
1.1	120 mm Thick PUF Panel for wall and ceiling in Cold Store	Sq. m	6,055.00		
1.2	60 mm Thick PUF Panel for ceiling in IQF Area	Sq. m	880.00		
2.0	Manual Sliding Door of Size 1500 mm x 2100 mm x 120 mm thick	Nos.	9		
3.0	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tar-felt, bitumen and Polythene Sheets				
3.1	120 mm thick without Ante room	Sq. m	2110		
4.0	Panel Fixing Accessories comprising:				
4.1	Sealant, pop rivets and flashings, PUF Chemicals, Aluminum tee only.	Sq. m	6055		
4.2	Pressure Relief Valve	Nos.	16		
4.3	PVC Strip Curtains for Doors	Nos.	9		
5.0	Installation				
5.1	Installation of Panels	Sq. m	6055		
5.2	Installation of Floor Insulation	Sq. m	2110		
5.3	Installation of Hinged Door	Nos.	9		

**PRICE SCHEDULE Include (Design, Supply, Installation, commissioning, Trail run)**

#### **INCLUSIONS**

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation.

**Design, Supply, Installation, Testing, Commissioning of Plant  
& Machineries including Puff Panel works and Stacking  
Arrangements for Potato Cold Storage-3000 MT and the  
packhouse for Potato capacity 2MT/Hr.**



## BASIS OF DESIGN

## BASIS OF DESIGN

### 1. Cold Store 1 - 2

Product	:	Potato
Storage Capacity per chamber	:	1500MT
Daily Loading	:	75 Ton/Day/Chamber
No. of Rooms	:	02
Room Dimension	:	24 x 18 x 12 m H
Product Inlet Temp.	:	25°C
Room Temperature	:	2°C
Relative Humidity	:	85 - 90%
Cooling Load	:	26 TR Each

## SECTION A

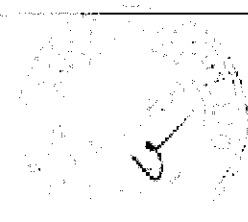
### TECHNICAL SPECIFICATIONS FOR REFRIGERATION SYSTEM

Design, Supply, Installation, Testing, Commissioning of Plant & Machineries including Puff Panel works and Stacking Arrangements for Potato Cold Storage-3000 MT

<u>S. No.</u>	<u>Description</u>	<u>Unit</u>	<u>Qty.</u>	<u>Unit Rate</u>	<u>Amount</u>
<b>1</b>	<b>High Stage Compressor For Cold Store</b> <u>high speed single stage multi cylinder reciprocating ammonia compressor, complete with Driver accessories comprising of coupling and coupling guard, Safety valve, Oil sight glass, Suction and Discharge valves, tools, wrenches &amp; foundation bolts &amp; gauge cum control panel and capacity control arrangement, ammonia head &amp; oil cooling and skid mounting.</u> <u>Intermediate Temp. : (-) 5°C</u> <u>Condensing Temp. : 38°C</u> <u>Capacity : 55 TR</u> <u>Power Consumed : 63 BHP</u> <u>Rpm : 960</u> - -	<b>Nos.</b>	<b>1.00</b>		
<b>2</b>	<b>cyclone type oil separator flanged connections with companion flanges and oil drain valve.</b>	<b>Nos.</b>	<b>1.00</b>		
<b>3</b>	<b>ABB/ Siemens make 75 HP, 4-pole, IE2, IP 55, Class F</b>	<b>Nos.</b>	<b>1.00</b>		



