



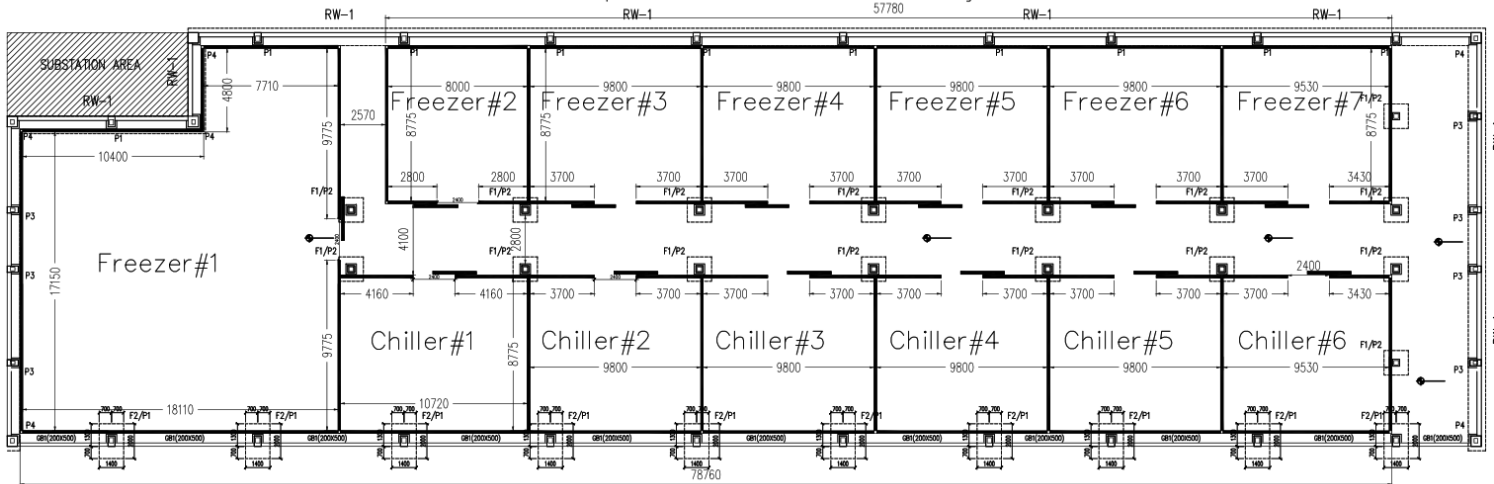
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**PROJECT: DESIGN, SUPPLY, AND INSTALLATION OF COLD ROOMS
(NAFCO)**

Technical & Commercial Proposal

Proposed New Cold Stores Layout



M/s IB QATAR

Attn: Eng. Sarfraz

E-Mail: sarfraz@ibqatar.com

Subject: Technical & Commercial Proposal- NAFCO COLD STORES

Dear Sir,

With reference to your inquiry, and further to the Drawings, we are glad to submit our proposal for the following categories based on **Design, Supply, Installation, Testing & Commissioning** for the following:

- 1) FREEZER & Chiller rooms
- 2) Insulated Cold Store Sandwich Panels **PUR**
- 3) Manual Sliding Doors
- 4) Floor Insulation (XPS Polystyrene)
- 5) Temperature Monitoring System.

We remain at your disposal for any clarifications.

Metri Engineering Services



TABLE OF CONTENTS

1- General Description:	4
2- Commercial Offer	5
3-Technical Submittal	7
A.INSULATED PANELS AND DOORS;.....	7
B.REFRIGERATION SYSTEM	9
Freezer Rooms:	9
Chiller Rooms:	9
C. HEAT LOAD CALCULATIONS & TECHNICAL SELECTION	10
D. SUMMARY OF EQUIPMENT SELECTION	11
Option I: Independent Refrigeration System for each room.....	11
E. ELECTRICAL AND MONITORING SYSTEM:	11
F. COLD STORES LAYOUT	12

1- General Description:

Design, Supply & Installation of 13 nos. pre-insulated cold rooms (**7 Freezer Rooms -18°C**) & (**6 Chiller Rooms 0°C→12°C**) as per the attached layout all using friendly Refrigerants R404A, R134A. The cold stores will be monitored via a monitoring system which gives the client complete reporting on each cold room status with alarming & notification functions to e-mail & mobile app push notification. Each cold room will have its own control panel which is explained in the technical section.