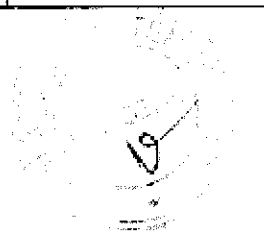
	<u>Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor.</u>				
<u>4</u>	<u>L&amp;T/ Equiv make star delta starter for the above motors.</u>	<u>Nos.</u>	<u>1.00</u>		
<u>5</u>	<u>High Stage Compressor For Cold Store</u>  <u>high speed single stage multi cylinder reciprocating ammonia compressor, complete with Fly-wheel, Safety valve, Oil sight glass, Suction and Discharge valves, Driver accessories comprising of motor pulley, V-belts and belt guard, tools, wrenches &amp; foundation bolts &amp; gauge cum control panel and capacity control arrangement, ammonia head &amp; oil cooling and skid mounting.</u>  <u>Intermediate Temp. : (-) 5°C</u> <u>Condensing Temp. : 38°C</u> <u>Capacity : 28 TR</u> <u>Power Consumed : 33 BHP</u> <u>Rpm : 960</u>	<u>Nos.</u>	<u>1.00</u>		
<u>6</u>	<u>cyclone type oil separator flanged connections with companion flanges and oil drain valve.</u>	<u>Nos.</u>	<u>1.00</u>		
<u>7</u>	<u>ABB/ Siemens make 40 HP, 4-pole, IE2, IP 55, Class F Insulation, Ambient 50°C, IMB3 mount, TEFC Sq. Cage induction motor suitable for electric supply of 3ph x 415V x 50HZ, AC supply with slide rails for compressor</u>	<u>Nos.</u>	<u>1.00</u>		
<u>8</u>	<u>L&amp;T/ Equiv make star delta starter for the above motors.</u>	<u>Nos.</u>	<u>1.00</u>		
<u>9</u>	<u>ammonia receiver of size 20" Dia. x 16' Long constructed with Liquid Inlet And outlet valves, safety valve, charging valve, drain valve, Purge valve, pressure gauge and gauge glass with valves.</u>	<u>Nos.</u>	<u>1.00</u>		
<u>10</u>	<u>LP Receiver For Cold Store</u>	<u>Nos.</u>	<u>1.00</u>		



	<u>ammonia low pressure receiver 42" dia x 12' Long constructed with liquid Inlet &amp; outlet valves, safety valve, gauge glass with valves, pressure gauge with valve saddle supports, and pump out connection with valve. Also incorporating all the nozzles and valves for easy connection with ACU's and suction - discharged lines</u>				
11	<u>hermetically sealed liquid ammonia pump for ammonia recirculation with motor and accessories comprising of suction strainer, suction and discharge valves, check valve.</u>	<u>Nos.</u>	<u>2.00</u>		
12	<u>Set of Danfoss /Manik make controls for liquid re-circulation system comprising of:</u> <u>Electronic Float switch : 03 Nos. Pressure Differential Controller : 02 Nos. Differential Pressure Regulating Valve : 01 No. Liquid line solenoid valve : 01 No.</u> <u>Frost-free gauge glass : 01 No.</u>	<u>Nos.</u>	<u>1.00</u>		
13	<u>wall mounted / ceiling suspended frigid coil air Cooling unit complete with SS Tubes &amp; AL finned cooling coil. Total GI enclosure, drain pan, axial flow fan with motor, water defrost arrangement etc.</u> <u>Cold Store 1 – 2</u> <u>Capacity : 7 TR @5°C No. of Coil :</u> <u>05 Nos. Each</u>	<u>Nos.</u>	<u>10.00</u>		
14	<u>Set of Danfoss /Manik make Controls for Coil:</u> <u>Liquid line solenoid valve</u> <u>Digital Temp. Indicator cum controller</u>	<u>Nos.</u>	<u>2.00</u>		
15	<u>M/S 'C' class refrigerant pipes, pipe fittings and ammonia valves to interconnect above equipment in the system comprising of suction, discharge, liquid and oil lines as per PID and based on compact plant layout.</u>	<u>Lot.</u>	<u>1.00</u>		



16	<u>G.I 'B' class pipes, pipefitting and valves for condenser make up water, cylinder head cooling defrost and drain line piping as per PID and based on assumption that condenser shall be placed at a distance have not more than 10 m from the plant room</u>	<u>Lot.</u>	<u>1.00</u>	
17	<u>PUF insulation for accumulators/vessel, suction line, liquid lines and wet return lines with fixing material bitumen/ CPRX compound and aluminum cladding of 26G with in battery limit.</u>	<u>Lot.</u>	<u>1.00</u>	
18	<u>Structural Material for pipe installation and plat form Piping support to be fabricated and installed at site with steel channel and steel angle distance between the supports to be Approx. 5 meters, with variance depend on the building condition.</u>	<u>Lot.</u>	<u>1.00</u>	
19	<u>MCC panel will be cubical type switchboard with bus bar, Incoming ACB, indicating lamps, push buttons, switches, fuses, voltmeters, Voltmeter switch, ammeters, ammeters switch and starter for</u>  <u>a) compressors motor,</u> <u>b) condenser fan motor &amp; pump,</u> <u>c) Cooling coil fan motor,</u>	<u>Lot.</u>	<u>1.00</u>	
20	<u>Power &amp; Control cabling with cable tray for complete refrigeration plant.</u>	<u>Lot</u>	<u>1.00</u>	
21	<u>manual gas purger with safety valve for purging non- condensable Gases from the system.</u>	<u>Lot</u>	<u>1.00</u>	



<b>22</b>	<b>First charge of ammonia gas and lubricant compressor oil.</b>	<b>Lot</b>	<b>1.00</b>		
<b>23</b>	<b>Installation, Testing &amp; Commissioning of the complete refrigeration plant and putting in operation. Our scope is as follows:</b>  - Erection of the equipment as per our layout with proper operation and alignment - Connecting various equipment's with pipelines, fittings, controls and instruments - Painting of Equipment & Piping - Pressure testing, charging of gas and commissioning of the plant.	<b>Job</b>	<b>1.00</b>		
<b>25</b>	<b>ALL ELECTRICAL FIXTURES INCLUDE ALL SWITCHES AND lighting AS REQUIRED -Complete Facility for Cold Storage and Packhouse.</b>	<b>Lot</b>	<b>1.00</b>		
<b>26</b>	<b>Dock leveller of platform with hinged lip made of profile and anti-slip steel. Pairs of super bumpers with heavy steel support. Hydraulic power pack suitable for p load of 40 tones as defined by EN 1398.</b>	<b>Nos.</b>	<b>1.00</b>		
<b>27</b>	<b>Stacking Arrangement</b>	-	-		
<b>A</b>	<b>Lot of MS Material for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material</b>	<b>Kg (Approx)</b>	<b>250000.00</b>		
<b>B</b>	<b>Lot of Labor Job for MS structure for Floor loading in each room made from MS Square Pipes, MS 'I' Beam, MS 'C' channel, MS Angle, MS Plate and other MS material which is fabricated at site will all consumables like Electric Rod and Gas with labor job for painting. All MS material, Redoxide and Color which is required will be supplied by Vendor</b>	<b>Kg (Approx)</b>	<b>250000.00</b>		
<b>C</b>	<b>Wooden batten required for Wooden Flooring with accessories like strip and nails including installation.</b>	<b>Nos (Approx)</b>	<b>140000.00</b>		
<b>D</b>	<b>Wooden Planks required for staircase inside the cold room with fixing material</b>	<b>Nos.</b>	<b>90.00</b>		



E	COLOR AND PRIMER MATERIAL FOR STEEL STRUCTURE	Lot	1.00		
-	-	-	-		
28	PUF Panel & Doors	-	-		
-	-	-	-		
A	-	-	-		
1	Supply of PUF Insulated Composite wall and ceiling panels.	-	-		
1.1	100 mm Thick PUF Panel for wall and ceiling in Cold Store	Sq.m	3230		
2	Hinged Door of Size 1200 mm x 2100 mm x 80 mm thick	Nos.	2		
3	Floor Insulation with PUF Sheets in single layer. PUF Density will be $40 \pm 2$ kg/cum with vapour barrier i.e., tarfelt, bitumen and Polythene Sheets	-	-		
3.1	100 mm thick	Sq.m	998		
4	Panel Fixing Accessories comprising:	-	-		
4.1	Sealant, pop rivets and flashings, PUF Chemicals, Aluminum tee only.	Sq.m	3230		
4.2	PVC Strip Curtains for Doors	Nos.	2		
5	Installation	-	-		
5.1	Installation of Panels	Sq.m.	3230		
5.2	Installation of Floor Insulation	Sq.m.	998		
5.3	Installation of Hinged Door	Nos.	2		
6	Freight	Nos.	1		
-	-	-	-		
31	Civil work for Machineries	-	-		
-	-	-	-		
-	Total	-	-	-	₹
-	GST@18%	-	-	-	₹
-	Grand Total	-	-	-	₹
-	-	-	-	-	-

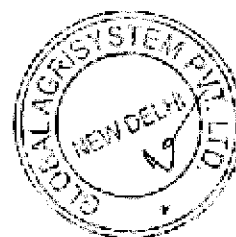
### Technical Specification

#### PUF Panel

PUF insulated (PUR) panels to be cladded on both sides with 0.5 mm thick (TCT) light profiled pre painted GI sheet in off white colour (RAL 9002); 120 gsm; RMP. The PUF density to be  $40 \pm 2$  Kg /m<sup>3</sup>. The panels to be provided with Cam lock and tongue & Groove jointing system for leak proof joints. The thermal conductivity of PUF to be  $(0.023 \pm 5\%)$  w/m<sup>2</sup>.k. For PUF Insulated panel thickness.