Proposed Refrigeration Systems:-

Option I: Independent refrigeration system for each cold room. Each room will be served by independent refrigeration circuit consisting of 1 No. Condensing Unit made by COPELAND or BITZER or DORIN & 1 No. Evaporator made by KELVION or Searle or Guntner or THERMOWAY. Except Freezer room#1 which will be served by 4nos. condensing units & 4nos. evaporators.

2- Commercial Offer

**Lump sum price for OPTION I= 2,600,000Q.R.
(Two Million Six Hundred Thousand Qatari Riyal)**

VALIDITY:

This offer shall be valid for a period of 30 days after which a reconfirmation of the price shall be required.

Erection Period:

6 month + 2 weeks mobilization

PAYMENT TERMS:

50% Down Payment

15% upon arrival of units to Qatar and before delivering to site

20% upon arrival of the sandwich panels when will be ready before delivery to site.

10% against installation

5% against testing and commissioning

WARRANTY:

400 days for the whole project from the date of commissioning whichever occurs first. The warranty is applicable for parts only and labor is chargeable by our service department as per standard rates. Warranty obligation will only start if all outstanding payments towards the contract is over. The warranty on replacement of spares against only manufacturing defects (Not the defects caused due to malfunctioning, improper use, not to follow up as per the maintenance schedule, etc)

EXCLUSIONS:-

Our delivery includes only the equipment and service as specified above,
The following works are excluded from our scope of works and shall be carried out by main contractor

- 1) All types of civil/builders work (major or minor) including but not limited to the concrete / steel foundations, breaking and making good of all openings in the walls/ceiling slabs, grouting, providing sleeves/ducts, excavation, cutting of concrete, back filling, painting, carpentry, warring tapes, etc.
- 2) Any Electrical Works.
- 3) Any type of false ceiling works, removing existing ones, cutting, etc.
- 4) The cost of providing insurance. If required, our contract will be covered under the Main Contract Insurance Policy.
- 5) Leveled floor and a shed for the erection of the cold room, etc
- 6) Top concrete slab over floor insulation
- 7) Shelving or racking.
- 8) Ventilation piping & top concrete slab over floor insulation
- 9) Fire fighting & Fire alarm equipment.
- 10) Dock Doors, dock levelers and roll up doors.
- 11) Provision of incoming electrical supply & connection in our control panels.
- 12) Any local taxes or custom duties or insurance or any statutory fees for service connection.
- 13) Any manhole, soak away pit, grease trap etc.
- 14) Service platform to access the units and structural supports to suspend the evaporator units.
- 15) Structure for the condensers, steel protection bumpers for doors
- 16) Temporary power and water during erecting.
- 17) Any other item not specifically mentioned in this offer.

3-Technical Submittal

BASIS OF DESIGN

A.INSULATED PANELS AND DOORS;

EXTERNAL DIMENSIONS: 79600 x 23360 x 5850 mm high to be divided by partition into sixteen (16) rooms and a corridor as per the design drawings.

INSULATION : PUR Rigid injected CFC free Polyurethane foam.

OVERALL DENSITY : 40-42 Kg/m³

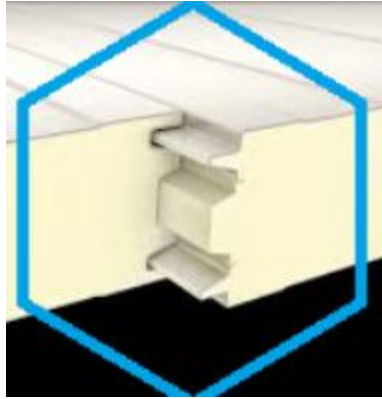
THICKNESS : 150 mm

CLADDING : 0.5 mm pre-painted GI sheets with nylon protective film

FIRE RATING :