#### Panel Fixing Accessories

Panel fixing accessories comprise of plain pre – painted GI Sheet corner flashing, Sealant, Pop Rivets and aluminum / PCGI Sheet angles. Aluminum Tee with suspension system for ceiling panel support



#### **Floor Insulation with PUF Sheets**

The Floor Insulation to be with PUF Sheets conforming to IS: 4671-1984, in double/single layer. The density of PUF Sheet to be  $40 \pm 2 \text{ Kg /m}^3$ . The supply includes sufficient quantity of vapor barrier such as tar-felt, polythene sheet and blown bitumen of 85/25 Grade. The floor insulation to be laid as per IS: 661-1974

#### **Hinged door**

Hinged Doors comprising Door Shutter cladded on both sides with 0.5mm thick (tct) plain pre-painted GI sheet in Off- white colour. Door to be fitted with standard door fittings comprising Hinges, Locking Arrangement with Emergency Push Rod, and Gasket suitable.

#### **Motorized Horizontal Sliding Doors**

Motorized / Manually Operated Horizontal Sliding Doors to be complete with sliding rail, door shutter cladded on all sides with 0.6 mm thick Pre-painted GI Sheet, PVC reinforced doorframe and be fitted with EPDM gasket suitable sliding arrangement.

#### **PVC STRIP CURTAINS**

PVC strip curtains required to maintain Cold Storage Temp. & Hygienic Environment by Restricting Insect, Dust & Hot Air. Creates Dust Free & Clean Environment Inside cold rooms, process area etc.

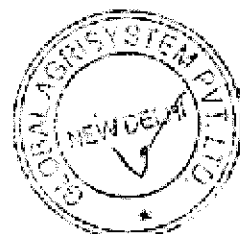
#### **Pressure relief Valve**

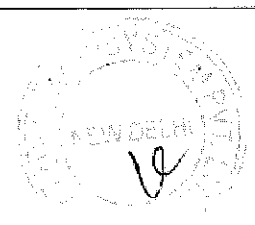
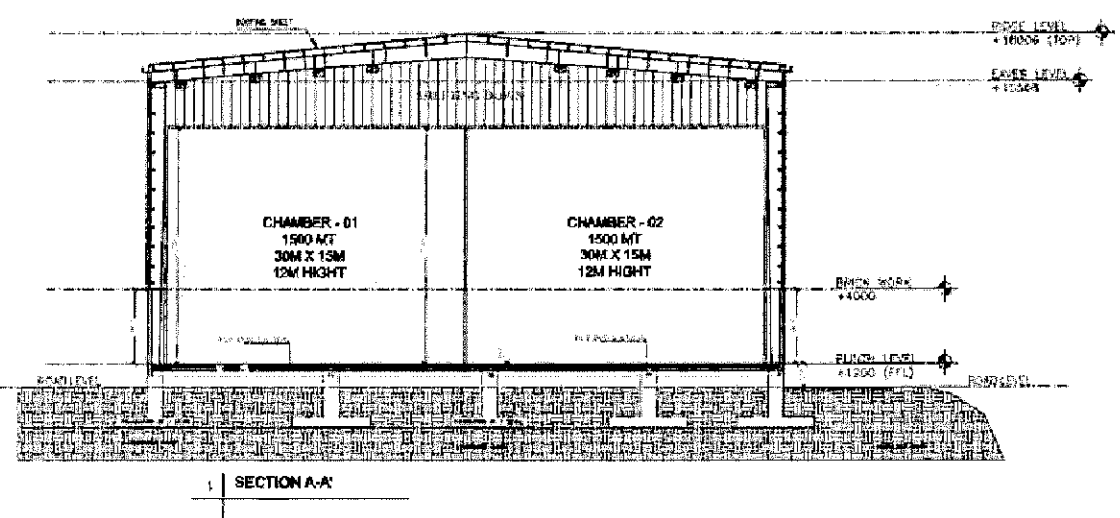
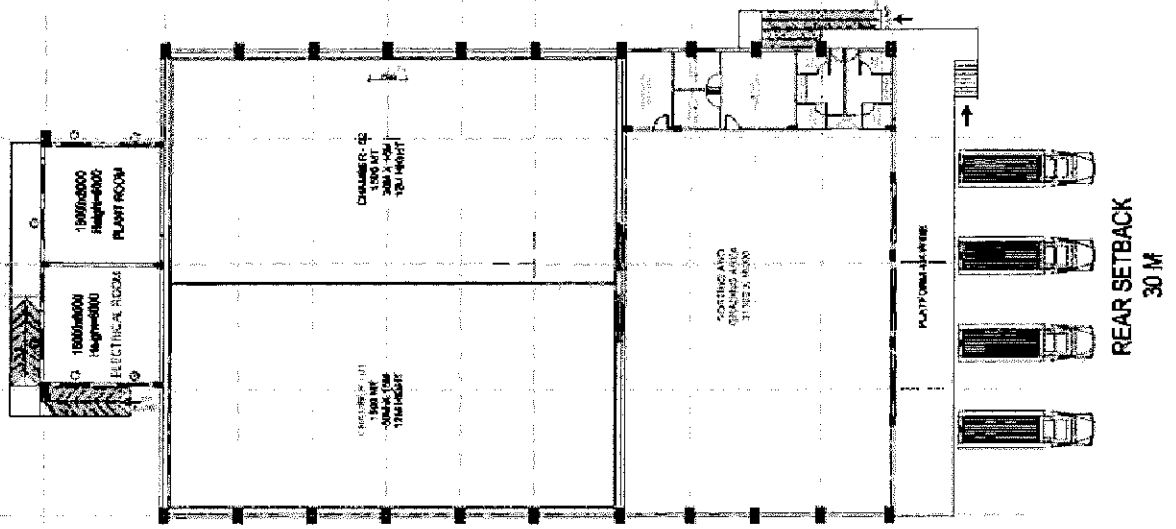
The walls and ceilings of cold rooms are constantly subjected to strains variations came by pressure variations, either from inside and from outside. The FERMOD valves make it possible to balance internal and external pressure, through venting.

**PRICE SCHEDULE: Include (Design, Supply, Installation, commissioning, Trail run & AMC)**

#### **INCLUSIONS**

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation.



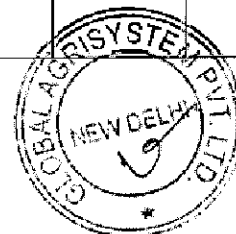


# SORTING, WASHING, DRYING & GRADING LINE CAP. 2 MTPH

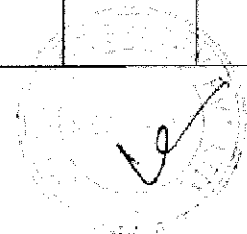
## **SECTION B**

### **TECHNICAL SPECIFICATIONS FOR SORTING, GRADING, WASHING AND PACKING.**

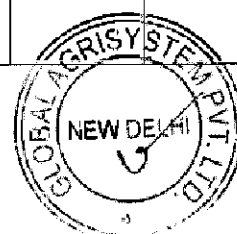
sorting Grading Line for Potato				
S. No.	Description	Qty.	Unit Rate	Amount
1	<b>BULK HOPPER</b>	1.00		
	This hopper is design to feed produce in Bulk quantity in processing line. It acts as buffer in grading. Arrangement provided for spreading produce across the conveyor.			
	The hopper is design in such a way that it can be fed by trolley on big bags.			



	<p>We provide suitable inclination to the machine so that flow rate is always even.</p> <p>Length : 7500 mm Width : 3000 mm Power : 10 HP, 3 Ph</p>			
2	<p><b>SOIL REMOVER</b></p> <p>This machine is mounted with bulk hopper. It is most efficient &amp; gentle way of pre-cleaning. SS Rollers are designed in such a way to take out loose dirt and loose skin. This machine enhance the capacity of the line and reduce the soil particle to go into the other machines.</p> <p>Length : 1500 mm Width : 1200-1400 mm Power : 1.5 HP, 3 Ph</p>	1.00		
3	<p><b>WATER DUMPING TANK</b></p> <p>Consisting of UHMWPE Belt conveyor. Contact parts made of stainless steel and structure, pipelines also stainless steel. The products will be dumped into wet hopper. Water will soften surface soil of produce. Water jets moves product up to belt conveyer and further conveyed with the help of clit type Belt conveyor.</p> <p>Sprinkler/water jet arrangement will be provided on the top of the moving products by a water pump and pipelines. Water will be sprayed on the products while they move forward slowly. This washing process is automatic only the machine should be connected with a constant water supply point.</p> <p>Length : 4300 mm.</p> <p>Width : 600 mm of Belt Width Motor Power : 2 HP. 3 PH</p> <p>Pump power : 3HP.1PH</p> <p>M.O.C : All Material in SS 304,Structure</p> <p>pipe will be in M.S.Length : 4300 mm.</p> <p>Width : 600 mm of Belt Width Motor Power : 2 HP. 3 PH</p> <p>Pump power : 3HP.1PH</p> <p>M.O.C : All Material in SS 304,Structure</p> <p>pipe will be in M.S.</p>	1.00		
4	<p><b>DRUM WASHER</b></p> <p>It consist of rotary drum.</p> <p>Produce is fed into the drum washer and is washed as it travels through rotating drum. High pressure spray jet provided inside the drum to remove debris (dirt, mud, cut piece) from ginger.</p>	1.00		