Polyurethane Density (EN 1602)	40 (±2) kg/m ³
Polyurethane Thickness Thermal	50 - 75 - 100 – 150 - 200 mm
Conductivity (EN 13165)	0,022-0,024 W/mK
Dimensional Stability (EN 13165)	Level DS(TH) 11
Reaction to Fire (13501)	B. S2 . d0
Water Absorption (EN ISO 354)	By Volume 2% (168 hours)
Closed Cell Percentage (EN 14509)	95%
Vapour Diffusion Resistance (EN 12086)	30-100
Heat Resistance	-200 / +110 °C

CONSTRUCTION : Panels are joined together by means of tongue and Groove



FLOOR (by civil contractor): 2 x 50 mm thick Polystyrene boards by MES while

150 mm concreting and epoxy...etc by civil contractor. 1000 Gauge Black polythene sheet will be applied to the surface above the Insulation sheets. **(by civil contractor)**

SLIDING DOORS : Single leaf manual sliding doors will be provided
Size: 2000 x 2500 mm (h) → 13 Nos.

EXIT DOORS : Single leaf manual HINGED door will be provided
Size: 800 x 1900 mm (h) → 1 Nos.

DOOR ACCESSORIES : Doors have 120 mm thick and same finish as that of the walls and ceiling, complete with fittings and accessories including rubber gaskets, internal safety release handles, door heaters.

M/ ACCESSORIES : Will be provided including rivets, internal and external flashing, silicon & plastic buttons for camlocks.

CEILING : Ceiling will be self-supported.

B.REFRIGERATION SYSTEM

Basis of Design

Freezer Rooms:

- Room temperature (C°) : -18
- Room dimension (m) : AS PER DRAWING
- Product Load / Day (KG) :
 - FREEZER ROOM # 1 → 17000 KG
 - FREEZER ROOM # 2 → 9000 KG
 - FREEZER ROOM # 3,4,5,6,7 → 15000 KG
- Pull Down Time (Hr) : 24
- Product : General mixed products
- Product Entering Temp. (C°) : -15
- Ambient Temp. (C°) : 46 DB
- Refrigerant : R404A

Chiller Rooms:

- Room temperature (C°) : 0 → +12
- Room dimension (m) : AS PER DRAWING
- Product Load / Day (KG) :
 - CHILLER ROOM # 1 → 5000 KG
 - CHILLER ROOM # 2 → 7000 KG
 - CHILLER ROOM # 3,4,5,6 → 15000 KG
- Pull Down Time (Hr) : 24
- Product : Fruit, Vegetable, Juices (Packaged)
- Product Entering Temp. (C°) : +10
- Ambient Temp. (C°) : 46 DB
- Refrigerant : R134a

C. HEAT LOAD CALCULATIONS & TECHNICAL SELECTION

D. SUMMARY OF EQUIPMENT SELECTION

Option I: Independent Refrigeration System for each room

REF	Condensing Unit Model	QTY	Evaporator Model	QTY
	AIRCOOLED CU	-16-	MATCHING EVAP	-16-

Brands:

- 1) Air cooled Condensing Units (COPELAND, BITZER, DORIN)
- 2) EVaporators Units (KELVION, SEARLE, THERMOWAY, GUNTNER)

E. ELECTRICAL AND MONITORING SYSTEM:

CONTROL PANELS (Separate control panel for each room)

Enclosures with IP 44 protection

- Mains with rotary handle
- A main voltmeter with voltage selector switch
- An under voltage relay and earth leakage relay with visual and audible alarms
- Rail system and terminal strips with numbers and coded connected terminals
- MCB s for motors and controlling group
- Automatic star delta starters
- DOL starters
- Overload relay for all motor applications
- Indicators
- Cable entry and exit through the bottom (may vary as per the site requirement)
- All components are Schnieder Electrics or equal standards.
- There are a total of 16 Control Panels to cover each cold store independently.

CABLING DETAILS:

- All wiring of control panel will be done and delivered to site along with compressor units.
- Power Cabling, Cladding will be done from main control panel to the refrigeration equipment is the responsibility of the main contractor/electrical contractor.
- Cable ducts, Cable trays, junction boxes and other auxiliary materials are the responsibility of the main contractor/electrical contractor.

MONITORING SYSTEM:

- Monitoring system to store live readings of each room thermostat data with reporting/alarming function BY EMAIL AND PHONE PUSH NOTIFICATION.

F. COLD STORES LAYOUT

Proposed New Cold Stores Layout