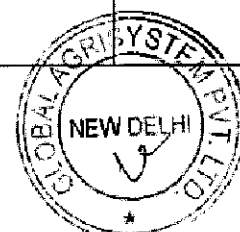
	<p>It effectively and gently washes produce while removing soil, mud and stones.</p> <p>Debris (soil, mud, leaves) are collected in the Tank underneath the drum. Discharge valve regularly clean mud &amp; other impurities.</p> <p>Outfeed (inbuilt) elevator transfers produce to the next machine.</p> <p>MOC : SS304</p> <p>Length : 3000 mm Width : 1500 mm</p> <p>Power : 8HP, 3 Ph</p>			
5	BY PASS CONVEYOR Length : 3500-4000 mm Width : 900 mm	1.00		
6	<p>POLISHER</p> <p>It is a rotary drum with inbuilt row of nylon brusher. 1 No. Rs. 18,70,000 1,870,000.00</p> <p>Produce enter through infeed chute directly from previous machine. Two water pipes spray fresh water on the produce as it travels in linear direction towards outlet window.</p> <p>At the outlet produce slides down through spout with zero drop position for smooth transition to down stream equipment.</p> <p>Water tank provided at bottom for collection of water. Length : 1800-2000 mm Width : 1200-1500 mm</p> <p>Power : 10 HP 3 Ph for motors 2 HP 1 Ph for pump</p>	1.00		
7	<p>FEED ELEVATOR</p> <p>MOC: G.I. Sheet &amp; M.S. Pipe Conveyor Length: 2500-3000 mm Conveyor Width: 600 mm</p> <p>Powered by: 1 HP, 3 Ph geared motor</p> <p>The products will be dumped manually on the hopper. The hopper is designed in such a way that all the load of the products gets centralized at the entrance of the belt. The belt elevated the products to the required height.</p>	1.00		
8	<p>DRYING SECTION</p> <p>This machine comprises of Aluminium Rollers on which the products are conveyed after being washed. Structure of mild steel. Contact parts made up of food graded materials. Complete with air circulating fan.</p>	1.00		



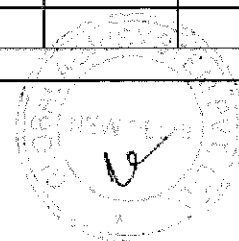
	Length: 3500-4000 mm Width : 800 mm of roller Power: 2 HP 3 Ph.			
9	<b>SORTING TABLE</b> Consisting of PVC rollers. On the sorting section, rollers will move on their own axis & at the same time shall move forward. These rollers will carry the products forward. The workers standing on both sides of the machine will sort out the damaged or rotten products and will take those products out of the machine. Frame is made up of M.S. Length :3000-3500 mm. Width :910 mm of roller Power :1H.P, 3 Ph	1.00		
10	<b>SCREEN SIZER WITH COLLECTION BELT</b> The sizer is fitted with vibrating rubber screens with perforations on its surface. The width of the rubber belt is 90 cm. No of grades: 2+1 oversize The graded products will be collected through collection belts. Shaker assembly is fitted to vibrate the screen. Greater grading efficiency than other types of graders due to the orientation of the products on the screens. For each module: Length: 1800 mm (approx). Width: 1400 mm Power: 1.5 H.P The conveyor will be fitted under the grading screen for the collection of the graded products. Length: 2400 mm Width: 600 mm Power: 0.5 H.P	2.00		
11	<b>OVERSIZE COLLECTION BELT</b> Consisting of PVC food grade belt having side guide at the both side at bottom. The conveyor will be fitted under the grading screen for the collection of the graded products. Length: 2400 mm Width: 600 mm of belt Power: 0.5 H.P	1.00		
12	<b>SINGLE HEAD WEIGHER &amp; BAGGER</b> Suitable for weighing bags for free flowing commodity. Capacity: 2-5 TPH Capacity: 2-5 TPH Accuracy: +- 200-250gm Range: upto 20-50kg bags/crate.	1		
	Manufactured with a double belt feed system. Crop is fed up in big hopper. At initial both belts are running. Main belt stop before the target weight. Now narrower belt			



	feed the bag to achieve target weight.			
	Once the target weight is reached, we need to replace the bag with the help of clamp. Adjustable platform provided.			
	Whole system will control through PLC programming & servo motors.			
13	<b>ELECTRIC CONTROL PANEL (PLC BASED)</b> The motor control panel will be equipped with an incoming supply ON/OFF switch along with VAF meter. All motor starters will be provided with short circuit and overload protection. The DOL, SD, Soft starter and VFD will be given as per machine requirements. Also 2nos. 6/16A sockets of 230V AC will be provided for ancillary equipments, lights etc. See the following for detailed features: a) Motor Overload Protection b) Motor Short Circuit Protection c) Door Interlocking d) Emergency Stop e) Fuse Protection at starters control f) Motor Status (ON/Trip Indication) g) Supply Indication h) FRLS Wire i) Supply Fault Indication j) Control Supply Healthy Indication k) Isolated Control Supply l) Supply Metering m) Panel Light n) Under & Over Voltage Protection o) Single & Reverse Phase Protection p) Thermostat Controlled Panel Fan	1.00		
14	<b>ERECTION &amp; COMMISSIONING CHARGES SUPPLIER SCOPE (AGROSAW)</b> 1.Assembly & Erection of Equipment. 2. To arrange unskilled labour and masons required for assembly & erection of plant. 3. To arrange crane, fork lift, chain block, floor breaker, hammer drill, welding machine & any other heavy tool. 4. Electrical connection to all equipment from the supplied electrical control panel. Electric control panel shall be installed at maximum distance up to 5m from the machine, distance beyond 5m shall be to the customer account, laying of cables shall be under ground in PVC pipes.	1.00		



6. To provide electric cables, electric items required for electrification of complete plant.			
7. Commissioning & Trial of machines with the product.			
8. Training to user's staff for proper maintenance, adjustment & operation of the machine.			
<b>CUSTOMER/PURCHASER SCOPE</b>			
1. To unload & to transport the equipment from unloading point to installation site.			
2. Proper building & space for installation & commissioning of the machines/plants & any other civil work beyond supplier scope.			
3. Electric cables from main grid to main control panel of the plant with proper earthing.			
4. Facility to work at site after office hours/holidays, if required.			
5..To provide warehouse to store equipment which need protection from bad weather conditions & thefts etc.			
6. To arrange electric connection at site to run tools & equipment required for installation & commissioning of the project.			
7. To arrange water for civil works & safe drinking water for work force to be engaged to install & commission the project. 8.To provide fruits/vegetables for trial purpose.			
9. Licenses, permissions & necessary authorization for installation if required.			
10. To arrange operator/Responsible Person for Operational/Maintenance works.			
11. If customer wants cable to be laid on cable trays and or in trenches then expenditure on this shall be to customer account.			
12. To arrange widening of gate height & width for machine to enter in the building & after machines are shifted inside godown, then customer shall arrange the repair at his cost.			
13. Noise reducing system, Firefighting, General Electric installation, Work contract tax is in the scope of the customer.			
<b>Total</b>			
<b>GST@18%</b>			
<b>Grand Total</b>			



**PRICE SCHEDULE: Include (Design, Supply, Installation, commissioning, Trail run)**

**INCLUSIONS**

- Road crossing bridge and primary support (interconnection of rafter for piping and hanging for air cooling unit) for plant room, cold room and process area.
- All masonry work such as foundations for equipment, cutting and making good of holes in the walls, structural supports, plastering and flooring work etc.
- Make up water connection and drain piping Inside the Frozen/Chiller Store
- Unloading, shifting of equipment at site and transportation.

**Note: LOT Details-** This is the estimated quantity and the bidders are requested to visit the site and check the drawings before submission.

